



# **T803**

## **Tone Remote And Alarm Interface**

### **Service Manual**

**Preliminary Issue**

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**M803-00-PRELIM**



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## About This Manual

<b>Scope</b>	This manual contains preliminary general, technical and servicing information on the T803 tone remote and alarm interface.
<b>PCB Information</b>	PCB information is provided for the T803 main and front panel PCBs, as well as for the associated T800-53-0000 rack frame backplane PCB. You will find the parts list, grid reference index (if necessary), PCB layouts and circuit diagram(s) for each individual PCB grouped together.
<b>Errors</b>	If you find an error in this manual, or have a suggestion on how it might be improved, please do not hesitate to contact Customer Support, Radio Systems Division, Tait Electronics Ltd, Christchurch, New Zealand (full contact details are on page 2).

## Updating Equipment And Manuals

In the interests of improving performance, reliability or servicing, Tait Electronics Ltd reserve the right to update their equipment and/or manuals without prior notice.

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## Ordering Tait Service Manuals

You can order additional copies of this service manual from your nearest Tait Dealer or Customer Service Organisation. When ordering, make sure you quote the correct Tait product code ("M" number).

## Publication Information

T803 Service Manual		
Issue	Publication Date	Product Code
Preliminary	May 1999	M803-00-PRELIM

## Table Of Contents

This manual is divided into the five sections listed below. There is a detailed table of contents at the start of each section.

<b>Section</b>	<b>Title</b>
1	General Information
2	Circuit Operation
3	Introduction To Servicing
4	Setting Up, Testing & Fault Finding
5	PCB Information

# 1 General Information

This section provides a brief description of the T803 tone remote, along with detailed specifications and information on system configuration.

The following topics are covered in this section.

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## 1.1 Introduction

The T803 is an AC tone remote with alarm monitoring, voting tone generation and simple highsite control and is designed to fit into a Tait T800 Series II rack frame. It interfaces either a 2-wire or 4-wire line circuit to any standard T800 Series II receiver/transmitter/exciter/power amplifier combination. It plugs into a backplane PCB (which may be purchased separately or as part of a T800 Series II rack frame) which eliminates wiring between the T803 and T800 Series II radios. The T803 is configured using Tait PGM800Win programming software (V3.0 and later) which runs on a PC.

The T803 AC tone remote function enables a user to:

- remotely key a T800 Series II transmitter/exciter;
- defeat a receiver's CTCSS mute (to monitor a channel);
- change their set channel (up to 128 channels);
- change between base station and repeater modes (repeater knockdown);
- cancel alarms;
- turn repeater site equipment on or off (highsite control);
- loop back line audio (4-wire line interface only).

This is achieved using three industry-standard tone signalling plans for ease of integration into existing control systems and choice of vendor for office/control room equipment. These plans are:

- EIA tone remote using a single function tone. In this system, when the control room user presses the transmit key, the line control equipment sends a 120mS burst of high level guard tone (HLGT - usually 2175Hz at +10dBm to line). This is followed by a single 40mS function tone at 0dBm to line. This function tone can change channel (1850Hz or 1950Hz) or monitor the radio channel (defeat receiver CTCSS - 2050Hz). Other tones (1050Hz to 1750Hz in 100Hz steps) can be used for various functions. Following these initial tone bursts, a low level guard tone (LLGT - usually 2175Hz at -20dBm) is sent to line and speech is gated onto line (at approx. 0dBm peak level). This continues until the user releases the transmit key, whereupon speech is removed from the line and LLGT tone ceases.
- EIA enhanced tone remote using two function tones. In this variant of the above system two function tones are sent one after the other in the period between HLGT and LLGT. The tone set is also expanded (650Hz to 2050Hz in 100Hz steps) to give 225 possible combinations which can be allocated to various actions. Often the duration of both HLGT and function tones can be varied.
- Simple Tx keying using LLGT. This is used where complex functionality is not required. One application is to key a link transmitter where HLGT, the function tones and speech + LLGT are transparently carried to an end base station. Note in this application the notch filters (which ordinarily remove the key tone from the audio path) must be turned off using PGM800Win so that the keying signal is propagated to the end transmitter.

The T803 can also generate voting tones where a 4-wire line interface is used. Voting systems are used where several base station receivers are tuned to the same radio chan-

nel and located at different sites, sending audio back to a central control where the best quality audio must be selected or "voted upon". Tone-on-idle or sliding voting tones can be generated to interface a T800 Series II rack frame to a wide variety of industry standard radio voting systems. In tone-on-idle applications, a tone (normally the same frequency as LLGT) is transmitted to line when the T800 Series II receiver is muted. When the tone disappears, control room equipment can perform signal-to-noise measurements on incoming audio lines and select the best for feeding to the control room user. In sliding voting tone systems a tone is transmitted to line whose frequency is proportional to the T800 Series II receiver's RSSI. Control room equipment determines which receiver has the highest RSSI and thus selects which line carries the highest quality incoming audio.

The T803 monitors three T800 Series II rack alarms (transmitter/PA forward & reverse power and low battery/power supply), one line alarm (line fail indication) and four external closure alarms. If alarms are triggered, the T803 will generate tone sequences to alert system users of a problem.

The T803 has a width of 60mm and occupies a single space in a Tait rack frame, which has the ability to accommodate up to seven standard modules.



## 1.2 Specifications

### 1.2.1 Introduction

The performance figures given are minimum figures, unless otherwise indicated, for equipment operating at standard room temperature (+22°C to +28°C) and standard test voltage (13.8V DC).

Details of test methods and the conditions which apply for Type Approval testing in all countries can be obtained from Tait Electronics Ltd.

### 1.2.2 General

Complies with ETS 300 086 & CISPR22 radiated & conducted emissions specifications.

Supply Voltage:

Operating Voltage	.. 10.8 to 16V DC
Standard Test Voltage	.. 13.8V DC
Polarity	.. negative earth only

Supply Current .. 250mA max.

Operating Temperature Range .. -30 to +70°C.

Dimensions:

Height	.. 183mm
Width	.. 60mm
Length	.. 310mm

Weight .. 1.5kg

### 1.2.3 Line

Complies with TBR15 (2-wire line) & TBR17 (4-wire line) ETSI specifications.

Line Output (for receiver with 1kHz tone @ 60% mod):

2-Wire	.. -10dBm ±0.5dBm
4-Wire	.. -14dBm ±0.5dBm

Automatic Level Control (ALC):

Range	.. 40dB
Line Input For -3dB To Transmitter	.. -28dBm typical
Attack/Decay Time	.. 20mS/5sec nominal

Maximum Line Attenuation For Correct Tone Remote Operation:

Sending Unit With Standard Line Output	.. 30dB typical
Sending Unit ETSI Compliant	.. 20dB typical

### 1.2.4 Tone Remote

Keytone Accept Bandwidth (speech @ -10dBm, keytone @ -30dBm)	.. $\pm 0.73\%$ typical ( $\pm 16\text{Hz}$ @ 2175Hz)
Talkoff (max. difference between speech & keytone)	.. $>27\text{dB}$
Keytone Sensitivity	.. $<-50\text{dBm}$
Programmable Guardtone Frequencies	.. 2100, 2175, 2325, 2500, 2600, 2800, 2970 & 3000Hz
Programmable HLGT Duration	.. 60 - 200mS
Function Tone Frequencies	.. 650Hz - 2050Hz in 100Hz steps
Function Tone Accept Bandwidth	.. $\pm 19\text{Hz}$ typical
Maximum Number Of Function Tones	.. 2
Programmable Function Tone Duration	.. 20 - 100mS

### 1.2.5 Audio Response

Frequency Response	.. $\pm 1\text{dB}$ 300Hz to 3kHz except at notch frequency
Notch Filter Bandwidth At -40dB	.. $\pm 0.5\%$ typical ( $\pm 10\text{Hz}$ @ 2175Hz)
Notch Filter Bandwidth At -3dB	.. $\pm 1.28\%$ typical ( $\pm 28\text{Hz}$ @ 2175Hz)
Audio Distortion:	
From Line	.. $<5\%$
From Receiver	.. $<2\%$

### 1.2.6 Alarms

Supply Voltage Alarm Threshold	.. 10.7V $\pm 0.05\text{V}$
RF Power Alarm Thresholds	.. adjusted inside Tx/PA

Line Fail Alarm Timer	.. off or 1 minute - 4 hours
Alarm Input Threshold	.. <1.5V (or to 0V via 3k3 resistor)
Maximum Alarm Input Voltage	.. 25V
Alarm Sequence	.. 0 - 14 tones to radio and/or line
Programmable 5-Tone Standards	.. CCIR, EIA, EEA, ZVEI & DZVEI
5-Tone Carrier Deviation (for test tone set @ 60%)	.. 70% nom. system deviation @ 1kHz
Alarm Pip Tone Frequency/Duration	.. 600Hz/200mS on tail of audio

### 1.2.7 Morse Code

Sending Speed	.. 20 words per minute
Maximum Code Length	.. 15.36 seconds
Tone Frequency	.. 1200Hz
Valid Station ID	.. alphanumeric only
Repetition Rate	.. off or 1 - 60 minutes
Carrier Deviation (for test tone set @ 60%)	.. 20% nominal system deviation

### 1.2.8 Voting

Programmable Tone-On-Idle Frequencies	.. 1950, 2100, 2175, 2325, 2500, 2600, 2800, 2970 and 3000Hz
Programmable Sliding Voting Tone Frequencies	.. 2700 to 3000Hz
Voting Tone Level To Line	.. -30dBm to -10dBm

### 1.2.9 Miscellaneous

Auxiliary Output Rating	.. open collector, 50V, 250mA (@25°C)
Momentary Monitor (CTCSS Defeat) Time	.. off or 1 - 20 seconds
Line Fail Timer	.. off or 1 - 240 minutes

### 1.3 System Configuration

The following flow chart will help you to configure your T800 Series II system to include a T803 tone remote module. Refer to [Section 1.4](#) for details on the product types mentioned in this chart.

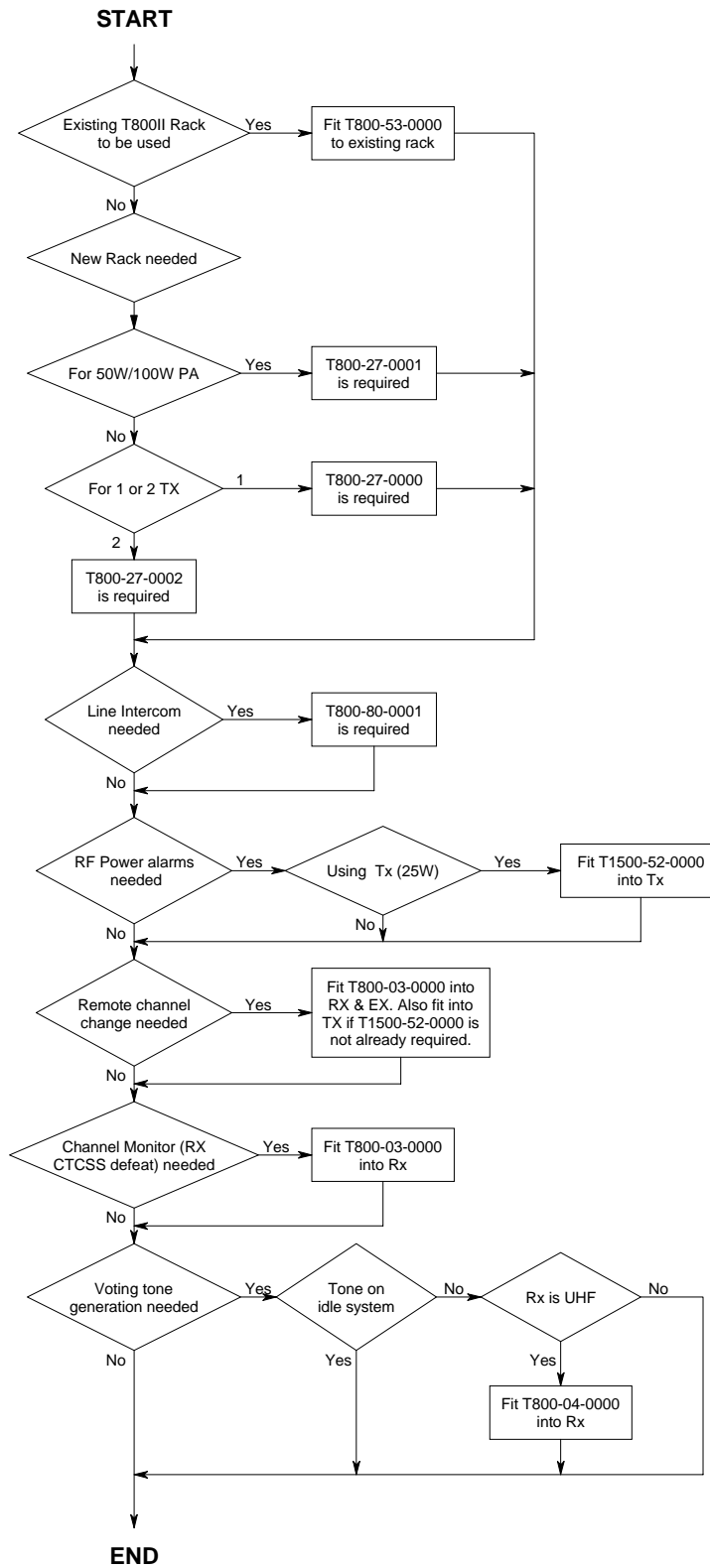


Figure 1.1 T803 System Configuration

## 1.4 Product Codes

The following table provides a brief description of the products mentioned in [Section 1.3](#). Consult your nearest Tait Dealer or Customer Service Organisation for more information on these products.

Product Code	Description
T800-01-0000	PGM800Win V3.0. Includes programming cable.
T800-03-0000	T800 auxiliary D-range kit.
T800-04-0000	T800 UHF RSSI kit.
T800-27-0000	T800 rack frame assembled for T803, Rx, 25W Tx & PSU. Includes T800-53-0000.
T800-27-0001	T800 rack frame assembled for T803, Rx, Ex, PA (50W & 100W) & PSU. Includes T800-53-0000.
T800-27-0002	T800 rack frame assembled for dual T803, dual Rx, dual Tx & single PSU. Includes T800-53-0000.
T800-53-0000	T800 rack frame backplane PCB for T803-00-0000.
T800-80-0001	T803 test microphone. Used for line intercom and to talk on air.
T803-00-0000	Tone remote module.
T1500-52-0000	Tx alarm & multichannel kit.

## 1.5 Regulatory Information

### 1.5.1 Canada

#### 1.5.1.1 Industry Canada Warnings

**Notice:**

The Industry Canada Label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.



**Caution:** Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

#### 1.5.1.2 Avis d'Industrie Canada

**Avis:**

L'étiquette d'Industrie Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme aux normes de protection, d'exploitation et de sécurité des réseaux de télécommunications, comme le prescrivent les documents concernant les exigences techniques relatives au matériel terminal. Le Ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunication. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêche pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être coordonnées par un représentant désigné par le fournisseur. L'entreprise de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause de mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.



**Avertissement:** L'utilisateur ne doit pas tenter de faire ces raccordements lui-même; il doit avoir recours à un service d'inspection des installations électriques, ou à un électricien, selon le cas.

**1.5.2 United States Of America****Analogue Device Warnings**

This equipment complies with Part 68 of the Federal Communications Commission (FCC) rules for the United States.

A label is located on the rear panel of the unit indicating the FCC registration number and Ringer Equivalence Number (REN). You must upon request, provide the following information to your local telephone company:

T803 Tone Remote and Alarm Interface, FCC Registration Number XXXXX.

Unit Configuration	Function	USOC Jack Type	REN
T803 2-wire	2-wire leased line	RJ-11C	-
T803 4-wire	4-wire leased line	RJ-48S	-

Should you experience trouble with this telephone equipment, please contact:

**Tait Electronics USA Inc.**  
**39434 Old Katy Road**  
**Houston, TX77055**  
**Ph: 713 984 8684**  
**Fax: 713 468 6944**

If trouble is experienced with this equipment *T803 Tone Remote and Alarm Interface*, for repair or warranty information, please contact **Tait Electronics USA Inc. at 713 984 8684**. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

For repair/warranty information. The telephone company may ask you to disconnect this equipment from the line network until the problem has been corrected.

This equipment cannot be used on public coin phone service provided by the telephone company. Connection to party line service is subject to state tariffs.

Your telephone company may discontinue your service if your equipment causes harm to the telephone network. They will notify you in advance of disconnection, if possible. During notification, you will be informed of your right to file a complaint to the FCC.

Occasionally, your telephone company may make changes in its facilities, equipment, operation, or procedures that could affect the operation of your equipment. If so, you will be given advance notice of the change to give you an opportunity to maintain uninterrupted service.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



### 1.5.3 Europe

#### European Union Declaration Of Conformity (according to IEC Guide 22)

We:-

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Christchurch  
New Zealand

**European Representative:**

Tait Europe Ltd  
Ermine Business Park  
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Cambridgeshire  
PE18 6YA  
United Kingdom

declare under our sole legal responsibility and according to the requirements of the following EC Council Directives:

89/336/EEC + 92/31/EEC EMC Directive  
73/23/EEC + 93/68/EEC LV Directive  
91/263/EEC + 98/13/EEC TTE Directive  
93/68/EEC CE Mark Directive

that the terminal equipment identified as:

**Model: Tone Remote and Alarm Interface**  
**Part Number: T803-00-0000**

produced or sold by the above to which this declaration relates is in conformity with the following Common Technical Regulations and or normative documents (or the relevant standards where national approvals apply):

**CTR 15, CTR 17**  
**EN60950:1992 +A1, +A2, +A3, +A4**  
**EN55022:1994**  
**EN50082-1:1997**

For and of behalf of Tait Electronics Ltd



David Balloch  
RSD Development Manager  
Christchurch, NZ, 18 May 1999, RSD/TCF/2027 Rev 001

**1.5.4 New Zealand****Warning****T803-00-0000 for use in New Zealand**

"The grant of a Telepermit for any item of terminal equipment indicates only that Telecom New Zealand has accepted that the item complies with minimum conditions for connection to its network. It indicates no endorsement of the product by Telecom New Zealand, nor does it provide any sort of warranty. Above all, it provides no assurance that any item will work correctly in all respects with another item of Telepermitted equipment of a different make or model, nor does it imply that any product is compatible with all of Telecom New Zealand's network services."

"This equipment does not fully meet Telecom New Zealand's impedance requirements. Performance limitations may occur when used in conjunction with some parts of the network. Telecom New Zealand will accept no responsibility should difficulties arise in such circumstances."

## 2 Circuit Operation

This section provides a basic description of the circuit operation of the T803 tone remote.

**Note:** Unless otherwise specified, the term "PGM800Win" used in this and following sections refers to version 3.00 and later of the software.

Refer to Section 5 where the parts lists, grid reference index and diagrams will provide detailed information on identifying and locating components and test points on the main PCB.

The following topics are covered in this section.

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## 2.1 Introduction

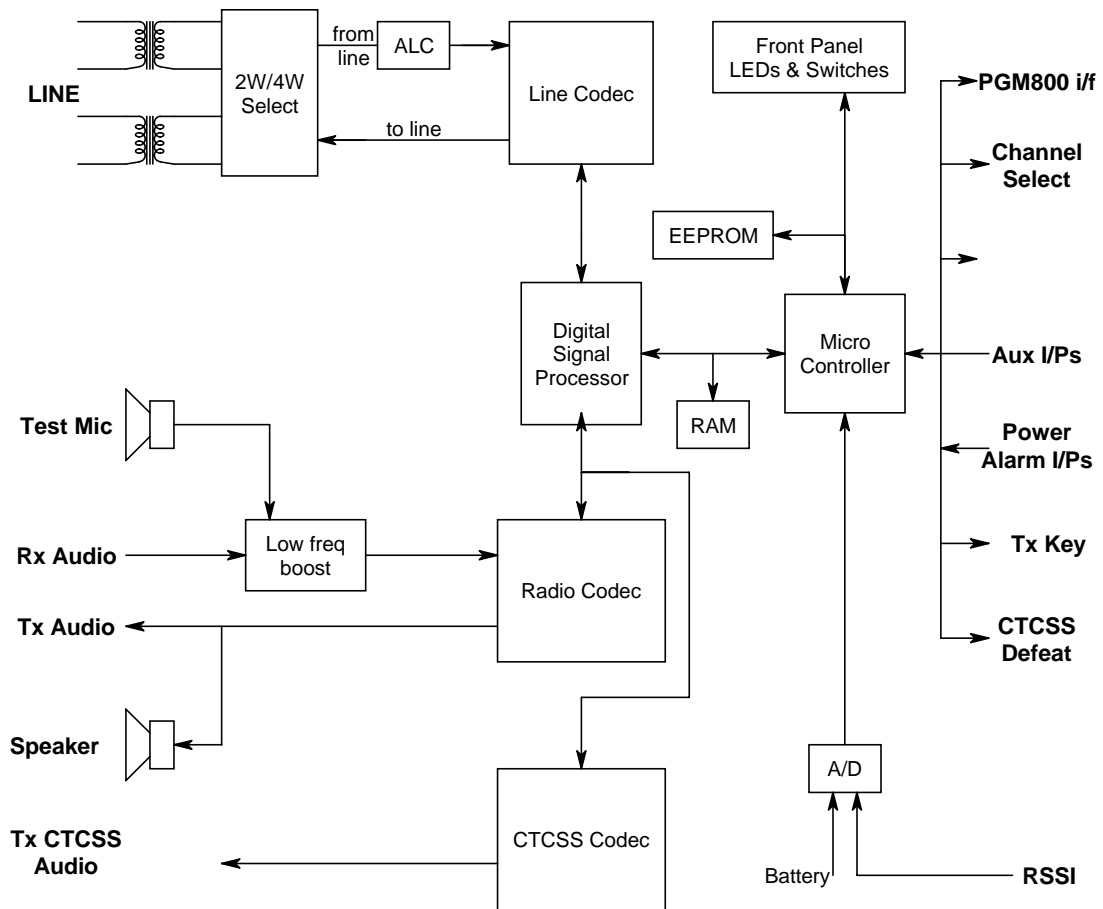


Figure 2.1 High Level Block Diagram

The T803 is connected to a leased line from control room equipment by means of an RJ45 connector. 600R transformers are used to couple the audio into and out of the T803. On the secondary of these line matching transformers are analogue transmission switches which configure the line interface as either 2-wire or 4-wire compatible. Audio from line is passed through an automatic level control (ALC) circuit before entering a CODEC where it is digitised. The ALC ensures a good signal-to-noise ratio and effective radio channel utilisation for a wide range of line input levels. Audio to line is output from the same line CODEC.

The line CODEC is connected to a digital signal processor (DSP) which is also connected to a similar radio CODEC (the CTCSS CODEC is not used in this application). The radio CODEC receives audio from the T800 Series II receiver and sends audio to the T800 Series II transmitter/exciter to which it is connected via the special backplane PCB. Receiver audio is low frequency filtered to extend the radio CODEC's effective frequency range.

The DSP processes the digitised audio streams from the CODECs in accord with instructions sent to it by the T803's microcontroller. The DSP can:

- detect HLGT, LLGT and function tones coming from line, notch filter line in and receiver audio (used to eliminate LLGT from line out and transmitter audio);

- generate 5-tone alarms and pip tones to line out and transmitter audio;
- generate voting tones to line out;
- generate morse code to transmitter audio;
- cross connect line and radio audio paths;
- mute audio from line in and receiver.

The microcontroller boot loads the DSP, interfaces with the user via the front panel switches and LEDs, interfaces with PGM800Win and runs the T803 state machines (alarm monitoring, alarm tone generation, HLGT/function tone/LLGT timing, RSSI/voting tone conversion etc.).

## 3 Introduction To Servicing

This section of the manual provides some general and advisory information on servicing procedures.

**Note:** Unless otherwise specified, the term "PGM800Win" used in this and following sections refers to version 3.00 and later of the software.

Refer to Section 5 where the parts lists, grid reference index and diagrams will provide detailed information on identifying and locating components and test points on the main PCB.

The following topics are covered in this section.

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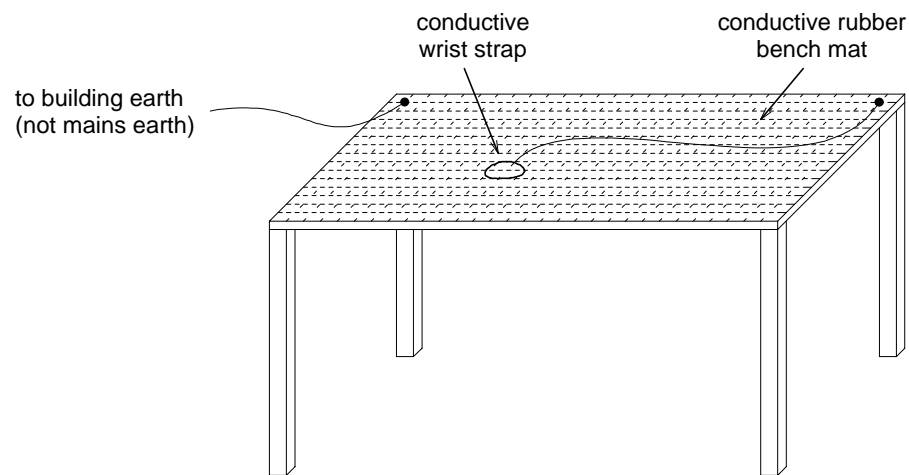


### 3.1 Caution: CMOS Devices

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 the manufacturers' data books, e.g. Philips data books covering CMOS devices, or Motorola CMOS data books, Section 5 'Handling', etc.

An anti-static bench kit (refer to [Figure 3.1](#)) is available from Tait Electronics Ltd under the following product codes:

- KS0001 - 1 conductive rubber bench mat  
- 1 earth lead to connect the mat to ground
- KS0004 - 1 wrist strap.



**Figure 3.1 Typical Anti-static Bench Set-up**

## 3.2 Mechanical

### 3.2.1 Torx Recess Head Screws

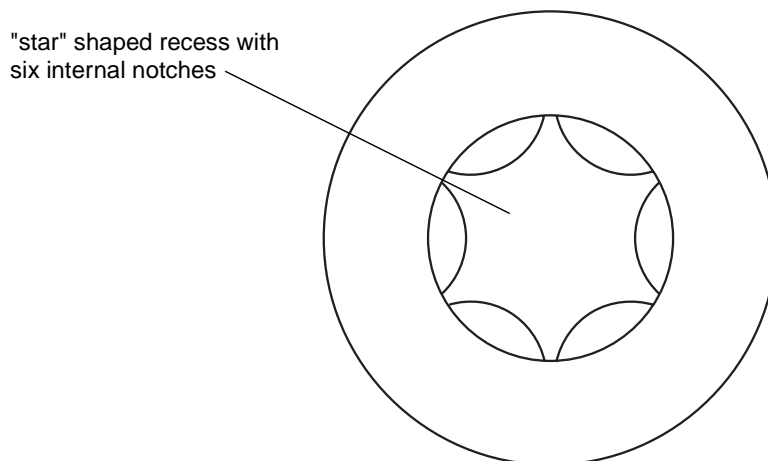
Torx recess head screws are becoming the standard screw head type in all T800 Series II equipment, with Pozidriv and Philips recess head screws being used in fewer applications.

The Torx recess head has the advantage of improved screwdriver tip location, reducing the chances of screw head damage caused by the driver tip rotating within the recess. In addition, using a ball-tip Torx screwdriver allows you to drive a Torx head screw with the driver on a slight angle, which can be useful in situations where access is restricted.

It is important that you use the correct Torx screwdriver tip:

M3 screws - T10  
M4 screws - T20.

Figure 3.2 below shows a typical Torx recess head screw (actual hardware may differ slightly from this illustration due to variations in manufacturing techniques).



**Figure 3.2 Torx Screw Identification**

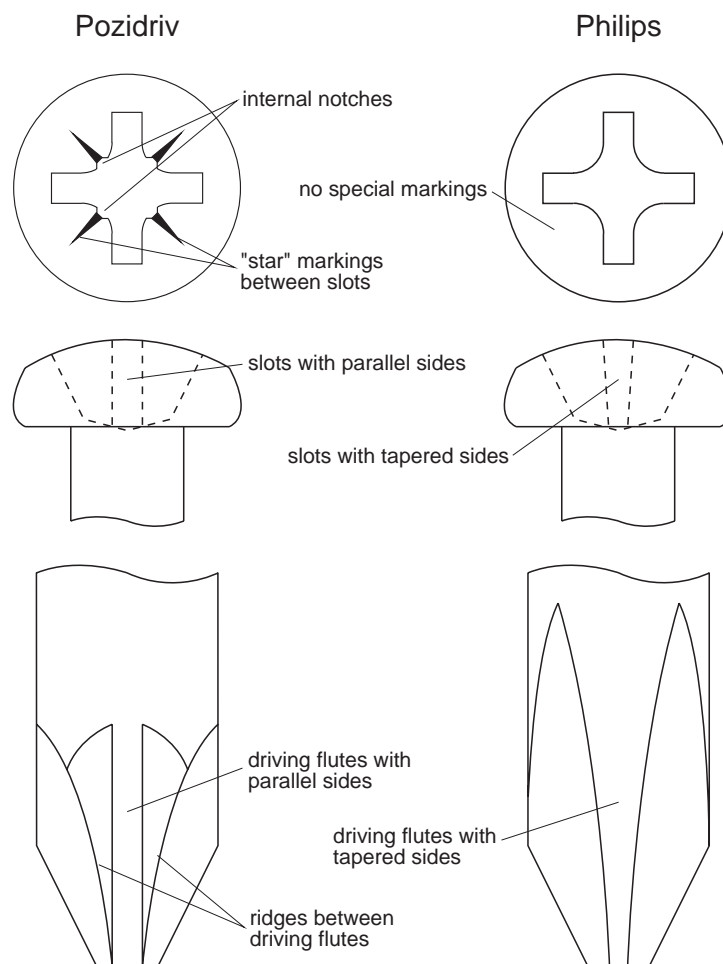
### 3.2.2 Pozidriv & Philips Recess Head Screws

Pozidriv and Philips recess head screws will continue to be used in T800 Series II equipment in a few special applications. It is important that you use the correct type and size screwdriver for each screw type to avoid damaging the screw head.

It is particularly important that you do not use Philips screwdrivers on Pozidriv screw heads as the tapered driving flutes of the Philips screwdriver do not engage correctly with the parallel-sided slots in the Pozidriv screw head. This can result in considerable damage to the screw head if the screwdriver tip turns inside the recess.

**Note:** If you find you need excessive downwards pressure to keep the screwdriver tip in the Pozidriv screw head, you are probably using the wrong type and/or size screwdriver.

Figure 3.3 below shows the main differences between typical Pozidriv and Philips screw heads and screwdriver tips (actual hardware may differ slightly from these illustrations due to variations in manufacturing techniques).



**Figure 3.3** Pozidriv & Philips Screw & Screwdriver Identification

## 3.3 Component Replacement

### 3.3.1 Leaded Components

Whenever you are doing any work on the PCB that involves removing or fitting components, you must take care not to damage the copper tracks. The two satisfactory methods of removing components from plated-through hole (PTH) PCBs are detailed below.

**Note:** The first method requires the use of a desoldering station, e.g. Philips SBC 314 or Pace MBT-100E.

#### 3.3.1.1 Desoldering Iron Method

Place the tip over the lead and, as the solder starts to melt, move the tip in a circular motion.

Start the suction and continue the movement until 3 or 4 circles have been completed.

Remove the tip while continuing suction to ensure that all solder is removed from the joint, then stop the suction.

*Before* pulling the lead out, ensure it is not stuck to the plating.

If the lead is still not free, resolder the joint and try again.

**Note:** The desoldering iron does not usually have enough heat to desolder leads from the ground plane. Additional heat may be applied by holding a soldering iron on the tip of the desoldering iron (this may require some additional help).

#### 3.3.1.2 Component Cutting Method

Cut the leads on the component side of the PCB.

Heat the solder joint *sufficiently* to allow *easy* removal of the lead by drawing it out from the component side: do *not* use undue force.

Fill the hole with solder and then clear with solderwick.

### 3.3.2 Surface Mount Devices

**Caution:**

Surface mount devices (SMDs) require special storage, handling, removal and replacement techniques. This equipment should be serviced only by an approved Tait Dealer or Customer Service Organisation equipped with the necessary facilities. Repairs attempted with incorrect equipment or by untrained personnel may result in permanent damage. If in doubt, contact your nearest Tait Dealer or Customer Service Organisation.



## 4 Setting Up, Testing & Fault Finding



**Caution:** This equipment contains CMOS devices which are susceptible to damage from static charges. Refer to [Section 3.1](#) for more information on anti-static procedures when handling these devices.

This section of the manual describes how to set up the T803 in a T800 Series II rack frame and test that it is functioning correctly. It also provides a brief fault finding procedure.

Refer to Section 5 where the parts lists, grid reference index and diagrams will provide detailed information on identifying and locating components and test points on the main PCB.

The following topics are covered in this section.

Section	Title	Page
<b>4.1</b>	<b>Setting Up</b>	<b>4.3</b>
4.1.1	Rack Frame Preparation	4.3
4.1.2	T800 Series II Equipment Preparation	4.4
<b>4.2</b>	<b>Testing</b>	<b>4.5</b>
<b>4.3</b>	<b>Fault Finding</b>	<b>4.6</b>

Figure	Title	Page
4.1	T800-53-0000 Backplane PCB Link Locations	4.3
4.2	Test Equipment Set-up	4.4





## 4.1 Setting Up

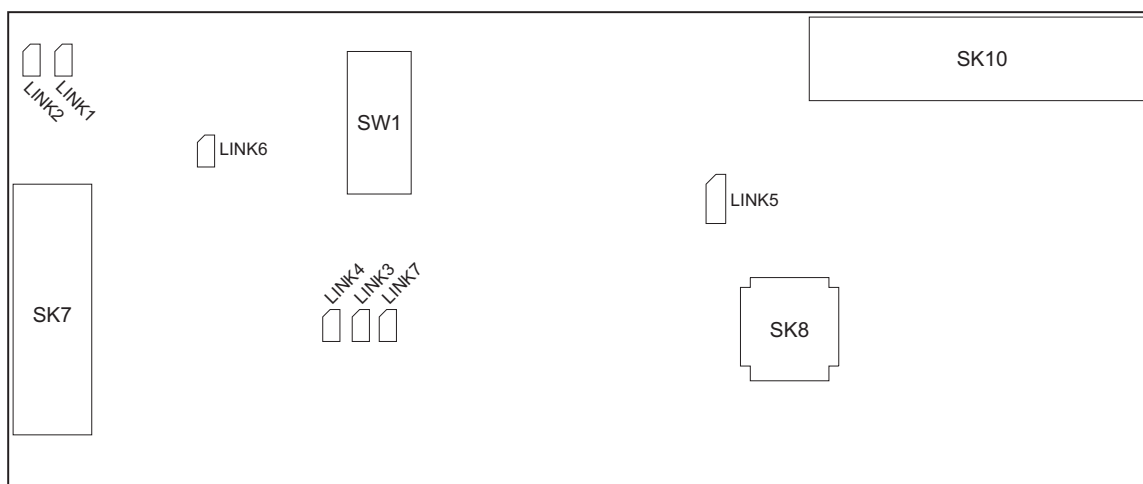
### 4.1.1 Rack Frame Preparation

If you are not using a prewired T800-27-000X rack frame, you will have to install a T800-53-0000 3-bin tone remote backplane PCB into the left side (looking from the front) of a T800 Series II rack frame.

If you are using a transmitter and need to use power alarms, connect LINK1 & LINK2 on the backplane PCB.

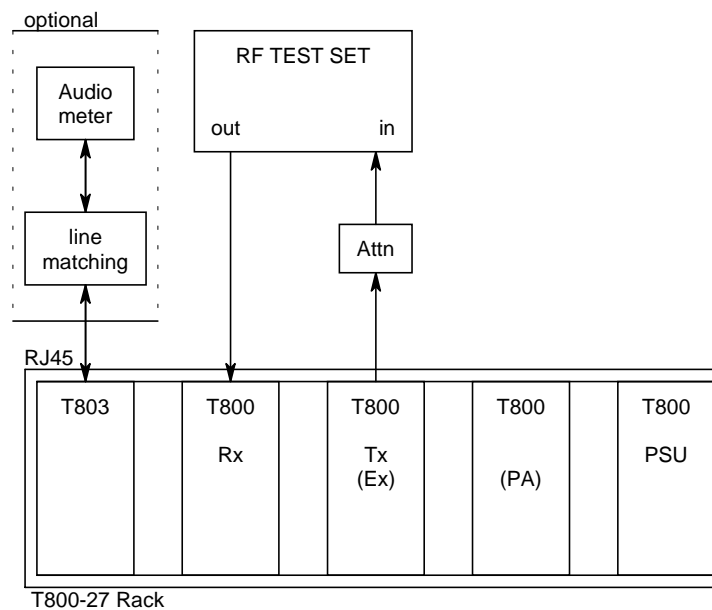
**Note:** For correct power alarm operation these links should be correctly set at power-up.

Connect pins 1 and 2 of LINK5.



**Figure 4.1** T800-53-0000 Backplane PCB Link Locations

### 4.1.2 T800 Series II Equipment Preparation



**Figure 4.2** *Test Equipment Set-up*

Remove any coaxial relay/duplexer from the T800 modules' RF path and connect the modules directly to an RF test set. Ensure that the transmitter/PA RF output is sufficiently attenuated to prevent damage to the test set (refer to [Figure 4.2](#)).

Run up the receiver and transmitter/exciter/PA as instructed in the appropriate T800 Series II service manual.

Install the T803, receiver and transmitter/exciter/PA in the rack frame as shown in [Figure 4.2](#).

**Note 1:** A T800-03-0000 auxiliary D-range is required where remote channel change or CTCSS defeat (for monitoring) is required.

**Note 2:** A T1500-52-0000 should be fitted if a transmitter is being used and power alarms are required.

## 4.2 Testing

Put the T803 into test mode by pressing the "Monitor On/Off" and "Mode Toggle" buttons on the front panel simultaneously and holding them pressed for three seconds.

Check that the T803 keys on the associated transmitter/exciter and encodes a 1kHz test tone to the transmitter/exciter for one minute. The test tone can be heard on the built-in speaker and appears on the line out pair at -10dBm (2-wire) or -14dBm (4-wire).

Adjust the "Line Sensitivity" control on the front panel of the transmitter/exciter to give a reading on the RF test set of 60% system modulation, making allowances for any CTCSS tone deviation.

Press the "Monitor On/Off" and "Mode Toggle" buttons on the T803 front panel simultaneously to cancel test mode.

Use the RF test set to unmute the receiver.

Press the "Mode Toggle" switch on the T803 to put the unit into talk through mode.

Modulate the RF carrier with a 1kHz tone at 60% system modulation, adding CTCSS tone if necessary. Ensure that CTCSS tone is removed from the receiver's audio output by selecting the correct links inside the receiver.

Check that the transmitter/exciter is keyed on.

Adjust the "Line Level" control on the receiver front panel to produce 60% system deviation at the transmitter/exciter RF output as measured on the test set.

The line levels are now automatically set to comply with ETSI TBR15 (2-wire line) and TBR17 (4-wire line) specifications.

## 4.3 Fault Finding

1. Connect the T803 to its companion dispatch terminal via the leased line. Check that speech sent from the terminal can be heard on the T803 speaker. One possible cause of incorrect operation is that the line connections have become transposed in the wiring network or that the dispatch terminal uses different Go/Return pairs (also the speaker could be muted).
2. Use the console to key on the transmitter. If the transmitter does not key on, check that the dispatch terminal and T803 have been compatibly programmed, i.e:
  - check 2-wire/4-wire;
  - check the keytone frequency;
  - check if function tones are used;
  - check high level guard tone and function tone periods (if used) are the same.

Finally check that the dispatch terminal is sending appropriate signal levels and that tone durations are correct (which are often variable), and that the line is not causing unacceptable attenuation or distortion.

3. If the dispatch terminal can key the transmitter but not change channel, repeater/base station mode, auxiliary outputs, Rx defeat or cancel alarms, carry out the checks in Step 1 above, but pay particular attention to the function tone programming.
4. If the dispatch terminal can key the transmitter except when speech is present, talkoff is occurring due to the keytone being 27dB lower than peak speech. Adjust the relative levels inside the dispatch terminal (keytone should be 20dB lower than peak speech).

## 5 T803 PCB Information



**Caution:** This equipment contains CMOS devices which are susceptible to damage from static charges. Refer to [Section 3.1](#) for more information on anti-static procedures when handling these devices.

This section provides the following information on the T803 and its associated rack frame backplane PCB, the T800-53-0000:

- parts list
- grid reference index
- PCB layouts
- circuit diagrams.

Section	Title	IPN	Page
5.1	Introduction		5.1.3
5.2	T803 Main & Front Panel PCBs	220-01581-01	5.2.1
5.3	T800-53-0000 Backplane PCB	220-01449-02	5.3.1



# 5.1 Introduction

## PCB Identification

All PCBs are identified by a unique 10 digit "internal part number" (IPN), e.g. 220-12345-00, which is screen printed onto the PCB (usually on the top side), as shown in the example below:



The last 2 digits of this number define the issue status, which starts at 00 and increments through 01, 02, 03, etc. as the PCB is updated. Some issue PCBs never reach full production status and are therefore not included in this manual. A letter following the 10 digit IPN has no relevance in identifying the PCB for service purposes.

**Note:** It is important that you identify which issue PCB you are working on so that you can refer to the appropriate set of PCB information.

## Parts Lists

The 10 digit numbers (000-00000-00) in this Parts List are "internal part numbers" (IPNs). We can process your spare parts orders more efficiently and accurately if you quote the IPN and provide a brief description of the part.

The components listed in this parts list are divided into two main types: those with a circuit reference (e.g. C2, D1, R121, etc.) and those without (miscellaneous and mechanical).

Those with a circuit reference are grouped in alphabetical order and then in numerical order within each group. Each component entry comprises three or four columns, as shown below:

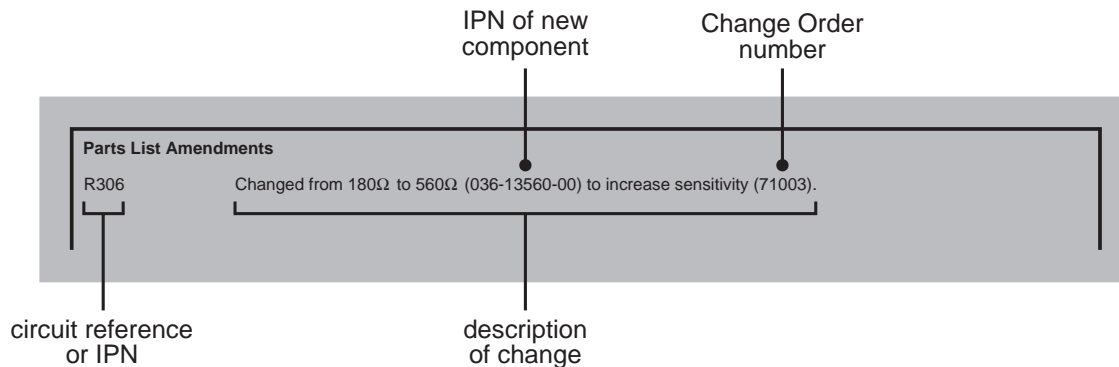
Ref	Var	IPN	Description
C126		015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C127		020-09220-01	CAP ELECT RADL 220M 16V 10X12.5MM
C128		015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C129		015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
&C130	10	015-25100-08	CAP CER 0805 CHIP 10N 10% X7R 50V
&C130	15	015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
&C130	20	015-25100-08	CAP CER 0805 CHIP 10N 10% X7R 50V
&C130	25	015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C131		015-24100-08	CAP CER 0805 CHIP 1N 10% X7R 50V
C132		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C133		015-05470-08	CAP CER 1206 CHIP 47N 10% X7R 50V

circuit reference - lists components in alphanumeric order  
 variant column - indicates that this is a variant component which is fitted only to the product type listed  
 description - gives a brief description of the component  
 Internal Part Number - order the component by this number

The mechanical and miscellaneous section lists the variant and common parts in IPN order.

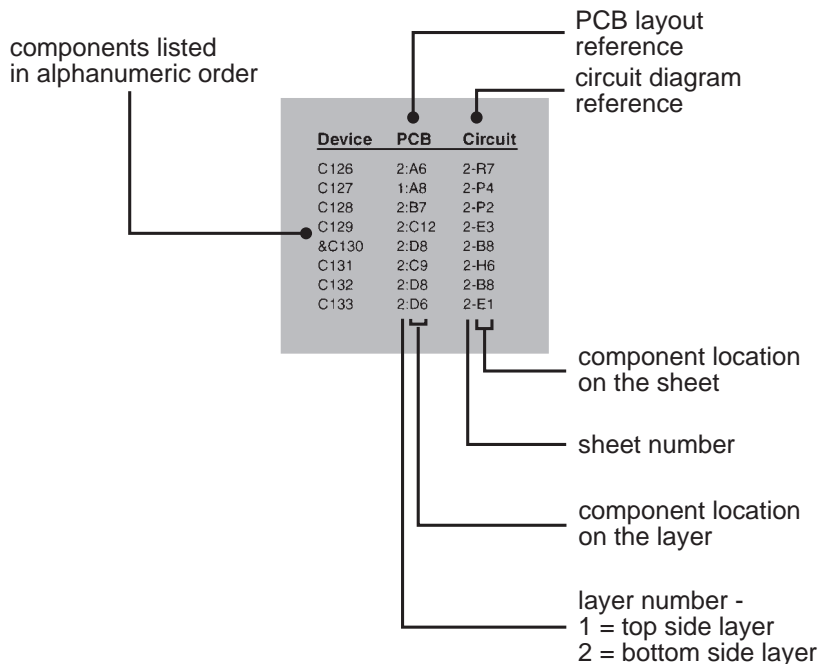
### Parts List Amendments

At the front of the parts list is the Parts List Amendments box (an example of which is shown below). This box contains a list of component changes which took place after the parts list and diagrams in this section were compiled. These changes (e.g. value changes, added/deleted components, etc.) are listed by circuit reference in alphanumeric order and supersede the information given in the parts list or diagrams. Components without circuit references are listed in IPN order. The number in brackets at the end of each entry refers to the Tait internal Change Order document.



### Grid Reference Index

This section contains a component grid reference index to help you find components and labelled pads on the PCB layouts and circuit diagrams. This index lists the components and pads in alphanumeric order, along with the appropriate alphanumeric grid references, as shown below:

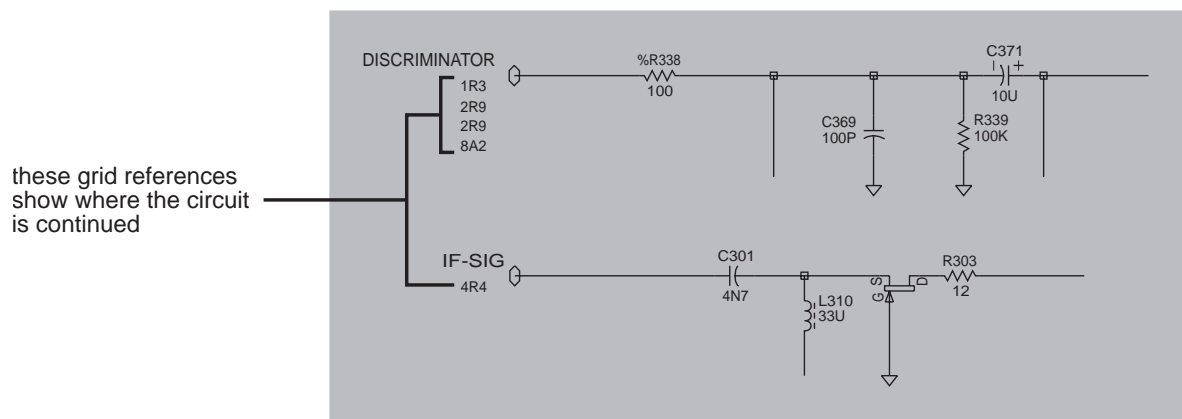




## Using CAD Circuit Diagrams

Reading a CAD circuit diagram is similar to reading a road map, in that both have an alphanumeric border. The circuit diagrams in this manual use letters to represent the horizontal axis, and numbers for the vertical axis. These circuit diagram “grid references” are useful in following a circuit that is spread over two or more sheets.

When a line representing part of the circuitry is discontinued, a reference will be given at the end of the line to indicate where the rest of the circuitry is located, as shown below. The first digit refers to the sheet number and the last two characters refer to the location on that sheet of the continuation of the circuit (e.g. 1R3).





## 5.2 T803 Main & Front Panel PCBs

This section contains the following information.

IPN	Section	Page
220-01581-01	Parts List	5.2.3
	Mechanical & Miscellaneous Parts	5.2.7
	Grid Reference Index	5.2.8
	PCB Layout - Top Side	5.2.11
	PCB Layout - Bottom Side	5.2.12
	Overview & Front Panel Circuit Diagram	5.2.13
	Interface Circuit Diagram	5.2.14
	Control & Processing Circuit Diagram	5.2.15
	P100 PI Filters Circuit Diagram	5.2.16
	SK100 PI Filters Circuit Diagram	5.2.17
	SK102 PI Filters Circuit Diagram	5.2.18



## T803 Parts List (IPN 220-01581-01)

### How To Use This Parts List

The components listed in this parts list are divided into two main types: those with a circuit reference (e.g. C2, D1, R121, etc.) and those without (miscellaneous and mechanical).

Those with a circuit reference are grouped in alphabetical order and then in numerical order within each group. Each component entry comprises three or four columns: the circuit reference, variant (if applicable), IPN and description. A number in the variant column indicates that this is a variant component which is fitted only to the product type listed. Static sensitive devices are indicated by an (S) at the start of the description column.

The miscellaneous and mechanical section lists the variant and common parts in IPN order. Where possible, a number in the legend column indicates their position in the mechanical assembly drawing.

The Parts List Amendments box below lists component changes that took place after the parts list and diagrams in this section were compiled. These changes (e.g. value changes, added/deleted components, etc.) are listed by circuit reference in alphanumeric order and supersede the information given in the parts list or diagrams. Components without circuit references are listed in IPN order.

### Parts List Amendments

There were no amendments to the parts list at the time of publication.

Ref	Var	IPN	Description	Ref	Var	IPN	Description
C1		015-24100-08	CAP CER 0805 1N 10% X7R 50V	C427		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C2		016-08100-01	CAP EL 6X4 10M 20% 16V	C428		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C3		015-24100-08	CAP CER 0805 1N 10% X7R 50V	C429		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C4		015-26100-08	CAP CER 0805 100N 10% X7R 50V	C430		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C5		016-08470-01	CAP EL SMD 6*4 47U 16V	C431		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C6		016-08470-01	CAP EL SMD 6*4 47U 16V	C432		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C7		015-27100-10	CAP CER 0805 1M+80-20% Y5V 16V	C433		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C128		015-24100-08	CAP CER 0805 1N 10% X7R 50V	C434		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C145		015-24100-08	CAP CER 0805 1N 10% X7R 50V	C435		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C162		016-08470-01	CAP EL SMD 6*4 47U 16V	C436		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C163		016-08100-01	CAP EL 6X4 10M 20% 16V	C437		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C164		015-24100-08	CAP CER 0805 1N 10% X7R 50V	C438		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C165		015-24100-08	CAP CER 0805 1N 10% X7R 50V	C439		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C166		015-24100-08	CAP CER 0805 1N 10% X7R 50V	C440		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C167		016-08470-01	CAP EL SMD 6*4 47U 16V	C441		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C168		016-08100-01	CAP EL 6X4 10M 20% 16V	C442		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C170		015-24100-08	CAP CER 0805 1N 10% X7R 50V	C443		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C172		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C444		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C173		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C445		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C174		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C446		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C202		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C447		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C203		016-07470-06	CAP SMD ELECT BI-P 4U7 50V 20%	C448		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C204		016-07470-06	CAP SMD ELECT BI-P 4U7 50V 20%	C449		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C205		015-25220-08	CAP CER 0805 22N 10% X7R 50V	C450		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C206		015-25220-08	CAP CER 0805 22N 10% X7R 50V	C451		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C207		015-24470-08	CAP CER 0805 4N7 10% X7R 50V	C452		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C208		015-24470-08	CAP CER 0805 4N7 10% X7R 50V	C453		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C210		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C500		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C211		015-23470-08	CAP CER 0805 470P 10% X7R 50V	C501		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C212		015-05330-08	CAP CER 1206 33N 10% X7R 50V	C502		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C213		015-05330-08	CAP CER 1206 33N 10% X7R 50V	C503		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C214		015-23470-08	CAP CER 0805 470P 10% X7R 50V	C504		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C215		015-23470-08	CAP CER 0805 470P 10% X7R 50V	C505		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C216		015-23470-08	CAP CER 0805 470P 10% X7R 50V	C506		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C217		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C507		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C218		015-27100-10	CAP CER 0805 1M+80-20% Y5V 16V	C508		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C219		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C509		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C220		015-27100-10	CAP CER 0805 1M+80-20% Y5V 16V	C510		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C221		015-26100-08	CAP CER 0805 100N 10% X7R 50V	C511		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C222		015-24100-08	CAP CER 0805 1N 10% X7R 50V	C512		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C223		016-08470-01	CAP EL SMD 6*4 47U 16V	C513		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C224		015-27100-10	CAP CER 0805 1M+80-20% Y5V 16V	C514		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C225		015-26100-08	CAP CER 0805 100N 10% X7R 50V	C515		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C226		015-24470-08	CAP CER 0805 4N7 10% X7R 50V	C516		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C227		015-26100-08	CAP CER 0805 100N 10% X7R 50V	C517		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C232		015-26100-08	CAP CER 0805 100N 10% X7R 50V	C518		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C233		015-24100-08	CAP CER 0805 1N 10% X7R 50V	C519		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C235		015-26100-08	CAP CER 0805 100N 10% X7R 50V	C520		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C236		015-26100-08	CAP CER 0805 100N 10% X7R 50V	C521		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C239		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C522		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C240		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C523		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C300		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C524		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C301		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C525		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C302		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C526		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C303		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C527		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C304		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C600		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C305		015-22270-01	CAP CER 0805 27P 5% NPO 50V	C601		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C306		015-22270-01	CAP CER 0805 27P 5% NPO 50V	C602		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C307		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C603		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C308		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C604		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C310		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C605		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C311		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C606		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C312		015-24100-08	CAP CER 0805 1N 10% X7R 50V	C607		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C313		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C608		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C314		015-22270-01	CAP CER 0805 27P 5% NPO 50V	C609		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C315		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C610		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C316		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C611		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C317		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C612		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C318		015-25100-08	CAP CER 0805 10N 10% X7R 50V	C613		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C319		015-25100-08	CAP CER 0805 10N 10% X7R 50V				
C320		015-25100-08	CAP CER 0805 10N 10% X7R 50V	D1		008-00014-81	LED BICOLOR 5MM RED/GREEN
C400		015-24100-08	CAP CER 0805 1N 10% X7R 50V	D2		008-00014-81	LED BICOLOR 5MM RED/GREEN
C401		015-24100-08	CAP CER 0805 1N 10% X7R 50V	D3		008-00014-81	LED BICOLOR 5MM RED/GREEN
C402		015-24100-08	CAP CER 0805 1N 10% X7R 50V	D4		008-00014-81	LED BICOLOR 5MM RED/GREEN
C403		015-24100-08	CAP CER 0805 1N 10% X7R 50V	D5		008-00014-81	LED BICOLOR 5MM RED/GREEN
C404		015-24100-08	CAP CER 0805 1N 10% X7R 50V	D6		001-10084-62	S)DIODE ZENSMD BZX84C6V2 SOT23
C405		015-24100-08	CAP CER 0805 1N 10% X7R 50V	D206		001-10000-56	S) DIODE SMD BAW56 D-SW SOT23
C406		015-24100-08	CAP CER 0805 1N 10% X7R 50V	D207		001-18410-00	DIODE ZENSMD BZX84C10V SOT23
C407		015-24100-08	CAP CER 0805 1N 10% X7R 50V				
C408		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC1		002-10078-00	S)IC SMD MC78M05CDT 5V REG0.5A
C409		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC2		002-74905-95	S) IC SMD 74HC595 SHIFT REG
C410		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC3		002-10854-10	LSH)IC TDA8541T 1W AUDIO AMP
C411		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC100		002-10078-00	S)IC SMD MC78M05CDT 5V REG0.5A
C412		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC101		002-10078-00	S)IC SMD MC78M05CDT 5V REG0.5A
C413		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC200		002-74905-95	S) IC SMD 74HC595 SHIFT REG
C414		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC201		002-12003-00	IC SMD ULN2003AD 7-DARL 16P SO
C415		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC202		002-10140-21	S) IC MC14021BDR2 8B SREG SO16
C416		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC203		002-74905-95	S) IC SMD 74HC595 SHIFT REG
C417		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC204		002-74940-53	IC SMD 74HC4053 SO16
C418		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC205		002-11454-80	LSH) IC SMD MC145480DW PCM
C419		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC206		002-11454-80	LSH) IC SMD MC145480DW PCM
C420		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC208		002-10832-00	IC TLC0832 8BIT A/D 8PIN SO
C421		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC209		002-74940-53	IC SMD 74HC4053 SO16
C422		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC300		002-10203-00	IC TMS320C203 80MHz PQFP100
C423		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC301		002-74940-53	IC SMD 74HC4053 SO16
C424		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC303		002-74900-00	S) IC SMD 74HC00 4X 2 I/P NAND
C425		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC307		002-00090-00	IC SRAM 64Kx16 15*5 44SOJ
C426		015-24100-08	CAP CER 0805 1N 10% X7R 50V	IC310		002-74905-73	S) IC SMD 74HC573D 8X 3STATE

Ref	Var	IPN	Description	Ref	Var	IPN	Description
IC311		002-18952-20	IC AT89C52 PLCC44 MIC 20MHz	R213		036-14100-10	RES M/F 0805 1K 1%
IC312		002-12416-00	S)IC SMD AT24C16N-10SC EEPROM	R214		036-14100-10	RES M/F 0805 1K 1%
IC313		002-10012-32	SMD DS1232LPS-2 LP RESET&W-DOG	R215		036-14100-10	RES M/F 0805 1K 1%
JP302		036-10000-00	RES M/F 0805 ZERO OHM	R216		036-15100-10	RES M/F 0805 10K 1%
JP303		036-10000-00	RES M/F 0805 ZERO OHM	R217		036-14120-00	RES M/F 0805 1K2 5%
JP307		036-10000-00	RES M/F 0805 ZERO OHM	R218		036-15100-10	RES M/F 0805 10K 1%
L1		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R219		036-14560-00	RES M/F 0805 5K6 5%
L114		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R220		036-15100-10	RES M/F 0805 10K 1%
L131		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R221		036-15100-10	RES M/F 0805 10K 1%
L132		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R223		036-15100-10	RES M/F 0805 10K 1%
L200		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R224		036-15100-10	RES M/F 0805 10K 1%
L201		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R225		036-15100-10	RES M/F 0805 10K 1%
L202		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R226		036-15100-10	RES M/F 0805 10K 1%
L203		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R227		036-14220-00	RES M/F 0805 2K2 5%
L400		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R228		036-12100-00	RES M/F 0805 10E 5%
L401		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R229		036-12390-00	RES M/F 0805 39E 5%
L402		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R230		036-13470-00	RES M/F 0805 470E 5%
L403		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R231		036-16100-00	RES M/F 0805 100K 5%
L404		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R232		036-13470-00	RES M/F 0805 470E 5%
L405		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R233		036-12330-00	RES M/F 0805 33E 5%
L406		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R234		036-15100-10	RES M/F 0805 10K 1%
L407		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R235		036-13470-00	RES M/F 0805 470E 5%
L408		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R236		036-14330-10	RES M/F 0805 3K3 1%
L409		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R237		036-15100-10	RES M/F 0805 10K 1%
L410		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R238		036-15150-00	RES M/F 0805 15K 5%
L411		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R240		036-14220-00	RES M/F 0805 2K2 5%
L412		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R241		036-14100-10	RES M/F 0805 1K 1%
L413		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R242		036-14820-10	RES M/F 0805 8K2 1%
L414		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R243		036-15100-10	RES M/F 0805 10K 1%
L415		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R244		036-15180-00	RES M/F 0805 18K 5%
L416		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R245		036-15100-10	RES M/F 0805 10K 1%
L417		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R246		036-15100-10	RES M/F 0805 10K 1%
L418		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R247		036-15470-10	RES M/F 0805 47K 1%
L419		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R248		036-15100-10	RES M/F 0805 10K 1%
L420		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R250		036-17100-10	RES M/F 0805 1M 1%
L421		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R251		036-14470-10	RES M/F 0805 4K7 1%
L422		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R252		036-16120-00	RES M/F 0805 120K 5%
L423		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R254		036-15100-10	RES M/F 0805 10K 1%
L424		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R256		036-14150-00	RES M/F 0805 1K5 5%
L425		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R257		036-15120-00	RES M/F 0805 12K 5%
L426		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R258		036-15100-10	RES M/F 0805 10K 1%
L500		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R261		036-16120-00	RES M/F 0805 120K 5%
L501		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R262		036-15100-10	RES M/F 0805 10K 1%
L502		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R264		036-12220-00	RES M/F 0805 22E 5%
L503		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R266		036-15330-00	RES M/F 0805 33K 5%
L504		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R267		036-12100-00	RES M/F 0805 10E 5%
L505		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R268		036-12100-00	RES M/F 0805 10E 5%
L506		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R269		036-15100-10	RES M/F 0805 10K 1%
L507		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R271		036-15100-10	RES M/F 0805 10K 1%
L508		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R272		036-14220-00	RES M/F 0805 2K2 5%
L509		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R273		036-14470-10	RES M/F 0805 4K7 1%
L510		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R274		036-14470-10	RES M/F 0805 4K7 1%
L511		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R275		036-14470-10	RES M/F 0805 4K7 1%
L512		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R276		036-14470-10	RES M/F 0805 4K7 1%
L513		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R277		036-14470-10	RES M/F 0805 4K7 1%
L600		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R280		036-15100-10	RES M/F 0805 10K 1%
L601		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R281		036-18100-00	RES M/F 0805 10M 10%
L602		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R301		036-14220-00	RES M/F 0805 2K2 5%
L603		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R302		036-14220-00	RES M/F 0805 2K2 5%
L604		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R303		036-14470-10	RES M/F 0805 4K7 1%
L605		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R310		036-15100-10	RES M/F 0805 10K 1%
L606		057-10120-03	IND 805 EMI SUP 120E@100M 0.2A	R311		036-15100-10	RES M/F 0805 10K 1%
P1		240-04020-72	SKT HOUSING 2W CORD MTG ULTREX	R312		036-15100-10	RES M/F 0805 10K 1%
P100		240-00026-34	PLUG 15WAY DRNG DUAL PORT	R313		036-15100-10	RES M/F 0805 10K 1%
Q201		000-10008-48	S) XSTR SMD BCW60 NPN SOT23 SS	R314		036-15100-10	RES M/F 0805 10K 1%
Q202		000-10008-48	S) XSTR SMD BCW60 NPN SOT23 SS	R317		036-15100-10	RES M/F 0805 10K 1%
Q203		000-10008-48	S) XSTR SMD BCW60 NPN SOT23 SS	R318		036-15100-10	RES M/F 0805 10K 1%
R1		036-12100-00	RES M/F 0805 10E 5%	R320		036-15100-10	RES M/F 0805 10K 1%
R2		036-14470-10	RES M/F 0805 4K7 1%	R321		036-14470-10	RES M/F 0805 4K7 1%
R3		036-13470-00	RES M/F 0805 470E 5%	R322		036-14180-00	RES M/F 0805 1K8 5%
R4		036-13330-00	RES M/F 0805 330E 5%	R323		036-14180-00	RES M/F 0805 1K8 5%
R5		036-13220-00	RES M/F 0805 220E 5%	R324		036-14180-00	RES M/F 0805 1K8 5%
R7		036-13330-00	RES M/F 0805 330E 5%	R325		036-14180-00	RES M/F 0805 1K8 5%
R8		036-13220-00	RES M/F 0805 220E 5%	R326		036-14180-00	RES M/F 0805 1K8 5%
R9		036-13330-00	RES M/F 0805 330E 5%	R327		036-14180-00	RES M/F 0805 1K8 5%
R10		036-13220-00	RES M/F 0805 220E 5%	R328		036-14180-00	RES M/F 0805 1K8 5%
R12		036-13330-00	RES M/F 0805 330E 5%	R330		036-14180-00	RES M/F 0805 1K8 5%
R13		036-13220-00	RES M/F 0805 220E 5%	R331		036-14180-00	RES M/F 0805 1K8 5%
R14		036-13330-00	RES M/F 0805 330E 5%	R332		036-14180-00	RES M/F 0805 1K8 5%
R15		036-13220-00	RES M/F 0805 220E 5%	R333		036-14180-00	RES M/F 0805 1K8 5%
R100		036-10000-00	RES M/F 0805 ZERO OHM	R334		036-14180-00	RES M/F 0805 1K8 5%
R201		036-14100-10	RES M/F 0805 1K 1%	R336		036-15100-10	RES M/F 0805 10K 1%
R202		036-14100-10	RES M/F 0805 1K 1%	R341		036-15100-10	RES M/F 0805 10K 1%
R203		036-14100-10	RES M/F 0805 1K 1%	R342		036-15100-10	RES M/F 0805 10K 1%
R204		036-14100-10	RES M/F 0805 1K 1%	R343		036-15100-10	RES M/F 0805 10K 1%
R205		036-14100-10	RES M/F 0805 1K 1%	R344		036-15100-10	RES M/F 0805 10K 1%
R206		036-14100-10	RES M/F 0805 1K 1%	R345		036-15100-10	RES M/F 0805 10K 1%
R207		036-14100-10	RES M/F 0805 1K 1%	R346		036-15100-10	RES M/F 0805 10K 1%
R208		036-14100-10	RES M/F 0805 1K 1%	R347		036-15100-10	RES M/F 0805 10K 1%
R209		036-14470-10	RES M/F 0805 4K7 1%	R348		036-15100-10	RES M/F 0805 10K 1%
R210		036-14100-10	RES M/F 0805 1K 1%	R351		036-15100-10	RES M/F 0805 10K 1%
R211		036-14100-10	RES M/F 0805 1K 1%	R352		036-14150-00	RES M/F 0805 1K5 5%
R212		036-14100-10	RES M/F 0805 1K 1%	R353		036-15100-10	RES M/F 0805 10K 1%
				RV1		040-05500-09	POT 10K LOG 15K10 VERT PCB MTG
				S1		230-00020-38	SWITCH SPNO THRU HOLE PCB MTG

Ref	Var	IPN	Description	Ref	Var	IPN	Description
S2		230-00020-38	SWITCH SPNO THRU HOLE PCB MTG				
SK1		240-10000-07	CONN SMD SKT 16W 2R M-MATCH				
SK2		240-04021-60	SKT P/JACK 6-WAY VER 69254-001				
SK100		240-04021-80	SKT 8WAY R.J45 R/A PCB LOW-PROF				
SK101		240-10000-07	CONN SMD SKT 16W 2R M-MATCH				
T200		054-00010-16	(L) XFMR LINE 600 OHM 1:1				
T201		054-00010-16	(L) XFMR LINE 600 OHM 1:1				
XL300		274-00010-59	XTAL 18.432MHz HC-49/U				



**T803 Mechanical & Miscellaneous Parts (220-01581-01)**

<b>IPN</b>	<b>Legend</b>	<b>Description</b>	<b>IPN</b>	<b>Legend</b>	<b>Description</b>
201-00030-08		WIRE T/C 7/0.2 PVC GREY			
201-00030-10		WIRE T/C 7/0.2 PVC BLACK			
219-02685-00		TONE REMOTE RIBBON CABLE LOOM			
220-01581-01		PCB T803-00-0000 TONE REMOTE			
230-00010-38		SWITCH EXTENDER CAP 19MM S1 & S2			
240-00020-72		HEADER 2W PCB MG ULTREX			
240-04020-42		SKT 44 PIN SMD PLCC IC311			
240-04020-76		SKT RECEP CRIMP 4 ULTREX HOUS			
252-00010-74		SPEAKER 36MM 16E MERRY			
303-23149-00		COVER SIDE T1511-20-0000			
308-01007-02		HANDLE BASE STN-SII INT THREAD			
316-06706-00		PNL FRT SUB CHASSIS 14mm			
316-06707-00		PNL FRT T803-00-0000			
316-21252-00		PNL REAR T803-00-0000 (RJ45)			
318-01037-00		RAIL CHAS T1511-20 EXTR ALUM			
345-00040-08		SCRW M3*12MM P/POZ ST BZ			
345-00040-09		SCRW M3*6MM CSK POZI TRUNC			
345-00050-04		SCRW M4X10MM CSK POZI ST BZ			
349-00020-08		SCRW T/T 4-40X3/8 CSK POZI BZ			
349-00020-09		SCRW T/T 4-40X3/8 IN P/POZ BLK			
349-00020-36		SCREW TT M3X8m PANTORX BLK			
365-00100-20		LABEL WHITE S/A 28X11MM			
365-01391-01		LABEL 30*10.8 T/MARK VOID			
369-01035-01		TAPE DIE CUT T3000 SPKR-F/P			
399-00010-51		BAG PLASTIC 75*100MM			
410-01081-01		CRT T800 SERIES II			

## T803 Grid Reference Index (IPN 220-01581-01)

**How To Use This Grid Reference Index**

The first digit in the PCB layout reference is a "1" or "2", indicating the top or bottom side layout respectively, and the last two characters give the location of the component on that diagram.

The first digit in the circuit diagram reference is the sheet number, and the last two characters give the location of the component on that sheet.

Device	PCB	Circuit	Device	PCB	Circuit	Device	PCB	Circuit	Device	PCB	Circuit
C1	1:Q10	1-N3	C303	1:M14	3-D9	C442	1:D7	4-J7	D3	2:T7	1-S2
C2	1:Q11	1-O3	C304	1:K14	3-D9	C443	1:D7	4-J7	D3	2:T7	1-T2
C3	1:Q11	1-O3	C305	1:K14	3-G4	C444	1:D6	4-J6	D4	2:T6	1-S1
C4	1:S11	1-P3	C306	1:K14	3-G4	C445	1:D7	4-J5	D4	2:T6	1-T1
C5	1:S11	1-Q3	C307	1:K11	3-I4	C446	1:D3	4-J4	D5	2:S14	1-S0
C6	1:S7	1-Q4	C308	1:L11	3-J4	C447	1:D3	4-J4	D5	2:S14	1-T0
C7	1:S7	1-R3	C310	1:H9	3-L8	C448	1:C3	4-J3	D6	1:Q3	1-O0
C128	1:H5	1-A0	C311	1:K10	3-M6	C449	1:D5	4-J2	*D200	1:B12	2-E9
C145	1:H5	1-B0	C312	1:K15	3-H7	C450	1:D5	4-J2	*D201	1:B9	2-E8
C162	1:H5	1-B0	C313	1:L10	3-M6	C451	1:D4	4-J1	*D202	1:F12	2-H9
C163	1:H8	1-C0	C314	1:H9	3-P3	C452	1:D5	4-J0	*D203	1:F12	2-H9
C164	1:H8	1-D0	C315	1:L6	3-P6	C453	1:D4	4-J0	*D204	1:F10	2-H8
C165	1:H3	1-E0	C316	1:L8	3-P7	C500	1:M6	5-E8	*D205	1:F10	2-H8
C166	1:H3	1-F0	C317	1:K9	3-Q7	C501	1:M5	5-E7	D206	1:B15	2-M6
C167	1:H4	1-F0	C318	1:M8	3-Q7	C502	1:M5	5-E6	D206	1:B15	2-M6
C168	1:H4	1-G0	C319	1:H12	3-F3	C503	1:M4	5-E5	D207	1:E8	2-M2
C170	1:G4	1-G0	C320	1:J5	3-Q2	C504	1:M4	5-E3			
C172	1:G5	1-H0	C400	1:D7	4-H8	C505	1:M3	5-E2	IC1	1:R12	1-O3
C173	1:G5	1-H0	C401	1:E8	4-H8	C506	1:M3	5-E1	IC2	1:S9	1-P1
C174	1:G5	1-I0	C402	1:D6	4-H7	C507	1:M5	5-F8	IC3	1:R7	1-R3
C202	1:F5	2-E2	C403	1:D6	4-H6	C508	1:M5	5-F7	IC100	1:H6	1-C0
C203	1:C12	2-E9	C404	1:D7	4-H6	C509	1:M4	5-F6	IC101	1:G3	1-F0
C204	1:C9	2-E8	C405	1:D4	4-H5	C510	1:M4	5-F5	IC200	1:F4	2-F1
C205	1:C12	2-F9	C406	1:D3	4-H4	C511	1:M4	5-F3	IC201	1:E3	2-F3
C206	1:C9	2-F8	C407	1:D5	4-H3	C512	1:M3	5-F2	IC202	1:F6	2-G4
C207	1:C12	2-F9	C408	1:D6	4-H3	C513	1:M3	5-F1	IC203	1:F3	2-H3
C208	1:C9	2-F8	C409	1:D5	4-H2	C514	1:M6	5-G8	IC204	1:F11	2-J8
C210	1:F4	2-G4	C410	1:D4	4-H1	C515	1:M5	5-G7	IC205	1:F14	2-O7
C211	1:F12	2-G9	C411	1:D4	4-H1	C516	1:M5	5-G6	IC206	1:D14	2-O4
C212	1:F12	2-G9	C412	1:D6	4-H0	C517	1:M4	5-G5	*IC207	1:G14	2-O2
C213	1:F10	2-G8	C413	1:D8	4-H8	C518	1:M4	5-G4	IC208	1:F8	2-P1
C214	1:F10	2-G7	C414	1:E8	4-H8	C519	1:M3	5-G3	IC209	1:G11	2-S0
C215	1:F11	2-H9	C415	1:D6	4-H7	C520	1:M3	5-G2	IC300	1:L14	3-F5
C216	1:F10	2-H7	C416	1:D6	4-H6	C521	1:M5	5-G8	IC300	1:L14	3-B9
C217	1:F7	2-H5	C417	1:D7	4-H6	C522	1:M5	5-G7	IC301	1:G12	3-F2
C218	1:C15	2-K5	C418	1:D4	4-H5	C523	1:M4	5-G6	IC303	1:H9	3-K8
C219	1:F11	2-J9	C419	1:D3	4-H4	C524	1:M4	5-G5	IC303	1:H9	3-J8
C220	1:D15	2-L5	C420	1:D5	4-H3	C525	1:M4	5-G4	IC303	1:H9	3-I8
C221	1:D15	2-L4	C421	1:D5	4-H3	C526	1:M3	5-G3	IC303	1:H9	3-I8
C222	1:F8	2-N2	C422	1:D5	4-H2	C527	1:M3	5-G2	IC303	1:H9	3-I9
C223	1:B14	2-N7	C423	1:D4	4-H1	C600	1:J4	6-E6	IC307	1:L11	3-J1
C224	1:C14	2-M4	C424	1:D3	4-H1	C601	1:K4	6-E5	IC310	1:L9	3-M5
C225	1:D15	2-M4	C425	1:D6	4-H0	C602	1:L4	6-E4	IC311	1:L7	3-P5
C226	1:E15	2-M5	C426	1:D7	4-J9	C603	1:J4	6-F6	IC312	1:K6	3-Q1
C227	1:D14	2-N4	C427	1:D8	4-J8	C604	1:K4	6-F5	IC313	1:G9	3-R3
*C228	1:E13	2-N8	C428	1:D7	4-J7	C605	1:L4	6-F4			
*C230	1:D14	2-N5	C429	1:D7	4-J7	C606	1:J4	6-F6	JP200	1:F15	2-L8
*C231	1:G13	2-N4	C430	1:D6	4-J6	C607	1:J4	6-F5	JP201	1:E13	2-M8
C232	1:E15	2-N7	C431	1:D7	4-J5	C608	1:K4	6-F4	*JP210	1:B15	2-M6
C233	1:F7	2-O1	C432	1:D4	4-J4	C609	1:L4	6-F3	JP300	1:K15	3-F7
*C234	1:G15	2-N2	C433	1:D3	4-J4	C610	1:J4	6-G6	JP301	1:J15	3-E5
C235	1:F13	2-P8	C434	1:C3	4-J3	C611	1:K4	6-G5	JP302	1:J15	3-F5
C236	1:E13	2-P5	C435	1:D6	4-J2	C612	1:K4	6-G4	JP303	1:J15	3-E4
*C237	1:H13	2-O4	C436	1:D5	4-J2	C613	1:L4	6-G3	JP304	1:J15	3-F4
C239	1:F8	2-O2	C437	1:D4	4-J1				JP306	1:H9	3-P3
C240	1:E15	2-K5	C438	1:D5	4-J0	D1	2:T9	1-T2	JP307	1:H9	3-P3
C300	1:L15	3-A9	C439	1:D4	4-J0	D1	2:T9	1-S2			
C301	1:M15	3-B9	C440	1:D8	4-J9	D2	2:T8	1-T2	L1	1:Q11	1-O3
C302	1:K13	3-D9	C441	1:D8	4-J8	D2	2:T8	1-S2	L114	1:J5	1-B0

Device	PCB	Circuit	Device	PCB	Circuit	Device	PCB	Circuit	Device	PCB	Circuit
L131	1:H3	1-E0	R13	1:S8	1-T1	R277	1:G11	2-T1	TP304	1:J13	3-G4
L132	1:G5	1-H0	R14	1:R13	1-S0	R280	1:E15	2-L5	TP305	1:J12	3-E3
L200	1:C12	2-E9	R15	1:R13	1-T0	R281	1:B15	2-L7	TP306	1:H12	3-G3
L201	1:C12	2-E8	R100	1:F5	1-H0	R301	1:L15	3-E6			
L202	1:C9	2-E8	R201	1:F5	2-E2	R302	1:J13	3-E5	XL300	1:J14	3-G4
L203	1:C9	2-E8	R202	1:E5	2-E2	R303	1:H12	3-E3			
L400	1:E8	4-H8	R203	1:E5	2-E2	R310	1:K15	3-F7			
L401	1:E8	4-H8	R204	1:E5	2-E1	R311	1:L15	3-G3			
L402	1:D6	4-H7	R205	1:E4	2-E1	R312	1:M15	3-G4			
L403	1:E6	4-H6	R206	1:E4	2-E1	R313	1:H9	3-H9			
L404	1:D7	4-H6	R207	1:E4	2-E1	R314	1:J10	3-H8			
L405	1:D4	4-H5	R208	1:E4	2-E1	R317	1:L13	3-I2			
L406	1:D3	4-H4	R209	1:H11	2-E1	R318	1:K12	3-K4			
L407	1:D5	4-H4	R210	1:E6	2-E5	R320	1:K13	3-K3			
L408	1:D5	4-H3	R211	1:E6	2-E5	R321	1:K15	3-H7			
L409	1:E5	4-H2	R212	1:E6	2-E5	R322	1:K9	3-M4			
L410	1:E4	4-H1	R213	1:E7	2-E5	R323	1:L9	3-M4			
L411	1:E3	4-H1	R214	1:G6	2-E5	R324	1:K9	3-M4			
L412	1:D6	4-H0	R215	1:G6	2-E5	R325	1:L9	3-M4			
L413	1:D8	4-J9	R216	1:E6	2-E5	R326	1:K9	3-M4			
L414	1:E8	4-J8	R217	1:F8	2-M2	R327	1:L9	3-M4			
L415	1:E7	4-J7	R218	1:E6	2-F5	R328	1:K9	3-M4			
L416	1:E7	4-J7	R219	1:F8	2-N2	R330	1:L9	3-M4			
L417	1:E6	4-J6	R220	1:E6	2-F5	R331	1:J7	3-M4			
L418	1:D7	4-J5	R221	1:E7	2-F5	R332	1:J7	3-M4			
L419	1:D3	4-J5	R223	1:G6	2-F5	R333	1:J6	3-M4			
L420	1:E3	4-J4	R224	1:G6	2-F5	R334	1:J7	3-M4			
L421	1:C3	4-J3	R225	1:G7	2-G5	R335	1:J7	3-M4			
L422	1:E5	4-J2	R226	1:E7	2-G5	R336	1:K13	3-L3			
L423	1:E5	4-J2	R227	1:G6	2-H5	R341	1:N10	3-P4			
L424	1:E4	4-J1	R228	1:F13	2-K8	R342	1:N10	3-P4			
L425	1:D5	4-J0	R229	1:F10	2-H8	R343	1:G10	3-P4			
L426	1:D4	4-J0	R230	1:F11	2-I8	R344	1:N10	3-P4			
L500	1:M5	5-F8	R231	1:F12	2-J8	R345	1:J8	3-P4			
L501	1:M5	5-F7	R232	1:F13	2-K8	R346	1:J8	3-P4			
L502	1:M5	5-F6	R233	1:B15	2-L7	R347	1:L6	3-O2			
L503	1:M4	5-F5	R234	1:C15	2-L5	R348	1:L5	3-P2			
L504	1:M4	5-F4	R235	1:F15	2-L8	R351	1:G9	3-Q3			
L505	1:M3	5-F3	R236	1:D15	2-L5	R352	1:H9	3-Q3			
L506	1:M3	5-F2	R237	1:D15	2-L5	R353	1:M8	3-R6			
L507	1:N5	5-G8	R238	1:C15	2-L5						
L508	1:N5	5-G7	R240	1:E15	2-L8	RV1	2:R6	1-S3			
L509	1:N5	5-G6	R241	1:B14	2-L7						
L510	1:N4	5-G5	R242	1:D15	2-L4	S1	2:T5	1-T1			
L511	1:N4	5-G4	R243	1:F13	2-L8	S2	2:T4	1-S1			
L512	1:N3	5-G3	R244	1:D15	2-M5	*S300	1:G8	3-R3			
L513	1:N3	5-G2	R245	1:C15	2-M7						
L600	1:J3	6-E6	R246	1:D15	2-M4	*SG200	1:B12	2-D9			
L601	1:K3	6-E5	R247	1:F15	2-M8	*SG201	1:B9	2-D8			
L602	1:L3	6-E4	R248	1:E13	2-M8						
L603	1:J3	6-G6	R250	1:E15	2-M5	SK1	1:R8	1-M2			
L604	1:K3	6-G5	R251	1:D13	2-M5	SK2	2:S2	1-T0			
L605	1:K3	6-G4	R252	1:C15	2-M7	SK100	1:B11	1-B9			
L606	1:L3	6-G3	*R253	1:G15	2-M3	SK101	1:P4	1-K2			
			R254	1:C14	2-M4	*SK102	1:K3	1-L3			
			*R255	1:G13	2-M3						
P1	2:Q5	1-T3	R256	1:C14	2-N7	T200	1:D12	2-G9			
P100	1:B5	1-B3	R257	1:E13	2-N8	T201	1:D10	2-G8			
P101	1:P9	1-U8	R258	1:D13	2-N5						
P101	1:P9	1-U6	*R260	1:G15	2-M3	TP200	1:F12	2-L8			
*P300	1:P14	3-H3	R261	1:E15	2-N5	TP201	1:G12	2-L3			
*P301	1:K4	3-R0	R262	1:F7	2-N1	TP202	1:B14	2-M7			
			*R263	1:G13	2-M3	TP203	1:C14	2-M5			
Q201	1:B14	2-L7	R264	1:D14	2-N4	TP204	1:G12	2-M8			
Q202	1:B14	2-L7	*R265	1:G15	2-N3	TP205	1:F12	2-Q4			
Q203	1:J5	2-G0	R266	1:F8	2-O1	TP206	1:H12	2-Q2			
			R267	1:G13	2-O9	TP207	1:C14	2-R7			
R1	1:Q3	1-O0	R268	1:E13	2-O6	TP208	1:H12	2-P3			
R2	1:S7	1-S3	R269	1:H10	2-R0	TP209	1:J13	2-L3			
R3	1:R7	1-T3	*R270	1:H13	2-O4	TP211	1:G12	2-R8			
R4	1:S9	1-S2	R271	1:J5	2-G0	TP212	1:G12	2-R5			
R5	1:S9	1-T2	R272	1:K5	2-G0	TP213	1:H12	2-R3			
R7	1:S8	1-S2	R273	1:G12	2-S7	TP300	1:J12	3-C5			
R8	1:S9	1-T2	R274	1:G12	2-S5	TP301	1:J12	3-C5			
R9	1:S8	1-S2	R275	1:G12	2-S3	TP302	1:H13	3-C4			
R10	1:S8	1-T2	R276	1:H11	2-S1	TP303	1:J13	3-G5			
R12	1:S7	1-S1									



## 5.3 T800-53-0000 Backplane PCB

This section contains the following information.

IPN	Section	Page
220-01449-02	Parts List	5.3.3
	PCB Layout - Top Side	5.3.5
	PCB Layout - Bottom Side	5.3.6
	Circuit Diagram	5.3.7



## T800-53-0000 Parts List (IPN 220-01449-02)

### How To Use This Parts List

The components listed in this parts list are divided into two main types: those with a circuit reference (e.g. C2, D1, R121, etc.) and those without (miscellaneous and mechanical).

Those with a circuit reference are grouped in alphabetical order and then in numerical order within each group. Each component entry comprises three or four columns: the circuit reference, variant (if applicable), IPN and description. A number in the variant column indicates that this is a variant component which is fitted only to the product type listed. Static sensitive devices are indicated by an (S) at the start of the description column.

The miscellaneous and mechanical section lists the variant and common parts in IPN order. Where possible, a number in the legend column indicates their position in the mechanical assembly drawing.

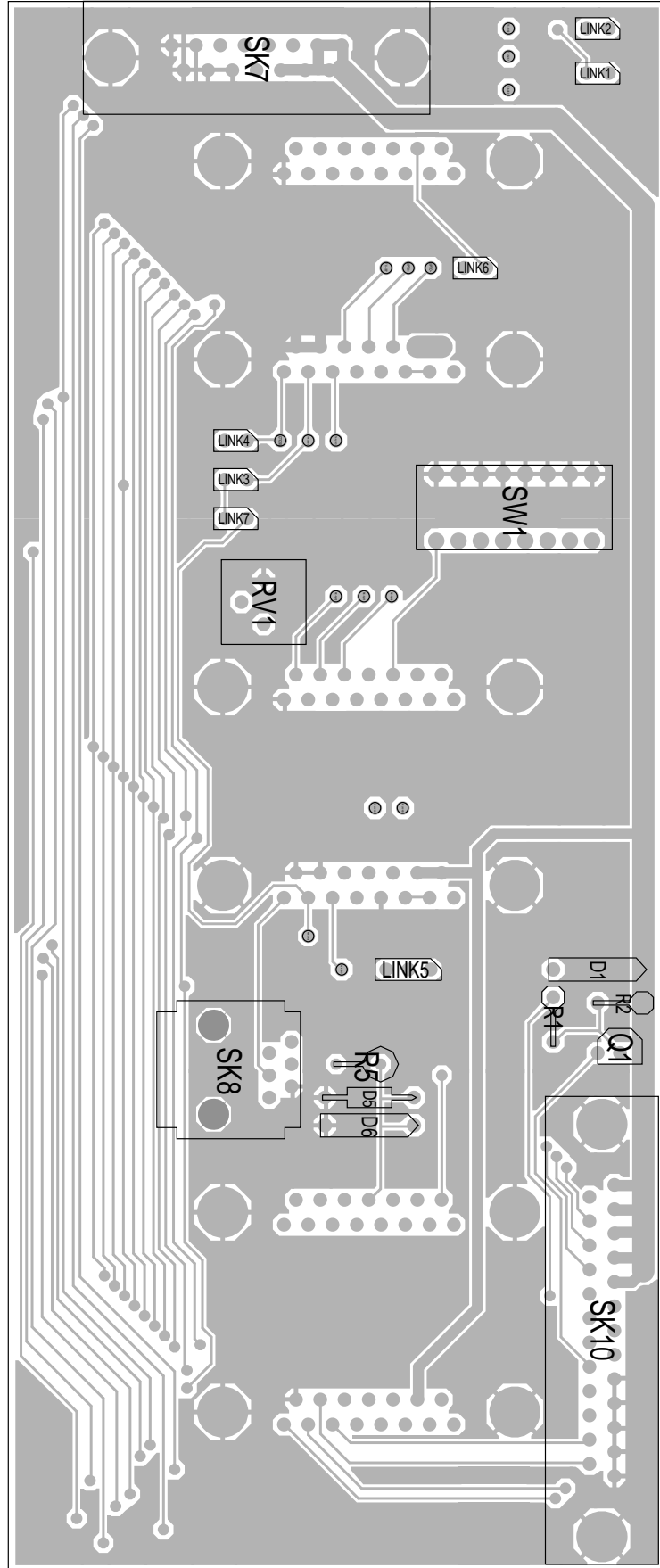
The Parts List Amendments box below lists component changes that took place after the parts list and diagrams in this section were compiled. These changes (e.g. value changes, added/deleted components, etc.) are listed by circuit reference in alphanumeric order and supersede the information given in the parts list or diagrams. Components without circuit references are listed in IPN order.

### Parts List Amendments

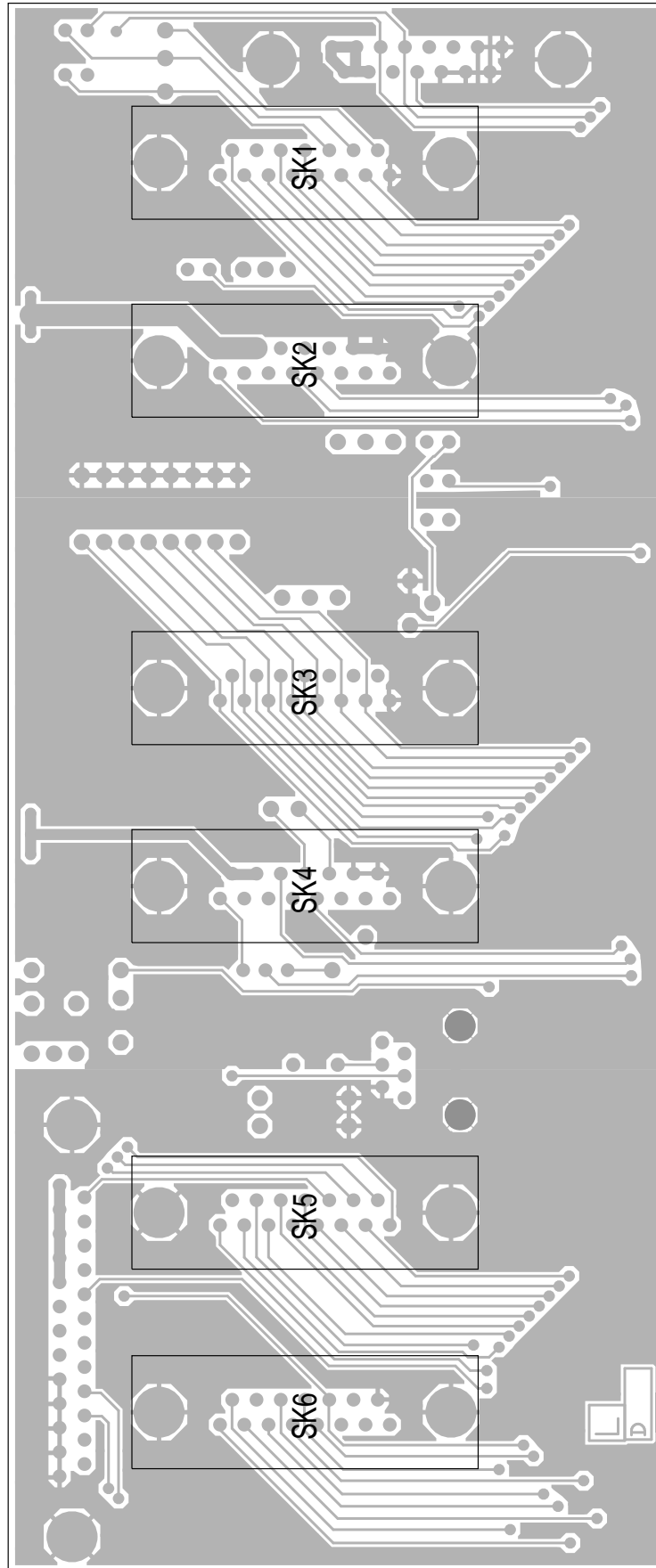
There were no amendments to the parts list at the time of publication.

Ref	Var	IPN	Description	Ref	Var	IPN	Description
D1		001-00011-70	S) DIODE 1N4001 1A/50V				
D5		001-00015-12	S) DIODE ZEN 5V6 0.4W 5%				
D6		001-00011-70	S) DIODE 1N4001 1A/50V				
Q1		000-50010-60	S) XSTR AI BC327 PNP TO92 AF				
R1		030-06180-00	RES FILM 180K 5% 0.25W 7X2.5				
R2		030-05100-00	RES FILM 10K 5% 0.25W 7X2.5				
R5		032-32100-00	RES M/F PWR 10E 5% 1W 10X4MM				
RV1		042-05100-10	RES PRE 10K CER 9.5MM SQ FLAT				
SK1		240-02020-15	SKT 15 DRANGE PCB PLUS PCB HW				
SK2		240-02020-15	SKT 15 DRANGE PCB PLUS PCB HW				
SK3		240-02020-15	SKT 15 DRANGE PCB PLUS PCB HW				
SK4		240-02020-15	SKT 15 DRANGE PCB PLUS PCB HW				
SK5		240-02020-15	SKT 15 DRANGE PCB PLUS PCB HW				
SK6		240-02020-15	SKT 15 DRANGE PCB PLUS PCB HW				
SK7		240-02020-15	SKT 15 DRANGE PCB PLUS PCB HW				
SK8		240-04021-60	SKT P/JACK 6-WAY VER 69254-001				
SK10		240-02020-20	SKT 25 DRANGE PCB PLUS FULL HW				
SW1		230-00010-19	SWITCH*8 SPST DIP PKG				
		220-01449-02	PCB TONE-REMOTE 3 BIN BACKPLAN				
		240-00020-59	HEADER 3 W 1 R PCB MTG				
		240-00020-68	HEADER 2W PCB MTG STD				
		240-04020-62	SKT 2 W RECEP SHORTING LINK				
		349-00020-03	SCRW T/T 4-40X1/4IN P/POZ				





T800-53-0000 PCB (IPN 220-01449-02) - Top Side



T800-53-0000 PCB (IPN 220-01449-02) - Bottom Side