T803-02-0000

Tone Remote and Alarm Interface

Service Manual

March 2003

M803-02-002-812

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About This Manual

Scope

This manual contains general, technical and servicing information for the separately sold T803 Tone Remote and Alarm Interface.

PCB Information

PCB information is provided for all current issue PCBs at time of issue. Thus, you will find the parts list, grid reference index (if necessary), PCB layouts and circuit diagram(s) for each individual PCB grouped together.

PCBs may change without notice. The latest parts lists are available from your nearest Customer Service Organisation.

Errors

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, Tait Electronics Ltd, Christchurch, New Zealand (full contact details are on page 2).

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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). Note that only the latest issue of the manual will be available for order.

Publication Information

Publication Date	Product Code
February 2003	M803-02-001-812
March 2003	M803-02-002-812

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.

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.

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 rack frame. It interfaces either a 2-wire or 4-wire line circuit to any standard T800 receiver/transmitter combination. It plugs into a backplane PCB (which may be purchased separately) which eliminates wiring between the T803 and T800 radios. The T803 is configured using Tait PGM800Win programming software (V4.02 and later) which runs on a PC.

The T803 AC tone remote function enables a remotely located user to:

- key a transmitter or 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)
- monitor and 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. The available tone set is 650Hz to 2050Hz in 100Hz steps. This function tone can change channel, monitor the radio channel (defeat receiver CTCSS) or a variety of other 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. This removes speech from the line and the low level guard tone ceases.
- **EIA enhanced tone remote using two function tones.**
  This is a variant of the above system where two function tones are sent one after the other in the period between the high level guard tone and the low level guard tone. The tone set is also expanded (650Hz to 2050Hz in 100Hz steps) to give 225 possible combinations which can be allocated to various actions. The duration of both the high level guard tone and the function tones can be varied.
- **Simple Transmitter keying using low level guard tone.**
  This is used where complex functionality is not required. One application is to key a link transmitter where the high level guard tone, the function tones, speech and low level guard tone are transparently carried to an end base station. Note that 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 channel 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 rack frame to a wide variety of industry standard radio voting systems. In tone-on-idle applications, a tone (normally the same frequency as the low level guard tone) is transmitted to line when the T800 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 receiver's RSSI. Control room equipment determines which receiver has the highest RSSI and thus selects which line carries the highest quality incoming audio.

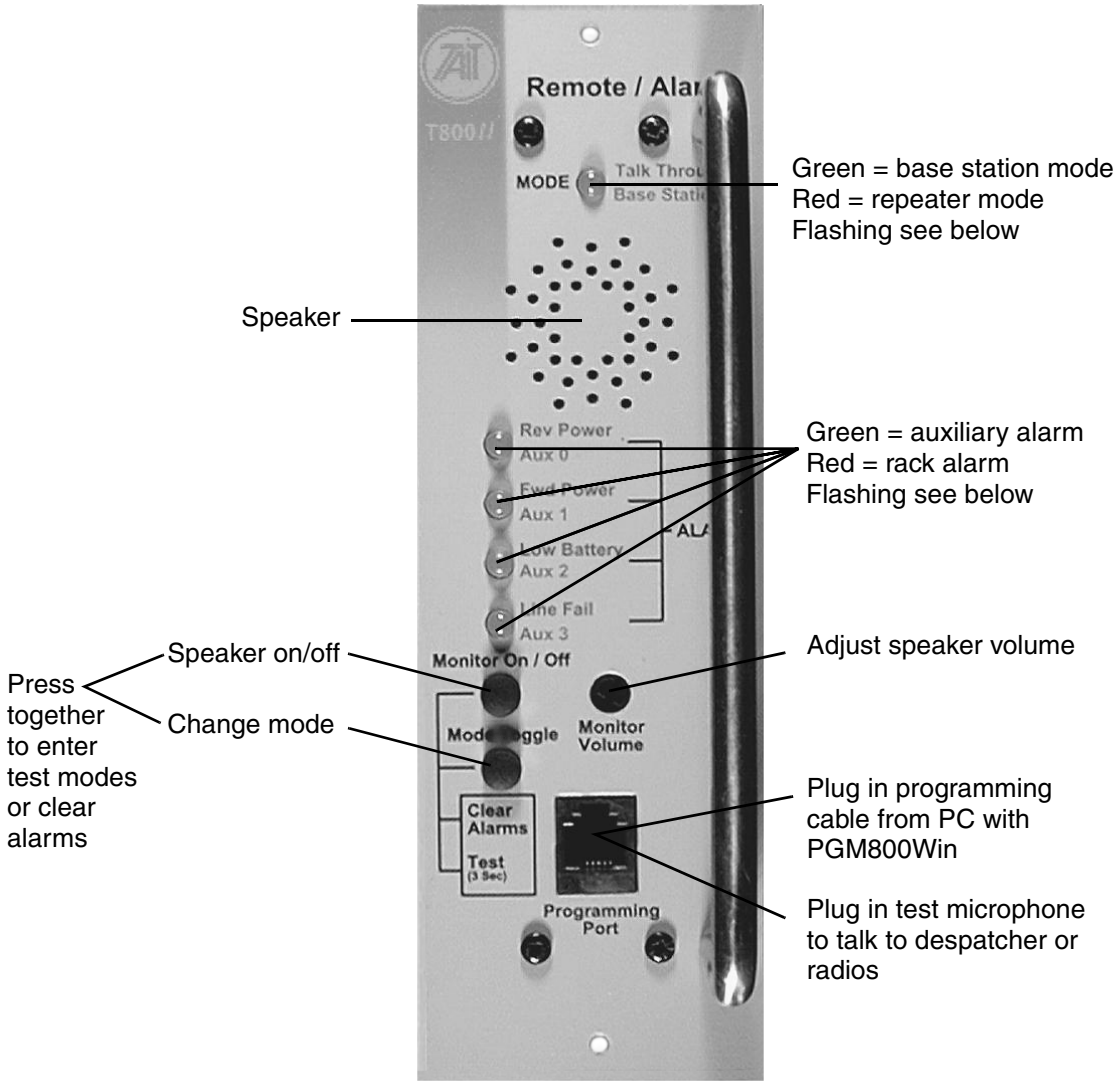
The T803 can transmit a Morse code identification sequence (CWID) at programmable intervals between transmissions. User programmable line levels and transmit/receive path delays are available (PGM800Win V4.02 and later).

The T803 monitors three T800 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.

1.1.1 Front Panel and LED Displays

1.1.1.1 Front Panel Display



1.1.1.2 Front Panel Mode LED

The colour of the Mode LED on the front panel indicates the T803 mode of operation:

- Green = Base station mode
- Red = Repeater (talk through) mode

The LED flashes in different ways, depending on the particular condition.

Flash Rate		Condition
	equal 0.3s on/ 0.3s off	Module is linked with PGM800Win
	long flash 1 s on/0.3 s off	Microcontroller has detected an internal communications error
	short off 0.3 s on/0.08 s off	Speaker is on.

Where two or more conditions occur at the same time, the precedence is in the order shown above (i.e. module linked has the highest priority, followed by microcontroller error, then speaker on).

1.1.1.3 Alarm LEDs

The alarm LED turns on only when its alarm condition has been triggered. The colour of the LED indicates the source of the alarm trigger:

- Green = Auxiliary alarm
- Red = Rack alarm

The LED flashes in different ways as indicated below.

Flash Rate and Colour		Alarm
	short off 0.32s on/0.1s off	Rack
	very short off 0.32s on/0.01s off	Auxiliary
	alternating red and green 0.32s on/0.1s off/ 0.32s on/0.1s off	Rack and Auxiliary

Press the Monitor and Mode Toggle buttons together to reset all alarms.

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

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 +60°C.

Dimensions:

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

Weight .. 1.5kg

1.2.3 Line

1.2.3.1 Input levels

Line In (Level required to produce a transmitter output at 60% full system deviation):

Programmable	.. -27dBm to +3dBm
Maximum input peak	.. +7dB relative to programmed level

1.2.3.2 Output levels

Line Out (Radio receiver level to T803 must be 230mV RMS)

Programmable	.. -27dBm to -1dBm
Dynamic range	.. +7dB relative to programmed level
Maximum output peak	.. +5.5dBm

For compliance with TIA/EIA-IS-968, CS-03 (Canada), PTC200 (New Zealand) and HKTA 2023 (Hong Kong):

Programmable Line Output level must be set to ≤ -10dBm.

For compliance with ACA TS002 (Australia):

Programmable Line Output level must be set to ≤ -11dBm.

For compliance with TS PSTN1 (Singapore):

Programmable Line Output level must be set to ≤ -7dBm.

1.2.4 Radio Levels

From Radio Receiver .. 230mV_{RMS} at input of T803
(for 1kHz tone at 60% full system deviation)
(Note: This input of theT803 is high impedance)

To Radio Transmitter:

From Line In .. -4.5dBm
From Radio Receiver .. -4.5dBm
(With receiver level to T803 set to 230mV_{RMS})

1.2.5 Tone Remote

Keytone Sensitivity .. 29dB less than programmed Line-In level

Keytone Accept Bandwidth .. ±0.75% typical (±16Hz at 2175Hz)
(Speech at -10dBm,
keytone at -30dBm)

Talkoff
(Max. difference between speech & keytone)

2-wire mode .. 32dB typical
4-wire mode .. 35dB typical

Programmable Guardtone Frequencies .. 1950, 2100, 2175, 2325, 2500, 2600, 2800, 2900, 2970, 3000 and 3100Hz

Programmable High Level Guard Tone Duration .. 60 - 200ms

Function Tone Frequencies .. 650Hz - 2050Hz in 100Hz steps

Function Tone Accept Bandwidth .. ±24Hz typical

Maximum Number of Function Tones .. 2

Programmable Function Tone Duration	..	20 to 100ms

1.2.6 Audio Response

Frequency Response	..	±1dB 300Hz to 3kHz except at notch frequency
Notch Filter Bandwidth At -38dB	..	±0.6% typical (±13Hz @ 2175Hz)
Notch Filter Bandwidth At -3dB	..	±1.28% typical (±28Hz @ 2175Hz)
Notch Filter Attenuation	..	38dB
Audio Distortion:		
From Line	..	<2.5%
From Receiver	..	<2%
Programmable Audio Delay:		
Minimum	..	0ms
Maximum	..	500ms
Step	..	1ms

1.2.7 Alarms

Supply Voltage Alarm Threshold	..	10.7V ±0.05V
RF Power Alarm Thresholds	..	adjusted inside Tx/PA
Line Fail Alarm Timer	..	off or 1 minute to 4 hours
Alarm Input Trigger	..	First and subsequent falling edges
Alarm Input Threshold	..	<1.5V (or to 0V via 3.3KΩ resistor)
Maximum Alarm Input Voltage	..	25V
Alarm/Confirmation Sequence	..	0 to 14 tones to radio and/or line (and/or Aux output when enabled)
Programmable Signalling Standards	..	Selcall (CCIR, EIA, EEA, ZVEI, & DZVEI) DTMF and EIA Tone Remote function tone format.
Tone Carrier Deviation (for test tone set @ 60%)	..	70% nom. system deviation @ 1kHz
Alarm Pip Tone Frequency/Duration	..	600Hz/200ms on tail of audio

1.2.8 Morse Code

Sending Speed	..	20 words per minute (PARIS)
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

1.2.9 Voting

Programmable Tone-On-Idle Frequencies	..	1950, 2100, 2175, 2325, 2500, 2600, 2800, 2900, 2970, 3000 and 3100Hz
Programmable Sliding Voting Tone Frequencies	..	2700 to 3500Hz
Voting Tone Level To Line	..	-40dBr to -1dBr (Adjustable relative to Line-Out setting)

1.2.10 Miscellaneous

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

1.3 System Configuration

The following flow chart will help you to configure your T800 system to include a T803 tone remote module. Refer to Section 1.3.1 for details on the product types mentioned in this chart.

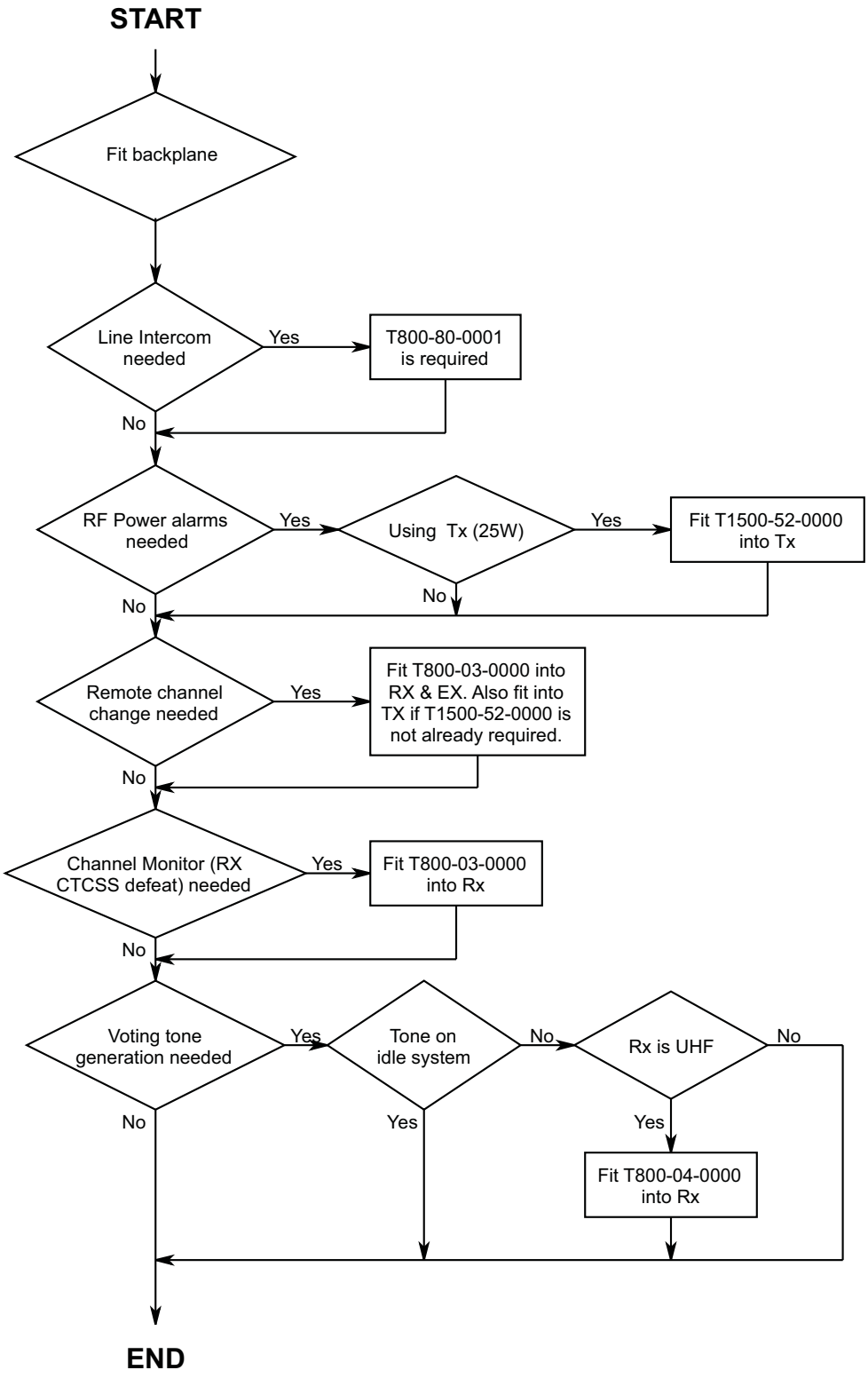


Figure 1.1 T803 System Configuration

1.3.1 Product Codes

The following table provides a brief description of the products mentioned in Figure 1.1. Consult your nearest Tait Dealer or Customer Service Organisation for more information on these products.

Product Code	Description
T800-03-0000	T800 auxiliary D-range kit.
T800-04-0000	T800 UHF RSSI kit.
T800-80-0001	T803 test microphone. Used for line intercom and to talk on air.
T803-02-0000	Tone remote module.
T1500-52-0000	Tx alarm & multichannel kit.

1.4 Regulatory Information

1.4.1 Canada

This product meets:

- Industry Canada Telecommunications Apparatus Compliance Specification CS-03. Registration No. 737A-10118A.
- Canadian ICES-003 (Radiated and conducted emissions, and electromagnetic susceptibility specifications) for Class A digital apparatus.

1.4.2 United States Of America

A copy of the Declaration of Conformity is available at www.taitworld.com

This equipment complies with TIA/EIA/IS-968, Part 15 Class A of 47CFR and Part 68 of 47CFR as detailed below.

- **TIA/EIA/IS-968** (Telecommunications - Telephone Terminal Equipment - Technical Requirements). Adopted criteria of the Administrative Council on Terminal Attachments (ACTA).
- **Part 15 Class A of 47CFR** (Radiated and conducted emissions, and electromagnetic susceptibility specifications) of the FCC rules for the United States. Operation is subject to the following conditions:
  1. This device may not cause harmful interference, and
  2. This device must not accept any interference received, including interference that may cause undesired operation.

Warning:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial enviroment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

- **Part 68 of 47CFR** (Connection of terminal equipment to the telephone network) of the Federal Communications Commission (FCC) rules and the requirements adopted by ACTA. On the rear face of this equipment is a label that contains, among other information, the product identifier i.e. US: 6FPNZL-34203-OT-N. If requested this number must be provided to the telephone company.

Warnings:

If this equipment, *T803 Tone remote and Alarm Interface*, causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could effect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information

If trouble is experienced with this equipment, *T803 Tone remote and Alarm Interface*, for repair or warranty information, please contact:

Tait North America Inc
Building 1, Suite 450
15740 Park Row
Houston, Texas, 77084, USA
Phone: 0800 320 4037
Fax: 281 829-3320
Mobile: 713-703-4991

Only approved Tait Dealer or Customer Service Organisations equipped with the necessary facilities should perform any servicing. Repairs attempted with incorrect equipment or untrained personnel may result in permanent damage. If the equipment, *T803 Tone Remote and Alarm Interface*, is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

1.4.2.1 Facility Interface and Service Order Codes

Unit Configuration	Function	USOC Jack type	REN[a]	FIC[b]	SOC[c]
T803 2-wire	2-wire leased line	RJ-11C	-	Metallic	9.0N
T803 4-wire	4-wire leased line	RJ61X	-	Metallic	9.0N

a. Ringer Equivalence Number

b. Facility Interface Code

c. Service Order Code

1.4.3 Europe

For Declaration of Conformity refer to www.taitworld.com

According to the requirements of the EC Council Directive:
1999/5/EC Radio Equipment and Telecommunications Terminal Equipment Directive,

The T803-02-0000 Tone Remote and Alarm Interface complies with;

- EN 301 489-5 Radiated and conducted emissions, and electromagnetic susceptibility specifications.
- EN60950 : 2000 Electrical safety

1.4.4 New Zealand

This product complies with the following standards:

- PTC200 Requirements for analogue telecommunications equipment.
- AS/NZS 3548 Class A Radiated and conducted emissions specifications

Warning:

T803-02-0000 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 Telecom New Zealand's Network services."

"This equipment does not fully met 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."

1.4.5 Australia

This product complies with the following standards:

- AS/ACIF S006 - 2001 Telecommunications technical standard
- AS/ NZS 3260 Electrical safety
- AS/NZS 3548 Class A Radiated and conducted emissions specifications

1.4.6 Hong Kong

This product complies with the Network Connection specification HKTA 2023

1.4.7 Singapore

This product complies with the Type Approval specification IDA TS PSTN1

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 4.02 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.

2.1 Introduction

T803 Hardware Block Diagram

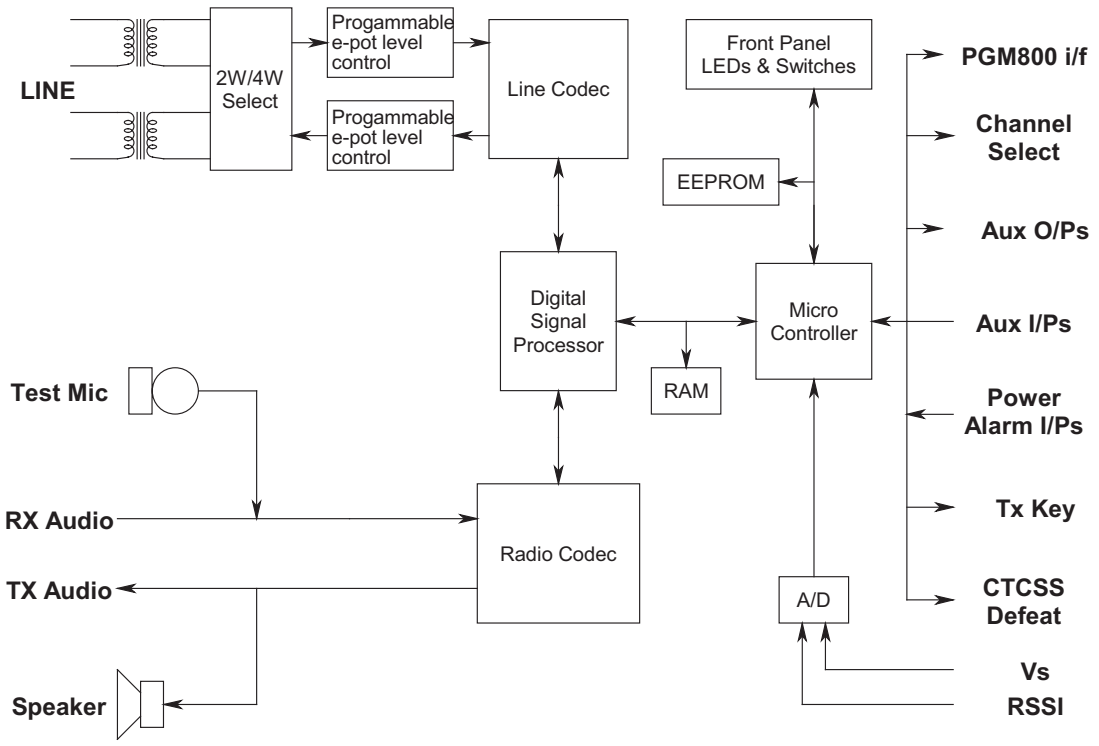


Figure 2.1 High Level Block Diagram

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 a programmable e-pot level control circuit before entering a CODEC where it is digitised. Audio to line is output from the same line CODEC, via a second programmable e-pot level control circuit.

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 receiver and sends audio to the T800 transmitter or 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 high level guard tone, low level guard tone and function tones coming from line, notch filter line in and receiver audio (used to eliminate low level guard tone from line out and transmitter audio);
- generate 5-tone DTMF/function 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;
- adjusts the line-in and line-out levels;
- mute audio from line in and receiver;
- delay the audio.

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, high level guard tone/function tone/low level guard tone timing, RSSI/voting tone conversion etc.).

2.2 Alarm Monitoring Operation

The T803 microprocessor monitors eight alarm sources:

- Transmitter and PA forward and reverse power
- low battery
- line fail
- 4 external closure alarms.

Once they are triggered they are latched (indicated by the corresponding LED on the front panel) and they cannot be re-triggered until they are cancelled.

If the T803 is keying the transmitter or sending receiver audio to line the latched alarm is ignored. Once the T803 re-enters the idle state the latched alarms are actioned. The microprocessor reads the EEPROM to determine what tone sequence the user programmed and instructs the DSP accordingly. If the tone sequence is to be sent to the transmitter, it is keyed 500ms before the tones are generated. If several alarms are latched together they are actioned in the priority order Line fail, Low battery, Forward power, Reverse power and then external closure 0 – 3. If the programmed alarm action is pip tone, the micro will instruct the DSP to append a 200ms burst of 600Hz tone to each transmission (to line and/or radio).

2.2.1 Alarm Triggers

The alarms are triggered according to their type.

RF Power Alarm

The forward and reverse power alarms are only tested when the T803 is keying the transmitter. The alarms must be active (high) for two seconds before they are latched. The two seconds sampling period allows for settling time inherent in some older T800 PA designs. Note that if a Transmitter fitted with a T1500-52-0000 PCB is being used, rack backplane links LK1 and LK2 must be fitted at power up.

Low Battery Alarm

The 13.8V supply line voltage is measured by the A/D converter (IC208) every 50ms. If the voltage is below the alarm threshold (10.7V±0.05V) for more than 25 seconds of a 30 second sampling period, the alarm is latched. The long sampling period allows for load fluctuation effects on the supply.

Line Fail Alarm

If no keying from line occurs within the period programmed by the user from PGM800Win, the microprocessor latches this alarm, saves the mode status and puts the T803 into Repeater mode. Note that programming zero as the line fail time disables this alarm.

External Closure Alarm

The 8 bit input latch (IC202) is sampled every 50ms. If two successive samples are the same value then the state of the closure alarms is tested (This has the effect of debouncing the alarm inputs). If any alarm is low then those alarms are latched.

2.2.2 Clearing Alarms

The alarms can be cleared by either pressing both front panel switches together or sending the T803 a correctly programmed function tone. All alarms are cancelled together.

Note: If the alarm condition is still valid when the latched alarm is cleared, a new one will be latched and the user-programmed action will be executed. When the Line failed alarm is cancelled, the T803 will resume the mode it was in before the alarm was triggered. A keying sequence from line will reset the Line fail alarm and (if no other alarms are latched) will cancel the pip tone. Pip tone can also be cancelled by a correctly programmed function tone from line.

2.3 Voting Tone Operation

When the T803 is programmed to generate a tone on idle, the microprocessor monitors the receiver Mute-In signal. When it is high the DSP is commanded to generate a voting tone to line out. When receiver Mute-In is low the voting tone is turned off. To prevent false detection of the idle tone at the far end voting equipment, the DSP filters energy at the idle tone frequency from the receiver audio transmitted to line out.

If the T803 is programmed to generate a Sliding (or Simoco compatible) Voting Tone the microprocessor reads the receiver RSSI level every 6ms using the A/D converter and sends this value to the DSP. The DSP generates a voting tone to line out. The tone frequency is proportional to the RSSI level. To prevent incorrect operation of the far end voting equipment, the DSP low pass filters the receiver audio transmitted to line out.

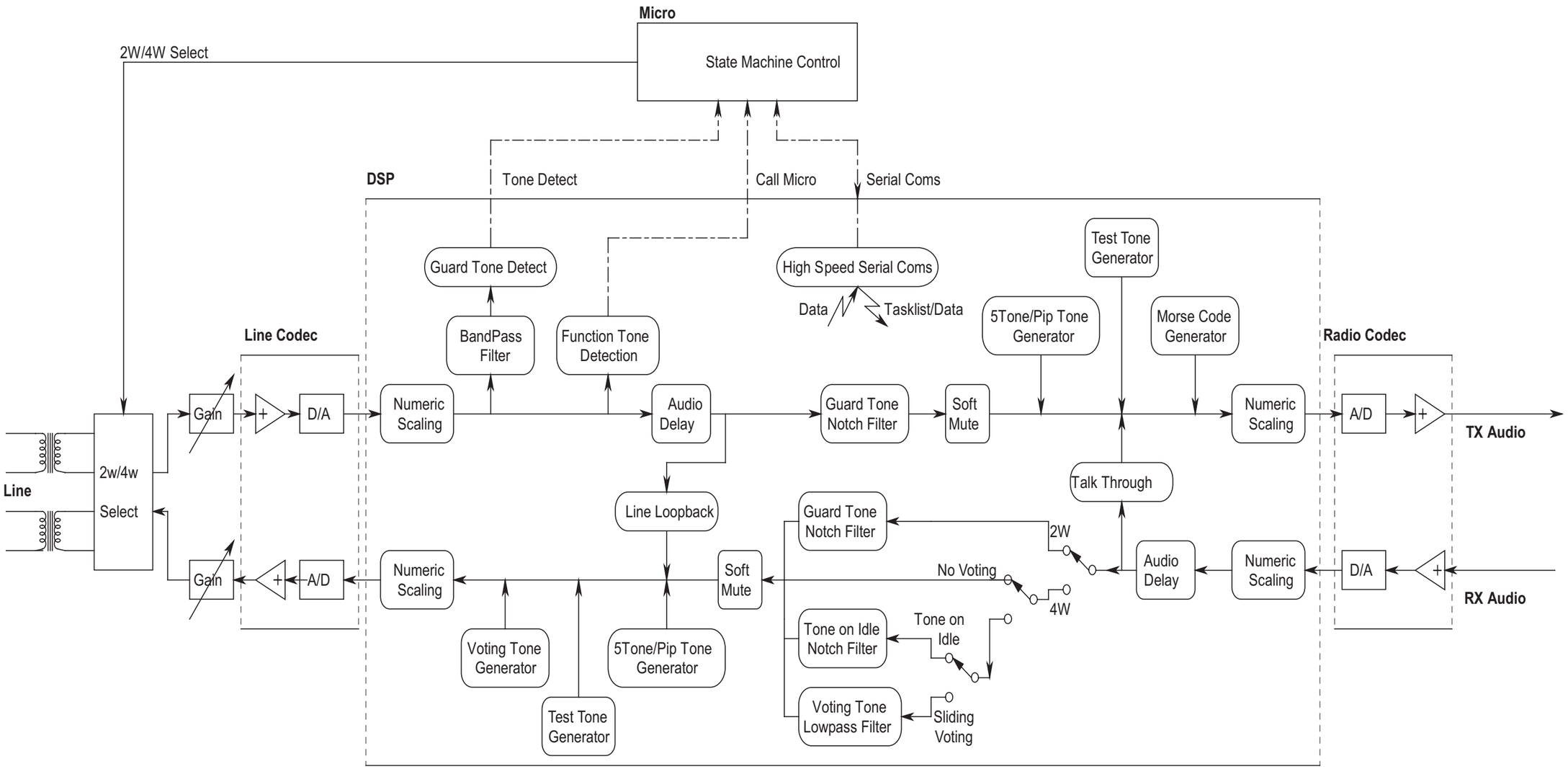


Figure 2.2 Signal Flow

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.

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.

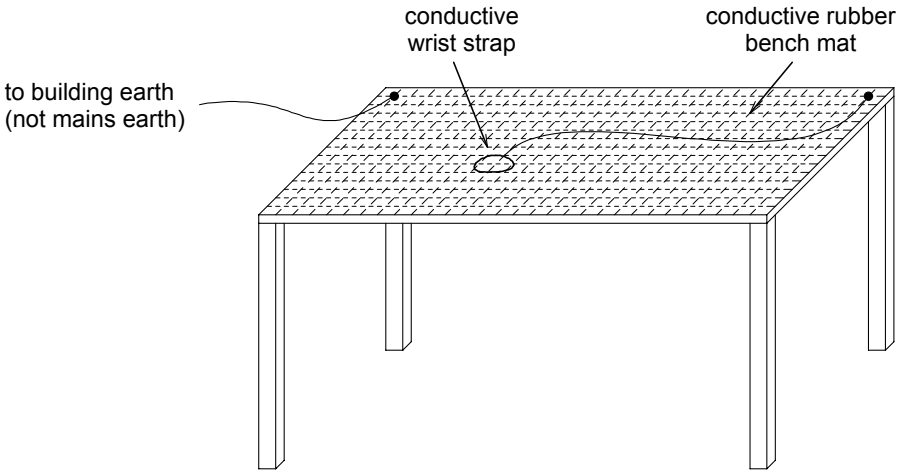


Figure 3.1 Typical Anti-static Bench Set-up

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).

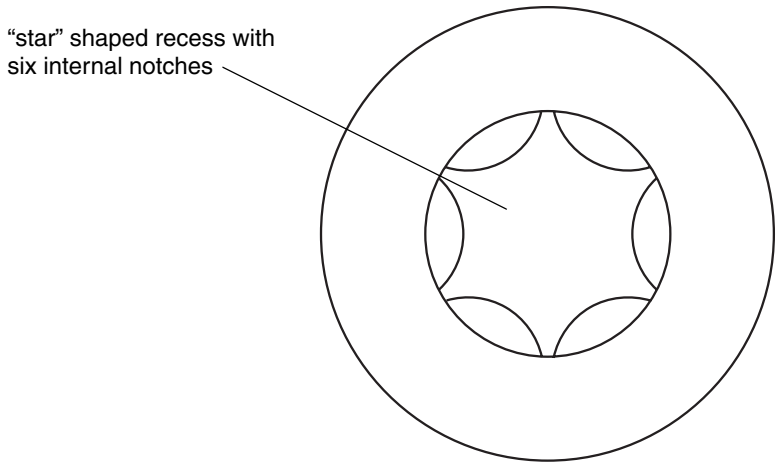


Figure 3.2 Torx Screw Identification

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).

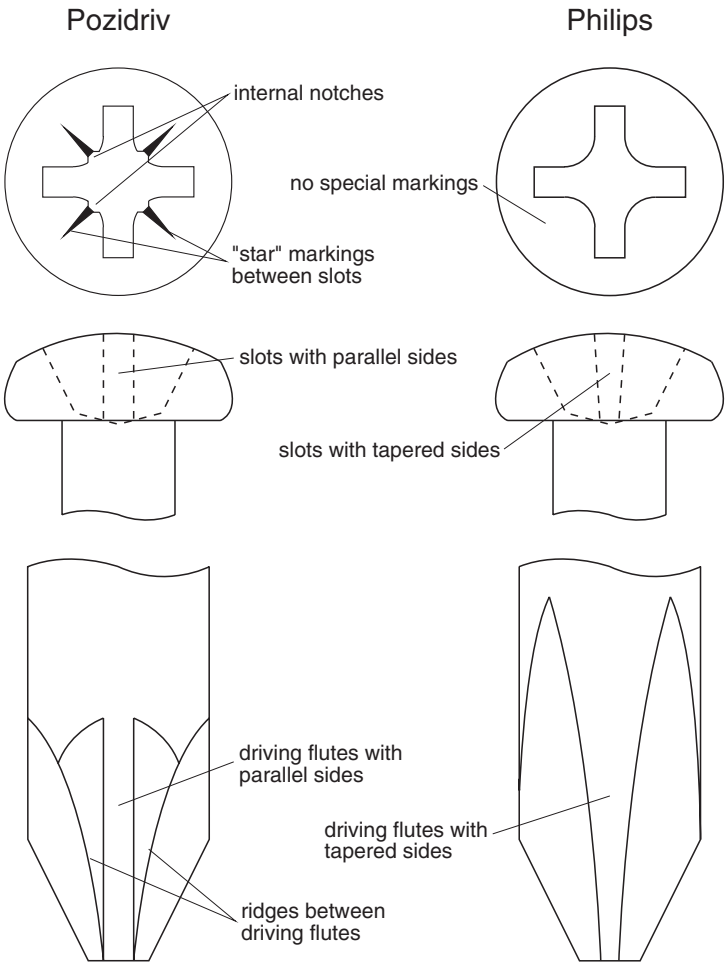


Figure 3.3 Pozidriv & Philips Screw & Screwdriver Identification

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 anti-static procedures for 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.

4.1 Rack Setup and Connections

4.1.1 Rack Frame Preparation (Backplane)

If you are not using a prewired T800-27-000X rack frame, you will have to install a T800-54-0000 3-bin tone remote backplane PCB into the left side (looking from the front) of a T800 rack frame. Set the links and switch SW1 as described in the following table.

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

Link	Setting
1, 2 & 8	fit if you are using a transmitter fitted with a T1500-52-0000 RF alarm PCB
3 & 7	fit if you are using a T800 receiver/exciter/transmitter that: • is not fitted with a T1500-52-0000 RF alarm PCB • is not fitted with a T800-03-0000 auxiliary D-range • has not been modified for operation in a Series I rack frame
4	not fitted as standard
5	connect pins 2 & 3 and 4 & 5
6	not fitted as standard
9	not fitted as standard
10	connect pins 1 & 2
switch SW1	Set all switches to off if you wish to select channels via the T803 and/or PGM800Win

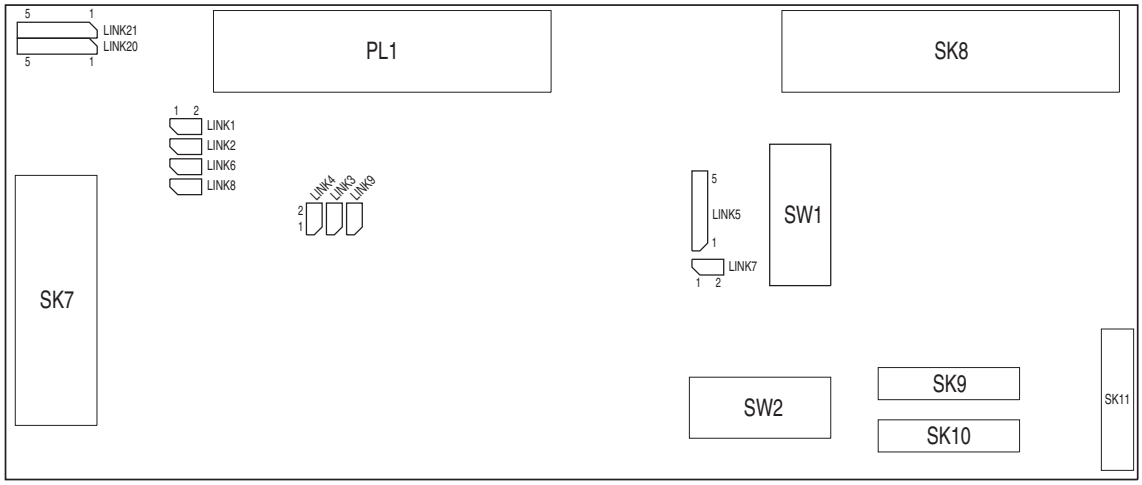


Figure 4.1 T800-54-0000 Backplane PCB Link Locations (IPN 220-01449-06)

4.1.2 Installing the T803

Install the T803, receiver and transmitter (or exciter and PA) in the rack as shown below.

Note 1: The 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

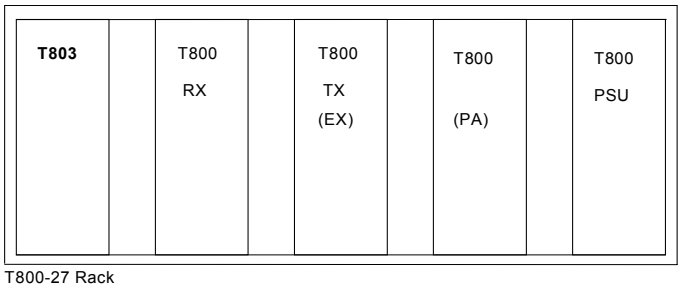


Figure 4.2 T803 Installation

4.1.3 Line Interface

The following table describes the pin configuration for interfacing with the T803 on 4-wire and 2-wire networks.

RJ45 pins	4-Wire	2-Wire
3	LineOut+	NC
4	LineIn+	Line In / Out
5	LineIn-	Line In / Out
6	LineOut-	NC

The T803 accommodates an input signal range of 28dB. Normally this is sufficient, however by shorting JP200 (found on the T803 PCB) an extra 15dB gain is added.

4.1.4 Auxiliary Inputs / Outputs

The 25 way female D-range connector (SK8) located on the T800-54-0000 backplane board allows for 4 auxiliary inputs and 4 auxiliary outputs. Refer to Section 5.3 for backplane circuit and overlays diagrams.

The table below indicates the pin assignments of SK8.

Description	Pin	Description	Pin
Alarm0 Input	14	Adjacent Ground	1
Alarm1 Input	15	Adjacent Ground	2
Alarm2 Input	16	Adjacent Ground	3
Alarm3 Input	17	Adjacent Ground	4
		Ground	5
Aux0 Output	25	Adjacent 13.8Volts	13
Aux1 Output	24	Adjacent 13.8Volts	12
Aux2 Output	23	Adjacent 13.8Volts	11
Aux3 Output	22	Adjacent 13.8Volts	10
PTT Output	21	13.8Volts	9
Other configura-tions	6,7,8,18,19,20		

4.1.4.1 Auxiliary Alarm Inputs

The T803 has 4 closure alarm inputs. On every falling edge the associated alarm is (re)triggered, and sent when the T803 becomes idle. Alarm 0 has a higher priority than Alarm 3, in that the alarm will be actioned first.

Maximum input voltage = 25V

Note: the behaviour is different from the T803-00 version as it will resend alarms on every closure.

4.1.4.2 Auxiliary Control Outputs

The 4 auxiliary outputs are of common collector type (they will only sink current), and are rated to a maximum of 50V and 250mA. The outputs can be controlled via a function tone sequence (Enable, Toggle, or Disable) or enabled on an alarm.

4.2 T803 Setup

Before using the T803, input and output levels need to be properly configured. Specifically, line input and output levels, the level from the receiver and the level at the radio transmitter.

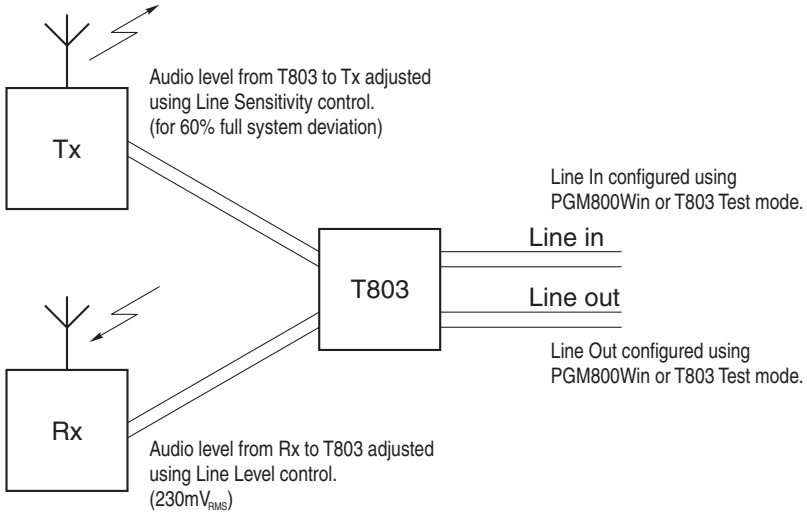


Figure 4.3 T803 setup

The line in/line out levels can be setup using either the programming application (PGM800Win) or the test modes of the T803 (accessed via the buttons on the front panel. See Section 4.2.3). The advantage of the Test mode method is that it can provide a direct test of the system. The programming method is required when access to the far end controller is difficult.

Using the test modes, the T803 levels are set up using actual signals present on the line. These signals, test tone and keytone, are generated by the far end controller and applied to the T803 via the leased line. Alternatively, an audio generator could be used with the line loss simulated.

Programming the levels using PGM800Win does not require any connection to the line. However, input/output specifications of the controller and actual line loss must be known so that the T803 levels can be properly calculated and programmed.

Setting up receiver and transmitter levels can only be done using T803 test modes and/or measurement. These levels are not programmable.

Caution: **The audio input level to the T803 must not exceed the set line levels. This will ensure that the output will not exceed the power level requirements of the telecommunications leased line.**

4.2.1 Equipment Setup for Level Configuration.

Configuring the T803 Line levels (using PGM800Win or Test Mode) and radio receiver or transmitter levels requires the rack and test equipment to be set-up as shown below.

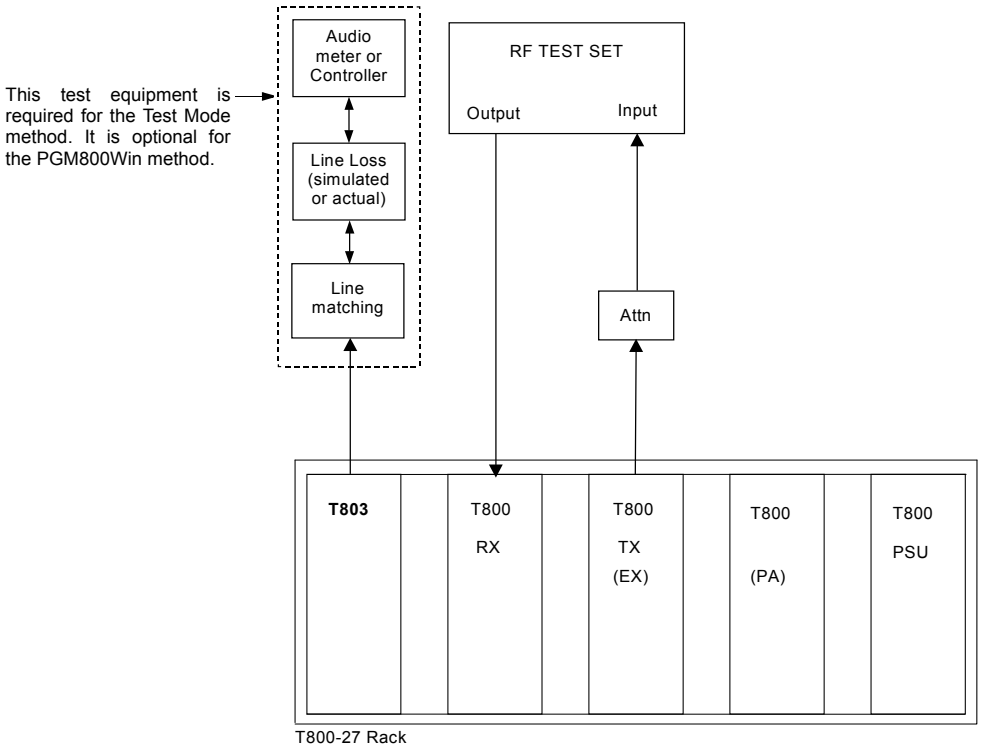


Figure 4.4 Rack and test equipment setup

Remove any coaxial relay or duplexer in the T800 modules' RF path and connect them directly to an RF Test Set. Ensure that transmitter or PA RF output is sufficiently attenuated to prevent damage to the test set.

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

4.2.2 Use of Test Microphone

The T803 test microphone is used to communicate both on air to radios and down the line to dispatch consoles (controllers). It plugs into the RJ11 connector on the front panel which doubles as a programming port. It is electrically connected in parallel with the receiver (microphone with receiver audio & PTT button with receiver mute).

Most controllers are equipped with an intercom facility whereby speech can be sent to line without a keytone. This enables the dispatcher to talk to service personnel at the repeater site using the T803's built in speaker without broadcasting speech to air. The service personnel can talk back to the dispatcher using the T803 test microphone (the PTT must be pressed to gate microphone speech). Note that if the T803 is in repeater mode, PTT on the test microphone will key up the transmitter and thus broadcast test speech to air.

4.2.3 Test Modes

The T803 has three test modes to assist with setting levels:

- Test Tone mode
- Line-In Level Configuration mode
- Line-Out Level Configuration mode[1]

To enter the test modes, press the Monitor and Mode Toggle buttons on the front of the T803 simultaneously for three seconds. The alarm LEDs will start flashing colours and travelling up and down the display to indicate Test Tone mode. The T803 will key-on the associated transmitter or exciter and encode a 1kHz test tone to the transmitter or exciter for one minute. The test tone can also be heard on the T803 speaker.

While still in Test Tone mode, simultaneously pressing the Monitor and Mode Toggle buttons briefly will change the mode to Line-In Level Configuration mode. All the LEDs will be on — either entirely red or entirely green.

- Green = Keytone present. T803 will key-on the associated transmitter or exciter.
- Red = No keytone present

While still in Line-In level configuration mode, simultaneously pressing the Monitor and Mode Toggle buttons briefly again will change the mode to Line-Out Configuration mode. To indicate this, all the LEDs will be orange.

Note: After entering each mode, a one to two second pause is required before attempting the simultaneous press to enter the next mode (or to exit).

While in Line-In or Line-Out Configuration mode, the Monitor and Mode Toggle buttons operate as 'gain' adjust buttons. A short press on the Monitor button will increase the Line-In/Line-Out gain and toggle the top alarm LED on or off, indicating a level increase. The LED will no longer toggle (it will stay on) when the top of the range has been reached. Conversely the Mode Toggle button will decrease the gain and toggle the bottom alarm LED. Likewise, the LED stays on when the bottom of the range has been reached. In both of these modes Line-in audio can be heard on the monitor speaker.

To exit Line-Out Configuration mode, briefly press both the buttons again. Alternatively, the unit will automatically return to normal operation mode after one minute. This occurs in all three Test modes.

Note: These levels are always preserved on exit. Take care not to change them unintentionally during simultaneous button press.

1. Line-Out Configuration mode is only available in T803 firmware version 2.07 or later.

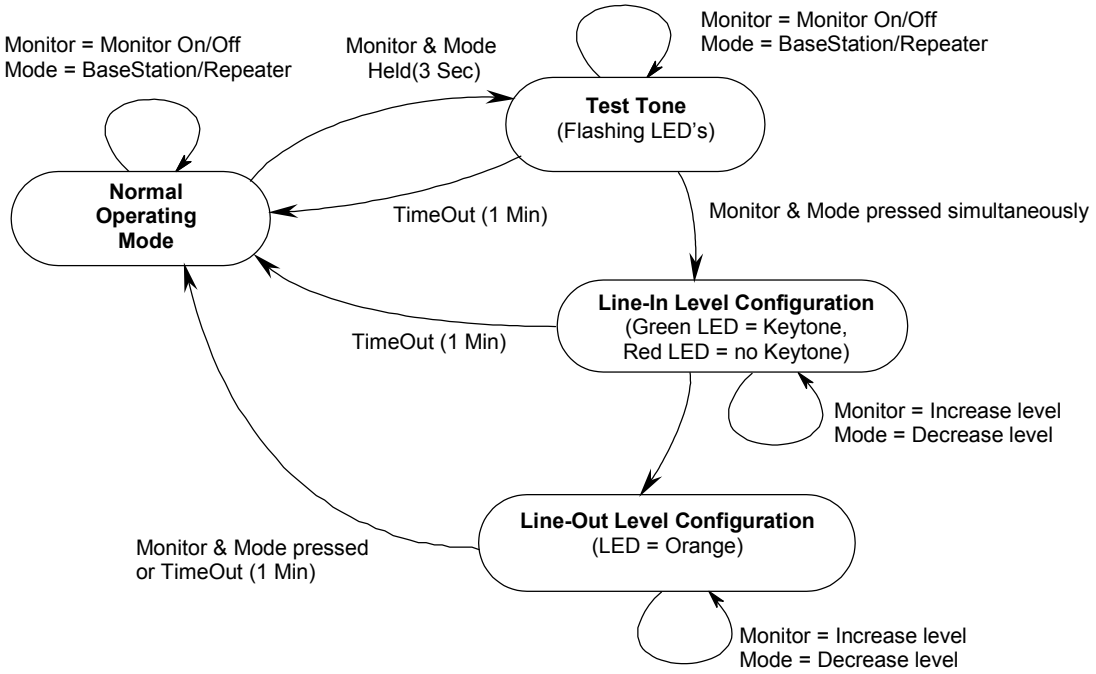


Figure 4.5 Cycle of switching between the modes

4.2.4 Level Configuration

4.2.4.1 Audio Level from T803 to Transmitter or Exciter

The level of audio received from the T803 is adjusted on the input of the transmitter.

1. Set the T803 into Test Tone mode (See Section 4.2.3)

2. Adjust the Line Sensitivity Control on the front panel of the transmitter or exciter to give a reading on the RF Test Set of 60% full system deviation (compensate for any CTCSS tone deviation).

	Narrow Band	Wide Band
Channel Spacing	12.5kHz	25kHz
Maximum deviation (specifications)	2.5kHz	5kHz
60% of maximum deviation	1.5kHz	3.0kHz

4.2.4.2 Line-In Level Adjustment

The Line-In level can be set-up in two ways:

- on the T803 in Level Configuration mode
- using PGM800Win software version 4.02 or later.

Using Level Configuration Mode:

Note: The audio level from T803 to the transmitter or exciter must be set-up before commencing with this procedure (Section 4.2.4.1).

1. Set the T803 into Line-In Level Configuration mode (See Section 4.2.3).

2. Connect a Tone Remote Control Console to the far end of the line, or simulate the controller and line loss using an audio generator.

3. Press the PTT on the far end controller. This will send a keytone to the T803. Ensure the controller also sends a test tone (at nominal level to line).

4. The alarm LEDs on the front panel of the T803 should change to green, indicating that a keytone has been detected, for as long as the PTT is pressed.

5. Adjust the Line-In level by pressing the Monitor button (increases the level) or the Mode Toggle button (decreases the level) until the transmitter or exciter deviation reading, monitored on the RF Test Set, indicates 60% full system deviation (compensate for any CTCSS tone deviation).

6. Press the PTT on the far end controller again, but this time use speech instead of the test tone. Ensure the LEDs on the T803 remain constant on green during speech transmission. If not see Section 4.4.1 (item 7) on how to troubleshoot for Talkoff.

Note: The monitor speaker is forced on in this mode so that the test-microphone may be used as an intercom to communicate to the controller room (See Section 4.2.2).

Using PGM800 software:

1. Determine the nominal output level of the controller. This may be a preset or default value specified in the controller manual or a value programmed by the operator.

2. Determine the actual line-loss between the controller and the T803.

3. Calculate T803 Line-In Level as follows:
   T803 Line-In Level = Controller nominal output level (dBm) - Line-loss (dB)

4. Program the T803 with the calculated level.

Example case:
Controller nominal output level = -13dBm
Measured Line loss = 6.5dBm
T803 Line-In level = -13 - 6.5 = -19.5dBm

4.2.4.3 Audio Level from Receiver to T803

The audio level from the receiver to the T803 is adjusted using the Line Level control of the receiver. Three methods can be used to set this level:

- Direct measurement of receiver audio on the backplane
- Using transmitter or exciter deviation as a measure of receiver audio level
- Using Line-Out level as a measure of receiver audio level

Direct Measurement of Receiver audio on the Backplane:

1. Use the RF Test Set to un-mute the receiver.

2. Modulate the RF carrier with a 1020Hz tone at 60% full system deviation, adding CTCSS tone if necessary (ensure that CTCSS tone is removed from the receiver audio output by selecting the correct links inside the receiver).

3. Monitor the audio level from the receiver on the T800-54-0000 backplane at Link5 pin3 with the links in place as directed in Section 4.1.1.

4. Adjust the Line Level control on the front of the receiver for an audio level of 230mV$_{RMS}$.

Using Transmitter or Exciter Deviation as a Measure of Receiver Audio Level:

Note: This method is not suitable for simplex configured repeaters.

1. Return the T803 to normal operating mode.

2. Use the RF Test Set to un-mute the receiver.

3. Modulate the RF carrier with a 1020Hz tone at 60% full system deviation, adding CTCSS tone if necessary (ensure that CTCSS tone is removed from the receiver audio output by selecting the correct links inside the receiver).

Note: 1020Hz tone is used because some Test Sets can produce unstable deviation readings.

4. Put the T803 unit into Talk Through mode (also known as Repeater Mode) using the Mode Toggle button. The Mode LED should be red, constant or flashing, and the transmitter or exciter should be keyed on.

Note: The Mode Toggle button can be disabled from PGM800Win.

5. Adjust the Line Level control on the front of the receiver to produce 60% full system deviation at the Transmitter or Exciter RF output as measured on the Test Set.

Note: De-Emphasis should be off on the test set receiver.

Using Line-Out level as a measure of receiver audio level:

1. Return the T803 to normal operating mode.

2. Use the RF Test Set to un-mute the receiver.

3. Modulate the RF carrier with a 1020Hz tone at 60% full system deviation, adding CTCSS tone if necessary (ensure that CTCSS tone is removed from the receiver audio output by selecting the correct links inside the receiver).

Note: 1020Hz tone is used because some Test Sets can produce unstable deviation readings

4. Put the T803 into Base Station Mode (Mode Toggle button). The Mode LED should be green, constant or flashing.

Note: The Mode Toggle button can be disabled from PGM800Win.

5. Monitor the T803 Line-Out level and by adjusting the Line Level control on the front of the receiver, set this level to equal the programmed Line-Out Level as set in PGM800Win.

4.2.4.4 Line-Out Level Adjustment

The Line-Out Level can be set-up in two ways:

- On the T803 in Level Configuration mode
- using PGM800Win software version 4.02 or later.

Using Level Configuration Mode (T803 firmware version 2.07 or later):

1. Set the T803 into Line-Out Level Configuration mode (See Section 4.2.3).

2. Use the RF Test Set to un-mute the receiver.

3. Modulate the RF carrier with a 1020Hz tone at 60% full system deviation, adding CTCSS tone if necessary (ensure that CTCSS tone is removed from the receiver audio output by selecting the correct links inside the receiver).

4. Monitor the T803 Line-Out level and adjust by pressing the Monitor button (increases the level) or the Mode Toggle button (decreases the level) until the level is acceptable at the far end controller.

Note: The monitor speaker is forced on in this mode so the test-microphone may be used as an intercom to communicate to the Controller room (See Section 4.2.2).

Using PGM800 software:

1. Determine the nominal input level required at the far end controller. This may be a preset or default value specified in the controller manual or a value programmed by the operator.

2. Determine the actual line-loss between the controller and the T803.

3. Calculate T803 Line-Out Level as follows:
T803 Line-Out Level = Controller nominal input level (dBm) + Line-loss (dB)

4. Program the T803 with the calculated level.

Example case:
Controller nominal input level = -13dBm
Measured Line loss = 6.5dBm
T803 Line-Out level = -13 + 6.5 = -6.5dBm

4.3 Programming: Replacing a T803-00 with a T803-02

The process of programming the T803 using PGM800Win has not changed.

A T803-00 can be replaced with a new T803-02 without manually reprogramming all the settings. The following instruction outlines the steps required to do this:

1. Insert the T803-00 in the rack
2. In PGM800Win, read the contents of the T803-00.
3. Save the database to file.
4. Insert the new T803-02 in the rack.
5. In PGM800Win, read in the previously saved database file.
6. Change the Serial Number field to reflect the new unit.
7. Write to the rack.

Note: Steps 3 and 5 are optional, and only required if the Tone Remote dialog is closed.

4.4 Fault Finding

1. Connect the T803 to its companion dispatch terminal (controller) via the leased line. Check that speech sent from the controller can be heard on the T803 speaker (un-mute speaker if required).

   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 Send/Receive pairs.

2. Use the console to key-on the transmitter. If the transmitter does not key-on, check that the controller and T803 have been compatibly programmed.
   - check 2-wire or 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 controller 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 controller can key the transmitter but not change repeater/basestation mode, auxiliary outputs, receiver defeat or cancel alarms, carry out the checks in Step 2 above, but pay particular attention to the function tone programming.

   If changing channels is a problem check that the appropriate channel selection DIP switches (SW1) on the rack backplane are off.

4.4.1 Troubleshooting/Known Issues

1. Sometimes misses function tone command

Setup the line-in level so that the function tones are about $2V_{pp}$ at TP204.

2. Misses function tone sequence on very fast key repetition

A minimum of 200ms pause is required between pressing buttons on the controller. Some controllers do not limit the maximum keying rate.

3. PGM800Win: "Warning: the Firmware version is not compatible. Data read maybe incorrect"

This warning occurs when reading the T803 with the old version of PGM800Win.

This can be ignored as the T803 unit is backwards compatible. However, it is recommended to use the latest PGM800Win with full T803 support.

4. Loop-Line functionality (also known as Loopback)

Loopback can be activated by programming and using function tones.

5. While in Line-In Level Configuration mode, the LEDs flash green only briefly when the far end Controller PTT is pressed

The line-in level is too low. The T803 is only detecting the high-level guard tone (HLGT).

While still in Line-in Level Configuration mode, activate the controller PTT and adjust the Line-In level by pressing the Monitor button (increases the line-In level) until the LEDs remain constant green. The top alarm LED will toggle on and off, indicating a level increase until the top of the range is reached (may be as many as 65 presses). If this still fails, open up the unit and add JP200, and try again.

6. When the PTT is pressed, a pulsing sound can be heard from the speaker

The line-in level is too high. The function tones can not be decoded properly hence it keys off.

While still in Line-in Level Configuration mode, activate the controller PTT and adjust the Line-In level by pressing the Mode button. The bottom alarm LED will toggle on and off, indicating a level decrease until the bottom of the range is reached. Using an oscilloscope measure the signal on TP204—the function tone level should be about half the level of the high level guard tone.

7. The Controller keys the transmitter correctly except when speech is present

This is known as Talkoff and occurs when the difference between the keytone level and speech peak level exceeds specification (32dB in 2-wire mode and 35dB in 4-wire mode)

Adjust the relative levels sent from the controller. For reliable operation, the keytone level should be no more than 35dB lower than peak speech level.

If this is not possible to adjust the levels at the controller, reduce the Line-In level of the T803 until Talkoff is eliminated. This requires that the Audio Level from T803 to transmitter or exciter will also need to be re-adjusted (using the transmitters Line Sensitivity control) to maintain 60% full system deviation for the test tone sent from the Controller.

8. Keytone Falsing in 2-wire mode

When operating in 2-wire mode with lossy lines (i.e. significant separation required between T803 Line-in and Line-Out levels) the keytone detector can become de-sensitised.

- Firstly check to ensure that the input level from the receiver is correctly setup at 230mV_{RMS} (See Section 4.2.4.3).

- Check the receiver mute open level (squelch). If necessary adjust the receiver Gating Sensitivity control on the front panel of the receiver, so that the receiver mute opens at a higher SINAD level (12dB or preferably greater). This has the effect of reducing the noise on the input of the T803.

- If there is still a problem after the squelch level has been adjusted as much as practicable, it becomes necessary to reduce the separation between the T803 Line-in and Line-out levels. This separation may need to be reduced to less than 8dB for 12dB receiver audio SINAD (or less then 12dB for 14dB receiver audio SINAD). To achieve this, adjust the relative input and output levels of the far end controller. Again, this has the effect of reducing the noise on the input of the T803.

If the above solutions do not help resolve the problem, the 2-wire line loss may be too severe and unacceptable for normal 2-wire T803 operation. In this case an external hardware solution involving a notch filter fitted to the receiver audio path (TA1086-01) and a 2-wire/4-wire hybrid fitted across the line may be required. This solution has been verified and documentation is available detailing how to install the TA1086-01.

9. Continuous function tone output from T803 when alarm is triggered (2-wire mode only)

When operating in 2-wire mode, if the keytone frequency is within approximately 300Hz of a programmed Selcall or function tone alarm response, the alarm tone is fed back into the T803 input, causing the transmitter to key up and a continuous function tone to be output.

Reprogram the T803 and the controller so that there is at least 300Hz frequency separation between the keytone and the alarm function tones or Selcall response.

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 T800-54-0000:

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

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.

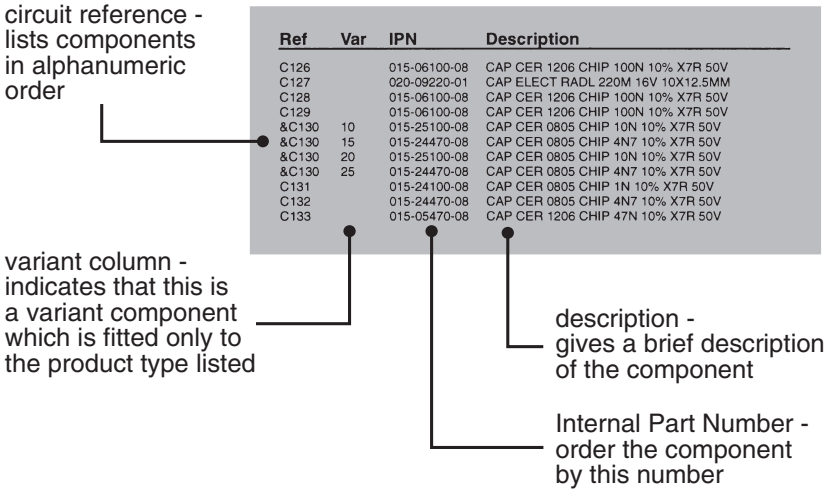
Note: It is important that you identify which issue PCB you are working on so that you can refer to the appropriate set of PCB information.

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).

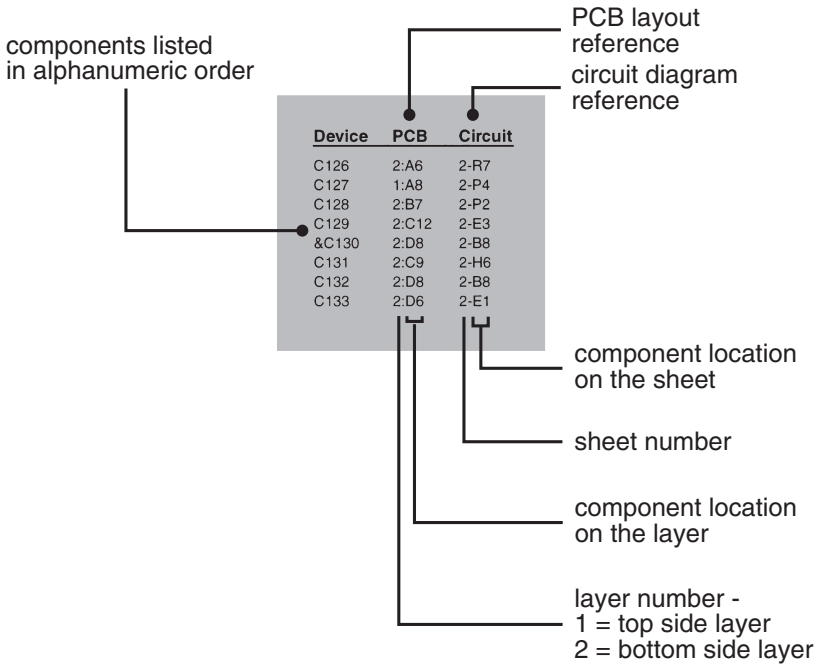
Those with a circuit reference are grouped in alphabetical order and then in numerical order within each group. Each component entry comprises three or four columns, as shown below:



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

Grid Reference Index

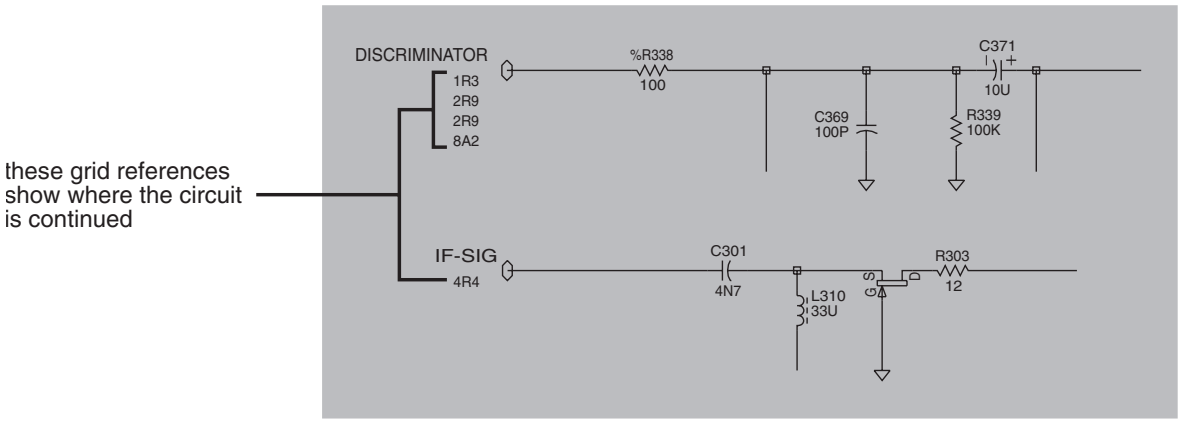
This section contains a component grid reference index to help you find components and labelled pads on the PCB layouts and circuit diagrams. This index lists the components and pads in alphanumeric order, along with the appropriate alphanumeric grid references, as shown below:



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.

T803 Parts List (IPN 220-01581-04)

How To Use This Parts List

The components listed in this parts list 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.

This parts list is correct at the time of publishing, but is subject to change without notification. An up to date parts list can be obtained from your local Customer Service Organisation

Ref	Var	IPN	Description
C1		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C128		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C145		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C162		016-08470-01	CAP ELEC SMD 47UF 6*4 16V
C163		016-08100-01	CAP ELEC SMD 10M 4*5.2 16V 20%
C164		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C165		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C166		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C167		016-08470-01	CAP ELEC SMD 47UF 6*4 16V
C168		016-08100-01	CAP ELEC SMD 10M 4*5.2 16V 20%
C170		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C172		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C173		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C174		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C2		016-08100-01	CAP ELEC SMD 10M 4*5.2 16V 20%
C202		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C203		016-07470-06	CAP ELEC SMD BI-P 4U7 50V 20%
C204		016-07470-06	CAP ELEC SMD BI-P 4U7 50V 20%
C205		015-25220-08	CAP CER 0805 22N 10% X7R 50V
C206		015-25220-08	CAP CER 0805 22N 10% X7R 50V
C207		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C208		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C210		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C211		015-23470-08	CAP CER 0805 470P 10% X7R 50V
C212		015-05330-08	CAP CER 1206 33N 10% X7R 50V
C213		015-05330-08	CAP CER 1206 33N 10% X7R 50V
C214		015-23470-08	CAP CER 0805 470P 10% X7R 50V
C215		015-23470-08	CAP CER 0805 470P 10% X7R 50V
C216		015-23470-08	CAP CER 0805 470P 10% X7R 50V
C217		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C218		015-27100-10	CAP CER 0805 1M+80-20% Y5V 16V
C219		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C220		015-27100-10	CAP CER 0805 1M+80-20% Y5V 16V
C222		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C224		015-27100-10	CAP CER 0805 1M+80-20% Y5V 16V
C225		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C226		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C227		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C232		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C233		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C235		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C236		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C238		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C239		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C240		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C242		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C3		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C300		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C301		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C302		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C303		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C304		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C305		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C306		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C307		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C308		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C310		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C311		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C312		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C313		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C314		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C315		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C316		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C317		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C318		015-25100-08	CAP CER 0805 10N 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
C4		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C400		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C401		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C402		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C403		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C404		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C405		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C406		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C407		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C408		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C409		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C410		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C411		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C412		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C413		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C414		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C415		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C416		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C417		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C418		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C419		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C420		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C421		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C422		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C423		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C424		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C425		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C426		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C427		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C428		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C429		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C430		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C431		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C432		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C433		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C434		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C435		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C436		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C437		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C438		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C439		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C440		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C441		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C442		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C443		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C444		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C445		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C446		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C447		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C448		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C449		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C450		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C451		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C452		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C453		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C454		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C455		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C5		016-08470-01	CAP ELEC SMD 47UF 6*4 16V
C500		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C501		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C502		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C503		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C504		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C505		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C506		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C507		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C508		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C509		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C510		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C511		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C512		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C513		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C514		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C515		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C516		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C517		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C518		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C519		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C520		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C521		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C522		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C523		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C524		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C525		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C526		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C527		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C6		016-08470-01	CAP ELEC SMD 47UF 6*4 16V
C600		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C601		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C602		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C603		015-24100-08	CAP CER 0805 1N 10% X7R 50V

Ref	Var	IPN	Description
C604		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C605		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C606		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C607		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C608		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C609		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C610		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C611		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C612		015-22270-01	CAP CER 0805 27P 5% NPO 50V
C613		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C7		015-27100-10	CAP CER 0805 1M+80-20% Y5V 16V
D1		008-00014-81	LED 5MM RED/GRN BICOLOR
D2		008-00014-81	LED 5MM RED/GRN BICOLOR
D207		001-18410-00	DIODE SMD BZX84C10V ZEN SOT23
D3		008-00014-81	LED 5MM RED/GRN BICOLOR
D4		008-00014-81	LED 5MM RED/GRN BICOLOR
D5		008-00014-81	LED 5MM RED/GRN BICOLOR
D6		001-10084-62	DIODE SMD BZX84C6V2 ZEN SOT23
IC1		002-10078-00	IC SMD MC78M05CDT5V REG0.5A
IC100		002-10078-00	IC SMD MC78M05CDT5V REG0.5A
IC101		002-10078-00	IC SMD MC78M05CDT5V REG0.5A
IC2		002-74905-95	IC SMD 74HC595 SHIFT REG
IC200		002-74905-95	IC SMD 74HC595 SHIFT REG
IC201		002-12003-00	IC SMD ULN2003AD 7-DARL 16P S0
IC202		002-10140-21	IC MC14021BDR2 8B SREG S016
IC203		002-74905-95	IC SMD 74HC595 SHIFT REG
IC204		002-74940-53	IC SMD 74HC4053 S016
IC205		002-11454-80	IC SMD MC145480DW PCM
%IC206		002-11454-80	IC SMD MC145480DW PCM
IC208		002-10832-00	IC TLC0832 8BIT A/D 8PIN S0
IC209		002-74940-53	IC SMD 74HC4053 S016
IC210		002-10126-71	IC SMD DS1868 DGTL POT TSOP20
IC3		002-10854-10	IC TDA8541T 1W AUDIO AMP
IC300		002-10203-00	IC TMS320C203 80MHZ PQFP100
IC301		002-74940-53	IC SMD 74HC4053 S016
IC303		002-74900-00	IC SMD 74HC00 4X 2 I/P NAND
IC307		002-00090-00	IC SRAM 64KX16 15*5 44SOJ
IC310		002-74905-73	IC SMD 74HC573D 8X 3STATE
%IC311		240-04020-42	SKT 44 PIN SMD PLCC
IC312		002-12416-00	IC SMD AT24C16N-10SC EEPROM
IC313		002-10012-32	IC DS1232LPS-2 LO-P RESET&WDOG
JP302		036-10000-00	RES M/F SMD 0805 0E 0.125W
JP303		036-10000-00	RES M/F SMD 0805 0E 0.125W
JP307		036-10000-00	RES M/F SMD 0805 0E 0.125W
L1		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L114		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L131		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L132		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L200		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L201		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L202		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L203		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L400		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L401		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L402		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L403		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L404		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L405		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L406		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L407		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L408		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L409		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L410		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L411		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L412		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L413		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L414		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L415		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L416		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L417		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L418		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L419		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L420		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L421		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L422		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L423		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L424		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L425		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L426		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L427		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L500		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L501		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L502		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L503		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L504		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L505		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L506		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L507		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L508		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L509		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L510		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L511		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L512		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L513		057-10120-03	IND 0805 120E@100M .2 EMI SUPR

Ref	Var	IPN	Description
L600		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L601		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L602		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L603		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L604		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L605		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L606		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
P1		240-04020-72	SKT HSNG 2W CORD MTG ULTREX
P100		240-00026-34	PLG 15W DRNG DUAL PORT
Q203		000-10008-47	XSTR SMD BC847B NPN SOT23
R1		036-12100-10	RES M/F SMD 0805 10E 1%
R10		036-13220-10	RES M/F SMD 0805 220E 1%
R100		036-10000-00	RES M/F SMD 0805 0E 0.125W
R12		036-13330-00	RES M/F SMD 0805 330E 5%
R13		036-13220-10	RES M/F SMD 0805 220E 1%
R14		036-13330-00	RES M/F SMD 0805 330E 5%
R15		036-13220-10	RES M/F SMD 0805 220E 1%
R2		036-14470-10	RES M/F SMD 0805 4K7 1%
R201		036-14100-10	RES M/F SMD 0805 1K 1%
R202		036-14100-10	RES M/F SMD 0805 1K 1%
R203		036-14100-10	RES M/F SMD 0805 1K 1%
R204		036-14100-10	RES M/F SMD 0805 1K 1%
R205		036-14100-10	RES M/F SMD 0805 1K 1%
R206		036-14100-10	RES M/F SMD 0805 1K 1%
R207		036-14100-10	RES M/F SMD 0805 1K 1%
R208		036-14100-10	RES M/F SMD 0805 1K 1%
R209		036-14470-10	RES M/F SMD 0805 4K7 1%
R210		036-14100-10	RES M/F SMD 0805 1K 1%
R211		036-14100-10	RES M/F SMD 0805 1K 1%
R212		036-14100-10	RES M/F SMD 0805 1K 1%
R213		036-14100-10	RES M/F SMD 0805 1K 1%
R214		036-14100-10	RES M/F SMD 0805 1K 1%
R215		036-14100-10	RES M/F SMD 0805 1K 1%
R216		036-15100-10	RES M/F SMD 0805 10K 1%
R217		036-14120-00	RES M/F SMD 0805 1K2 5%
R218		036-15100-10	RES M/F SMD 0805 10K 1%
R219		036-14560-00	RES M/F SMD 0805 5K6 5%
R220		036-15100-10	RES M/F SMD 0805 10K 1%
R221		036-15100-10	RES M/F SMD 0805 10K 1%
R223		036-15100-10	RES M/F SMD 0805 10K 1%
R224		036-15100-10	RES M/F SMD 0805 10K 1%
R225		036-15100-10	RES M/F SMD 0805 10K 1%
R226		036-15100-10	RES M/F SMD 0805 10K 1%
R227		036-14220-00	RES M/F SMD 0805 2K2 5%
R228		036-12100-10	RES M/F SMD 0805 10E 1%
R229		036-12390-00	RES M/F SMD 0805 39E 5%
R230		036-13470-00	RES M/F SMD 0805 470E 5%
R231		036-15470-10	RES M/F SMD 0805 47K 1%
R232		036-13470-00	RES M/F SMD 0805 470E 5%
R234		036-15100-10	RES M/F SMD 0805 10K 1%
R235		036-13470-00	RES M/F SMD 0805 470E 5%
R236		036-15100-10	RES M/F SMD 0805 10K 1%
R237		036-15100-10	RES M/F SMD 0805 10K 1%
R239		036-13220-10	RES M/F SMD 0805 220E 1%
R240		036-14150-10	RES M/F SMD 0805 1K5 1%
R243		036-14100-10	RES M/F SMD 0805 1K 1%
R244		036-14560-00	RES M/F SMD 0805 5K6 5%
R246		036-15100-10	RES M/F SMD 0805 10K 1%
R247		036-15470-10	RES M/F SMD 0805 47K 1%
R250		036-14560-00	RES M/F SMD 0805 5K6 5%
R251		036-14470-10	RES M/F SMD 0805 4K7 1%
R254		036-15100-10	RES M/F SMD 0805 10K 1%
R257		036-14680-10	RES M/F SMD 0805 6K8 1%
R258		036-15100-10	RES M/F SMD 0805 10K 1%
R259		036-16100-10	RES M/F SMD 0805 100K 1%
R261		036-15470-10	RES M/F SMD 0805 47K 1%
R262		036-15100-10	RES M/F SMD 0805 10K 1%
R264		036-12220-00	RES M/F SMD 0805 22E 5%
R266		036-15330-10	RES M/F SMD 0805 33K 1%
R267		036-12100-10	RES M/F SMD 0805 10E 1%
R268		036-12100-10	RES M/F SMD 0805 10E 1%
R269		036-15100-10	RES M/F SMD 0805 10K 1%
R271		036-15100-10	RES M/F SMD 0805 10K 1%
R272		036-14220-00	RES M/F SMD 0805 2K2 5%
R273		036-14470-10	RES M/F SMD 0805 4K7 1%
R274		036-14470-10	RES M/F SMD 0805 4K7 1%
R275		036-14470-10	RES M/F SMD 0805 4K7 1%
R276		036-14470-10	RES M/F SMD 0805 4K7 1%
R277		036-14470-10	RES M/F SMD 0805 4K7 1%
R280		036-15100-10	RES M/F SMD 0805 10K 1%
R3		036-13470-00	RES M/F SMD 0805 470E 5%
R301		036-14220-00	RES M/F SMD 0805 2K2 5%
R302		036-14220-00	RES M/F SMD 0805 2K2 5%
R303		036-14470-10	RES M/F SMD 0805 4K7 1%
R310		036-15100-10	RES M/F SMD 0805 10K 1%
R311		036-15100-10	RES M/F SMD 0805 10K 1%
R312		036-15100-10	RES M/F SMD 0805 10K 1%
R313		036-15100-10	RES M/F SMD 0805 10K 1%
R314		036-15100-10	RES M/F SMD 0805 10K 1%
R317		036-15100-10	RES M/F SMD 0805 10K 1%
R318		036-15100-10	RES M/F SMD 0805 10K 1%
R320		036-15100-10	RES M/F SMD 0805 10K 1%
R321		036-14470-10	RES M/F SMD 0805 4K7 1%
R322		036-14180-00	RES M/F SMD 0805 1K8 5%
R323		036-14180-00	RES M/F SMD 0805 1K8 5%

Ref	Var	IPN	Description
R324		036-14180-00	RES M/F SMD 0805 1K8 5%
R325		036-14180-00	RES M/F SMD 0805 1K8 5%
R326		036-14180-00	RES M/F SMD 0805 1K8 5%
R327		036-14180-00	RES M/F SMD 0805 1K8 5%
R328		036-14180-00	RES M/F SMD 0805 1K8 5%
R330		036-14180-00	RES M/F SMD 0805 1K8 5%
R331		036-14180-00	RES M/F SMD 0805 1K8 5%
R332		036-14180-00	RES M/F SMD 0805 1K8 5%
R333		036-14180-00	RES M/F SMD 0805 1K8 5%
R334		036-14180-00	RES M/F SMD 0805 1K8 5%
R335		036-14180-00	RES M/F SMD 0805 1K8 5%
R336		036-15100-10	RES M/F SMD 0805 10K 1%
R341		036-15100-10	RES M/F SMD 0805 10K 1%
R342		036-15100-10	RES M/F SMD 0805 10K 1%
R343		036-15100-10	RES M/F SMD 0805 10K 1%
R344		036-15100-10	RES M/F SMD 0805 10K 1%
R345		036-15100-10	RES M/F SMD 0805 10K 1%
R346		036-15100-10	RES M/F SMD 0805 10K 1%
R347		036-15100-10	RES M/F SMD 0805 10K 1%
R348		036-15100-10	RES M/F SMD 0805 10K 1%
R351		036-15100-10	RES M/F SMD 0805 10K 1%
R352		036-14150-10	RES M/F SMD 0805 1K5 1%
R353		036-15100-10	RES M/F SMD 0805 10K 1%
R4		036-13330-00	RES M/F SMD 0805 330E 5%
R5		036-13220-10	RES M/F SMD 0805 220E 1%
R7		036-13330-00	RES M/F SMD 0805 330E 5%
R8		036-13220-10	RES M/F SMD 0805 220E 1%
R9		036-13330-00	RES M/F SMD 0805 330E 5%
RV1		042-05100-10	RES PRE 10K CER 9.5MM SQ FLAT
S1		230-00010-38	SW EXTENDER CAP 19MM
S2		230-00010-38	SW EXTENDER CAP 19MM
SK1		240-10000-07	CONN SMD 16W 2R SKT M/MATCH
SK100		240-04021-80	SKT 8W RJ45 HOR MTG
SK101		240-10000-07	CONN SMD 16W 2R SKT M/MATCH
SK2		240-04021-60	SKT 6W MODR PH VRT T-ENT
T200		054-00010-16	XFMR LINE 600 OHM 1:1 P1200
T201		054-00010-16	XFMR LINE 600 OHM 1:1 P1200
XL300		274-00010-59	XTAL 18.432MHZ HC49/U

T803 Mechanical & Miscellaneous Parts (220-01581-04)

IPN	Legend	Description
002-00021-03		IC W78LE54 PLCC44 MICRO 24MHZ
069-00010-31		CLAMP FER FOR 13MM CBL DIA
201-00030-08		WIRE T/C 7/0.2MM PVC GREY
201-00030-10		WIRE T/C 7/0.2MM PVC BLK
219-02685-00		T0NE RMT RBBN CBL LOOM
220-01581-04		PCB T803 T0NE RMT/T805-08 QS
230-00020-38		SW SPNO THRU HOLE PCB MTG
240-00020-72		HDR 2W PCB MTG ULTREX
240-04020-76		SKT HSNG 4W RECEP CRIMP ULTREX
252-00010-55		MIC SPKR 40MM 0.5W 16E FOSTER
303-23149-00		CVR SIDE T1511-20-0000
308-01007-02		HANDLE BS SII INT THREAD
316-06706-00		PNL FRT SUB CHASS 14MM
316-06707-01		PNL FRT T803-00-0000
316-21252-00		PNL REAR T803-00-0000 RJ45
318-01037-00		RAIL CHASS T1511-20 EXTRA AL
345-00040-08		SCRW M3*12MM P/P S/T BZ
345-00040-09		SCRW M3*6MM CSK POZI TRUNCATE
345-00050-04		SCRW M4*10MM CSK POZI S/T BZ
349-00020-09		SCRW 4-40*3/8" T/T P/P BLK
349-00020-08		SCRW 4-40*3/8" T/T CSK POZI BZ
349-00020-55		SCRW M3*8MM T/T P/P BZ
369-01039-00		ADH RING 40MM T/ORCA SPKR

T803 Grid Reference Index (IPN 220-01581-04)

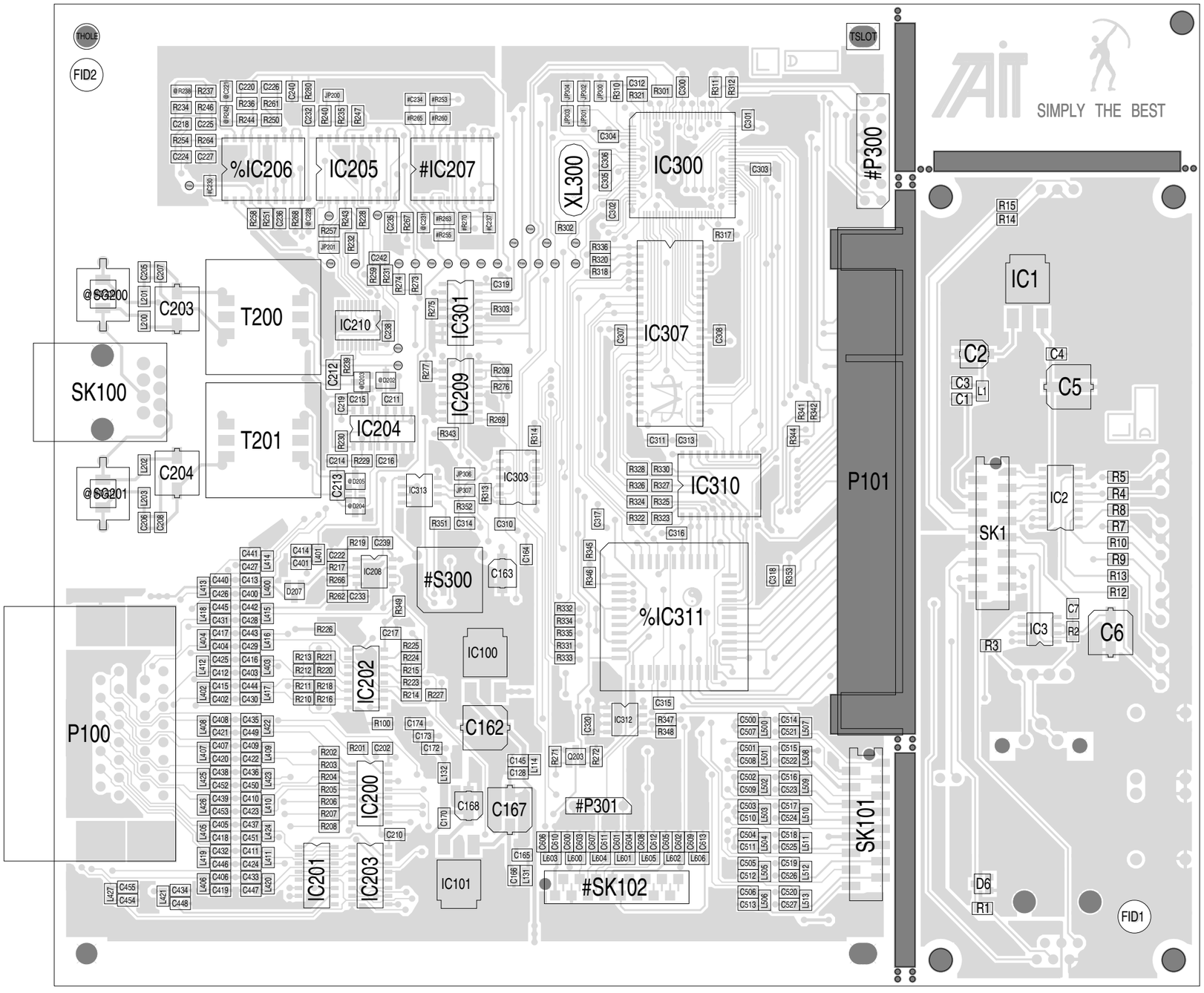
How To Use This Grid Reference Index

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	C302	1:K13	3-D9	C441	1:D8	4-J8	D1	2:T9	1-S2
C2	1:Q11	1-O3	C303	1:M14	3-D9	C442	1:D7	4-J7	D2	2:T8	1-T2
C3	1:Q11	1-O3	C304	1:K14	3-D9	C443	1:D7	4-J7	D2	2:T8	1-S2
C4	1:S11	1-P3	C305	1:K14	3-G4	C444	1:D6	4-J6	D3	2:T7	1-S2
C5	1:S11	1-Q3	C306	1:K14	3-G4	C445	1:D7	4-J5	D3	2:T7	1-T2
C6	1:S7	1-Q4	C307	1:K11	3-I4	C446	1:D3	4-J4	D4	2:T6	1-S1
C7	1:S7	1-R3	C308	1:L11	3-J4	C447	1:D3	4-J4	D4	2:T6	1-T1
C128	1:H5	1-A0	C310	1:H9	3-L8	C448	1:C3	4-J3	D5	2:S14	1-S0
C145	1:H5	1-B0	C311	1:K10	3-M6	C449	1:D5	4-J2	D5	2:S14	1-T0
C162	1:H5	1-B0	C312	1:K15	3-H7	C450	1:D5	4-J2	D6	1:Q3	1-O0
C163	1:H8	1-C0	C313	1:L10	3-M6	C451	1:D4	4-J1	@D200	1:B12	2-E9
C164	1:H8	1-D0	C314	1:H9	3-P3	C452	1:D5	4-J0	@D201	1:B9	2-E8
C165	1:H3	1-E0	C315	1:L6	3-P6	C453	1:D4	4-J0	@D202	1:F11	2-H9
C166	1:H3	1-F0	C316	1:L8	3-P7	C454	1:B3	4-J0	@D203	1:F11	2-H9
C167	1:H4	1-F0	C317	1:K9	3-Q7	C455	1:B3	4-J0	@D204	1:F9	2-H8
C168	1:H4	1-G0	C318	1:M8	3-Q7	C500	1:M6	5-E8	@D205	1:F9	2-H8
C170	1:G4	1-G0	C319	1:H12	3-F3	C501	1:M5	5-E7	D207	1:E8	2-M2
C172	1:G5	1-H0	C320	1:J5	3-Q2	C502	1:M5	5-E6			
C173	1:G5	1-H0	C400	1:D7	4-H8	C503	1:M4	5-E5	FID1	1:T3	1-I0
C174	1:G5	1-I0	C401	1:E8	4-H8	C504	1:M4	5-E3	FID2	1:B15	1-I0
C202	1:F5	2-E2	C402	1:D6	4-H7	C505	1:M3	5-E2			
C203	1:C12	2-E9	C403	1:D6	4-H6	C506	1:M3	5-E1	IC1	1:R12	1-O3
C204	1:C9	2-E8	C404	1:D7	4-H6	C507	1:M5	5-F8	IC2	1:S9	1-P1
C205	1:C12	2-F9	C405	1:D4	4-H5	C508	1:M5	5-F7	IC3	1:R7	1-R3
C206	1:C9	2-F8	C406	1:D3	4-H4	C509	1:M4	5-F6	IC100	1:H6	1-C0
C207	1:C12	2-F9	C407	1:D5	4-H3	C510	1:M4	5-F5	IC101	1:G3	1-F0
C208	1:C9	2-F8	C408	1:D6	4-H3	C511	1:M4	5-F3	IC200	1:F4	2-F1
C210	1:F4	2-G4	C409	1:D5	4-H2	C512	1:M3	5-F2	IC201	1:E3	2-F3
C211	1:F10	2-G9	C410	1:D4	4-H1	C513	1:M3	5-F1	IC202	1:F6	2-G4
C212	1:F11	2-G9	C411	1:D4	4-H1	C514	1:M6	5-G8	IC203	1:F3	2-H3
C213	1:F9	2-G8	C412	1:D6	4-H0	C515	1:M5	5-G7	IC204	1:F10	2-J8
C214	1:F9	2-G7	C413	1:D8	4-H8	C516	1:M5	5-G6	IC205	1:F14	2-O7
C215	1:F10	2-H9	C414	1:E8	4-H8	C517	1:M4	5-G5	%IC206	1:D14	2-O4
C216	1:F9	2-H7	C415	1:D6	4-H7	C518	1:M4	5-G4	#IC207	1:G14	2-O2
C217	1:F7	2-H5	C416	1:D6	4-H6	C519	1:M3	5-G3	IC208	1:F8	2-P1
C218	1:C15	2-K5	C417	1:D7	4-H6	C520	1:M3	5-G2	IC209	1:G11	2-S0
C219	1:F10	2-J9	C418	1:D4	4-H5	C521	1:M5	5-G8	IC210	1:F12	2-R8
C220	1:D15	2-L5	C419	1:D3	4-H4	C522	1:M5	5-G7	IC210	1:F12	2-K8
@C221	1:D15	2-L4	C420	1:D5	4-H3	C523	1:M4	5-G6	IC210	1:F12	2-M8
C222	1:F8	2-N2	C421	1:D5	4-H3	C524	1:M4	5-G5	IC300	1:L14	3-B9
C224	1:C14	2-M4	C422	1:D5	4-H2	C525	1:M4	5-G4	IC300	1:L14	3-F5
C225	1:D15	2-M4	C423	1:D4	4-H1	C526	1:M3	5-G3	IC301	1:G12	3-F2
C226	1:E15	2-M5	C424	1:D3	4-H1	C527	1:M3	5-G2	IC303	1:H9	3-I8
C227	1:D14	2-N4	C425	1:D6	4-H0	C600	1:J4	6-E6	IC303	1:H9	3-K8
@C228	1:E13	2-N8	C426	1:D7	4-J9	C601	1:K4	6-E5	IC303	1:H9	3-I9
#C230	1:D14	2-N5	C427	1:D8	4-J8	C602	1:L4	6-E4	IC303	1:H9	3-I8
@C231	1:G13	2-N4	C428	1:D7	4-J7	C603	1:J4	6-F6	IC303	1:H9	3-J8
C232	1:E15	2-N7	C429	1:D7	4-J7	C604	1:K4	6-F5	IC307	1:L11	3-J1
C233	1:F7	2-O1	C430	1:D6	4-J6	C605	1:L4	6-F4	IC310	1:L9	3-M5
#C234	1:G15	2-N2	C431	1:D7	4-J5	C606	1:J4	6-F6	%IC311	1:L7	3-P5
C235	1:F13	2-P8	C432	1:D4	4-J4	C607	1:J4	6-F5	IC312	1:K6	3-Q1
C236	1:E13	2-P5	C433	1:D3	4-J4	C608	1:K4	6-F4	IC313	1:G9	3-R3
#C237	1:H13	2-O4	C434	1:C3	4-J3	C609	1:L4	6-F3			
C238	1:F11	2-R9	C435	1:D6	4-J2	C610	1:J4	6-G6	JP200	1:F15	2-L8
C239	1:F8	2-O2	C436	1:D5	4-J2	C611	1:K4	6-G5	JP201	1:E13	2-M8
C240	1:E15	2-K5	C437	1:D4	4-J1	C612	1:K4	6-G4	JP300	1:K15	3-F7
C242	1:F13	2-M7	C438	1:D5	4-J0	C613	1:L4	6-G3	JP301	1:J15	3-E5
C300	1:L15	3-A9	C439	1:D4	4-J0				JP302	1:J15	3-F5
C301	1:M15	3-B9	C440	1:D8	4-J9	D1	2:T9	1-T2	JP303	1:J15	3-E4

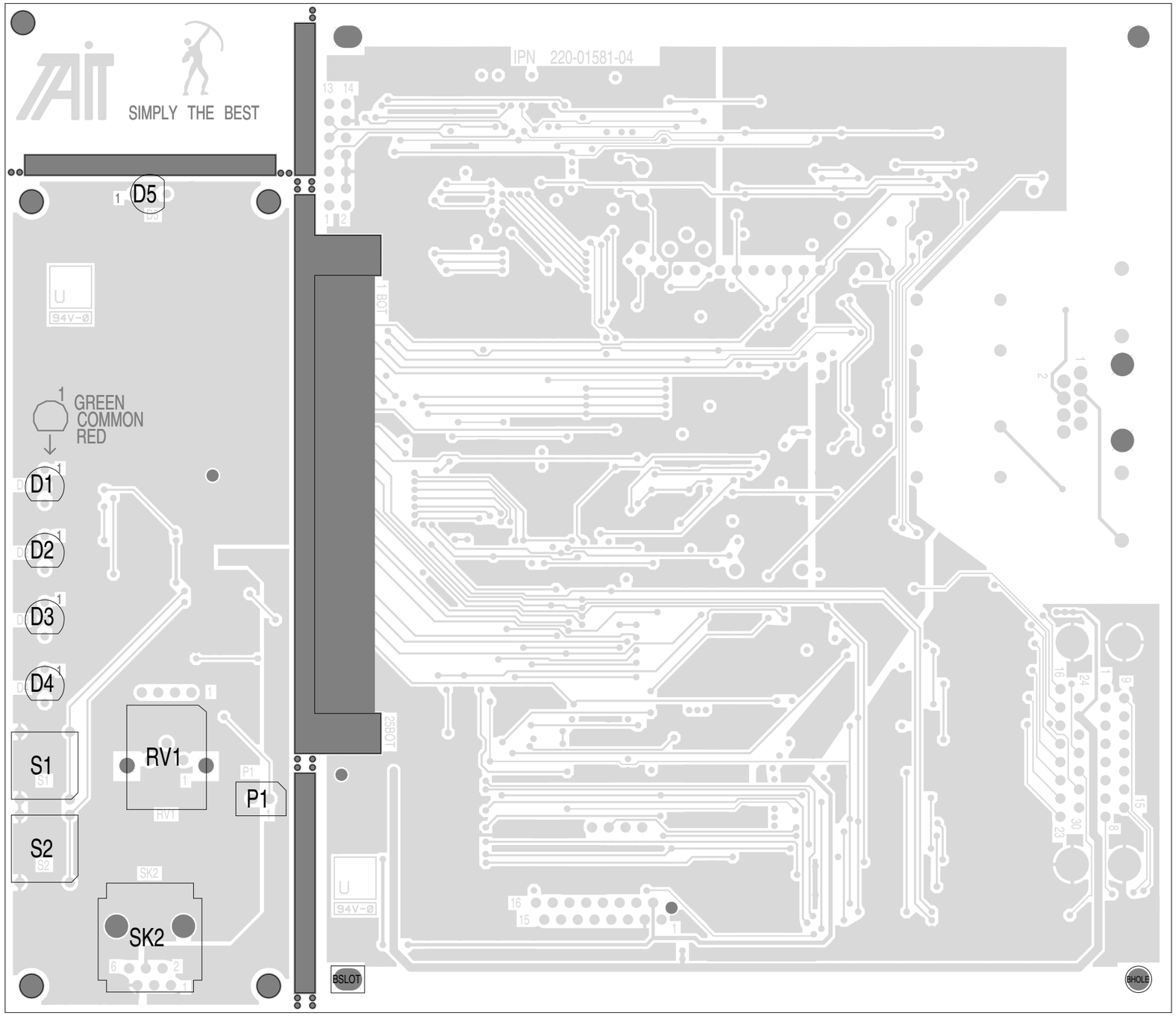
Device	PCB	Circuit
JP304	1:J15	3-F4
JP306	1:H9	3-P3
JP307	1:H9	3-P3
L1	1:Q11	1-O3
L114	1:J5	1-B0
L131	1:H3	1-E0
L132	1:G5	1-H0
L200	1:C12	2-E9
L201	1:C12	2-E8
L202	1:C9	2-E8
L203	1:C9	2-E8
L400	1:E8	4-H8
L401	1:E8	4-H8
L402	1:D6	4-H7
L403	1:E6	4-H6
L404	1:D7	4-H6
L405	1:D4	4-H5
L406	1:D3	4-H4
L407	1:D5	4-H4
L408	1:D5	4-H3
L409	1:E5	4-H2
L410	1:E4	4-H1
L411	1:E3	4-H1
L412	1:D6	4-H0
L413	1:D8	4-J9
L414	1:E8	4-J8
L415	1:E7	4-J7
L416	1:E7	4-J7
L417	1:E6	4-J6
L418	1:D7	4-J5
L419	1:D3	4-J5
L420	1:E3	4-J4
L421	1:C3	4-J3
L422	1:E5	4-J2
L423	1:E5	4-J2
L424	1:E4	4-J1
L425	1:D5	4-J0
L426	1:D4	4-J0
L427	1:B3	4-J0
L500	1:M5	5-F8
L501	1:M5	5-F7
L502	1:M5	5-F6
L503	1:M4	5-F5
L504	1:M4	5-F4
L505	1:M3	5-F3
L506	1:M3	5-F2
L507	1:N5	5-G8
L508	1:N5	5-G7
L509	1:N5	5-G6
L510	1:N4	5-G5
L511	1:N4	5-G4
L512	1:N3	5-G3
L513	1:N3	5-G2
L600	1:J3	6-E6
L601	1:K3	6-E5
L602	1:L3	6-E4
L603	1:J3	6-G6
L604	1:K3	6-G5
L605	1:K3	6-G4
L606	1:L3	6-G3
P1	2:Q5	1-T3
P100	1:B5	1-B3
P101	1:P9	1-U8
P101	1:P9	1-U6
#P300	1:P14	3-H3
#P301	1:K4	3-R0
Q203	1:J5	2-G0
R1	1:Q3	1-O0
R2	1:S7	1-S3
R3	1:R7	1-T3
R4	1:S9	1-S2
R5	1:S9	1-T2
R7	1:S8	1-S2
R8	1:S9	1-T2
R9	1:S8	1-S2
R10	1:S8	1-T2
R12	1:S7	1-S1
R13	1:S8	1-T1
R14	1:R13	1-S0
R15	1:R13	1-T0
R100	1:F5	1-H0
R201	1:F5	2-E2
R202	1:E5	2-E2
R203	1:E5	2-E2
R204	1:E5	2-E1
R205	1:E4	2-E1
R206	1:E4	2-E1
R207	1:E4	2-E1
R208	1:E4	2-E1
R209	1:H11	2-E1
R210	1:E6	2-E5
R211	1:E6	2-E5
R212	1:E6	2-E5
R213	1:E7	2-E5
R214	1:G6	2-E5
R215	1:G6	2-E5
R216	1:E6	2-E5
R217	1:F8	2-M2
R218	1:E6	2-F5
R219	1:F8	2-N2
R220	1:E6	2-F5
R221	1:E7	2-F5
R223	1:G6	2-F5
R224	1:G6	2-F5
R225	1:G7	2-G5
R226	1:E7	2-G5
R227	1:G6	2-H5
R228	1:F13	2-L8
R229	1:F9	2-H8
R230	1:F10	2-I8
R231	1:F12	2-J8
R232	1:F13	2-L8
R234	1:C15	2-L5
R235	1:F15	2-L8
R236	1:D15	2-L5
R237	1:D15	2-L5
@R238	1:C15	2-L5
R239	1:F11	2-K8
R240	1:E15	2-L8
@R242	1:D15	2-L4
R243	1:F13	2-L8
R244	1:D15	2-M5
R246	1:D15	2-M4
R247	1:F15	2-M8
R250	1:E15	2-M5
R251	1:D13	2-M5
#R253	1:G15	2-M3
R254	1:C14	2-M4
#R255	1:G13	2-M3
R257	1:E13	2-N8
R258	1:D13	2-N5
R259	1:F12	2-N7
#R260	1:G15	2-M3
R261	1:E15	2-N5
R262	1:F7	2-N1
#R263	1:G13	2-M3
R264	1:D14	2-N4
#R265	1:G15	2-N3
R266	1:F8	2-O1
R267	1:G13	2-O9
R268	1:E13	2-O6
R269	1:H10	2-R0
#R270	1:H13	2-O4
R271	1:J5	2-G0
R272	1:K5	2-G0
R273	1:G12	2-S7
R274	1:G12	2-S5
R275	1:G12	2-S3
R276	1:H11	2-S1
R277	1:G11	2-T1
R280	1:E15	2-L5
R301	1:L15	3-E6
R302	1:J13	3-E5
R303	1:H12	3-E3
R310	1:K15	3-F7
R311	1:L15	3-G3
R312	1:M15	3-G4
R313	1:H9	3-H9
R314	1:J10	3-H8
R317	1:L13	3-I2
R318	1:K12	3-K4
R320	1:K13	3-K3
R321	1:K15	3-H7
R322	1:K9	3-M4
R323	1:L9	3-M4
R324	1:K9	3-M4
R325	1:L9	3-M4
R326	1:K9	3-M4
R327	1:L9	3-M4
R328	1:K9	3-M4
R330	1:L9	3-M4
R331	1:J7	3-M4
R332	1:J7	3-M4
R333	1:J6	3-M4
R334	1:J7	3-M4
R335	1:J7	3-M4
R336	1:K13	3-L3
R341	1:N10	3-P4
R342	1:N10	3-P4
R343	1:G10	3-P4
R344	1:N10	3-P4
R345	1:J8	3-P4
R346	1:J8	3-P4
R347	1:L6	3-O2
R348	1:L5	3-P2
R349	1:G7	3-P4
R351	1:G9	3-Q3
R352	1:H9	3-Q3
R353	1:M8	3-R6
RV1	2:R6	1-S3
S1	2:T5	1-T1
S2	2:T4	1-S1
#S300	1:G8	3-R3
@SG200	1:B12	2-D9
@SG201	1:B9	2-D8
SK1	1:R8	1-M2
SK2	2:S2	1-T0
SK100	1:B11	1-B9
SK101	1:P4	1-K2
#SK102	1:K3	1-L3
T200	1:D12	2-G9
T201	1:D10	2-G8
TP200	1:F12	2-L8
TP201	1:G12	2-L3
TP203	1:C14	2-M5
TP204	1:G12	2-M8
TP205	1:E12	2-Q4
TP206	1:H12	2-Q2
TP207	1:F13	2-T9
TP208	1:H12	2-P3
TP209	1:J13	2-L3
TP211	1:G12	2-R8
TP212	1:G12	2-R5
TP213	1:H12	2-R3
TP214	1:F11	2-K9
TP215	1:F11	2-K9
TP216	1:E13	2-N9
TP300	1:J12	3-C5
TP301	1:J12	3-C5
TP302	1:H13	3-C4
TP303	1:J13	3-G5
TP304	1:J13	3-G4
TP305	1:J12	3-E3
TP306	1:H12	3-G3
XL300	1:J14	3-G4
XXX1000	nil	1-E4



TAIT ELECTRONICS	IPN: 220-01581-04	ISS: A	ID: 1.TA	DATE: 1 Mar 2002
T803 / T805 PCB LAYOUT - TOP SIDE				

Scale:1.5:1 ; Rotation: 0 degrees

T803 PCB Layout - Top Side
220-01581-04

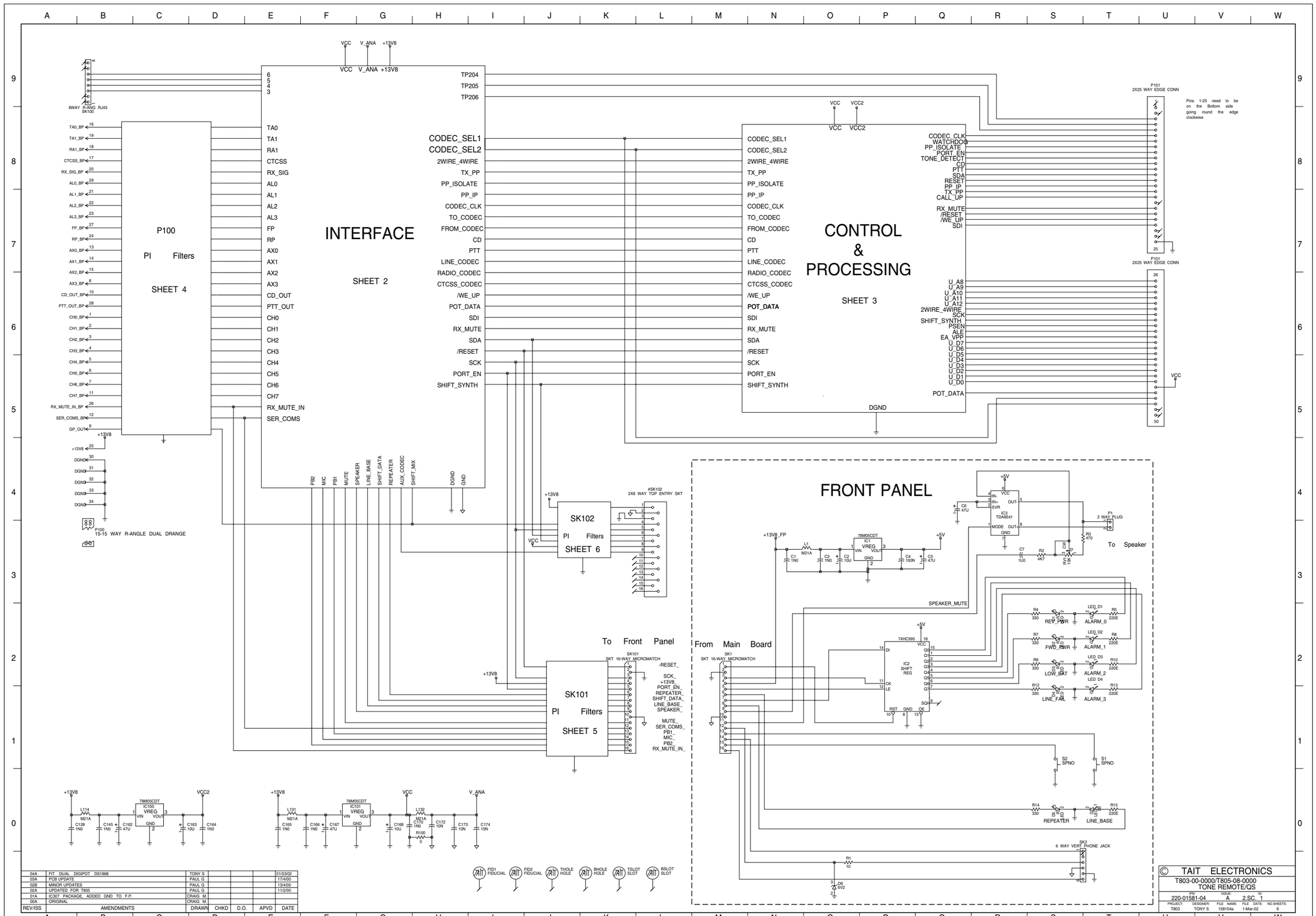


TAIT ELECTRONICS	IPN: 220-01581-04	ISS: A	ID: 4.BA	DATE: 1 Mar 2002
T803 / T805 PCB LAYOUT - BOTTOM SIDE				

Scale:1.5:1 ; Rotation: 0 degrees

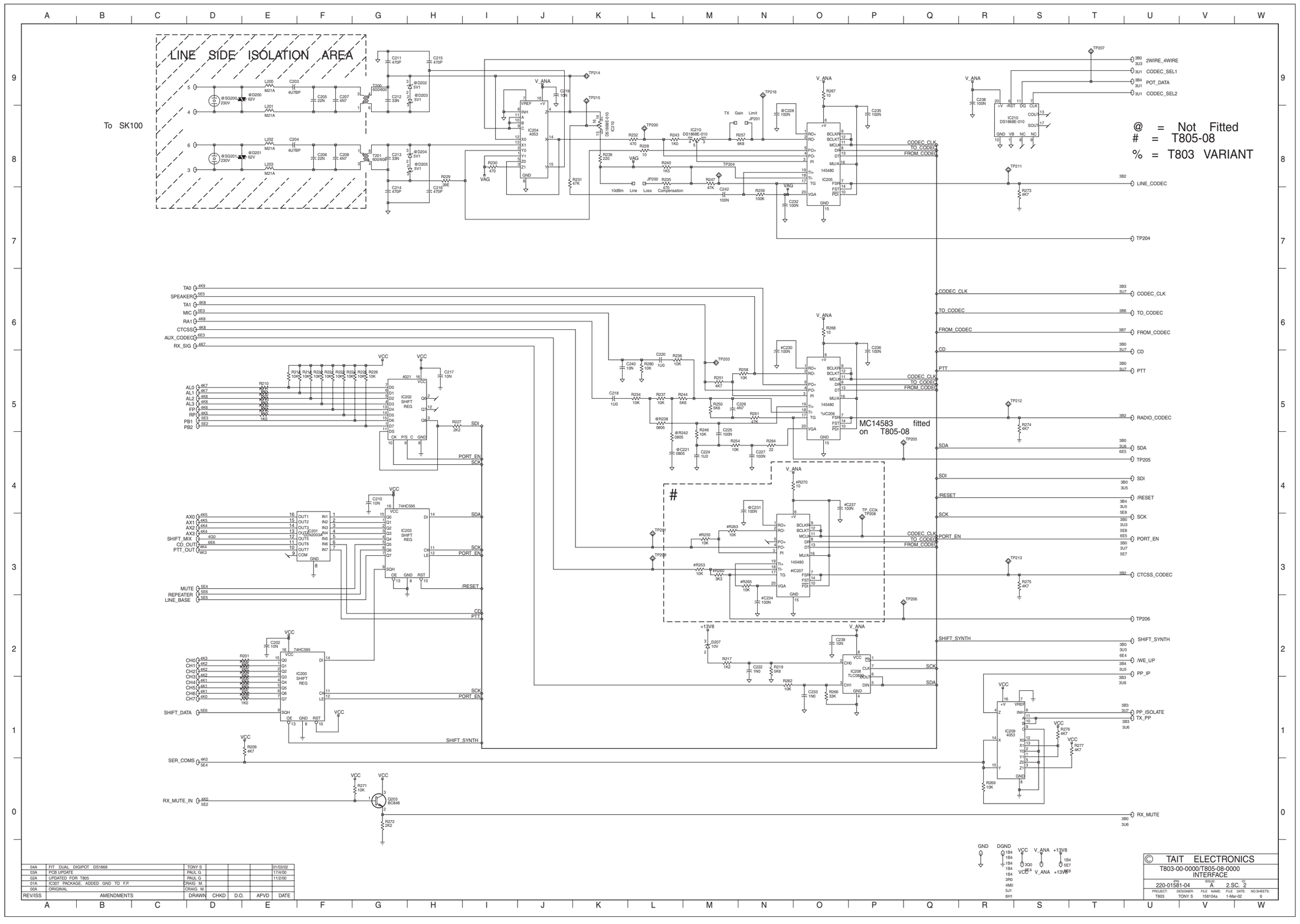
T803 PCB Layout - Bottom Side
220-01581-04

21/03/03



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
04A	FIT DUAL DIGIPOT DS1868	TONY S				01/03/02
03A	PCB UPDATE	PAUL G				17/4/00
02B	MINOR UPDATES	PAUL G				13/4/00
02A	UPDATED FOR T805	PAUL G				11/2/00
01A	IC307 PACKAGE, ADDED GND TO F.P.	CRAIG M.				
00A	ORIGINAL	CRAIG M.				

Sheet 1 - T803 Overview & Front Panel
220-01581-04



Sheet 2 - T803 Interface
220-01581-04

@ = Not Fitted
# = T805-08
% = T803 Variant

DSP_BUS(0:46)

MICRO_BUS(0:35)

AT89C55 fitted on T805-08

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
04A	FIT DUAL DIGIPOT DS1868	TONY S				01/03/02
03A	PCB UPDATE	PAUL G				17/4/00
02A	UPDATED FOR T805	PAUL G				11/2/00
01A	IC307 PACKAGE, ADDED GND TO F.P.	CRAIG M.				
00A	ORIGINAL	CRAIG M.				

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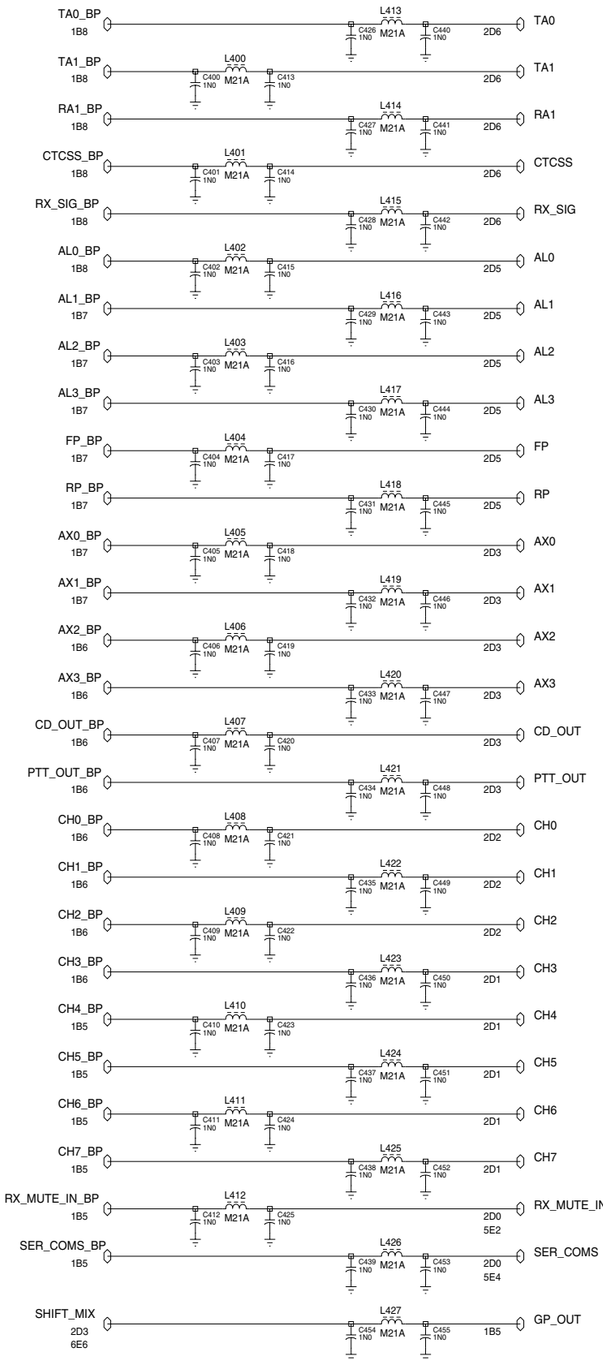
T803-00-0000/T805-08-0000
CONTROL & PROCESSING
DRG 220-01581-04 ISSUE A SC. 3
PROJECT: T803 DESIGNER: TONY S FILE NAME: 158104a FILE DATE: 1-Mar-02 NO.SHEETS: 6

Sheet 3 - T803 Control & Processing
220-01581-04



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
04A	FIT DUAL DIGIPOT DS1868	TONY S				01/03/02
03A	PCB UPDATE	PAUL G				17/4/00
02A	UPDATED FOR T805	PAUL G				11/2/00
01A	IC307 PACKAGE, ADDED GND TO F.P.	CRAIG M.				
00A	ORIGINAL	CRAIG M.				

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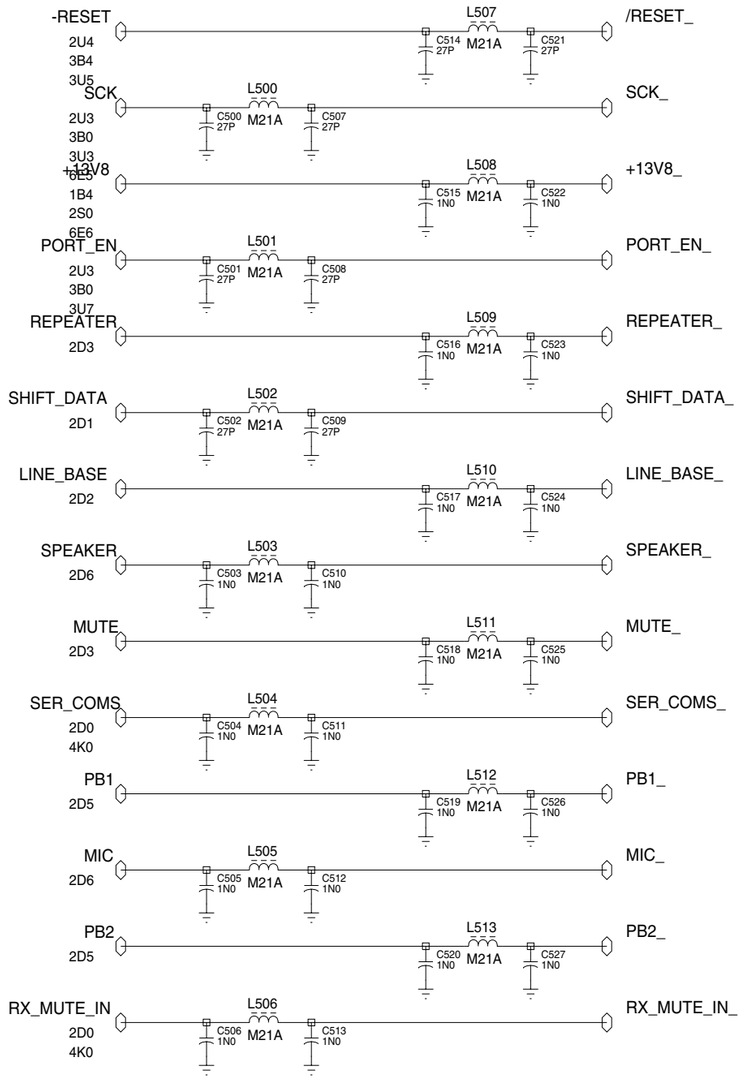
T803-00-0000/T805-08-0000
P100 PI FILTERS

IPN:	ISSUE:	ID:
220-01581-04	A	2.SC. 4

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T803	TONY S	158104a	1-Mar-02	6

Sheet 4 - T803 P100 PI filters
220-01581-04



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
04A	FIT DUAL DIGIPOT DS1868	TONY S				01/03/02
03A	PCB UPDATE	PAUL G				17/4/00
02A	UPDATED FOR T805	PAUL G				11/2/00
01A	IC307 PACKAGE, ADDED GND TO F.P.	CRAIG M.				
00A	ORIGINAL	CRAIG M.				

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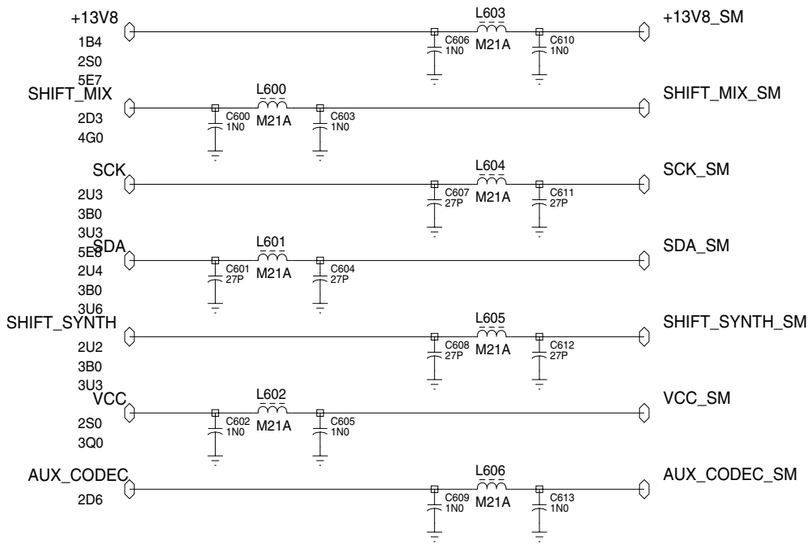
T803-00-0000/T805-08-0000
SK101 PI FILTERS

IPN:	ISSUE:	ID:
220-01581-04	A	2.SC. 5

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T803	TONY S	158104a	1-Mar-02	6

Sheet 5 - T803 SK101 PI Filters
220-01581-04



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
04A	FIT DUAL DIGIPOT DS1868	TONY S				01/03/02
03A	PCB UPDATE	PAUL G				17/4/00
02A	UPDATED FOR T805	PAUL G				11/2/00
01A	IC307 PACKAGE, ADDED GND TO F.P.	CRAIG M.				
00A	ORIGINAL	CRAIG M.				

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T803-00-0000/T805-08-0000
SK102 PI FILTERS

IPN:	ISSUE:	ID:.
220-01581-04	A	2.SC. 6

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T803	TONY S	158104a	1-Mar-02	6

Sheet 6 - T803 SK102 PI Filters
220-01581-04

5.3 T800-54-0000 Backplane PCB

This section contains the following information.

T800-54-0000 Parts List/Grid Reference Index (IPN 220-01449-06)

How To Use This Parts List

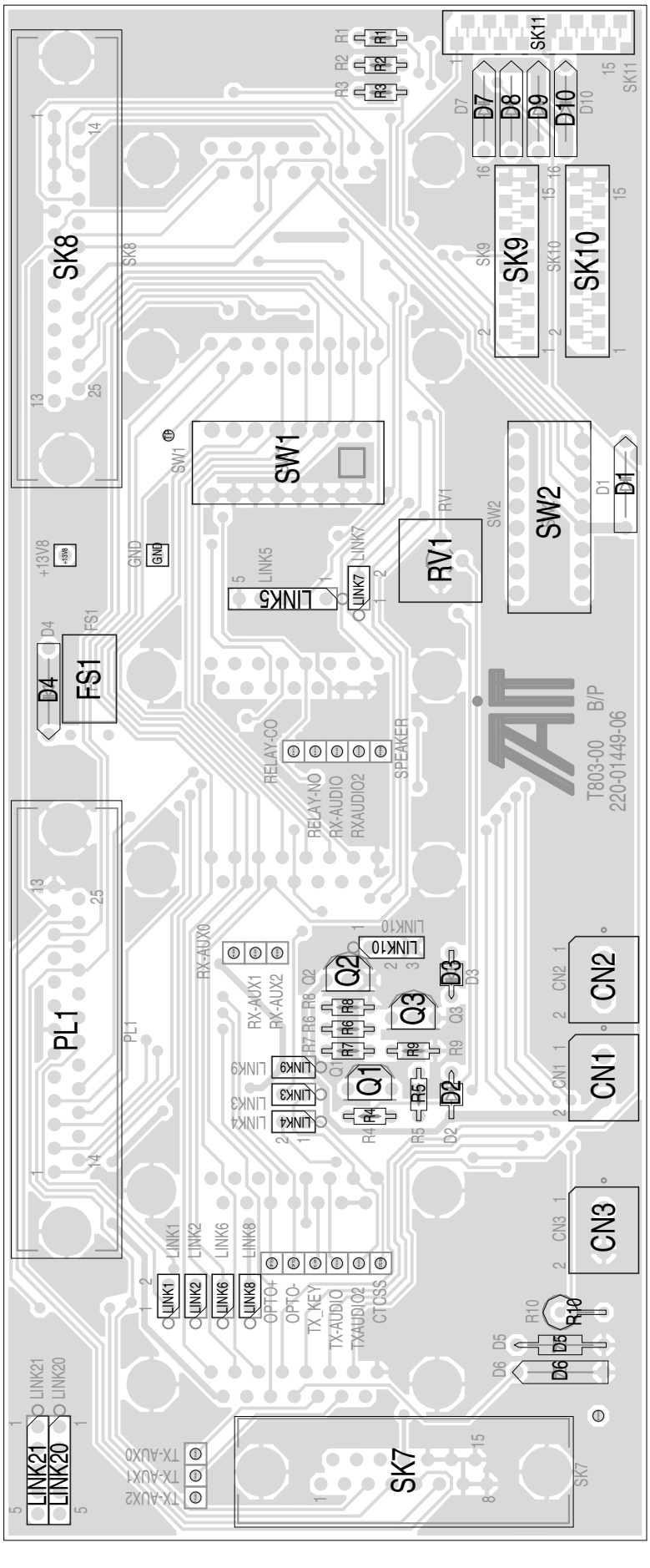
The components listed in this parts list are grouped in alphabetical order and then in numerical order within each group. Each component entry comprises three or four columns: the circuit reference, variant (if applicable), IPN and description. A number in the variant column indicates that this is a variant component which is fitted only to the product type listed.

This parts list is correct at the time of publishing, but is subject to change without notification. An up to date parts list can be obtained from your local Customer Service Organisation

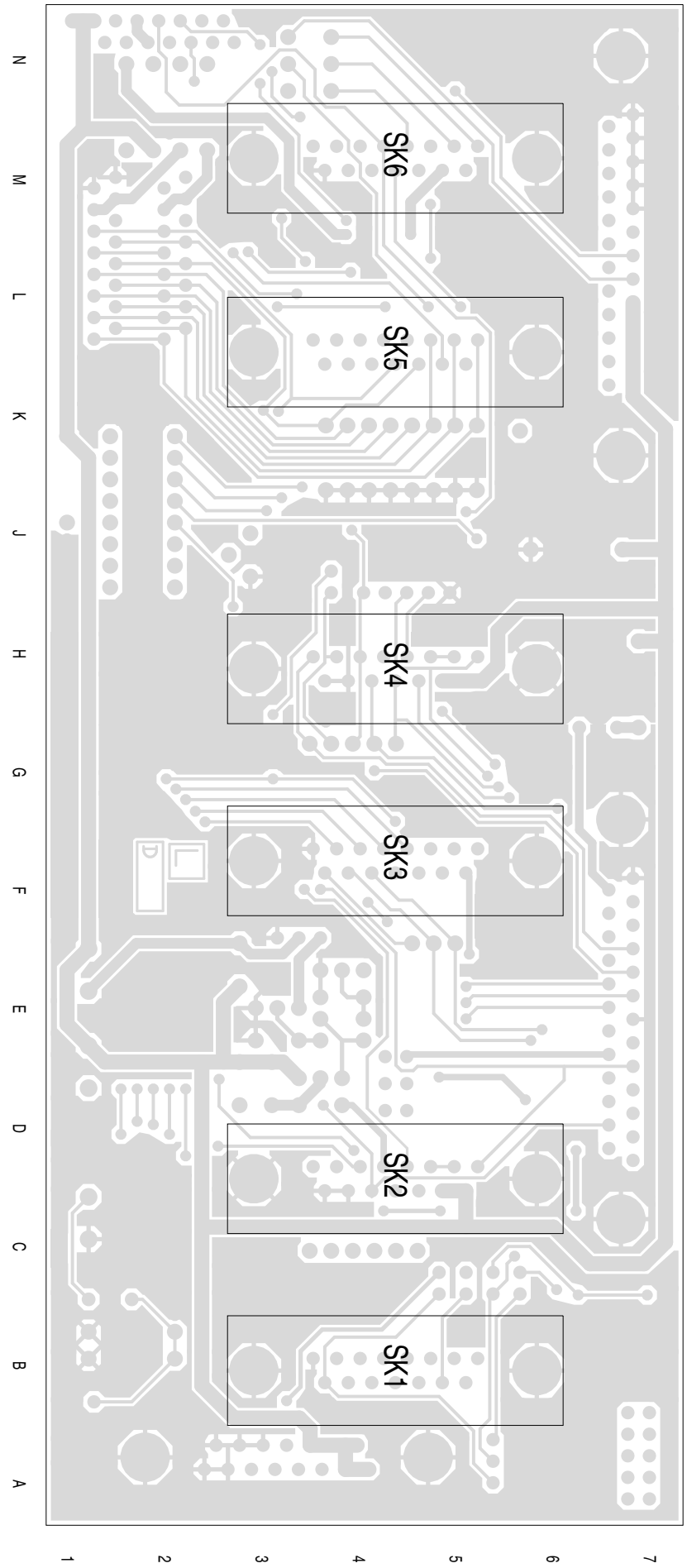
Ref	Var	IPN	Description
		240-04020-62	Skt 2w 0.1" Recep Shorting Lnk
		240-00020-58	Hdr 5w 1row Pcb Mtg
		349-00020-03	Scrw 4-40*1/4" T/T P/P Bz
CN1		240-04030-09	Term Block 2w Pcb Mtg 5mm
CN2		240-04030-09	Term Block 2w Pcb Mtg 5mm
CN3		240-04030-09	Term Block 2w Pcb Mtg 5mm
D1		001-00011-70	Diode 1N4001 1a/50v
D10		001-00011-70	Diode 1N4001 1a/50v
D2		001-00011-70	Diode 1N4001 1a/50v
D3		001-00011-70	Diode 1N4001 1a/50v
D4		001-00011-70	Diode 1N4001 1a/50v
D5		001-00015-12	Diode 5v6 0.4w 5% Zen
D6		001-00011-70	Diode 1N4001 1a/50v
D7		001-00011-70	Diode 1N4001 1a/50v
D8		001-00011-70	Diode 1N4001 1a/50v
D9		001-00011-70	Diode 1N4001 1a/50v
F1		265-00010-69	Fuse .900Ma Rstbl Rue090
LN1		240-00020-68	Hdr 2w Pcb Mtg Std
LN10		240-00020-59	Hdr 3w 1row Pcb Mtg
LN2		240-00020-68	Hdr 2w Pcb Mtg Std
LN3		240-00020-68	Hdr 2w Pcb Mtg Std
LN4		240-00020-68	Hdr 2w Pcb Mtg Std
LN6		240-00020-68	Hdr 2w Pcb Mtg Std
LN7		240-00020-68	Hdr 2w Pcb Mtg Std
LN8		240-00020-68	Hdr 2w Pcb Mtg Std
LN9		240-00020-68	Hdr 2w Pcb Mtg Std
PL1		240-00021-22	Plg Drng 25w With Mtg h/w
Q1		000-00010-60	Xstr BC327 PNP AF Pwr TO92
Q2		000-00010-66	Xstr BC337 NPN AF Pwr TO92
Q3		000-00010-66	Xstr BC337 NPN AF Pwr TO92
R1		030-53270-20	Res Flm 7x2.5 270e 5% 0.5w
R10		030-52100-20	Res Flm 4x1.6 10e 5% 0.4w
R2		030-53270-20	Res Flm 7x2.5 270e 5% 0.5w
R3		030-53270-20	Res Flm 7x2.5 270e 5% 0.5w
R4		030-55100-20	Res Flm 4x1.6 10k 5% 0.4w
R5		030-54100-20	Res Flm 4x1.6 1k 5% 0.4w
R6		030-54100-20	Res Flm 4x1.6 1k 5% 0.4w
R7		030-54100-20	Res Flm 4x1.6 1k 5% 0.4w
R8		030-54100-20	Res Flm 4x1.6 1k 5% 0.4w
R9		030-54100-20	Res Flm 4x1.6 1k 5% 0.4w
RV1		042-05100-10	Res Pre 10k Cer 9.5mm Sq Flat
SK1		240-02020-15	Skt 15 Drng Pcb + Pcb H/W
SK10		240-04020-54	Skt 16w 2x8 P Mtg M/Match
SK11		240-04020-54	Skt 16w 2x8 P Mtg M/Match
SK2		240-02020-15	Skt 15 Drng Pcb + Pcb H/W
SK3		240-02020-15	Skt 15 Drng Pcb + Pcb H/W
SK4		240-02020-15	Skt 15 Drng Pcb + Pcb H/W
SK5		240-02020-15	Skt 15 Drng Pcb + Pcb H/W
SK6		240-02020-15	Skt 15 Drng Pcb + Pcb H/W
SK7		240-02020-15	Skt 15 Drng Pcb + Pcb H/W
SK8		240-02020-20	Skt 25w Drng Pcb + Full H/W
SK9		240-04020-54	Skt 16w 2x8 P Mtg M/Match
SW1		230-00010-19	Sw Spst Dip Pkg X8
SW2		230-00010-19	Sw Spst Dip Pkg X8

Device	PCB	Circuit
+13V8	1:J7	1-L2
CN1	1:E1	1-Q3
CN2	1:E1	1-Q2
CN3	1:C1	1-Q0
CTCSS	1:C4	1-C6
D1	1:K1	1-M2
D2	1:D3	1-P3
D3	1:E3	1-P1
D4	1:H7	1-E3
D5	1:B2	1-P0
D6	1:B2	1-P0
D7	1:N2	1-H1
D8	1:N2	1-K1
D9	1:N2	1-L2
D10	1:N2	1-L8
FS1	1:G7	1-E3
GND	1:J6	1-N0
LINK1	1:C6	1-B5
LINK2	1:C5	1-B5
LINK3	1:D4	1-D5
LINK4	1:D4	1-D5
LINK5	1:J5	1-H7
LINK6	1:C5	1-B5
LINK7	1:J4	1-G6
LINK8	1:C5	1-B4
LINK9	1:E4	1-N3
LINK10	1:F3	1-P2
LINK20	1:A7	2-F5
LINK21	1:A7	2-G5
OPTO-	1:C4	1-C6
OPTO+	1:C5	1-C6
PL1	1:E7	1-D2
Q1	1:D4	1-N3
Q2	1:E4	1-P2
Q3	1:E3	1-P1
R1	1:N4	1-M7
R2	1:N4	1-M7
R3	1:N4	1-M7
R4	1:D4	1-N3
R5	1:D3	1-N3
R6	1:E4	1-P3
R7	1:E4	1-N2
R8	1:E4	1-P2
R9	1:E3	1-N1
R10	1:C1	1-P0
RELAY-CO	1:G4	1-G6
RELAY-NO	1:G4	1-G6
RV1	1:J3	1-G3
RX-AUDIO	1:G4	1-H7
RXAUDIO2	1:G4	1-G6
RX-AUX0	1:F5	1-F6
RX-AUX1	1:F5	1-F6

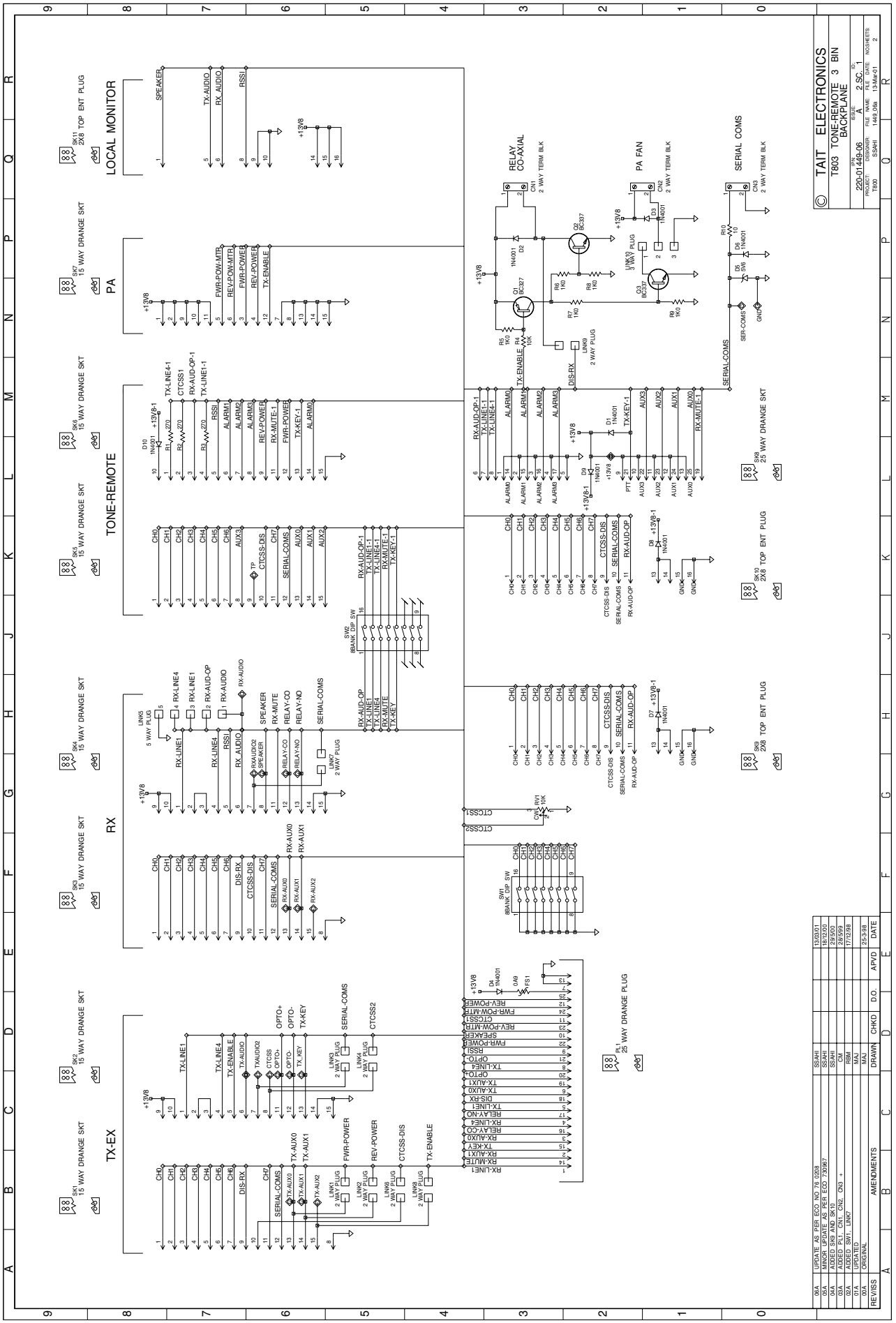
Device	PCB	Circuit
RX-AUX2	1:F5	1-F6
SER-COMS	1:B1	1-N0
SK1	2:B4	1-B8
SK2	2:D4	1-C8
SK3	2:F4	1-F8
SK4	2:H4	1-G8
SK5	2:L4	1-K8
SK6	2:M4	1-L8
SK7	1:A3	1-N8
SK8	1:L7	1-L0
SK9	1:L2	1-G0
SK10	1:L1	1-J0
SK11	1:N2	1-Q8
SPEAKER	1:G4	1-G6
SW1	1:K4	1-F2
SW2	1:J2	1-J4
TP	1:K6	1-K6
TX-AUDIO	1:C4	1-C7
TXAUDIO2	1:C4	1-C6
TX-AUX0	1:A5	1-B6
TX-AUX1	1:A5	1-B6
TX-AUX2	1:A5	1-B6
TX_KEY	1:C4	1-C6



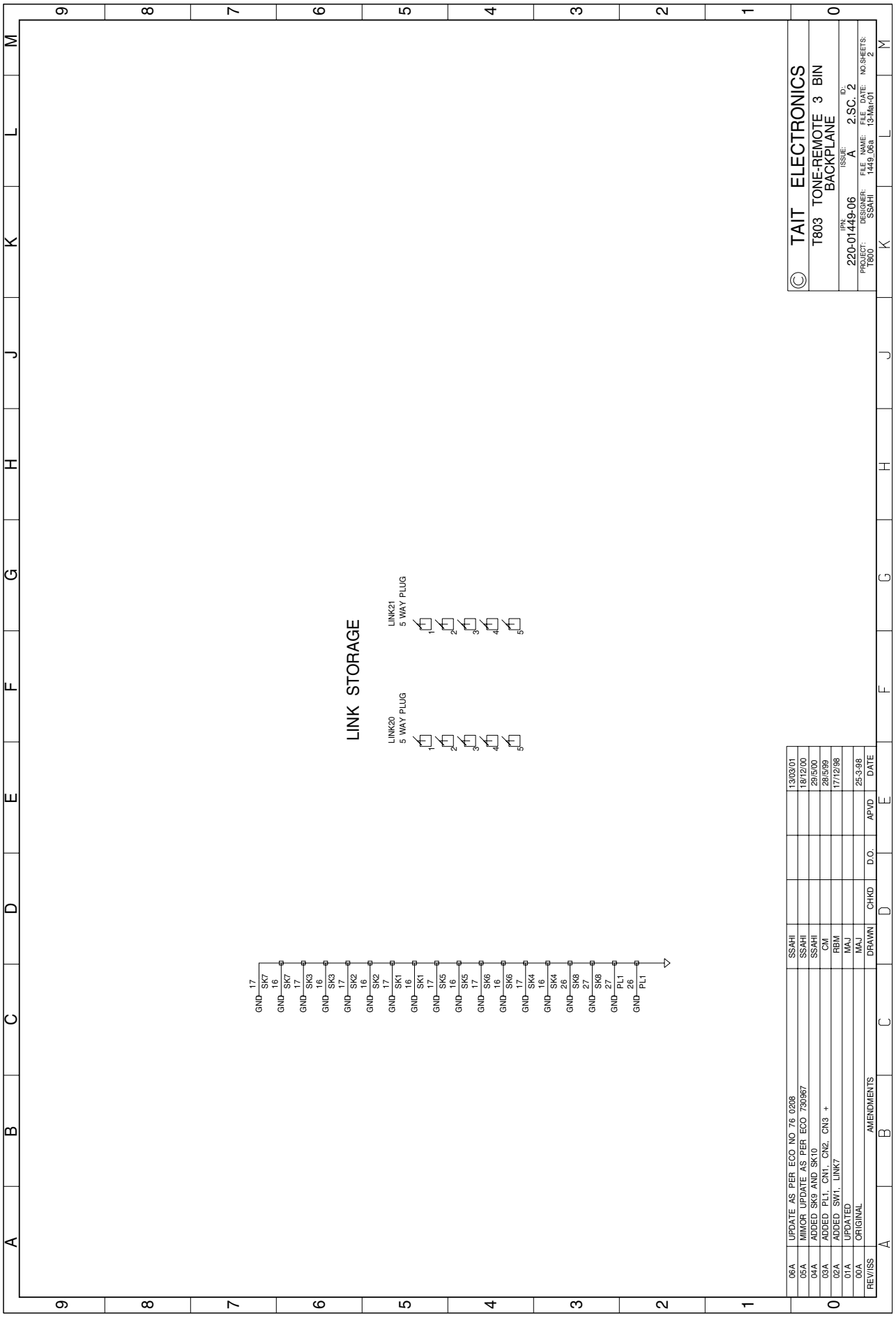
T800-54-0000 PCB (IPN 220-01449-06) - Top Side



T800-54-0000 PCB (IPN 220-01449-06) - Bottom Side



T800-54-0000 PCB Schematic (IPN 220-01449-06) - Sheet 1



T800-54-0000 PCB Schematic (IPN 220-01449-06) - Sheet 2

