Part D T803-02-9000 Tone Remote

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

Section	Title
1	General Information
2	Circuit Operation
3	Installation and Configuration
4	T803 PCB Information

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1 General Information

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

The following topics are covered in this section.

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1.1 Introduction

The T803-02 is a tone-operated Remote Controller otherwise known as a Tone Remote. Features include alarm monitoring, voting tone generation and simple high site control. It interfaces either a 2-wire or 4-wire line circuit to the T800 SL2 Base Station and thus enables a dispatch console (also known as a desktop controller) to monitor and control the remote basestation. The T803-02 interfaces with the SL2 receiver and transmitter via the backplane PCB (X800-56-PCB3) and two small flat cable looms plugged into the D-ranges on the back. The T803 is configured using the Tait PGM800Win programming software (V4.02 and later) on a PC.

1.1.1 Tone Remote

The T803 tone remote enables a remotely located user to:

- key the transmitter
- defeat the receiver's CTCSS mute (to monitor a channel)
- change the set channel (up to 256 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 long 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 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 high level guard tone and 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 tones are transparently carried to an end base station. Note that in

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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.

1.1.2 Alarm Monitoring and Confirmations

The T803 monitors three T800 sub-rack alarms (transmitter forward and reverse power, and low battery/power supply), one line alarm (line fail indication) and four external closure alarms. If alarms are triggered the T803 can be programmed to generate tone sequences (DTMF, Selcall or function tones) and/or enable auxiliary outputs, to alert system users of a problem. The tone sequences can be sent to line and/or radio.

Additionally the T803-02 can be programmed to respond to as many as eight different non-alarm triggers. These can be used as confirmation that an event has occurred. Confirmations can be programmed to occur in the event of power-up, channel change and/or the detection of up to six user defined function tones. In the same way as for alarms, the T803 can generate tone sequences and/or enable auxiliary outputs as a response to a confirmation.

1.1.3 Voting Tones

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 sub-rack to a wide variety of industry standard Radio Voting systems.

In Tone on Idle applications, a tone (normally the same frequency as LLGT) is transmitted to line when the T800 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.

1.1.4 Other Features

- Programmable Morse Code Encoder for automatic station identification (CWID)
- User programmable Line levels
- Programmable Transmit and Receive audio path delays
- Programmable (on/off) notch filtering.

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1.1.5 Front Panel Operating Controls

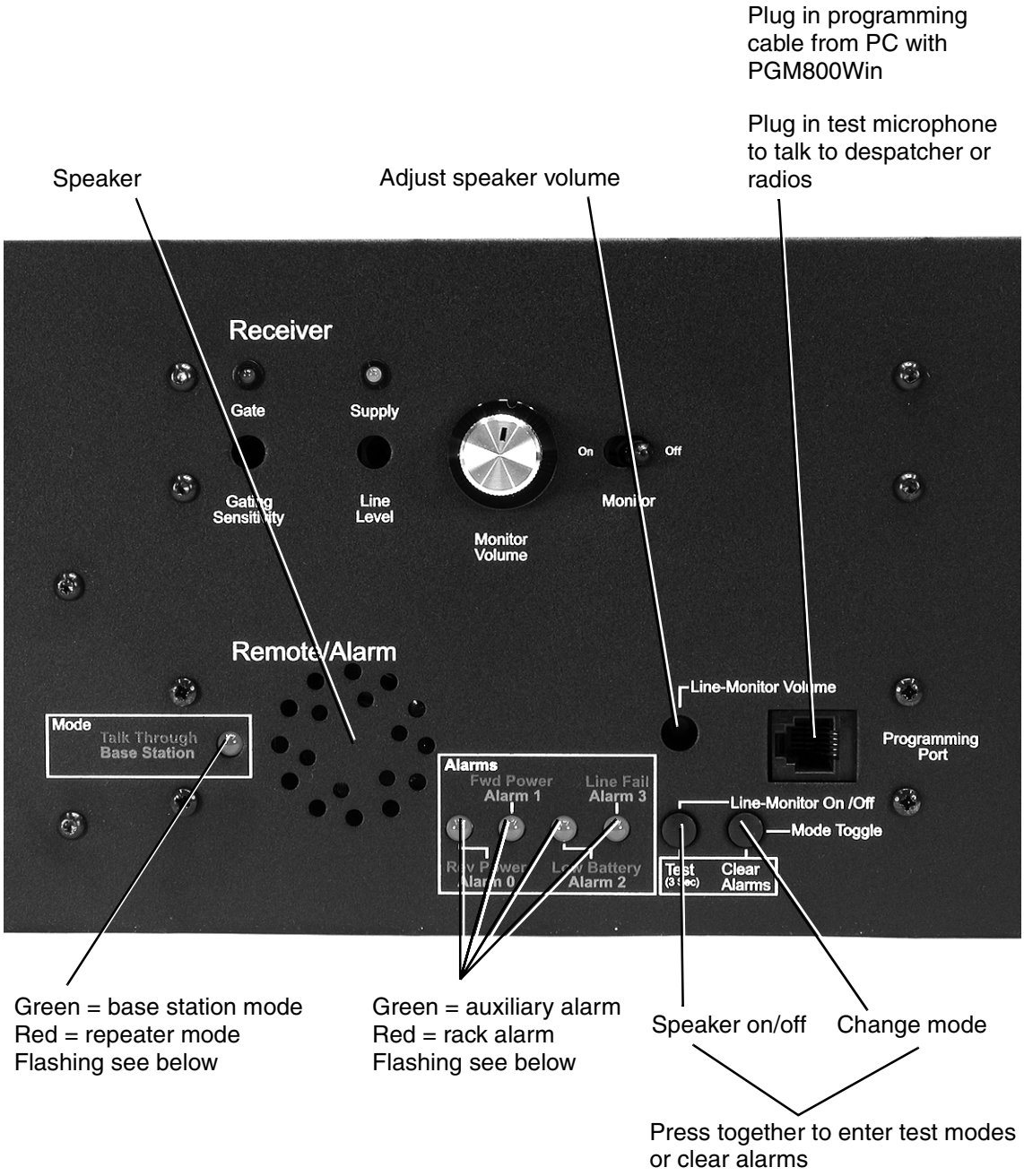


Figure 1.1 Front Panel Layout

1.1.5.1 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

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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).

1.1.5.2 Alarm LEDs

The alarm LED turns on only when its alarm condition has been latched. 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
	green very short off 0.32s on/0.01s off	Rack
	red short off 0.32s on/0.1s 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.

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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.

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.

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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 … –4.4dBm
From Radio Receiver … –4.4dBm
(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 and 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 to200ms

Function Tone Frequencies … 650Hz to 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

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Notch Filter Bandwidth at –38dB	… ±0.6% typical (±13Hz at 2175Hz)
Notch Filter Bandwidth at –3dB	… ±1.28% typical (±28Hz at 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	
Firmware up to version 2.10	… 10.7V ±0.05V
Firmware version 2.11 or later	… programmable 10.7V to 14.1V (0.2V steps)
RF Power Alarm Thresholds	… adjusted inside transmitter or PA
Line Fail Alarm Timer	… off or 1 minute to 4 hours
Auxiliary Alarm	
Input Trigger	… First and subsequent falling edges
Input Threshold	… <1.5V (or to 0V via 3.3KΩ resistor)
Maximum Input Voltage	… 5V
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, and DZVEI) DTMF and EIA Tone Remote function tone format.
Tone Carrier Deviation (for test tone set at 60%)	… 70% nom. system deviation at 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

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Tone Frequency	… 1200Hz
Valid Station ID	… alphanumeric only
Repetition Rate	… off or 1 to 60 minutes
Carrier Deviation (for test tone set at 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 (at25°C)
Momentary Monitor (CTCSS Defeat) Time	… off or 1 to 20 seconds

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1.3 System Configuration

The following flow chart will help you to configure your T800 SL2 system to utilise the features of the T803 Tone Remote. Refer to Section 1.3.1 for details on the product types mentioned in this chart.

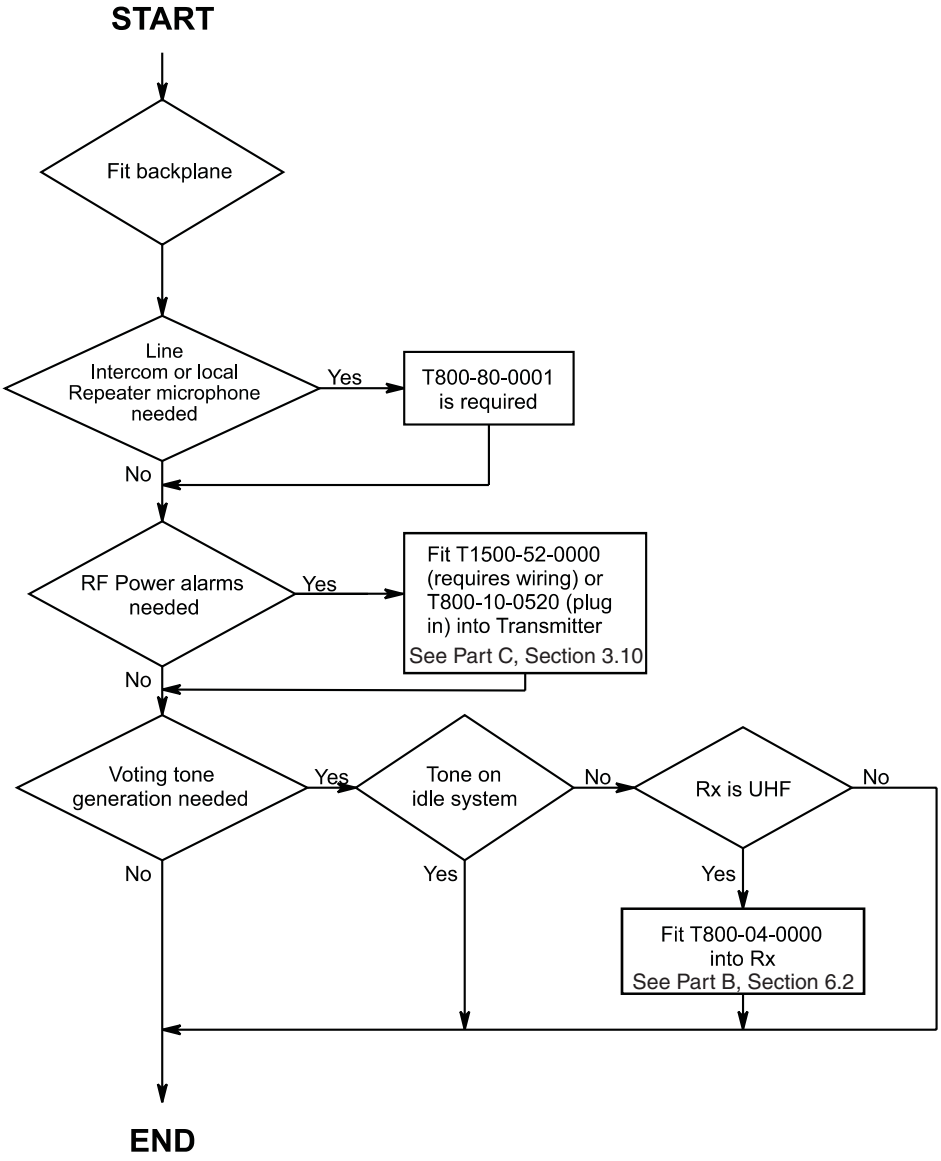


Figure 1.2 T803 System Configuration

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1.3.1 Product Codes

The following table provides a brief description of the products mentioned in Figure 1.2. Consult your nearest Tait Dealer or Customer Service Organisation for more information on these products.

Product Code	Description
T800-04-0000	T800 UHF RSSI kit.
T800-80-0001	T803 test microphone. Used for line intercom and to talk on air.
T1500-52-0000	Tx alarm and multichannel kit (wired connection).
T800-10-0520	Tx Alarm kit (plug in).

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.

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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.

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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	7.0Y
T803 4-wire	4-wire leased line	RJ61X	—	Metallic	7.0Y

a. Ringer Equivalence Number

b. Facility Interface Code

c. Service Order Code

1.4.3 Europe

For Declaration of Conformity refer to eudocs.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;

- EN60950 : 2000 Electrical Safety
- EN 301 489-5 Radiated and conducted emissions, and electromagnetic susceptibility specifications. Compliance to this standard is subject to the fitting of an additional EMC filter to the 2-wire/4-wire line interface. For more information see the following section.

1.4.3.1 Additional EMC filter fitting instructions

Applicability

In order for the T803-02 to comply with the RF electromagnetic field immunity requirements of the EMC standard EN 301 489-05 (07-2000), an additional filter must be fitted to the 2-wire or 4-wire line when the unit is installed. This filter, a clamp-on ferrite, helps prevent electromagnetic energy from being coupled into the product.

Required Component

The T803-02 Tone Remote and Alarm Interface unit is supplied together with the following separate EMC Filter:

IPN	069-00010-31
Description	Clamp-on ferrite EMC filter for 13mm diameter cable
Manufacturer and part number	Fair-Rite Part No. 0431 164181

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Instructions

1. The clamp-on ferrite must be located on the 2-wire or 4-wire line as close as possible to the T803. If the ferrite is not located within 10cm of the line socket, there is no guarantee that the T803 complies with the EMC standards.

2. Only one turn of the 2-wire or 4-wire line is required through the ferrite. However, two turns are recommended (see Figure 1.3) as this provides extra immunity while also securing the ferrite in position.

3. Ensure that the 2-wire or 4-wire line does not impede the closing of the ferrite clamp.

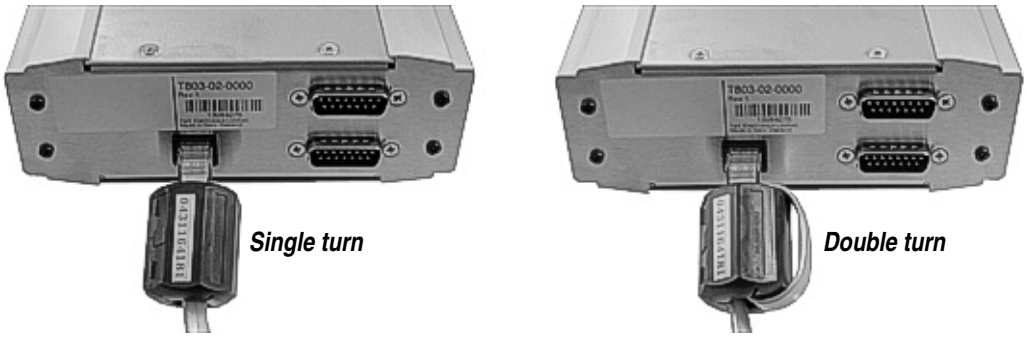


Figure 1.3 Single and double turn of line through filter

Technical Support

Contact your local Tait Electronics agent or Customer Service Organisation or visit Tait Electronics Technical Support at support.taitworld.com.

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

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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

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2 Circuit Operation

This section provides a description of the circuit and operation of the T803-02 tone remote.

Note: Unless otherwise specified, the term "PGM800Win" used in this and following sections refers to version 4.02 or later of the programming software.

Refer to Section 4 where the parts lists, grid reference index and diagrams will provide detailed information on identifying and locating components and test points on the main PCB.

The following topics are covered in this section.

Section	Title	Page
2.1	**Circuit Overview**	**2.3**
2.2	**Tone Detection**	**2.4**
2.3	**Alarm Monitoring**	**2.5**
2.3.1	Alarm Triggers	2.6
2.4	**Confirmations**	**2.7**
2.5	**Clearing Alarms and Confirmations**	**2.7**
2.6	**Voting Tone Operation**	**2.8**

Figure	Title	Page
2.1	High Level Block Diagram	2.3
2.2	Signal Flow	2.9

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2.1 Circuit Overview

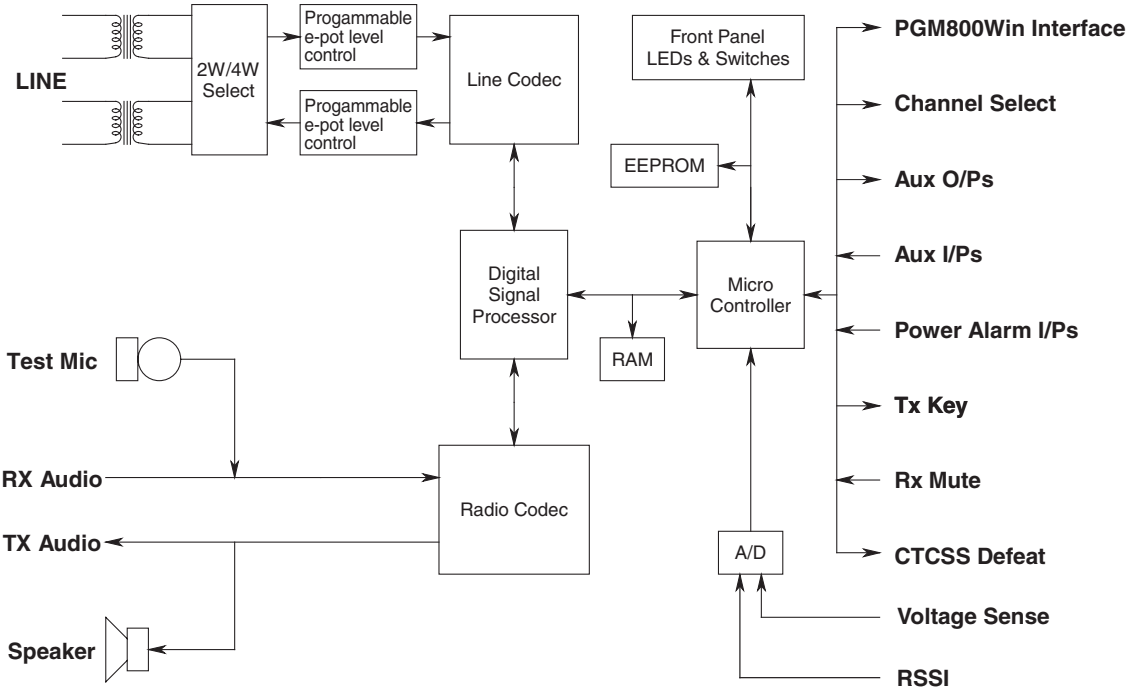


Figure 2.1 High Level Block Diagram

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 electronic potentiometer (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 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 Selcall 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;

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- 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 Tone Detection

In the quiescent state, audio on the Line-In pair is passed through the DSP (IC300) unfiltered to the T803 loudspeaker (which is connected to Tx audio – TP203). The audio is bandpass filtered to detect guard tone. In normal operation (keytone and function tone operation) the tone detector threshold is set for high level guard tone (HLGT).

If HLGT is detected, the DSP signals this detection to the micro using the TONE_DETECT line (TP300 is pulled low). The micro instructs the DSP, using the asynchronous serial communications connection (TP306) between them, to switch on the in line guard tone notch filter, lower the threshold of the guard tone detector (so that it can detect low level guard tone – LLGT) and turn on the function tone detectors.

Where the T803 is operating in 2-wire mode and receiver audio (RX audio) is being gated to line, the micro will soft mute the RX audio first). The micro then starts an internal timer, the duration of which is set by the HLGT and function tone times programmed by PGM800Win.

If a function tone is detected, the DSP signals the micro using the CALL_UP line (TP301 pulled low). The micro then interrogates the DSP via the serial communications connection to find out what frequency was detected.

If no tones are detected and the timer expires, the micro resets the DSP to its quiescent state. If two different frequencies are detected or if only one function tone frequency is decoded and the timer expires, the micro decodes them/it into an action by reading data programmed into the EEPROM (IC312) by PGM800Win. The micro then keys on the transmitter (PTT line) and instructs the DSP to turn off the function tone detectors and the talk-through gate (if it was on). If the function tone sequence decodes into a channel number that is different from the currently set channel, the micro will output the channel number on CH0 – CH7 for 250ms. This change may be latched into the T800 radios providing the sub-rack PCB channel select switches do not create a conflict.

As long as the DSP is detecting LLGT (indicated by a low level on TP300) the micro will keep the transmitter keyed on. When the DSP fails to detect LLGT the micro turns off the transmitter key and returns the DSP to the quiescent state.

When the T803 is programmed for keytone-only operation, the micro keying of the transmitter follows the state of the TONE_DETECT line from the DSP.

In the quiescent state when the receiver mute line (RX_MUTE) goes low, the micro instructs the DSP to gate audio from the receiver to Line-Out. If the line interface is 2-wire, Line-In and Line-Out are joined and the Rx audio will pass through the line inter-

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nally to the loudspeaker. It will therefore also reach the guard tone detector. Rx audio is therefore notch filtered at the guard tone frequency to prevent false guard tone detection. If the line interface is 4-wire this filtering is unnecessary but the talk-through gate must be turned on to send Rx audio to the loudspeaker. If the T803 is in repeater mode the transmitter is keyed and will remain so until the RX_MUTE line goes high. Note that the T803 will not key the transmitter if the receiver's CTCSS is defeated (CD_OUT is low) to prevent receiver channel noise being transmitted.

From the description above of the keytone/function tone detection it can be seen that keying from line has priority over repeater mode keying and audio gating.

2.3 Alarm Monitoring

The T803 microprocessor monitors eight alarm sources:

- Transmitter forward power
- Transmitter reverse power
- low battery
- line fail
- four external closure alarms

When an alarm is triggered it is latched as indicated by the corresponding LED on the front panel. If the T803 is keying the transmitter or sending receiver audio to the 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. Additionally the user may program any of the 4 auxiliary output ports as a response to an alarm event. The micro will activate (pull low) these outputs if enabled. If several alarms are latched together they are actioned in the order of priority:

1. External closure alarms 0 to 3
2. Reverse power
3. Forward power
4. Low battery
5. Line fail

If the programmed alarm action is a pip tone, the micro will instruct the DSP to append 200ms burst of 600Hz tone to each transmission (to line and/or radio).

Note: Sub-rack alarms (Fwd and Rev Power, Low battery or Line fail) cannot be re-triggered until they are cleared. The 4 external closure alarms however will re-send any user programmed tone sequence if re-triggered when already latched.

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2.3.1 Alarm Triggers

The alarms are triggered according to their type.

Priority	Alarm Type	Trigger Type	Re-triggerable when latched	LED colour
1	Auxiliary Input 0 to Input 3	External closure. Sampled every 50ms	Yes	Green
2	Reverse Power	Sampled every 50ms while the T803 is keying the transmitter. Incorporates a 2s settling time.	No	Red
3	Forward Power			
4	Low Battery	Voltage must be below the programmed threshold for 25s of a 30s period.	No	Red
5	Line Fail	Programmable non-activity time period	No	Red

Table 2.1 Alarm Summary Table

External Closure Alarm (Auxiliary Input Alarms)

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.

RF Power Alarm

The forward and reverse power alarms are only tested when the T803 is keying the transmitter. The alarms must be active (low) 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 programmed alarm threshold (±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.

Programmable low voltage threshold is only available in T803 firmware version 2.11 or later. Prior to this, the threshold was fixed at 10.7V ±0.05V.

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.

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2.4 Confirmations

Additional to alarms the T803 microprocessor also monitors eight non-alarm triggers known as Confirmations:

- Power-up
- Channel change
- Up to six user defined function tone inputs

The T803 micro responds to a confirmation trigger in the same way as it does to an alarm trigger – depending on what has been programmed into the EEPROM, a tone sequence may be sent, an auxiliary output enabled and/or a pip tone enabled. These are all actioned by the micro with the same rules as for alarm triggers. The only difference is that there are no LEDs associated with confirmations.

If several confirmations are triggered together they are actioned in the following order of priority: Power-up, Channel change and then User Confirmation 0 to 5. If several alarms and confirmations are triggered together the Power-up confirmation, if enabled, is always actioned first, followed by any alarms and then any other confirmations, both in their normal priority order.

Note: Confirmations will re-send any user programmed tone sequence if re-triggered.

2.5 Clearing Alarms and Confirmations

The alarms can be cleared by either pressing both front panel switches together or sending the T803 a correctly programmed ("Clear Alarms") function tone. All alarms are cleared together. Clearing alarms turns off all LEDs, cancels any associated pip tones and resets auxiliary outputs. If an alarm condition is still valid when it is cleared, it will be re-latched and the user-programmed action will be executed. If required, pip tones can be cleared separately (leaving alarms latched) by using a "Clear Alarm/Confirmation Pip tones" function tone.

When the Line fail alarm is cleared, the T803 will revert to the mode it was in (Basestation or Repeater) before the alarm was triggered. A keying sequence from line can also clear this alarm in the same way except that the pip tone will not be cleared if used by other latched alarms. Line fail is the only alarm that can be cleared individually in this way.

Confirmations can not be cleared by a single command like the Alarms. Confirmation pip tones are cancelled by using a "Clear Alarm/Confirmation Pip tones" programmed function tone and the auxiliary outputs are individually reset by using a "Turn OFF Auxiliary output (x)" function tone.

It is possible to have more than one Alarm or Confirmation using the pip tone. In this situation the clearing behaviour must be carefully considered:

- Line Fail Pip – Cleared by line keying-sequence only if pip tone is not 'active' for other Alarms and/or Confirmations.

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- Alarm Pips (including Line Fail) – Cleared by "Clear Alarms" command only if confirmation pips are not 'active'. Always cleared by "Clear Alarm/Confirmation Pip tones" command.
- Confirmation Pips – Cleared by "Clear Alarm/Confirmation Pip tones" command.

Additionally, it is also possible to have a single auxiliary output assigned to more than one alarm or confirmation. However, be aware that any command that resets auxiliary outputs, such as "Clear Alarms" or "Toggle Auxiliary Output (x)", will not make any check for multiple use – auxiliary outputs will be reset regardless.

2.6 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 (receiver muted) the DSP is instructed 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.

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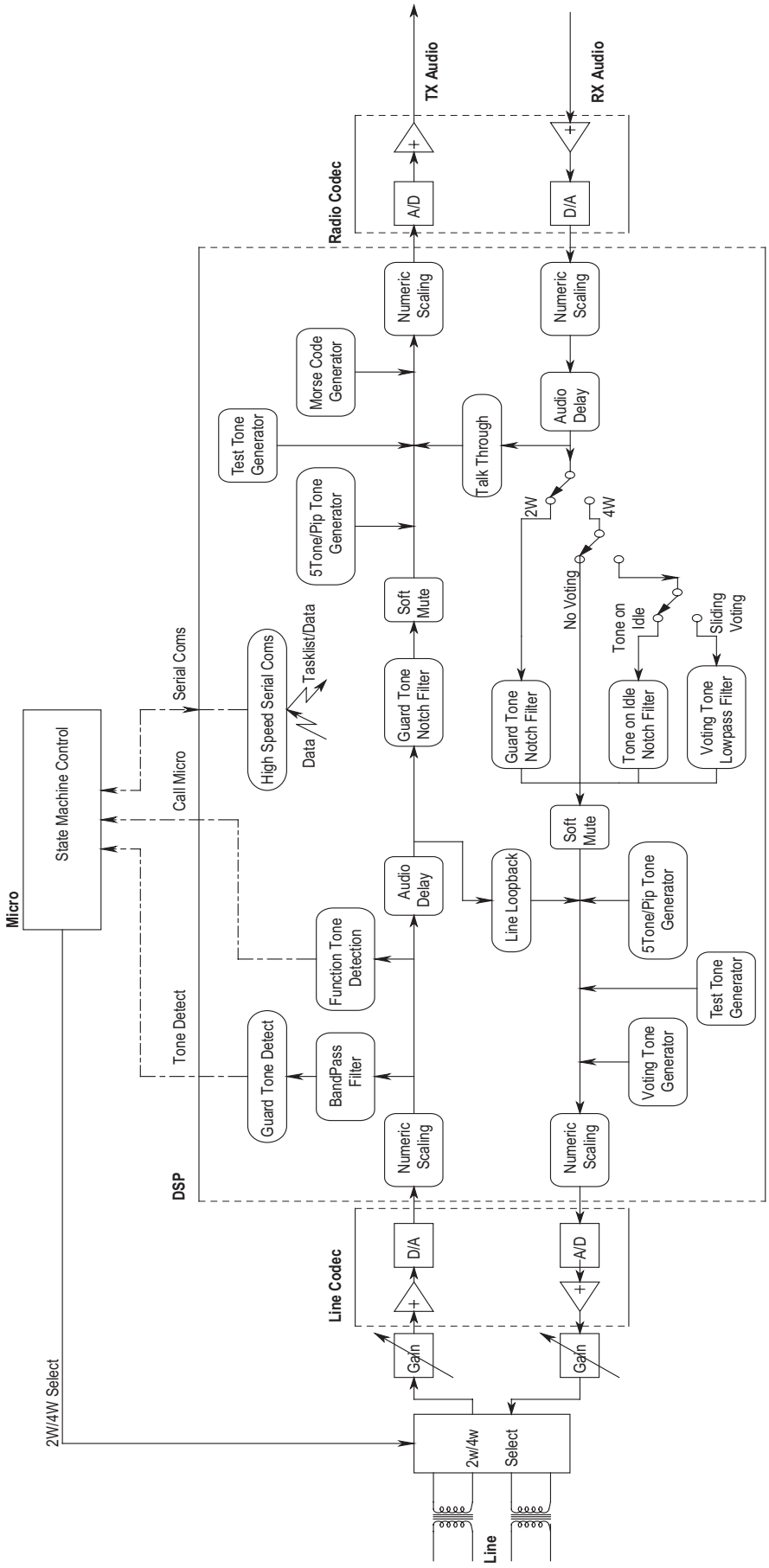


Figure 2.2 Signal Flow

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3 Installation and Configuration

Caution: **This equipment contains CMOS devices which are susceptible to damage from static charges. Refer to Section 1.2 in Part A for anti-static procedures for handling these devices.**

This section of the manual describes how to install and configure the T803 in a T800 SL2 sub-rack and test that it is functioning correctly. It also provides a brief fault finding procedure.

Note: Unless otherwise specified, the term "PGM800Win" used in this and following sections refers to version 4.02 or later of the programming software.

Refer to Section 4 where the parts lists, grid reference index and diagrams will provide detailed information on identifying and locating components and test points on the main PCB.

The following topics are covered in this section.

Section	Title	Page
3.1	**Installation**	**3.3**
3.1.1	Backplane Configuration	3.3
3.1.2	Auxiliary Inputs/Outputs	3.5
3.1.2.1	Auxiliary Alarms Inputs	3.6
3.1.2.2	Auxiliary Control Outputs	3.6
3.1.3	Line Interface	3.6
3.2	**T803 Configuration**	**3.7**
3.2.1	Equipment Setup for Level Configuration.	3.8
3.2.2	Use of Test Microphone	3.8
3.2.3	Test Modes	3.9
3.2.4	Level Configuration	3.10
3.2.4.1	Tx Audio – Audio Level from T803 to Transmitter	3.11
3.2.4.2	Line-In Level	3.11
3.2.4.3	Rx Audio – Audio Level from Receiver to T803	3.12
3.2.4.4	Line-Out Level	3.15
3.3	**Fault Finding**	**3.15**
3.3.1	Troubleshooting	3.16

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Figure	Title	Page
3.1	X800-56-PCB3 backplane connectors, links and switches	3.4
3.2	T803 setup	3.7
3.3	Rack and test equipment setup	3.8
3.4	Cycle of switching between the modes	3.8

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3.1 Installation

3.1.1 Backplane Configuration

To support the T803-02 Tone Remote an X800-56-PCB3 backplane should be fitted to the T800 SL2. The backplane should be configured as described in the following table. These are the default factory settings (for SL2 with T803).

Link	Setting	Function	Notes
LN1 and LN2	Not fitted as standard	Talk-through audio path (balanced)	
LN3	Not fitted as standard	Talk-through Rx-gate to Tx-Key	
LN4	Link pins 2 – 3	For Serial Comms with the T803	See SW2 settings below
LN5 and LN12	Not required for T803	Associated with TX-Relay-Driver output from transmitter	
LN6	Not required for T803	Determines I/O on pin 11 of SK6	See Section 6.2 in Part G
LN7	Not required for T803	External CTCSS Audio to Transmitter	
LN8	Link pins 1 – 2	Unbalanced Rx Audio ('Audio1') to T803. Not to be used when CTCSS is present on RX audio as internal CTCSS filtering cannot be applied to this path. For CTCSS use the option below.	Adjust level using RV2. Level to T803 independent of Rx Line Level control. See Section 3.2.4.3
	Link Pins 2 – 3 and Pins 4 – 5 (recommended)	Changes the balanced Rx Line audio output to unbalanced for the T803. This option should be used when CTCSS is present on RX audio so that the internal CTCSS filtering can be applied.	Level to T803 controlled by RX Line Level control. Note: Balanced Rx to TX audio becomes unavailable with this setup. See Section 3.2.4.3
LN9	Link pins 2 – 3	FWD power alarm signal to T803.	Internal alarm board must be fitted to T854. See Section 3.10 in Part C
LN10	Link pins 2 – 3	REV power alarm signal to T803.	
LN11	Fitted	RX CTCSS disable	See Section 6.2 in Part G

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Switch	Setting	Function	Notes
SW1	Set all switches to OFF	Channel select via T803 and or PGM800Win	
SW2	Set switch 4 and 5 to ON	For Serial Comms with the Tx, Rx and T803	See LN4 settings above
SW3	Set switch 1 to ON	Rx Audio to T803	See LN8 settings
	Set switch 2 and 3 to ON	Balanced audio from T803 to transmitter	
	Set switch 4 to ON	RSSI from receiver to T803	
	Set switch 5 to ON	Tx-Key from T803	
	Set switch 6 to ON	Rx-Gate to T803	

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

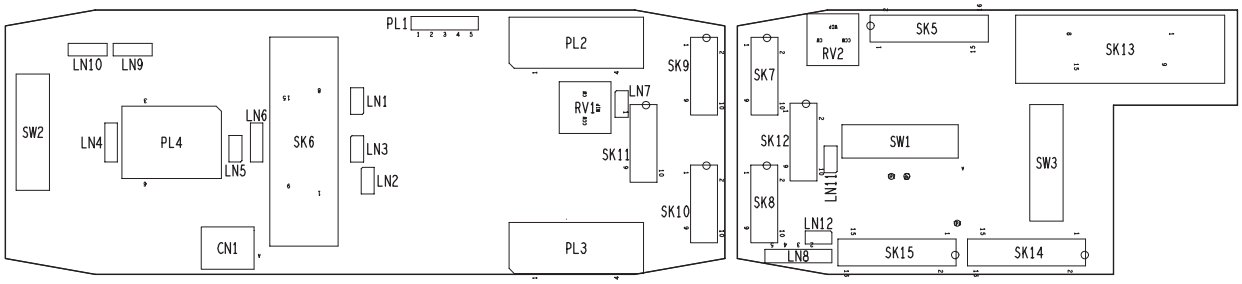


Figure 3.1 X800-56-PCB3 backplane connectors, links and switches

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3.1.2 Auxiliary Inputs/Outputs

The 15-way female D-range connector (SK13) located on the X800-56-PCB3 backplane board allows for external connection to a number of T803 inputs and outputs. These include the four T803 alarm inputs and the four T803 auxiliary outputs. Refer to Section 6.2 in Part G for backplane circuit and overlay diagrams.

The table below indicates the pin assignments of SK13

Pin	Name	Signal path	Logic	Description and specifications
1	+13.8V	Output	—	+13.8V_{DC} output. Maximum current = 900mA
2	RX-AUDIO-1-1	Receiver output – with SW3-1 in ON position (normal)	—	Unbalanced audio output from the receiver. Should only be used with high impedance loads (>10kW)
		T803 input – with SW3-1 in OFF position	—	Unbalanced high impedance audio input (>10kW) to the T803. Level required for correct T803 operation = 230mV_{rms}
3	TX_EX LINE1_1	T803 output	—	Parallel connection to the 600Ω balanced Tx Audio path between the T803 and the Transmitter. Connection to these lines must be done using a high impedance load to not upset the match/levels. Output level = –4.4dBm (when the T803 Line-In level is properly set-up or when the T803 is in Test Mode).
4	TX_EX LINE4_1		—	
5	TONE REMOTE ALARM 0	T803 input	5V CMOS 0V = active	T803 Alarm Input0. Maximum input voltage = 5V
6	TONE REMOTE ALARM 1			T803 Alarm Input1. Maximum input voltage =5V
7	TONE REMOTE ALARM 2			T803 Alarm Input2. Maximum input voltage =5V
8	TONE REMOTE ALARM 3			T803 Alarm Input3. Maximum input voltage =5V
9	RX-GATE-1	Receiver output with SW3-6 in ON position (normal).	Open collector 0V = audio	Max applied voltage = 40V Maximum sink current = 150mA
		T803 input with SW3-6 in OFF position.	5V logic < 1.5V = audio	Maximum applied voltage = 5V
10	TX_KEY_1	T803 output	Open collector 0V = active	Maximum applied voltage = 50V Maximum sink current = 250mA
11	TONE REMOTE AUX0	T803 output	Open collector 0V = active	T803 Auxiliary Output 0. Maximum applied voltage = 50V Maximum sink current = 250mA
12	TONE REMOTE AUX1			T803 Auxiliary Output 1. Maximum applied voltage = 50V Maximum sink current = 250mA
13	TONE REMOTE AUX2			T803 Auxiliary Output 2. Maximum applied voltage = 50V Maximum sink current = 250mA
14	TONE REMOTE AUX3			T803 Auxiliary Output 3. Maximum applied voltage = 50V Maximum sink current = 250mA
15	GND	—	—	Ground

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3.1.2.1 Auxiliary Alarms Inputs

The T803-02 has 4 closure alarm inputs. On every falling edge the associated alarm is (re)triggered, and sent when the T803 becomes idle. Alarm0 has higher priority than Alarm3, in that the alarm will be actioned first.

Maximum input voltage = 5V

Note: The behaviour is different from the T803-00 as it will resend any user programmed tone sequence if re-triggered when already latched.

3.1.2.2 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 or confirmation.

3.1.3 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.

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3.2 T803 Configuration

Before using the T803, line input (the level from the receiver) and output level (the level presented to the radio transmitter) need to be properly configured.

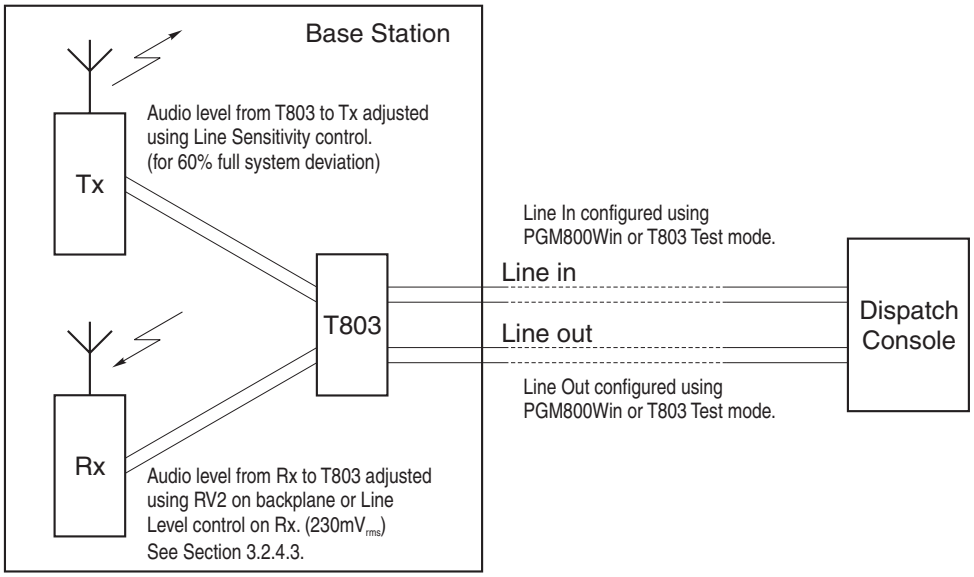


Figure 3.2 T803 setup

The Line-In/Line-Out levels can be set up using either the programming application (PGM800Win) or the test modes of the T803 (accessed via the buttons on the front panel. See Section 3.2.3). 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 dispatch console is difficult.

Using the test modes, the T803 levels are set up using actual signals present on the line. For the Line-In level, the test tone and keytone, are generated by the dispatch console and sent to the T803 via the leased line (or an audio generator could be used with the line loss simulated). For the Line-Out level, the test tone is generated by the T803.

Programming the Line-In/Line-Out levels using PGM800Win does not require any connection to the line. However, input/output specifications of the dispatch console 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.

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3.2.1 Equipment Setup for Level Configuration.

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

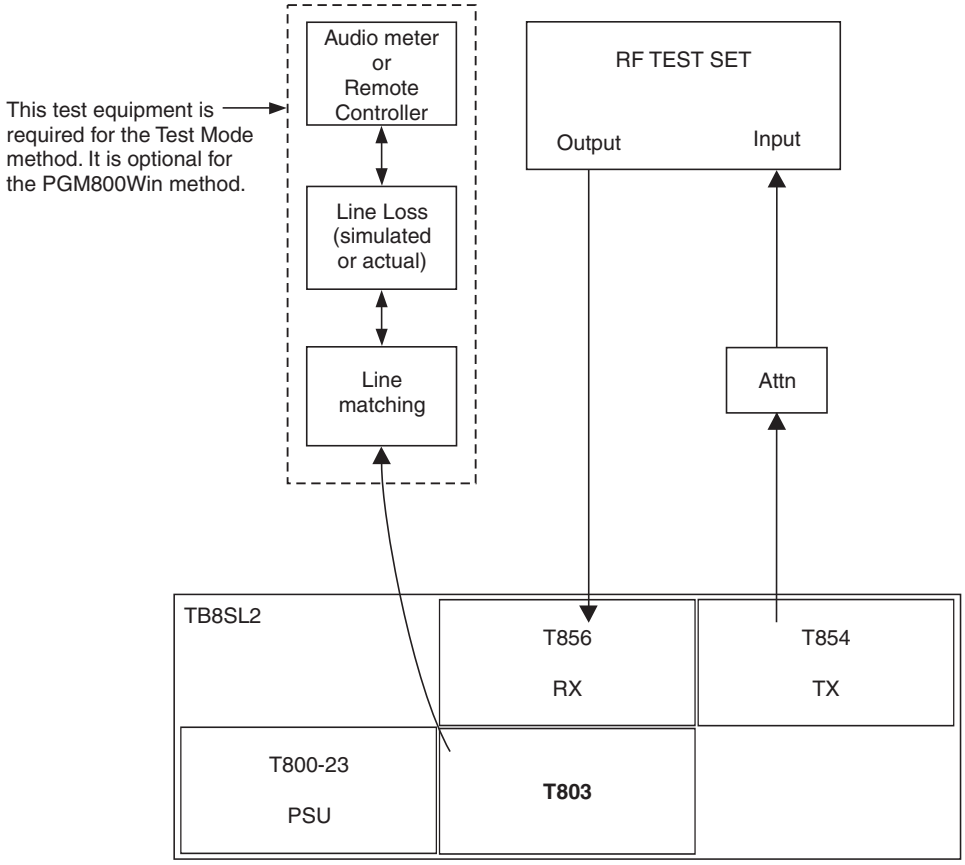


Figure 3.3 Rack and test equipment setup

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 as instructed in Part B and C of this manual.

3.2.2 Use of Test Microphone

The T803 test microphone is used to communicate both on air to radios and down the line to dispatch consoles. 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 and PTT button with receiver mute).

Most dispatch consoles 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).

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Note: If the T803 is in repeater mode, PTT on the test microphone will key-on the transmitter and thus broadcast test speech to air.

3.2.3 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 panel 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 transmitter and encode a 1kHz test tone to the transmitter 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 transmitter.
- Red = No keytone present

While still in Line-In Level Configuration Mode, simultaneously pressing the Monitor and Mode Toggle buttons again will change the mode to Line-Out Configuration Mode[1]. 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. Again, 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 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. For firmware versions prior to 2.07, a simultaneous button press while in Line-In Configuration Mode will exit Test Mode .

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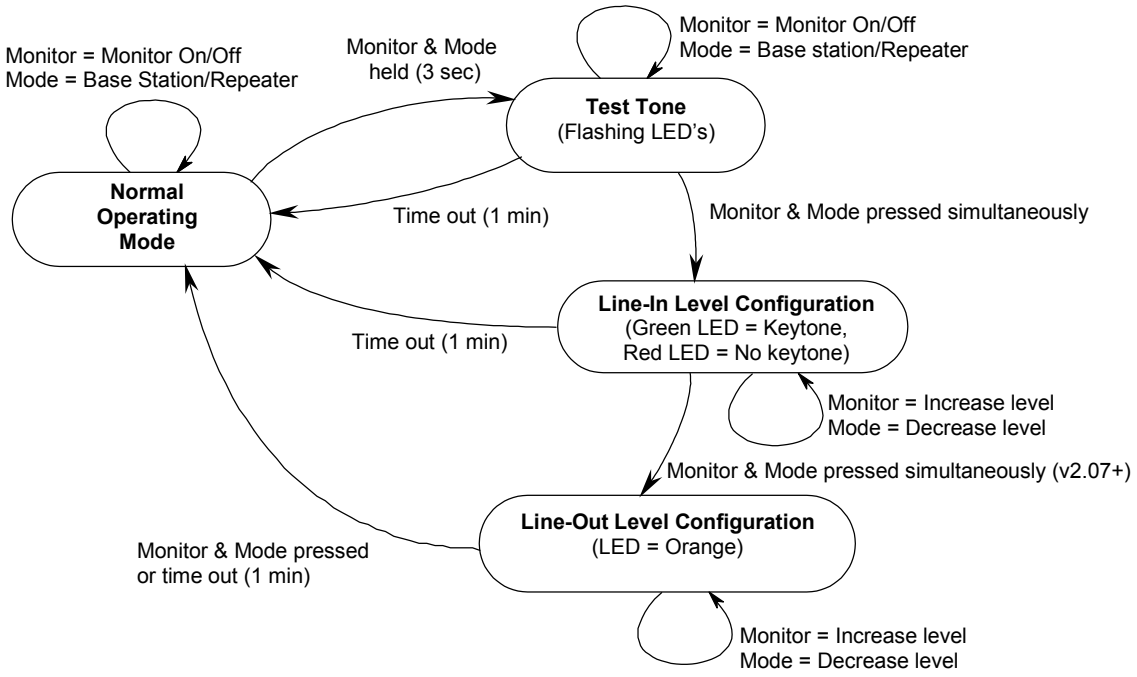


Figure 3.4 Cycle of switching between the modes

3.2.4 Level Configuration

Before proceeding with any level configuration the transmitter and receiver must be run-up and configured for the application. Also, ensure that the equipment has been set up correctly as indicated in Section 3.2.1. It is important that the T800 Transmitter output is connected to the Test Set (through an attenuator as required) because it will often be keyed during these level setting procedures.

The following levels need to be set:

- Tx Audio – Audio level from T803 to transmitter (balanced)
- Line-In level
- Rx Audio – Audio level from receiver to T803 (unbalanced)
- Line-Out level

The only consideration of order is that the Tx Audio level needs to be configured before the Line-In level can be done.

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3.2.4.1 Tx Audio – Audio Level from T803 to Transmitter

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

1. Set the T803 into Test Tone Mode (See Section 3.2.3)

2. Adjust the Line Sensitivity Control on the front panel of the transmitter 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

3.2.4.2 Line-In Level

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

- On the T803 in Level Configuration Mode
- Using PGM800Win programming software.

Using Level Configuration Mode:

Note: The Tx audio level must be set up before starting this procedure (Section 3.2.4.1).

1. Set the T803 into Line-In Level Configuration Mode (See Section 3.2.3).

2. Connect a dispatch console to the far end of the line, or simulate the console and line loss using an audio generator.

3. Press the PTT on the dispatch console. This will send a keytone to the T803. Ensure the console also sends a test tone at speech level to line (this tone is required for this method of configuring the Line-In level).

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 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 dispatch console 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 3.3.1 (point 7) on how to troubleshoot for Talkoff.

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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 dispatcher room (See Section 3.2.2).

Using PGM800 software:

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

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

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

4. Program the T803 with the calculated level.

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

3.2.4.3 Rx Audio – Audio Level from Receiver to T803

The Rx Audio level is adjusted using either the Line Level control on the front of the receiver or the RV2 potentiometer on the backplane, depending on the configuration of the link LN8 on the backplane.

The recommended (and default) configuration of LN8 is with pins 2–3 and 4–5 linked. With this configuration the balanced audio from the receiver (Rx-Line-1 and Rx-Line-4) is changed to unbalanced audio for the T803 (this means the Rx Line output can no longer be used as direct balanced audio to the transmitter). The level to the T803 is adjusted using the Line Level control on the front of the receiver. The advantage of using this path is that it allows CTCSS filtering to be applied (using the receiver's internal CTCSS filter. See Section 3.5 in Part B).

Alternatively if CTCSS is not used, the receiver unbalanced audio output (Rx-Audio-1) can be used to provide audio to the T803 by linking pins 1–2 on LN8. In this case the level to the T803 is adjusted using the RV2 potentiometer on the backplane. This audio path is not suitable for CTCSS systems because complete CTCSS filtering cannot be applied. The only filtering directly available is the optional receiver de-emphasis filtering. See Section 3.5 in Part B. The T803 does however apply a 160Hz to 3kHz high pass filter resulting in an overall audio response for this path very similar to the default high pass filtered receiver balanced Line output. See the table below.

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Receiver/T803 system	Backplane links (LN8)	Adjustment of Rx Audio to T803	Audio Frequency Response
With CTCSS on Rx audio	Link pins 2–3 and pins 4–5	Line Level control on the front of the Receiver	Receiver internal CTCSS filter should be included in the path (see Section 3.5 in Part B) 400Hz to 3kHz
No CTCSS on Rx audio	Link pins 2–3 and pins 4–5	Line Level control on the front of the receiver	Receiver internal CTCSS filter not in path but high pass filter in path (Rx default setup) 220Hz to 3kHz
No CTCSS on Rx audio	Link pins 1–2	RV2 on the backplane	T803 high pass filter only 160Hz to 3kHz

The table above shows that configuring LN8 with links 2–3 and 4–5 could be used for systems with or without CTCSS. Configuring LN8 with link 1–2 in normally only used with systems without CTCSS on the Rx audio.

Procedure

Before commencing this procedure set up the receiver audio processing, such as de-emphasis and CTCSS filtering, as required for the application. See Section 3.5 in Part B. This is important for the T803 Telecom line compliance. See the Caution below.

CAUTION: The Rx audio level must not exceed 230mV_{rms} at 60% full system deviation. This will ensure that the actual T803 Line-Out level corresponds to the programmed value and thus ensures levels do not exceed the power level requirements of the Telecommunications line.

There are three possible ways to monitor the Rx Audio level during adjustment:

- Direct measurement of receiver audio on the backplane
- Indirectly, using transmitter deviation
- Indirectly, using the T803 Line-Out level

Direct measurement of receiver audio on the backplane:

1. Use the RF Test Set to generate an on-channel signal to un-mute the receiver.

2. Modulate the RF carrier with a 1020Hz tone[1] at 60% full system deviation, adding CTCSS tone for a CTCSS system (ensure that CTCSS filtering is applied in the receiver as required for the application. See Section 3.5 in Part B).

3. Monitor the audio level from the receiver on the X800-56-PCB3 backplane at pin2 of LN8, with the links (jumpers) in place as directed in Section 3.1.1. Use a high impedance meter such as an oscilloscope for the measurement.

1. A 1020Hz tone is used (rather than 1kHz) because some Test Sets can produce unstable deviation readings

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4. For LN8 with pins 2–3 and 4–5 linked, adjust the line level control on the front of the receiver for an audio level of 230mV_{rms}.

   For LN8 with pins 1–2 linked, adjust RV2 on the backplane for an audio level of 230mV_{rms}.

Using transmitter deviation:

This method is not suitable for simplex configured repeaters.

1. Use the RF Test Set to generate an on-channel signal to un-mute the receiver.

2. Modulate the RF carrier with a 1020Hz tone1 at 60% full system deviation, adding CTCSS tone for a CTCSS system (ensure that CTCSS filtering is applied in the receiver as required for the actual working system. See Section 3.5 in Part B).

3. Put the T803 unit into Talk Through Mode (also known as Repeater Mode) using the Mode Toggle button[1]. The Mode LED should be red, constant or flashing, and the transmitter should be keyed on.

4. For LN8 with pins 2–3 and 4–5 linked, adjust the Line Level control on the front of the receiver to produce 60% full system deviation at the transmitter RF output as measured on the test set.

5. For LN8 with pins 1–2 linked, adjust RV2 on the backplane to produce 60% full system deviation at the transmitter RF output as measured on the test set.

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

Using the T803 Line-Out level:

1. Use the RF test set to generate an on-channel signal to un-mute the receiver.

2. Modulate the RF carrier with a 1020Hz tone[2] at 60% full system deviation, adding CTCSS tone for a CTCSS system (ensure that CTCSS filtering is applied in the receiver as required for the actual working system. See Section 3.5 in Part B).

3. Put the T803 into Base Station Mode using the Mode Toggle button[1]. The Mode LED should be green (constant or flashing).

4. For LN8 with pins 2–3 and 4–5 linked, monitor the T803 Line-Out level (600Ω balanced audio) 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.

   For LN8 with pins 1–2 linked, monitor the T803 Line-Out level (600Ω balanced audio) and by adjusting RV2 on the backplane, set this level to equal the programmed 'Line-Out Level' as set in PGM800Win.

1. The Mode Toggle button may be disabled from PGM800Win
2. A 1020Hz tone is used (rather than 1kHz) because some Test Sets can produce unstable deviation readings

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3.2.4.4 Line-Out Level

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

- On the T803 in Level Configuration Mode
- Using PGM800Win programming 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 3.2.3).

2. Use the RF Test Set to generate an on-channel signal 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 dispatch console.

Note: The monitor speaker is forced on in this mode so the test-microphone may be used as an intercom to communicate to the dispatcher room (See Section 3.2.2).

Using PGM800Win software:

1. Determine the input level required at the dispatch console. This may be a preset or default value specified in the console's manual or a value programmed by the operator.

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

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

4. Program the T803 with the calculated level.

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

3.3 Fault Finding

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

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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 dispatch console to key-on the transmitter. If the transmitter does not key-on, check that the console 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 console 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 console 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.

3.3.1 Troubleshooting

1. Sometimes misses function tone command

Set up 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 console. Some consoles 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 an 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 enabled in PGM800Win. It is then activated by sending the T803 the programmed function tones.

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5. While in Line-In Level Configuration Mode, the LEDs flash green only briefly when the dispatch console 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 console 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 console 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 console 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), causing the keytone detection to fail.

For reliable operation, the keytone level should be no more than 35dB lower than ***peak*** speech level.

If it is not possible to adjust the levels at the console, decrease the programmed Line-In level of the T803 until talkoff is eliminated. This requires that the audio level from T803 to transmitter will also need to be re-adjusted (using the transmitter's Line Sensitivity control) to maintain 60% full system deviation for the test tone sent from the console.

Adjust the relative audio levels (keytone and speech) sent from the dispatch console.

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 by noise.

- Check to ensure that the input level from the receiver is correctly set up at $230mV_{rms}$ (See Section 3.2.4.3).

- 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 line input of the T803 in 2-wire mode.

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- If there is still a problem after the squelch gating 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 dispatch console. Again, this has the effect of reducing the noise on the line 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. Contact your your nearest Tait Dealer or Customer Service Organisation for more information.

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4 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.

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

Section	Title	IPN	Page
4.1	**Introduction**		**4.1.3**
4.2	**T803 Main and Front Panel PCBs**	**220-01581-01**	**4.2.1**

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4.1 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.

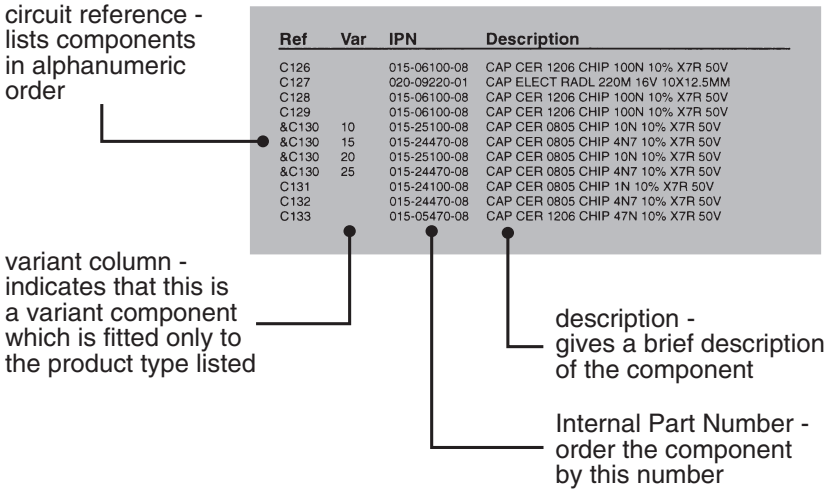
Note: It is important that you identify which issue PCB you are working on so that you can refer to the appropriate set of PCB information.

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:

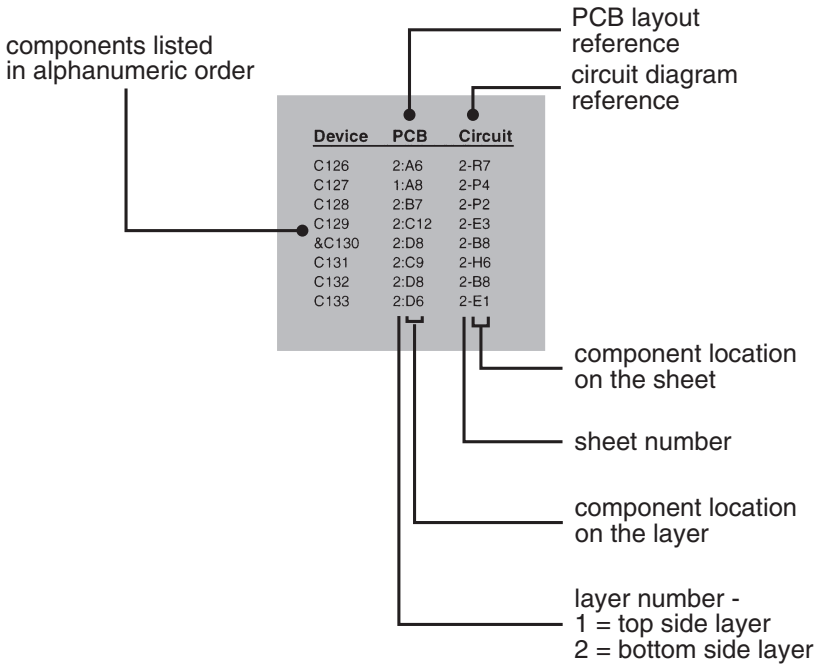


The mechanical and miscellaneous section lists the variant and common parts in IPN order.

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Grid Reference Index

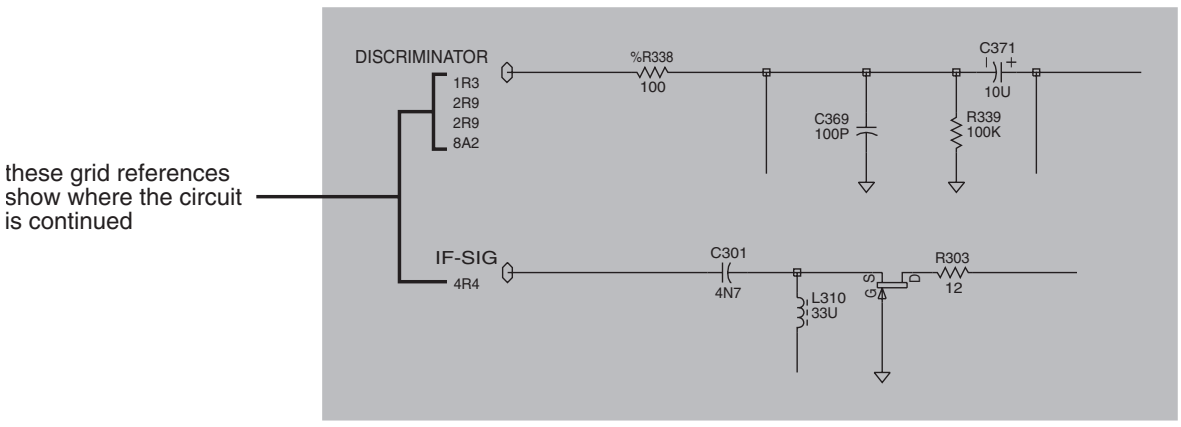
This section contains a component grid reference index to help you find components and labelled pads on the PCB layouts and circuit diagrams. This index lists the components and pads in alphanumeric order, along with the appropriate alphanumeric grid references, as shown below:



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).



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4.2 T803 Main and Front Panel PCBs

This section contains the following information.

IPN	Section	Page
220-01581-04	Parts List	4.2.3
	Mechanical and Miscellaneous Parts	4.2.6
	Grid Reference Index	4.2.7
	PCB Layout – Top Side	4.2.9
	PCB Layout – Bottom Side	4.2.10
	Overview and Front Panel Circuit Diagram	4.2.11
	Interface Circuit Diagram	4.2.12
	Control and Processing Circuit Diagram	4.2.13
	P100 PI Filters Circuit Diagram	4.2.14
	SK100 PI Filters Circuit Diagram	4.2.15
	SK102 PI Filters Circuit Diagram	4.2.16

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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

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Ref	Var	IPN	Description
C602		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C603		015-24100-08	CAP CER 0805 1N 10% X7R 50V
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

Ref	Var	IPN	Description
L512		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
L513		057-10120-03	IND 0805 120E@100M .2 EMI SUPR
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%

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Ref	Var	IPN	Description
R322		036-14180-00	RES M/F SMD 0805 1K8 5%
R323		036-14180-00	RES M/F SMD 0805 1K8 5%
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

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T803 Mechanical and 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

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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

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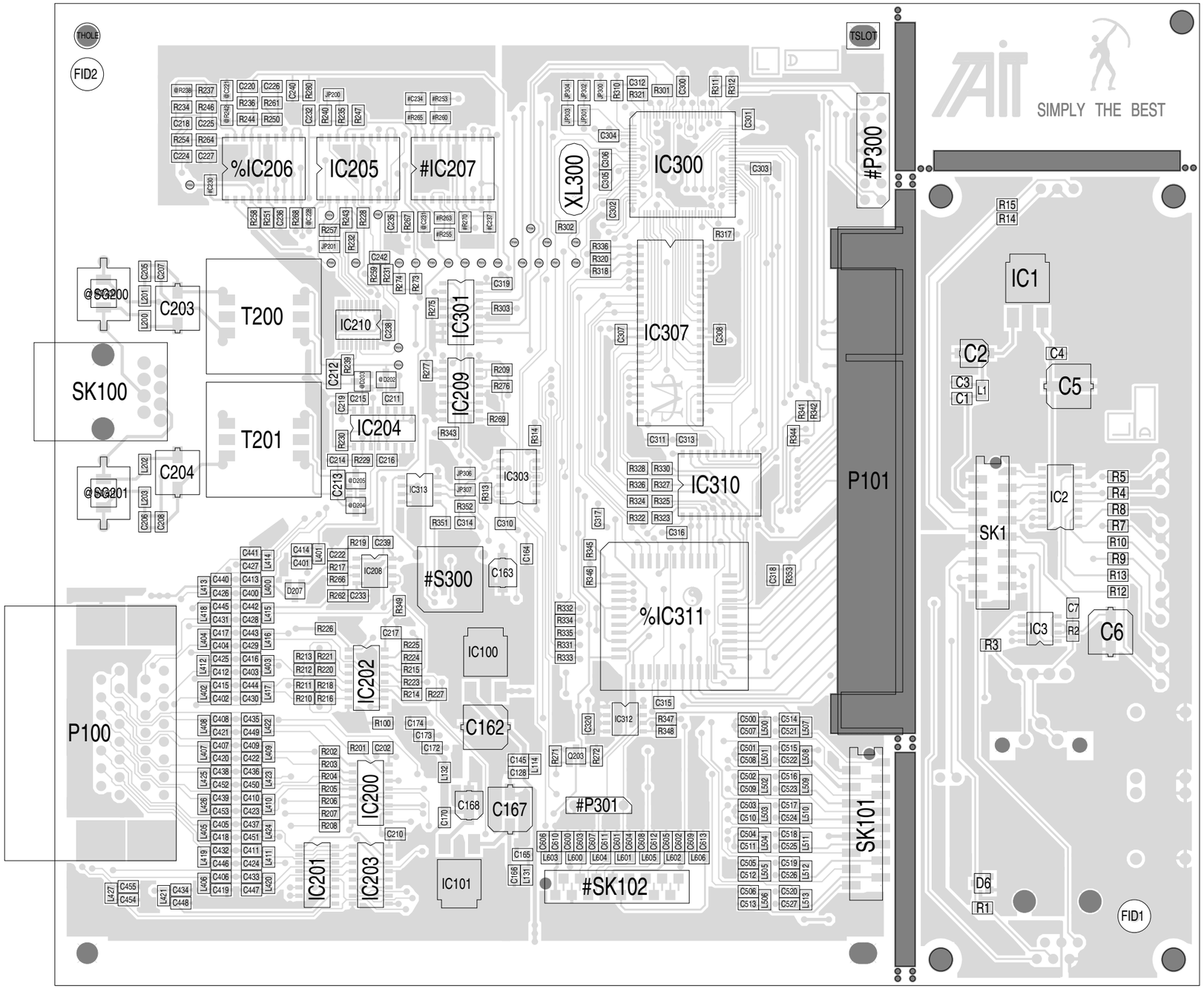
Device	PCB	Circuit
JP304	1:J15	3-F4
JP306	1:H9	3-P3
JP307	1:H9	3-P3
L1	1:Q11	1-O3
L114	1:J5	1-B0
L131	1:H3	1-E0
L132	1:G5	1-H0
L200	1:C12	2-E9
L201	1:C12	2-E8
L202	1:C9	2-E8
L203	1:C9	2-E8
L400	1:E8	4-H8
L401	1:E8	4-H8
L402	1:D6	4-H7
L403	1:E6	4-H6
L404	1:D7	4-H6
L405	1:D4	4-H5
L406	1:D3	4-H4
L407	1:D5	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

Device	PCB	Circuit
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

Device	PCB	Circuit
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

Device	PCB	Circuit
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

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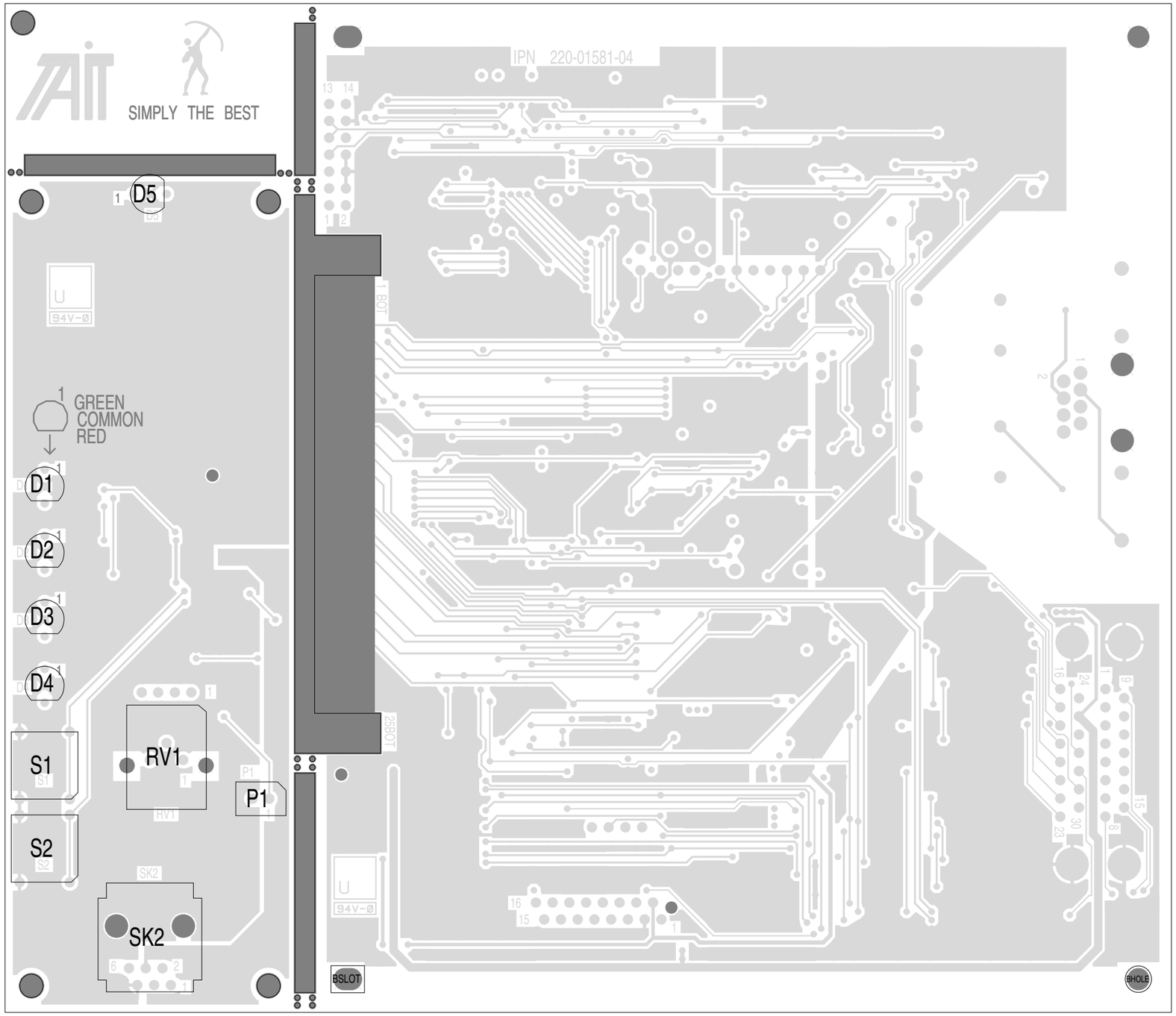


TAIT ELECTRONICS	IPN: 220-01581-04	ISS: A	ID: 1.TA	DATE: 1 Mar 2002
T803 / T805 PCB LAYOUT - TOP SIDE				

Scale:1.5:1 ; Rotation: 0 degrees

T803 PCB Layout – Top Side
220-01581-04

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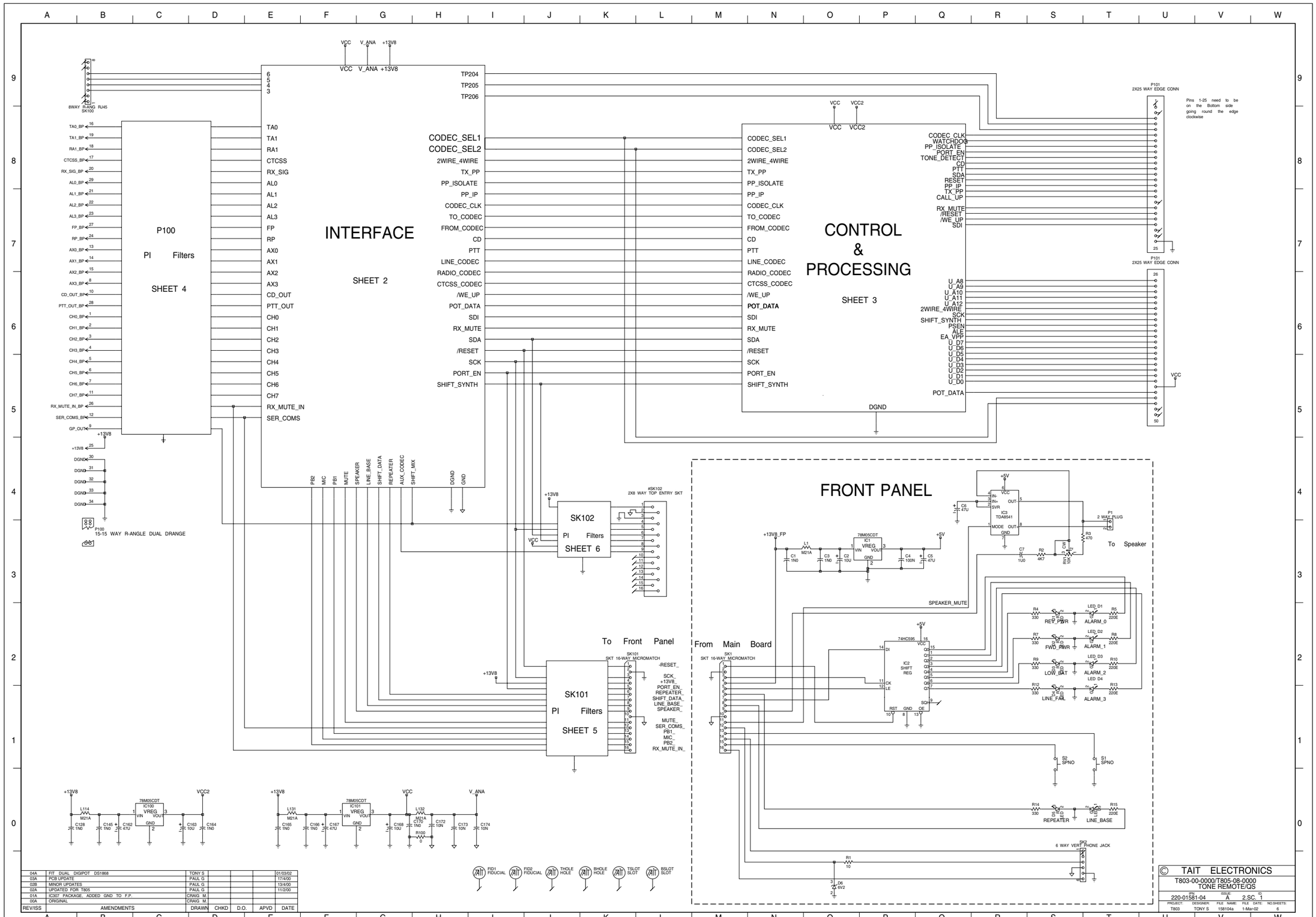
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TAIT ELECTRONICS	IPN: 220-01581-04	ISS: A	ID: 4.BA	DATE: 1 Mar 2002
T803 / T805 PCB LAYOUT - BOTTOM SIDE				

Scale:1.5:1 ; Rotation: 0 degrees

T803 PCB Layout – Bottom Side
220-01581-04

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Sheet 1 – T803 Overview and Front Panel
220-01581-04

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LINE SIDE ISOLATION AREA

To SK100

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

MC14583 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	IC207 PACKAGE, ADDED GND TO F.P.	CRAIG M.				
00A	ORIGINAL	CRAIG M.				

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T803-00-0000/T805-08-0000
INTERFACE

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

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

Sheet 2 – T803 Interface
220-01581-04

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@ = 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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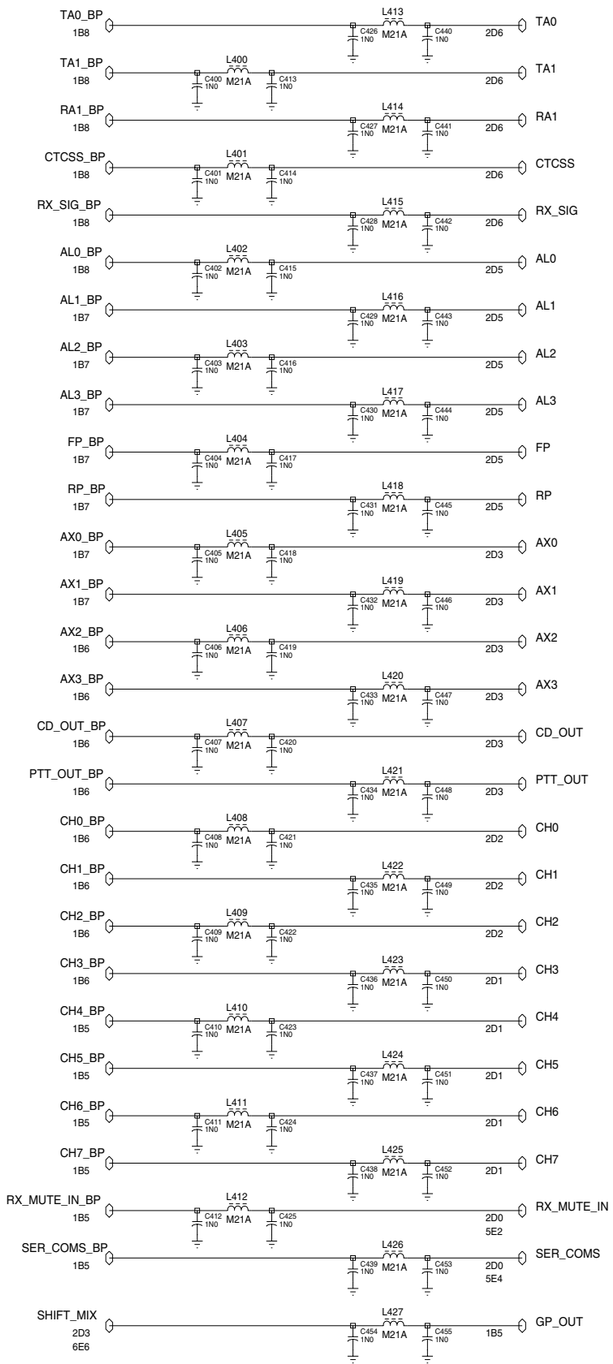
T803-00-0000/T805-08-0000
CONTROL & PROCESSING

DRG	ISSUE	SC
220-01581-04	A	2 SC. 3

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

Sheet 3 – T803 Control and Processing
220-01581-04

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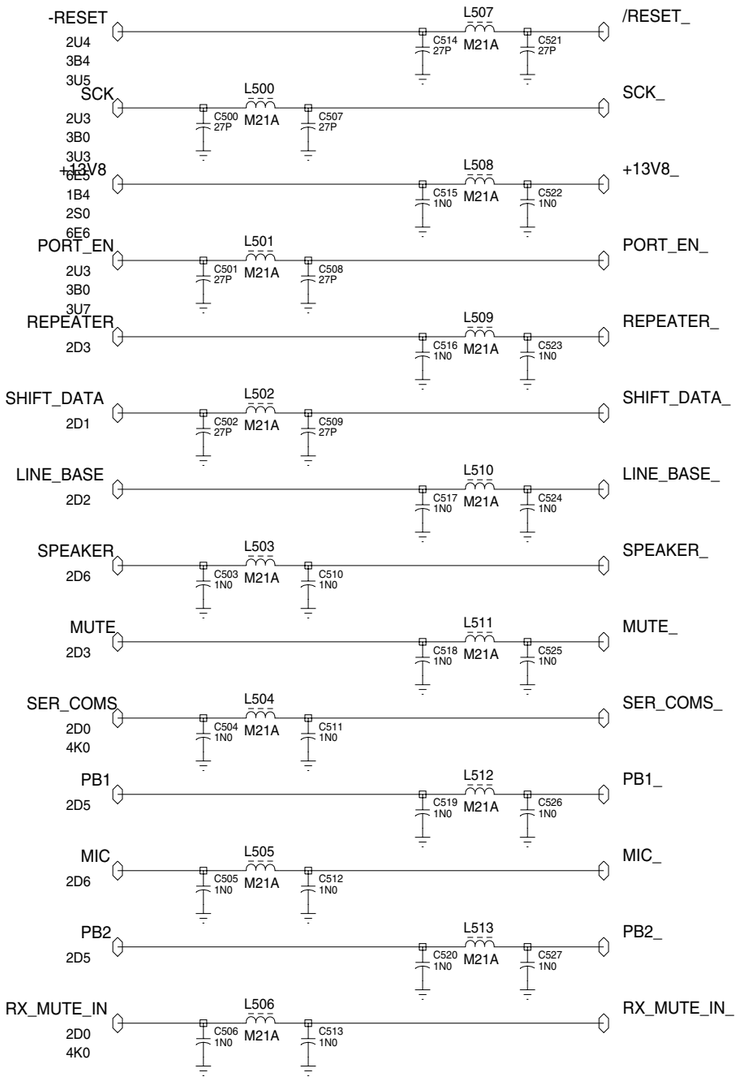
T803-00-0000/T805-08-0000
P100 PI FILTERS

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

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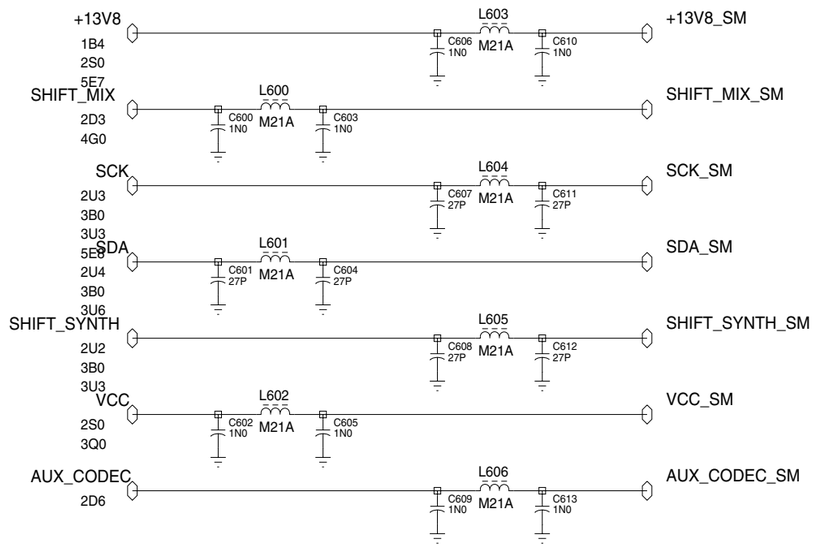
T803-00-0000/T805-08-0000
SK101 PI FILTERS

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

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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

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Part E T850 VCO PCB Information

This part of the manual provides the parts list, PCB layouts and circuit diagram for the T850 VCO PCB. There is a detailed table of contents at the start of Section 2.

Section	Title	IPN	Page
1	Introduction		1.1
2	T850 VCO PCB	220-01145-07	2.1

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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.

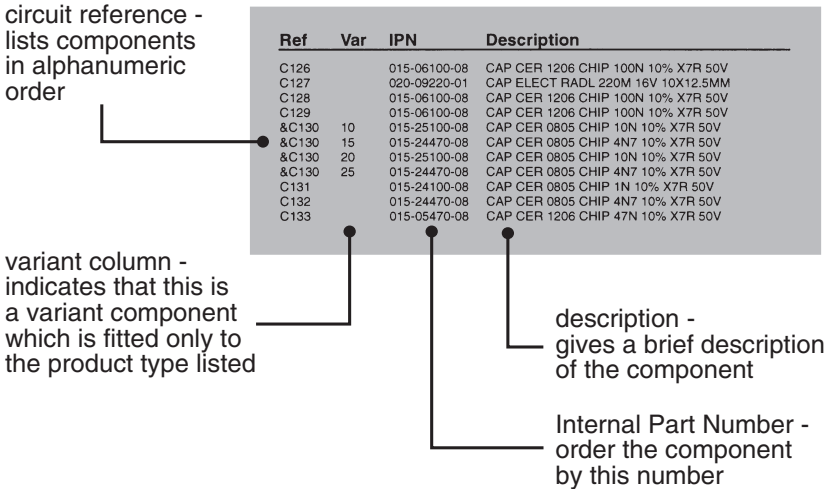
Note: It is important that you identify which issue PCB you are working on so that you can refer to the appropriate set of PCB information.

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.

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Variant Components

A variant component is one that has the same circuit reference but different value or specification in different product types. Variant components have a character prefix, such as “&”, “=” or “#”, before the circuit reference (e.g. &R100).

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2 T850 VCO PCB

This section contains the following information.

IPN	Section	Page
220-01145-07	Parts List	2.3
	PCB Layout – Bottom Side	2.5
	PCB Layout – Top Side	2.6
	Circuit Diagram	2.7

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T850 VCO Parts List (IPN 220-01145-07)

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.

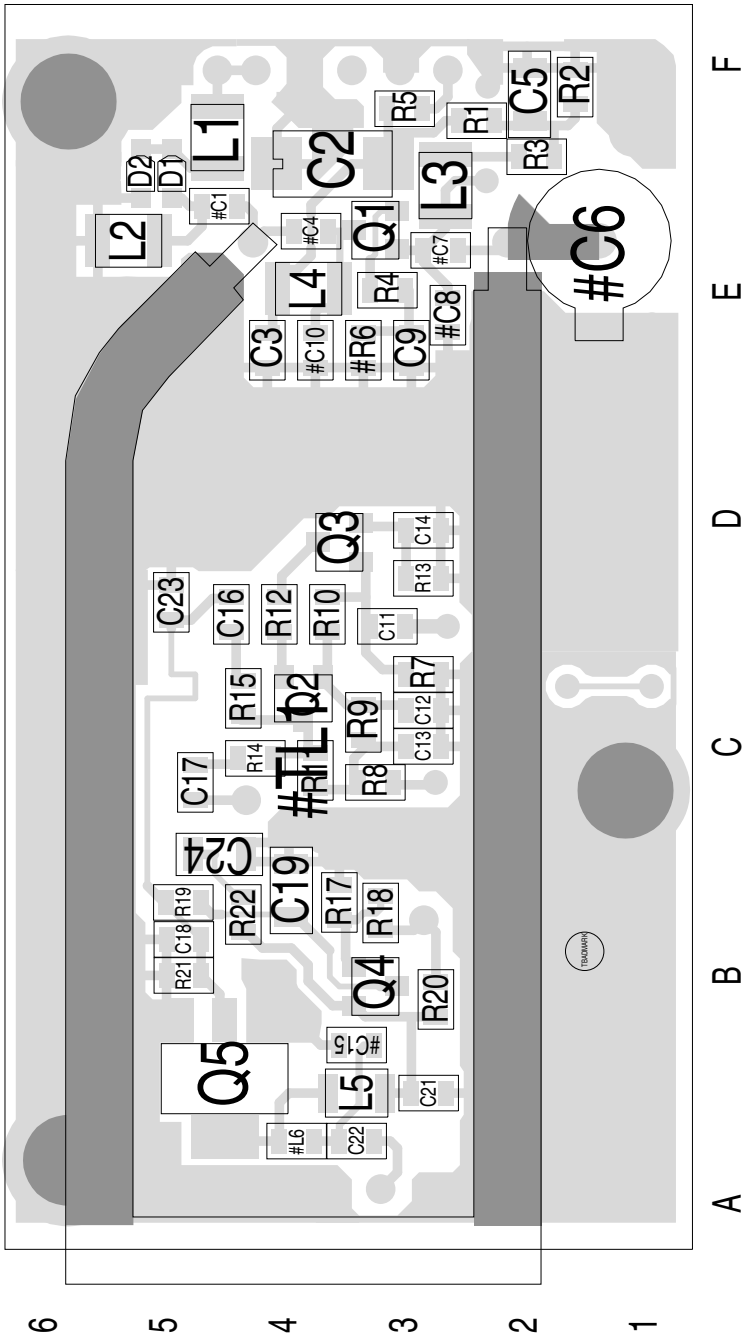
This parts list is correct at the time of publishing, but is subject to change without notification. An up to date parts list can be obtained from your local Customer Service Organisation

Variant Code	Description	T855 (MHz)	T854 (MHz)
A	Tx High	—	480 to 500
B	Tx Mid/Rx High	480 to 520	440 to 480
C	Tx Low/Rx Mid	440 to 480	400 to 440
D	Rx Low	400 to 440	—

Ref	Var	IPN	Description
#C1	A	015-21120-02	Cap Cer 0805 1p2 1% NPO 50v
#C1	B	015-21120-02	Cap Cer 0805 1p2 1% NPO 50v
#C1	C	015-21150-01	Cap Cer 0805 1p5+-0.25 NPO 50v
#C1	D	015-21150-05	Cap Cer 0805 1p5 +0.1pf 200v
C2		014-08100-00	Cap Tant SMD 10u 16v 20% 267c
C3		015-24100-08	Cap Cer 0805 1n 10% X7r 50v
#C4	A	015-21100-02	Cap Cer 0805 1po 1% NPO 50v
#C4	B	015-21100-02	Cap Cer 0805 1po 1% NPO 50v
#C4	C	015-21100-02	Cap Cer 0805 1po 1% NPO 50v
#C4	D	015-21100-02	Cap Cer 0805 1po 1% NPO 50v
C5		015-06100-08	Cap Cer 1206 100n 10% X7r 50v
#C6	A	028-02111-00	Cap Trim 16pf Piston Prec
#C6	B	028-02111-00	Cap Trim 16pf Piston Prec
#C6	C	028-02111-00	Cap Trim 16pf Piston Prec
#C6	D	028-02111-00	Cap Trim 16pf Piston Prec
#C7	A	015-21330-02	Cap 0805 3p3 +/-0.1p NPO 50v
#C7	B	015-21470-02	Cap 0805 4p7 1% NPO 50v
#C7	C	015-21680-02	Cap 0805 6p8 +/-0.1p NPO 50v
#C7	D	015-21820-02	Cap 0805 8p2 0.1 NPO 50v
#C8	A	015-22220-01	Cap Cer 0805 22p 5% NPO 50v
#C8	B	015-22220-01	Cap Cer 0805 22p 5% NPO 50v
#C8	C	015-22270-01	Cap Cer 0805 27p 5% NPO 50v
#C8	D	015-22330-01	Cap Cer 0805 33p 5% NPO 50v
C9		015-23120-01	Cap Cer 0805 120p 5% NPO 50v
#C10	A	015-21180-02	Cap 0805 1p8 1% NPO 50v
#C10	B	015-21180-02	Cap 0805 1p8 1% NPO 50v
#C10	C	015-21180-02	Cap 0805 1p8 1% NPO 50v
#C10	D	015-21180-02	Cap 0805 1p8 1% NPO 50v
C11		015-21330-02	Cap 0805 3p3 +/-0.1p NPO 50v
C12		015-24100-08	Cap Cer 0805 1n 10% X7r 50v
C13		015-24100-08	Cap Cer 0805 1n 10% X7r 50v
C14		015-23120-01	Cap Cer 0805 120p 5% NPO 50v
C16		015-23120-01	Cap Cer 0805 120p 5% NPO 50v
C17		015-23120-01	Cap Cer 0805 120p 5% NPO 50v
C18		015-22270-01	Cap Cer 0805 27p 5% NPO 50v
C19		015-05470-08	Cap Cer 1206 47n 10% X7r 50v
C21		015-23120-01	Cap Cer 0805 120p 5% NPO 50v
C22	A	015-22100-02	Cap 0805 10p +/-0.1p NPO 50v
C22	B	015-22150-01	Cap Cer 0805 15p 5% NPO 50v
C22	C	015-22150-01	Cap Cer 0805 15p 5% NPO 50v
C22	D	015-23120-01	Cap Cer 0805 120p 5% NPO 50v
C23		015-21820-02	Cap 0805 8p2 0.1 NPO 50v
C24		015-05470-08	Cap Cer 1206 47n 10% X7r 50v
D1	A	001-10015-30	Diode SMD Vcap BB153 SOD323
D1	B	001-10043-90	Diode SMD BB439 Vcap SOD323
D1	C	001-10043-90	Diode SMD BB439 Vcap SOD323
D1	D	001-10043-90	Diode SMD BB439 Vcap SOD323
D2	A	001-10015-30	Diode SMD Vcap BB153 SOD323
D2	B	001-10043-90	Diode SMD BB439 Vcap SOD323
D2	C	001-10043-90	Diode SMD BB439 Vcap SOD323
D2	D	001-10043-90	Diode SMD BB439 Vcap SOD323
L1		056-10330-02	Ind SMD 1210 330nh 10% Simid02
L2		056-10330-02	Ind SMD 1210 330nh 10% Simid02
L3		056-10330-02	Ind SMD 1210 330nh 10% Simid02
L4		056-10330-02	Ind SMD 1210 330nh 10% Simid02
L5		057-00047-10	Ind Fxd 47nh +-5% 1206
#L6	A	056-10015-03	Ind SMD 0805cs 15nh 20%
#L6	B	056-10015-03	Ind SMD 0805cs 15nh 20%
#L6	C	056-10015-03	Ind SMD 0805cs 15nh 20%
#L6	D	056-10015-03	Ind SMD 0805cs 15nh 20%

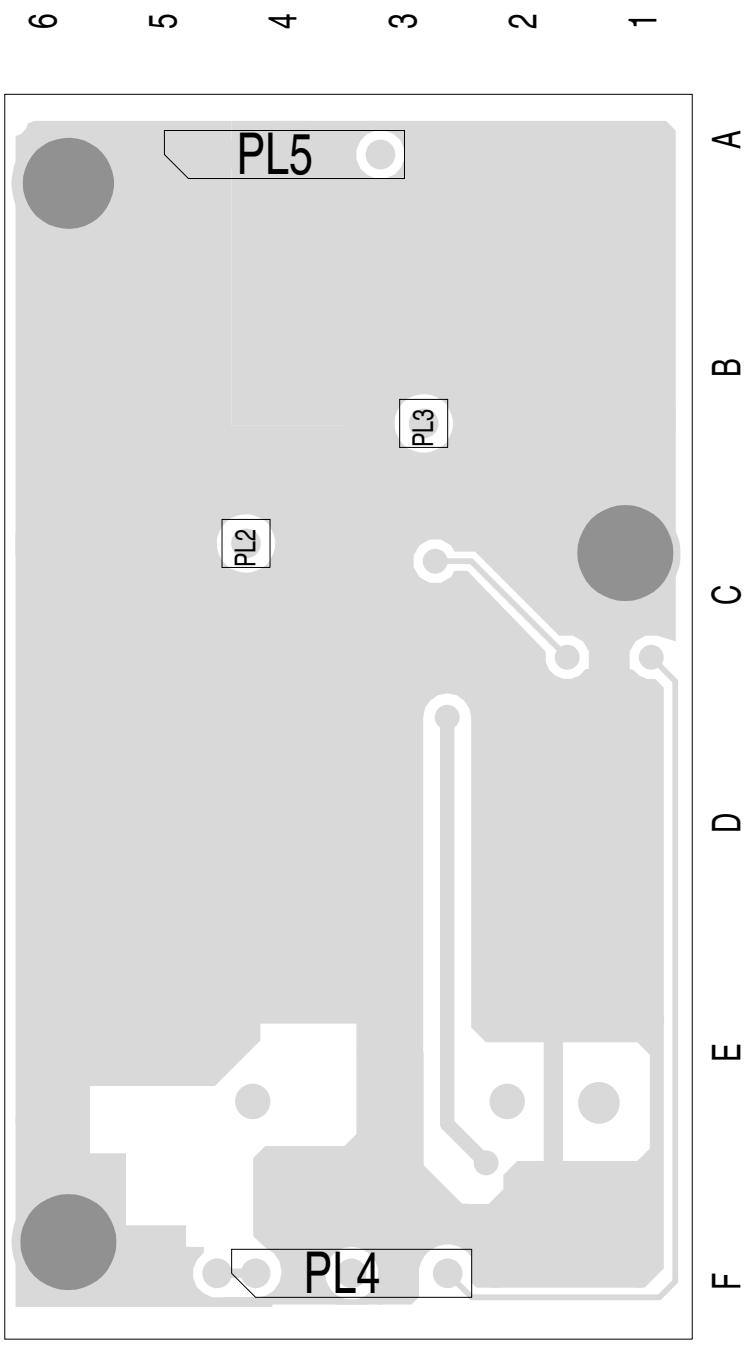
Ref	Var	IPN	Description
Q1		000-10009-30	Xstr SMD BFR93A NPN SOT23
Q2		000-10009-30	Xstr SMD BFR93A NPN SOT23
Q3		000-10009-30	Xstr SMD BFR93A NPN SOT23
Q4		000-10008-57	Xstr SMD BC857 PNP SOT23 SS
Q5		000-10050-00	Xstr SMD BLT50 UHF SOT22
R1		036-14390-10	Res M/F SMD 0805 3k9 1%
R2		036-14100-10	Res M/F SMD 0805 1k 1%
R3		036-13100-10	Res M/F SMD 0805 100e 1%
R4		036-12220-00	Res M/F SMD 0805 22e 5%
R5		036-12270-00	Res M/F SMD 0805 27e 5%
#R6	A	036-13100-10	Res M/F SMD 0805 100e 1%
#R6	B	036-13100-10	Res M/F SMD 0805 100e 1%
#R6	C	036-13100-10	Res M/F SMD 0805 100e 1%
#R6	D	036-13100-10	Res M/F SMD 0805 100e 1%
R7		036-14100-10	Res M/F SMD 0805 1k 1%
R8		036-12220-00	Res M/F SMD 0805 22e 5%
R9		036-14270-10	Res M/F SMD 0805 2k7 1%
R10		036-14120-00	Res M/F SMD 0805 1k2 5%
R11		036-13150-10	Res M/F SMD 0805 150e 1%
R12		036-12100-10	Res M/F SMD 0805 10e 1%
R13	A	036-12270-00	Res M/F SMD 0805 27e 5%
R13	B	036-12390-00	Res M/F SMD 0805 39e 5%
R13	C	036-12390-00	Res M/F SMD 0805 39e 5%
R13	D	036-12560-00	Res M/F SMD 0805 56e 5%
R14		036-13330-00	Res M/F SMD 0805 330e 5%
R15		036-12100-10	Res M/F SMD 0805 10e 1%
R17	A	036-14680-10	Res M/F SMD 0805 6k8 1%
R17	B	036-14680-10	Res M/F SMD 0805 6k8 1%
R17	C	036-14680-10	Res M/F SMD 0805 6k8 1%
R17	D	036-14820-10	Res M/F SMD 0805 8k2 1%
R18		036-14180-00	Res M/F SMD 0805 1k8 5%
R19		036-14100-10	Res M/F SMD 0805 1k 1%
R20		036-12180-00	Res M/F SMD 0805 18e 5%
R21		036-13330-00	Res M/F SMD 0805 330e 5%
R22		036-12100-10	Res M/F SMD 0805 10e 1%
#TL1	A	051-00005-43	Reso Tait #543 480-520
#TL1	B	051-00005-42	Reso Tait #542 435-480
#TL1	C	051-00005-41	Reso Tait #541 395-440
#TL1	D	051-00005-40	Reso Tait #540 355-395
		240-00026-32	Plg 32w 1row Pcb Mtg
		220-01145-07	PCB T855/856/857/870 VCO
		345-00040-10	Scrw M3*6mm P/P S/T Bz
		350-00016-42	Spcr 5mm Hi 8*M3 Stud 2.5*M3ho
		353-00010-13	Wshr M3 S/Proof Int Bz

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T850 VCO PCB (IPN 220-01145-07) – Top Side

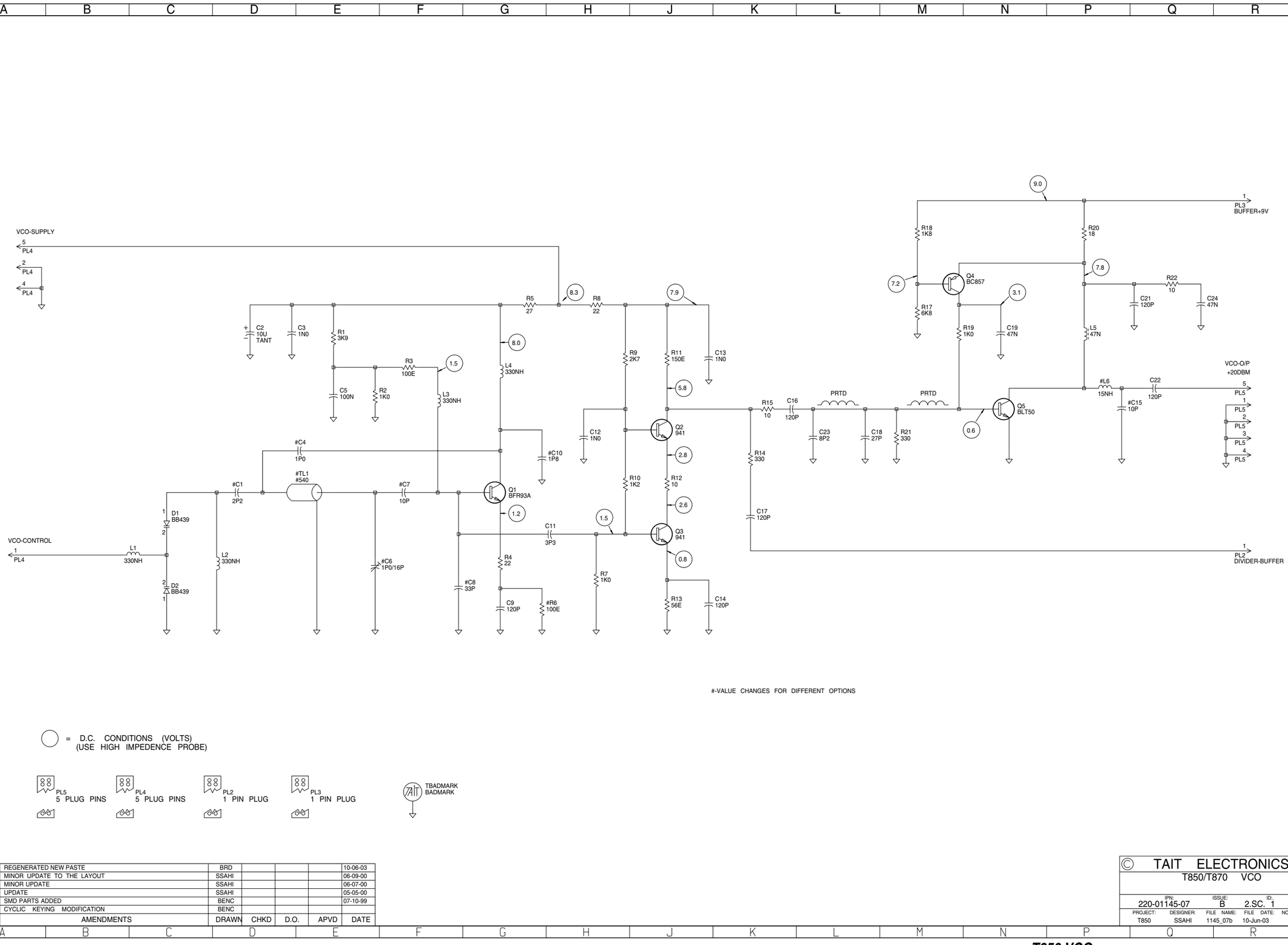
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T850 VCO PCB (IPN 220-01145-07) – Bottom Side

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#-VALUE CHANGES FOR DIFFERENT OPTIONS

○ = D.C. CONDITIONS (VOLTS)
(USE HIGH IMPEDENCE PROBE)

PL5 5 PLUG PINS
PL4 5 PLUG PINS
PL2 1 PIN PLUG
PL3 1 PIN PLUG
TBADMARK BADMARK

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
07B	REGENERATED NEW PASTE	BRD				10-06-03
07A	MINOR UPDATE TO THE LAYOUT	SSAHI				06-09-00
06A	MINOR UPDATE	SSAHI				06-07-00
05A	UPDATE	SSAHI				05-05-00
04A	SMD PARTS ADDED	BENC				07-10-99
03A	CYCLIC KEYING MODIFICATION	BENC				

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T850/T870 VCO

IPN:	ISSUE:	ID:
220-01145-07	B	2.SC. 1

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T850	SSAHI	1145_07b	10-Jun-03	1

T850 VCO
220-01145-07

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Part F T800-23-0011 Power Supply

This part of the manual provides information on the power supply, and is divided into six sections as listed below..

Section	Title
1	General Information
2	Power Supply Description
3	Installation Guidelines
4	Functional Testing
5	Troubleshooting
6	Service Information

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1 General Information

This section provides a brief description of the T800-23-0011 Switch Mode Power Supply, as well as detailed specifications.

1.1 Introduction

The T800-23-0011 is a switching power supply designed to meet the requirements of the T800 SL2 25W Continuous Basestation. It is capable of suppling $13.8V_{DC}$ at up to 14.5A (see derating information in Section 1.2.4). The unit provides power to the T800 SL2 Basestation modules via a cable assembly (with a 12A fuse) which connects between the DC output connector on the back of the unit, and the backplane PCB (X800-56-PCB3).

The T800-23-0011 is protected against damage caused by faults in the line or load, or by temperature variations. (refer to Section 1.2 for specifications). The protection features include:

- Short circuit protection.
- Overload protection
- Over voltage protection
- Over Temperature protection

Electromagnetic compatibility (EMC) and operator safety are important and critical requirements for a switching power supply. Refer to Section 1.3.1 and Section 1.3.2 for specifications.



Caution: To prevent the T800-23-0011 equipment from overheating, do not exceed the rated current.

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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).

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

Basic Power Supply Concept	… switched mode technology pulse width modulation
Overtemperature Protection	… shuts down when PC Board temperature rises above 95°C ±5°C Reset: auto recovery
Cooling	… convection and forced air (fan)
Efficiency	… 80%, full load
Temperature Range:	
230V_{AC} supply	… –10 to +60°C
115V_{AC} supply	… –10 to +50°C
Isolation:	
Input to Output	… 3000V_{AC}, 1 minute
Input to Ground/Chassis	… 1500V_{AC}, 1 minute
Output to Ground/Chassis	… 500V_{AC}, 1 minute

1.2.3 AC Mains Input

Voltage:	… 100 to 130V_{AC} 47–63Hz 200 to 240V_{AC} 47–63Hz
AC Input Current	… 2.8A maximum (115V_{AC} at full load)
Maximum Inrush Current	… 40A maximum (230V_{AC} at full load)
Connection to mains supply	… IEC plug on rear panel

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Power Factor at full load:

$230V_{AC}$ supply	… >0.96
$115V_{AC}$ supply	… >0.98

Note: Exact power factor depends on impedance of mains supply.

Input Fuse (Internal) … 5A 250V fast acting
(Littlefuse 217 series)

1.2.4 Output

Output Voltage … $13.8V_{DC}$

Note: A drop of up to 0.5V may be expected across the wiring from the power supply to the load.

Voltage Regulation … ±0.5%

Current

Operation from 200–240V_{AC} supply:

Continuous, –10°C to +50°C	… 0 to $14.5A_{DC}$
Continuous, up to +60°C	… 0 to $8.5A_{DC}$

Operation from 100–130V_{AC} supply:

Continuous, –10°C to +20°C	… 0 to $14.5A_{DC}$
Continuous, +20°C to +50°C	… 0 to $8.5A_{DC}$

Note: Continuous operation from $115V_{AC}$ supplies in ambient temperatures exceeding +50°C is not recommended, as this will cause the equipment to overheat.

Output Overvoltage Protection … 14.8 to $19.1V_{DC}$
Type: Shutdown
Reset: Power off and on

Output Hum and Noise … $<100mV_{pp}$
(At full load, with mains supply voltage = 230V)

Current Overload Limit … 15.2 to 21.8A
Type: Constant current limiting
Reset: Auto recovery

Output Connector … Molex 6-way receptacle

Note: Refer to Figure 3.1 in Section 3.2 for the output connector pinouts.

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1.3 Regulatory Information

1.3.1 EMC Conformity

This equipment complies with:

ETSI EN301 349-1 V1.3.1 (2001-09) "Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part1: Common technical requirements".

Tested in accordance to:

- BS EN55022: 1998
- BS EN61000-3-2: 2001
- BS EN61000-3-3: 1995
- IEC 61000-4-2: 1995
- IEC 61000-4-3: 2002
- IEC 61000-4-4: 1995
- IEC 61000-4-5: 1995
- IEC 61000-4-6: 1996
- IEC 61000-4-11: 1994

BS EN55022: 1998 for class B Radiated and conducted emissions, and electromagnetic susceptibility specifications.

AS/NZS CISPR22: 2002 for class B Radiated and conducted emissions, and electromagnetic susceptibility specifications.

FCC 47 Part 15: 2001 for class B (Radiated and conducted emissions, and electromagnetic susceptibility specifications) of the FCC rules for the United States. Operation is subject to the following two 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 B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

  Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

1.3.2 Safety Approvals

This equipment complies with:

IEC 60950 : 1999 "Safety of information technology equipment". All the relevant provisions including AS/NZS and EN deviations.

CAN/CSA-C22.2 No 950-95 "Safety of information technology equipment".

ANSI/UL Std N0 1950 Third Edition "Safety of information technology equipment".



Warning: Safety approval will become void if T800-23-0011 components are replaced with non-equivalent rated or non-certified/approved components. Contact Tait Electronics Technical Support before replacing components of the T800-23-0011. See Section 6 for important servicing information.

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2 Power Supply Description

2.1 Introduction

The T800-23-0011 power supply consists of a Power Supply Unit (PSU) Module, connectors, and ferrite filters. These components are shown in Figure 2.1 below.

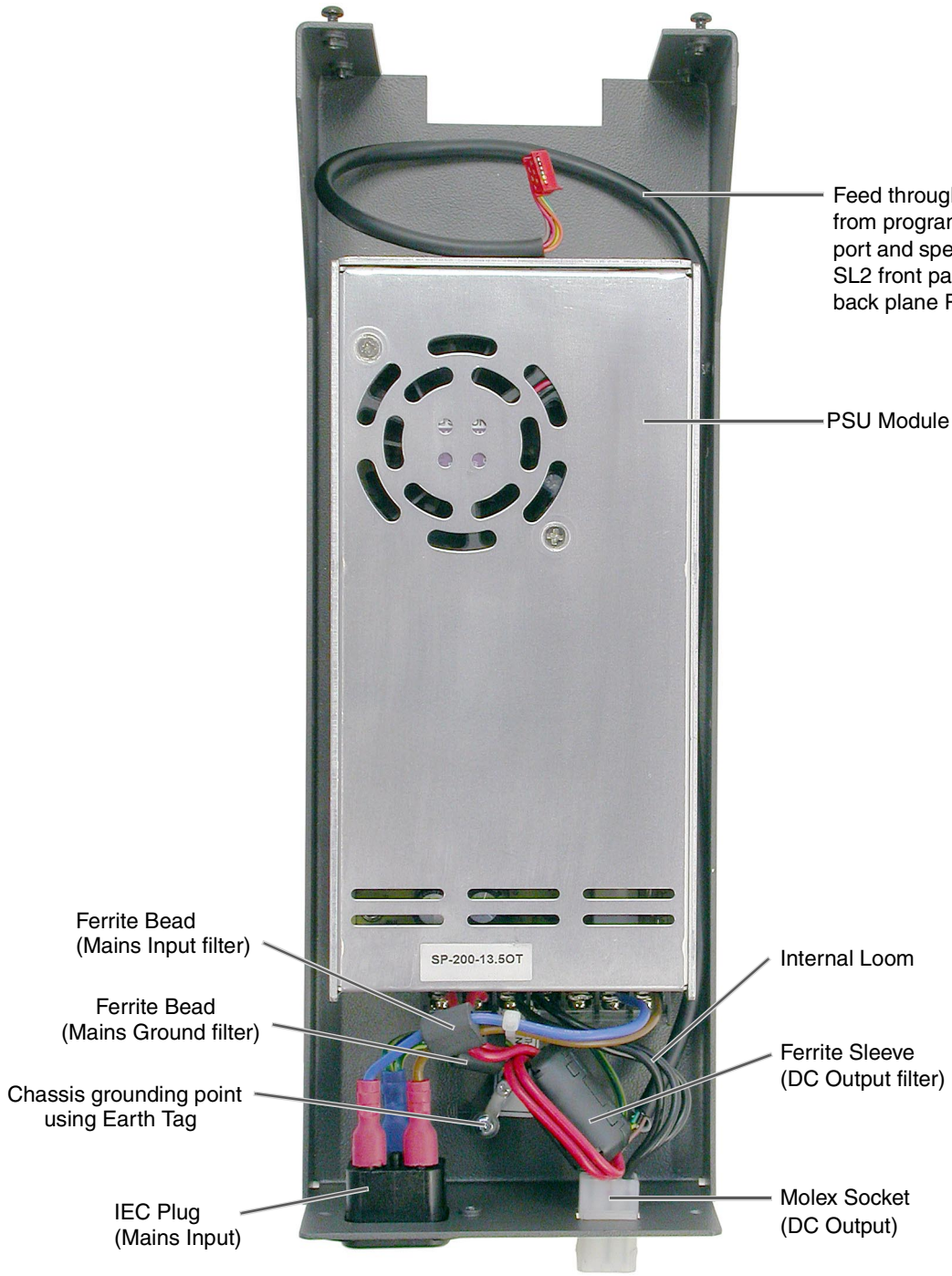


Figure 2.1 T800-23-0011 internal view. See the Parts List in Section 6.2.2 for more detail.

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2.1.1 PSU Module

The PSU module used in the T800-23-0011 power supply has over temperature, current overload and overvoltage protection. Refer to Section 1.2 for specification details.

Overvoltage applied on the module's output will cause the module to shutdown. To reset the module, remove the mains supply to the T800-23-0011, allow 30 seconds for charges to leak away, and then reconnect the T800-23-0011.

The module is protected from current overload by a voltage foldback method. If the load on the output starts drawing more current than the specified maximum, the voltage will start dropping away. This condition will recover automatically when the load is removed or returns to normal.

Over temperature will cause the module to shutdown. It will recover automatically when it has cooled down to an acceptable operational temperature.



Caution: Correct mounting of the T800-23-0011 power supply is important: Refer to Section 3.3 for ventilation guidelines. Ignoring these conditions may cause the module to overheat, and consequently, to shut down.

2.1.2 Internal Loom

Mains power to the PSU module is supplied via an IEC plug on the rear panel and then filtered by a ferrite bead (shown in Figure 2.1). The mains ground line is filtered by a ferrite bead and then connected to the T800-23-0011 chassis and to the PSU module's floating ground contact.

The PSU module's output is filtered by a ferrite sleeve on the positive line, and then interfaces to the SL2 backplane via a Molex connector on the T800-23-0011 rear panel.

Additionally a 'feed-through' loom is connected to the Molex connector. This loom forms part of the path for the programming and speaker connection between the SL2 backplane and the SL2 front panel. The external cable connection between the T800-23-0011 and the SL2 backplane completes this path.

For the wiring diagram, refer to Section 6.2.1.

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3 Installation Guidelines

The following section gives a brief description of the basic rack mounting and wiring procedures.

3.1 General

The T800-23-0011 is supplied mounted to the SL2 front panel by four M3x10 button hex screws.

A small cable extending out of the front of the T800-23-0011 plugs onto to the SL2 front panel. This cable forms part of the programming and speaker connection between the SL2 front panel and the backplane. The external cable connection between the T800-23-0011 and the SL2 backplane provides the DC power supply to the basestation and also incorporates 3 wires completing the programming and speaker connection.

Warning: FUSE
The cable connecting the T800-23-0011 DC power output to the backplane also includes a fuse. This fuse is critical to the IEC 60950 safety compliance of the T800 SL2 Base Station and must be replaced with the same component or compliance will be voided.
The Fuse is a Bussmann TDC10 Series fast blow fuse rated at 12A ($60V_{AC}$)

For the AC mains input connection of the T800-23-0011 use only an IEC type detachable power supply cord (with a moulded IEC connector). Ensure that it has a current rating of at least 5A.

3.2 Connector Pinouts

The pinouts for the AC mains input connector and the DC output connector on the rear of the T800-23-0011 are shown in Figure 3.1 below.

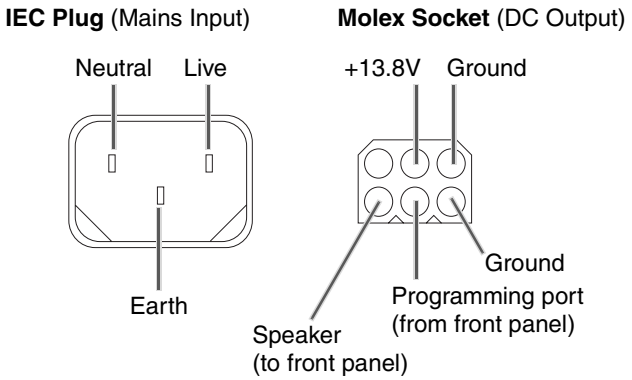


Figure 3.1 Connector Pinouts on the T800-23-0011 rear panel.

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3.3 Equipment Cooling

Although the T800-23-0011 is a high efficiency switching power supply, a considerable amount of heat is generated during normal operation. An adequate flow of cooling air is therefore essential for reliable operation.



Caution: Do not operate this unit in a completely enclosed cabinet.

It is estimated that the average life expectancy of this unit will double with every 10°C drop in ambient temperature. It is therefore recommended to:

- Keep the ambient temperature low.
- Ensure that airflow is not restricted.

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4 Functional Testing

The following test procedures will confirm that the T800-23-0011 has been set up and adjusted correctly and is fully operational. Refer to Figure 4.1 for test equipment details.

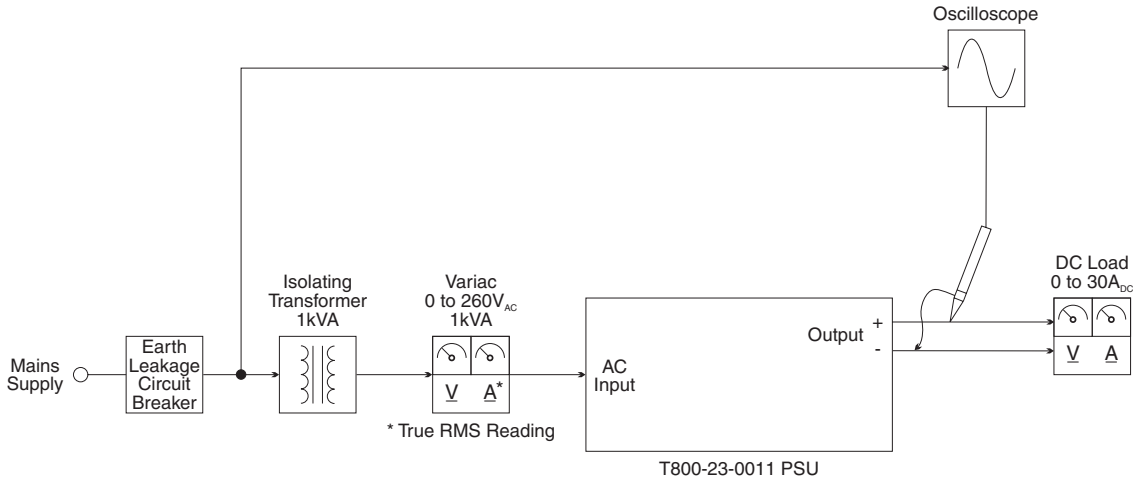


Figure 4.1 Test equipment setup

4.1 Basic Operation

To confirm the basic operation of the power supply, proceed as follows.

- Ensure that the main supply to the T800-23-0011 is switched off. Set up the test equipment as shown in Figure 4.1.
- Set the output DC load to maximum resistance/minimum current.
- Connect the T800-23-0011 to the mains supply and switch it on.
- Vary the DC load and check that the output voltage and current are within the specifications (refer to Section 1.2.4).

4.2 Output Current Overload

To confirm the operation of the current overload protection circuitry, proceed as follows.

- Ensure that the main supply to the T800-23-0011 is switched off. Set up the test equipment as shown in Figure 4.1.
- Set the output DC load to draw approximately 11A.
- Switch on the mains supply and slowly decrease the load resistance, thereby increasing the current until voltage foldback occurs. The current should not rise above the Current Overload Limit (refer to Section 1.2.4), but voltage should drop away.

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4.3 Output Noise

To check that output noise is within specification, proceed as follows.

- Ensure that the main supply to the T800-23-0011 is switched off. Set up the test equipment as shown in Figure 4.1. Connect the T800-23-0011 to the mains supply and switch it on.
- Connect a digital voltmeter (e.g. Fluke 77) across the load terminals and set the meter to its lowest AC volts range.
- Check that the reading is less than $100mV_{pp}$ under all load and line conditions.

Note: A ***real*** reading of the level of noise present on the output of a switching power supply is very difficult to obtain, as low noise levels, common mode noise paths and ground loops all lead to inaccurate measurement results. The procedure outlined above will, however, give a good indication of the output noise.

4.4 Overall Power Supply Stability

To check for overall PSU stability, proceed as follows.

- Ensure that the main supply to the T800-23-0011 is switched off. Set up the test equipment as shown in Figure 4.1. Connect the T800-23-0011 to the mains supply and switch it on.
- Connect the oscilloscope across the output.
- Vary the mains voltage and DC load over the full specified range (refer to Section 1.2).
- Check on the oscilloscope that no oscillations occur.

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5 Troubleshooting

The following is a list of possible power supply fault symptoms and possible causes.

Symptoms		Possible Causes and their Solutions	
1.	No output voltage	Mains supply not present or too low	Check and rectify mains supply
		Equipment has over-heated and thermal cut-out has operated	See Symptom 3 below
		Defective switching circuitry	Replace module and return faulty module for servicing
2.	Output voltage below specification	Mains supply is to low	Check and correct mains supply problem
		Current overload protection is active	Check for possible causes, e.g. short-circuits
		Defective switching circuitry	Replace module or return faulty module for servicing
3.	Power Supply overheats	Mains supply is to low	Check and correct mains supply problem
		Equipment cooling is inefficient due to incorrect installation of the T800-23-0011	Refer to Section 3.3 for installation guidelines
		The T800-23-0011 internal fan has failed	Replace module or return faulty module for servicing

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6 Service Information

This section provides specific information on servicing procedures for the T800-23-0011.

6.1 Warnings

6.1.1 Warning: Lethal Voltages

The T800-23-0011 power supply contains voltages that may be lethal.

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

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

6.1.2 Warning: Fuse

The cable connecting the T800-23-0011 DC power output to the backplane also includes a fuse. This fuse is critical to the IEC 60950 safety compliance of the T800 SL2 Base Station and must be replaced with the same component or compliance will be voided.

The Fuse is a Bussmann TDC10 Series fast blow fuse rated at 12A ($60V_{AC}$)

6.1.3 Caution: Handle With Care

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

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6.2 Mechanical

This section provides information necessary for replacement of various parts and modules of the T800-23-0011 power supply.

Warning: **Safety approval will become void if T800-23-0011 components are replaced with non-equivalent rated or non-certified/approved components. Contact Tait Electronics Technical Support before replacing components of the T800-23-0011.**

The power supply module is not a user serviceable item. This module contains components that operate at voltages that may be lethal. Do not open this module.

Caution: Disconnect the mains IEC connector and wait for 5 minutes for the internal voltages to drain away before dismantling the T800-23-0011.

6.2.1 Wiring Diagram

Refer to the diagram below for connection information between the T800-23-0011's connectors and powers supply module.

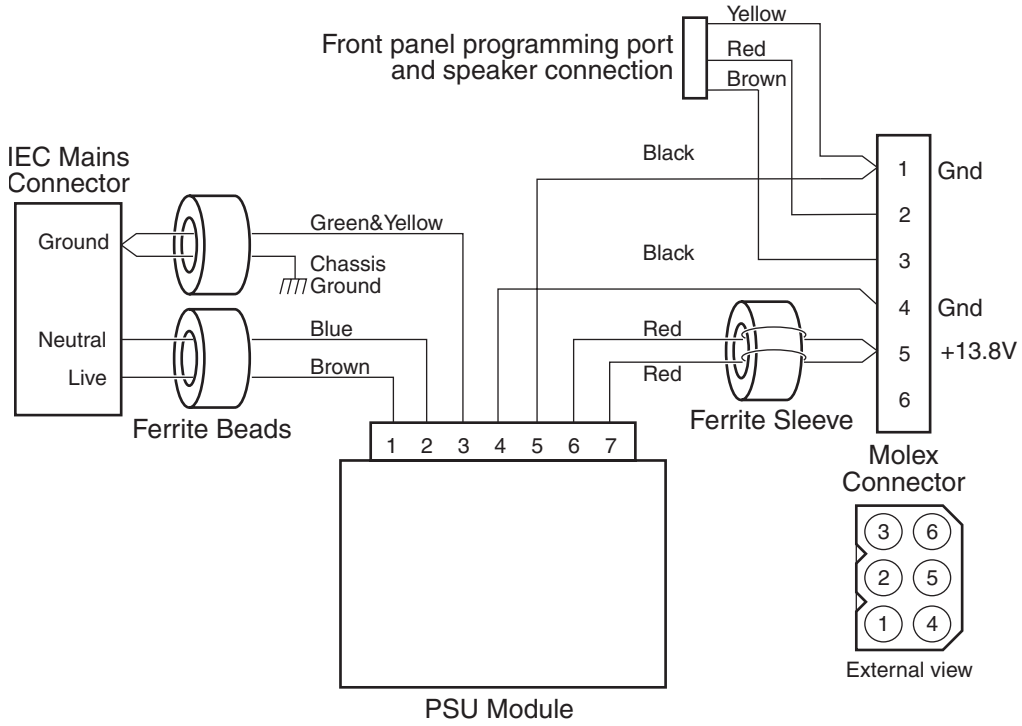
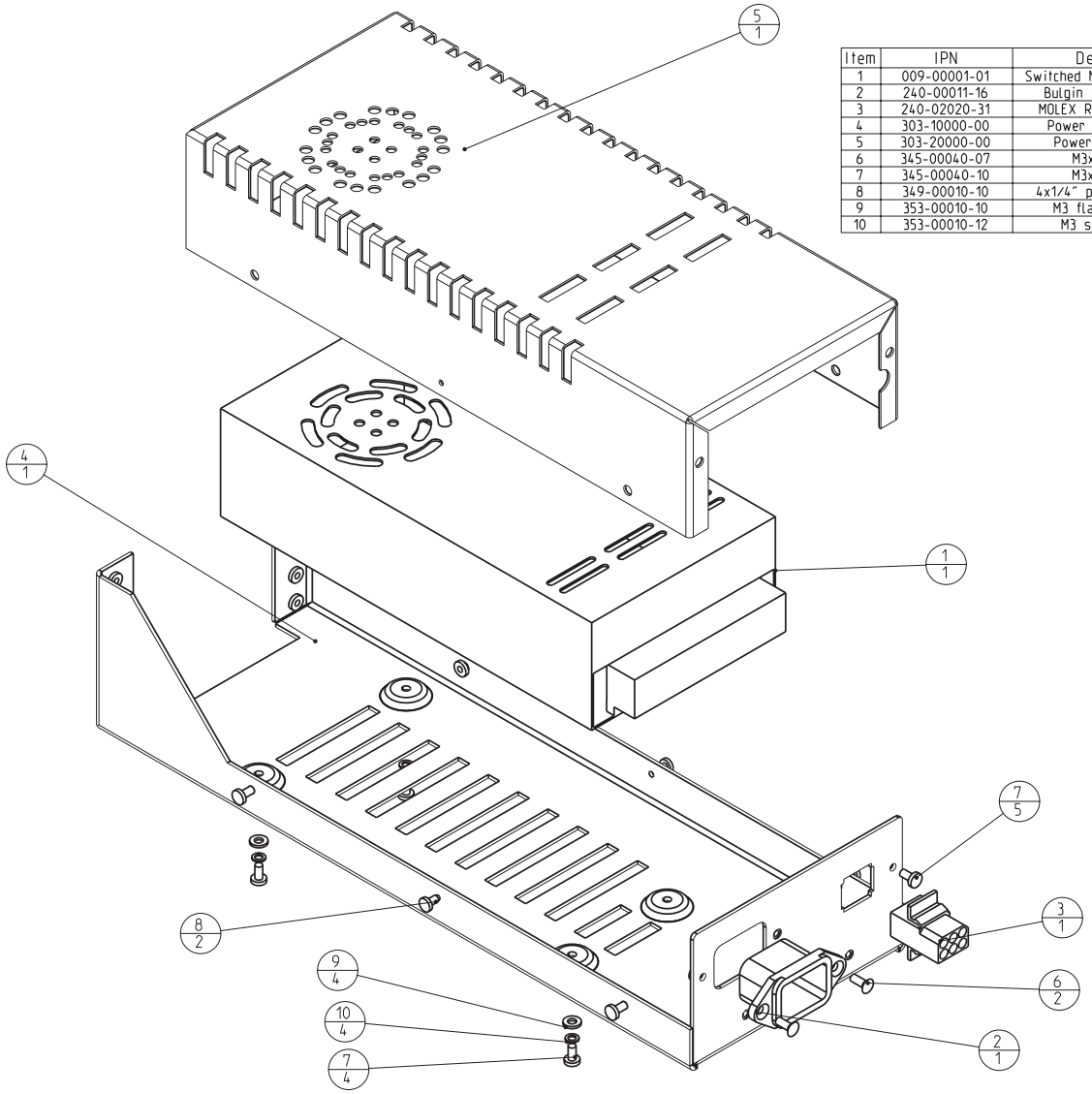


Figure 6.1 T800-23-0011 Wiring Diagram

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6.2.2 Assembly Drawing

Figure 6.2 below shows an exploded view of the T800-23-0011.



Item	IPN	Description	Qty
1	009-00001-01	Switched Mode Power Supply	1
2	240-00011-16	Bulgin 230V Panel mtg	1
3	240-02020-31	MOLEX Receptacle 6 CKT	1
4	303-10000-00	Power Supply Chassis	1
5	303-20000-00	Power Supply Cover	1
6	345-00040-07	M3x8 csk pozi	2
7	345-00040-10	M3x6 pan pozi	9
8	349-00010-10	4x1/4" pan pozi self tap	2
9	353-00010-10	M3 flat washer OD7	4
10	353-00010-12	M3 spring washer	4

Figure 6.2 Mechanical assembly of the T800-23-0011.

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Part G Installation and Configuration

This part of the manual is divided into the sections listed below. These sections give a brief description of the mounting and wiring procedures as well as some brief information on basic system types and how to configure T800 SL2 equipment for use in them.

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1.2	Mounting	1.2
1.3	Power Supply	1.2
1.4	Reverse Polarity and Overvoltage Protection	1.3
1.5	D-range Wiring	1.5
1.6	RF Coax Cable and N-Type Connector	1.6
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Figure	Title	Page
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1.3	T854 D-Range 1 Wiring – Rear View	1.4
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1 T800 SL2 Installation

1.1 Specifications

Overall Dimensions:

Height	… 132mm
Width	… 480mm
Depth	… 335mm

Weight with Tone Remote	… 16kg
Weight without Tone Remote	… 13kg

1.2 Mounting

The T800SL2 unit is shipped ready assembled for fitting into racks. All that is required is for the connection of suitable cables.

1.3 Power Supply

The power rating information for the T800SL2 with the Tait supplied power supply module (T800-23-0011), is provided on the label located on the top cover as visible in Figures 1.6.

The power rating information for the T800SL2 for use with a customer supplied DC power source, is provided on the label located on the top rear of the Transmitter module.

In order to comply with the safety requirements of EN60950, the power supply module used with the T800SL2 must be provided with an easily accessible mains disconnect device compliant with IEC61058, such as a switch or circuit breaker. This provides the means to rapidly disconnect the mains power in an emergency.

All Tait supplied racks incorporate a power distribution board with a circuit breaker easily accessible in the back of the rack, on the lower right hand side (viewed from the rear). The circuit breaker will disconnect the mains to the entire rack. If only one channel needs to be mains-isolated and the Tait power supply module is T800-23-0011, then it is acceptable practice to pull the IEC connector directly out of the power supply module.

If a customer supplied power source is used, it must have the following features:

- An easily accessible and safety compliant mains disconnect device.
- The capability to provide enough current to drive the T800 system.
- Free from excessive ripple or noise.
- Meets all EMC and safety regulations for the intended market.

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The entire system should be protected by the use of appropriately rated fuses in the power supply.

Note: It is particularly important when the prime power source is a battery that fuses be employed in all the supply lines.

Warning: **Fuse – DC powered Base Stations**
The cable supplied for connecting a DC power source such as a battery to the backplane of the SL2 Base Station, includes a fuse. This fuse is critical to the IEC 60950 safety compliance of the T800 SL2 Base Station and must be used or compliance will be voided. If the fuse has blown it must be replaced with the same component
The Fuse is a Bussmann TDC10 Series fast blow fuse rated at 12A ($60V_{AC}$)

1.4 Reverse Polarity and Overvoltage Protection

A crowbar diode is fitted to all T854 transmitters for protection against connection to a power supply of incorrect polarity. It also provides overvoltage protection from voltage transients caused by lightning strikes.

Note: A fuse must be fitted in the power supply line for the diode to provide effective protection.

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1.5 D-range wiring

The T855 and T854 D-range input and output connections are shown in Figure 1.1 to Figure 1.4..

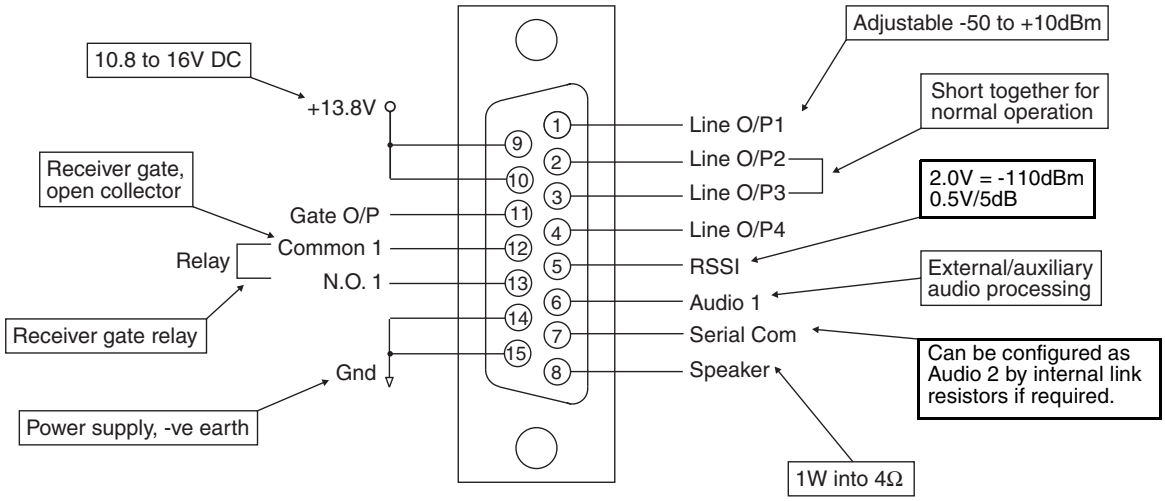


Figure 1.1 T855 D-Range 1 Wiring – Rear View

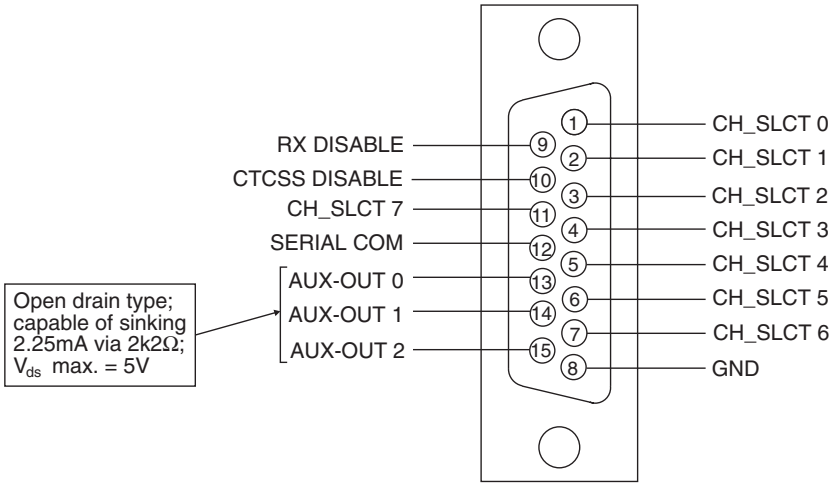


Figure 1.2 T855 D-Range 2 Wiring – Rear View (standard T800-03-0000 kit)

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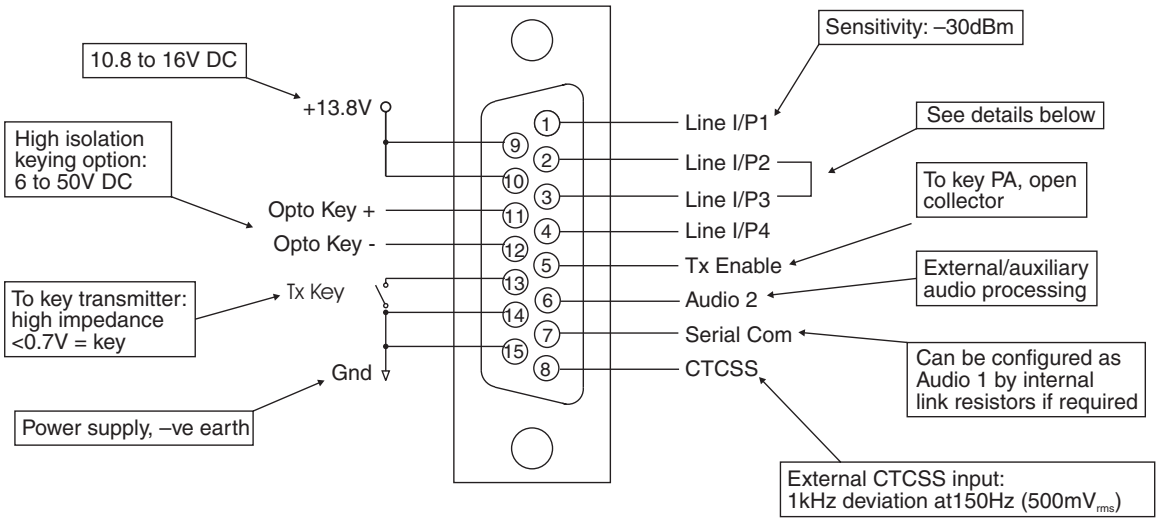


Figure 1.3 T854 D-Range 1 Wiring – Rear View

Line I/P2 and Line I/P3

If %T210A or %T210B is fitted without a centre tapped transformer (usual configuration), these lines can be shorted together or left open to be used as inputs to the audio cavity.

If %T210A or %T210B is fitted with a centre tapped transformer, these lines must be left open. Line I/P3 becomes the centre tap on the transformer.

If %T210 is fitted (Pot core type), short these lines together for normal operation.

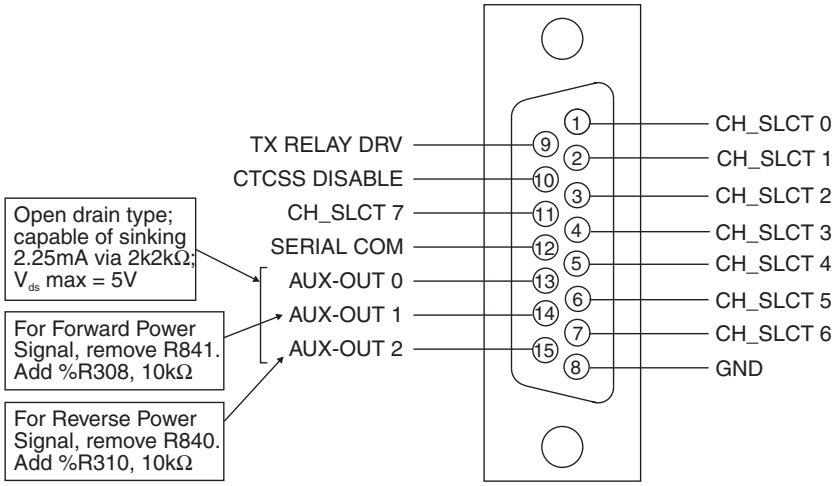


Figure 1.4 T854 D-Range 2 Wiring – Rear View (standard T800-03-0000 kit)

Note: Figure 1.4 above shows the standard pin allocations for the T800-03-0000 auxiliary D-range kit. A T800-03 auxiliary D-range kit is also available for special applications requiring custom internal wiring.

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1.6 RF Coax Cable and N-Type Connector

Make sure the RF coax cable to the N-type connector is free from sharp bends or twists. If access to the rear of the rack frame is restricted, the cable should be long enough to allow the slimline assembly to be fully withdrawn from the cabinet.

Make sure that any N-type plugs connected to Tait equipment are assembled according to the manufacturer's instructions. It is particularly important that the centre pin in the plug is positioned correctly:

- if the pin is positioned too far back in the plug, it may not make good contact with the socket;
- if the pin protrudes too far (as shown in Figure 1.5), or is not straight, it may damage the socket when the plug is screwed in.

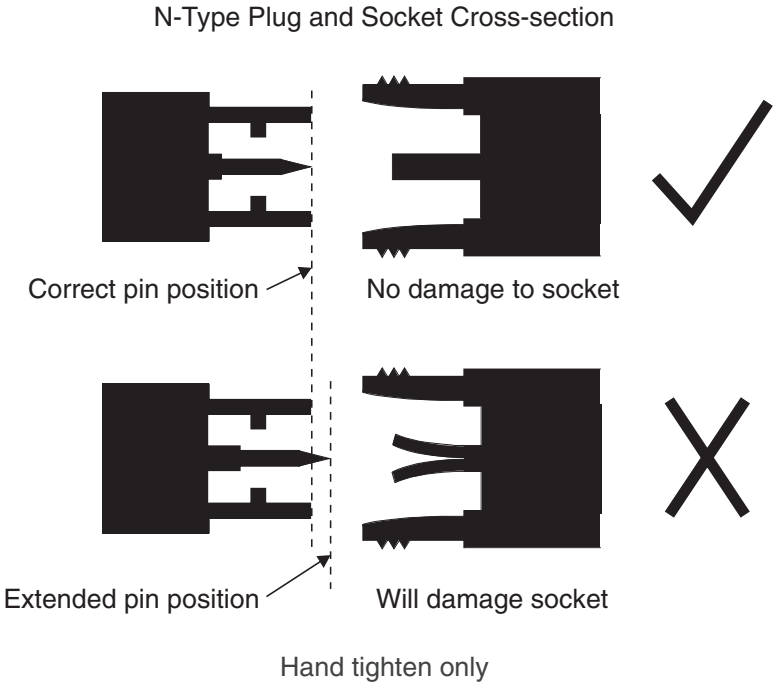
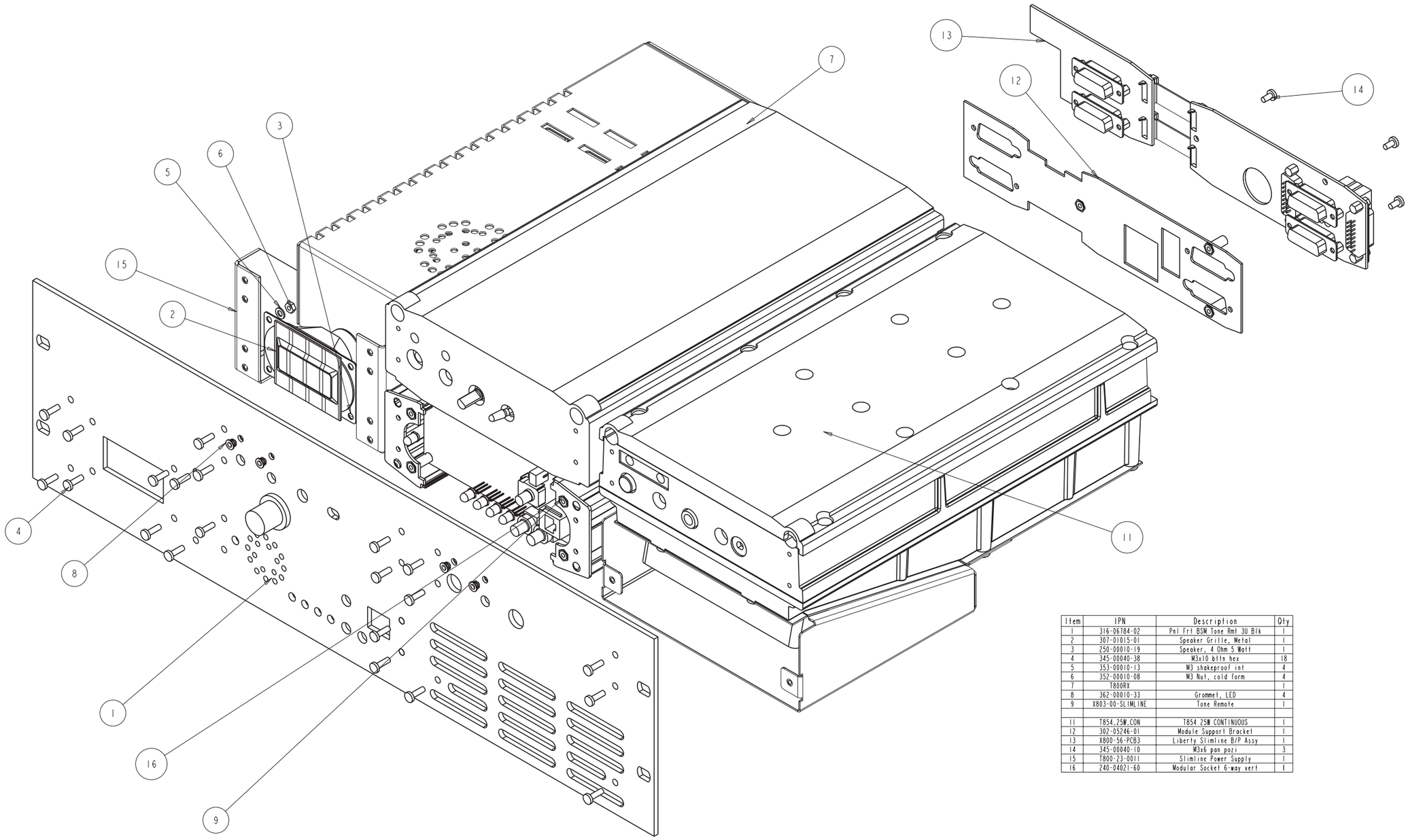


Figure 1.5 N-Type Plug Assembly Details

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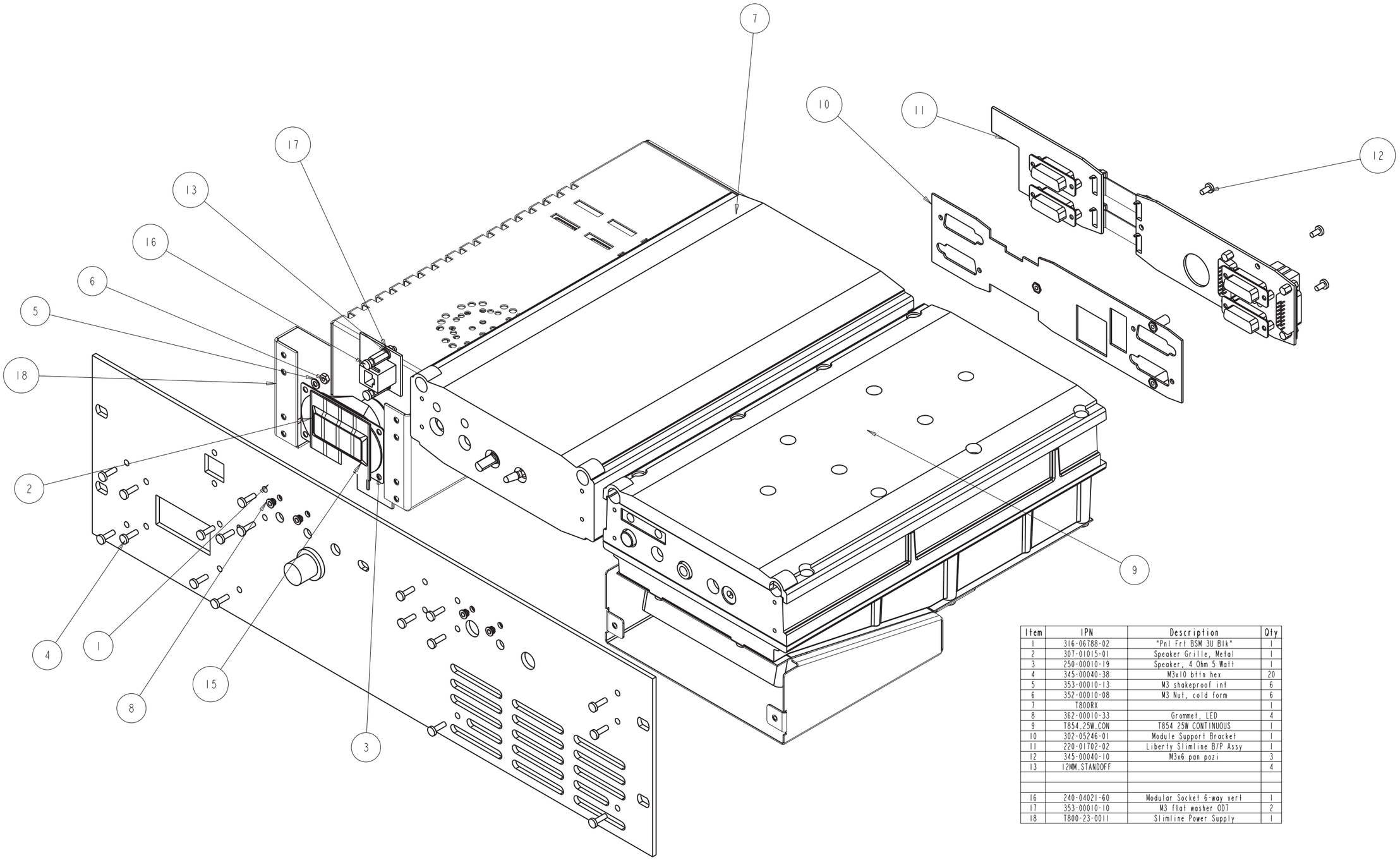
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Item	IPN	Description	Qty
1	316-06784-02	Pnl Frt BSM Tone Rmt 3U Blk	1
2	307-01015-01	Speaker Grille, Metal	1
3	250-00010-19	Speaker, 4 Ohm 5 Watt	1
4	345-00040-38	M3x10 bttn hex	18
5	353-00010-13	M3 shakeproof int	4
6	352-00010-08	M3 Nut, cold form	4
7	T800RX		1
8	362-00010-33	Grommet, LED	4
9	X803-00-SLIMLINE	Tone Remote	1
11	T854.25W.CON	T854 25W CONTINUOUS	1
12	302-05246-01	Module Support Bracket	1
13	X800-56-PCB3	Liberty Slimline B/P Assy	1
14	345-00040-10	M3x6 pan pozi	3
15	T800-23-0011	Slimline Power Supply	1
16	240-04021-60	Modular Socket 6-way vert	1

Figure 1.6 T800 SL2 Assembly – with T803 fitted

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Item	IPN	Description	Qty
1	316-06788-02	"Pnl Frt BSM 3U Blk"	1
2	307-01015-01	Speaker Grille, Metal	1
3	250-00010-19	Speaker, 4 Ohm 5 Watt	1
4	345-00040-38	M3x10 bttn hex	20
5	353-00010-13	M3 shakeproof int	6
6	352-00010-08	M3 Nut, cold form	6
7	T800RX		1
8	362-00010-33	Grommet, LED	4
9	T854_25W_CON	T854 25W CONTINUOUS	1
10	302-05246-01	Module Support Bracket	1
11	220-01702-02	Liberty Slimline B/P Assy	1
12	345-00040-10	M3x6 pan pozi	3
13	12MM_STANDOFF		4
16	240-04021-60	Modular Socket 6-way vert	1
17	353-00010-10	M3 flat washer OD7	2
18	T800-23-0011	Slimline Power Supply	1

Figure 1.7 T800 SL2 Assembly – without T803 fitted

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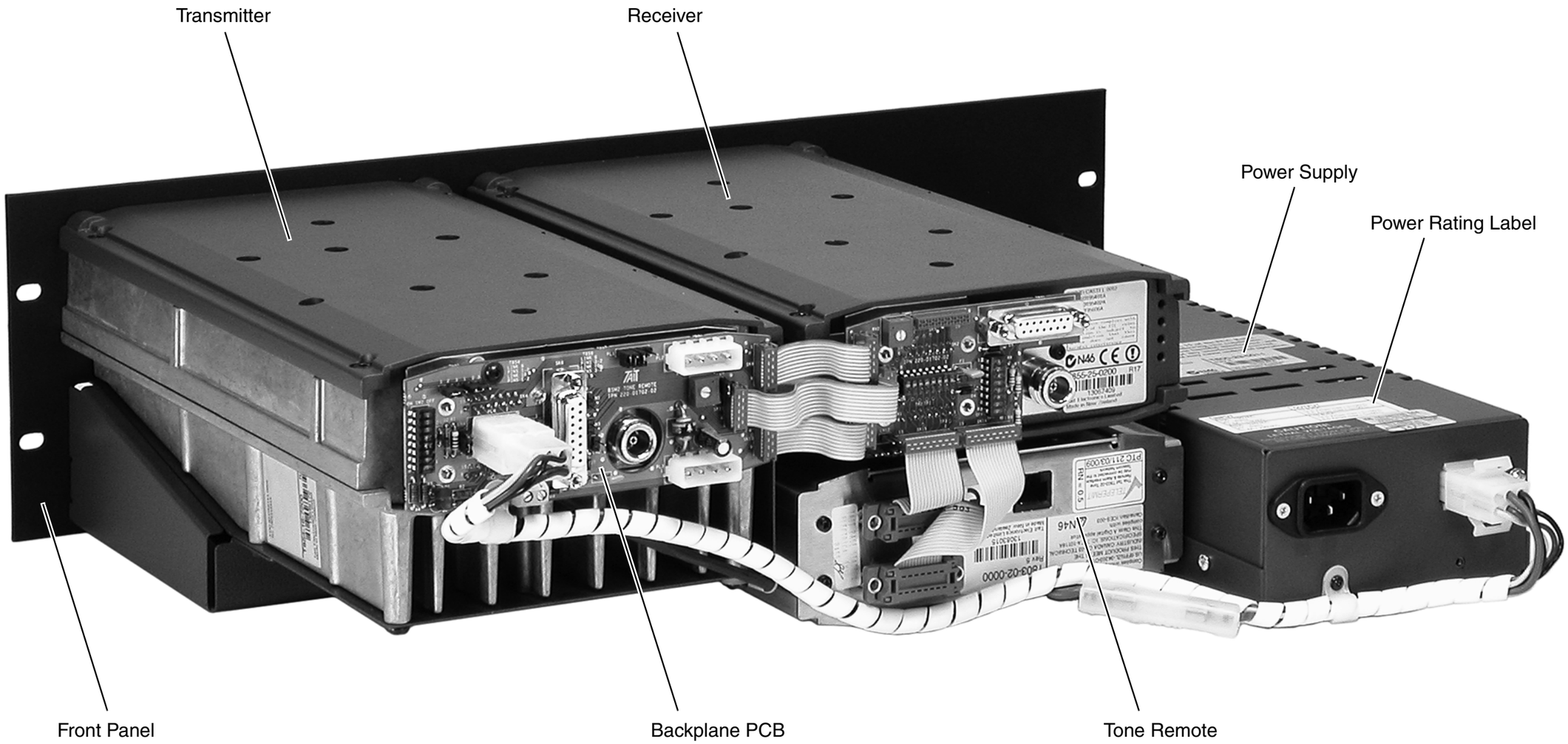


Figure 1.8 T800 SL2 Assembly – with T803 fitted (rear view)

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2 T854 Optional Features

2.1 Audio Processor

The T854 come with a number of link selectable features which give added system flexibility.

Note: The tables in this section are the same as those in Section 3.5 in Part C. They have been repeated here for ease of reference.

2.1.1 Link Details

Use the following table to set up the audio processor to the configuration you require. You should set the audio processor links before carrying out any of the tuning and adjustment procedures.

Plug	Link[a]		Function
PL201	1–2	A	not connected
	3–4[b]	B	microphone pre-amp output to compressor input
	5–6	C	microphone pre-amp output to multiplexer input
	7–8	D	pre-emphasis output to multiplexer input
	9–10[b]	E	pre-emphasis output to limiter input
	11–12	F	not connected
	13–14	G	not connected
PL202	1–2[b]	H	compressor output to multiplexer input
	3–4	I	compressor output to limiter input
	5–6	J	compressor output to pre-emphasis input
	7–8	K	not connected
	9–10[b]	L	multiplexer output to pre-emphasis input
	11–12	M	multiplexer output to limiter input
	13–14	N	multiplexer output to compressor input

a. The letters in this column refer to the letters printed on the PCB beside each pair of pins. Note that the link names and pin numbers are different to earlier products. The lettering A to N is however the same.

b. Factory Setting

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2.1.2 Typical Options

	PL205	PL210	PL215	PL220
microphone pre-amp. compressed and pre-emphasised; line input pre-emphasised (standard set-up)	3–4[a] B	1–2[a] L	3–4[a] H	3–4[a] E
microphone pre-amp. compressed and pre-emphasised; line input unprocessed	3–4 B	3–4 M	7–8 J	1–2 D
line and microphone compressed and pre-emphasised	5–6 C	5–6 N	7–8 J	3–4 E
microphone pre-amp. compressed; line and microphone flat response	3–4 B	3–4 M	3–4 H	5–6 F

a. Factory Setting

2.2 Line Transformer Configuration and Options

There are four Line Transformer options.

%T210 original T800 Line transformer T4030, 300/300:300/300

%T210A ETAL P1200 or similar 600:600 non centre-tapped leaded encapsulated Line transformer

or ETAL P2602 or similar 300/300:600 centre-tapped leaded encapsulated Line transformer

%T210B ETAL P2781 or similar 600:600 non centre-tapped SMD encapsulated Line transformer

or ETAL P2782 or similar 300/300:600 centre-tapped SMD encapsulated Line transformer

No transformer leaded (%R200 and %R203) or SMD (%R200A and %R203A) by-pass resistors fitted, and an attenuator pad if necessary.

The default option is %T210B, SMD P2781 or similar 600:600 non centre-tapped SMD encapsulated Line transformer.

%T210A and %T210B use a standard footprint which allows the use of other similar transformers with special characteristics, such as the ETAL P3181 ultra-low distortion V.90 SMD.

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The line transformer is designed to provide a balanced interface to 600Ω lines, connected between LINE I/P 1 and LINE I/P 4. When %T210 is fitted, the two centre connections (LINE I/P 2 and LINE I/P 3) are shorted together for normal operation. With the other options these two centre connections are available to the user via P204 and P208, unless a centre-tapped %T210A or %T210B is used, wired to LINE I/P 3.

The secondary winding of the transformer is connected via 1kΩ (R202) and 10Ω (R160) resistors to pin 6 (AUDIO-2) of D-range 1 and may be used to monitor audio on the line. Pin 7 of D-range 1 can be reconfigured as AUDIO-1 by removing R808 and R160, and placing %R150. Note that this configuration does not allow external programming of the module

Transformer	**T4030**	**P1200**	**P2781**	**No Transformer**
IPN	053-00010-17	054-00010-16	054-00010-18	
Designator	%T210	%T210A	%T210B	
%R200	Not Fitted	Not Fitted	Not Fitted	Not Fitted
%R200A	Not Fitted	Not Fitted	Not Fitted	0Ω
%R203	Not Fitted	Not Fitted	Not Fitted	Not Fitted
%R203A	Not Fitted	Not Fitted	Not Fitted	0Ω
%R203B	Not Fitted	0Ω	0Ω	Not Fitted
%R203C	0Ω	Not Fitted	Not Fitted	Not Fitted
%R203D	0Ω	Not Fitted	Not Fitted	Not Fitted
%R203E	Not Fitted	560Ω	560Ω	560Ω
%R201	560Ω	Not Fitted	Not Fitted	Not Fitted
C201	4U7 BP	4U7 BP	4U7 BP	Not Fitted
C202	4U7 BP	4U7 BP	4U7 BP	Not Fitted
%C204	4U7 BP	Not Fitted	Not Fitted	Not Fitted
%C205	4U7 BP	Not Fitted	Not Fitted	Not Fitted
%C203A	Not Fitted	15nF	15nF	Not Fitted
%C203B	Not Fitted	15nF	15nF	Not Fitted

%R203C and %R203D have replaced SL201 and SL202.

To retain the DC loop keying keying facility, there is a centre-tapped version of the ETAL leaded and SMD transformers, the P2602 and P2782 respectively. This will only work for Common Earth systems. If full isolated DC loop keying is required, then the T4030 must still be used. The T4030 must also be used if the Transmitter is to be used as half of a 2-wire to 4-wire hybrid.

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2.2.1 Line Limiter Option

This option should be fitted if no line transformer is installed.

	Enabled	**Disabled**
%D205	1N4531	Not Fitted
%D210	1N4531	Not Fitted

2.2.2 Line Attenuator Option

When enabled this attenuates the line input by approximately 20dB

	Enabled	**Disabled**
Link 1	Open	Closed
%R211	470Ω	Not Fitted
%R220	470Ω	Not Fitted
%R228	120Ω	Not Fitted

2.3 Opto Key

The keying circuitry may be completely isolated from the rest of the system by means of the optocoupler (IC250). A constant current source (Q270) allows keying voltages between 6 and 50 V.

	Opto+ to PL100/11	**PL100/11 Free**
R240	0Ω	Not Fitted
	Opto- to PL100/12	PL100/12 Free
R243	0Ω	Not Fitted

R240 and R243 have replaced SL203 and SL204, originally on the T856 underside. These connect the opto key to D-range 1 pins 11 and 12, and when removed free the D-range pins for alternative use.

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2.4 Relay Driver

A dedicated transistor (Q250) is provided for the purpose of switching an external (e.g. coaxial) relay. The output is open collector and is activated by the Tx-Reg rail. This output is available on pin 9 of the T800-03-0000 auxiliary D-range connector (D-range 2).

2.5 Local Microphone

Use of the local microphone (via the front panel stereo socket) will disable the audio input from the line. The audio switching occurs when the PTT switch is closed.

2.6 Keying With Option PCBs

If an option PCB is fitted, the exciter may be keyed via the TX-ENB-OPT pad in the audio processor. The line must be pulled low to key.

2.7 Transmit Key Time

(Refer to the appropriate test points and options connections drawing in Section 6 in Part C.)

A solder link (SL501) is provided on the bottom of the PCB to allow two transmit key time options, as shown in the table below.

Transmit Key Time		SL501
standard	30ms (approx.)	not linked
short*	<5ms	linked

*In this configuration the standby spurious emissions should be <–65dBm.

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2.8 Local PTT Indication for A800 SIM

This option allows the use of D-range 1 pin 3 for an external PTT indication when the mic PTT or carrier switch is activated. Used for A-800 SIM or any other external control or CTCSS unit.

	Enabled	**Disabled**
D245	BAW56	BAW57
R276	0Ω	0Ω
%R276A	0Ω	Not fitted
%R203C	Not fitted	See transformer option table

2.9 Direct input to Buffer option

A direct input for data use. Note that this input will have 4.5V half-rail, and needs isolation unless R289 is also removed. Leaving R291 as 0Ω and removing &R290 may improve data shape (less overshoot), as &C289 is still in circuit.

	Enabled	**Disabled**
%R246	0Ω	Not fitted
%R291	Not fitted	0Ω
%C265	Not fitted	4U7 BP
%R259	Not fitted	22K

2.10 Line Input Control Replacement

The Line Input control can be replaced with fixed resistors if required.

	Enabled	**Disabled**
%R222	4K7	Not fitted
%R234	4K7	Not fitted
%RV210	Not fitted	10K Log

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3 Talk Through Repeater

In this configuration the receiver directly keys the transmitter when the signal is received. The demodulated audio is fed via 600Ω lines to the transmitter to modulate the carrier. The receiver and transmitter operate simultaneously and must therefore be on different frequencies. The minimum frequency separation depends on the duplexer used.

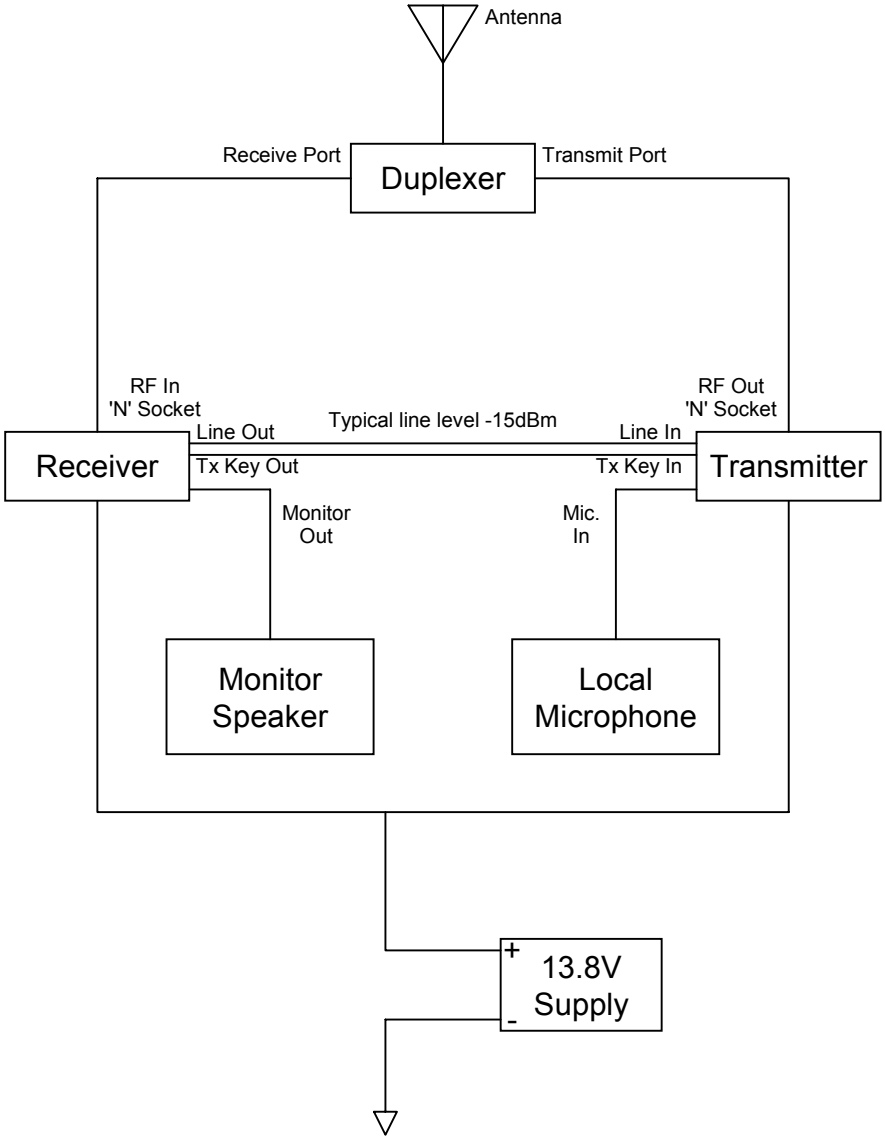


Figure 3.1 Talk Through Repeater

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4 Line Controlled Base without Talk Through

4.11 General

This installation contains a transmitter and receiver which may or may not be on the same frequency, thus simultaneous transmission and reception is not possible. When the transmitter is keyed, the coaxial relay is also energised. When the relay is in its rest position, signals from the antenna are passed to the receiver and the demodulated output is fed via 600Ω lines to the RCU.

The receiver is disabled when the transmitter is energised to prevent the receiver mute opening from RF due to lack of isolation in the relay, direct radiation or the noise skirt of the dual frequency link.

Since the base station may be controlled via a 2-wire line and a 4-wire to 2-wire hybrid, there is a possibility of system oscillation if the receiver is not disabled during transmit. This occurs when the transmit energy enters the receiver and produces an audio response which can pass from the receive to the transmit audio part of the hybrid (impedance imbalance, etc).

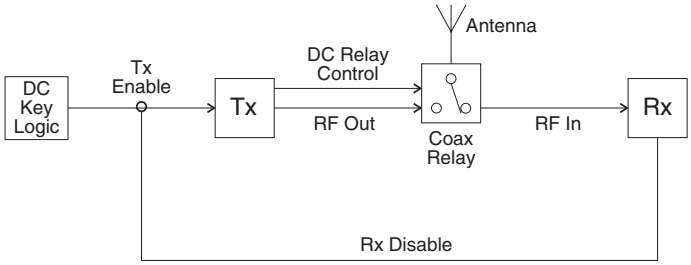


Figure 4.2 Basic Configuration

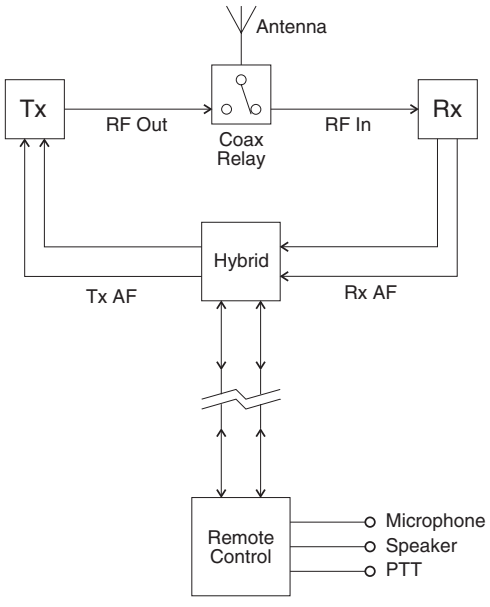


Figure 4.3 Remote Line Controlled Base Station

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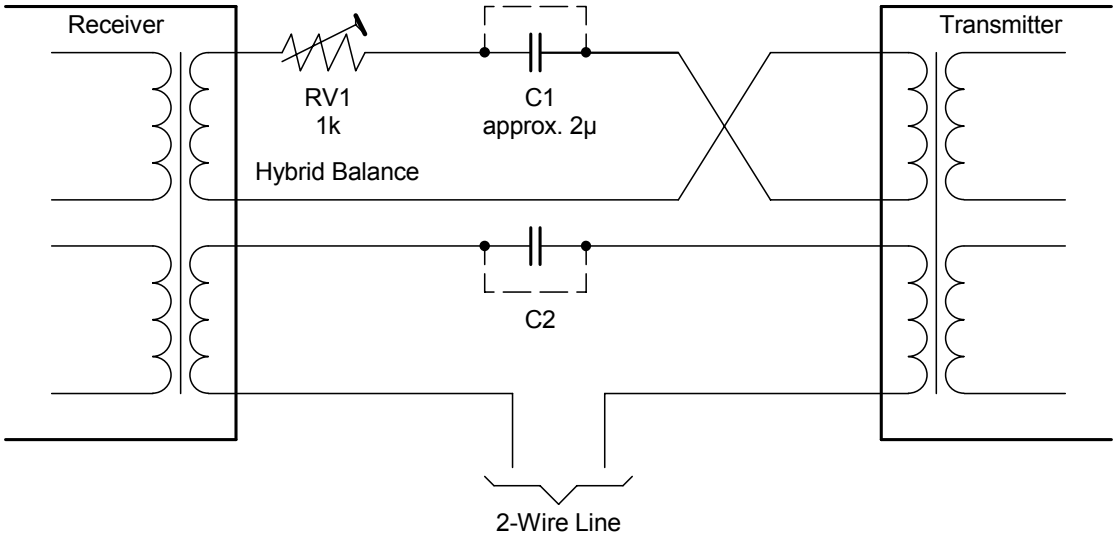


Figure 4.4 4-Wire to 2-Wire Converter

Note: This configuration is only possible when transformer %T210 and T4030 are fitted. Refer to Section 2.2.

4.12 Transmitter Tail Timer

If the transmitter has the tail timer enabled:

- the receiver disable timer must be set so that ^{t}Rx/Dis > ^{t}Tx/Tail;

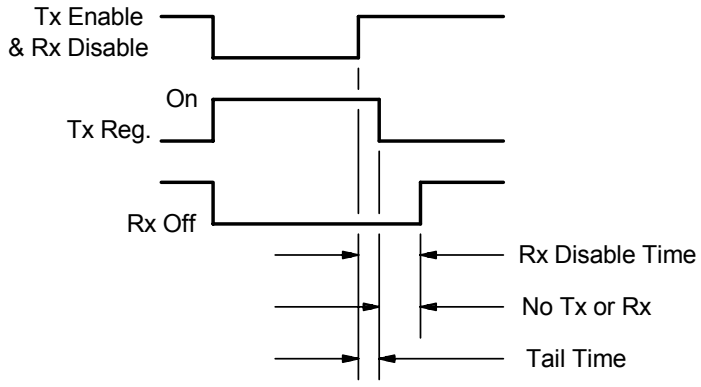


Figure 4.5 Receiver Disable Time vs Tail Time

- if the system configuration also uses an aerial changeover relay as well as the tail timer, the changeover relay must be driven from the relay driver (Q250) in the audio processor, rather than by Tx-Key or Tx-Enable; this output is available on pin 9 of the T800-03-000 auxiliary D-range (D-range 2);

- depending on tail time requirements, it is possible for the transmitter tail time to exceed the receiver disable time capability; in this situation the receiver disable line should also be driven from relay driver Q250 (D-range 2 pin 9).

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5 DC Line Keying

Where the transmitter and receiver are separated by only a short distance and DC isolation is not required, DC loop keying may be employed.

Note: This feature is not available with standard line transformer ETAL P2781 (%T201B). Refer to Section 2.2.

A small DC current (usually less than 10mA) can be fed via the balanced 2-wire line to provide remote control of various functions.

In a duplex system the receiver mute is used to key a transmitter, provided there is a common earth between the two units (refer to Figure 5.6).

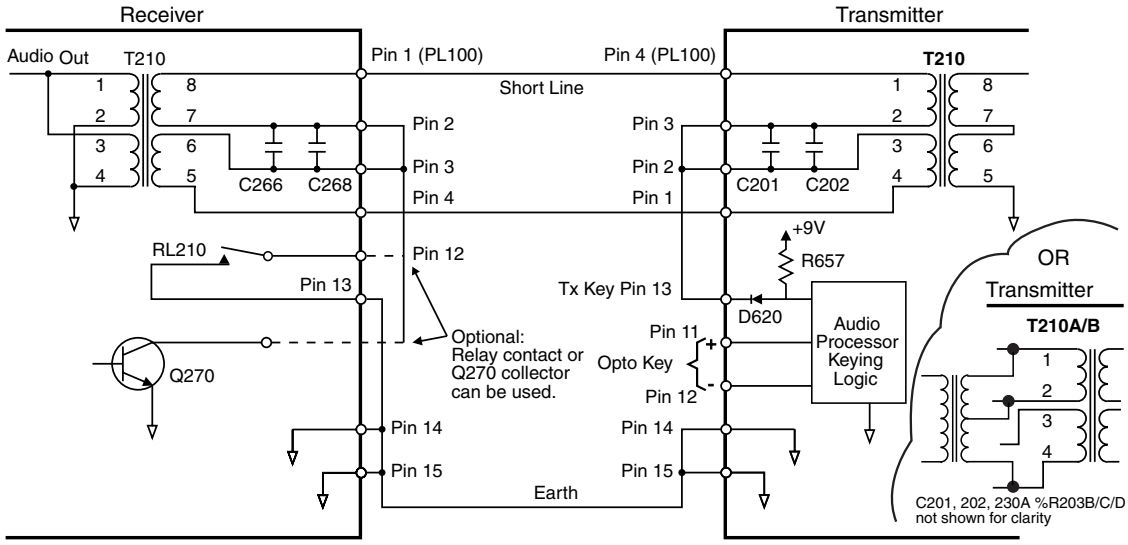


Figure 5.6 DC Loop Keying With Common Earth

Where the receiver and transmitter (or remote control) are distant, DC loop keying is provided by an isolated supply, driver and detector because an earth cannot be relied on (refer to Figure 5.7, Figure 5.8 and Figure 5.9).

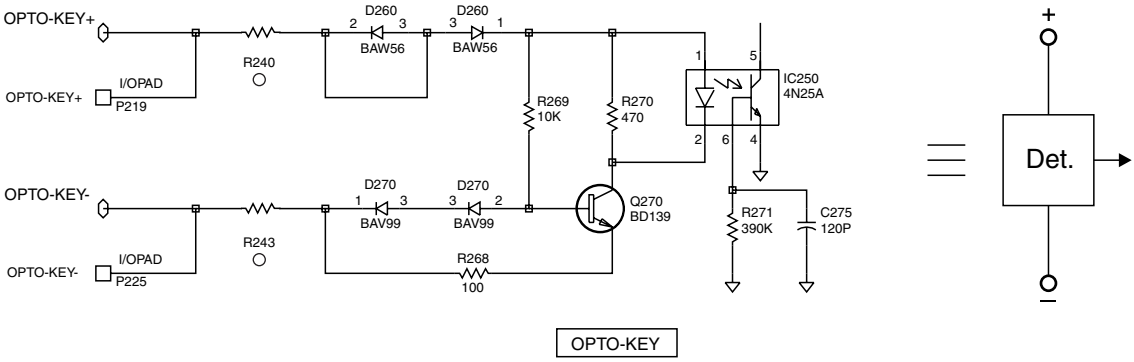


Figure 5.7 Isolated Constant Current Loop Current Detector (Opto-key input on T854)

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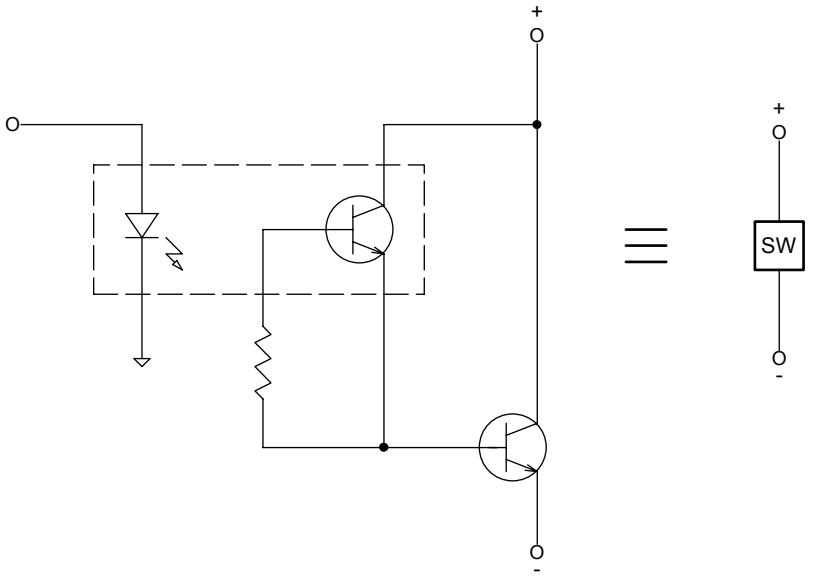


Figure 5.8 Isolated Loop Current Switch

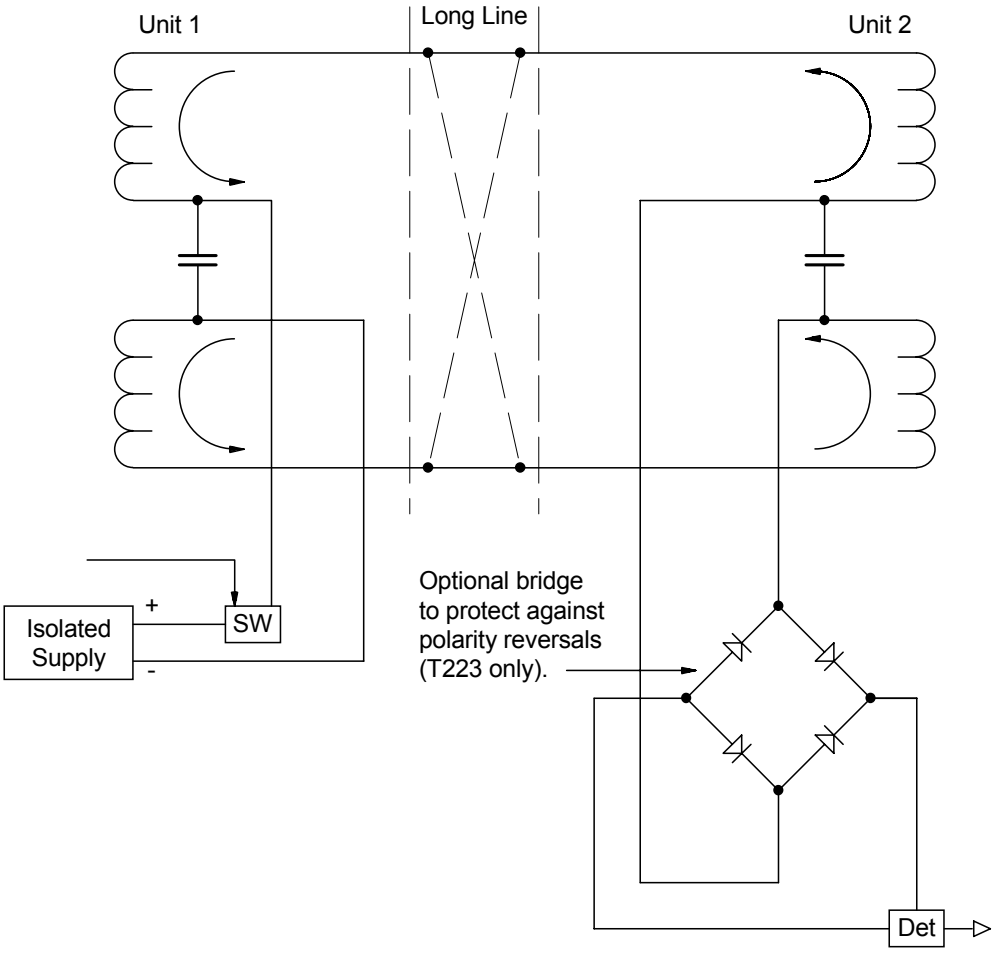


Figure 5.9 Typical System

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6.2 X800-56-PCB3 Backplane PCB

Caution: **This equipment contains CMOS devices which are susceptible to damage from static charges.**

This section contains the following information.

IPN	Section	Page
220-01702-02	Backplane Links and Switches	6.2.3
	Parts List	6.2.5
	PCB Layout – Top Side	6.2.7
	PCB Layout – Bottom Side	6.2.8
	Circuit Diagram	6.2.9

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6 X800-56-PCB3 PCB Information

This part of the manual provides the parts list, PCB layouts and circuit diagram for the X800-56-PCB3 backplane PCB. There is a detailed table of contents at the start of Section 2.

Section	Title	IPN	Page
1	**Introduction**		**6.1.1**
2	**X800-56-PCB3 backplane PCB**	**220-01702-02**	**6.2.1**

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6.1 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.

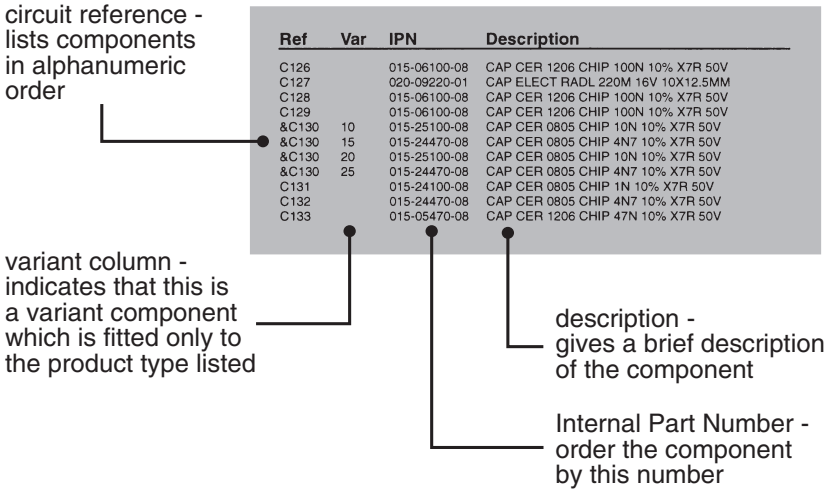
Note: It is important that you identify which issue PCB you are working on so that you can refer to the appropriate set of PCB information.

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:

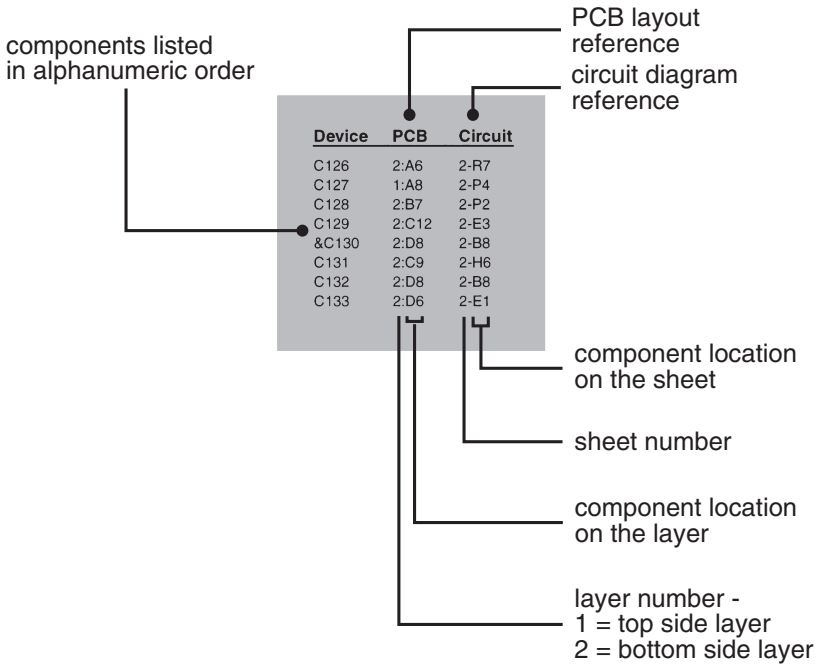


The mechanical and miscellaneous section lists the variant and common parts in IPN order.

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Grid Reference Index

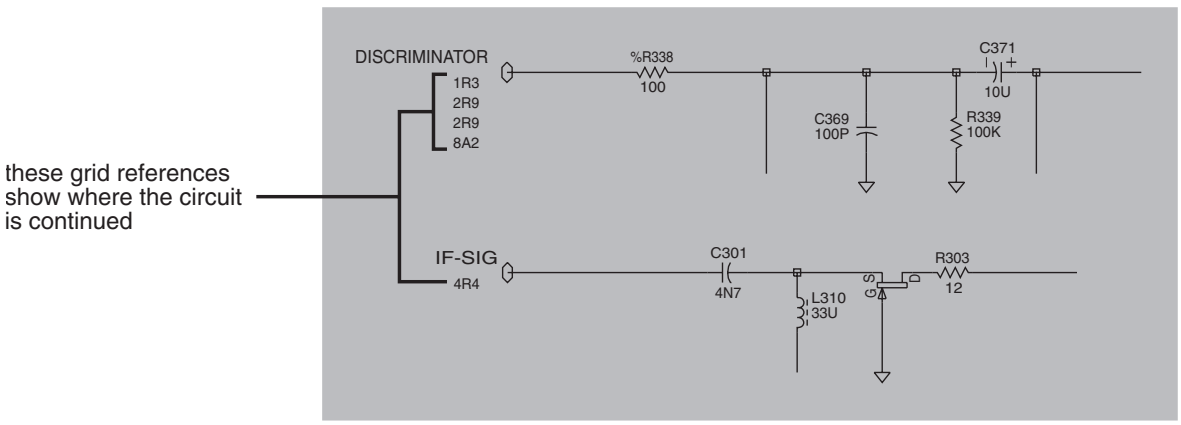
This section contains a component grid reference index to help you find components and labelled pads on the PCB layouts and circuit diagrams. This index lists the components and pads in alphanumeric order, along with the appropriate alphanumeric grid references, as shown below:



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).



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Backplane Links and Switches

The tables below explain the functions of each of the links and switches on the X800-56-PCB3 backplane.

Link	Function	Notes
LN1, LN2	Connects balanced audio from the receiver to the transmitter.	For talk-through operation.
LN3	Connects Rx-Gate to Tx-Key.	
LN4	Select between primary serial comms (link pins 2–3) or secondary (link pins 1–2).	Secondary serial comms is via the receiver and transmitter Aux connectors (second D-ranges).
LN5	Connects Tx-Relay-Driver output from transmitter to the coax relay.	
LN6	Select between serial comms (link pins 1–2) or RSSI (link pins 2–3) on pin 11 of SK6 (Auxiliary connector).	
LN7	Links external (or T803) CTCSS audio to transmitter.	T803 CTCSS audio not available at time of publication.
LN8	Link pins 1–2. Connects unbalanced Rx audio ('Audio1') to T803. Not to be used when CTCSS is present on RX audio as internal CTCSS filtering cannot be applied to this path. For CTCSS use the option below.	Adjust level using RV2. Level to T803 independent of Rx Line Level control.
	Link Pins 2–3 and Pins 4–5. Changes the balanced Rx Line audio output to unbalanced for the T803. This option should be used when CTCSS is present on RX audio so that the internal CTCSS filter can be applied.	Level to T803 controlled by RX Line Level control.
LN9	**T854 transmitters (after S/N 13098764):** Select between Transmitter Aux-Out-0 (link pins 2–3) or direct FWD power sense voltage (link pins1–2). The latter could be used for an externally fitted RF power indicator or alarm.	If an internal alarm board is fitted Aux-Out-0 (link pins 2–3) becomes FWD power alarm output.
	Older T854 transmitters (s/n 13098764 or earlier): Select between Transmitter Aux-Out-0 (link pins 2–3) or Aux-Out-1 (link pins 1–2).	
LN10	**T854 transmitters (after S/N 13098764):** Select between direct FWD power sense voltage (link pins 2–3) or direct REV power sense voltage (link pins1–2). Could be used for an externally fitted RF power indicator or alarm.	If an internal alarm board is fitted direct FWD power sense voltage (link pins 2–3) becomes REV power alarm output.
	Older T854 transmitters (s/n 13098764 or earlier): Selection between transmitter Aux-Out-1 (link pins 2–3) or Aux-Out-2 (link pins1–2).	
LN11	Connects RX CTCSS disable from the T803 to the receiver.	
LN12	Connects Tx-Relay-Driver output from the transmitter to RX-Inhibit on the receiver.	Recommended setting to prevent the receiver mute from inadvertently opening.

Table 6.1 X800-56-PCB3 links

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Switch	Function	Notes
SW1-1	Hardware selection of channel select 1	Leave OFF for Channel select via T803 and or PGM800Win
SW1-2	Hardware selection of channel select 2	
SW1-3	Hardware selection of channel select 3	
SW1-4	Hardware selection of channel select 4	
SW1-5	Hardware selection of channel select 5	
SW1-6	Hardware selection of channel select 6	
SW1-7	Hardware selection of channel select 7	
SW1-8	Hardware selection of channel select 8	
SW2-1	**T854 transmitters (after S/N 13098764):** When ON connects transmitter Aux-Out-0 or direct FWD power sense voltage to ground, depending on the links on LN9. See description of LN9 in the previous table	Not recommended that direct FWD power sense voltage is grounded.
	For older T854 transmitters (s/n 13098764 or earlier): When ON connects transmitter Aux-Out-0 or Aux-Out-1 to ground, depending on the links on LN9. See description of LN9 in the previous table.	
SW2-2	**T854 transmitters (after S/N 13098764):** When ON connects direct FWD power sense voltage or direct REV power sense voltage to ground depending on the links on LN10. See description of LN10 in the previous table.	Not recommended
	For older T854 transmitters (s/n 13098764 or earlier): When ON connects transmitter Aux-Out-1 or Aux-Out-2 to ground, depending on the links on LN10. See description of LN10 in the previous table.	
SW2-3	When ON connects Serial Comms to Pin 6 of transmitter D-Range1	
SW2-4	When ON connects Serial Comms to the transmitter (Tx D-Range1 pin 7)	Default = ON
SW2-5	When ON connects Serial Comms to the receiver (Rx D-range1 pin 7) and the T803	Default = ON
SW2-6	Not used	
SW2-7	When ON connects Tx-Key to ground	
SW2-8	Not used	
SW3-1	When ON connects Rx-Audio through to the T803 and the external Auxiliary connector (SK13 pin2)	
SW3-2, SW3-3	When ON connects balanced audio from the T803 or the external Auxiliary connector (SK13 pins 3 and 4) to the Transmitter.	
SW3-4	When ON connects Receiver RSSI through to the T803	
SW3-5	When ON connects Tx-Key from the T803 to the Transmitter	
SW3-6	When ON connects Rx-Gate to the T803 and the external Auxiliary connector (SK13 pin9)	
SW3-7	When ON connects T803 CTCSS audio to the transmitter.	T803 CTCSS audio not available at time of publication.
SW3-8	Not used.	

Figure 6.10 X800-56-PCB3 switches

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X800-56-PCB3 Parts List/Grid Reference Index (IPN 220-01702-02)

How To Use This Parts List

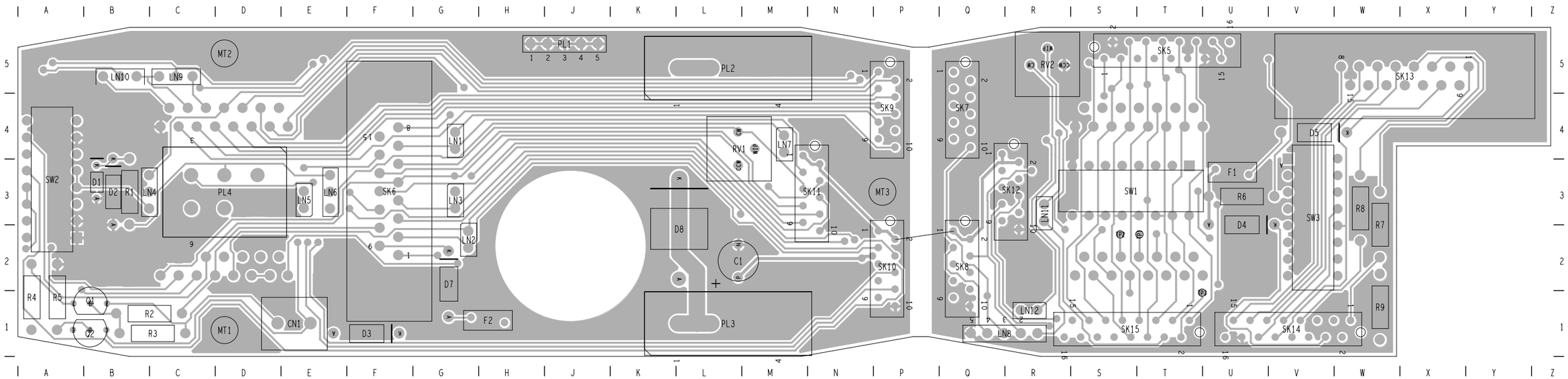
The components listed in this parts list are grouped in alphabetical order and then in numerical order within each group. Each component entry comprises three or four columns: the circuit reference, variant (if applicable), IPN and description. A number in the variant column indicates that this is a 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	IPN	Description
C1	020-09120-01	120UF 6.3Dx15H mm
CN1	240-04030-09	SK2TB TERMINAL BLOCK 2WAY SIDE ENTRY
D1	001-50012-05	1N4531 AI SMALL SIGNAL
D2	001-00015-12	BZX79 VOLTAGE REGULATOR
D3	001-00011-70	1N4001 GENERAL PURPOSE
D4	001-00011-70	1N4001 GENERAL PURPOSE
D5	001-00011-70	1N4001 GENERAL PURPOSE
D7	001-00011-70	1N4001 GENERAL PURPOSE
D8	001-00011-60	MR760 HIGH CURRENT CASE 194-04
F1	265-00010-69	900MA RESETABLE 30V 40A
F2	265-00010-69	900MA RESETABLE 30V 40A
LN1	240-00020-68	HEADER PLUG 2WAY WITH SHORTING LINK
LN10	240-00020-59	HEADER PLUG 3WAY WITH SHORTING LINK
LN11	240-00020-68	HEADER PLUG 2WAY WITH SHORTING LINK
LN12	240-00020-68	HEADER PLUG 2WAY WITH SHORTING LINK
LN2	240-00020-68	HEADER PLUG 2WAY WITH SHORTING LINK
LN3	240-00020-68	HEADER PLUG 2WAY WITH SHORTING LINK
LN4	240-00020-59	HEADER PLUG 3WAY WITH SHORTING LINK
LN5	240-00020-68	HEADER PLUG 2WAY WITH SHORTING LINK
LN6	240-00020-59	HEADER PLUG 3WAY WITH SHORTING LINK
LN7	240-00020-68	HEADER PLUG 2WAY WITH SHORTING LINK
LN8	240-00020-58	HEADER PLUG 5WAY WITH SHORTING LINK
LN9	240-00020-59	HEADER PLUG 3WAY WITH SHORTING LINK
MT1	MTG-C420P-35	P3MM5_420C MOUNTING HOLE 3.5MM HOLE 4.2MM PAD
MT2	MTG-C420P-35	P3MM5_420C MOUNTING HOLE 3.5MM HOLE 4.2MM PAD
MT3	MTG-C420P-35	P3MM5_420C MOUNTING HOLE 3.5MM HOLE 4.2MM PAD
PL1	240-00020-58	HEADER PLUG 5WAY WITH SHORTING LINK
PL2	240-02011-20	"HEADER 4WAY 1ROW 200"" PITCH TOP ENT WITH SHROUD"
PL3	240-02011-20	"HEADER 4WAY 1ROW 200"" PITCH TOP ENT WITH SHROUD"
PL4	240-00010-64	HEADER PLUG 6WAY 2X3 TOP ENTRY WITH SHROUD
Q1	000-50010-60	BC327 AI AF POWER
Q2	000-00010-66	BC337 AF POWER
R1	030-02100-00	10 FILM 7X2.5MM
R2	032-05100-00	10K M/F 7X2.5MM
R3	032-04100-00	1K M/F 7X2.5MM
R4	032-04100-00	1K M/F 7X2.5MM
R5	032-04100-00	1K M/F 7X2.5MM
R6	032-04220-00	2.2K M/F 7X2.5MM
R7	030-03270-00	270 FILM 7X2.5MM
R8	030-03270-00	270 FILM 7X2.5MM
R9	030-03270-00	270 FILM 7X2.5MM
RV1	042-05100-10	10K CERMET 9.5mm SQ Top Adjust 3386P
RV2	042-06100-09	100K CERMET 9.5mm SQ Top Adjust 3386P
SK1	240-02020-15	SKT 15WAY DRANGE ASTRON AT-DB500-15-F-A55
SK10	240-00010-79	SKT 10WAY 2X5 AMP MICRO MATCH TOP ENTRY
SK11	240-00010-79	SKT 10WAY 2X5 AMP MICRO MATCH TOP ENTRY
SK12	240-00010-79	SKT 10WAY 2X5 AMP MICRO MATCH TOP ENTRY
SK13	240-02020-15	SKT 15WAY DRANGE ASTRON AT-DB500-15-F-A55
SK14	240-04020-54	SKT 16WAY AMP MICRO MATCH TOP ENTRY
SK15	240-04020-54	SKT 16WAY AMP MICRO MATCH TOP ENTRY
SK2	240-02020-15	SKT 15WAY DRANGE ASTRON AT-DB500-15-F-A55
SK3	240-02020-15	SKT 15WAY DRANGE ASTRON AT-DB500-15-F-A55
SK4	240-02020-15	SKT 15WAY DRANGE ASTRON AT-DB500-15-F-A55
SK5	240-04020-54	SKT 16WAY AMP MICRO MATCH TOP ENTRY
SK6	240-02020-15	SKT 15WAY DRANGE ASTRON AT-DB500-15-F-A55
SK7	240-00010-79	SKT 10WAY 2X5 AMP MICRO MATCH TOP ENTRY
SK8	240-00010-79	SKT 10WAY 2X5 AMP MICRO MATCH TOP ENTRY
SK9	240-00010-79	SKT 10WAY 2X5 AMP MICRO MATCH TOP ENTRY
SW1	230-00010-19	DIP-8 SW X 8 SPST DIP
SW2	230-00010-19	DIP-8 SW X 8 SPST DIP
SW3	230-00010-19	DIP-8 SW X 8 SPST DIP
TP1	UNI-009TP-XX	PROBE TESTPOINT WITH A 0.8MM HOLE AND A 1.25MM COPPER PAD
TP2	UNI-009TP-XX	PROBE TESTPOINT WITH A 0.8MM HOLE AND A 1.25MM COPPER PAD
TP3	UNI-009TP-XX	PROBE TESTPOINT WITH A 0.8MM HOLE AND A 1.25MM COPPER PAD

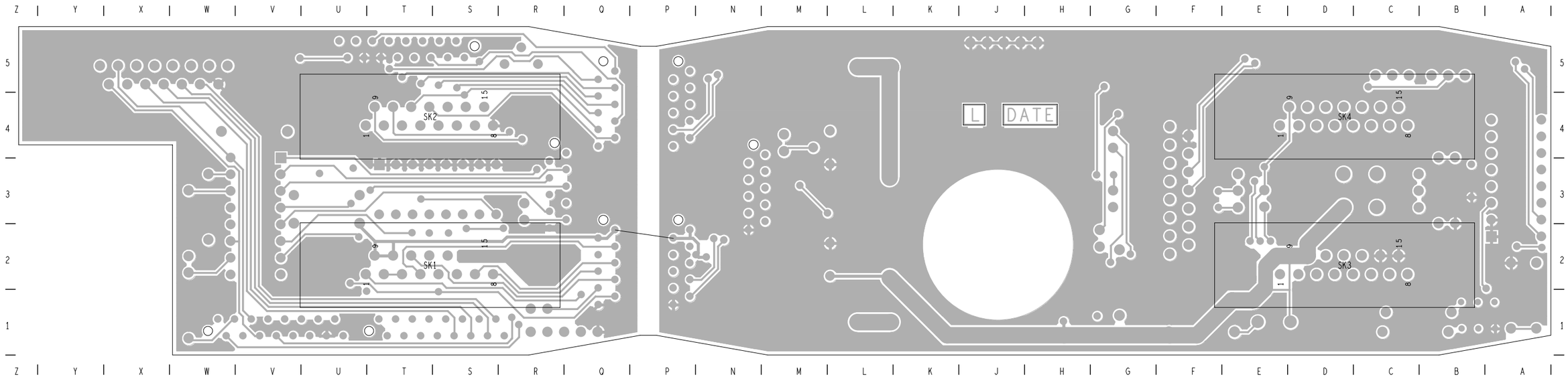
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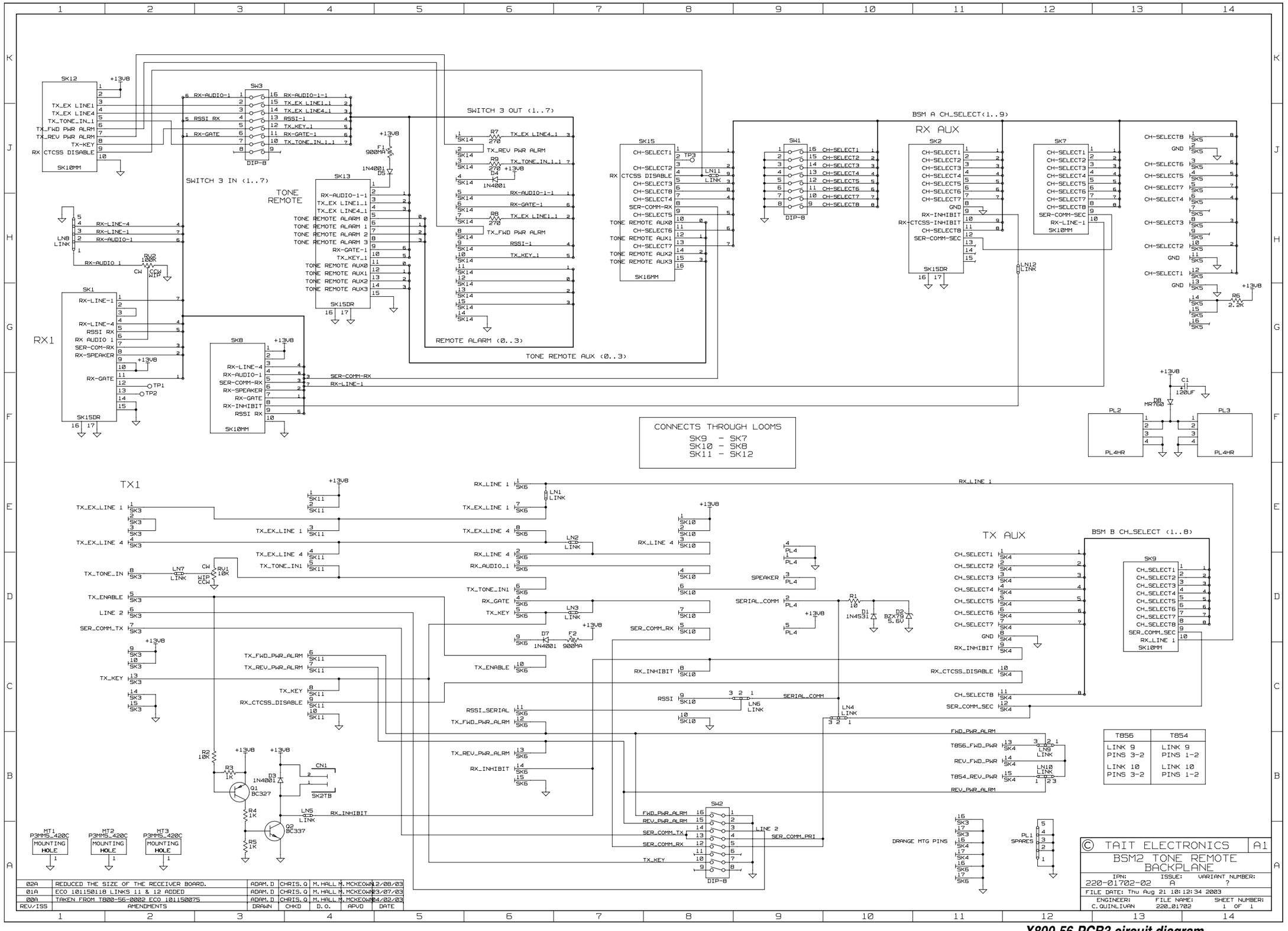
X800-56-PCB3 PCB (IPN 220-01702-02) – Top Side
220-01702-02

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X800-56-PCB3 PCB (IPN 220-01702-02) – Bottom Side
220-01702-02

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X800-56-PCB3 circuit diagram
220-01702-02

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Part H T800 Ancillary Equipment

This part of the manual features a brief description of the major ancillaries that may be used with T800 SL2 equipment. For a comprehensive list of available ancillary equipment, please contact your nearest Tait Dealer or Customer Service Organisation.

Section	Page
Programming Kits	**1.1**
General Ancillaries	**1.2**
Paging	**1.3**
External Frequency Reference	**1.4**

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1 T800 Ancillary Equipment

1.1 Programming Kits

T800-01-0000

The T800-01-0000 kit is used for programming T800 SL2 base station equipment using a standard IBM™ (or compatible) PC.

The kit comprises the following items:

PGM800Win programming software user's manual
PGM800Win Windows™ based programming software on CD
T800-01-0002 programming cable.

T800-01-0001

The T800-01-0001 kit is the same as the T800-01-0000 kit described above, but with the addition of the T800-01-0004 module programming interface.

T800-01-0002

The T800-01-0002 programming cable connects the PC directly to the programming socket on the T800 SL2 rack frame speaker panel or backplane PCB, thus enabling T800 SL2 modules to be read or programmed while in the rack frame. It can also connect to the programming socket on the T800-01-0004 programming module interface if the module is to be read or programmed while out of the rack frame.

T800-01-0003

The T800-01-0003 programming kit contains a T800-01-0002 programming cable and a T800-01-0004 programming module interface.

T800-01-0004

The T800-01-0004 programming module interface is designed to allow a PC to connect directly to a T800 SL2 module. It comprises a small PCB on which is mounted a D-range socket, a programming socket, a Micromatch socket and a DC input connector.

The T800-01-0004 plugs directly into D-range 1 or D-range 2 (selected by a switch on the PCB), or into SK805 in the microcontroller compartment via the supplied ribbon cable loom, and is then connected to the PC with a T800-01-0002 programming cable.

Refer to the T800 Ancillary Equipment Service Manual for more information.

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1.2 General Ancillaries

T800-09-0001 RF Coaxial Relay

The T800-09-0001 is an RF coaxial relay assembly fitted with three female N-type connectors, and comes complete with a mounting bracket and two coaxial cables terminated in male N-type connectors. It can be used, for example, in base station applications where the receiver and transmitter share the same antenna, in which case it can be driven by the T800 SL2 transmitter relay driver (refer to Section 2.4 in Part G for more information).

T800-01-0010 Calibration Test Unit

The T800-01-0010 provides all inputs and outputs necessary to carry out the full tuning and adjustment procedure for T800 Series I and II receivers, exciters and transmitters. It provides a convenient method of connecting test equipment, including a PC and power supply, to a T800 Series I or II module (via D-range 1) without the need to construct custom wiring looms.

The T800-01-0010 also has a built-in speaker, a switch for selecting Series I or II modules, and uses standard BNC and "banana plug" sockets.

T800-03 Auxiliary D-Range

The T800-03 is an additional D-range kit comprising one D-range plug assembly and two locating pins, nuts and washers. Although originally a T800 Series I ancillary, it can be used in T800 SL2 products for special applications requiring custom internal wiring.

T800-03-0000 Auxiliary D-Range

The T800-03-0000 is an additional D-range kit (normally fitted as D-range 2) comprising one D-range plug assembly complete with connecting loom and mounting screws. The ribbon cable loom connects the D-range PCB to the Micromatch socket (SK805) in the microcontroller compartment. Typical uses of the T800-03-0000 are in paging applications and where external channel control is required. Refer to Figure 1.4 in Part G for the T800-03-0000 pin connections.

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T800-04-0000 RSSI

The T800-04 RSSI option PCB plugs directly into the main PCB (support circuitry being fitted as standard). It is fitted to the T855, T875 and T885 whenever receiver signal strength monitoring is required, e.g. trunking or voting. Its function is to provide a DC voltage proportional to the signal level at the receiver input.

T800-10-0000 Channel Select PCB

The T800-10-0000 is a small PCB that plugs into the Micromatch connector (SK805) in the microcontroller compartment of a T800 SL2 receiver, exciter or transmitter. It is fitted with an eight-switch DIP switch which allows the manual selection of any one of the channels already programmed into the module by PGM800Win. The T800-10-0000 is also fitted with a Micromatch socket to provide access to SK805 for programming purposes.

T800-80-0000 Local Microphone

A 600Ω microphone complete with 300mm cord terminated in a ¼" stereo plug for use with the T854.

T800-80-0001 T803 Microphone

A 600Ω microphone complete with 300mm cord terminated with a RJ11connector for use with the T803.

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1.3 Paging

T800-30-0000 and T800-30-0002 DFSK Modulators

The T800-30-0000 (formerly T800-30) and T800-30-0002 (formerly T800-35) are DFSK modulators for T800 SL2 transmitters, suitable for POCSAG or similar paging data formats. Analogue transmissions (e.g. tone or speech) are still possible by disabling the data path via a control line. 512 or 1200 baud data rates are link selectable. The T800-30-0002 is adapted for use with an external reference oscillator for simulcast transmission. The T800-30-0000 and T800-30-0002 are not designed for use with 66 to 88MHz equipment.

T800-32-0000 and T800-32-0010 DFSK Modulators

The T800-32-0000 and T800-32-0010 are DFSK modulator PCBs which can be fitted to T800 SL2 transmitters to enable them to function as low-speed paging transmitters. These new PCBs have been specifically designed for Series II transmitters and are much easier to fit into the latest design transmitters.

Both PCBs are suitable for POCSAG or similar paging data formats, but are not designed for analogue transmissions (e.g. tone or speech). The T800-32-0010 is adapted for use with an external reference oscillator for simulcast transmission. The T800-32-0000 and T800-32-0010 are not designed for use with 66 to 88MHz equipment.

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1.4 External Frequency Reference

T800-06-0000 External Frequency Reference Kit

The T800-06-0000 kit provides an additional D-range plug/PCB assembly which incorporates a miniature RF connector to carry an externally generated 12.8MHz reference signal into a T800 SL2 module. This enables the use of very high stability external reference oscillators for special applications.

The D-range PCB is also fitted with a Micromatch socket which can be connected to SK805 in the microcontroller section via the supplied loom to provide access to the channel change lines.

The kit comes complete with fitting instructions and all installation hardware.

T800-06-0001 External Frequency Reference Kit

The T800-06-0001 is the same as the T800-06-0000 kit with the addition of a special coax cable for external frequency reference input. One end of this coax is terminated with a miniature RF connector which fits into the D-range socket in an appropriate backplane PCB to connect to a T800 SL2 module fitted with a T800-06-0000 kit. The other end is terminated with a BNC connector which can be mounted on the rack frame.

T801-00 Frequency Reference Module

The T801-00 frequency reference module provides a high stability frequency source to which the synthesiser within a T800 SL2 base station can be locked. The master standard within the T801-00 is primarily intended to be rubidium, although high quality ovenised crystal oscillators can also be used in applications where more frequent readjustment of frequency is acceptable. The T801-00 converts the output frequency from its master standard to the 12.8MHz required by the T800 SL2 base station.

Refer to M801-00.

T801-10 OCXO Module

The T801-10 OCXO module provides a high stability frequency source to which the synthesiser within a T800 SL2 base station can be locked. This will provide T800 SL2 transmitters with the frequency stability required for simulcast transmission. The master standard within the T801-10 is a high quality ovenised crystal oscillator (OCXO). Three outputs are provided on the rear panel, which allows up to three T800 SL2 transmitters to be referenced to the source oscillator.

Refer to M801-10.

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