

T820 Series II
Base Station Equipment
66-88MHz

Tuning & Adjustment Manual

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M820-00-2TA



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About This Manual

Scope

This manual contains general, technical, tuning and adjustment information on T820 Series II 25W and 50W base stations which comprise the following equipment:

| | |
|------------------|---|
| 25W base station | T825 receiver T826 25W transmitter |
| 50W base station | T825 receiver T827 exciter T828 50W power amplifier |

PCB Information

PCB information is provided for all current issue PCBs, as well as all previous issue PCBs manufactured in production quantities, and is grouped according to PCB. Thus, you will find the parts list, grid reference index (if necessary), PCB layouts and circuit diagram(s) for each individual PCB grouped together.

Errors

If you find an error in this manual, or have a suggestion on how it might be improved, please do not hesitate to contact Customer Support, Tait Electronics Ltd, Christchurch, New Zealand (full contact details are on page 2).

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You can order additional copies of this manual from your nearest Tait Dealer or Customer Service Organisation. When ordering, make sure you quote the correct Tait product code ("M" number). Note that only the latest issue of the manual will be available for order.

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| B | T825 Receiver |
| C | T826 Transmitter & T827 Exciter |
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| E | T820 VCO PCB Information |

Part A Introduction To Servicing

This part of the manual is divided into the sections listed below. These sections provide some general and advisory information on servicing procedures, and a brief history of PGM800Win programming software.

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1 General

1.1 Additional Technical Information

If you have any questions about this manual or the equipment it describes, please contact your nearest Tait Dealer or Customer Service Organisation. If necessary, you can get additional technical help from Customer Support, Radio Systems Division, Tait Electronics Ltd, Christchurch, New Zealand (full contact details are on page 2).

When requesting information, please quote either the manual product code (e.g. M820-00-200), or the equipment product code and serial number which are printed on a label on the back of the product (as shown in Figure 1.1).

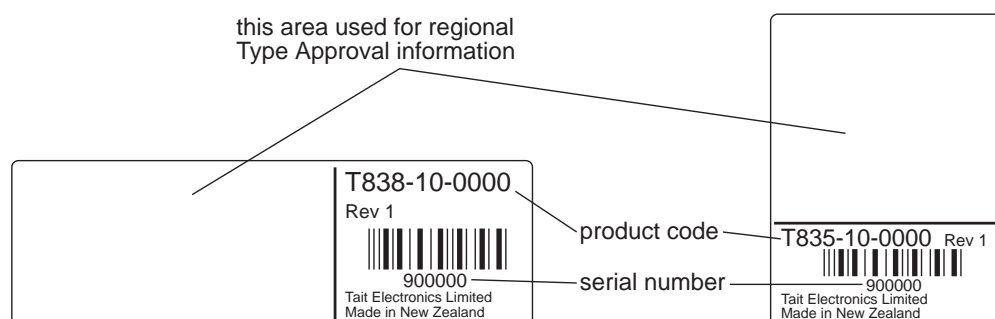


Figure 1.1 Typical Product Code & Serial Number Labels

If you require information about a particular PCB, please quote the full PCB internal part number (IPN) which is screen printed onto the top side of the board (refer to the appropriate PCB Information section in this manual for more details).



1.2 Caution: CMOS Devices

This equipment contains CMOS Devices which are susceptible to damage from static charges. Care when handling these devices is essential. For correct handling procedures refer to the manufacturers' data books, e.g. Philips data books covering CMOS devices, or Motorola CMOS data books, Section 5 'Handling', etc.

An anti-static bench kit (refer to Figure 1.2) is available from Tait Electronics Ltd under the following product codes:

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

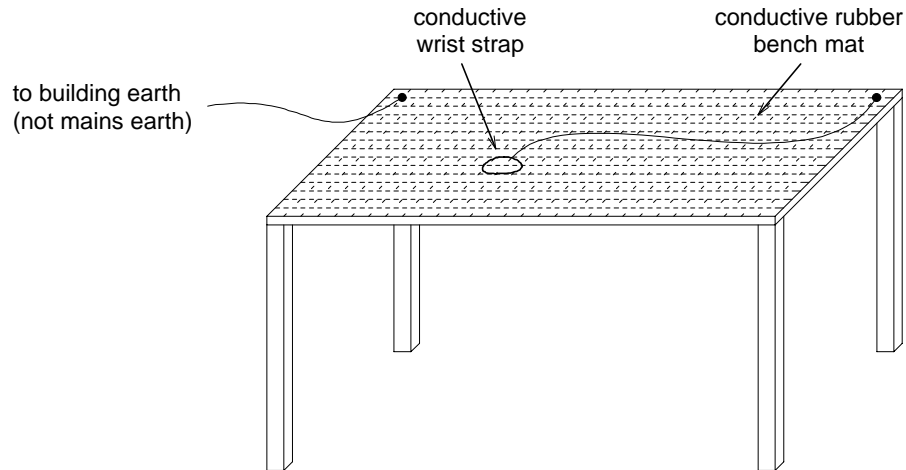


Figure 1.2 Typical Anti-static Bench Set-up

1.3 **Caution: Aerial Load**

The equipment has been designed to operate safely under a wide range of aerial loading conditions. However, we strongly recommend that the transmitter should always be operated with a suitable load to prevent damage to the transmitter output power stage.

1.4 **Caution: Beryllium Oxide & Power Transistors**

The RF power transistors in current use all contain some beryllium oxide. This substance, while perfectly harmless in its normal solid form, can become a severe health hazard when it has been reduced to dust. For this reason the RF power transistors should not be broken open, mutilated, filed, machined, or physically damaged in any way that can produce dust particles.

2 Mechanical

2.1 Torx Recess Head Screws

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

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

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

M3 screws - T10
M4 screws - T20.

Figure 2.1 below shows a typical Torx recess head screw (actual hardware may differ slightly from this illustration due to variations in manufacturing techniques).

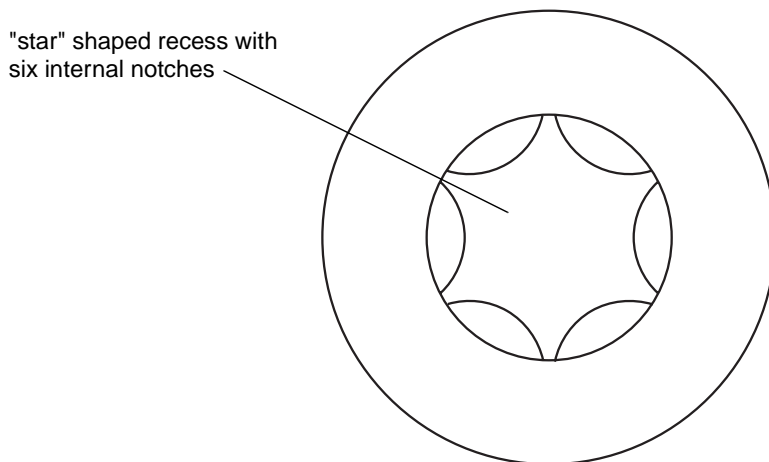


Figure 2.1 Torx Screw Identification

2.2 Pozidriv & Philips Recess Head Screws

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

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

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

Figure 2.2 below shows the main differences between typical Pozidriv and Philips screw heads and screwdriver tips (actual hardware may differ slightly from these illustrations due to variations in manufacturing techniques).

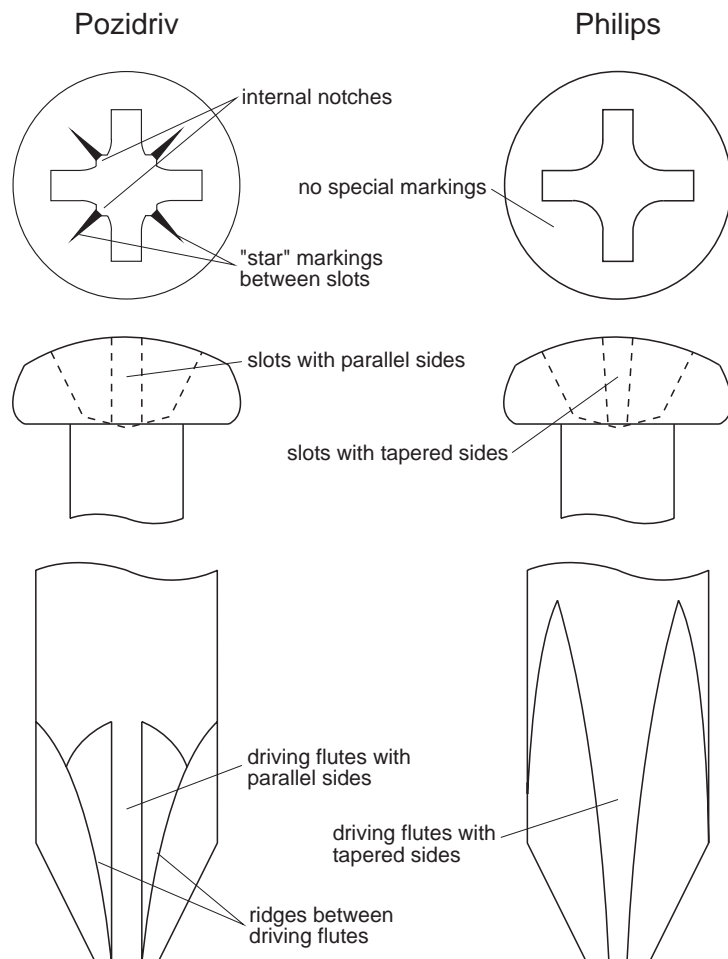


Figure 2.2 *Pozidriv & Philips Screw & Screwdriver Identification*

2.3 Disassembly/Reassembly

2.3.1 Receivers/Exciters/Transmitters

To carry out alignment or change option links, you need to remove only the top cover, i.e. the one adjacent to the front panel handle and on the opposite side to the main D-range connector (D-range 1/PL100).

You need to remove the bottom cover to:

- access transmitter RF power transistors and many SMD components
- change solder blob links
- fit test leads to circuit block access points.

2.3.2 Power Amplifiers

You should carry out the tuning and power output level setting procedures with the cover on.

2.4 Cover Screw Torques

| | |
|---------------------------------|---------------------|
| Receivers/Exciters/Transmitters | .. 1.36Nm/12in.lbf. |
| Power Amplifiers | .. 0.9Nm/8in.lbf. |

2.5 Chassis & Cover Compatibility

The chassis and covers used in T800 Series II modules incorporate a number of design changes to improve Electro-Magnetic Compatibility (EMC) performance. It is important that only the new-design covers are fitted to the new chassis to ensure correct mechanical fit and continued compliance with appropriate EMC Type Approval regulations.

Figure 2.3 below shows some of the main features which can be used to identify the new-design chassis and covers.

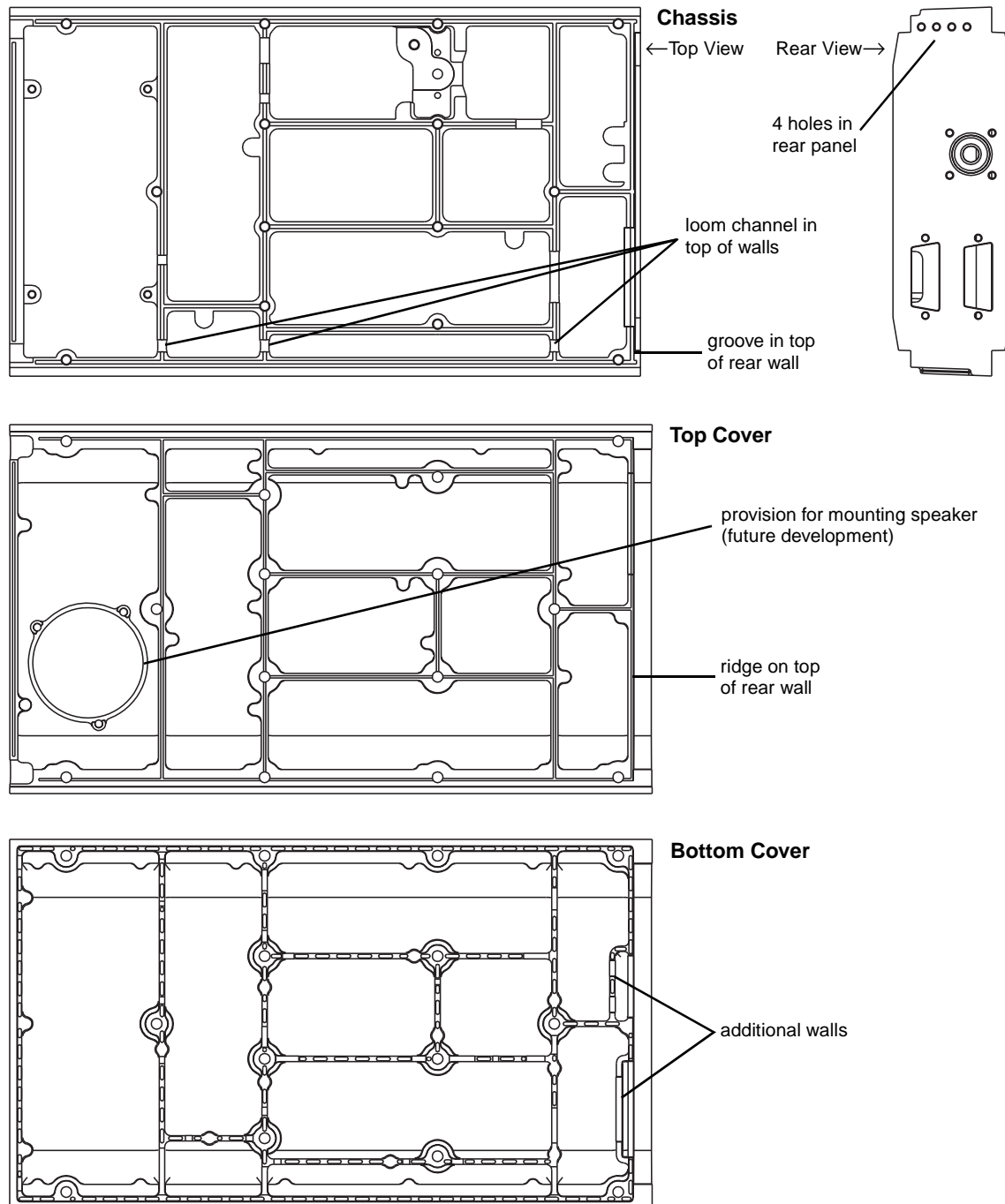


Figure 2.3 Identification Of New-Design Chassis & Covers

3 Component Replacement

3.1 Leaded Components

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

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

3.1.1 Desoldering Iron Method

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

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

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

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

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

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

3.1.2 Component Cutting Method

Cut the leads on the component side of the PCB.

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

Fill the hole with solder and then clear with solderwick.

3.2 Surface Mount Devices

**Caution:**

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

3.3 Cased Mica Capacitors

Cased mica capacitors can be removed by heating the top with a heavy-duty soldering iron and gently lifting the capacitor off the PCB with a solder-resistant spike or equivalent.

4 Software History

28/06/96 PGM800Win Version 1.0
18/08/97 PGM800Win Version 2.00

4.1 PGM800Win V1.0

PGM800Win V1.0 is different in concept from DOS versions of PGM800 in that it is Windows¹ based. It also includes many new and improved features over DOS versions of PGM800.

The major changes are outlined below:

- The Windows™ environment makes data entry and editing significantly easier.
- PGM800Win includes several new radio models which are not programmable with DOS versions of PGM800.
- Out of range frequencies will result in warning messages and will not be accepted for entry into the standard library module. User defined modules can be created, however, allowing variation from the standard library module.
- Channel numbers default to 0-127 to match the EPROM memory locations. However, the user can change this setting so that the channel numbers run from 1-128 to suit his/her particular needs.

Note: The data files produced by BASEPROG V1.0 and all DOS versions of PGM800 are still compatible with PGM800Win V1.0.

4.2 PGM800Win V2.00

PGM800Win V2.00 is an upgraded and expanded version of PGM800Win V1.0. It has been developed specifically for T800 Series II base stations, but retains the ability to program Series I equipment.

The major changes are outlined below:

- PGM800Win V2.0 will program T800 Series II base station modules via serial communications.
- Deviation and reference modulation settings are written automatically to the radio.

1. Windows is a registered trademark of the Microsoft Corporation.

- Extra information that is not stored in the radio (but which is still relevant to the radio) can be saved to a file on disk (e.g. note field, auxiliary pin names, etc.).

Note: The data files produced by BASEPROG V1.0, all DOS versions of PGM800, and PGM800Win V1.0 are still compatible with PGM800Win V2.00.

Part B T825 Receiver

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

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| 2 | Circuit Operation |
| 3 | Initial Tuning & Adjustment |
| 4 | Functional Testing (not available for Tuning & Adjustment manual) |
| 5 | Fault Finding (not available for Tuning & Adjustment manual) |
| 6 | PCB Information |

1 T825 General Information

This section provides a brief description of the T825 receiver, along with detailed specifications and a list of types available.

The following topics are covered in this section.

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1.1 Introduction

The T825 is a high performance microprocessor controlled FM base station receiver designed for single or multichannel operation in the 66 to 88MHz frequency range¹.

The receiver is a dual conversion superhet with a synthesised local oscillator. The first IF is 10.7MHz, allowing exceptionally high spurious signal rejection to be achieved in the receiver front end. The second IF section (455kHz) combines amplitude limiting, detection and RSSI within a single integrated circuit. This IC also drives a noise level detector for gating the audio output. RSSI can also be used to drive a carrier mute for audio output gating (link selectable).

The audio section output can be adjusted to deliver >+10dBm to a 600 ohm balanced output, and 1W to a local monitor speaker. A flat or de-emphasised audio response is link selectable.

The synthesiser frequency is programmed via the serial communications port. Eight channel select lines are accessible via an optional D-range connector (D-range 2 - T800-03-0000) at the rear of the set.

All components except those on the VCO board are mounted on a single PCB. This is secured to a die-cast chassis which is divided into compartments to individually shield each section of circuitry. Access to both sides of the main PCB is obtained by removing each of the two chassis covers. There is provision within the chassis to mount small option PCBs.

The front panel controls include gating sensitivity, line level, monitor volume and a monitor mute switch.

The T825 has a width of 60mm and occupies a single space in a Tait rack frame, which has the ability to accommodate up to seven standard modules.

1. Although capable of operating over the 66-88MHz frequency range, the T825 has a 2MHz switching range (see Section 1.2.3 and Section 3.1).

1.2 Specifications

1.2.1 Introduction

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

Where applicable, the test methods used to obtain the following performance figures are those described in the EIA and ETS specifications. However, there are several parameters for which performance according to the CEPT specification is given. Refer to Section 1.2.6 for details of test standards.

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

The terms "wide bandwidth" and "narrow bandwidth" used in this and following sections are defined in the following table.

| | Channel Spacing | Modulation 100% Deviation | Receiver IF Bandwidth |
|------------------|-----------------|------------------------------|--------------------------|
| Wide Bandwidth | 25kHz | ±5.0kHz | 15.0kHz |
| Narrow Bandwidth | 12.5kHz | ±2.5kHz | 7.5kHz |

Sensitivity and distortion figures are stated for both de-emphasised and flat audio responses under standard operating conditions. Note that the sensitivity and distortion figures will be degraded when flat audio is selected.

| | Link PL210 | Link PL220 |
|---------------------|------------|------------|
| De-emphasised Audio | 1-2 | 2-3 |
| Flat Audio | 2-3 | 1-2 |

1.2.2 General

| | |
|-----------------------------|--------------------------------|
| Number Of Channels | .. 128 (standard) ¹ |
| Supply Voltage: | |
| Operating Voltage | .. 10.8 to 16V DC |
| Standard Test Voltage | .. 13.8V DC |
| Polarity | .. negative earth only |
| Polarity Protection | .. crowbar diode |
| Supply Current: | |
| Standby | .. 350mA |
| Full Audio | .. 750mA |
| Operating Temperature Range | .. -30°C to +60°C |
| Dimensions: | |
| Height | .. 183mm |
| Width | .. 60mm |
| Length | .. 322mm |
| Weight | .. 2.13kg |

1.2.3 RF Section

| | |
|---|--|
| Frequency Range | .. 66-88MHz |
| Type | .. dual conversion superheterodyne |
| Frequency Increment | .. 5 or 6.25kHz |
| Switching Range | .. 2MHz (i.e. ±1MHz from the centre frequency) |
| Input Impedance | .. 50 ohms |
| Frequency Stability (see also Section 1.4) | .. ±2.5ppm, -30°C to +60°C (±1ppm available for special applications) |
| Signal Strength Indicator (RSSI) | .. -115dBm to -70dBm, 3.5 to 6.5V at approx. 15dB/V |

1. Additional channels may be factory programmed. Contact your nearest Tait Dealer or Customer Service Organisation.

IF Amplifiers:

| | | |
|-----------------------|----|--------------------|
| Frequencies | .. | 10.7MHz and 455kHz |
| Bandwidths- | | |
| Narrow Bandwidth (NB) | .. | 7.5kHz |
| Wide Bandwidth (WB) | .. | 15kHz |

Sensitivity (De-emphasised Response):

| | | |
|------------------------|----|----------------------------------|
| Single Channel | .. | -117dBm |
| Bandsread (12dB Sinad) | .. | -115dBm (across switching range) |

Sensitivity (Flat Response):

| | | |
|------------------------|----|----------------------------------|
| Single Channel | .. | -111dBm |
| Bandsread (12dB Sinad) | .. | -109dBm (across switching range) |

Signal+Noise To Noise Ratio (Typical):

| | | <u>De-emphasised</u> | <u>Flat</u> |
|-------------------------|----|------------------------|------------------------|
| RF Level -107dBm (CEPT) | .. | 30dB (WB) 25dB (NB) | 25dB (WB) 20dB (NB) |
| RF Level -83dBm (CEPT) | .. | 50dB (NB) | 45dB (NB) |
| RF Level -57dBm (EIA) | .. | 55dB (WB) | 52dB (WB) |

Selectivity:

| | | |
|------------------------------------|----|-------------|
| Narrow Bandwidth (± 12.5 kHz) | .. | 90dB (CEPT) |
| Wide Bandwidth (± 25 kHz) | .. | 95dB (EIA) |

Offset Selectivity (Canada only) .. 20dB

Spurious Response Attenuation .. 100dB EIA (typical)

Intermodulation Response Attenuation:

| | | |
|------------------|----|---------------------|
| Narrow Bandwidth | .. | 80dB CEPT (typical) |
| Wide Bandwidth | .. | 85dB EIA (typical) |

Blocking .. 100dB

Co-channel Rejection .. 6dB

Amplitude Characteristic .. 3dB

Spurious Emissions:

| | | |
|-----------|----|----------------------------------|
| Conducted | .. | -90dBm to 4GHz |
| Radiated | .. | -57dBm to 1GHz -47dBm to 4GHz |

1.2.4 Audio Section

1.2.4.1 General

| | | |
|-------------------------------------|----|---|
| Outputs Available | .. | line and monitor |
| Frequency Response | .. | flat or de-emphasised (750µs) (link selectable) |
| Flat Response: | | |
| Bandwidth | .. | 67 to 3400Hz |
| Response | .. | within +1, -2dB of output level at 1kHz |
| De-emphasised Response: | | |
| Bandwidth | .. | 300 to 3400Hz |
| Response | .. | within +1, -3dB of a 6dB/octave de-emphasis characteristic (ref. 1kHz) |
| Line Output: | | |
| Power | .. | adjustable to >+10dBm |
| Load Impedance | .. | 600 ohms |
| Distortion (@ -70dBm signal level): | | |
| | | <u>De-emphasised</u> <u>Flat</u> |
| Wide Bandwidth | .. | ≤2% ≤2% |
| Narrow Bandwidth | .. | ≤2% ≤4% |
| Monitor Output: | | |
| Power | .. | 1W |
| Speaker Impedance | .. | 4 ohms |
| Distortion | .. | ≤3% |
| | | (@ -70dBm signal level, links set to de-emphasis) |

1.2.4.2 CTCSS

| | | |
|--------------------------------|----|---|
| Linkable High Pass Filter: | | |
| Bandwidth | .. | 350 to 3400Hz |
| Response | .. | within +1, -3dB of level at 1kHz |
| Hum And Noise | .. | 30dB min. at 250.3Hz |
| (1kHz at 60% system deviation | | 35dB typical (67 to 240Hz) |
| CTCSS at 10% system deviation) | | |
| Tone Detect: | | |
| Tone Squelch Opening | .. | better than 6dB sinad 3dB sinad at 250.3Hz (typical) 4dB sinad at 100Hz (typical) |
| Tone Detect Bandwidth | .. | ±2.1Hz accept (typical) ±3.0Hz reject (typical) |
| Response Time | .. | 150ms open and close (typical) |

1.2.4.3 Mute Operation

Systems Available .. noise mute and carrier mute

Noise Mute:

| | |
|-----------------|--------------------------|
| Operating Range | .. 6-20dB sinad |
| Hysteresis | .. 1.5 to 6dB |
| Threshold | .. adjustable to -105dBm |
| Opening Time | .. 20ms |
| Closing Time | .. 50ms |

Carrier Mute (Optional):

| | |
|-----------------|-------------------|
| Operating Range | .. -115 to -80dBm |
| Hysteresis | .. 2 to 10dB |
| Opening Time | .. 5ms |
| Closing Time | .. 50ms |

Note: The opening and closing times given above are for the standard set-up (SL210 linked and SL220 not linked - refer to Section 3.8).

1.2.5 Microcontroller

Auxiliary Ports:

| | |
|----------------------|---|
| Open Drain Type | .. capable of sinking 2.25mA via 2k2 Ω |
| V _{ds} max. | .. 5V |

1.2.6 Test Standards

Where applicable, this equipment is tested in accordance with the following standards.

1.2.6.1 European Telecommunication Standard

ETS 300 086 January 1991

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment with an internal or external RF connector intended primarily for analogue speech.

ETS 300 113 March 1996

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment intended for the transmission of data (and speech) and having an antenna connector.

ETS 300 219 October 1993

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment transmitting signals to initiate a specific response in the receiver.

ETS 300 279 February 1996

Radio equipment and systems; electromagnetic compatibility (EMC) standard for private land mobile radio (PMR) and ancillary equipment (speech and/or non-speech).

1.2.6.2 DTI CEPT Recommendation T/R-24-01**Annex I: 1988**

Technical characteristics and test conditions for radio equipment in the land mobile service intended primarily for analogue speech.

Annex II: 1988

Technical characteristics of radio equipment in the land mobile service with regard to quality and stability of transmission.

1.2.6.3 Telecommunications Industry Association**ANSI/TIA/EIA-603-1992**

Land mobile FM or PM communications equipment measurement and performance standards.

1.3 Product Codes

The three groups of digits in the T820 Series II product code provide information about the model, type and options fitted, according to the conventions described below.

The following explanation of T820 Series II product codes is not intended to suggest that any combination of features is necessarily available in any one product. Consult your nearest Tait Dealer or Customer Service Organisation for more information regarding the availability of specific models, types and options.

Model

The Model group indicates the basic function of the product, as follows:

| | |
|----------------------|--------------------------|
| T82X -XX-XXXX | T825 receiver |
| | T826 25W transmitter |
| | T827 exciter |
| | T828 50W power amplifier |

Type

The Type group uses two digits to indicate the basic RF configuration of the product.

The first digit in the Type group designates the frequency range:

| | |
|----------------------|------------------|
| T82X- X -XXXX | '1' for 66-88MHz |
|----------------------|------------------|

The second digit in the Type group indicates the channel spacing:

| | |
|-------------------------|------------------------------------|
| T82X-XX- X -XXXX | '0' for wide bandwidth (25kHz) |
| | '5' for narrow bandwidth (12.5kHz) |

Options

| | |
|----------------------|---|
| T82X-XX- XXXX | The Options group uses four digits and/or letters to indicate any options that may be fitted to the product. This includes standard options and special options for specific customers. '0000' indicates a standard Tait product with no options fitted. The large number of options precludes listing them here. |
|----------------------|---|

1.4 Standard Product Range

The following table lists the range of standard T825 types (i.e. no options fitted) available at the time this manual was published. Consult your nearest Tait Dealer or Customer Service Organisation for more information.

| Frequency Range (MHz) ^a | | 66-88 | |
|------------------------------------|------------------------|---------|---------|
| IF Bandwidth (kHz) | | 7.5 | 15 |
| TCXO ^b | ±2.5ppm -30°C to +60°C | • | • |
| Receiver Type: T825- | | 15-0000 | 10-0000 |

- a. Selectable by solder links - refer to Section 3.7.
- b. A TCXO with a stability of ±1ppm (0°C to +60°C) is available to suit specific requirements. Contact your nearest authorised Tait Dealer or Customer Service Organisation for further details.

You can identify the receiver type by checking the product code printed on a label on the rear of the chassis (Figure 1.1 in Part A shows typical labels). You can further verify the receiver type by checking the placement of an SMD resistor in the table that is screen printed onto the PCB (refer to Section 6.1 for more details).

2 T825 Circuit Operation

This section provides a basic description of the circuit operation of the T825 receiver.

Note: Unless otherwise specified, the term "PGM800Win" used in this and following sections refers to version 2.00 and later of the software.

Refer to Section 6 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 parts list and diagrams for the VCO PCB are in Part E.

The following topics are covered in this section.

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| 2.3 | Mixer | 2.5 |
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2.1 Introduction

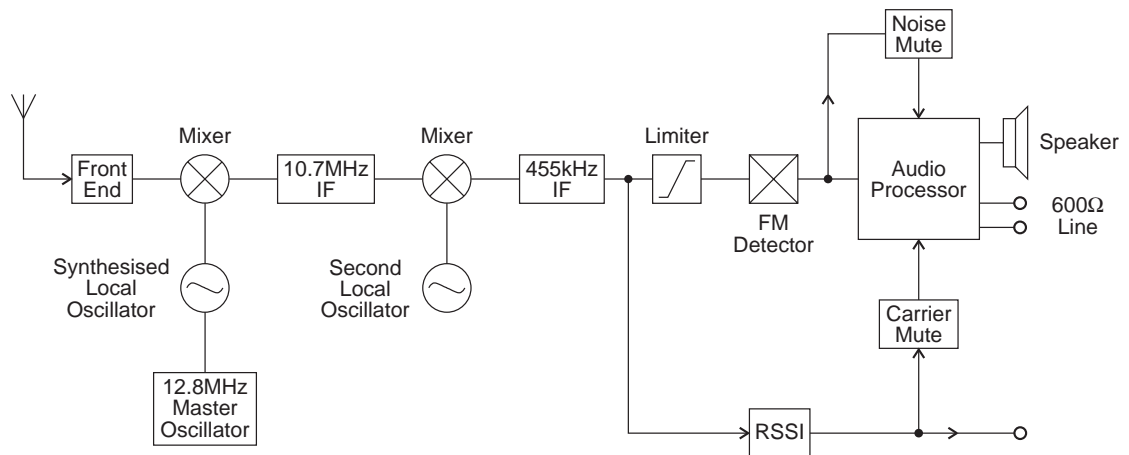


Figure 2.1 T825 High Level Block Diagram

The T825 receiver consists of a number of distinct stages:

- front end
- mixer
- synthesised local oscillator
- IF
- audio processor
- mute (squelch)
- regulator circuits
- received signal strength indicator (RSSI).

These stages are clearly identifiable in Figure 2.1. Refer to the circuit diagrams in Section 6 for further detail.

2.2 Receiver Front End

(Refer to the front end, IF section and audio processor circuit diagrams (sheets 4, 3 and 2 respectively) in Section 6.)

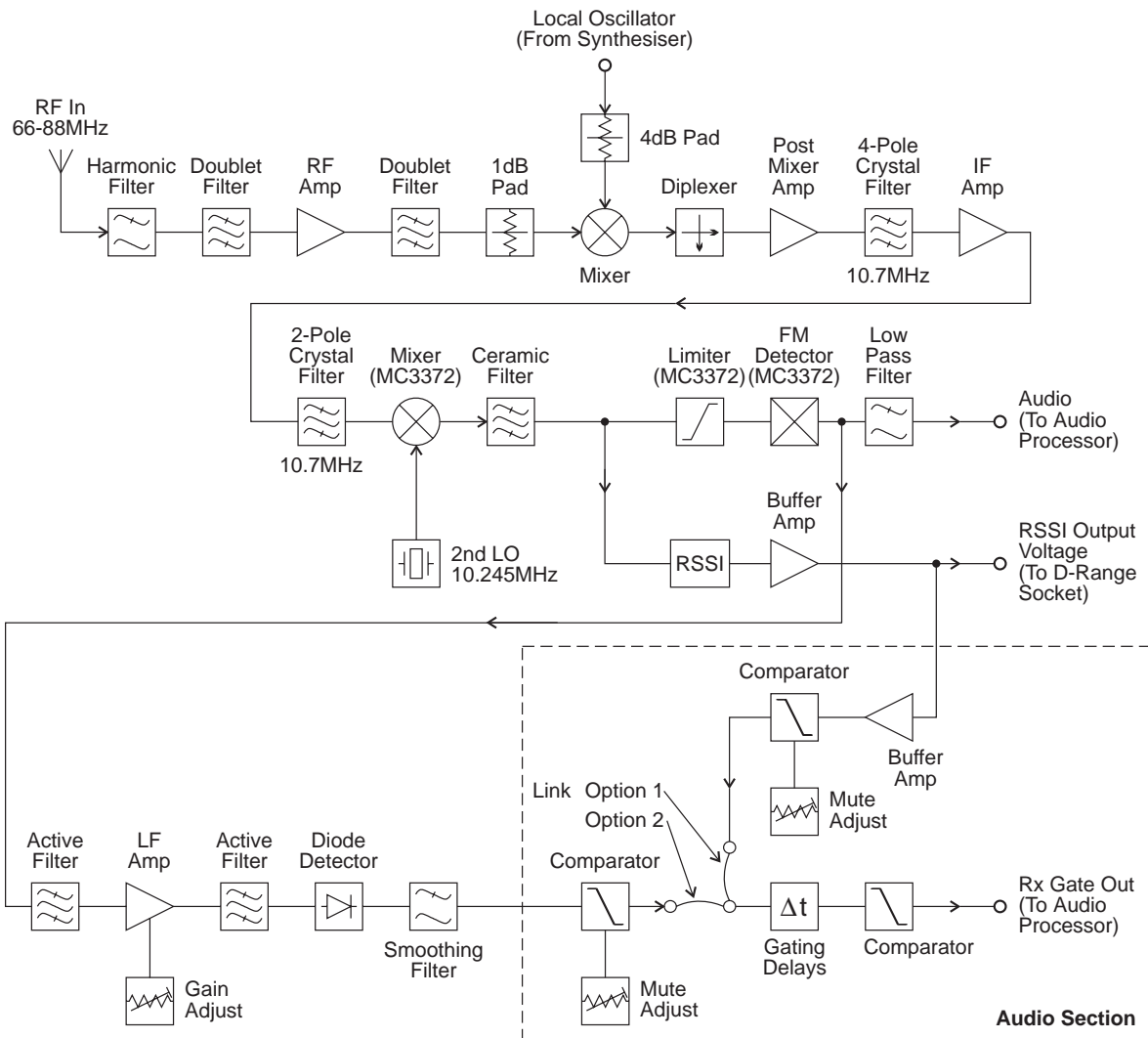


Figure 2.2 T825 Front End, IF and Mute Block Diagram

The incoming signal from the N-type antenna socket is fed through a 7-pole, low pass filter with a cut frequency of approximately 100MHz. This low loss filter (typically less than 0.5dB insertion loss over 66-88MHz) provides excellent immunity to interference from high frequency signals.

The signal is then further filtered, using a notched doublet (L410, L409) which provides exceptional image rejection, before being amplified by approximately 12dB (Q400). The signal is then passed through a further doublet (L403, L402) before being presented to the mixer via an attenuator pad (1dB for narrow bandwidth, 0dB for wide bandwidth).

Each sub-block within the front end has been designed with 50 ohm terminations for ease of testing and fault finding.

2.3 Mixer

(Refer to the front end circuit diagram (sheet 4) in Section 6 and Figure 2.2.)

IC410 is a high level mixer requiring a local oscillator (LO) drive level of +17dBm (nominal). The voltage controlled oscillator (VCO) generates a level of +22dBm (typical) and this is fed to the mixer via a 4dB attenuator pad. A diplexer terminates the IF port of the mixer in a good 50 ohms, thus preventing unnecessary intermodulation distortion.

2.4 IF Circuitry

(Refer to the IF section circuit diagram (sheet 3) in Section 6 and Figure 2.2.)

Losses in the mixer are made up for in a tuned, common gate, post mixer amplifier (Q302). Several stages of amplification and filtering are employed in the IF circuitry. The first crystal filter is a 4-pole device (&XF300 and &XF301) which is matched into 50 ohms on both its input and output ports. This stage is followed by a two-stage amplifier (designed as a 50 ohm block) and second crystal filter (2 pole, &XF302), after which the signal is mixed down to 455kHz with the second local oscillator (10.245MHz) by IC330.

The 455kHz signal is filtered using a six-pole ceramic filter (&XF304) before being limited and detected.

The second IF mixer, limiter, detector and RSSI is in a 16-pin IC (IC330). Quadrature detection is employed, using L330, and the recovered audio on pin 9 of IC330 is typically 1.0V p-p for 60% system deviation.

2.5 Noise Mute (Squelch)

(Refer to the audio processor and IF section circuit diagrams (sheets 2 and 3 respectively) in Section 6 and Figure 2.2.)

The noise mute operates on the detected noise outside the audio bandwidth. An operational amplifier in IC340 is used as an active band pass filter centred on 70kHz to filter out audio components. The noise spectrum is then further amplified in a variable gain, operational amplifier (IC340), followed by another active band pass filter. The noise is then rectified (D330) and filtered to produce a DC voltage proportional to the noise amplitude. The lowest average DC voltage corresponds to a high RF signal strength and the highest DC voltage corresponds to no signal at the RF input.

The rectified noise voltage is compared with a threshold voltage set up on RV230, the front panel "Gating Sensitivity" potentiometer. Hysteresis is introduced by the feedback resistor (R267) to prevent the received message from being chopped when the average noise voltage is close to the threshold. R281 and R280 determine the mute opening and closing times and, in combination with solder links SL210 and SL220, provide three time delay options (SL210 is linked as standard - refer to Section 3.8). The mute control signal at pin 1 of IC270 is used to disable the speaker and line audio outputs. The speaker output can be separately enabled for test purposes by operating the front panel mute disable switch, SW201.

2.6 Carrier Mute

(Refer to the audio processor and IF section circuit diagrams (sheets 2 and 3 respectively) in Section 6 and Figure 2.2.)

A high level carrier mute facility is also available. The RSSI (refer to Section 2.12) provides a DC voltage proportional to the signal strength. This voltage is compared with a preset level, set up on RV235, and may be linked into the mute timing circuit using PL250. PL250 selects either the noise mute or the carrier mute. From this point both the noise and carrier mute circuits operate in the same manner, using common circuitry.

2.7 Audio Processor

(Refer to the audio processor circuit diagram (sheet 2) in Section 6.)

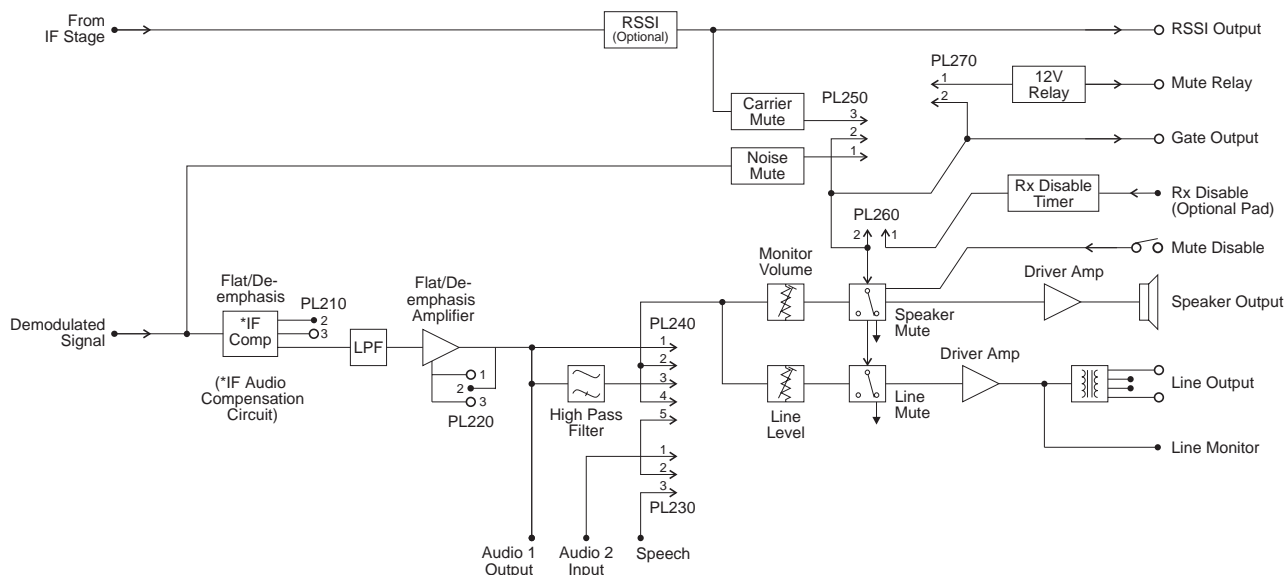


Figure 2.3 T825 Audio Processor Block Diagram

The recovered audio on pin 9 of IC330 is passed through a frequency compensation network and a third order elliptic active filter (IC210) to give the required response. Linking (PL220 & PL210) is available to give either a flat or de-emphasised audio response, with de-emphasis giving a 6dB/octave roll off. The output of IC210 is split to provide separate paths for the speaker and line outputs. The "Audio 1", Audio 2" and "Speech" lines allow access to the receiver's audio path for external signalling purposes (refer to Section 3.5).

The signals are passed to audio drive amplifiers IC240 and IC260. Under muted conditions the inputs of these amplifiers are shunted to ground via transistors Q230 and Q290 respectively. The audio output of IC240 has a DC component which is removed by C249, and this then drives a speaker directly. The output of IC260 is fed into a line transformer to provide a balanced 2-wire or 4-wire, 600 ohm output.

The speaker volume is set using the front panel "Monitor Volume" knob (RV205) and the line level is set using the recessed "Line Level" potentiometer (RV210).

The red front panel "Gate" LED (D250) indicates the status of the mute circuit. When a signal above the mute threshold is received, the LED is illuminated. The "Monitor Mute" switch (SW201) on the front panel opens the mute, allowing continuous monitoring of the audio signal (on = audio muted; off = audio unmuted).

The mute control line is available on pads 234 and 231 ("RX GATE OUT") for control of external circuitry. A high (9V) indicates that the audio is disabled and a low (0V) indicates that a signal above the mute threshold level is being received.

The audio can also be disabled using the "RX-DISABLE" inputs, pads 225 or 228, having connected the "RX-DISABLE" link between pins 1 & 2 of PL260. An adjustable time delay (RV220) is provided on these lines. In order to disable the audio, either pad must be pulled to 0V.

An undedicated relay is provided (RL210) for transmitter keying or other functions and this can be operated from the mute line by linking pins 1 & 2 of PL270.

2.8 Power Supply And Regulators

(Refer to the regulators circuit diagram (sheet 6) in Section 6.)

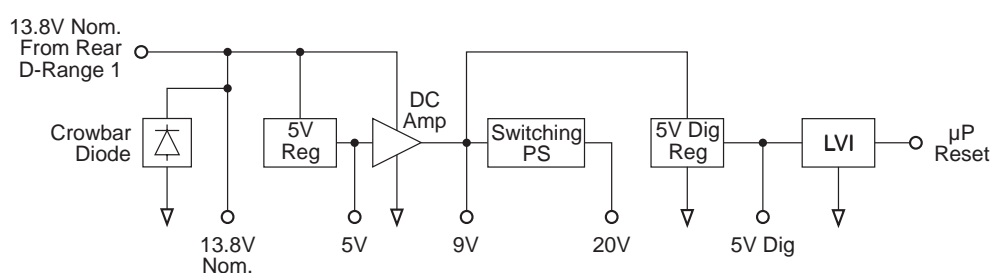


Figure 2.4 T825 Power Supply And Regulators Block Diagram

The T825 is designed to operate off a 10.8-16V DC supply (13.8V nominal). A 5.3V regulator (IC630) runs directly from the 13.8V rail, driving much of the synthesiser circuitry. It is also used as the reference for a DC amplifier (IC640, Q630 & Q620) which provides a medium current capability 9V supply.

A switching power supply, based on Q670 and Q660, runs off the 9V supply and provides a low current capability +20V supply. This is used to drive the synthesiser loop filter (IC740), giving a VCO control voltage of up to 20V.

The 13.8V supply drives both output audio amplifiers without additional regulation. A separate 5V regulator (IC610) drives the microprocessor and associated digital circuitry. The output of this regulator is monitored by the Low Voltage Interrupt (LVI) circuit (IC650).

A crowbar diode is fitted for protection against connection to a power supply of incorrect polarity. It also provides transient overvoltage protection.

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

2.9 Microcontroller

(Refer to the microcontroller circuit diagram (sheet 8) in Section 6.)

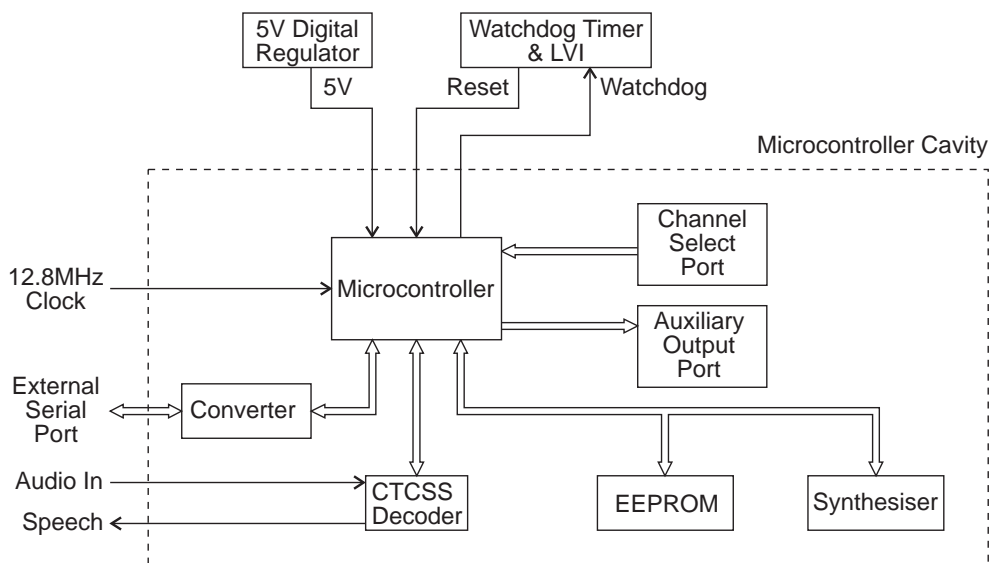


Figure 2.5 T825 Microcontroller Block Diagram

Overall system control of the T825 is accomplished by the use of a member of the 80C51 family of microcontrollers (IC810) which runs from internal ROM and RAM. Four ports are available for input/output functions.

Non-volatile data storage is achieved by serial communication with a 16kBit EEPROM (IC820). This serial bus is also used by the microcontroller to program the synthesiser (IC740).

The main tasks of the microcontroller are as follows:

- program the synthesiser;
- interface with the PGM800Win programming software at 9600 baud via the serial communication lines on D-range 1 (PL100) & D-range 2;
- monitor channel change inputs from D-range 2;
- generate timing waveforms for CTCSS detection;
- coordinate and implement timing control of the receiver;
- control the front panel "Supply" LED.

2.10 Synthesised Local Oscillator

(Refer to the synthesiser circuit diagram (sheet 7) in Section 6 and the VCO circuit diagram in Part E.)

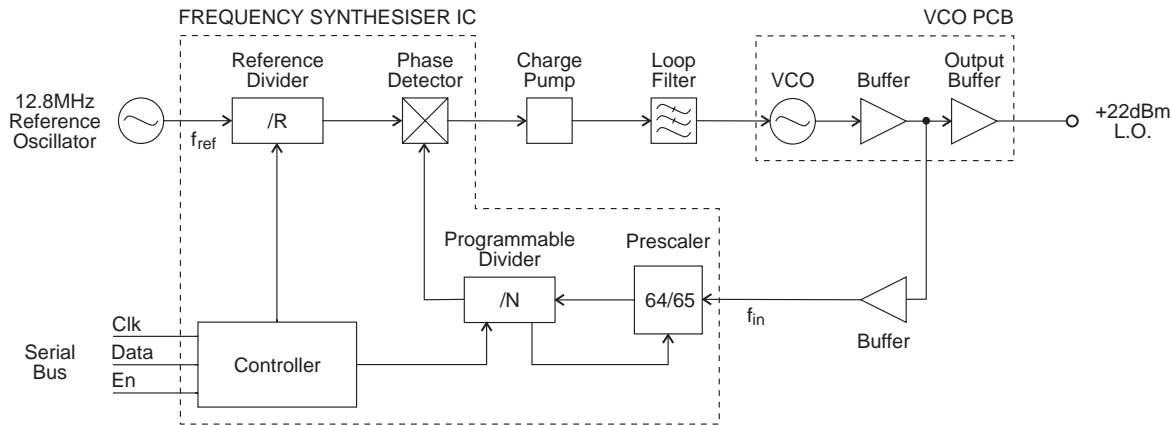


Figure 2.6 T825 Synthesiser Block Diagram

The synthesiser (IC740) employs a phase-locked loop (PLL) to lock a voltage controlled oscillator (VCO) to a given reference frequency. The synthesiser receives the divider information from the control microprocessor via a 3-wire serial bus (clock, data, enable). When the data has been latched in, the synthesiser processes the incoming signals from the VCO buffer (f_{in}) and the reference oscillator (f_{ref}).

A reference oscillator at 12.8MHz (=IC700) is buffered (IC710) and divided down to 6.25kHz or 5kHz within the synthesiser IC (IC740).

A buffered output of the VCO is divided with a prescaler and programmable divider which is incorporated into the synthesiser chip (IC740). This signal is compared with the reference signal at the phase detector (also part of the synthesiser chip). The phase detector outputs drive a balanced charge pump circuit (Q760, Q770, Q775, Q780, Q785) and active loop filter (IC750, Q790) which produces a DC voltage between 0V and 20V to tune the VCO. This VCO control line is further filtered (R510, C505) to attenuate noise and other spurious signals. Note that the VCO frequency increases with increasing control voltage.

2.11 VCO

(Refer to the VCO circuit diagram in Part E.)

The VCO transistor (Q1) operates in a common source configuration, with an LC tank circuit coupled between its gate and drain to provide the feedback necessary for oscillation. The VCO control voltage from the loop filter (IC750) is applied to the varicaps (D1-D6) to facilitate tuning within a 2MHz band of frequencies. A trimcap (&VC1-RX) is used for coarse tuning of the VCO. The output from the oscillator circuit drives a cascode amplifier stage (Q2, Q3) which supplies +10dBm (typically) to a further stage of amplification, Q5. This is the final amplifier on the VCO PCB, and delivers +22dBm (typically) to the receiver mixer input pad.

A low level "sniff" is taken from the input to Q5 and used to drive the divider buffer for the synthesiser (IC740).

The VCO operates at the actual frequency required by the first mixer, i.e. there are no multiplier stages.

The VCO frequency spans from 76.7-98.7MHz and is tuned to 10.7MHz above the desired receive frequency (high side injection) to produce a 10.7MHz IF signal at the output of the mixer.

2.12 Received Signal Strength Indicator (RSSI)

(Refer to the IF section circuit diagram (sheet 3) in Section 6.)

The RSSI provides a DC voltage proportional to the signal level at the receiver input and is an on-chip function of IC330. RSSI level adjustment, temperature compensation and buffering is provided by IC332 and IC333. The RSSI voltage is available at D-range 1 (PL100 pin 5).

The RSSI also provides the capability for high level signal strength muting, which may be selected on PL250 (refer to Section 3.5). The mute threshold may be set between -115dBm and -70dBm at RV235.

3 T825 Initial Tuning & Adjustment



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

The following section describes both short and full tuning and adjustment procedures and provides information on:

- channel programming
- selecting the required audio links
- synthesiser alignment
- receiver front end and IF alignment
- noise and carrier level mute adjustment
- setting the line and monitor output levels
- setting up the RSSI.

Note: Unless otherwise specified, the term "PGM800Win" used in this and following sections refers to version 2.00 and later of the software.

Refer to Section 6 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 parts list and diagrams for the VCO PCB are in Part E.

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| 3.11 | Audio Processor | 3.13 |
| 3.11.1 | Line Amplifier Output | 3.13 |
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| 3.12 | CTCSS | 3.13 |
| 3.12.1 | Decoder Operation | 3.13 |
| 3.12.2 | Opening Sinad | 3.13 |
| 3.12.3 | High Pass Filter | 3.14 |
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| 3.1 | T825 Test Equipment Set-up For Short Tuning Procedure | 3.4 |
| 3.2 | T825 Test Equipment Set-up For Full Tuning & Adjustment Procedure | 3.4 |

3.1 Introduction

When you receive your T825 receiver it will be run up and working on a particular frequency (the "default channel")¹. If you want to switch to a frequency that is within the 2MHz switching range (i.e. ± 1 MHz from the factory programmed frequency), you should only need to reprogram the receiver with the PGM800Win software (refer to the PGM800Win programming kit and Section 3.2 below).

However, if you want to switch to a frequency outside the 2MHz switching range, you will have to reprogram and re-tune the receiver to ensure correct operation. In this case you should carry out the short tuning procedure described in Section 3.4.

If you have carried out repairs or other major adjustments, you must carry out the full tuning and adjustment procedure described in this section (except for Section 3.4).

3.2 Channel Programming

You can program up to 128 channel frequencies into the receiver's EEPROM memory (IC820) by using the PGM800Win software package and an IBM™ PC. You can also use PGM800Win to select the receiver's current operating frequency (or "default channel").

If the receiver is installed in a rack frame, you can program it via the programming port in the speaker panel. However, you can also program the receiver before it is installed in a rack frame as follows:

- by using a T800-01-0010 calibration test unit;
- via D-range 1;
- via D-range 2 (standard T800-03-0000 auxiliary D-range only);
- via SK805 (internal Micromatch connector).

If you do not use the T800-01-0010, you will have to connect the PC to the receiver via a module programming interface (such as the T800-01-0004).

For a full description of the channel programming procedure, refer to the PGM800Win programming software user's manual.

Note: When an auxiliary D-range kit (D-range 2 - T800-03-0000) is fitted, you can also select a channel with an external switch, such as the DIP switch on the rack frame backplane PCB. Refer to Part C in the T800 Series Ancillary Equipment Service Manual (M800-00-101 or later issue) or consult your nearest Tait Dealer or Customer Service Organisation for further details.

1. Use the "Read Module" function in PGM800Win to find out what the default channel is.

3.3 Test Equipment Required

You will need the following test equipment:

- computer with PGM800Win installed
 - T800 programming kit
 - module programming interface (e.g. T800-01-0004 - optional)
 - 13.8V power supply
 - digital multimeter
 - audio signal generator
 - RF signal generator
 - audio voltmeter
 - sinad meter
- } or RF test set (optional)
- oscilloscope
 - distortion meter
- } not needed for short tuning procedure
- T800-01-0010 calibration test unit (optional)
 - 4Ω speaker (not needed if the calibration test unit is used)

Figure 3.1 and Figure 3.2 show typical test equipment set-ups (with and without a T800-01-0010 calibration test unit).

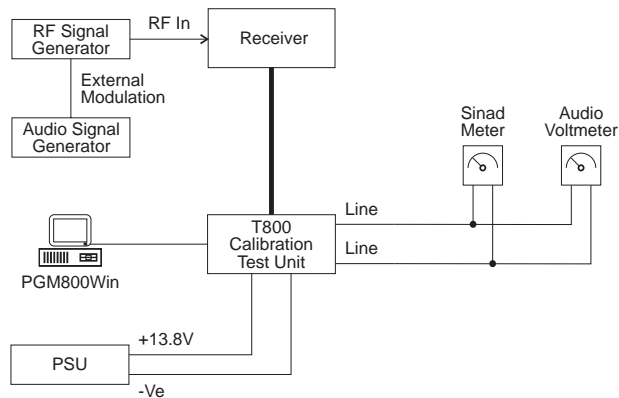


Figure 3.1 T825 Test Equipment Set-up For Short Tuning Procedure

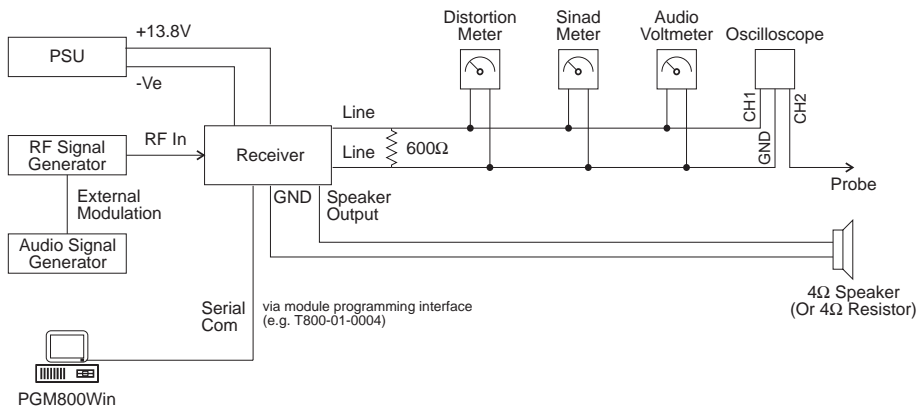


Figure 3.2 T825 Test Equipment Set-up For Full Tuning & Adjustment Procedure

3.4 Short Tuning Procedure

Use this procedure only if you want to reprogram the receiver to a frequency outside the 2MHz switching range and do not intend to carry out any other major adjustments or repairs.

3.4.1 Introduction

Reprogram the operating frequency as described in the PGM800Win programming kit (refer to Section 3.2).

Remove the top cover (nearest the handle).

Set up the test equipment as described in Section 3.3.

Set the links in the audio processor section as required (refer to Section 3.5).

3.4.2 Synthesiser Alignment

- Connect a high impedance voltmeter to PL4-1 or the junction of L1 & R1 in the VCO (this measures the synthesiser loop voltage).

- **Single Channel** Tune VCO trimmer & VC1-RX for a synthesiser loop voltage of 9V.

Multichannel Tune VCO trimmer & VC1-RX for a synthesiser loop voltage of 9V on the middle channel.

If there is no middle channel, tune & VC1-RX so that the channels are symmetrically placed around a loop voltage of 9V.

All channels should lie within the upper and lower limits of 13V and 5V respectively.

Do not attempt to program channels with a greater frequency separation than the specified switching range of 2MHz.

3.4.3 Front End Alignment

Note 1: In this and following sections deviation settings are given first for wide bandwidth sets, followed by settings in brackets for narrow bandwidth sets [].

Note 2: For multichannel operation align the receiver on a frequency in the middle of the required band.

Set RV230 (front panel gating sensitivity) fully clockwise.

Inject a strong on-channel RF signal with $\pm 3\text{kHz}$ deviation [$\pm 1.5\text{kHz}$] at 1kHz into the antenna socket and adjust front end doublets L410, L409, L403 & L402 to give best sinad.

Continually decrease the RF level to maintain 12dB sinad.

Readjust L410, L409, L403 & L402 to give best sinad.

With PL210 and PL220 connected for de-emphasised audio response, the receiver sensitivity should be better than -117dBm , assuming that the audio levels are not being overdriven (refer to Section 3.4.5).

3.4.4 Mute Adjustment

Carry out the one of the following sets of instructions according to the mute option you have selected.

3.4.4.1 Noise Mute

Connect pins 1 & 2 of PL250 to enable the noise mute.

Set the RF level to -105dBm with $\pm 3\text{kHz}$ deviation [$\pm 1.5\text{kHz}$] at 1kHz .

Set RV230 (front panel gating sensitivity) fully anticlockwise.

Adjust RV331 (noise mute gain) fully anticlockwise to close the mute (if necessary turn off the RF signal and then turn it on again).

Rotate RV331 clockwise until the mute just opens.

Reset the signal generator for the required opening sinad and adjust RV230 clockwise until the mute just opens.

3.4.4.2 Carrier Level Mute

Connect pins 2 & 3 of PL250 to enable the carrier mute and disable the noise mute.

Apply an on-channel signal from the RF generator at the required mute opening level with $\pm 3\text{kHz}$ deviation [$\pm 1.5\text{kHz}$] at 1kHz .

Adjust RV235 (carrier mute) clockwise to close the mute (if necessary, momentarily turn off the RF), then slowly adjust it anticlockwise until the mute just opens. The mute should now open at this preset level.

3.4.5 Line Amplifier Output

Apply an on-channel signal from the RF generator at a level of -70dBm with $\pm 3\text{kHz}$ deviation [$\pm 1.5\text{kHz}$] at 1kHz .

Adjust RV210 (front panel line level) to set the line level to the required output level.

3.4.6 CTCSS

3.4.6.1 Decoder Operation

Program a CTCSS tone on the default channel using PGM800Win.

Set the RF signal generator output to -70dBm.

Modulate the generator with both:

- a 1kHz tone at ± 3 kHz deviation [± 1.5 kHz];
- and a CTCSS tone at the programmed frequency at ± 500 Hz deviation [± 300 Hz].

Check that the receiver gate opens and the front panel "Gate" LED is on.

3.4.6.2 Opening Sinad

Ensure a CTCSS tone is present (as described in Section 3.4.6.1).

Adjust RV230 (front panel gating sensitivity) fully clockwise.

Reduce the RF signal level to -110dBm.

Observe the sinad meter and reduce the RF level until the receiver mute closes.

Slowly increase the signal level until the receiver mute just opens and stays open.

With PL240 pins 1 & 2 linked (high pass filter bypassed), check that the sinad is less than 6dB.

Reset the signal generator for the required opening sinad, adjust RV230 fully anti-clockwise, then clockwise until the mute just opens.

3.4.6.3 High Pass Filter

Ensure a CTCSS tone is present (as described in Section 3.4.6.1).

Set the audio processor links as follows:

| Plug | Link | Function |
|-------|-------|---|
| PL210 | 1 - 2 | de-emphasised response |
| PL220 | 2 - 3 | |
| PL230 | 2 - 3 | audio from internal CTCSS speech filter |
| PL240 | 4 - 5 | audio input via PL230 or I/O pad |

Reset the RF signal generator output to -70dBm and note the line level (measurement A).

Reduce the 1kHz generator to zero output and measure the line level again (measurement B).

Check that measurement B is at least 30dB below measurement A.

3.4.7 RSSI (If Used)

Align the receiver as instructed in Section 3.6 and Section 3.7.

Apply an on-channel signal from the RF generator at a level of -100dBm with ± 3 kHz deviation [± 1.5 kHz] at 1kHz.

Adjust RV330 (RSSI level) to give 4.5V RSSI output on pin 5 of D-range 1 (PL100) when measured with a high impedance DMM.

3.5 Audio Processor Links

3.5.1 General

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 the receiver alignment. The factory settings are shown in brackets [].

| Plug | Link | Function |
|--------------------|---------------------------|--|
| PL210 | [1 - 2] 2 - 3 | de-emphasised response flat response |
| PL220 | 1 - 2 [2 - 3] | flat response de-emphasised response |
| PL230 ^a | 1 - 2 [2 - 3] 3 - 4 | audio input via AUDIO-2 pad audio from internal CTCSS speech filter audio input via I/O pad P250 |
| PL240 ^a | 1 - 2 | bypass high pass filter |
| | [2 - 3] or 3 - 4 | 300Hz high pass filter in circuit |
| | 4 - 5 | audio input via PL230 or I/O pad |
| PL250 | [1 - 2] 2 - 3 | noise mute carrier mute |
| PL260 | 1 - 2 [2 - 3] | RX-DISABLE link not connected |

| Plug | Link | Function |
|-------|------------------|-----------------------------|
| PL270 | [1 - 2] 2 - 3 | relay link not connected |

- a. Refer to Section 3.5.2 for further details.

3.5.2 Audio Processor Linking Details For CTCSS

You must connect the audio processor links correctly according to the CTCSS option used, as shown in the table below.

| CTCSS Option | PL230 | PL240 |
|--|-------|-------|
| standard, no CTCSS | 2 - 3 | 2 - 3 |
| received CTCSS + speech passed to line output | 3 - 4 | 1 - 2 |
| high pass filtered speech, internal CTCSS detection | 2 - 3 | 4 - 5 |
| external CTCSS detection | 1 - 2 | 4 - 5 |

The conditions stated in the above table are defined as follows:

- standard, no CTCSS
 - no CTCSS or other sub-audio signalling used
 - audio bandwidth 300Hz to 3kHz
 - hum & noise -55dB
- received CTCSS tone
+ speech to line output
 - tone and speech transmitted down 600 ohm line
 - audio bandwidth 10Hz to 3kHz
 - hum & noise -45dB
- high pass filtered speech
+ internal CTCSS detection
 - 400Hz to 3kHz
 - hum & noise -30dB with 250.3Hz tone present
- external CTCSS detection
 - decoding performed through the receiver (but externally)
 - speech injected back into receiver via "AUDIO-2" and sent down 600 ohm line

Note 1: AUDIO-2 is available on D-range 1 (PL100) pin 7 via the link resistor R160. Although PL100 pin 7 is already assigned to SERIAL-COM, this can be disabled by removing R808.

Note 2: External CTCSS units can connect in series with the audio chain via AUDIO-1 and AUDIO-2.

3.6 Synthesiser Alignment

- Ensure that the receiver has been programmed with the required frequencies using PGM800Win software.
- Connect a high impedance voltmeter to PL4-1 or the junction of L1 & R1 in the VCO (this measures the synthesiser loop voltage).
- **Single Channel** Tune VCO trimmer &VC1-RX for a synthesiser loop voltage of 9V.
- **Multichannel** Tune VCO trimmer &VC1-RX for a synthesiser loop voltage of 9V on the middle channel.
If there is no middle channel, tune &VC1-RX so that the channels are symmetrically placed around a loop voltage of 9V.
All channels should lie within the upper and lower limits of 13V and 5V respectively.
Do not attempt to program channels with a greater frequency separation than the specified switching range of 2MHz.
- The TCXO (=IC700) output frequency should be trimmed when the IF is tuned - refer to Section 3.7.

3.7 Alignment Of Receiver Front End And IF

Note 1: In this and following sections deviation settings are given first for wide bandwidth sets, followed by settings in brackets for narrow bandwidth sets [].

Note 2: Before carrying out this alignment procedure, check that the solder links in the receiver front end are set as described in the following table:

| Frequency Range | Linked | Not Linked |
|-----------------|--------------------------------------|--------------------------------------|
| 66-76MHz | #SL400 #SL402 #SL403 #SL405 | #SL401 #SL404 |
| 76-88MHz | #SL401 #SL404 | #SL400 #SL402 #SL403 #SL405 |

Align the synthesiser as instructed in Section 3.6. For multichannel operation align the receiver on a frequency in the middle of the required band.

Set RV230 (front panel gating sensitivity) fully clockwise.

Inject a strong on-channel RF signal with $\pm 3\text{kHz}$ deviation [$\pm 1.5\text{kHz}$] at 1kHz into the antenna socket and adjust front end doublets L410, L409, L403 & L402 to give best sinad.

Continually decrease the RF level to maintain 12dB sinad.

Tune quad coil L330 for maximum audio level.

While maintaining a low level unmodulated RF input to the receiver, loosely couple into the first IF an additional high level signal at 10.7MHz - you will hear a beat note.

Trim the synthesiser TCXO (=IC700) for zero beat.

Note: If a second oscillator is not available, you can connect a frequency counter to IC710 pin 6 (i.e. after the TCXO buffer) via an oscilloscope probe to measure the TCXO frequency directly (12.8MHz). At this point the voltage level is approximately 4V p-p.

Readjust L410, L409, L403 & L402 to give best sinad.

Change the RF signal level to -70dBm and modulate with $\pm 3\text{kHz}$ deviation [$\pm 1.5\text{kHz}$] at 1kHz .

Connect plugs PL210 and PL220 to give a flat audio response (refer to Section 3.5).

Adjust quad coil L330 and CV300 for minimum audio distortion.

Check that the distortion reading is:

| | |
|------------------|------------|
| wide bandwidth | $\leq 2\%$ |
| narrow bandwidth | $\leq 4\%$ |

If required, reconnect plugs PL210 and PL220 to give a de-emphasised audio response and check that the distortion reading is $\leq 2\%$ (both bandwidths).

Reduce the RF level until 12dB sinad is reached. The receiver sensitivity should be better than -117dBm (de-emphasised) or -111dBm (flat), assuming that the audio levels are not being overdriven (refer to Section 3.11).

3.8 Gating Delay

Two solder links (SL210 & SL220) are provided on the top of the PCB to allow three gate delay time options, as shown in the table below.

| SL210 | SL220 | Closing Delay |
|------------|------------|---------------|
| linked | not linked | <50ms* |
| not linked | linked | <25ms |
| not linked | not linked | <20ms |

*Factory setting.

3.9 Noise Mute Adjustment

Connect pins 1 & 2 of PL250 to enable the noise mute.

Align the receiver as instructed in Section 3.6 and Section 3.7.

Set the RF level to -105dBm with ± 3 kHz deviation [± 1.5 kHz] at 1kHz.

Set RV230 (front panel gating sensitivity) fully anticlockwise.

Adjust RV331 (noise mute gain) fully anticlockwise to close the mute (if necessary turn off the RF signal and then turn it on again).

Rotate RV331 clockwise until the mute just opens.

Reset the signal generator for the required opening sinad and adjust RV230 clockwise until the mute just opens.

3.10 Carrier Level Mute

Connect pins 2 & 3 of PL250 to enable the carrier mute and disable the noise mute.

Apply an on-channel signal from the RF generator at the required mute opening level with ± 3 kHz deviation [± 1.5 kHz] at 1kHz.

Adjust RV235 (carrier mute) clockwise to close the mute (if necessary, momentarily turn off the RF), then slowly adjust it anticlockwise until the mute just opens. The mute should now open at this preset level.

3.11 Audio Processor

3.11.1 Line Amplifier Output

Apply an on-channel signal from the RF generator at a level of -70dBm with ± 3 kHz deviation [± 1.5 kHz] at 1kHz.

Adjust RV210 (front panel line level) to give an output of +10dBm on the 600 ohm line.

Check for any clipping or distortion on the oscilloscope.

Set the line level to the required output level.

3.11.2 Monitor Amplifier Output (Speaker Output)

Adjust RV205 (front panel monitor volume) to give an output of 2V rms into a 4 ohm resistive load.

Check for any clipping or distortion on the oscilloscope.

Switch to a 4 ohm speaker and adjust RV205 to the required level.

3.12 CTCSS

3.12.1 Decoder Operation

Program a CTCSS tone on the default channel using PGM800Win.

Set the RF signal generator output to -70dBm.

Modulate the generator with both:

- a 1kHz tone at ± 3 kHz deviation [± 1.5 kHz];
- and a CTCSS tone at the programmed frequency at ± 500 Hz deviation [± 300 Hz].

Check that the receiver gate opens and the front panel "Gate" LED is on.

3.12.2 Opening Sinad

Ensure a CTCSS tone is present (as described in Section 3.12.1).

Adjust RV230 (front panel gating sensitivity) fully clockwise.

Reduce the RF signal level to -110dBm.

Observe the sinad meter and reduce the RF level until the receiver mute closes.

Slowly increase the signal level until the receiver mute just opens and stays open.

With PL240 pins 1 & 2 linked (high pass filter bypassed), check that the sinad is less than 6dB.

Reset the signal generator for the required opening sinad, adjust RV230 fully anti-clockwise, then clockwise until the mute just opens.

3.12.3 High Pass Filter

Ensure a CTCSS tone is present (as described in Section 3.12.1).

Set the audio processor links as follows:

| Plug | Link | Function |
|-------|-------|---|
| PL210 | 1 - 2 | de-emphasised response |
| PL230 | 2 - 3 | audio from internal CTCSS speech filter |
| PL240 | 4 - 5 | audio input via PL230 or I/O pad |

Reset the RF signal generator output to -70dBm and note the line level (measurement A).

Reduce the 1kHz generator to zero output and measure the line level again (measurement B).

Check that measurement B is at least 30dB below measurement A.

3.13 RSSI

Align the receiver as instructed in Section 3.6 and Section 3.7.

Apply an on-channel signal from the RF generator at a level of -100dBm with ± 3 kHz deviation [± 1.5 kHz] at 1kHz.

Adjust RV320 (RSSI level) to give 4.5V RSSI output on pin 5 of D-range 1 (PL100) when measured with a high impedance DMM.

6 T825 PCB Information



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

This section provides the following information on the T825 receiver:

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

| Section | Title | IPN | Page |
|---------|-------------------|--------------|-------|
| 6.1 | Introduction | | 6.1.3 |
| 6.2 | T825 Receiver PCB | 220-01446-03 | 6.2.1 |

6.1 Introduction

Product Type Identification

You can identify the receiver type by checking the product code printed on a label on the rear of the chassis (product codes are explained in Section 1.3 in this Part of the manual, and Figure 1.1 in Part A shows typical labels). You can further verify the receiver type by checking the placement of an SMD resistor in the table that is screen printed onto the top side of the PCB, similar to the example drawn below. In this example, the resistor indicates that the product was built as a T825-10-XXXX.

| <table border="1"> <tbody> <tr> <td>■ ■ 825-</td> </tr> <tr> <td>■ ■ 825-</td> </tr> <tr> <td>■ ■ 825-</td> </tr> <tr> <td>PRODUCT TYPE</td> </tr> </tbody> </table> | ■ ■ 825- | ■ ■ 825- | ■ ■ 825- | PRODUCT TYPE | <table border="1"> <thead> <tr> <th colspan="2">PRODUCT TYPE</th> </tr> </thead> <tbody> <tr> <td>■ ■ 825-10</td> <td>■ ■ 825-</td> </tr> <tr> <td>■ ■ 825-</td> <td>■ ■ 825-</td> </tr> <tr> <td>■ ■ 825-15</td> <td>■ ■ 825-</td> </tr> </tbody> </table> | PRODUCT TYPE | | ■ ■ 825-10 | ■ ■ 825- | ■ ■ 825- | ■ ■ 825- | ■ ■ 825-15 | ■ ■ 825- |
|--|----------|----------|----------|--------------|---|--------------|--|------------|----------|----------|----------|------------|----------|
| ■ ■ 825- | | | | | | | | | | | | | |
| ■ ■ 825- | | | | | | | | | | | | | |
| ■ ■ 825- | | | | | | | | | | | | | |
| PRODUCT TYPE | | | | | | | | | | | | | |
| PRODUCT TYPE | | | | | | | | | | | | | |
| ■ ■ 825-10 | ■ ■ 825- | | | | | | | | | | | | |
| ■ ■ 825- | ■ ■ 825- | | | | | | | | | | | | |
| ■ ■ 825-15 | ■ ■ 825- | | | | | | | | | | | | |

Note: The only function of this resistor is to indicate the product type. It has no effect on the circuitry or operation of the receiver.

PCB Identification

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



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

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

Parts Lists

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

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

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

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

Annotations:

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

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

Parts List Amendments

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

| Parts List Amendments | IPN of new component | Change Order number |
|---|----------------------|---------------------|
| R306 | 036-13560-00 | 71003 |
| Changed from 180Ω to 560Ω (036-13560-00) to increase sensitivity (71003). | | |

Annotations:

- circuit reference or IPN
- description of change

Variant Components

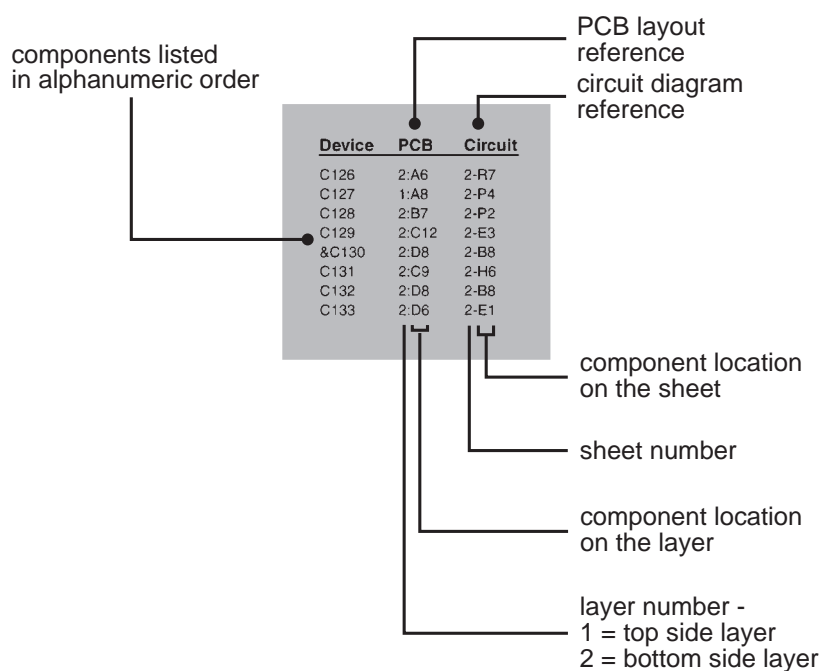
A variant component is one that has the same circuit reference but different value or specification in different product types. Where two products share the same PCB, the term “variant” is also used to describe components unplaced in one product. Variant components have a character prefix, such as “&”, “=” or “#”, before the circuit reference (e.g. &R100).

The table below explains the variant prefixes used in T800 Series II products:

| If the variant prefix is. . . | the component will. . . |
|-------------------------------|---|
| & | change according to channel spacing |
| = | change according to frequency stability |
| # | change according to frequency range |
| % | change or be placed/unplaced for special applications |
| * | be unplaced in one product (where two products share the same PCB) |

Grid Reference Index

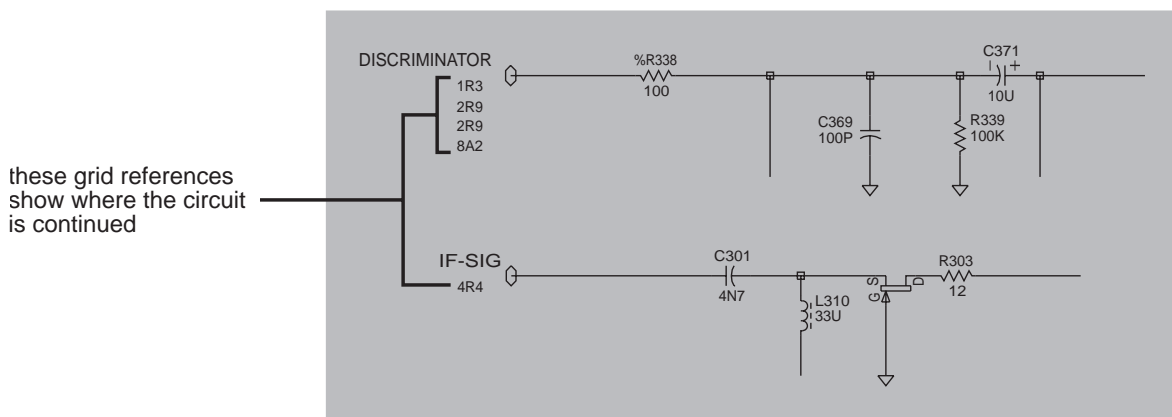
This section contains a component grid reference index to help you find components and labelled pads on the PCB layouts and circuit diagrams. This index lists the components and pads in alphanumeric order, along with the appropriate alphanumeric grid references, as shown below:



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).



6.2 T825 Receiver PCB

This section contains the following information.

| IPN | Section | Page |
|--------------|----------------------------------|--------|
| 220-01446-03 | Parts List | 6.2.3 |
| | Mechanical & Miscellaneous Parts | 6.2.9 |
| | Grid Reference Index | 6.2.11 |
| | PCB Layout - Top Side | 6.2.15 |
| | PCB Layout - Bottom Side | 6.2.16 |
| | Receiver Overview Diagram | 6.2.17 |
| | Audio Processor Circuit Diagram | 6.2.18 |
| | IF Section Circuit Diagram | 6.2.19 |
| | Front End Circuit Diagram | 6.2.20 |
| | VCO Section Circuit Diagram | 6.2.21 |
| | Regulators Circuit Diagram | 6.2.22 |
| | Synthesiser Circuit Diagram | 6.2.23 |
| | Microcontroller Circuit Diagram | 6.2.24 |
| | Harmonic Filter Circuit Diagram | 6.2.25 |

T825 Parts List (IPN 220-01446-03)

How To Use This Parts List

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

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

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

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

Parts List Amendments

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

Parts List Amendments - Continued

This page is provided for entering future amendments to the parts list.

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-------|-----|--------------|--------------------------------|-------|-----|--------------|--------------------------------|
| C201 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% | C348 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| C203 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C349 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V |
| C205 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | C350 | | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V |
| C207 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM | C351 | | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V |
| C209 | | 016-08470-03 | CAP SMD ELEC 47mF 20% 25v 8.3m | C352 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C210 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C353 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C211 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | C354 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C212 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C355 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C213 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | C357 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| C215 | | 015-21220-01 | CAP CER 0805 2P2+-1/4P NPO 50V | C358 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| C217 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | C359 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C219 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | C360 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C221 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C361 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V |
| C222 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% | C362 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% |
| C223 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C363 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V |
| C225 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C364 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| C227 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V | C365 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| C229 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% | C366 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% |
| C231 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% | C367 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C233 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% | C400 | | 015-23220-01 | CAP CER 0805 220P 5% NPO 50V |
| C235 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C401 | | 015-23220-01 | CAP CER 0805 220P 5% NPO 50V |
| C237 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C402 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V |
| C238 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C403 | | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V |
| C239 | | 016-09100-05 | CAP SMD ELECT 100U 25V 20% | C404 | | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V |
| C240A | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C405 | | 015-23470-08 | CAP CER 0805 470P 10% X7R 50V |
| C240B | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C408 | | 015-22390-01 | CAP CER 0805 39P 5% NPO 50V |
| C240C | | 016-09220-01 | CAP SMD ELECT 220U 35V 20% | C409 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V |
| C249 | | 016-09470-01 | LJCAP ELECT 470U 20% SMD | C410 | | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V |
| C251 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C411 | | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V |
| C253 | | 016-09100-05 | CAP SMD ELECT 100U 25V 20% | C412 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V |
| C255 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C416 | | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V |
| C257 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C417 | | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V |
| C259 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C418 | | 015-22390-01 | CAP CER 0805 39P 5% NPO 50V |
| C260A | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C419 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V |
| C260B | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C420 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V |
| C260C | | 016-09220-01 | CAP SMD ELECT 220U 35V 20% | C424 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V |
| C261 | | 016-09100-05 | CAP SMD ELECT 100U 25V 20% | C425 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V |
| C262 | | 016-09100-05 | CAP SMD ELECT 100U 25V 20% | C426 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| C264 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C427 | | 015-05470-08 | CAP CER 1206 47N 10% X7R 50V |
| C266 | | 016-07470-06 | CAP SMD ELECT BI-P 4U7 50V 20% | C428 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| C268 | | 016-07470-06 | CAP SMD ELECT BI-P 4U7 50V 20% | C432 | | 015-22820-01 | CAP CER 0805 82P 5% NPO 50V |
| C270 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C433 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V |
| C272 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C434 | | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V |
| C273 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% | C435 | | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V |
| C274 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C436 | | 015-22390-01 | CAP CER 0805 39P 5% NPO 50V |
| C276 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | C440 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V |
| C278 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C441 | | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V |
| C280 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | C442 | | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V |
| C286 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | C443 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V |
| C300 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C444 | | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V |
| CV300 | | 028-01500-01 | CAP TRM 1.5/5P NPO TOP ADJ | C448 | | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V |
| C301 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C449 | | 015-22390-01 | CAP CER 0805 39P 5% NPO 50V |
| C302 | | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V | C450 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V |
| C303 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% | C505 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C304 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C515 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C305 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C530 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER |
| C306 | | 015-22390-01 | CAP CER 0805 39P 5% NPO 50V | C535 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C307 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V | C610A | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| C308 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V | C610B | | 014-09100-00 | CAP TANT SMD 100U 16V 20% |
| &C309 | 10 | 015-22180-01 | CAP CER 0805 18P 5% NPO 50V | C611A | | 014-09100-00 | CAP TANT SMD 100U 16V 20% |
| &C309 | 15 | 015-22220-01 | CAP CER 0805 22P 5% NPO 50V | C611B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| &C310 | 10 | 015-21180-01 | CAP CER 0805 1P8+-1/4P NPO 50V | C623 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| &C310 | 15 | 015-22180-01 | CAP CER 0805 18P 5% NPO 50V | C625 | | 020-09470-07 | CAPEL470M16V20%V 8*20 3.5L.ESR |
| &C311 | 10 | 015-22180-01 | CAP CER 0805 18P 5% NPO 50V | C626 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V |
| &C311 | 15 | 015-22220-01 | CAP CER 0805 22P 5% NPO 50V | C628 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| C312 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V | C630 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C313 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C631A | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C314 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% | C631B | | 014-08100-03 | CAP TANT SMD 10U 35V 20% |
| C315 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C637 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| C316 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C640 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| C317 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C650 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| &C318 | 10 | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V | C651 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| &C318 | 15 | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V | C658 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| &C319 | 10 | 015-22180-01 | CAP CER 0805 18P 5% NPO 50V | C660 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| &C319 | 15 | 015-22180-01 | CAP CER 0805 18P 5% NPO 50V | C665 | | 014-08100-03 | CAP TANT SMD 10U 35V 20% |
| C320 | | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V | C670 | | 014-07330-10 | CAP TANT SMD 3U3 35V 10% |
| C321 | | 015-23330-08 | CAP CER 0805 330P 10% X7R 50V | C673 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V |
| &C325 | 10 | 015-22180-01 | CAP CER 0805 18P 5% NPO 50V | C677 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM |
| &C325 | 15 | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V | C681 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| &C326 | 10 | 015-22220-01 | CAP CER 0805 22P 5% NPO 50V | C684 | | 014-08100-03 | CAP TANT SMD 10U 35V 20% |
| C327 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C687 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| C329 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C690 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C330 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | C693 | | 014-08100-03 | CAP TANT SMD 10U 35V 20% |
| C331 | | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V | C700 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C332 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C702 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| C333 | | 014-07470-03 | L) CAP TANT SMD 4U7 35V 20% | C703 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| C334 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | C705 | | 015-21820-02 | LJCAP 0805 8P2 15 NPO 50V |
| C335 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C707 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V |
| C336 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | C708 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V |
| C337 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | C709 | | 015-22100-01 | CAP CER 0805 10P+-1/2P NPO 50V |
| C338 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C710A | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM |
| C339 | | 015-22100-01 | CAP CER 0805 10P+-1/2P NPO 50V | C710B | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| C340 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C710C | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| C341 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C711 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V |
| C342 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | C712 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V |
| C343 | | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V | C713 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| C344 | | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V | C735 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V |
| C345 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | C736 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V |

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-----------|-----|--------------|--------------------------------|--------|-----|--------------|--------------------------------|
| C740A | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | IC630 | | 002-12523-17 | (S)IC LM317L REG TO-252 0.5A |
| C740B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | IC640 | | 002-10003-58 | S) IC SMD LM358 DUAL O-AMP |
| C741A | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | IC650 | | 002-10012-32 | SMD DS1232LPS-2 LP RESET&W-DOG |
| C741B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | =IC700 | 10 | 539-00010-41 | TCXO 12.8MHZ +-2.5PPM -30 +70C |
| C742A | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | =IC700 | 15 | 539-00010-41 | TCXO 12.8MHZ +-2.5PPM -30 +70C |
| C742B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | IC710 | | 002-74900-04 | S) IC SMD 74HC04D 6X INV BUFFD |
| C743 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | IC740 | | 002-14519-10 | S) IC MC145191F SMD SYNTH |
| C745 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | IC750 | | 002-10330-78 | S) IC MC33078D 2X AMP LO NOISE |
| C750 | | 014-08100-03 | CAP TANT SMD 10U 35V 20% | IC820 | | 002-12416-00 | S)IC SMD AT24C16N-10SC EEPROM |
| C757 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | IC830 | | 002-10003-24 | S) IC SMD 324 4X O-AMP SO14 |
| C759 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | IC840 | | 002-10040-53 | S)JMC14053B SMD BREAK B4 MAKE |
| C761 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | IC850 | | 002-10003-24 | S) IC SMD 324 4X O-AMP SO14 |
| C762 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | L230 | | 057-10100-60 | IND SHLD 100UH SMD 600MA |
| C764 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L300 | | 056-10102-12 | IND SMD 1u2 1812CS 5% |
| C765 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | L301 | | 056-10802-12 | IND SMD 8u2 1812CS 5% |
| C767 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L302 | | 056-10105-12 | IND SMD 1u5 1812CS 5% |
| C769 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | &L303 | 10 | 056-10102-12 | IND SMD 1u2 1812CS 5% |
| C770 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | &L303 | 15 | 056-10105-12 | IND SMD 1u5 1812CS 5% |
| C772 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | &L304 | 10 | 056-10010-12 | IND SMD 10uH 1812CS 5% |
| C774 | | 022-07100-05 | CAP METAL PPS 1U 20% 63V 5MM | &L304 | 15 | 056-10802-12 | IND SMD 8u2 1812CS 5% |
| C776 | | 015-25330-08 | CAP CER 0805 CHIP 33NF | &L305 | 10 | 056-10010-12 | IND SMD 10uH 1812CS 5% |
| C782 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | &L305 | 15 | 056-10802-12 | IND SMD 8u2 1812CS 5% |
| C784 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | &L306 | 10 | 056-10102-12 | IND SMD 1u2 1812CS 5% |
| C786 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | &L306 | 15 | 056-10105-12 | IND SMD 1u5 1812CS 5% |
| C788 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | &L307 | 10 | 056-10102-12 | IND SMD 1u2 1812CS 5% |
| C790 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V | &L307 | 15 | 056-10105-12 | IND SMD 1u5 1812CS 5% |
| C792 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | &L308 | 10 | 056-10010-12 | IND SMD 10uH 1812CS 5% |
| C793 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | &L308 | 15 | 056-10802-12 | IND SMD 8u2 1812CS 5% |
| C810 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | &L309 | 10 | 056-10010-12 | IND SMD 10uH 1812CS 5% |
| C812 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V | &L310 | 10 | 056-10802-12 | IND SMD 8u2 1812CS 5% |
| C813 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | &L325 | 15 | 056-10010-12 | IND SMD 10uH 1812CS 5% |
| C814 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L330 | | 050-15119-75 | COIL SMD 455KHz IF 5119-T075 |
| C815 | | 015-05100-07 | CAP 1206 CHIP NPO 10nF 25V | L400 | | 056-10001-10 | IND SMD 1uH 1206CS 5% |
| C816 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L401 | | 056-10001-10 | IND SMD 1uH 1206CS 5% |
| C818 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L402 | | 050-00016-54 | COIL 654 10 CAN T720 |
| C819 | | 015-22330-01 | CAP CER 0805 33P 5% NPO 50V | L403 | | 050-00016-54 | COIL 654 10 CAN T720 |
| C820 | | 015-23220-01 | CAP CER 0805 220P 5% NPO 50V | L404 | | 056-14150-02 | (L) IND SMD 1.5UH |
| C822 | | 015-25220-08 | CAP CER 0805 22N 10% X7R 50V | L405 | | 056-14150-02 | (L) IND SMD 1.5UH |
| C824 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | L406 | | 056-10105-12 | IND SMD 10uH 1812CS 5% |
| C826 | | 015-05100-07 | CAP 1206 CHIP NPO 10nF 25V | L409 | | 050-00016-54 | COIL 654 10 CAN T720 |
| C828 | | 015-05100-07 | CAP 1206 CHIP NPO 10nF 25V | L410 | | 050-00016-54 | COIL 654 10 CAN T720 |
| C830 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | L750 | | 056-10330-02 | (L) IND SMD 330NH |
| C832 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM | L900 | | 056-10121-00 | IND SMD 120NH 1812SMS 5% |
| C833 | | 015-25220-08 | CAP CER 0805 22N 10% X7R 50V | L901 | | 056-10121-00 | IND SMD 120NH 1812SMS 5% |
| C834 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L902 | | 056-10121-00 | IND SMD 120NH 1812SMS 5% |
| C836 | | 015-05100-07 | CAP 1206 CHIP NPO 10nF 25V | PL100 | | 070-01001-00 | D-RANGE 15 WAY COMPL T800 |
| C837 | | 015-05100-07 | CAP 1206 CHIP NPO 10nF 25V | PL200 | | 240-10000-16 | HEADER 4W PCB MTG SMD |
| C838 | | 015-05100-07 | CAP 1206 CHIP NPO 10nF 25V | PL210 | | 240-10000-16 | HEADER 4W PCB MTG SMD |
| C840 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | PL220 | | 240-10000-16 | HEADER 4W PCB MTG SMD |
| C842 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM | PL230 | | 240-10000-16 | HEADER 4W PCB MTG SMD |
| C844 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM | PL240 | | 240-10005-00 | HEADER 5W PCB MTG SMD |
| C846 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM | PL250 | | 240-10000-16 | HEADER 4W PCB MTG SMD |
| C848 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM | PL260 | | 240-10000-16 | HEADER 4W PCB MTG SMD |
| C850 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | PL270 | | 240-10000-16 | HEADER 4W PCB MTG SMD |
| C873 | | 015-25220-08 | CAP CER 0805 22N 10% X7R 50V | Q210 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| C876 | | 014-09100-00 | CAP TANT SMD 100U 16V 20% | Q220 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| C879 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +-20% | Q230 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| C900 | | 015-22330-01 | CAP CER 0805 33P 5% NPO 50V | Q240 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| C901 | | 015-22680-01 | CAP CER 0805 68P 5% NPO 50V | Q245 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| C902 | | 015-22680-01 | CAP CER 0805 68P 5% NPO 50V | Q250 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| C903 | | 015-22330-01 | CAP CER 0805 33P 5% NPO 50V | Q255 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| %D111A 10 | | 001-10015-50 | DIODE SMD ZENER 1.5SMC22AT3 | Q260 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| %D111A 15 | | 001-10015-50 | DIODE SMD ZENER 1.5SMC22AT3 | Q270 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 |
| D220 | | 001-10000-56 | S) DIODE SMD BAW56 D-SW SOT23 | Q280 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D230 | | 001-10000-70 | S) DIODE SMD BAV70 D-SW SOT23 | Q290 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D240 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 | Q300 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D250 | | 008-00014-79 | S)LED 3MM RED WITH WIRE | Q301 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D260 | | 001-10084-33 | S)DIODE ZENSMD BX84C3V3 SOT23 | Q302 | | 000-10003-10 | S) XSTR SMD BFJ310 JFET UHF |
| D270 | | 001-10000-70 | S) DIODE SMD BAV70 D-SW SOT23 | Q303 | | 000-10095-10 | S) XSTR SMD BR951 NPN UHF |
| D280 | | 008-00014-80 | S)LED 3MM GREEN WITH WIRE | Q304 | | 000-10095-10 | S) XSTR SMD BR951 NPN UHF |
| D285 | | 001-10011-73 | DIODE SMD MRA4003T3 1A/300V SM | Q331 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D289 | | 001-10011-73 | DIODE SMD MRA4003T3 1A/300V SM | Q400 | | 000-10054-00 | XSTR SMD BFG540 NPNUHF SOT143B |
| D290 | | 001-10011-73 | DIODE SMD MRA4003T3 1A/300V SM | Q401 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| D295 | | 001-10011-73 | DIODE SMD MRA4003T3 1A/300V SM | Q540 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D330 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 | Q620 | | 000-00033-12 | XSTR BD242 TO-220 PNP ISOLDT |
| D400 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 | Q630 | | 000-10003-00 | S) XSTR BSR30 PNP AF SOT-89 |
| D610 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 | Q660 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 |
| D640 | | 001-10000-70 | S) DIODE SMD BAV70 D-SW SOT23 | Q670 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| D645 | | 001-10010-40 | DIODE SMD ZENER 33V BZG03-C33 | Q750 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| D730 | | 001-10165-00 | DIODE BAT165 SCHOTTKY SOD-323 | Q760 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D740 | | 001-10165-00 | DIODE BAT165 SCHOTTKY SOD-323 | Q770 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| D820 | | 001-10165-00 | DIODE BAT165 SCHOTTKY SOD-323 | Q775 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| D860 | | 001-10000-70 | S) DIODE SMD BAV70 D-SW SOT23 | Q780 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D880 | | 001-10000-70 | S) DIODE SMD BAV70 D-SW SOT23 | Q785 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| IC210 | | 002-10003-58 | S) IC SMD LM358 DUAL O-AMP | Q790 | | 000-10003-12 | S) XSTR SMD BFR31 N JFET SOT23 |
| IC240 | | 002-00014-05 | S) IC TDA7231 1.6W AF PWR | Q795 | | 000-10009-30 | XSTR SMD BFR93A NPN SOT23 |
| IC260 | | 002-00014-05 | S) IC TDA7231 1.6W AF PWR | Q810 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 |
| IC270 | | 002-10003-58 | S) IC SMD LM358 DUAL O-AMP | Q820 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| IC280 | | 002-10003-58 | S) IC SMD LM358 DUAL O-AMP | Q840 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| IC330 | | 002-10337-20 | S) IC MC3372D SMD IF DETECTOR | Q850 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| IC332 | | 002-10003-58 | S) IC SMD LM358 DUAL O-AMP | Q860 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| IC333 | | 002-10003-58 | S) IC SMD LM358 DUAL O-AMP | Q870 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| IC339 | | 002-10078-05 | S) IC SMD 78L05 5V REG | Q880 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| IC340 | | 002-10008-40 | S)IC SMD TL084CD 4X O-AMP JFET | Q890 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| IC410 | | 002-10000-14 | MIXER DBL BALANCE 2-500 MHZ | Q895 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| IC610 | | 002-10078-05 | S) IC SMD 78L05 5V REG | | | | |

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-------|-----|--------------|-------------------------------|-------|-----|--------------|-------------------------------|
| R160 | | 036-12100-00 | RES M/F 0805 10E 5% | R319 | | 036-12390-00 | RES M/F 0805 39E 5% |
| R201 | | 036-14470-10 | RES M/F 0805 4K7 1% | R320 | | 036-13150-10 | RES M/F 0805 150E 1% |
| R202 | | 036-14470-10 | RES M/F 0805 4K7 1% | R321 | | 036-13150-10 | RES M/F 0805 150E 1% |
| R204 | | 036-15100-10 | RES M/F 0805 10K 1% | &R323 | 15 | 036-10000-00 | RES M/F 0805 ZERO OHM |
| R205 | | 036-16220-00 | RES M/F 0805 220K 5% | &R324 | 15 | 036-10000-00 | RES M/F 0805 ZERO OHM |
| RV205 | | 040-05100-22 | POT 10K LOG DUAL PCB 6 OD SFT | R329 | | 036-17100-10 | RES M/F 0805 1M 1% |
| R207 | | 036-14820-10 | RES M/F 0805 8K2 1% | R330 | | 036-10000-00 | RES M/F 0805 ZERO OHM |
| &R209 | 10 | 036-15220-00 | RES M/F 0805 22K 5% | RV330 | | 042-04220-05 | RES PRESET SMD 2K CER 4MM SQ |
| &R209 | 15 | 036-15180-10 | RES M/F 0805 18K 1% | RV331 | | 042-05100-05 | RES PRESET SMD 10K CER 4MM SQ |
| R210 | | 036-15150-00 | RES M/F 0805 15K 5% | R333 | | 036-12220-00 | RES M/F 0805 22E 5% |
| RL210 | | 237-10010-00 | RELAY 12V DPTD 10PIN SMD | R336 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| RV210 | | 040-05100-23 | POT 10K LOG PCB 15MM SLOT SFT | R337 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| R211 | | 036-15390-00 | RES M/F 0805 39K 5% | R338 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R213 | | 036-14270-00 | RES M/F 0805 2K7 5% | R339 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R215 | | 036-15150-00 | RES M/F 0805 15K 5% | R340 | | 036-16220-00 | RES M/F 0805 220K 5% |
| R218 | | 036-14390-10 | RES M/F 0805 3K9 1% | R341 | | 036-16120-00 | RES M/F 0805 120K 5% |
| &R219 | 10 | 036-15100-10 | RES M/F 0805 10K 1% | R342 | | 036-15220-00 | RES M/F 0805 22K 5% |
| &R219 | 15 | 036-14820-10 | RES M/F 0805 8K2 1% | R343 | | 036-15100-10 | RES M/F 0805 10K 1% |
| RV220 | | 042-05100-05 | RES PRESET SMD 10K CER 4MM SQ | R344 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R221 | | 036-15470-10 | RES M/F 0805 47K 1% | &R346 | 10 | 036-15560-10 | RES MF 0805 56K 1% |
| R222 | | 036-16100-00 | RES M/F 0805 100K 5% | &R346 | 15 | 036-16100-00 | RES M/F 0805 100K 5% |
| %R223 | 10 | 036-12100-00 | RES M/F 0805 10E 5% | R347 | | 036-15470-10 | RES M/F 0805 47K 1% |
| %R223 | 15 | 036-12100-00 | RES M/F 0805 10E 5% | R348 | | 036-14820-10 | RES M/F 0805 8K2 1% |
| R224 | | 036-14390-10 | RES M/F 0805 3K9 1% | R349 | | 036-14560-00 | RES M/F 0805 5K6 5% |
| R225 | | 036-13470-00 | RES M/F 0805 470E 5% | R350 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R227 | | 036-14270-00 | RES M/F 0805 2K7 5% | R351 | | 036-14560-00 | RES M/F 0805 5K6 5% |
| R229 | | 036-14470-10 | RES M/F 0805 4K7 1% | R352 | | 036-14390-10 | RES M/F 0805 3K9 1% |
| R230 | | 036-14470-10 | RES M/F 0805 4K7 1% | R353 | | 036-16220-00 | RES M/F 0805 220K 5% |
| RV230 | | 040-05100-21 | POT 10K LIN PCB 15MM SLOT SFT | R354 | | 036-16220-00 | RES M/F 0805 220K 5% |
| R232 | | 036-15470-10 | RES M/F 0805 47K 1% | R355 | | 036-14330-10 | RES M/F 0805 3K3 1% |
| R233 | | 036-14820-10 | RES M/F 0805 8K2 1% | R356 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| R234 | | 036-15470-10 | RES M/F 0805 47K 1% | R357 | | 036-15270-10 | RES M/F 0805 27K 1% |
| RV235 | | 042-05100-05 | RES PRESET SMD 10K CER 4MM SQ | R358 | | 036-16220-00 | RES M/F 0805 220K 5% |
| R236 | | 036-15470-10 | RES M/F 0805 47K 1% | R359 | | 045-15100-00 | RES NTC SMD 10K 5% |
| R238 | | 036-11470-00 | RES M/F 0805 4E7 10% | R360 | | 036-15100-10 | RES M/F 0805 5M 1% |
| R239 | | 036-14100-10 | RES M/F 0805 1K 1% | R361 | | 036-16390-00 | RES M/F 0805 390K 5% |
| R241 | | 036-14100-10 | RES M/F 0805 1K 1% | R362 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R242 | | 036-13100-10 | RES M/F 0805 100E 1% | R363 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R244 | | 036-14680-10 | RES M/F 0805 6K8 1% | R365 | | 036-13220-10 | RES 0805 220E 1% |
| R245 | | 036-14100-10 | RES M/F 0805 1K 1% | R368 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R247 | | 036-14220-00 | RES M/F 0805 2K2 5% | R369 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| R249 | | 036-15100-10 | RES M/F 0805 10K 1% | R370 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R251 | | 036-15390-00 | RES M/F 0805 39K 5% | R371 | | 036-14820-10 | RES M/F 0805 8K2 1% |
| R252 | | 036-14470-10 | RES M/F 0805 4K7 1% | R372 | | 036-14560-00 | RES M/F 0805 5K6 5% |
| R254 | | 036-14820-10 | RES M/F 0805 8K2 1% | R373 | | 036-16390-00 | RES M/F 0805 390K 5% |
| R255 | | 036-15470-10 | RES M/F 0805 47K 1% | R374 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R256 | | 036-14270-00 | RES M/F 0805 2K7 5% | R375 | | 036-16390-00 | RES M/F 0805 390K 5% |
| R258 | | 036-15470-10 | RES M/F 0805 47K 1% | R376 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R260 | | 036-11470-00 | RES M/F 0805 4E7 10% | R377 | | 036-16390-00 | RES M/F 0805 390K 5% |
| R261 | | 036-13150-10 | RES M/F 0805 150E 1% | R378 | | 036-16390-00 | RES M/F 0805 390K 5% |
| R262 | | 036-14100-10 | RES M/F 0805 1K 1% | R382 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R264 | | 036-15100-10 | RES M/F 0805 10K 1% | R383 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R265 | | 036-13100-10 | RES M/F 0805 100E 1% | R384 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R266 | | 036-15270-10 | RES M/F 0805 27K 1% | R400 | | 036-13220-10 | RES 0805 220E 1% |
| R267 | | 036-16180-00 | RES M/F 0805 180K 5% | R401 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R269 | | 036-14220-00 | RES M/F 0805 2K2 5% | R402 | | 036-13220-10 | RES 0805 220E 1% |
| R271 | | 036-16100-00 | RES M/F 0805 100K 5% | R403 | | 036-12820-10 | RES M/F 0805 28E 5% |
| R272 | | 036-15470-10 | RES M/F 0805 47K 1% | R404 | | 036-12820-00 | RES M/F 0805 28E 5% |
| R273 | | 036-15150-00 | RES M/F 0805 15K 5% | R408 | | 036-11470-00 | RES M/F 0805 4E7 10% |
| R274 | | 036-13120-00 | RES M/F 0805 120E 5% | R409 | | 036-13820-00 | RES M/F 0805 820E 5% |
| R275 | | 036-13100-10 | RES M/F 0805 100E 1% | R410 | | 036-13820-00 | RES M/F 0805 820E 5% |
| R276 | | 036-13120-00 | RES M/F 0805 120E 5% | R411 | | 036-17100-10 | RES M/F 0805 1M 1% |
| R277 | | 036-14560-00 | RES M/F 0805 5K6 5% | R412 | | 036-10000-00 | RES M/F 0805 ZERO OHM |
| R278 | | 036-16220-00 | RES M/F 0805 220K 5% | R416 | | 036-17100-10 | RES M/F 0805 1M 1% |
| R279 | | 036-12270-00 | RES M/F 0805 27E 5% | R417 | | 036-13560-00 | RES M/F 0805 560E 5% |
| R280 | | 036-16100-00 | RES M/F 0805 100K 5% | R418 | | 036-12390-00 | RES M/F 0805 39E 5% |
| R281 | | 036-14470-10 | RES M/F 0805 4K7 1% | R419 | | 036-12390-00 | RES M/F 0805 39E 5% |
| R282 | | 036-16100-00 | RES M/F 0805 100K 5% | R420 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R284 | | 036-13100-10 | RES M/F 0805 100E 1% | R424 | | 036-13330-00 | RES M/F 0805 330E 5% |
| R285 | | 036-15470-10 | RES M/F 0805 47K 1% | R425 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| R287 | | 036-15100-10 | RES M/F 0805 10K 1% | R426 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R288 | | 036-14470-10 | RES M/F 0805 4K7 1% | R427 | | 036-14330-10 | RES M/F 0805 3K3 1% |
| R289 | | 036-14680-10 | RES M/F 0805 6K8 1% | R510 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| R290 | | 036-14100-10 | RES M/F 0805 1K 1% | R515 | | 036-12560-00 | RES M/F 0805 56E 5% |
| R292 | | 036-14680-10 | RES M/F 0805 6K8 1% | R555 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R293 | | 036-13560-00 | RES M/F 0805 560E 5% | R615 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R294 | | 036-14100-10 | RES M/F 0805 1K 1% | R617 | | 036-10000-00 | RES M/F 0805 ZERO OHM |
| R295 | | 036-14680-10 | RES M/F 0805 6K8 1% | R619 | | 036-01100-10 | RES 1 OHM 1 WATT 2512 CHIP |
| R296 | | 036-14120-00 | RES M/F 0805 1K2 5% | R621 | | 036-01100-10 | RES 1 OHM 1 WATT 2512 CHIP |
| R297 | | 030-52100-20 | RES FILM Al 10E 5% 0.4W 4X1.6 | R625 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R298 | | 036-15470-10 | RES M/F 0805 47K 1% | R629 | | 036-03270-10 | RES 270 OHM 1 WATT 2512 CHIP |
| R299 | | 036-15470-10 | RES M/F 0805 47K 1% | R633 | | 036-14680-10 | RES M/F 0805 6K8 1% |
| R300 | | 036-14680-10 | RES M/F 0805 6K8 1% | R636 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R301 | | 036-12270-00 | RES M/F 0805 27E 5% | R637 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R302 | | 036-12120-00 | RES M/F 0805 12E 5% | R640 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R303 | | 036-12100-00 | RES M/F 0805 10E 5% | R641 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| R304 | | 036-13820-00 | RES M/F 0805 820E 5% | R645 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R307 | | 036-14100-10 | RES M/F 0805 1K 1% | R649 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R308 | | 036-14330-10 | RES M/F 0805 3K3 1% | R653 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R309 | | 036-14100-10 | RES M/F 0805 1K 1% | R681 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R310 | | 036-11470-00 | RES M/F 0805 4E7 10% | R685 | | 036-15150-00 | RES M/F 0805 15K 5% |
| R311 | | 036-12470-00 | RES M/F 0805 47E 5% | R689 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R312 | | 036-13100-10 | RES M/F 0805 100E 1% | R693 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R313 | | 036-12560-00 | RES M/F 0805 56E 5% | R696 | | 036-15560-10 | RES MF 0805 56K 1% |
| R314 | | 036-12390-00 | RES M/F 0805 39E 5% | R701 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R315 | | 036-13470-00 | RES M/F 0805 470E 5% | R702 | | 036-17100-10 | RES M/F 0805 1M 1% |
| R317 | | 036-14330-10 | RES M/F 0805 3K3 1% | R703 | | 036-17100-10 | RES M/F 0805 1M 1% |
| R318 | | 036-12560-00 | RES M/F 0805 56E 5% | R706 | | 036-15150-00 | RES M/F 0805 15K 5% |

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|------|-----|--------------|----------------------|---------|-----|--------------|---------------------------------|
| R707 | | 036-15470-10 | RES M/F 0805 47K 1% | R869 | | 036-15270-10 | RES M/F 0805 27K 1% |
| R708 | | 036-13100-10 | RES M/F 0805 100E 1% | R870 | | 036-17120-10 | RES M/F 0805 1M2 1% |
| R709 | | 036-13100-10 | RES M/F 0805 100E 1% | R871 | | 036-16820-10 | RES M/F 0805 820K 1% |
| R710 | | 036-13100-10 | RES M/F 0805 100E 1% | R872 | | 036-14510-10 | RES M/F 0805 5K1 1% |
| R711 | | 036-13100-10 | RES M/F 0805 100E 1% | R873 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| R712 | | 036-12100-00 | RES M/F 0805 10E 5% | R875 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R713 | | 036-16470-00 | RES M/F 0805 470K 5% | R876 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R730 | | 036-13470-00 | RES M/F 0805 470E 5% | R877 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R731 | | 036-13470-00 | RES M/F 0805 470E 5% | R878 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R732 | | 036-13470-00 | RES M/F 0805 470E 5% | R879 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R742 | | 036-13150-10 | RES M/F 0805 150E 1% | R881 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R743 | | 036-13150-10 | RES M/F 0805 150E 1% | R882 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R744 | | 036-12220-00 | RES M/F 0805 22E 5% | R884 | | 036-16150-00 | RES M/F 0805 150K 5% |
| R746 | | 036-12220-00 | RES M/F 0805 22E 5% | R885 | | 036-16150-00 | RES M/F 0805 150K 5% |
| R747 | | 036-12220-00 | RES M/F 0805 22E 5% | R886 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R748 | | 036-15470-10 | RES M/F 0805 47K 1% | R887 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R749 | | 036-15470-10 | RES M/F 0805 47K 1% | R888 | | 036-14820-10 | RES M/F 0805 8K2 1% |
| R750 | | 036-12220-00 | RES M/F 0805 22E 5% | R889 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R752 | | 036-12220-00 | RES M/F 0805 22E 5% | R890 | | 036-16150-00 | RES M/F 0805 150K 5% |
| R753 | | 036-17100-10 | RES M/F 0805 1M 1% | R891 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R754 | | 036-14100-10 | RES M/F 0805 1K 1% | R892 | | 036-16330-00 | RES M/F 0805 330K 5% |
| R756 | | 036-16470-00 | RES M/F 0805 470K 5% | R894 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R757 | | 036-16470-00 | RES M/F 0805 470K 5% | R895 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R758 | | 036-14120-00 | RES M/F 0805 1K2 5% | R897 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R759 | | 036-13330-00 | RES M/F 0805 330E 5% | R898 | | 036-16470-00 | RES M/F 0805 470K 5% |
| R760 | | 036-13180-00 | RES M/F 0805 180E 5% | R900 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R762 | | 036-13100-10 | RES M/F 0805 100E 1% | | | | |
| R763 | | 036-13100-10 | RES M/F 0805 100E 1% | SW201 | | 230-00010-30 | SWITCH TOG SPDT R-ANG PCB MTG |
| R765 | | 036-13680-00 | RES M/F 0805 680E 5% | | | | |
| R766 | | 036-14100-10 | RES M/F 0805 1K 1% | SHLD610 | | 062-00010-13 | CAN 10MM SQ X 11MM CAN A4M1017 |
| R767 | | 036-13680-00 | RES M/F 0805 680E 5% | | | | |
| R769 | | 036-13180-00 | RES M/F 0805 180E 5% | SK805 | | 240-10000-07 | CONN SMD SKT 16W 2R M-MATCH |
| R771 | | 036-14820-10 | RES M/F 0805 8K2 1% | SK810 | | 240-04020-42 | SKT 44 PIN SMD PLCC |
| R772 | | 036-15220-00 | RES M/F 0805 22K 5% | | | | |
| R774 | | 036-14820-10 | RES M/F 0805 8K2 1% | T210 | | 053-00010-17 | XFMR T4030 LINE MATCH POTCORE |
| R775 | | 036-14270-00 | RES M/F 0805 2K7 5% | T610 | | 050-15119-52 | COIL SMD 680uH XFMR 5119-T052 |
| R784 | | 036-12680-00 | RES M/F 0805 68E 5% | | | | |
| R785 | | 036-14330-10 | RES M/F 0805 3K3 1% | &XF300 | 10 | 276-00010-36 | FLTR XTAL 10.7M 15KHZ PR 4POLE |
| R786 | | 036-12100-00 | RES M/F 0805 10E 5% | &XF300 | 15 | 276-00010-37 | FLTR XTAL 10.7M 7.5KHZ PR 4POLE |
| R787 | | 036-12100-00 | RES M/F 0805 10E 5% | &XF301 | 10 | 276-00010-36 | FLTR XTAL 10.7M 15KHZ PR 4POLE |
| R790 | | 036-13220-10 | RES 0805 220E 1% | &XF301 | 15 | 276-00010-37 | FLTR XTAL 10.7M 7.5KHZ PR 4POLE |
| R793 | | 036-13100-10 | RES M/F 0805 100E 1% | &XF302 | 10 | 276-00010-20 | FLTR XTAL 10.7M 15KHZ 2 POLE |
| R794 | | 036-14100-10 | RES M/F 0805 1K 1% | &XF302 | 15 | 276-00010-19 | FLTR XTAL 10.7M 7.5KHZ 2 POLE |
| R804 | | 036-15470-10 | RES M/F 0805 47K 1% | X330 | | 274-00010-10 | XTAL 10.245MHZ SPEC TE/4 |
| R805 | | 036-13470-00 | RES M/F 0805 470E 5% | | | | |
| R808 | | 036-12100-00 | RES M/F 0805 10E 5% | &XF304 | 10 | 276-10010-14 | FLTR CER SMD 455KHz E15KHz B/W |
| R809 | | 036-14470-10 | RES M/F 0805 4K7 1% | &XF304 | 15 | 276-10010-13 | FLTR CER SMD 455KHz G 9KHz B/W |
| R810 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R811 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R812 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R813 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R815 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R816 | | 036-16150-00 | RES M/F 0805 150K 5% | | | | |
| R818 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R819 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R820 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R821 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R822 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R823 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R824 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R825 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R826 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R827 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R828 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R829 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R830 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R831 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R832 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R833 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R835 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R836 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R837 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R838 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R839 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R840 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R841 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R842 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R843 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R844 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R845 | | 036-16150-00 | RES M/F 0805 150K 5% | | | | |
| R846 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R847 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R848 | | 036-13470-00 | RES M/F 0805 470E 5% | | | | |
| R852 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R853 | | 036-13470-00 | RES M/F 0805 470E 5% | | | | |
| R854 | | 036-16330-00 | RES M/F 0805 330K 5% | | | | |
| R855 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R856 | | 036-16150-00 | RES M/F 0805 150K 5% | | | | |
| R857 | | 036-16150-00 | RES M/F 0805 150K 5% | | | | |
| R858 | | 036-15270-10 | RES M/F 0805 27K 1% | | | | |
| R859 | | 036-17120-10 | RES M/F 0805 1M2 1% | | | | |
| R860 | | 036-16820-10 | RES M/F 0805 820K 1% | | | | |
| R861 | | 036-14510-10 | RES M/F 0805 5K1 1% | | | | |
| R863 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R865 | | 036-14270-00 | RES M/F 0805 2K7 5% | | | | |
| R866 | | 036-16820-10 | RES M/F 0805 820K 1% | | | | |
| R867 | | 036-16820-10 | RES M/F 0805 820K 1% | | | | |
| R868 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |

T825 Mechanical & Miscellaneous Parts (220-01446-03)

| IPN | Legend | Description | IPN | Legend | Description |
|--------------|---------------|--------------------------------|------------|---------------|--------------------|
| 002-08951-20 | | S) IC AT89C51 PLCC44 MIC 12MHZ | | | |
| 220-01446-03 | | PCB T825 RX SII | | | |
| 230-00010-31 | | SWITCH COVER FOR 230-00010-30 | | | |
| 240-02100-06 | | SKT COAX N TYPE PNL MTG OP-TER | | | |
| 240-04020-62 | | SKT 2 W RECEP SHORTING LINK | | | |
| 240-04021-77 | | SKT JACK 1.3 PCB MT 64W | | | |
| 303-11169-04 | | CHASSIS PAINTED T800 SER II | | | |
| 303-23118-00 | | COVER A3M2247 D RANGE T855/7 | | | |
| 303-50074-00 | | CLIP A3M2246 SPRING CLAMP T857 | | | |
| 308-01007-01 | | HANDLE BS SII 2 WASHERS INC | | | |
| 311-01015-00 | | KNOB 15MM & SKIRT 6MM SFT | | | |
| 312-01052-02 | | LID TOP T800 SER II PTND | | | |
| 312-01053-02 | | LID BOTTOM T800 SER II PNTD | | | |
| 316-06622-00 | | PNL FRT RX T800 SERIES II | | | |
| 349-00020-36 | | SCREW TT M3X8m PANTORX BLK | | | |
| 349-00020-36 | | SCREW TT M3X8m PANTORX BLK | | | |
| 349-00020-43 | | SCRW T/T M4X12MM P/POZ BZ | | | |
| 349-00020-45 | | SCRW T/T M4X20MM P/POZ BZ | | | |
| 349-00020-55 | | SCRW M3*8 P/P T/T BLCKZNC CHRM | | | |
| 352-00010-08 | | NUT M3 COLD FORM HEX ST BZ | | | |
| 352-00010-29 | | NUT M4 NYLOC HEX | | | |
| 353-00010-13 | | WSHR M3 S/PROOF INT BZ | | | |
| 353-00010-24 | | WSHR M4x8mm Flat | | | |
| 356-00010-03 | | TAG SOLDER 3MM LONG M614/3.2 | | | |
| 362-00010-33 | | GROMMET LED MTG 3MM | | | |
| 399-00010-51 | | BAG PLASTIC 75*100MM | | | |

T825 Grid Reference Index (IPN 220-01446-03)

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 |
|--------|------|---------|--------|------|---------|--------|------|---------|--------|------|---------|
| C201 | 1:B5 | 2-B9 | &C310 | 1:F7 | 3-G7 | C410 | 1:H8 | 4-K3 | C705 | 1:J3 | 7-C7 |
| C203 | 1:C5 | 2-B8 | &C311 | 1:E7 | 3-H7 | C411 | 1:J8 | 4-K3 | C707 | 1:J3 | 7-B5 |
| C205 | 1:D5 | 2-B8 | C312 | 1:F7 | 3-J7 | C412 | 1:J9 | 4-K3 | C708 | 1:J3 | 7-C5 |
| C207 | 1:C5 | 2-C8 | C313 | 1:F6 | 3-J7 | C416 | 1:J9 | 4-J3 | C709 | 1:H3 | 7-C5 |
| C209 | 1:C6 | 2-D8 | C314 | 1:E6 | 3-K8 | C417 | 1:J8 | 4-J4 | C710A | 1:H3 | 7-P7 |
| C210 | 1:C5 | 2-P0 | C315 | 1:E6 | 3-K8 | C418 | 1:J8 | 4-J3 | C710B | 1:J4 | 7-Q7 |
| C211 | 1:C4 | 2-D7 | C316 | 1:E6 | 3-K7 | C419 | 1:J8 | 4-J3 | C710C | 1:J3 | 7-P7 |
| C212 | 1:C5 | 2-E8 | C317 | 1:E6 | 3-L8 | C420 | 1:J7 | 4-G5 | C711 | 1:J2 | 7-E7 |
| C213 | 1:C5 | 2-E7 | &C318 | 1:E5 | 3-M7 | C424 | 1:J8 | 4-G4 | C712 | 1:H2 | 7-E7 |
| C215 | 1:C4 | 2-E7 | &C319 | 1:F5 | 3-N7 | C425 | 1:K8 | 4-G3 | C713 | 1:H2 | 7-E7 |
| C217 | 1:C4 | 2-E7 | C320 | 1:F8 | 3-C7 | C426 | 1:J8 | 4-G4 | C735 | 1:J2 | 7-A1 |
| C219 | 1:C5 | 2-H6 | C321 | 1:F8 | 3-C8 | C427 | 1:J7 | 4-F4 | C736 | 1:J2 | 7-B1 |
| C221 | 1:C5 | 2-H6 | &C325 | 1:E5 | 3-P7 | C428 | 1:K7 | 4-F3 | C740A | 1:H2 | 7-B4 |
| C222 | 1:B5 | 2-J9 | &C326 | 1:F5 | 3-Q7 | C432 | 1:K7 | 4-F3 | C740B | 1:H2 | 7-B3 |
| C223 | 1:B5 | 2-H8 | C327 | 1:E5 | 3-Q8 | C433 | 1:L9 | 4-E3 | C741A | 1:H2 | 7-C4 |
| C225 | 1:B5 | 2-J8 | C329 | 1:F4 | 3-D3 | C434 | 1:M9 | 4-E3 | C741B | 1:G2 | 7-C3 |
| C227 | 1:B5 | 2-J8 | C330 | 1:E4 | 3-C3 | C435 | 1:M8 | 4-E4 | C742A | 1:H2 | 7-D4 |
| C229 | 1:B6 | 2-K8 | C331 | 1:E4 | 3-C3 | C436 | 1:M8 | 4-E3 | C742B | 1:H3 | 7-D3 |
| C231 | 1:B6 | 2-K8 | C332 | 1:E4 | 3-C3 | C440 | 1:M8 | 4-D3 | C743 | 1:H2 | 7-B1 |
| C233 | 1:B5 | 2-J7 | C333 | 1:F4 | 3-E4 | C441 | 1:M8 | 4-D3 | C745 | 1:G3 | 7-D1 |
| C235 | 1:B6 | 2-M6 | C334 | 1:F3 | 3-E4 | C442 | 1:M8 | 4-D3 | C750 | 1:H4 | 7-R7 |
| C237 | 1:B6 | 2-N5 | C335 | 1:E3 | 3-G0 | C443 | 1:M9 | 4-D3 | C757 | 1:G4 | 7-G5 |
| C238 | 1:B6 | 2-N7 | C336 | 1:E4 | 3-F4 | C444 | 1:N9 | 4-C3 | C759 | 1:G4 | 7-G4 |
| C239 | 1:C6 | 2-P6 | C337 | 1:F4 | 3-F4 | C448 | 1:N8 | 4-C4 | C761 | 1:H3 | 7-J4 |
| C240A | 1:D5 | 2-P8 | C338 | 1:E3 | 3-E1 | C449 | 1:N8 | 4-C3 | C762 | 1:G3 | 7-K4 |
| C240B | 1:D5 | 2-P8 | C339 | 1:F4 | 3-F4 | C450 | 1:N8 | 4-C3 | C764 | 1:H3 | 7-J2 |
| C240C | 1:D6 | 2-Q8 | C340 | 1:E3 | 3-E2 | C505 | 1:K6 | 5-H7 | C765 | 1:G3 | 7-J2 |
| C249 | 1:D6 | 2-Q7 | C341 | 1:E3 | 3-G1 | C515 | 1:H5 | 5-D5 | C767 | 1:H3 | 7-K3 |
| C251 | 1:C6 | 2-Q7 | C342 | 1:F4 | 3-G3 | C530 | 1:K5 | 5-G3 | C769 | 1:H3 | 7-M4 |
| C253 | 1:D4 | 2-G4 | C343 | 1:F3 | 3-H3 | C535 | 1:K5 | 5-H3 | C770 | 1:H4 | 7-M4 |
| C255 | 1:C7 | 2-L2 | C344 | 1:E3 | 3-H3 | C610A | 1:M5 | 6-B6 | C772 | 1:G3 | 7-M2 |
| C257 | 1:C7 | 2-M2 | C345 | 1:F3 | 3-J4 | C610B | 1:M5 | 6-B6 | C774 | 1:H4 | 7-N2 |
| C259 | 1:C7 | 2-M3 | C348 | 1:D5 | 3-J2 | C611A | 1:M5 | 6-D6 | C776 | 1:H4 | 7-M1 |
| C260A | 1:D7 | 2-N4 | C349 | 1:F3 | 3-K3 | C611B | 1:M4 | 6-D6 | C782 | 1:G3 | 7-N0 |
| C260B | 1:D7 | 2-M4 | C350 | 1:F3 | 3-L4 | C623 | 1:N6 | 6-N8 | C784 | 1:G3 | 7-Q1 |
| C260C | 1:D8 | 2-M4 | C351 | 1:F3 | 3-L3 | C625 | 1:M6 | 6-Q8 | C786 | 1:G3 | 7-Q1 |
| C261 | 1:C7 | 2-N2 | C352 | 1:E3 | 3-H4 | C626 | 1:M6 | 6-R8 | C788 | 1:G3 | 7-P0 |
| C262 | 1:D7 | 2-P3 | C353 | 1:E3 | 3-J5 | C628 | 1:M6 | 6-R8 | C790 | 1:G4 | 7-Q0 |
| C264 | 1:C7 | 2-P3 | C354 | 1:E3 | 3-J4 | C630 | 1:N5 | 6-K4 | C792 | 1:G4 | 7-Q0 |
| C266 | 1:D2 | 2-R3 | C355 | 1:F3 | 3-L4 | C631A | 1:M5 | 6-M6 | C793 | 1:G3 | 7-Q1 |
| C268 | 1:D3 | 2-R3 | C357 | 1:F3 | 3-M4 | C631B | 1:N4 | 6-M6 | C810 | 1:L4 | 8-J8 |
| C270 | 1:C8 | 2-E3 | C358 | 1:F3 | 3-N4 | C637 | 1:M6 | 6-P5 | C812 | 1:K2 | 8-F4 |
| C272 | 1:C8 | 2-E1 | C359 | 1:E3 | 3-L0 | C640 | 1:M5 | 6-G0 | C813 | 1:J3 | 8-J5 |
| C273 | 1:C9 | 2-E0 | C360 | 1:E4 | 3-N0 | C650 | 1:N5 | 6-L4 | C814 | 1:L2 | 8-F6 |
| C274 | 1:C8 | 2-E1 | C361 | 1:E5 | 3-N4 | C651 | 1:M5 | 6-M4 | C815 | 1:N3 | 8-B1 |
| C276 | 1:D8 | 2-B0 | C362 | 1:F6 | 3-P0 | C658 | 1:L5 | 6-K1 | C816 | 1:N3 | 8-B2 |
| C278 | 1:D8 | 2-C0 | C363 | 1:E6 | 3-P4 | C660 | 1:L5 | 6-K1 | C818 | 1:N3 | 8-C1 |
| C280 | 1:D9 | 2-E0 | C364 | 1:F5 | 3-P0 | C665 | 1:L5 | 6-L1 | C819 | 1:N3 | 8-C2 |
| C286 | 1:B8 | 2-F2 | C365 | 1:F5 | 3-Q0 | C670 | 1:L5 | 6-L1 | C820 | 1:N4 | 8-D1 |
| C300 | 1:E9 | 3-B7 | C366 | 1:F5 | 3-R0 | C673 | 1:L5 | 6-N2 | C822 | 1:N3 | 8-C2 |
| C301 | 1:F9 | 3-B6 | C367 | 1:E3 | 3-M0 | C677 | 1:L6 | 6-P1 | C824 | 1:N3 | 8-C2 |
| C302 | 1:F8 | 3-C7 | C400 | 1:G8 | 4-P3 | C681 | 1:L6 | 6-Q2 | C826 | 1:N3 | 8-D0 |
| C303 | 1:E8 | 3-C8 | C401 | 1:G8 | 4-P3 | C684 | 1:L6 | 6-Q2 | C828 | 1:N3 | 8-D0 |
| C304 | 1:F9 | 3-C6 | C402 | 1:H9 | 4-L3 | C687 | 1:M6 | 6-P1 | C830 | 1:M4 | 8-K0 |
| C305 | 1:E8 | 3-D8 | C403 | 1:H9 | 4-L3 | C690 | 1:L6 | 6-Q1 | C832 | 1:M3 | 8-E2 |
| C306 | 1:F8 | 3-D7 | C404 | 1:H8 | 4-L4 | C693 | 1:L6 | 6-Q1 | C833 | 1:M4 | 8-E1 |
| C307 | 1:F8 | 3-E7 | C405 | 1:G8 | 4-Q3 | C700 | 1:J4 | 7-A8 | C834 | 1:M3 | 8-F2 |
| C308 | 1:F8 | 3-F7 | C408 | 1:H8 | 4-L3 | C702 | 1:J4 | 7-B8 | C836 | 1:M3 | 8-E0 |
| &C309 | 1:E7 | 3-F7 | C409 | 1:H8 | 4-K3 | C703 | 1:J3 | 7-B8 | C837 | 1:M3 | 8-F0 |

| Device | PCB | Circuit | Device | PCB | Circuit | Device | PCB | Circuit | Device | PCB | Circuit |
|--------|------|---------|--------|------|---------|--------|------|---------|--------|------|---------|
| C838 | 1:N4 | 8-F0 | IC333 | 1:E4 | 3-M0 | P204 | 1:D4 | 2-A9 | Q660 | 1:L5 | 6-N1 |
| C840 | 1:M2 | 8-K1 | IC333 | 1:E4 | 3-H0 | P207 | 1:C5 | 2-A8 | Q670 | 1:L6 | 6-P2 |
| C842 | 1:N2 | 8-L0 | IC339 | 1:F5 | 3-P0 | P210 | 1:D5 | 2-C7 | Q750 | 1:G4 | 7-G3 |
| C844 | 1:N3 | 8-L0 | IC340 | 1:F3 | 3-L4 | P213 | 1:D3 | 2-P0 | Q760 | 1:G3 | 7-J3 |
| C846 | 1:N2 | 8-M0 | IC340 | 1:F3 | 3-L0 | P216 | 1:D4 | 2-P0 | Q770 | 1:H3 | 7-J1 |
| C848 | 1:N2 | 8-M0 | IC340 | 1:F3 | 3-K4 | P219 | 1:D3 | 2-P0 | Q775 | 1:H3 | 7-K3 |
| C850 | 1:M2 | 8-N0 | IC340 | 1:F3 | 3-H3 | P222 | 1:B9 | 2-P0 | Q780 | 1:H3 | 7-K3 |
| C873 | 1:M3 | 8-P2 | IC340 | 1:F3 | 3-K0 | P225 | 1:C4 | 2-F4 | Q785 | 1:H3 | 7-K2 |
| C876 | 1:M4 | 8-P2 | IC410 | 1:G8 | 4-N3 | P228 | 1:C4 | 2-F3 | Q790 | 1:H3 | 7-L3 |
| C879 | 1:M4 | 8-Q0 | IC610 | 1:M5 | 6-C6 | P231 | 1:C9 | 2-G3 | Q795 | 1:G3 | 7-P0 |
| C900 | 1:P8 | 9-E4 | IC630 | 1:N5 | 6-K5 | P234 | 1:C4 | 2-G3 | Q810 | 1:K2 | 8-B6 |
| C901 | 1:P7 | 9-E4 | IC640 | 1:M5 | 6-N5 | P236 | 1:C8 | 2-A1 | Q820 | 1:K2 | 8-C6 |
| C902 | 1:P7 | 9-F4 | IC640 | 1:M5 | 6-J0 | P238 | 1:D8 | 2-A1 | Q840 | 1:K2 | 8-F5 |
| C903 | 1:P6 | 9-G4 | IC640 | 1:M5 | 6-G0 | P240 | 1:C7 | 2-G1 | Q850 | 1:L2 | 8-G5 |
| | | | IC650 | 1:L5 | 6-C2 | P242 | 1:C4 | 2-G1 | Q860 | 1:K4 | 8-B4 |
| CTP410 | 2:K7 | 4-E3 | =IC700 | 1:J3 | 7-A8 | P244 | 1:C4 | 2-G8 | Q870 | 1:L4 | 8-C4 |
| CTP420 | 1:K8 | 4-H3 | IC710 | 1:H3 | 7-D7 | P246 | 1:B5 | 2-H9 | Q880 | 1:L2 | 8-Q3 |
| CTP430 | 1:H8 | 4-M3 | IC710 | 1:H3 | 7-P7 | P248 | 1:A5 | 2-H9 | Q890 | 1:L4 | 8-H2 |
| CTP440 | 2:G8 | 4-Q3 | IC710 | 1:H3 | 7-C6 | P249 | 1:A5 | 2-K9 | Q895 | 1:M3 | 8-P1 |
| CTP900 | 2:P8 | 9-D4 | IC710 | 1:H3 | 7-D6 | P250 | 1:B2 | 2-K9 | | | |
| | | | IC710 | 1:H3 | 7-D6 | P252 | 1:B2 | 2-K9 | R160 | 1:P2 | 1-Q4 |
| CV300 | 1:F7 | 3-G7 | IC710 | 1:H3 | 7-C6 | P254 | 1:B2 | 2-K9 | R201 | 1:C5 | 2-B8 |
| | | | IC710 | 1:H3 | 7-J0 | P256 | 1:B2 | 2-L8 | R202 | 1:C5 | 2-B7 |
| %D111 | 1:P5 | 1-R1 | IC740 | 1:H2 | 7-D1 | P258 | 1:D3 | 2-P8 | R204 | 1:C5 | 2-C9 |
| %D111A | 1:P5 | 1-Q1 | IC750 | 1:H4 | 7-M3 | P260 | 1:D3 | 2-P7 | R205 | 1:C5 | 2-C8 |
| D220 | 1:C4 | 2-F4 | IC750 | 1:H4 | 7-Q7 | P263 | 1:C2 | 2-R1 | R207 | 1:C5 | 2-D8 |
| D220 | 1:C4 | 2-F4 | IC750 | 1:H4 | 7-H5 | P266 | 1:C2 | 2-Q1 | &R209 | 1:C4 | 2-D8 |
| D230 | 1:C6 | 2-J5 | IC820 | 1:L4 | 8-N4 | P268 | 1:C2 | 2-R1 | R210 | 1:C5 | 2-D8 |
| D230 | 1:C6 | 2-J5 | IC830 | 1:N4 | 8-G0 | P270 | 1:C1 | 2-R0 | R211 | 1:C5 | 2-E8 |
| D240 | 1:C8 | 2-E2 | IC830 | 1:N4 | 8-D2 | P280 | 1:C2 | 2-Q0 | R213 | 1:C5 | 2-G6 |
| D240 | 1:C8 | 2-E2 | IC830 | 1:N4 | 8-D0 | P282 | 1:C2 | 2-R0 | R215 | 1:B5 | 2-G9 |
| D250 | 1:B7 | 2-H0 | IC830 | 1:N4 | 8-F2 | P284 | 1:B4 | 2-P4 | R218 | 1:C5 | 2-G8 |
| D260 | 1:B7 | 2-H0 | IC830 | 1:N4 | 8-K0 | P287 | 1:B2 | 2-M0 | &R219 | 1:C5 | 2-G7 |
| D270 | 1:B7 | 2-J1 | IC840 | 1:M2 | 8-L0 | P300 | 1:F5 | 3-Q7 | R221 | 1:C5 | 2-H7 |
| D270 | 1:B7 | 2-H1 | IC850 | 1:M3 | 8-P0 | P810 | 1:K2 | 8-A5 | R222 | 1:C5 | 2-H7 |
| D280 | 1:B7 | 2-K1 | IC850 | 1:M3 | 8-Q2 | P815 | 1:L4 | 8-C4 | %R223 | 1:A5 | 2-J9 |
| D285 | 1:D2 | 2-L1 | IC850 | 1:M3 | 8-M2 | P820 | 1:K4 | 8-L8 | R224 | 1:B5 | 2-J8 |
| D289 | 1:B2 | 2-L0 | IC850 | 1:M3 | 8-M2 | P825 | 1:K4 | 8-L8 | R225 | 1:B5 | 2-J8 |
| D290 | 1:B2 | 2-L0 | IC850 | 1:M3 | 8-M0 | P830 | 1:K4 | 8-L8 | R227 | 1:B5 | 2-J7 |
| D295 | 1:B2 | 2-L0 | | | | P835 | 1:K4 | 8-L7 | R229 | 1:B6 | 2-M7 |
| D330 | 1:F3 | 3-M4 | L230 | 1:D2 | 2-L2 | P840 | 1:K4 | 8-L7 | R230 | 1:C6 | 2-M5 |
| D330 | 1:F3 | 3-M4 | L300 | 1:F9 | 3-C7 | | | | R232 | 1:B5 | 2-M7 |
| D400 | 1:J7 | 4-F4 | L301 | 1:E8 | 3-D8 | PIN4 | 1:J4 | 7-B8 | R233 | 1:B6 | 2-N7 |
| D400 | 1:J7 | 4-F5 | L302 | 1:E8 | 3-E7 | | | | R234 | 1:B6 | 2-N7 |
| D610 | 1:N6 | 6-L6 | &L303 | 1:E8 | 3-E7 | PL100 | 1:P3 | 1-A0 | R236 | 1:B5 | 2-N7 |
| D610 | 1:N6 | 6-M6 | &L304 | 1:E7 | 3-F7 | PL200 | 1:C6 | 2-R7 | R238 | 1:C6 | 2-Q6 |
| D640 | 1:L5 | 6-M2 | &L305 | 1:E7 | 3-H7 | PL210 | 1:C5 | 2-B8 | R239 | 1:C6 | 2-Q7 |
| D640 | 1:L5 | 6-M1 | &L306 | 1:F7 | 3-J7 | PL220 | 1:B5 | 2-H7 | R241 | 1:D4 | 2-G4 |
| D645 | 1:M5 | 6-H0 | &L307 | 1:E6 | 3-M8 | PL230 | 1:B2 | 2-L8 | R242 | 1:C4 | 2-G4 |
| D730 | 1:H3 | 7-H1 | &L308 | 1:E5 | 3-M8 | PL240 | 1:B6 | 2-K7 | R244 | 1:C4 | 2-G4 |
| D740 | 1:H3 | 7-K2 | &L309 | 1:E5 | 3-P8 | PL250 | 1:C8 | 2-D2 | R245 | 1:C4 | 2-H4 |
| D820 | 1:J3 | 8-B7 | &L310 | 1:E5 | 3-P8 | PL260 | 1:C4 | 2-H2 | R247 | 1:C7 | 2-J5 |
| D860 | 1:M2 | 8-P0 | &L325 | 1:E5 | 3-N7 | PL270 | 1:C2 | 2-L1 | R249 | 1:C6 | 2-J4 |
| D860 | 1:M2 | 8-P0 | L330 | 1:F4 | 3-F4 | | | | R251 | 1:B7 | 2-L3 |
| D880 | 1:M2 | 8-R2 | L400 | 1:G8 | 4-P3 | Q210 | 1:B5 | 2-J8 | R252 | 1:C6 | 2-L4 |
| D880 | 1:M2 | 8-R2 | L401 | 1:G8 | 4-P3 | Q220 | 1:B6 | 2-N7 | R254 | 1:B7 | 2-L3 |
| | | | L402 | 1:H8 | 4-L3 | Q230 | 1:B6 | 2-N6 | R255 | 1:B7 | 2-L3 |
| IC210 | 1:C5 | 2-F7 | L403 | 1:J8 | 4-J3 | Q240 | 1:C4 | 2-H4 | R256 | 1:C6 | 2-M4 |
| IC210 | 1:C5 | 2-G7 | L404 | 1:J8 | 4-G4 | Q245 | 1:B6 | 2-J4 | R258 | 1:C7 | 2-M3 |
| IC210 | 1:C5 | 2-N0 | L405 | 1:J7 | 4-G5 | Q250 | 1:C8 | 2-G2 | R260 | 1:C7 | 2-P2 |
| IC240 | 1:C6 | 2-P7 | L406 | 1:G9 | 4-Q3 | Q255 | 1:C7 | 2-H1 | R261 | 1:C7 | 2-P3 |
| IC260 | 1:C7 | 2-N3 | L408 | 1:K7 | 4-F3 | Q260 | 1:B7 | 2-K1 | R262 | 1:B4 | 2-P4 |
| IC270 | 1:C8 | 2-B2 | L409 | 1:L8 | 4-E3 | Q270 | 1:B8 | 2-L0 | %R263 | 1:C4 | 2-Q3 |
| IC270 | 1:C8 | 2-E3 | L410 | 1:M8 | 4-C3 | Q280 | 1:B7 | 2-L3 | R264 | 1:B8 | 2-B3 |
| IC270 | 1:C8 | 2-F2 | L750 | 1:G3 | 7-Q0 | Q290 | 1:B7 | 2-M3 | R265 | 1:B8 | 2-B2 |
| IC280 | 1:D8 | 2-E0 | L900 | 1:P7 | 9-E5 | Q300 | 1:E9 | 3-B7 | R266 | 1:B8 | 2-B2 |
| IC280 | 1:D8 | 2-B0 | L901 | 1:P7 | 9-F5 | Q301 | 1:F9 | 3-C7 | R267 | 1:C8 | 2-C3 |
| IC280 | 1:D8 | 2-C0 | L902 | 1:P7 | 9-G5 | Q302 | 1:F8 | 3-D7 | %R268 | 1:C3 | 2-Q2 |
| IC330 | 1:E4 | 3-P0 | | | | Q303 | 1:E6 | 3-K7 | R269 | 1:C8 | 2-B1 |
| IC330 | 1:E4 | 3-E3 | LINK1 | 1:B3 | 2-Q3 | Q304 | 1:F6 | 3-L8 | R271 | 1:D8 | 2-A0 |
| IC330 | 1:E4 | 3-N0 | LINK2 | 1:A4 | 2-Q2 | Q331 | 1:E3 | 3-G0 | R272 | 1:D8 | 2-A1 |
| IC330 | 1:E4 | 3-B3 | | | | Q400 | 1:K8 | 4-G3 | R273 | 1:D8 | 2-C1 |
| IC332 | 1:E3 | 3-N0 | P100 | 1:Q6 | 1-R8 | Q401 | 1:J7 | 4-F4 | R274 | 1:B3 | 2-P3 |
| IC332 | 1:E3 | 3-H1 | P160 | 1:P2 | 1-Q4 | Q540 | 1:K5 | 5-G4 | R275 | 1:D8 | 2-E0 |
| IC332 | 1:E3 | 3-F2 | P170 | 1:P2 | 1-R4 | Q620 | 1:N6 | 6-P8 | R276 | 1:B3 | 2-Q3 |
| IC333 | 1:E4 | 3-G1 | P201 | 1:C8 | 2-A9 | Q630 | 1:M6 | 6-P5 | R277 | 1:D8 | 2-D0 |

| Device | PCB | Circuit | Device | PCB | Circuit | Device | PCB | Circuit | Device | PCB | Circuit |
|--------|------|---------|--------|------|---------|--------|------|---------|---------|------|---------|
| R278 | 1:D8 | 2-C1 | R372 | 1:F3 | 3-L3 | R756 | 1:G3 | 7-G5 | R868 | 1:N4 | 8-E0 |
| R279 | 1:B3 | 2-Q3 | R373 | 1:F3 | 3-L3 | R757 | 1:G4 | 7-H4 | R869 | 1:M3 | 8-F0 |
| R280 | 1:C8 | 2-D2 | R374 | 1:E3 | 3-H5 | R758 | 1:H3 | 7-J4 | R870 | 1:M3 | 8-F0 |
| R281 | 1:C8 | 2-D2 | R375 | 1:E3 | 3-H4 | R759 | 1:H3 | 7-J4 | R871 | 1:N3 | 8-F0 |
| R282 | 1:C8 | 2-E2 | R376 | 1:E3 | 3-J5 | R760 | 1:H3 | 7-K4 | R872 | 1:N4 | 8-F0 |
| R284 | 1:C8 | 2-F3 | R377 | 1:E3 | 3-K4 | R762 | 1:H3 | 7-K4 | R873 | 1:N4 | 8-G0 |
| R285 | 1:B8 | 2-E3 | R378 | 1:F3 | 3-L4 | R763 | 1:H3 | 7-L4 | R875 | 1:M4 | 8-F2 |
| R287 | 1:C8 | 2-F2 | R382 | 1:F3 | 3-N4 | R765 | 1:H3 | 7-J2 | R876 | 1:M3 | 8-K1 |
| R288 | 1:B8 | 2-F2 | R383 | 1:F3 | 3-N4 | R766 | 1:G3 | 7-J3 | R877 | 1:M2 | 8-K1 |
| R289 | 1:C4 | 2-G2 | R384 | 1:E5 | 3-P4 | R767 | 1:H3 | 7-K2 | R878 | 1:M2 | 8-K0 |
| R290 | 1:C4 | 2-H3 | R400 | 1:G7 | 4-Q4 | R769 | 1:H3 | 7-K3 | R879 | 1:M2 | 8-K0 |
| R292 | 1:C7 | 2-G1 | R401 | 1:G7 | 4-P5 | R771 | 1:H4 | 7-L3 | R881 | 1:L4 | 8-H2 |
| R293 | 1:B7 | 2-H1 | R402 | 1:H7 | 4-P4 | R772 | 1:G4 | 7-L2 | R882 | 1:M4 | 8-H2 |
| R294 | 1:B8 | 2-H0 | R403 | 1:G8 | 4-P3 | R774 | 1:H3 | 7-L2 | R884 | 1:M3 | 8-P3 |
| R295 | 1:B6 | 2-J1 | R404 | 1:G8 | 4-P3 | R775 | 1:H4 | 7-M2 | R885 | 1:M3 | 8-P2 |
| R296 | 1:B7 | 2-K1 | R408 | 1:H9 | 4-M3 | R784 | 1:G3 | 7-P1 | R886 | 1:M3 | 8-Q3 |
| R297 | 1:B2 | 2-M0 | R409 | 1:G9 | 4-M3 | R785 | 1:G3 | 7-P1 | R887 | 1:M3 | 8-P3 |
| R298 | 1:B7 | 2-K1 | R410 | 1:H9 | 4-M3 | R786 | 1:G3 | 7-Q2 | R888 | 1:M3 | 8-P2 |
| R299 | 1:B7 | 2-K1 | R411 | 1:J8 | 4-H3 | R787 | 1:G2 | 7-Q2 | R889 | 1:M3 | 8-N1 |
| R300 | 1:E9 | 3-B7 | R412 | 1:K8 | 4-H3 | R790 | 1:G3 | 7-P0 | R890 | 1:M3 | 8-P1 |
| R301 | 1:F9 | 3-C6 | R416 | 1:K9 | 4-H3 | R793 | 1:G3 | 7-P1 | R891 | 1:M2 | 8-P0 |
| R302 | 1:F8 | 3-D7 | R417 | 1:J8 | 4-G4 | R794 | 1:G3 | 7-Q1 | R892 | 1:M2 | 8-P0 |
| R303 | 1:E8 | 3-D8 | R418 | 1:J7 | 4-G5 | R804 | 1:J3 | 8-B7 | R894 | 1:M2 | 8-Q0 |
| R304 | 1:F8 | 3-D8 | R419 | 1:K8 | 4-G3 | R805 | 1:J3 | 8-B7 | R895 | 1:M2 | 8-Q1 |
| R307 | 1:E6 | 3-K7 | R420 | 1:K8 | 4-G3 | R808 | 1:K2 | 8-B6 | R897 | 1:M2 | 8-Q2 |
| R308 | 1:F6 | 3-K8 | R424 | 1:J7 | 4-G3 | R809 | 1:K2 | 8-B6 | R898 | 1:M2 | 8-Q2 |
| R309 | 1:E6 | 3-K8 | R425 | 1:J7 | 4-F4 | R810 | 1:L2 | 8-C6 | R900 | 1:P6 | 9-G4 |
| R310 | 1:E6 | 3-K7 | R426 | 1:J8 | 4-F5 | R811 | 1:L2 | 8-C6 | | | |
| R311 | 1:F6 | 3-K8 | R427 | 1:J7 | 4-F4 | R812 | 1:K2 | 8-C6 | RL210 | 1:C2 | 2-R0 |
| R312 | 1:E6 | 3-L9 | R510 | 1:K6 | 5-H7 | R813 | 1:K2 | 8-C5 | RL210 | 1:C2 | 2-L1 |
| R313 | 1:E6 | 3-L8 | R515 | 1:H6 | 5-E5 | R815 | 1:K2 | 8-F4 | RL210 | 1:C2 | 2-R1 |
| R314 | 1:E6 | 3-L7 | R555 | 1:K5 | 5-G3 | R816 | 1:K2 | 8-F4 | | | |
| R315 | 1:E6 | 3-L7 | R615 | 1:M5 | 6-B6 | R818 | 1:K2 | 8-G5 | RV205 | 1:B5 | 2-M7 |
| R317 | 1:F5 | 3-Q7 | R617 | 1:M5 | 6-D5 | R819 | 1:L2 | 8-G5 | RV210 | 1:B7 | 2-K3 |
| R318 | 1:F5 | 3-Q7 | R619 | 1:N6 | 6-L8 | R820 | 1:K4 | 8-B4 | RV220 | 1:D4 | 2-G4 |
| R319 | 1:F6 | 3-L8 | R621 | 1:N6 | 6-L8 | R821 | 1:L4 | 8-C4 | RV230 | 1:B8 | 2-B2 |
| R320 | 1:F6 | 3-L7 | R625 | 1:N6 | 6-L7 | R822 | 1:L4 | 8-C4 | RV235 | 1:D9 | 2-D0 |
| R321 | 1:F6 | 3-L7 | R629 | 1:M6 | 6-P6 | R823 | 1:L4 | 8-C4 | RV330 | 1:E3 | 3-E1 |
| &R323 | 1:E5 | 3-P8 | R633 | 1:M5 | 6-Q8 | R824 | 1:K4 | 8-K8 | RV331 | 1:F3 | 3-K3 |
| &R324 | 1:E5 | 3-P8 | R636 | 1:M5 | 6-K6 | R825 | 1:K4 | 8-K8 | | | |
| R329 | 1:E4 | 3-D3 | R637 | 1:N5 | 6-K5 | R826 | 1:K4 | 8-K8 | SHLD610 | 1:L6 | 6-J3 |
| R330 | 1:E4 | 3-D3 | R640 | 1:M5 | 6-G0 | R827 | 1:K4 | 8-K7 | | | |
| R333 | 1:F3 | 3-E5 | R641 | 1:N5 | 6-L4 | R828 | 1:K4 | 8-K7 | SK501 | 1:G6 | 5-C6 |
| R336 | 1:F4 | 3-E4 | R645 | 1:N5 | 6-L5 | R829 | 1:K4 | 8-P9 | SK502 | 1:G6 | 5-C6 |
| R337 | 1:E3 | 3-G0 | R649 | 1:M5 | 6-M5 | R830 | 1:K3 | 8-P9 | SK503 | 1:G6 | 5-C5 |
| R338 | 1:E3 | 3-G0 | R653 | 1:M5 | 6-Q4 | R831 | 1:K3 | 8-P9 | SK504 | 1:G5 | 5-C4 |
| R339 | 1:F4 | 3-F4 | R681 | 1:L5 | 6-L2 | R832 | 1:K3 | 8-P8 | SK505 | 1:G5 | 5-C4 |
| R340 | 1:E3 | 3-E2 | R685 | 1:L5 | 6-N2 | R833 | 1:K3 | 8-P8 | SK513 | 1:H5 | 5-D4 |
| R341 | 1:E3 | 3-F3 | R689 | 1:L6 | 6-Q3 | R835 | 1:K3 | 8-P8 | SK522 | 1:H6 | 5-F6 |
| R342 | 1:E3 | 3-F3 | R693 | 1:L5 | 6-P1 | R836 | 1:K3 | 8-P8 | SK531 | 1:K6 | 5-J6 |
| R343 | 1:E3 | 3-G3 | R696 | 1:L6 | 6-P1 | R837 | 1:K3 | 8-P7 | SK532 | 1:K5 | 5-J6 |
| R344 | 1:D4 | 3-H1 | R701 | 1:J4 | 7-A9 | R838 | 1:L4 | 8-L6 | SK533 | 1:K5 | 5-J5 |
| &R346 | 1:F4 | 3-G5 | R702 | 1:J4 | 7-B9 | R839 | 1:L4 | 8-L6 | SK534 | 1:K5 | 5-J4 |
| R347 | 1:E3 | 3-H1 | R703 | 1:J4 | 7-B8 | R840 | 1:K3 | 8-P7 | SK535 | 1:K5 | 5-J4 |
| R348 | 1:F4 | 3-G3 | R706 | 1:J3 | 7-C6 | R841 | 1:K3 | 8-P7 | SK805 | 1:K3 | 8-Q9 |
| R349 | 1:F4 | 3-H3 | R707 | 1:J3 | 7-C7 | R842 | 1:K3 | 8-P6 | SK805 | 1:K3 | 8-Q9 |
| R350 | 1:E3 | 3-D2 | R708 | 1:J2 | 7-D7 | R843 | 1:K3 | 8-P6 | SK805 | 1:K3 | 8-Q7 |
| R351 | 1:E3 | 3-E1 | R709 | 1:H2 | 7-E7 | R844 | 1:L2 | 8-R3 | SK805 | 1:K3 | 8-Q8 |
| R352 | 1:E3 | 3-E1 | R710 | 1:J3 | 7-B6 | R845 | 1:L2 | 8-R3 | SK805 | 1:K3 | 8-Q6 |
| R353 | 1:E3 | 3-E1 | R711 | 1:H3 | 7-C6 | R846 | 1:L4 | 8-L6 | SK805 | 1:K3 | 8-Q8 |
| R354 | 1:E3 | 3-F2 | R712 | 1:J4 | 7-P8 | R847 | 1:L4 | 8-M6 | SK805 | 1:K3 | 8-Q6 |
| R355 | 1:E3 | 3-D2 | R713 | 1:J3 | 7-C6 | R848 | 1:L4 | 8-R5 | SK805 | 1:K3 | 8-Q8 |
| R356 | 1:E3 | 3-D2 | R730 | 1:J2 | 7-A2 | R852 | 1:L2 | 8-G6 | SK805 | 1:K3 | 8-Q7 |
| R357 | 1:E4 | 3-G1 | R731 | 1:J2 | 7-A2 | R853 | 1:L2 | 8-F6 | SK805 | 1:K3 | 8-Q8 |
| R358 | 1:E3 | 3-E2 | R732 | 1:J2 | 7-A2 | R854 | 1:N3 | 8-C2 | SK805 | 1:K3 | 8-Q7 |
| R359 | 1:E3 | 3-E2 | R742 | 1:H2 | 7-C4 | R855 | 1:N3 | 8-C2 | SK805 | 1:K3 | 8-Q5 |
| R360 | 1:E3 | 3-H1 | R743 | 1:H2 | 7-C4 | R856 | 1:N3 | 8-C2 | SK805 | 1:K3 | 8-Q7 |
| R361 | 1:F3 | 3-H3 | R744 | 1:G2 | 7-D4 | R857 | 1:N4 | 8-D2 | SK805 | 1:K3 | 8-Q6 |
| R362 | 1:E3 | 3-H1 | R746 | 1:H3 | 7-D4 | R858 | 1:N3 | 8-C1 | SK805 | 1:K3 | 8-Q9 |
| R363 | 1:F3 | 3-J4 | R747 | 1:H3 | 7-D4 | R859 | 1:N3 | 8-D0 | SK805 | 1:K3 | 8-Q6 |
| %R364 | 1:E4 | 3-J2 | R748 | 1:J2 | 7-A1 | R860 | 1:N3 | 8-D1 | SK810 | 1:L3 | 8-H5 |
| R365 | 1:E5 | 3-J2 | R749 | 1:J2 | 7-B1 | R861 | 1:M3 | 8-D0 | | | |
| R368 | 1:E3 | 3-J1 | R750 | 1:H4 | 7-Q8 | R863 | 1:N3 | 8-E2 | SL210 | 1:C8 | 2-E1 |
| R369 | 1:E3 | 3-J1 | R752 | 1:G4 | 7-F5 | R865 | 1:M3 | 8-E2 | SL220 | 1:C8 | 2-E1 |
| R370 | 1:F3 | 3-K3 | R753 | 1:G4 | 7-F3 | R866 | 1:M3 | 8-F2 | #SL400 | 1:N8 | 4-C3 |
| R371 | 1:F3 | 3-K4 | R754 | 1:G3 | 7-F3 | R867 | 1:M3 | 8-F1 | #SL401 | 1:M8 | 4-D3 |

| <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> |
|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|
| #SL402 | 1:M8 | 4-E3 | | | | | | | | | |
| #SL403 | 1:J8 | 4-J4 | | | | | | | | | |
| #SL404 | 1:H8 | 4-K3 | | | | | | | | | |
| #SL405 | 1:H8 | 4-L4 | | | | | | | | | |
| SW201 | 1:B4 | 2-L6 | | | | | | | | | |
| T210 | 1:C3 | 2-Q3 | | | | | | | | | |
| T610 | 1:L6 | 6-N2 | | | | | | | | | |
| TP202 | 1:C8 | 2-D9 | | | | | | | | | |
| TP211 | 1:D3 | 2-P8 | | | | | | | | | |
| TP300 | 1:E8 | 3-E7 | | | | | | | | | |
| TP301 | 1:F6 | 3-J7 | | | | | | | | | |
| TP302 | 1:F6 | 3-M8 | | | | | | | | | |
| TP305 | 1:E6 | 3-P4 | | | | | | | | | |
| TP601 | 1:N5 | 6-K9 | | | | | | | | | |
| TP602 | 1:L5 | 6-R9 | | | | | | | | | |
| TP603 | 1:L5 | 6-J2 | | | | | | | | | |
| TP604 | 1:L4 | 6-N6 | | | | | | | | | |
| TP607 | 1:M4 | 6-E6 | | | | | | | | | |
| TP710 | 1:G4 | 7-J5 | | | | | | | | | |
| &XF300 | 1:F7 | 3-G7 | | | | | | | | | |
| &XF301 | 1:F7 | 3-H7 | | | | | | | | | |
| &XF302 | 1:E5 | 3-N8 | | | | | | | | | |
| X330 | 1:E4 | 3-C3 | | | | | | | | | |
| &XF304 | 1:F4 | 3-E3 | | | | | | | | | |

Part C T826 Transmitter & T827 Exciter

This part of the manual is divided into six 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 | Initial Tuning & Adjustment |
| 4 | Functional Testing (not available for Tuning & Adjustment manual) |
| 5 | Fault Finding (not available for Tuning & Adjustment manual) |
| 6 | PCB Information |

1 T826/827 General Information

This section provides a brief description of the T826 transmitter and T827 exciter, along with detailed specifications and a list of types available.

The following topics are covered in this section.

| Section | Title | Page |
|------------|------------------------------------|-------------|
| 1.1 | Introduction | 1.3 |
| 1.2 | Specifications | 1.4 |
| 1.2.1 | Introduction | 1.4 |
| 1.2.2 | General | 1.4 |
| 1.2.3 | RF Section | 1.5 |
| 1.2.4 | Audio Processor | 1.6 |
| 1.2.4.1 | Inputs | 1.6 |
| 1.2.4.2 | Modulation Characteristics | 1.7 |
| 1.2.4.3 | CTCSS | 1.7 |
| 1.2.5 | Microcontroller | 1.7 |
| 1.2.6 | Test Standards | 1.8 |
| 1.3 | Product Codes | 1.9 |
| 1.4 | T826 Standard Product Range | 1.10 |
| 1.5 | T827 Standard Product Range | 1.10 |

1.1 Introduction

The T826 is a synthesised, microprocessor controlled FM base station transmitter designed for single or multichannel operation in the 66 to 88MHz frequency range¹ with a standard power output of 25W. The RF section of the transmitter comprises a frequency synthesiser which provides 125mW of frequency modulated RF drive to a two stage, wide band output driver followed by a 25W power amplifier. A thermal shut-down feature is provided in the T826 in case operating temperatures exceed acceptable levels.

The T827 is a synthesised, microprocessor controlled FM base station exciter designed for single or multichannel operation in the 66 to 88MHz frequency range¹. With a standard power output of only 1W, the exciter is designed for use with the T828 50W power amplifier. The RF section of the exciter comprises a frequency synthesiser which provides 125mW of frequency modulated RF drive to a two stage, wide band output amplifier.

A wide selection of audio characteristics may be obtained from the audio processor. Optional circuit blocks are an audio compressor and a pre-emphasis stage. They can be bypassed or linked to one or both audio inputs, and then back into the remaining audio circuitry in almost any combination. All audio processor options are link selectable.

The synthesiser frequency is programmed via the serial communications port. Eight channel select lines are accessible via an optional D-range connector (D-range 2 - T800-03-0000) at the rear of the set.

All components except those of the VCO are mounted on a single PCB. This is secured to a die-cast chassis which is divided into compartments to individually shield each section of circuitry. Access to both sides of the main circuit board is obtained by removing each of the chassis lids. There is provision within the chassis to mount small option PCBs.

The front panel controls include line sensitivity, microphone socket and carrier switch. This switch turns on the carrier (unmodulated) as an aid to servicing.

The T826 and T827 are both 60mm wide and each occupies a single space in a Tait rack frame, which has the ability to accommodate up to seven standard modules.

1. Although capable of operating over the 66-88MHz frequency range, the T826 and T827 have an 8MHz switching range (see Section 1.2.3 and Section 3.1).

1.2 Specifications

1.2.1 Introduction

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

Where applicable, the test methods used to obtain the following performance figures are those described in the EIA and ETS specifications. However, there are several parameters for which performance according to the CEPT specification is given. Refer to Section 1.2.6 for details of test standards.

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

The terms "wide bandwidth" and "narrow bandwidth" used in this and following sections are defined in the following table.

| | Channel Spacing | Modulation 100% Deviation | Receiver IF Bandwidth |
|------------------|-----------------|------------------------------|--------------------------|
| Wide Bandwidth | 25kHz | ±5.0kHz | 15.0kHz |
| Narrow Bandwidth | 12.5kHz | ±2.5kHz | 7.5kHz |

1.2.2 General

Number Of Channels .. 128 (standard)¹

Supply Voltage:

Operating Voltage .. 10.8 to 16V DC
 Standard Test Voltage .. 13.8V DC
 Polarity .. negative earth only
 Polarity Protection .. crowbar diode
 Line Keying Supply (if required) .. -50V DC

Supply Current:

Transmit - T826 .. 4.5A (typical)
 - T827 .. 650mA
 Standby .. 160mA (typical)

Operating Temperature Range .. -30°C to +60°C

1. Additional channels may be factory programmed. Contact your nearest Tait Dealer or Customer Service Organisation.

Dimensions:

| | |
|---------------------------|--|
| Height | .. 183mm |
| Width | .. 60mm |
| Length | .. 322mm |
| Weight | .. 2.1kg |
| Time-Out Timer (optional) | .. 0 to 5 minutes ¹ adjustable in 10 second steps |
| Tail Timer | .. 0 to 5 seconds adjustable in 100ms ² steps |
| Transmit Key Time | .. <30ms |
| Transmit Lockout Timer | .. 0 to 1 minute adjustable in 10 second steps |

1.2.3 RF Section

| | |
|--|--|
| Frequency Range | .. 66-88MHz (refer to Section 1.4 and Section 1.5) |
| Modulation Type | .. FM |
| Frequency Increment | .. 5 or 6.25kHz |
| Switching Range | .. 8MHz (i.e. ± 4 MHz from the centre frequency) |
| Load Impedance | .. 50 ohms |
| Frequency Stability (see also Section 1.4 and Section 1.5) | .. ± 2.5 ppm, -30°C to $+60^{\circ}\text{C}$ |
| Adjacent Channel Power (full deviation): | |
| Wide Bandwidth (WB) (± 25 kHz/ 15 kHz B/W) | .. -70dBc |
| Narrow Bandwidth (NB) (± 12.5 kHz/ 7.5 kHz B/W) | .. -60dBc |
| Transmitter Switching | .. complies with ETS 300 113 |
| Transmitter Side Band Noise: (no modulation, 15kHz bandwidth) | |
| At ± 25 kHz | .. -95dBc |
| At ± 1 MHz | .. -105dBc |

-
1. Adjustable from 0 to 10 minutes in PGM800Win version 2.12 and later.
 2. Adjustable in 20ms steps in PGM800Win version 2.12 and later.

| | |
|---|---|
| Intermodulation | .. -40dBc with interfering signal of -30dBc .. -70dBc with 25dB isolation & interfering signal of -30dBc (PA with output isolator) |
| T826 Mismatch Capability: | |
| Ruggedness | .. refer to your nearest Tait Dealer or Customer Service Organisation |
| Stability | .. 3:1 VSWR (all phase angles) |
| Radiated Spurious Emissions: | |
| Transmit | .. -36dBm to 1GHz .. -30dBm 1GHz to 4GHz |
| Standby | .. -57dBm to 1GHz .. -47dBm 1GHz to 4GHz |
| Conducted Spurious Emissions: (T826 Only) | |
| Transmit | .. -36dBm to 1GHz .. -30dBm 1GHz to 4GHz |
| Standby | .. -57dBm to 1GHz .. -47dBm 1GHz to 4GHz |
| Power Output: | |
| T826 - Rated Power | .. 25W |
| - Range Of Adjustment | .. 5-25W |
| T827 | .. 1W ±300mW |
| Duty Cycle (T826 Only) | |
| | .. 100% @ 25W at +25°C |
| | .. 30% @ 25W at +60°C |
| | .. 100% @ 10W at +60°C |

1.2.4 Audio Processor

1.2.4.1 Inputs

| | |
|---|-------------------------------|
| Inputs Available | .. line, microphone and CTCSS |
| Line Input: | |
| Impedance | .. 600 ohms (balanced) |
| Sensitivity (60% modulation @ 1kHz)- With Compressor | .. -50dBm |
| Without Compressor | .. -30dBm |
| Microphone Input: | |
| Impedance | .. 600 ohms |
| Sensitivity (60% modulation @ 1kHz)- With Compressor | .. -70dBm |
| Without Compressor | .. -50dBm |

1.2.4.2 Modulation Characteristics

Frequency Response (below limiting) .. flat or pre-emphasised (optional)

Line And Microphone Inputs:

Pre-emphasised Response-Bandwidth .. 300Hz to 3kHz (WB)
 .. 300Hz to 2.55kHz (NB)
 Below Limiting .. within +1, -3dB of a 6dB/octave pre-emphasis characteristic
 Flat Response .. within +1, -2dB of output at 1kHz

Above Limiting Response .. within +1, -2dB of a flat response (ref. 1kHz)

Distortion .. 2% max.

Hum And Noise:

Wide Bandwidth .. -55dB (300Hz to 3kHz [EIA]) typical
 Narrow Bandwidth .. -50dB (CEPT)

Compressor (optional):

Attack Time .. 10ms
 Decay Time .. 800ms
 Range .. 50dB

1.2.4.3 CTCSS

Standard Tones .. all 37 EIA group A, B and C tones plus 13 commonly used tones

Frequency Error (from EIA tones) .. 0.08% max.

Generated Tone Distortion .. 1.2% max.

Generated Tone Flatness .. flat across 67 to 250.3Hz to within 1dB

Modulation Level .. adjustable

Modulated Distortion .. <5%

1.2.5 Microcontroller

Auxiliary Ports:

Open Drain Type .. capable of sinking 2.25mA via 2k2Ω
 V_{ds} max. .. 5V

1.2.6 Test Standards

Where applicable, this equipment is tested in accordance with the following standards.

1.2.6.1 European Telecommunication Standard

ETS 300 086 January 1991

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment with an internal or external RF connector intended primarily for analogue speech.

ETS 300 113 March 1996

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment intended for the transmission of data (and speech) and having an antenna connector.

ETS 300 219 October 1993

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment transmitting signals to initiate a specific response in the receiver.

ETS 300 279 February 1996

Radio equipment and systems; electromagnetic compatibility (EMC) standard for private land mobile radio (PMR) and ancillary equipment (speech and/or non-speech).

1.2.6.2 DTI CEPT Recommendation T/R-24-01

Annex I: 1988

Technical characteristics and test conditions for radio equipment in the land mobile service intended primarily for analogue speech.

Annex II: 1988

Technical characteristics of radio equipment in the land mobile service with regard to quality and stability of transmission.

1.2.6.3 Telecommunications Industry Association

ANSI/TIA/EIA-603-1992

Land mobile FM or PM communications equipment measurement and performance standards.

1.3 Product Codes

The three groups of digits in the T820 Series II product code provide information about the model, type and options fitted, according to the conventions described below.

The following explanation of T820 Series II product codes is not intended to suggest that any combination of features is necessarily available in any one product. Consult your nearest Tait Dealer or Customer Service Organisation for more information regarding the availability of specific models, types and options.

Model

The Model group indicates the basic function of the product, as follows:

| | |
|----------------------|--------------------------|
| <u>T82X</u> -XX-XXXX | T825 receiver |
| | T826 25W transmitter |
| | T827 exciter |
| | T828 50W power amplifier |

Type

The Type group uses two digits to indicate the basic RF configuration of the product.

The first digit in the Type group designates the frequency range:

| | |
|-----------------------|------------------|
| T82X- <u>1</u> X-XXXX | '1' for 66-88MHz |
|-----------------------|------------------|

The second digit in the Type group indicates the channel spacing:

| | |
|-----------------------|------------------------------------|
| T82X- <u>0</u> X-XXXX | '0' for wide bandwidth (25kHz) |
| | '5' for narrow bandwidth (12.5kHz) |

Options

| | |
|----------------------|---|
| T82X-XX- <u>XXXX</u> | The Options group uses four digits and/or letters to indicate any options that may be fitted to the product. This includes standard options and special options for specific customers. '0000' indicates a standard Tait product with no options fitted. The large number of options precludes listing them here. |
|----------------------|---|

1.4 T826 Standard Product Range

The following table lists the range of standard T826 types (i.e. no options fitted) available at the time this manual was published. Consult your nearest Tait Dealer or Customer Service Organisation for more information.

| | | | |
|-------------------------|------------------------|---------|---------|
| Frequency Range (MHz) | | 66-88 | |
| Deviation (kHz) | | 2.5 | 5 |
| TCXO ^a | ±2.5ppm -30°C to +60°C | • | • |
| Transmitter Type: T826- | | 15-0000 | 10-0000 |

- a. A TCXO with a stability of ±1ppm (0°C to +60°C) is available to suit specific requirements. Contact your nearest authorised Tait Dealer or Customer Service Organisation for further details.

You can identify the transmitter type by checking the product code printed on a label on the rear of the chassis (Figure 1.1 in Part A shows typical labels). You can further verify the transmitter type by checking the placement of an SMD resistor in the table that is screen printed onto the PCB (refer to Section 6.1 for more details).

1.5 T827 Standard Product Range

The following table lists the range of standard T827 types (i.e. no options fitted) available at the time this manual was published. Consult your nearest Tait Dealer or Customer Service Organisation for more information.

| | | | |
|-------------------------|------------------------|---------|---------|
| Frequency Range (MHz) | | 66-88 | |
| Deviation (kHz) | | 2.5 | 5 |
| TCXO ^a | ±2.5ppm -30°C to +60°C | • | • |
| Transmitter Type: T827- | | 15-0000 | 10-0000 |

- a. A TCXO with a stability of ±1ppm (0°C to +60°C) is available to suit specific requirements. Contact your nearest authorised Tait Dealer or Customer Service Organisation for further details.

You can identify the exciter type by checking the product code printed on a label on the rear of the chassis (Figure 1.1 in Part A shows typical labels). You can further verify the exciter type by checking the placement of an SMD resistor in the table that is screen printed onto the PCB (refer to Section 6.1 for more details).

2 T826/827 Circuit Operation

This section provides a basic description of the circuit operation of the T826 transmitter and T827 exciter.

Note: Unless otherwise specified, the term "PGM800Win" used in this and following sections refers to version 2.00 and later of the software.

Refer to Section 6 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 parts list and diagrams for the VCO PCB are in Part E.

The following topics are covered in this section.

| Section | Title | Page |
|---------|--|------|
| 2.1 | Introduction | 2.3 |
| 2.2 | Microcontroller | 2.4 |
| 2.3 | Synthesised Local Oscillator | 2.5 |
| 2.3.1 | Two Point Modulation | 2.6 |
| 2.4 | VCO | 2.7 |
| 2.4.1 | VCO Supply | 2.7 |
| 2.5 | Audio Processor | 2.8 |
| 2.5.1 | General | 2.8 |
| 2.5.2 | Audio Inputs | 2.8 |
| 2.5.3 | Keying Inputs | 2.9 |
| 2.5.4 | Compressor (Automatic Level Control (ALC)) | 2.9 |
| 2.5.5 | Outputs To Modulators | 2.9 |
| 2.6 | Power Supply & Regulator Circuits | 2.10 |
| 2.7 | Transmit Timers | 2.11 |
| 2.8 | T826 Drive Amplifier & PA | 2.12 |
| 2.9 | T827 Exciter Drive Amplifier | 2.13 |

| Figure | Title | Page |
|--------|--|------|
| 2.1 | T826 High Level Block Diagram | 2.3 |
| 2.2 | T827 High Level Block Diagram | 2.3 |
| 2.3 | T826/827 Microcontroller Block Diagram | 2.4 |
| 2.4 | T826/827 Synthesiser Block Diagram | 2.5 |
| 2.5 | T826/827 Two Point Modulation | 2.6 |
| 2.6 | T826/827 Audio Processor Block Diagram | 2.8 |
| 2.7 | T826/827 Power Supply & Regulators Block Diagram | 2.10 |
| 2.8 | T826/827 Transmit Timers | 2.11 |

2.1 Introduction

The individual circuit blocks which make up the T826 and T827 are:

- synthesiser
- VCO
- audio processor
- drive amplifier
- power amplifier (T826 only)
- voltage regulators.

Each of these circuit blocks is set in its own shielded compartment, formed as an integral part of the main chassis.

The configuration of the circuit blocks may be seen on a functional level in Figure 2.1 and Figure 2.2. Refer to the circuit diagrams in Section 6.2 (T826) or 6.3 (T827) for more detail.

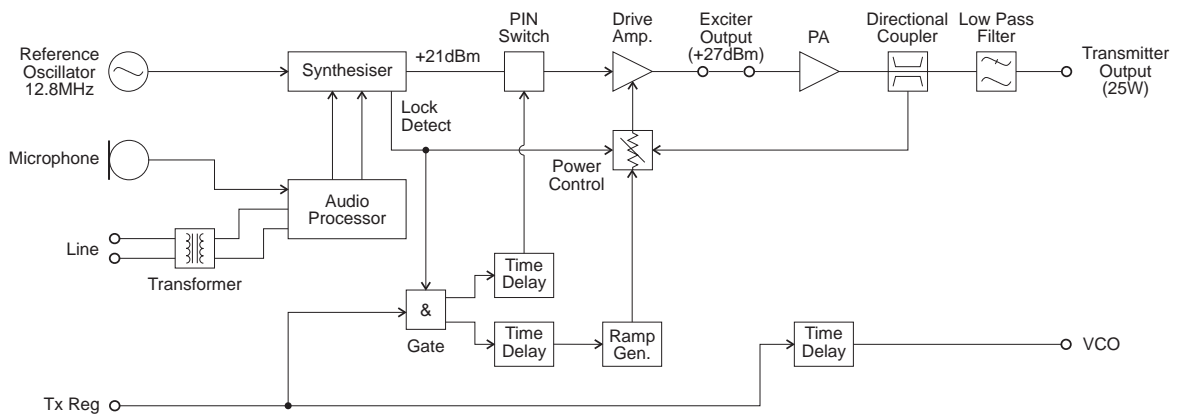


Figure 2.1 T826 High Level Block Diagram

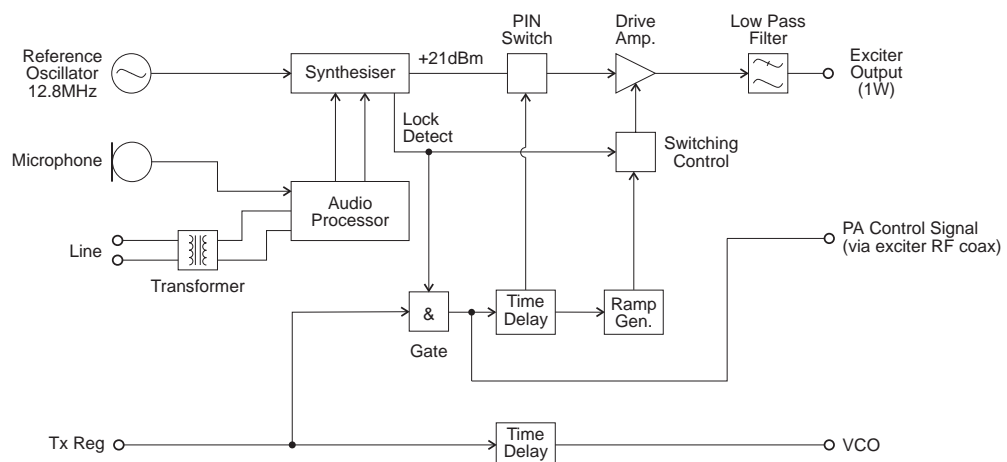


Figure 2.2 T827 High Level Block Diagram

2.2 Microcontroller

(Refer to the microcontroller circuit diagram (sheet 8) in Section 6.2 or 6.3.)

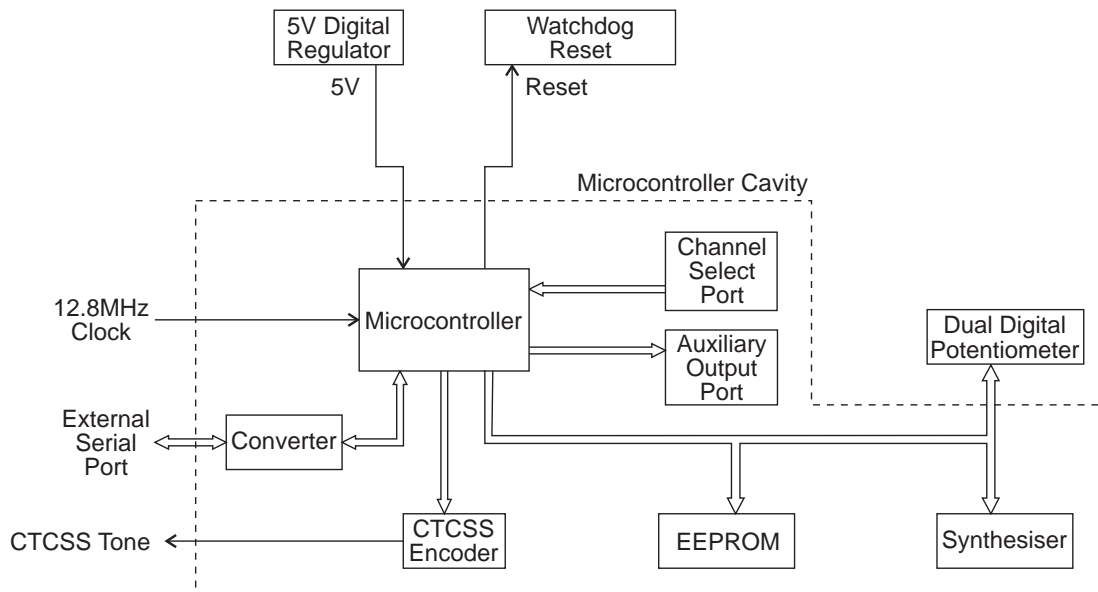


Figure 2.3 T826/827 Microcontroller Block Diagram

Overall system control of the T826/827 is accomplished by the use of a member of the 80C51 family of microcontrollers (IC810). It runs from internal ROM and RAM, thus leaving all four ports free for input/output functions.

Non-volatile data storage is achieved by serial communication with a 16kBit EEPROM (IC820). This serial bus is also used by the microcontroller to program the synthesiser (IC740) and deviation control EPOTS (IC220).

The main tasks of the microcontroller are as follows:

- program the synthesiser and EPOT;
- interface with the PGM800Win programming software at 9600 baud via the serial communication lines on D-range 1 (PL100) & D-range 2;
- monitor channel change inputs from D-range 2;
- generate timing waveforms for CTCSS encoding;
- coordinate and implement timing control of the exciter/transmitter;
- control the front panel "Supply" LED.

2.3 Synthesised Local Oscillator

(Refer to the synthesiser circuit diagram (sheet 7) in Section 6.2 or 6.3 and the VCO circuit diagram in Part E.)

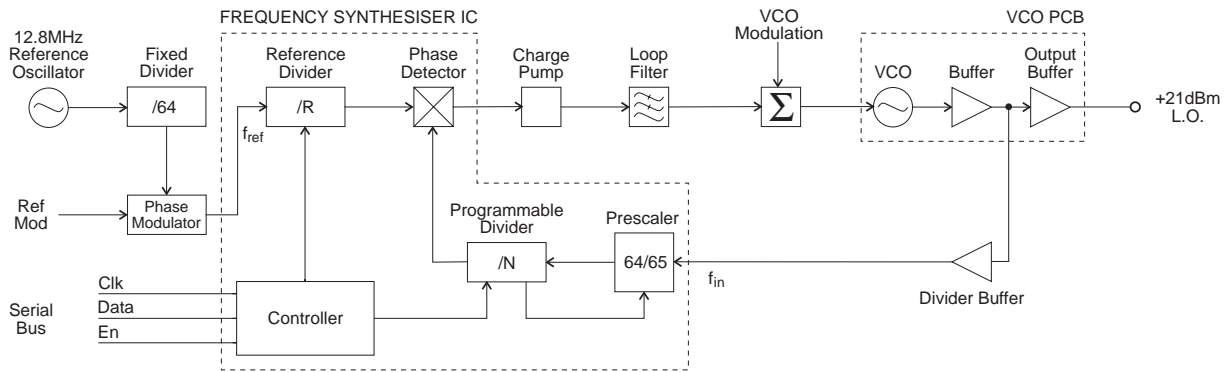


Figure 2.4 T826/827 Synthesiser Block Diagram

The synthesiser (IC740) employs a phase-locked loop (PLL) to lock a voltage controlled oscillator (VCO) to a given reference frequency. The synthesiser receives the divider information from the control microprocessor via a 3 wire serial bus (clock, data, enable). When the data has been latched in, the synthesiser processes the incoming signals from the VCO buffer (f_{in}) and the phase modulator (f_{ref}).

A reference oscillator at 12.8MHz (=IC700) is buffered (IC710 pins 5 & 6) and divided down to 200kHz (IC730). This 200kHz square wave is then summed with the modulating audio and passed to an integrator (IC720 pins 9 & 8, Q710, Q720). This produces a ramping waveform which is centred around a DC level determined by the incoming audio. IC720 pins 5 & 6 perform as a comparator, ultimately producing a phase-modulated 200kHz square wave. This is followed by another phase shifting stage (IC720 pins 3 & 4, Q730, Q740), before being divided down to 6.25kHz or 5kHz within the synthesiser IC (IC740).

A buffered output of the VCO (Q795) is divided with a prescaler and programmable divider which is incorporated into the synthesiser chip (IC740). This signal is compared with the phase modulated reference signal at the phase detector (also part of the synthesiser chip). The phase detector outputs drive a balanced charge pump circuit (Q760, Q770, Q775, Q780, Q785) and active loop filter (IC750 pins 5, 6 & 7) which produces a DC voltage between 0V and 20V to tune the VCO. This VCO control line is further filtered to attenuate noise and other spurious signals. Note that the VCO frequency increases with increasing control voltage.

If the synthesiser loop loses lock, a pulsed signal appears at LD (pin 2) of IC740. This signal is filtered and buffered by IC750 pins 1, 2 & 3, producing the Lock-Detect signal used to shut off the power supply to the drive amplifier. IC750 pin 1 is at 20V when the synthesiser is out of lock.

2.3.1 Two Point Modulation

Frequency modulation occurs by modulating both the VCO input and the synthesiser reference input. This process is called two point modulation and ensures a flat modulation response from 67Hz to 3kHz (2.55kHz for narrow bandwidth).

The PLL has a fast response time, allowing a Tx key-up time of <30ms. Because of this fast response time the PLL sees lower modulation frequencies superimposed on the VCO as an error and corrects for it, resulting in no modulation on the carrier. At modulation frequencies greater than 300Hz the loop cannot correct fast enough and modulation is seen on the carrier. The response of the loop to VCO modulation is shown by f_2 in Figure 2.5 below.

To achieve low frequency modulation, the reference oscillator is also modulated so that the phase detector of IC740 detects no frequency error under modulation. Thus, the synthesiser loop will not attempt to correct for modulation and the audio frequency response of the transmitter remains unaffected. The response of the loop to reference frequency modulation is shown by f_1 in Figure 2.5.

The reference modulation is controlled by a 256-step 10k electronic potentiometer (EPOT) which is adjustable via PGM800Win. The EPOT is made up of 256 resistive sections (representing approximately 39Ω each) which can be individually addressed by the microcontroller. Each section can be switched in or out of circuit to achieve the required total resistance, thus giving control of the reference modulation.

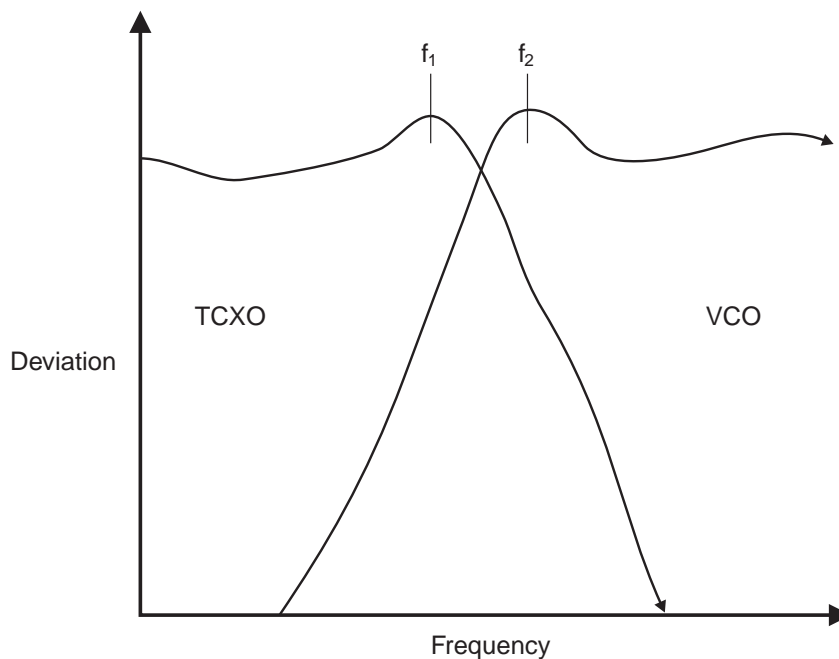


Figure 2.5 T826/827 Two Point Modulation

2.4 VCO

(Refer to the VCO circuit diagram in Part E.)

The VCO transistor (Q1) operates in a common source configuration, with an LC tank circuit coupled between its gate and drain to provide the feedback necessary for oscillation. The VCO control voltage from the loop filter (IC750 pin 7) is applied to the varicaps (D1-D6) to facilitate tuning within an 8MHz band of frequencies. A trimcap (&VC1-TX) is used for coarse tuning of the VCO. The output from the oscillator circuit drives a cascode amplifier stage (Q2, Q3) which supplies +10dBm (typically) to a further stage of amplification, Q5. This is the final amplifier on the VCO PCB, and delivers +21dBm (typically) to the exciter drive amplifier.

A low level "sniff" is taken from the output of Q3 and used to drive the divider buffer (Q795) for the synthesiser (IC740).

The VCO operates at the actual output frequency of the exciter, i.e. there are no multiplier stages. The VCO is modulated by superimposing the audio signal onto the control voltage and by phase modulating the reference signal.

2.4.1 VCO Supply

The VCO is supplied from two switched +9V supplies under the control of the Tx-Reg. supply.

The VCO (Q1) and buffer amplifier (Q2 & Q3) are supplied from one +9V switched supply by Q540 via the capacitor multiplier (Q550, C550).

The output amplifier is supplied from the other +9V supply by Q520, Q530, and Q510.

A delay circuit holds the VCO on for a short time after the Tx-Reg. supply has been switched off. This is to allow the RF power circuits (both exciter and PA) to ramp down in the correct manner before the VCO is switched off.

2.5 Audio Processor

(Refer to the audio processor circuit diagram (sheet 2) in Section 6.2 or 6.3.)

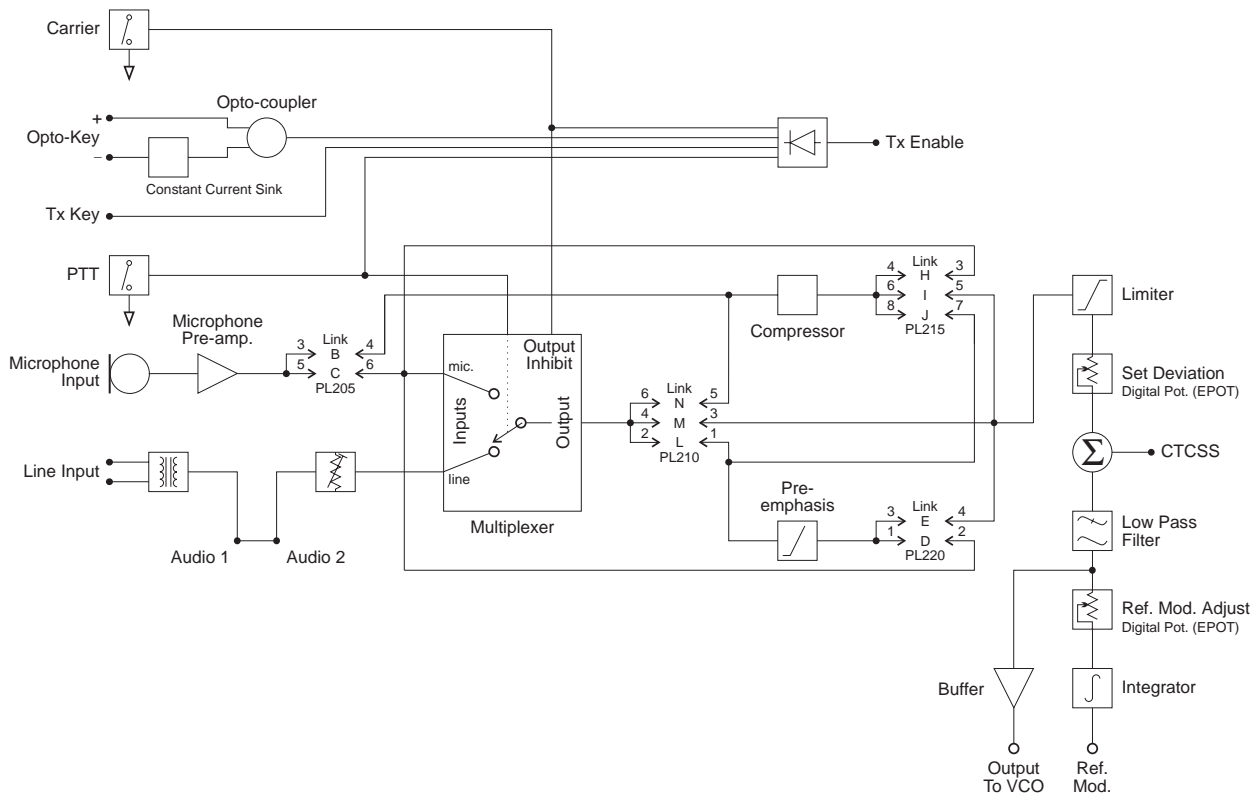


Figure 2.6 T826/827 Audio Processor Block Diagram

2.5.1 General

The audio processor comprises several link selectable circuit blocks which may be configured in a variety of combinations to suit individual requirements. The pre-emphasis network and compressor may be linked individually or cascaded between either or both audio inputs and the limiter.

Refer to Section 3.5.1 for linking details.

2.5.2 Audio Inputs

Two audio inputs are available: one from a 600 ohm balanced (or unbalanced) line, and the other from a local microphone. The microphone signal is passed first to a pre-amplifier (Q210) and ultimately to a multiplexer (IC240), but in between may pass through the compressor (depending on the linking details). The line transformer is also connected to the multiplexer and is disabled by the microphone PTT switch.

A third input for external CTCSS tones is also provided.

2.5.3 Keying Inputs

There are four ways to key the exciter:

- pulling the Tx-Key line low (pin 13 on D-range 1 [PL100]) at the rear of the set);
- pushing the "Carrier" button on the front panel - this will inhibit all audio;
- using the PTT button on the local microphone, disabling audio from the line;
- via the opto-key inputs (pins 11 and 12 on D-range 1 [PL100]) when electrical isolation is required. This features a constant current sink (Q270) to ensure reliable activation of the opto-coupler (IC250) at low keying voltages.

2.5.4 Compressor (Automatic Level Control (ALC))

The input signal is fed via a current controlled attenuator (Q230, Q220) to a high gain stage (IC230) from which the output signal is taken. This signal is passed to a comparator (IC230) which toggles whenever the audio signal exceeds a DC threshold determined by RV220. Thus, the comparator produces a square wave whose mark-space ratio is determined by the amplitude of the audio signal. This square wave pumps up the reservoir capacitor (C233) which controls the attenuator (Q230, Q220), thus completing the feedback loop.

The compression level is set by adjustment of the comparator threshold (RV220).

Note: Although the high dynamic range of the compressor allows the use of very low audio signal levels, such conditions will be accompanied by a degradation of the signal-to-noise ratio. Very low audio input levels should therefore be avoided where possible.

2.5.5 Outputs To Modulators

The output signal from the limiter (IC210, IC230) is added with a CTCSS tone at a summing amplifier (IC260). The signal is then low pass filtered (IC260) and split to supply the two modulators.

Since the VCO modulator is a true frequency modulator, its audio is simply buffered (IC260). The reference modulator, however, is a phase modulator and its audio must first be integrated (IC210).

It is vital that the audio levels to the modulators are accurately set, *relative to each other*. Hence the inclusion of level adjustment in the reference modulator path. Once set, adjustments to absolute deviation may be made only by IC220, a 256-step 10k electronic potentiometer (EPOT), which is controlled via PGM800Win. The EPOT is made up of 256 resistive sections (representing approximately 39Ω each) which can be individually addressed by the microcontroller. Each section can be switched in or out of circuit to achieve the required total resistance, thus adjusting the absolute deviation level.

2.6 Power Supply & Regulator Circuits

(Refer to the regulators circuit diagram (sheet 6) in Section 6.2 or 6.3.)

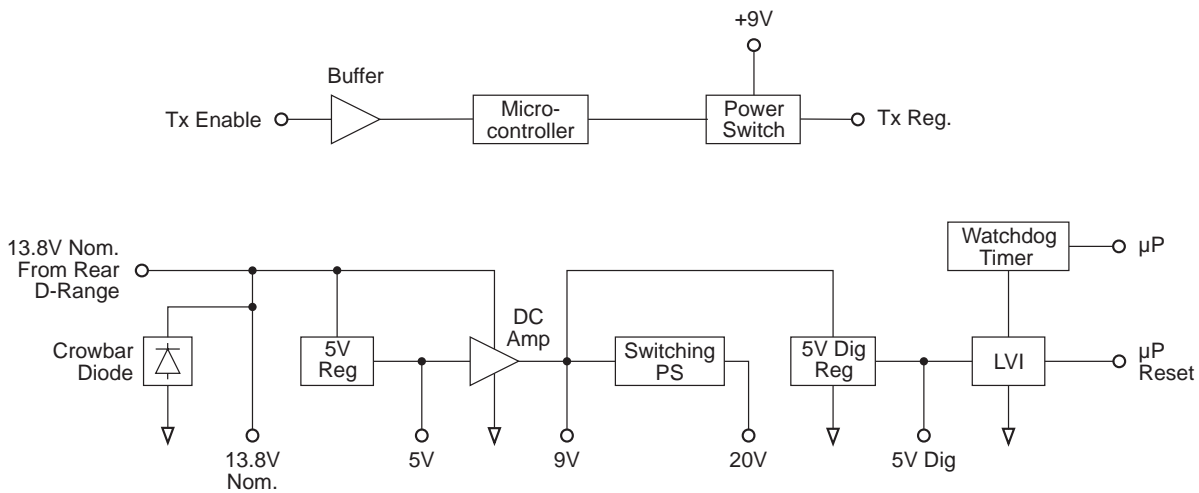


Figure 2.7 T826/827 Power Supply & Regulators Block Diagram

The T826 and T827 are designed to operate from a 10.8-16V DC supply (13.8V nominal). A 5.3V regulator (IC630) runs directly from the 13.8V rail, driving much of the synthesiser circuitry. It is also used as the reference for a DC amplifier (IC640, Q630, Q620) which provides a medium current capability 9V supply.

A switching power supply (Q660, Q670) runs from the 9V supply and provides a low current capability +20V supply. This is used to drive the synthesiser loop filter (IC750), giving a VCO control voltage range of up to 20V, and the Lock-Detect amplifiers.

Ultimate control of the transmitter is via the Tx-Reg. supply, switched from 9V by Q610. This is enabled via the Tx-Enable signal from the audio processor, and microprocessor.

A crowbar diode is fitted for protection against connection to a power supply of incorrect polarity. It also provides transient overvoltage protection.

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

2.7 Transmit Timers

The transmit tail timer, transmit timeout timer and transmit lockout timer can all be set from PGM800Win. The fields for setting these are found on the system information page. These three timers operate as follows (refer also to Figure 2.8):

| Timer | Function | Adjustment |
|------------------|--|---|
| Transmit Tail | Sets the tail time during which the transmitter stays keyed after the external key source has been removed. | 0-5 seconds in 100ms steps ^a |
| Transmit Timeout | Sets the maximum continuous transmission time. Once the timer has timed out, the transmitter must be keyed again, unless prevented by the transmit lockout timer. | 0-300 seconds ^b in 10 second steps |
| Transmit Lockout | Sets the period of time that must elapse after a timeout before the transmitter can re-transmit. Once the timer has timed out, the transmitter can be keyed again. | 0-60 seconds in 10 second steps |

a. Adjustable in 20ms steps in PGM800Win version 2.12 and later.

b. Adjustable from 0 to 600 seconds in PGM800Win version 2.12 and later.

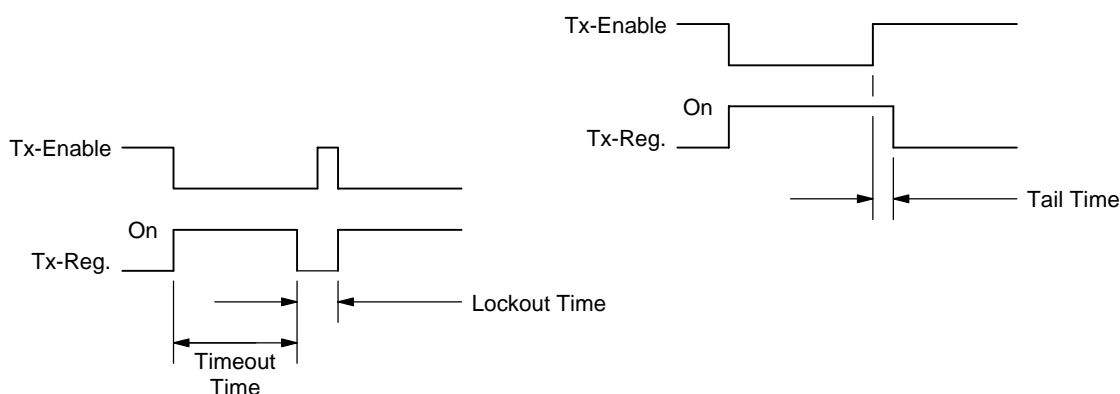


Figure 2.8 T826/827 Transmit Timers

2.8 T826 Drive Amplifier & PA

(Refer to Figure 2.1 and the exciter and PA circuit diagrams (sheets 3 & 4) in Section 6.2.)

The output power of the PA is maintained at a constant level via a power control loop applied to the two-stage, wide band exciter amplifier (Q307, Q312). The forward and reverse RF power levels are sensed via a dual directional coupler and detector diodes (D440, D441 in the PA cavity). The detected DC signals are summed with the "power set" level and fed to the control integrator (IC310 pins 1, 2 & 3). The output control voltage is buffered by Q309 and Q315, and applied to the collectors of the wide band exciter amplifiers.

Note: Forward and reflected power signals are summed so that, under high VSWR, the power control will turn the output RF level down.

The maximum output power of the transmitter is limited by a voltage clamp circuit (consisting of a potential divider formed by R369//R374 and R375//R359//R360) which turns on Q308, clamping the control voltage to approximately 7.8V. When the maximum operating temperature is exceeded, the clamp voltage is reduced to approximately 5.7V by removing R359//R360 from the circuit (see below).

To reduce the spurious output level when the synthesiser is out-of-lock, the Tx-Reg. and Lock-Detect signals are gated to inhibit the PA control circuit and to switch off the RF signal at the input to the drive amplifier. The RF input signal is switched by a PIN switch attenuator (D300, D301, D302).

Cyclic keying control is provided by additional circuitry consisting of several time delay, ramp and gate stages:

- Q305, IC310 power ramping
- Q304, Q305 Tx-Reg. and $\overline{\text{Lock-Detect}}$ gate
- Q300, Q301, Q302 delay and PIN switch drive.

This is to allow the RF power circuits (both exciter and PA) to ramp up and down in a controlled manner so that minimal adjacent channel interference is generated during the transition.

The output of the wide band amplifier is approximately 550mW (+27.5dBm) for an input of 65mW (+18dBm) when the power control is set to maximum.

Note: The VCO output level of 125mW (+21dBm) is attenuated by a 3dB attenuator (R517, R518 & R519) in the VCO cavity. This provides good VCO/exciter isolation as well as the correct exciter drive level.

A temperature sensor (R480) is provided so that the RF output power can be reduced to a preset level when a set temperature is exceeded. This is a protection circuit (IC310 pins 5, 6 & 7, Q311) to prevent overheating, as the unit is *not* rated for continuous operation at high temperatures (refer to Section 1.2.3 for duty cycle specifications). RV302 sets the PA output power while under high temperature fold-back conditions.

The output of the temperature-sense comparator (IC310 pin 7) also feeds to a secondary shutdown clamp circuit (Q303, Q360, Q308). The clamp voltage is set to approximately

5.7V by the potential divider R369//R374 and R375 when the maximum operating temperature is exceeded. This ensures that the temperature shutdown will reduce the output power even if the power control circuit is in an open loop condition.

The attenuator (R410, R411 & R412) aids in reducing exciter/PA interaction while also ensuring a reasonable match for Q312.

The RF output from the exciter is fed to the driver stage (Q415) and then to the final (Q425). The DC supply is fed to the final via a low pass filter with special low frequency decoupling.

The directional coupler provides the required feedback for the power control loop while the harmonics are attenuated by the low pass filter.

2.9 T827 Exciter Drive Amplifier

(Refer to Figure 2.2 and the exciter circuit diagram (sheet 3) in Section 6.3.)

A two-stage, wide band amplifier (Q320, Q321) provides an output level of approximately 1W (+30dBm) for an input of 125mW (+21dBm) from the VCO. IC300 pins 5, 6 & 7, Q301 and Q302 provide a 10.5V regulated supply for the exciter.

To reduce the spurious output level when the synthesiser is out-of-lock, the Tx-Reg. and Lock-Detect signals are gated to inhibit the exciter control circuit and to switch off the RF signal at the input to the drive amplifier. This is achieved by a PIN switch attenuator (D320, D321, D322).

Cyclic keying control is provided by additional circuitry consisting of several time delay, ramp and gate stages:

- Q300, IC300 pins 5, 6 & 7 power ramping
- Q380, Q381 Tx-Reg. and $\overline{\text{Lock-Detect}}$ gate
- Q365, Q366, Q367, Q368 delay and PIN switch drive.

This is to allow the RF power circuits (both exciter and PA) to ramp up and down in a controlled manner so that minimal adjacent channel interference is generated during the transition.

R517, R518 and R519 form a 3dB attenuator to provide good VCO/drive amplifier isolation.

The output attenuator (R337, R338, R339) assists in reducing exciter/PA interaction while also ensuring a good match for Q321.

Note: The exciter provides a DC control signal to the PA via the RF coax. This is injected via %L382.

3 T826/827 Initial Tuning & Adjustment



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

The following section describes both short and full tuning and adjustment procedures and provides information on:

- channel programming
- selecting required audio links
- synthesiser alignment
- PA alignment (T826 only)
- modulator adjustment
- limiter adjustment
- setting line level
- compressor adjustment
- timer adjustment.

Note: Unless otherwise specified, the term "PGM800Win" used in this and following sections refers to version 2.00 and later of the software.

Refer to Section 6 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 parts list and diagrams for the VCO PCB are in Part E.

| Section | Title | Page |
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| 3.2 | Channel Programming | 3.3 |
| 3.3 | Test Equipment Required | 3.4 |
| 3.4 | Short Tuning Procedure | 3.5 |
| 3.4.1 | Introduction | 3.5 |
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| 3.5 | Audio Processor Links | 3.8 |
| 3.5.1 | Link Details | 3.8 |
| 3.5.2 | Typical Options | 3.8 |
| 3.6 | Synthesiser Alignment | 3.9 |
| 3.7 | Output Power Adjustment (T826 Only) | 3.10 |
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| 3.9 | Audio Processor & CTCSS | 3.11 |
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| 3.1 | T826/827 Test Equipment Set-up With T800-01-0010 | 3.4 |
| 3.2 | T826/827 Test Equipment Set-up Without T800-01-0010 | 3.4 |

3.1 Introduction

When you receive your T826 transmitter or T827 exciter it will be run up and working on a particular frequency (the "default channel")¹. If you want to switch to a frequency that is within the 8MHz switching range (i.e. ± 4 MHz from the factory programmed frequency), you should only need to reprogram the transmitter/exciter with the PGM800Win software (refer to the PGM800Win programming kit and Section 3.2 below).

However, if you want to switch to a frequency outside the 8MHz switching range, you will have to reprogram and re-tune the transmitter/exciter to ensure correct operation. In this case you should carry out the short tuning procedure described in Section 3.4.

If you have carried out repairs or other major adjustments, you must carry out the full tuning and adjustment procedure described in this section (except for Section 3.4).

3.2 Channel Programming

You can program up to 128 channel frequencies into the transmitter/exciter's EEPROM memory (IC820) by using the PGM800Win software package and an IBM™ PC. You can also use PGM800Win to select the transmitter/exciter's current operating frequency (or "default channel").

If the transmitter/exciter is installed in a rack frame, you can program it via the programming port in the speaker panel. However, you can also program the transmitter/exciter before it is installed in a rack frame as follows:

- by using a T800-01-0010 calibration test unit;
- via D-range 1;
- via D-range 2 (standard T800-03-0000 auxiliary D-range only);
- via SK805 (internal Micromatch connector).

If you do not use the T800-01-0010, you will have to connect the PC to the transmitter/exciter via a module programming interface (such as the T800-01-0004).

For a full description of the channel programming procedure, refer to the PGM800Win programming software user's manual.

Note: When an auxiliary D-range kit (D-range 2 - T800-03-0000) is fitted, you can also select a channel with an external switch, such as the DIP switch on the rack frame backplane PCB. Refer to Part C in the T800 Series Ancillary Equipment Service Manual (M800-00-101 or later issue) or consult your nearest Tait Dealer or Customer Service Organisation for further details.

1. Use the "Read Module" function in PGM800Win to find out what the default channel is.

3.3 Test Equipment Required

You will need the following test equipment:

- computer with PGM800Win installed
 - T800 programming kit
 - module programming interface (e.g. T800-01-0004 - optional)
 - 13.8V power supply
 - digital multimeter
 - audio signal generator
 - RF power meter
 - audio voltmeter x 2
 - modulation meter
 - oscilloscope (digital preferred)
 - 20dB or 40dB pad
 - T800-01-0010 calibration test unit (optional)
- } or RF test set (optional)

Figure 3.1 and Figure 3.2 show typical test equipment set-ups.

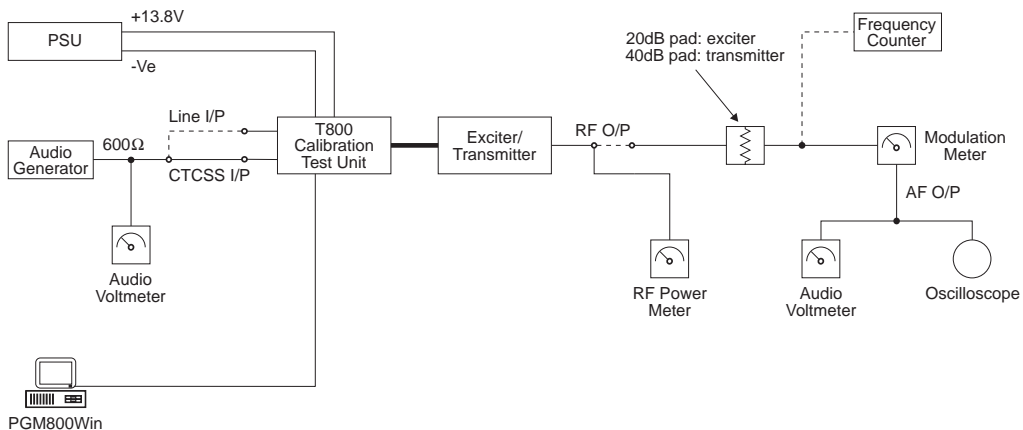


Figure 3.1 T826/827 Test Equipment Set-up With T800-01-0010

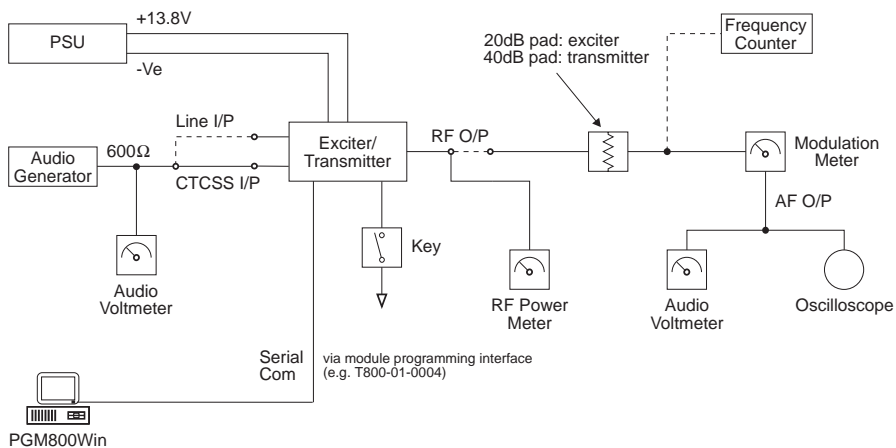


Figure 3.2 T826/827 Test Equipment Set-up Without T800-01-0010

3.4 Short Tuning Procedure

Use this procedure only if you want to reprogram the T826/827 to a frequency outside the 8MHz switching range and do not intend to carry out any other major adjustments or repairs.

3.4.1 Introduction

Reprogram the operating frequency as described in the PGM800Win programming kit (refer to Section 3.2).

Remove the top cover (nearest the handle).

Set up the test equipment as described in Section 3.3.

Set the links in the audio processor section as required (refer to Section 3.5).

3.4.2 Synthesiser Alignment

- Connect a high impedance voltmeter to PL4-1 or the junction of L1 & R1 in the VCO (this measures the synthesiser loop voltage).
- Key the transmitter by earthing the Tx-Key line.
- **Single Channel** Tune VCO trimmer & VC1-TX for a synthesiser loop voltage of 9V.
- **Multichannel** Tune VCO trimmer & VC1-TX for a synthesiser loop voltage of 9V on the middle channel.
If there is no middle channel, tune & VC1-TX so that the channels are symmetrically placed around a loop voltage of 9V.
All channels should lie within the upper and lower limits of 13V and 5V respectively.
Do not attempt to program channels with a greater frequency separation than the specified switching range of 8MHz.

3.4.3 Output Power Adjustment (T826 Only)

Connect an RF power meter with suitable attenuation to the output socket and key the transmitter.

Adjust RV301 for the required output power (between 5 and 25W).

3.4.4 Two Point Modulation Adjustment

Note 1: In this and following sections deviation settings are given first for wide bandwidth sets, followed by settings in brackets for narrow bandwidth sets [].

Note 2: The reference modulation and limiter adjustments are controlled by 256-step electronic potentiometers (EPOTs), which are adjusted via the “Reference Modulation” and “Deviation” settings in PGM800Win. This allows the two point modulation and deviation settings to be adjusted for each channel.

Note 3: To optimise the modulation response across the switching range, repeat steps 1-4 below for each channel that will be used (usually needed only for data applications). In applications where the modulation response is less critical (e.g. voice use only), carry out steps 1-4 below on the middle channel and use the “EPOT Fill” option¹ in PGM800Win to copy the value to the other channels.

Note 4: If you are using an RF test set, turn the low pass filter off and set the high pass filter to 15kHz *before* beginning this procedure.

1. Inject an audio signal of 450Hz 1.5V rms (+5dBm) into the CTCSS input (D-range 1 (PL100) pin 8).

Key the transmitter by earthing the Tx-Key line.

2. Adjust the output from the audio generator to obtain $\pm 3\text{kHz}$ [$\pm 1.5\text{kHz}$] deviation at 450Hz.

3. Change the input frequency to 100Hz and, using PGM800Win, adjust the value of the “Reference Modulation” EPOT setting for the current channel to obtain $\pm 3\text{kHz}$ [$\pm 1.5\text{kHz}$] deviation (you can use either the mouse or up and down arrow keys).

4. Change the input frequency back to 450Hz.

Repeat steps 2 and 3 above until the deviations achieved at the two input frequencies are within 0.2dB of each other. You will need to do this at least four times.

5. Sweep the audio between 50 and 300Hz for peaks.

Note: A peak between 50 and 300Hz will indicate a fault condition, i.e:

- incorrect set-up
- or - modulation circuitry fault.

The specification window is $\pm 1\text{dB}$ relative to 150Hz from 65 to 260Hz.

1. Use the “EDIT FILL” button on the tool bar or go to “Edit”, “Fill”, “Epot Settings” on the menu bar.

3.4.5 CTCSS Encoder (If Used)

Program a CTCSS tone on the default channel using PGM800Win.

If you are using an RF test set, turn off the 300Hz high pass filter.

Key the T826/827 with the front panel "Carrier" switch.

Adjust RV805 (CTCSS level adjust) to give $\pm 500\text{Hz}$ [$\pm 250\text{Hz}$] deviation.

Set the maximum deviation as per Section 3.4.6.

3.4.6 FM Deviation (Limiter) Adjustment

Note: If the T826/827 will be used over the whole 8MHz switching range, you must set the deviation for each channel. However, if the module will be used on frequencies that cover only a 1MHz (or less) switching range, you can set the deviation on the middle channel and use this value for all other channels with the "EPOT Fill" option in PGM800Win.

Inject 1kHz at -10dBm into the line input (D-range 1 (PL100) pins 1 & 4; pins 2 & 3 shorted).

Adjust RV210 (line sensitivity) fully clockwise and key the transmitter by earthing the Tx-Key line. Using PGM800Win, adjust the value of the "Deviation" EPOT setting for the current channel to obtain a deviation limit of $\pm 4.7\text{kHz}$ [$\pm 2.3\text{kHz}$] (you can use either the mouse or up and down arrow keys).

Sweep the audio frequency from 100Hz to 4kHz and ensure that the maximum deviation does not exceed $\pm 4.7\text{kHz}$ [$\pm 2.3\text{kHz}$]. Readjust "Deviation" if necessary via PGM800Win.

3.4.7 Line-in Level Adjustment

Remove the CTCSS signal (if used).

Set the injected signal at the line input to the required line level (typically -10 to -20dBm).

Adjust RV210 (line sensitivity) to provide $\pm 3\text{kHz}$ [$\pm 1.5\text{kHz}$] deviation.

Reapply the CTCSS signal (if required).

3.5 Audio Processor Links

3.5.1 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. The factory settings are shown in brackets [].

| Plug | Link ^a | Function |
|-------|-------------------|---|
| PL205 | 1-2 A | not connected |
| | [3-4] B | microphone pre-amp. output to compressor input |
| | 5-6 C | microphone pre-amp. output to multiplexer input |
| PL210 | [1-2] L | multiplexer output to pre-emphasis input |
| | 3-4 M | multiplexer output to limiter input |
| | 5-6 N | multiplexer output to compressor input |
| PL215 | 1-2 G | not connected |
| | [3-4] H | compressor output to multiplexer input |
| | 5-6 I | compressor output to limiter input |
| | 7-8 J | compressor output to pre-emphasis input |
| | 9-10 K | not connected |
| PL220 | 1-2 D | pre-emphasis output to multiplexer input |
| | [3-4] E | pre-emphasis output to limiter input |
| | 5-6 F | not connected |

- a. The letters in this column and in the table in Section 3.5.2 below refer to the identification letters screen printed onto the PCB beside each pair of pins.

3.5.2 Typical Options

| | PL205 | PL210 | PL215 | PL220 |
|--|------------|------------|------------|------------|
| microphone pre-amp. compressed and pre-emphasised; line input pre-emphasised (standard set-up) | [3-4] B | [1-2] L | [3-4] H | [3-4] 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 |

3.6 Synthesiser Alignment

- Ensure that the T826/827 has been programmed with the required frequencies using PGM800Win software.
- **Single Channel** Select a channel using PGM800Win.
Multichannel Select the middle channel via PGM800Win.
- Connect a high impedance voltmeter to PL4-1 or the junction of L1 and R1 in the VCO (this measures the synthesiser loop voltage).
- Key the transmitter by earthing the Tx-Key line.
 - Single Channel** Tune VCO trimmer &VC1-TX for a synthesiser loop voltage of 9V.
 - Multichannel** Tune VCO trimmer &VC1-TX for a synthesiser loop voltage of 9V on the middle channel.
 If there is no middle channel, tune &VC1-TX so that the channels are symmetrically placed around a loop voltage of 9V.
 All channels should lie within the upper and lower limits of 13V and 5V respectively.
 Do not attempt to program channels with a greater frequency separation than the specified switching range (8MHz).
- Measure the T826/827 output frequency (at the rear panel N-type connector) and adjust the TCXO (=IC700) trimmer if required.
- **T827 Only** Check that the exciter output power is 1W \pm 300mW (measured at the rear panel N-type connector).



Caution: This trimmer is susceptible to physical damage. Do not exert a downward force of more than 500g (1lb) when adjusting.

3.7 Output Power Adjustment (T826 Only)

Connect an RF power meter to the PA output.

Key the transmitter by earthing the Tx-Key line.

Adjust RV301 for 25W output power and check that the total current drawn is <4.5A.

Adjust RV301 for the required output power (between 5 and 25W).

3.8 Thermal Shutdown (T826 Only)

3.8.1 Normal Operation

Key the transmitter by earthing the Tx-Key line and set the output power to 25W as described in Section 3.7.

Short L480 to ground by connecting solder link SL480.

Set RV302 (high temperature power adjust) for an output power of 5W.

Remove the solder link on SL480.

Note: The thermal shutdown temperature is factory set (%R320 and %R328) to 88°C for 25W continuous operation at 25°C ambient temperature¹.

3.8.2 Continuous Operation

If you want to operate the transmitter continuously at 60°C ambient temperature, you must:

- reduce the output power to 10W;
- increase the thermal shutdown temperature to 105°C by changing the resistor values to those shown in the following table:

| Operating Conditions/ Ambient Temperature | %R320 | %R328 |
|--|-------|-------|
| 25W continuous @ 25°C | 18k | 18k |
| 10W continuous @ 60°C | 1k5 | 8k2 |

1. Ambient temperature is defined as the temperature of the air immediately surrounding the heatsink.

3.9 Audio Processor & CTCSS

3.9.1 Two Point Modulation

The T826 and T827 utilise two point modulation to obtain a wide audio bandwidth independent of the synthesiser loop filter response. This is achieved by simultaneously frequency modulating the VCO and phase modulating the synthesiser reference frequency. The relative signal levels fed to the two modulators are quite critical and cause interaction when setting up.

Both modulating signals require readjustment when the exciter is shifted in frequency greater than the switching range (i.e. $\Delta F > \pm 4\text{MHz}$).

Note 1: In this and following sections deviation settings are given first for wide bandwidth sets, followed by settings in brackets for narrow bandwidth sets [].

Note 2: The reference modulation and limiter adjustments are controlled by 256-step electronic potentiometers (EPOTs), which are adjusted via the "Reference Modulation" and "Deviation" settings in PGM800Win. This allows the two point modulation and deviation settings to be adjusted for each channel.

Note 3: To optimise the modulation response across the switching range, repeat steps 1-4 below for each channel that will be used (usually needed only for data applications). In applications where the modulation response is less critical (e.g. voice use only), carry out steps 1-4 below on the middle channel and use the "EPOT Fill" option¹ in PGM800Win to copy the value to the other channels.

Note 4: If you are using an RF test set, turn the low pass filter off and set the high pass filter to 15kHz *before* beginning this procedure.

3.9.2 Modulator Adjustment

1. Inject an audio signal of 450Hz 1.5V rms (+5dBm) into the CTCSS input (D-range 1 (PL100) pin 8).
Key the transmitter by earthing the Tx-Key line.
2. Adjust the output from the audio generator to obtain $\pm 3\text{kHz}$ [$\pm 1.5\text{kHz}$] deviation at 450Hz.
3. Change the input frequency to 100Hz and, using PGM800Win, adjust the value of the "Reference Modulation" EPOT setting for the current channel to obtain $\pm 3\text{kHz}$ [$\pm 1.5\text{kHz}$] deviation (you can use either the mouse or up and down arrow keys).

1. Use the "EDIT FILL" button on the tool bar or go to "Edit", "Fill", "Epot Settings" on the menu bar.

4. Change the input frequency back to 450Hz.
Repeat steps 2 and 3 above until the deviations achieved at the two input frequencies are within 0.2dB of each other. You will need to do this at least four times.
5. Sweep the audio between 50 and 300Hz for peaks.

Note: A peak between 50 and 300Hz will indicate a fault condition, i.e:

- incorrect set-up
- or - modulation circuitry fault.

The specification window is ± 1 dB relative to 150Hz from 65 to 260Hz.

3.9.3 CTCSS Encoder (If Used)

Program a CTCSS tone on the default channel using PGM800Win.

If you are using an RF test set, turn off the 300Hz high pass filter.

Key the T826/827 with the front panel "Carrier" switch.

Adjust RV805 (CTCSS level adjust) to give ± 500 Hz [± 250 Hz] deviation.

Set the maximum deviation as per Section 3.9.4.

3.9.4 Limiter Adjustment

Note: If the T826/827 will be used over the whole 8MHz switching range, you must set the deviation for each channel. However, if the module will be used on frequencies that cover only a 1MHz (or less) switching range, you can set the deviation on the middle channel and use this value for all other channels with the "EPOT Fill" option in PGM800Win.

Set the links in the audio processor section as required (refer to Section 3.5).

Inject 1kHz at -10dBm into the line input (D-range 1 (PL100) pins 1 & 4; and pins 2 & 3 shorted).

Adjust RV210 (line sensitivity) fully clockwise and key the transmitter by earthing the Tx-Key line. Using PGM800Win, adjust the value of the "Deviation" EPOT setting for the current channel to obtain a deviation limit of ± 4.7 kHz [± 2.3 kHz] (you can use either the mouse or up and down arrow keys).

Sweep the audio frequency from 100Hz to 4kHz and ensure that the maximum deviation does not exceed ± 4.7 kHz [± 2.3 kHz]. Readjust "Deviation" if necessary via PGM800Win.

3.9.5 Line Level Without Compressor

This section assumes that the compressor is not used. If the compressor is required, refer to Section 3.9.6.

Remove the CTCSS signal (if used).

Adjust the line sensitivity as follows:

- set the injected signal at the line input to the required line level (typically -10 to -20dBm);
- adjust RV210 (line sensitivity) to provide $\pm 3\text{kHz}$ [$\pm 1.5\text{kHz}$] deviation.

Reapply the CTCSS signal (if required).

3.9.6 Compressor

The compressor may be used on the line input only, the microphone input only, or on both the line and microphone inputs. If the compressor is used, refer to one of the following sections as appropriate.

3.9.6.1 Compressor On Line Input Only

Set RV210 (line sensitivity) fully clockwise and key the transmitter by earthing the Tx-Key line.

Reduce the line level to -50dBm at 1kHz and set RV220 (compression level) fully clockwise.

Check that $\pm 3\text{kHz}$ [$\pm 1.5\text{kHz}$] deviation is still available.

Slowly increase the audio input level until the demodulated waveform shows significant signs of clipping (approximately $\pm 4.5\text{kHz}$ [$\pm 2.3\text{kHz}$] deviation).

Adjust RV220 anticlockwise until the demodulated waveform is just clipping (approximately $\pm 4\text{kHz}$ [$\pm 2\text{kHz}$] deviation).

Increase the input level to -10dBm and check that the test tone is still held just into clipping. The input line level should be typically -10 to -20dBm.

3.9.6.2 Compressor On Microphone Input Only

Key the transmitter by earthing the Tx-Key line and plug a microphone jack into the front panel socket.

Adjust RV220 (compression level) fully clockwise.

Acoustically couple the microphone to a tone box (1kHz) and close the PTT switch.

Increase the audio level until the demodulated waveform shows significant signs of clipping (approximately $\pm 4.5\text{kHz}$ [$\pm 2.3\text{kHz}$] deviation).

Adjust RV220 anticlockwise until the demodulated waveform is just clipping (approximately $\pm 4\text{kHz}$ [$\pm 2\text{kHz}$] deviation).

Increase the audio level by 10dB and verify that the test tone is held just into clipping.

Whistle steadily into the microphone, checking that approximately $\pm 4\text{kHz}$ [$\pm 2\text{kHz}$] deviation is produced. The modulated waveform should be basically sinusoidal.

Speak into the microphone, checking that the modulation peaks reach about $\pm 5\text{kHz}$ [$\pm 2.5\text{kHz}$] deviation.

As the line is to be used without compression, set RV210 (line sensitivity) as described in Section 3.9.5.

3.9.6.3 Compressor On Both Line & Microphone Inputs

Set up as described in Section 3.9.6.1.

6 T826/827 PCB Information

**Caution:**

This equipment contains CMOS devices which are susceptible to damage from static charges. Refer to Section 1.2 in Part A for more information on anti-static procedures when handling these devices.

This section provides the following information on the T826 transmitter and T827 exciter:



- parts lists
- grid reference indexes
- PCB layouts
- circuit diagrams.

| Section | Title | IPN | Page |
|---------|----------------------|--------------|-------|
| 6.1 | Introduction | | 6.1.3 |
| 6.2 | T826 Transmitter PCB | 220-01443-04 | 6.2.1 |
| 6.3 | T827 Exciter PCB | 220-01447-04 | 6.3.1 |

6.1 Introduction

Product Type Identification

You can identify the transmitter or exciter type by checking the product code printed on a label on the rear of the chassis (product codes are explained in Section 1.3 in this Part of the manual, and Figure 1.1 in Part A shows typical labels). You can further verify the product type by checking the placement of an SMD resistor in the table that is screen printed onto the top side of the PCB, similar to the example drawn below. In this example, the resistor indicates that the product was built as a T826-10-XXXX.

| |
|--|
|  T82610 |
|  T82615 |
| PRODUCT TYPE |

Note: The only function of this resistor is to indicate the product type. It has no effect on the circuitry or operation of the transmitter or exciter.

PCB Identification

All PCBs are identified by a unique 10 digit “internal part number” (IPN), e.g. 220-01390-02, 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.

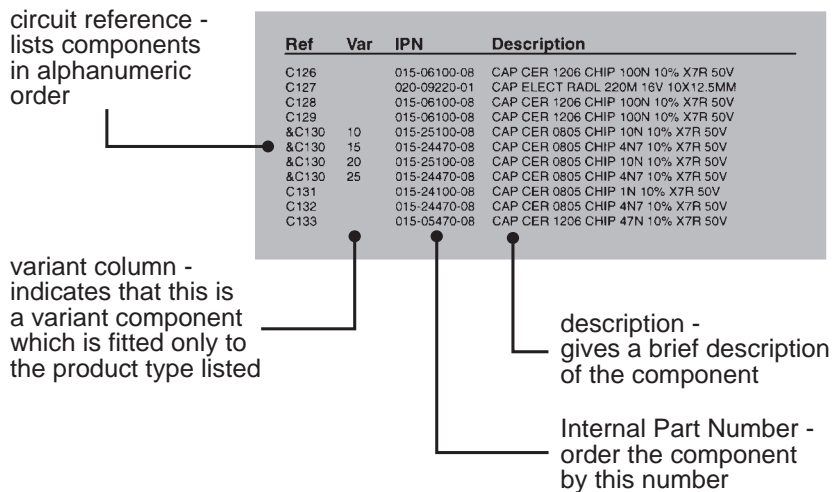
Note: It is important that you identify which issue PCB you are working on so that you can refer to the appropriate set of PCB information.

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).

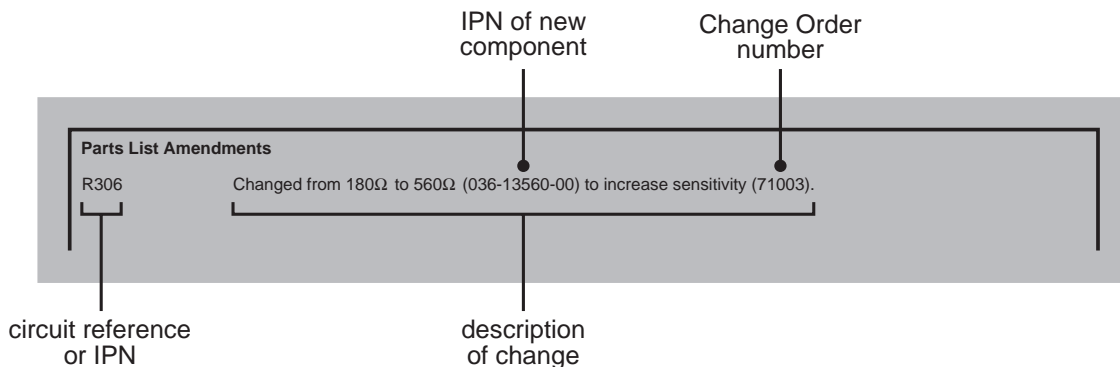
Those with a circuit reference are grouped in alphabetical order and then in numerical order within each group. Each component entry comprises three or four columns, as shown below:



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

Parts List Amendments

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



Variant Components

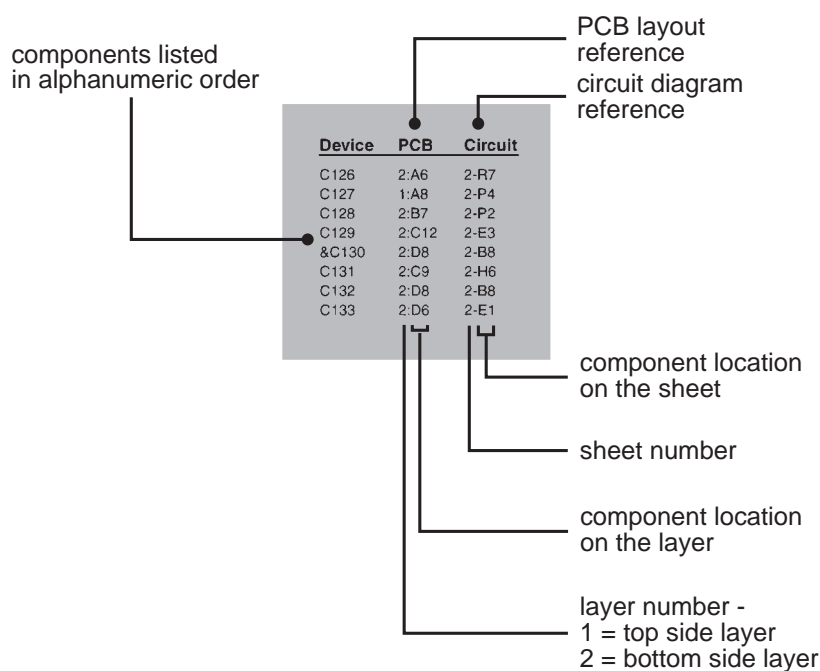
A variant component is one that has the same circuit reference but different value or specification in different product types. Where two products share the same PCB, the term “variant” is also used to describe components unplaced in one product. Variant components have a character prefix, such as “&”, “=” or “#”, before the circuit reference (e.g. &R100).

The table below explains the variant prefixes used in T800 Series II products:

| If the variant prefix is. . . | the component will. . . |
|-------------------------------|---|
| & | change according to channel spacing |
| = | change according to frequency stability |
| # | change according to frequency range |
| % | change or be placed/unplaced for special applications |
| * | be unplaced in one product (where two products share the same PCB) |

Grid Reference Index

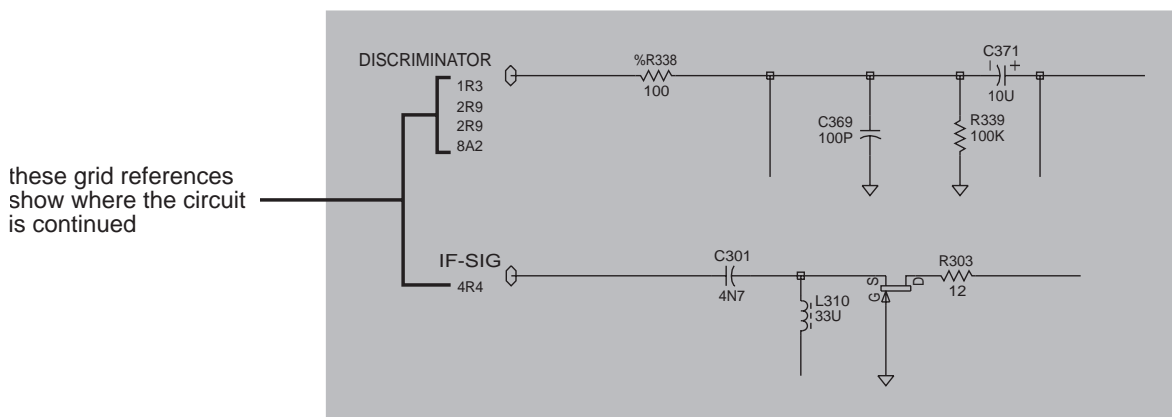
This section contains a component grid reference index to help you find components and labelled pads on the PCB layouts and circuit diagrams. This index lists the components and pads in alphanumeric order, along with the appropriate alphanumeric grid references, as shown below:



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).



6.2 T826 Transmitter PCB

This section contains the following information.

| IPN | Section | Page |
|---------------------------------|----------------------------------|--------|
| 220-01443-04 | Parts List | 6.2.3 |
| | Mechanical & Miscellaneous Parts | 6.2.10 |
| | Grid Reference Index | 6.2.11 |
| | PCB Layout - Top Side | 6.2.15 |
| | PCB Layout - Bottom Side | 6.2.16 |
| | Transmitter Overview Diagram | 6.2.17 |
| | Audio Processor Circuit Diagram | 6.2.18 |
| | Exciter Circuit Diagram | 6.2.19 |
| | PA Circuit Diagram | 6.2.20 |
| | VCO Section Circuit Diagram | 6.2.21 |
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| | Synthesiser Circuit Diagram | 6.2.23 |
| | Microcontroller Circuit Diagram | 6.2.24 |
| Harmonic Filter Circuit Diagram | 6.2.25 | |

T826 Parts List (IPN 220-01443-04)

How To Use This Parts List

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

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

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

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

Parts List Amendments

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

Parts List Amendments - Continued

This page is provided for entering future amendments to the parts list.

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|--|-----|--------------|--------------------------------|------|-----|--------------|--------------------------------|
| Note: %D205 and %D210 are optional level limiting diodes for special applications. =R705 (47 ohm) and =SK710 are fitted in place of =IC700 when an external frequency reference is used. These two components are supplied with the auxiliary D-range kits (T800-06-0000 & T800-06-0001). | | | | C328 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C329 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C330 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C331 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C332 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C333 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C334 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C335 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C336 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C337 | | 015-25220-08 | CAP CER 0805 22N 10% X7R 50V |
| | | | | C338 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C339 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C340 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C341 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V |
| | | | | C342 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C344 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C346 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V |
| | | | | C347 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C348 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C349 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C350 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V |
| | | | | C351 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C352 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V |
| | | | | C353 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C354 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C355 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C356 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C357 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C358 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM |
| | | | | C359 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C360 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C361 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C362 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C363 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C364 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C365 | | 014-18220-02 | LJCAP TANT SMD 22U 20% 35V |
| | | | | C366 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C367 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C369 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C370 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C371 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V |
| | | | | C372 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C373 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C374 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| | | | | C375 | | 015-22100-01 | CAP CER 0805 10P+-1/2P NPO 50V |
| | | | | C376 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C377 | | 015-22220-01 | CAP CER 0805 22P 5% NPO 50V |
| | | | | C378 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C379 | | 014-07470-04 | CAP TANT SMD 4U7 50V 20% |
| | | | | C380 | | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V |
| | | | | C381 | | 015-04100-06 | CAP CER 1210 1NF NPO200V GRM42 |
| | | | | C385 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C386 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C387 | | 014-07470-01 | CAP 4U7 'B'CASE 25V +-10% 267 |
| | | | | C388 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C389 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM |
| | | | | C390 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C393 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| | | | | C395 | | 014-07470-01 | CAP 4U7 'B'CASE 25V +-10% 267 |
| | | | | C396 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C397 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C400 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C401 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C402 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C403 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C410 | | 015-22820-01 | CAP CER 0805 82P 5% NPO 50V |
| | | | | C411 | | 015-03100-06 | CAP CER 1210 100P NPO500VGRM42 |
| | | | | C412 | | 014-07470-04 | CAP TANT SMD 4U7 50V 20% |
| | | | | C413 | | 015-02680-06 | CAP CER 1210 68P NPO500VGRM42 |
| | | | | C414 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V |
| | | | | C415 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C416 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V |
| | | | | C425 | | 015-03120-06 | CAP CER 1210 120P NPO500VGRM42 |
| | | | | C426 | | 015-03680-06 | CAP CER 1210 680P NPO200VGRM42 |
| | | | | C427 | | 014-07470-04 | CAP TANT SMD 4U7 50V 20% |
| | | | | C428 | | 015-03470-03 | CAP CER 470P 5% NPO200V GRH111 |
| | | | | C429 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C430 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V |
| | | | | C431 | | 015-05470-08 | CAP CER 1206 47N 10% X7R 50V |
| | | | | C440 | | 015-02470-06 | CAP CER 1210 47P NPO500VGRM42 |
| | | | | C441 | | 015-02470-06 | CAP CER 1210 47P NPO500VGRM42 |
| | | | | C442 | | 015-03120-06 | CAP CER 1210 120P NPO500VGRM42 |
| | | | | C443 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C444 | | 015-03150-06 | CAP CER 1210 150P NPO500VGRM42 |
| | | | | C445 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C446 | | 015-02390-06 | CAP CER 1210 39P NPO500VGRM42 |
| | | | | C447 | | 015-02390-06 | CAP CER 1210 39P NPO500VGRM42 |
| | | | | C448 | | 015-03680-06 | CAP CER 1210 680P NPO200VGRM42 |
| | | | | C449 | | 015-21560-01 | CAP CER 0805 5P6+-1/4P NPO 50V |
| | | | | C450 | | 015-21560-01 | CAP CER 0805 5P6+-1/4P NPO 50V |
| | | | | C451 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C452 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C480 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C503 | | 015-24220-08 | CAP CER 0805 2N2 10% X7R 50V |
| | | | | C505 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V |
| | | | | C510 | | 015-25220-08 | CAP CER 0805 22N 10% X7R 50V |
| | | | | C514 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C515 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| C201 | | 016-07470-06 | CAP SMD ELECT BI-P 4U7 50V 20% | | | | |
| C202 | | 016-07470-06 | CAP SMD ELECT BI-P 4U7 50V 20% | | | | |
| C204 | | 016-07470-06 | CAP SMD ELECT BI-P 4U7 50V 20% | | | | |
| C205 | | 016-07470-06 | CAP SMD ELECT BI-P 4U7 50V 20% | | | | |
| C207 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | | | | |
| C209 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | | | | |
| C210 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | | | | |
| C211 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | | | | |
| C213 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +-20% | | | | |
| C215 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | | | | |
| C217 | | 015-24220-08 | CAP CER 0805 2N2 10% X7R 50V | | | | |
| C219 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C221 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | | | | |
| C223 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | | | | |
| C225 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | | | | |
| C227 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | | | | |
| C229 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C230 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | | | | |
| C232 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C233 | | 016-08470-03 | CAP SMD ELEC 47mF 20% 25v 8.3m | | | | |
| C235 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C237 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM | | | | |
| C239 | | 016-07470-06 | CAP SMD ELECT BI-P 4U7 50V 20% | | | | |
| C241 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | | | | |
| C242 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +-20% | | | | |
| C243 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C245 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C247 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C249 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C251 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C253 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C255 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C257 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | | | | |
| C259 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | | | | |
| C260 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | | | | |
| C261 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | | | | |
| C263 | | 016-09100-05 | CAP SMD ELECT 100U 25V 20% | | | | |
| C265 | | 016-07470-06 | CAP SMD ELECT BI-P 4U7 50V 20% | | | | |
| C267 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | | | | |
| &C269 | 10 | 015-21150-01 | CAP CER 0805 1P5+-1/4P NPO 50V | | | | |
| &C269 | 15 | 015-21470-01 | CAP CER 0805 4P7+-1/4P NPO 50V | | | | |
| &C271 | 10 | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | | | | |
| &C271 | 15 | | | | | | |

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-------|-----|--------------|--------------------------------|--------|-----|--------------|--------------------------------|
| C516 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C838 | | 014-09100-00 | CAP TANT SMD 100U 16V 20% |
| C520 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C841 | | 014-09100-00 | CAP TANT SMD 100U 16V 20% |
| C522 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C844 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| C530 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C900 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 |
| C535 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | C901 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 |
| C536 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C902 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 |
| C537 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C903 | | 015-02220-06 | CAP CER 1210 22P 5% 500V GRM42 |
| C545 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C904 | | 015-02270-06 | CAP CER 1210 27P NPO500V/GRM42 |
| C546 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C905 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 |
| C550 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | C906 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 |
| C600 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | C907 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 |
| C601 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C605 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V | %D111A | 10 | 001-10015-50 | DIODE SMD ZENER 1.5SMC22AT3 |
| C610A | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | %D111A | 15 | 001-10015-50 | DIODE SMD ZENER 1.5SMC22AT3 |
| C610B | | 014-09100-00 | CAP TANT SMD 100U 16V 20% | D220 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 |
| C611A | | 014-09100-00 | CAP TANT SMD 100U 16V 20% | D230 | | 001-10010-40 | DIODE SMD ZENER 33V BZG03-C33 |
| C611B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | D240 | | 001-10000-56 | S) DIODE SMD BAW56 D-SW SOT23 |
| C615 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | D250 | | 001-10000-56 | S) DIODE SMD BAW56 D-SW SOT23 |
| C616 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | D260 | | 001-10000-56 | S) DIODE SMD BAW56 D-SW SOT23 |
| C623 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V | D270 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 |
| C625 | | 020-09470-07 | CAPEL470M16V20%V 8*20 3.5L.ESR | D300 | | 001-10000-18 | S) DIODE SMD BAT18 S-SW SOT23 |
| C626 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | D301 | | 001-10000-18 | S) DIODE SMD BAT18 S-SW SOT23 |
| C628 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | D302 | | 001-10000-18 | S) DIODE SMD BAT18 S-SW SOT23 |
| C630 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | D303 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 |
| C631A | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | D440 | | 001-10066-00 | DIODE SCHOTTKY HSMS2815 |
| C634 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% | D441 | | 001-10066-00 | DIODE SCHOTTKY HSMS2815 |
| C636 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | D610 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 |
| C638 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V | D620 | | 001-10000-70 | S) DIODE SMD BAV70 D-SW SOT23 |
| C640 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | D630 | | 001-10000-70 | S) DIODE SMD BAV70 D-SW SOT23 |
| C655 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | D635 | | 001-10165-00 | DIODE BAT165 SCHOTTKY SOD-323 |
| C660 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | D640 | | 001-10000-70 | S) DIODE SMD BAV70 D-SW SOT23 |
| C665 | | 014-08100-03 | CAP TANT SMD 10U 35V 20% | D645 | | 001-10010-40 | DIODE SMD ZENER 33V BZG03-C33 |
| C670 | | 014-07330-10 | CAP TANT SMD 3U3 35V 10% | D710 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 |
| C673 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | D720 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 |
| C677 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM | D730 | | 001-10165-00 | DIODE BAT165 SCHOTTKY SOD-323 |
| C681 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | D740 | | 001-10165-00 | DIODE BAT165 SCHOTTKY SOD-323 |
| C684 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% | D810 | | 001-10165-00 | DIODE BAT165 SCHOTTKY SOD-323 |
| C687 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V | | | | |
| C690 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | IC210 | | 002-10003-24 | S) IC SMD 324 4X O-AMP SO14 |
| C693 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +20% | IC220 | | 002-10126-70 | S) IC SMD DS1267S10K 2XDIG POT |
| C700 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | IC230 | | 002-10003-24 | S) IC SMD 324 4X O-AMP SO14 |
| C703 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | IC240 | | 002-10040-53 | S)JMC14053B SMD BREAK B4 MAKE |
| C706 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | IC250 | | 002-10020-50 | IC SMD 4N25A OPTOCOUPLER |
| C708 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | IC260 | | 002-10003-24 | S) IC SMD 324 4X O-AMP SO14 |
| C709 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | IC300 | | 002-10003-58 | S) IC SMD LM358 DUAL O-AMP |
| C710 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | IC310 | | 002-10003-58 | S) IC SMD LM358 DUAL O-AMP |
| C712 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | IC385 | | 002-12951-00 | IC SMD LP2951CM ADJ VLTGE REG |
| C714 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | IC610 | | 002-10078-05 | S) IC SMD 78L05 5V REG |
| C719 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | IC630 | | 002-12523-17 | (S)IC LM317L REG TO-252 0.5A |
| C720 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | IC640 | | 002-10003-58 | S) IC SMD LM358 DUAL O-AMP |
| C722 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | IC650 | | 002-10012-32 | SMD DS1232LPS-2 LP RESET&W-DOG |
| C724 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | =IC700 | 10 | 539-00010-41 | TCXO 12.8MHZ +-2.5PPM -30 +70C |
| C725 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | =IC700 | 15 | 539-00010-41 | TCXO 12.8MHZ +-2.5PPM -30 +70C |
| C726 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | IC710 | | 002-74900-04 | S) IC SMD 74HC04D 6X INV BUFFD |
| C727 | | 015-23220-01 | CAP CER 0805 220P 5% NPO 50V | IC720 | | 002-74910-04 | S) IC SMD 74HC04 6X INV |
| C729 | | 015-23220-01 | CAP CER 0805 220P 5% NPO 50V | IC730 | | 002-10045-20 | S) IC SMD 74HC4520T 2XCTR 4BIT |
| %C733 | 10 | 015-23470-08 | CAP CER 0805 470P 10% X7R 50V | IC740 | | 002-14519-10 | S) IC MC145191F SMD SYNTH |
| %C733 | 15 | 015-23470-08 | CAP CER 0805 470P 10% X7R 50V | IC750 | | 002-10330-78 | S) IC MC33078D 2X AMP LO NOISE |
| C735 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | IC820 | | 002-12416-00 | S)IC SMD AT24C16N-10SC EEPROM |
| C736 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | IC830 | | 002-10003-24 | S) IC SMD 324 4X O-AMP SO14 |
| C740A | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C740B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L300 | | 056-10820-02 | (L) IND SMD 820NH |
| C741A | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | L301 | | 056-10820-02 | (L) IND SMD 820NH |
| C741B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L302 | | 056-10820-02 | (L) IND SMD 820NH |
| C742A | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | L303 | | 052-08355-40 | COIL A/W 4T/5.5mm SMD 0.8mm |
| C742B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L304 | | 052-08350-20 | COIL A/W 2T/5.0MM SMD 0.8MM |
| C743 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | L305 | | 052-08330-50 | COIL A/W 5T/3.0MM SMD 0.8MM |
| C745 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V | L306 | | 056-10820-02 | (L) IND SMD 820NH |
| C750 | | 014-08100-03 | CAP TANT SMD 10U 35V 20% | L307 | | 065-10004-20 | BEAD FE SMD CBD 4.6/3/3-4S2 |
| C757 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L308 | | 056-10102-12 | IND SMD 1u2 1812CS 5% |
| C759 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L309 | | 052-08340-50 | COIL A/W 5T/4.0MM SMD 0.8MM |
| C761 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L310 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C762 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | L330 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C764 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L385 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C765 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | L400 | | 056-00021-00 | IND FXD 3.3UH AX |
| C767 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L401 | | 065-10004-20 | BEAD FE SMD CBD 4.6/3/3-4S2 |
| C769 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L410 | | 052-08135-55 | COIL A/W 5.5T/3.5MM HOR 0.8MM |
| C770 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | L411 | | 052-08140-15 | COIL A/W 1.5T/4.0MM HOR 0.8MM |
| C772 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | L412 | | 065-00010-01 | BEAD FERR 3B 6 HOLE |
| C776 | | 015-25220-08 | CAP CER 0805 22N 10% X7R 50V | L413 | | 052-08140-65 | COIL A/W 6.5T/4.0MM HOR 0.8MM |
| C778 | | 022-07100-05 | CAP METAL PPS 1U 20% 63V 5MM | L414 | | 065-00010-01 | BEAD FERR 3B 6 HOLE |
| C780 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V | L415 | | 065-10004-20 | BEAD FE SMD CBD 4.6/3/3-4S2 |
| C781 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L416 | | 056-00021-04 | IND FXD 330NH AX (uH33) |
| C782 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L425 | | 052-08130-25 | COIL A/W 2.5T/3.0MM HOR 0.8MM |
| C783 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L426 | | 052-08320-10 | COIL A/W 1T/2.0MM SMD 0.8MM |
| C784 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V | L427 | | 065-00010-01 | BEAD FERR 3B 6 HOLE |
| C785 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L428 | | 052-08150-55 | COIL A/W 5.5T/5.0MM HOR 0.8MM |
| C786 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L440 | | 052-08130-15 | COIL A/W 1.5T/3.0MM HOR 0.8MM |
| C810 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | L441 | | 052-08140-35 | COIL A/W 3.5T/4.0MM HOR 0.8MM |
| C812 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V | L442 | | 056-14330-02 | (L) IND SMD 3.3UH |
| C813 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L443 | | 056-10820-02 | (L) IND SMD 820NH |
| C822 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | L444 | | 056-10820-02 | (L) IND SMD 820NH |
| C823 | | 015-25220-08 | CAP CER 0805 22N 10% X7R 50V | L445 | | 056-14330-02 | (L) IND SMD 3.3UH |
| C824 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | L480 | | 056-10820-02 | (L) IND SMD 820NH |
| C826 | | 015-23220-01 | CAP CER 0805 220P 5% NPO 50V | L520 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C827 | | 015-22330-01 | CAP CER 0805 33P 5% NPO 50V | L535 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C828 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L600 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C830 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | L615 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-------|-----|--------------|--------------------------------|-------|-----|--------------|--------------------------------|
| L780 | | 056-10330-02 | (L) IND SMD 330NH | R233 | | 036-16100-00 | RES M/F 0805 100K 5% |
| L900 | | 052-08135-85 | COIL A/W 8.5T/3.5MM HOR 0.8MM | R235 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| L901 | | 052-08155-45 | COIL A/W 4.5T/5.5MM HOR 0.8MM | R237 | | 036-15470-10 | RES M/F 0805 47K 1% |
| L902 | | 052-08155-45 | COIL A/W 4.5T/5.5MM HOR 0.8MM | R238 | | 036-15470-10 | RES M/F 0805 47K 1% |
| L903 | | 052-08135-85 | COIL A/W 8.5T/3.5MM HOR 0.8MM | R239 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| L904 | | 052-08155-15 | COIL A/W 1.5T/5.5MM HOR 0.8MM | R241 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| PL100 | | 070-01001-00 | D-RANGE 15 WAY COMPL T800 | R242 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| PL205 | | 240-00020-67 | HEADER 6W 2X3 PCB MTG STD | R244 | | 036-15100-10 | RES M/F 0805 10K 1% |
| PL210 | | 240-00020-67 | HEADER 6W 2X3 PCB MTG STD | R245 | | 036-16100-00 | RES M/F 0805 100K 5% |
| PL215 | | 240-00020-44 | HEADER 10W X2R PCB MTG 5*2 | R247 | | 036-15100-10 | RES M/F 0805 10K 1% |
| PL220 | | 240-00020-67 | HEADER 6W 2X3 PCB MTG STD | R248 | | 036-16100-00 | RES M/F 0805 100K 5% |
| Q210 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | R249 | | 036-16100-00 | RES M/F 0805 100K 5% |
| Q220 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 | R251 | | 036-16100-00 | RES M/F 0805 100K 5% |
| Q230 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | R253 | | 036-16100-00 | RES M/F 0805 100K 5% |
| Q240 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | R254 | | 036-16100-00 | RES M/F 0805 100K 5% |
| Q250 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 | R255 | | 036-15100-10 | RES M/F 0805 10K 1% |
| Q260 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS | R256 | | 036-15470-10 | RES M/F 0805 47K 1% |
| Q270 | | 000-10004-10 | S) XSTR SMD MJD41C NPN SW DPAK | R257 | | 036-16560-00 | RES M/F 0805 560K 5% |
| Q300 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF | R258 | | 036-16150-00 | RES M/F 0805 150K 5% |
| Q301 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF | R259 | | 036-15220-00 | RES M/F 0805 22K 5% |
| Q302 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF | R260 | | 036-15470-10 | RES M/F 0805 47K 1% |
| Q303 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | R262 | | 036-15470-10 | RES M/F 0805 47K 1% |
| Q304 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF | R263 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| Q305 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | &R264 | 10 | 036-15220-00 | RES M/F 0805 22K 5% |
| Q307 | | 000-10095-10 | S) XSTR SMD BR951 NPN UHF | &R264 | 15 | 036-15270-10 | RES M/F 0805 27K 1% |
| Q308 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | &R265 | 10 | 036-15150-00 | RES M/F 0805 15K 5% |
| Q309 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 | &R265 | 15 | 036-15180-00 | RES M/F 0805 18K 5% |
| Q310 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF | &R266 | 10 | 036-15470-10 | RES M/F 0805 47K 1% |
| Q311 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | &R266 | 15 | 036-15560-10 | RES M/F 0805 56K 1% |
| Q312 | | 000-10938-20 | L)XSTR MRF9382TI HI FRQ PWRFR | R267 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| Q315 | | 000-00033-12 | XSTR BD242 TO-220 PNP ISOLD | R268 | | 036-13100-10 | RES M/F 0805 100E 1% |
| Q360 | | 000-10017-00 | LS) XSTR SMD BF170LT1 SOT23 | R269 | | 036-15100-10 | RES M/F 0805 10K 1% |
| Q415 | | 000-00026-27 | S) XSTR 2SC2627 NPN 5W VHF STD | R270 | | 036-14120-00 | RES M/F 0805 1K2 5% |
| Q425 | | 000-00000-60 | S) XSTR BLW60C 45W 175MHZ RF | R271 | | 036-17100-10 | RES M/F 0805 1M 1% |
| Q510 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF | R272 | | 036-13560-00 | RES M/F 0805 560E 5% |
| Q520 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF | R273 | | 036-15120-00 | RES M/F 0805 12K 5% |
| Q530 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF | R274 | | 036-15150-00 | RES M/F 0805 15K 5% |
| Q540 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF | R275 | | 036-14270-00 | RES M/F 0805 2K2 5% |
| Q550 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | R277 | | 036-16100-00 | RES M/F 0805 100K 5% |
| Q610 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF | R278 | | 036-16120-00 | RES M/F 0805 120K 5% |
| Q620 | | 000-00033-12 | XSTR BD242 TO-220 PNP ISOLD | R279 | | 036-17100-10 | RES M/F 0805 1M 1% |
| Q630 | | 000-10003-00 | S) XSTR BSR30 PNP AF SOT-89 | R280 | | 036-15100-10 | RES M/F 0805 10K 1% |
| Q660 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 | R282 | | 036-15560-10 | RES M/F 0805 56K 1% |
| Q670 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS | R283 | | 036-15560-10 | RES M/F 0805 56K 1% |
| Q710 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | R284 | | 036-17100-10 | RES M/F 0805 1M 1% |
| Q720 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS | R285 | | 036-10000-00 | RES M/F 0805 ZERO OHM |
| Q730 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | R286 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| Q740 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS | R287 | | 036-15100-10 | RES M/F 0805 10K 1% |
| Q750 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF | R288 | | 036-15120-00 | RES M/F 0805 12K 5% |
| Q760 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | R289 | | 036-16100-00 | RES M/F 0805 100K 5% |
| Q770 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS | &R290 | 10 | 036-13560-00 | RES M/F 0805 560E 5% |
| Q775 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS | &R290 | 15 | 036-13560-00 | RES M/F 0805 560E 5% |
| Q780 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | R291 | | 036-10000-00 | RES M/F 0805 ZERO OHM |
| Q785 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS | R292 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| Q790 | | 000-10003-12 | S) XSTR SMD BFR31 N JFET SOT23 | R293 | | 036-15470-10 | RES M/F 0805 47K 1% |
| Q795 | | 000-10057-10 | S) XSTR SMD BR571 NPN SOT23 | R294 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| Q810 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | R295 | | 036-14270-00 | RES M/F 0805 2K7 5% |
| Q820 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 | R296 | | 036-14100-10 | RES M/F 0805 1K 1% |
| Q830 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS | R297 | | 036-14560-00 | RES M/F 0805 5K6 5% |
| Q840 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS | %R298 | 10 | 036-16100-00 | RES M/F 0805 100K 5% |
| Q850 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | %R298 | 15 | 036-16100-00 | RES M/F 0805 100K 5% |
| Q860 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS | R299 | | 036-14270-00 | RES M/F 0805 2K7 5% |
| R160 | | 036-12100-00 | RES M/F 0805 10E 5% | R300 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R201 | | 036-13560-00 | RES M/F 0805 560E 5% | R301 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R202 | | 036-14100-10 | RES M/F 0805 1K 1% | RV301 | | 042-04220-05 | RES PRESET SMD 2K CER 4MM SQ |
| R204 | | 036-14220-00 | RES M/F 0805 2K2 5% | R302 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R205 | | 036-13220-10 | RES 0805 220E 1% | RV302 | | 042-06500-05 | RES PRESET SMD 500K CER 4MM SQ |
| R206 | | 036-14100-10 | RES M/F 0805 1K 1% | R303 | | 036-15220-00 | RES M/F 0805 22K 5% |
| R207 | | 036-14390-10 | RES M/F 0805 3K9 1% | R304 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| R208 | | 036-13560-00 | RES M/F 0805 560E 5% | R305 | | 036-15330-00 | RES M/F 0805 33K 5% |
| R209 | | 036-15100-10 | RES M/F 0805 10K 1% | R306 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R210 | | 036-14220-00 | RES M/F 0805 2K2 5% | R307 | | 036-15100-10 | RES M/F 0805 10K 1% |
| RV210 | | 040-05100-23 | POT 10K LOG PCB 15MM SLOT SFT | R308 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R211 | | 036-13470-00 | RES M/F 0805 470E 5% | R309 | | 036-12470-00 | RES M/F 0805 47E 5% |
| R212 | | 036-16100-00 | RES M/F 0805 100K 5% | R310 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R213 | | 036-15100-10 | RES M/F 0805 10K 1% | R311 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R214 | | 036-14820-10 | RES M/F 0805 8K2 1% | R312 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R215 | | 036-16100-00 | RES M/F 0805 100K 5% | R313 | | 036-13560-00 | RES M/F 0805 560E 5% |
| R216 | | 036-16100-00 | RES M/F 0805 100K 5% | R314 | | 036-13560-00 | RES M/F 0805 560E 5% |
| R217 | | 036-14100-10 | RES M/F 0805 1K 1% | R315 | | 036-11330-00 | RES M/F 0805 3E3 5% |
| R218 | | 036-16150-00 | RES M/F 0805 150K 5% | R316 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| R219 | | 036-14220-00 | RES M/F 0805 2K2 5% | R317 | | 036-14560-00 | RES M/F 0805 5K6 5% |
| R220 | | 036-13470-00 | RES M/F 0805 470E 5% | R318 | | 036-14270-00 | RES M/F 0805 2K7 5% |
| RV220 | | 042-05500-05 | RES PRESET SMD 50K CER 4MM SQ | R319 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R221 | | 036-14150-10 | RES M/F 0805 1K5 1% | %R320 | 10 | 036-15180-00 | RES M/F 0805 18K 5% |
| R223 | | 036-17100-10 | RES M/F 0805 1M 1% | %R320 | 15 | 036-15180-00 | RES M/F 0805 18K 5% |
| R224 | | 036-14680-10 | RES M/F 0805 6K8 1% | R321 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R225 | | 036-17100-10 | RES M/F 0805 1M 1% | R322 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| R226 | | 036-15100-10 | RES M/F 0805 10K 1% | R323 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R227 | | 036-14220-00 | RES M/F 0805 2K2 5% | R324 | | 036-15220-00 | RES M/F 0805 22K 5% |
| R228 | | 036-13120-00 | RES M/F 0805 120E 5% | R325 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R229 | | 036-16470-00 | RES M/F 0805 470K 5% | R326 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R230 | | 036-16100-00 | RES M/F 0805 100K 5% | R327 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R231 | | 036-15100-10 | RES M/F 0805 10K 1% | %R328 | 10 | 036-15180-00 | RES M/F 0805 18K 5% |
| R232 | | 036-16330-00 | RES M/F 0805 330K 5% | %R328 | 15 | 036-15180-00 | RES M/F 0805 18K 5% |
| | | | | R329 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| | | | | R330 | | 036-16100-00 | RES M/F 0805 100K 5% |
| | | | | R331 | | 036-15100-10 | RES M/F 0805 10K 1% |

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-------|-----|--------------|--------------------------------|-------|-----|--------------|-------------------------------|
| R332 | | 036-14220-00 | RES M/F 0805 2K2 5% | R633 | | 036-14680-10 | RES M/F 0805 6K8 1% |
| R333 | | 036-12680-00 | RES M/F 0805 68E 5% | R637 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R334 | | 036-15220-00 | RES M/F 0805 22K 5% | R638 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R335 | | 036-12680-00 | RES M/F 0805 68E 5% | R640 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R336 | | 036-15100-10 | RES M/F 0805 10K 1% | R641 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| R337 | | 036-16100-00 | RES M/F 0805 100K 5% | R645 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R338 | | 036-16100-00 | RES M/F 0805 100K 5% | R649 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R339 | | 036-15150-00 | RES M/F 0805 15K 5% | R653 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R340 | | 036-16100-00 | RES M/F 0805 100K 5% | R655 | | 036-10000-00 | RES M/F 0805 ZERO OHM |
| R341 | | 036-15150-00 | RES M/F 0805 15K 5% | R656 | | 036-10000-00 | RES M/F 0805 ZERO OHM |
| R342 | | 036-15100-10 | RES M/F 0805 10K 1% | R657 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R343 | | 036-15470-10 | RES M/F 0805 47K 1% | R661 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R344 | | 036-16470-00 | RES M/F 0805 470K 5% | R665 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R345 | | 036-03150-02 | RES RC-01 1206 150E 200V 250MW | R669 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R346 | | 036-12220-00 | RES M/F 0805 22E 5% | R673 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R347 | | 036-12270-00 | RES M/F 0805 27E 5% | R677 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R348 | | 036-16330-00 | RES M/F 0805 330K 5% | R681 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R349 | | 036-14100-10 | RES M/F 0805 1K 1% | R685 | | 036-15150-00 | RES M/F 0805 15K 5% |
| R350 | | 036-13330-00 | RES M/F 0805 330E 5% | R689 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R351 | | 036-14100-10 | RES M/F 0805 1K 1% | R693 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R352 | | 036-14100-10 | RES M/F 0805 1K 1% | R696 | | 036-15560-1K | RES M/F 0805 56K 1% |
| R353 | | 036-10000-00 | RES M/F 0805 ZERO OHM | R701 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R354 | | 036-13100-10 | RES M/F 0805 100E 1% | R702 | | 036-17100-10 | RES M/F 0805 1M 1% |
| R355 | | 036-03150-02 | RES RC-01 1206 150E 200V 250MW | R703 | | 036-17100-10 | RES M/F 0805 1M 1% |
| R356 | | 036-14220-00 | RES M/F 0805 2K2 5% | R705 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R358 | | 036-16150-00 | RES M/F 0805 150K 5% | R706 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R359 | | 036-16470-00 | RES M/F 0805 470K 5% | R708 | | 036-17100-10 | RES M/F 0805 1M 1% |
| R360 | | 036-14150-10 | RES M/F 0805 1K5 1% | R710 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R361 | | 036-16150-00 | RES M/F 0805 150K 5% | R711 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R362 | | 036-15470-10 | RES M/F 0805 47K 1% | R712 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R363 | | 036-15560-10 | RES M/F 0805 56K 1% | R713 | | 036-10000-00 | RES M/F 0805 ZERO OHM |
| R364 | | 036-13100-10 | RES M/F 0805 100E 1% | R714 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R365 | | 036-13100-10 | RES M/F 0805 100E 1% | %R715 | 10 | 036-14100-10 | RES M/F 0805 1K 1% |
| R369 | | 036-14470-10 | RES M/F 0805 4K7 1% | %R715 | 15 | 036-14100-10 | RES M/F 0805 1K 1% |
| R370 | | 036-11330-00 | RES M/F 0805 3E3 5% | R717 | | 036-14270-00 | RES M/F 0805 2K7 5% |
| R371 | | 036-15180-00 | RES M/F 0805 18K 5% | R718 | | 036-15150-00 | RES M/F 0805 15K 5% |
| R372 | | 036-14330-10 | RES M/F 0805 3K3 1% | R719 | | 036-15150-00 | RES M/F 0805 15K 5% |
| R373 | | 036-12270-00 | RES M/F 0805 27E 5% | R720 | | 036-15390-00 | RES M/F 0805 39K 5% |
| R374 | | 036-16100-00 | RES M/F 0805 100K 5% | R721 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R375 | | 036-13560-00 | RES M/F 0805 560E 5% | R722 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R376 | | 036-14220-00 | RES M/F 0805 2K2 5% | R723 | | 036-14270-00 | RES M/F 0805 2K7 5% |
| R377 | | 036-14100-10 | RES M/F 0805 1K 1% | R725 | | 036-15390-00 | RES M/F 0805 39K 5% |
| R378 | | 036-12470-00 | RES M/F 0805 47E 5% | %R726 | 10 | 036-13100-10 | RES M/F 0805 100E 1% |
| R380 | | 036-03033-10 | RES 3E3 1W SMD 2512 | %R726 | 15 | 036-13100-10 | RES M/F 0805 100E 1% |
| R385 | | 036-11330-00 | RES M/F 0805 3E3 5% | R727 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R386 | | 036-16100-00 | RES M/F 0805 100K 5% | R728 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R387 | | 036-14150-10 | RES M/F 0805 1K5 1% | R734 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R388 | | 036-14680-10 | RES M/F 0805 6K8 1% | R735 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R389 | | 036-14270-00 | RES M/F 0805 2K7 5% | R736 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R392 | | 036-12220-00 | RES M/F 0805 22E 5% | R742 | | 036-13150-00 | RES M/F 0805 150E 5% |
| R395 | | 036-12220-00 | RES M/F 0805 22E 5% | R743 | | 036-13150-00 | RES M/F 0805 150E 5% |
| R410 | | 036-13270-00 | RES M/F 0805 270E 5% | R744 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R411 | | 036-03118-10 | RES 18R 1W SMD 2512 | R746 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R412 | | 036-13270-00 | RES M/F 0805 270E 5% | R747 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R413 | | 036-11330-00 | RES M/F 0805 3E3 5% | R748 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R414 | | 036-03180-10 | RES 180R 1W SMD 2512 | R749 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R415 | | 036-03180-10 | RES 180R 1W SMD 2512 | R750 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R416 | | 036-03110-10 | RES 10R 1W SMD 2512 | R752 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R425 | | 036-11330-00 | RES M/F 0805 3E3 5% | R753 | | 036-17100-10 | RES M/F 0805 1M 1% |
| R426 | | 036-03110-10 | RES 10R 1W SMD 2512 | R754 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R427 | | 036-03110-10 | RES 10R 1W SMD 2512 | R756 | | 036-15120-00 | RES M/F 0805 12K 5% |
| R428 | | 036-03180-10 | RES 180R 1W SMD 2512 | R757 | | 036-15120-00 | RES M/F 0805 12K 5% |
| R429 | | 036-03180-10 | RES 180R 1W SMD 2512 | R758 | | 036-14120-00 | RES M/F 0805 1K2 5% |
| R440 | | 036-15470-10 | RES M/F 0805 47K 1% | R759 | | 036-13330-00 | RES M/F 0805 330E 5% |
| R441 | | 036-13270-00 | RES M/F 0805 270E 5% | R760 | | 036-13180-00 | RES M/F 0805 180E 5% |
| R442 | | 036-13100-10 | RES M/F 0805 100E 1% | R762 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R443 | | 036-13100-10 | RES M/F 0805 100E 1% | R763 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R444 | | 036-13270-00 | RES M/F 0805 270E 5% | R765 | | 036-13680-00 | RES M/F 0805 680E 5% |
| R445 | | 036-15470-10 | RES M/F 0805 47K 1% | R766 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R480 | | 045-04470-01 | RES NTC 4K7 5% 5MM DISC | R767 | | 036-13680-00 | RES M/F 0805 680E 5% |
| R504 | | 036-13330-00 | RES M/F 0805 330E 5% | R769 | | 036-13180-00 | RES M/F 0805 180E 5% |
| R505 | | 036-15270-10 | RES M/F 0805 27K 1% | R771 | | 036-14820-10 | RES M/F 0805 8K2 1% |
| R510 | | 036-14150-10 | RES M/F 0805 1K5 1% | R772 | | 036-15220-00 | RES M/F 0805 22K 5% |
| R514 | | 036-12180-00 | RES M/F 0805 18E 5% | R774 | | 036-14820-10 | RES M/F 0805 8K2 1% |
| R515 | | 036-12560-00 | RES M/F 0805 56E 5% | R775 | | 036-14270-00 | RES M/F 0805 2K7 5% |
| R517 | | 036-13330-00 | RES M/F 0805 330E 5% | R777 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| R518 | | 036-12180-00 | RES M/F 0805 18E 5% | R780 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R519 | | 036-13330-00 | RES M/F 0805 330E 5% | R781 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R520 | | 036-16120-00 | RES M/F 0805 120K 5% | R782 | | 036-12680-00 | RES M/F 0805 68E 5% |
| R522 | | 036-12680-00 | RES M/F 0805 68E 5% | R783 | | 036-13220-10 | RES 0805 220E 1% |
| R525 | | 036-15470-10 | RES M/F 0805 47K 1% | R784 | | 036-14330-10 | RES M/F 0805 3K3 1% |
| R530 | | 036-15220-00 | RES M/F 0805 22K 5% | R785 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R533 | | 036-12680-00 | RES M/F 0805 68E 5% | R786 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R535 | | 036-15100-10 | RES M/F 0805 10K 1% | R787 | | 036-12560-00 | RES M/F 0805 56E 5% |
| R540 | | 036-14220-00 | RES M/F 0805 2K2 5% | R801 | | 036-16150-00 | RES M/F 0805 150K 5% |
| R545 | | 036-14470-10 | RES M/F 0805 4K7 1% | R802 | | 036-15470-10 | RES M/F 0805 47K 1% |
| %R550 | 10 | 036-14470-10 | RES M/F 0805 4K7 1% | RV805 | | 042-05200-05 | RES PRESET SMD 20K CER 4MM SQ |
| %R550 | 15 | 036-14470-10 | RES M/F 0805 4K7 1% | R808 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R555 | | 036-14470-10 | RES M/F 0805 4K7 1% | R809 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R560 | | 036-13470-00 | RES M/F 0805 470E 5% | R810 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R609 | | 036-14100-10 | RES M/F 0805 1K 1% | R811 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R613 | | 036-13560-00 | RES M/F 0805 560E 5% | R812 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R615 | | 036-13100-10 | RES M/F 0805 100E 1% | R813 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R617 | | 036-10000-00 | RES M/F 0805 ZERO OHM | R815 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R619 | | 036-01100-10 | RES 1 OHM 1 WATT 2512 CHIP | R816 | | 036-16150-00 | RES M/F 0805 150K 5% |
| R621 | | 036-01100-10 | RES 1 OHM 1 WATT 2512 CHIP | R818 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R625 | | 036-14100-10 | RES M/F 0805 1K 1% | R819 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R629 | | 036-03270-10 | RES 270 OHM 1 WATT 2512 CHIP | R821 | | 036-15470-10 | RES M/F 0805 47K 1% |

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-------|-----|--------------|--------------------------------|-----|-----|-----|-------------|
| R822 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R824 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R825 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R826 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R827 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R828 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R829 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R830 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R831 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R832 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R833 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R835 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R836 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R837 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R840 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R841 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R842 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R843 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R845 | | 036-13470-00 | RES M/F 0805 470E 5% | | | | |
| R847 | | 036-13470-00 | RES M/F 0805 470E 5% | | | | |
| R848 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R849 | | 036-13470-00 | RES M/F 0805 470E 5% | | | | |
| R850 | | 036-13470-00 | RES M/F 0805 470E 5% | | | | |
| R853 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R854 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R855 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R859 | | 036-16150-00 | RES M/F 0805 150K 5% | | | | |
| R861 | | 036-16150-00 | RES M/F 0805 150K 5% | | | | |
| R863 | | 036-16150-00 | RES M/F 0805 150K 5% | | | | |
| R865 | | 036-16100-00 | RES M/F 0805 100K 5% | | | | |
| R867 | | 036-16100-00 | RES M/F 0805 100K 5% | | | | |
| R871 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R872 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R873 | | 036-15330-00 | RES M/F 0805 33K 5% | | | | |
| R874 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R875 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R876 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R877 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R879 | | 036-15100-10 | RES M/F 0805 10K 1% | | | | |
| SK200 | | 240-10000-05 | CONN SMD SKT 8W 2R M-MATCH | | | | |
| SK205 | | 240-02020-05 | SKT STEREO PHONE JACK PCB MTG | | | | |
| SK805 | | 240-10000-07 | CONN SMD SKT 16W 2R M-MATCH | | | | |
| SK810 | | 240-04020-42 | SKT 44 PIN SMD PLCC | | | | |
| SW230 | | 232-00010-26 | SWITCH PUSH SPDT R-ANG PCB MTG | | | | |
| T210 | | 053-00010-17 | XFMR T4030 LINE MATCH POTCORE | | | | |
| T610 | | 050-15119-52 | COIL SMD 680uH XFMR 5119-T052 | | | | |

T826 Mechanical & Miscellaneous Parts (220-01443-04)

| IPN | Legend | Description | IPN | Legend | Description |
|--------------|--------|--------------------------------|-----|--------|-------------|
| 002-08951-20 | | S) IC AT89C51 PLCC44 MIC 12MHZ | | | |
| 008-00014-79 | | S)LED 3MM RED WITH WIRE | | | |
| 008-00014-80 | | S)LED 3MM GREEN WITH WIRE | | | |
| 220-01443-04 | | PCB T826 TX SII | | | |
| 232-00020-26 | | BUTTON 232-00010-26 SWITCH | | | |
| 240-02100-06 | | SKT COAX N TYPE PNL MTG OP-TER | | | |
| 240-04020-62 | | SKT 2 W RECEP SHORTING LINK | | | |
| 240-04021-77 | | SKT JACK 1.3 PCB MT 64W | | | |
| 303-11169-04 | | CHASSIS PAINTED T800 SER II | | | |
| 303-23118-00 | | COVER A3M2247 D RANGE T855/7 | | | |
| 303-50074-00 | | CLIP A3M2246 SPRING CLAMP T857 | | | |
| 308-01007-01 | | HANDLE BS SII 2 WASHERS INC | | | |
| 308-13090-00 | | HSINK A4M2361 BRKT COPPER T856 | | | |
| 312-01052-02 | | LID TOP T800 SER II PTND | | | |
| 312-01053-02 | | LID BOTTOM T800 SER II PNTD | | | |
| 316-06621-00 | | PNL FRT TX T800 SERIES II | | | |
| 349-00020-36 | | SCREW TT M3X8m PANTORX BLK | | | |
| 349-00020-43 | | SCRW T/T M4X12MM P/POZ BZ | | | |
| 349-00020-45 | | SCRW T/T M4X20MM P/POZ BZ | | | |
| 349-00020-55 | | SCRW M3*8 P/P T/T BLCKZNC CHR | | | |
| 352-00010-08 | | NUT M3 COLD FORM HEX ST BZ | | | |
| 352-00010-29 | | NUT M4 NYLOC HEX | | | |
| 352-00010-35 | | NUT 8-32 UNC HEX XSTR MTG | | | |
| 353-00010-13 | | WSHR M3 S/PROOF INT BZ | | | |
| 353-00010-24 | | WSHR M4x8mm Flat | | | |
| 362-00010-23 | | GASKET SIL TO-220 CLIP MTG. | | | |
| 362-00010-33 | | GROMMET LED MTG 3MM | | | |
| 399-00010-51 | | BAG PLASTIC 75*100MM | | | |

T826 Grid Reference Index (IPN 220-01443-04)**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 |
|--------|------|---------|--------|------|---------|--------|------|---------|--------|------|---------|
| C201 | 1:C1 | 2-B8 | C305 | 1:F5 | 3-B4 | C370 | 1:F7 | 3-N5 | C516 | 1:J5 | 5-H4 |
| C202 | 1:C1 | 2-C8 | C306 | 1:F4 | 3-B0 | C371 | 1:F7 | 3-M5 | C520 | 1:J5 | 5-H0 |
| C204 | 1:B3 | 2-E8 | C307 | 1:F3 | 3-C2 | C372 | 1:E5 | 3-M1 | C522 | 1:H5 | 5-H3 |
| C205 | 1:A3 | 2-E8 | C308 | 1:F8 | 3-C8 | C373 | 1:F5 | 3-N1 | C530 | 1:J5 | 5-K2 |
| C207 | 1:C7 | 2-B6 | C309 | 1:F9 | 3-C7 | C374 | 1:F5 | 3-N0 | C535 | 1:K5 | 5-M2 |
| C209 | 1:C6 | 2-D6 | C310 | 1:F8 | 3-B6 | C375 | 1:F6 | 3-N0 | C536 | 1:K5 | 5-L2 |
| C210 | 1:C7 | 2-K0 | C311 | 1:F5 | 3-C4 | C376 | 1:E6 | 3-P1 | C537 | 1:J5 | 5-L2 |
| C211 | 1:B7 | 2-F8 | C312 | 1:F4 | 3-C0 | C377 | 1:F6 | 3-P0 | C545 | 1:J5 | 5-K2 |
| C213 | 1:B6 | 2-G8 | C313 | 1:E8 | 3-E6 | C378 | 1:E6 | 3-P2 | C546 | 1:K5 | 5-J3 |
| C215 | 1:B6 | 2-G8 | C314 | 1:F8 | 3-B6 | C379 | 1:F6 | 3-Q1 | C550 | 1:K5 | 5-K3 |
| C217 | 1:C6 | 2-H8 | C315 | 1:F3 | 3-C2 | C380 | 1:F7 | 3-Q0 | C600 | 1:L6 | 6-D8 |
| C219 | 1:C6 | 2-H7 | C316 | 1:F4 | 3-C1 | C381 | 1:F7 | 3-Q0 | C601 | 1:L6 | 6-D8 |
| C221 | 1:D5 | 2-G6 | C317 | 1:F4 | 3-C0 | C385 | 1:E8 | 3-H8 | C605 | 1:L6 | 6-C8 |
| C223 | 1:C5 | 2-J6 | C318 | 1:F8 | 3-C5 | C386 | 1:E8 | 3-H8 | C610A | 1:M5 | 6-F8 |
| C225 | 1:C3 | 2-K7 | C319 | 1:F3 | 3-D2 | C387 | 1:E8 | 3-J8 | C610B | 1:L5 | 6-F8 |
| C227 | 1:B4 | 2-K7 | C320 | 1:E7 | 3-D7 | C388 | 1:E9 | 3-L8 | C611A | 1:M6 | 6-H8 |
| C229 | 1:B3 | 2-L7 | C323 | 1:F5 | 3-D4 | C389 | 1:E9 | 3-L8 | C611B | 1:M5 | 6-H8 |
| C230 | 1:B4 | 2-J0 | C324 | 1:E8 | 3-F6 | C390 | 1:E9 | 3-M8 | C615 | 1:M6 | 6-R8 |
| C232 | 1:A4 | 2-M7 | C326 | 1:F5 | 3-D4 | C393 | 1:F8 | 3-R5 | C616 | 1:M6 | 6-R8 |
| C233 | 1:B5 | 2-N7 | C327 | 1:F5 | 3-E4 | C395 | 1:F8 | 3-R3 | C623 | 1:N6 | 6-M8 |
| C235 | 1:B5 | 2-K5 | C328 | 1:F3 | 3-E2 | C396 | 1:F8 | 3-R3 | C625 | 1:M6 | 6-Q8 |
| C237 | 1:C4 | 2-K5 | C329 | 1:E7 | 3-F4 | C397 | 1:F8 | 3-R3 | C626 | 1:M6 | 6-Q8 |
| C239 | 1:C4 | 2-L4 | C330 | 1:F3 | 3-F2 | C400 | 1:G7 | 4-C7 | C628 | 1:M6 | 6-Q8 |
| C241 | 1:B4 | 2-M6 | C331 | 1:E7 | 3-G3 | C401 | 1:G8 | 4-C7 | C630 | 1:M5 | 6-J5 |
| C242 | 1:B4 | 2-L6 | C332 | 1:E7 | 3-G4 | C402 | 1:G8 | 4-D7 | C631A | 1:N5 | 6-L6 |
| C243 | 1:B4 | 2-P6 | C333 | 1:E8 | 3-G6 | C403 | 1:G7 | 4-B7 | C634 | 1:N5 | 6-L5 |
| C245 | 1:C5 | 2-A4 | C334 | 1:F4 | 3-G0 | C410 | 1:H8 | 4-D3 | C636 | 1:M5 | 6-M5 |
| C247 | 1:C6 | 2-B4 | C335 | 1:E8 | 3-G3 | C411 | 1:H8 | 4-D2 | C638 | 1:M5 | 6-N6 |
| C249 | 1:D4 | 2-C4 | C336 | 1:E7 | 3-G3 | C412 | 1:H7 | 4-D5 | C640 | 1:M5 | 6-Q6 |
| C251 | 1:C3 | 2-E4 | C337 | 1:E8 | 3-G6 | C413 | 2:H8 | 4-E2 | C655 | 1:M4 | 6-C1 |
| C253 | 1:D3 | 2-E3 | C338 | 1:F4 | 3-H0 | C414 | 1:H7 | 4-E5 | C660 | 1:L5 | 6-K1 |
| C255 | 1:D3 | 2-D2 | C339 | 1:E4 | 3-H3 | C415 | 1:J7 | 4-E5 | C665 | 1:L5 | 6-K1 |
| C257 | 1:D3 | 2-F2 | C340 | 1:E8 | 3-H7 | C416 | 1:J9 | 4-E4 | C670 | 1:L5 | 6-L1 |
| C259 | 1:C6 | 2-J2 | C341 | 1:E8 | 3-H7 | C425 | 2:J8 | 4-G2 | C673 | 1:L5 | 6-P2 |
| C260 | 1:D8 | 2-H0 | C342 | 1:F7 | 3-F4 | C426 | 2:J8 | 4-G3 | C677 | 1:L6 | 6-P1 |
| C261 | 1:C6 | 2-K2 | C344 | 1:F7 | 3-J5 | C427 | 1:L7 | 4-G5 | C681 | 1:L6 | 6-R3 |
| C263 | 1:D6 | 2-L3 | C346 | 1:E4 | 3-J1 | C428 | 2:K8 | 4-G2 | C684 | 1:L6 | 6-R3 |
| C265 | 1:D6 | 2-N4 | C347 | 1:E7 | 3-H5 | C429 | 1:L7 | 4-G5 | C687 | 1:L6 | 6-Q1 |
| C267 | 1:C8 | 2-P3 | C348 | 1:E4 | 3-J0 | C430 | 1:L7 | 4-H5 | C690 | 1:L6 | 6-R1 |
| &C269 | 1:C8 | 2-P3 | C349 | 1:E4 | 3-J0 | C431 | 1:L7 | 4-J4 | C693 | 1:L6 | 6-R1 |
| &C271 | 1:C8 | 2-Q3 | C350 | 1:E4 | 3-K0 | C440 | 2:L8 | 4-J2 | C700 | 1:K3 | 7-A8 |
| C273 | 1:C8 | 2-Q4 | C351 | 1:E5 | 3-K1 | C441 | 2:L7 | 4-K2 | C703 | 1:J3 | 7-B7 |
| C275 | 1:C3 | 2-E1 | C352 | 1:E5 | 3-K0 | C442 | 1:L8 | 4-L2 | C706 | 1:J2 | 7-B5 |
| C277 | 1:C4 | 2-G1 | C353 | 1:F8 | 3-L5 | C443 | 1:G9 | 4-M5 | #C707 | 1:K4 | 7-C8 |
| C279 | 1:B4 | 2-G1 | C354 | 1:E5 | 3-K0 | C444 | 1:L8 | 4-L2 | C708 | 1:J2 | 7-C9 |
| C281 | 1:B5 | 2-J1 | C355 | 1:F8 | 3-M7 | C445 | 1:M9 | 4-M4 | C709 | 1:K4 | 7-D9 |
| C283 | 1:B5 | 2-K0 | C356 | 1:F7 | 3-M6 | C446 | 1:M8 | 4-M2 | C710 | 1:J3 | 7-D8 |
| C285 | 1:D7 | 2-L0 | C357 | 1:E5 | 3-L1 | C447 | 1:M8 | 4-M2 | C711 | 1:J3 | 7-C5 |
| C287 | 1:C6 | 2-M1 | C358 | 1:E5 | 3-L1 | C448 | 2:M8 | 4-N4 | C712 | 1:H2 | 7-E7 |
| &C289 | 1:C8 | 2-N1 | C359 | 1:E5 | 3-L2 | C449 | 1:M8 | 4-M4 | %C713 | 1:H2 | 7-E6 |
| C291 | 1:D7 | 2-P1 | C360 | 1:E5 | 3-L1 | C450 | 1:N7 | 4-N2 | C714 | 1:J3 | 7-E8 |
| C293 | 1:D7 | 2-Q1 | C361 | 1:F8 | 3-M7 | C451 | 1:N7 | 4-P2 | C719 | 1:J3 | 7-F8 |
| %C294 | 1:D7 | 2-Q0 | C362 | 1:F5 | 3-L0 | C452 | 1:G8 | 4-Q2 | C720 | 1:J3 | 7-F8 |
| %C295 | 1:C7 | 2-Q0 | C363 | 1:F7 | 3-L6 | C480 | 1:J8 | 4-P6 | C722 | 1:J4 | 7-G8 |
| C300 | 1:F5 | 3-B0 | C364 | 1:F8 | 3-M7 | C503 | 1:K6 | 5-L9 | C724 | 1:J4 | 7-H6 |
| C301 | 1:F8 | 3-C6 | C365 | 1:F7 | 3-L7 | C505 | 1:K5 | 5-M6 | C725 | 1:J4 | 7-J6 |
| C302 | 1:F8 | 3-B8 | C366 | 1:E5 | 3-P3 | C510 | 1:H5 | 5-C0 | C726 | 1:K4 | 7-J6 |
| C303 | 1:F9 | 3-B7 | C367 | 1:E5 | 3-L2 | C514 | 1:H5 | 5-H3 | C727 | 1:J3 | 7-J8 |
| C304 | 1:F8 | 3-C6 | C369 | 1:F8 | 3-N7 | C515 | 1:J5 | 5-F1 | C729 | 1:H3 | 7-M8 |

| Device | PCB | Circuit | Device | PCB | Circuit | Device | PCB | Circuit | Device | PCB | Circuit |
|--------|------|---------|--------|------|---------|--------|------|---------|--------|------|---------|
| %C733 | 1:H2 | 7-E3 | D610 | 1:N6 | 6-L6 | IC830 | 1:N3 | 8-C0 | P259 | 1:B8 | 2-R3 |
| C735 | 1:J2 | 7-A1 | D620 | 1:N4 | 6-B2 | | | | P261 | 1:B8 | 2-R3 |
| C736 | 1:J2 | 7-B1 | D620 | 1:N4 | 6-B1 | L300 | 1:F4 | 3-C0 | P263 | 1:B1 | 2-R2 |
| C740A | 1:H2 | 7-B4 | D630 | 1:M5 | 6-G2 | L301 | 1:F4 | 3-D0 | P267 | 1:C8 | 2-N2 |
| C740B | 1:H2 | 7-B3 | D630 | 1:M5 | 6-G3 | L302 | 1:E4 | 3-J2 | P269 | 1:D8 | 2-P2 |
| C741A | 1:H2 | 7-C4 | D635 | 1:M4 | 6-G3 | L303 | 1:E4 | 3-J0 | P271 | 1:C9 | 2-N1 |
| C741B | 1:G2 | 7-C3 | D640 | 1:L5 | 6-M1 | L304 | 1:E5 | 3-K0 | P273 | 1:D9 | 2-P0 |
| C742A | 1:H2 | 7-D4 | D640 | 1:L5 | 6-M2 | L305 | 1:F5 | 3-L0 | P275 | 1:D7 | 2-Q0 |
| C742B | 1:H3 | 7-D3 | D645 | 1:M5 | 6-R6 | L306 | 1:F5 | 3-L0 | P290 | 1:D5 | 2-E0 |
| C743 | 1:H2 | 7-B1 | D710 | 1:J3 | 7-L8 | L307 | 1:E6 | 3-P3 | P291 | 1:D5 | 2-G0 |
| C745 | 1:G3 | 7-D1 | D710 | 1:J3 | 7-L8 | L308 | 1:E6 | 3-P1 | P805 | 1:M2 | 8-A7 |
| C750 | 1:H4 | 7-Q7 | D720 | 1:H3 | 7-P8 | L309 | 1:F6 | 3-P0 | P810 | 1:L3 | 8-A5 |
| C757 | 1:G4 | 7-F5 | D720 | 1:H3 | 7-P8 | L310 | 1:F8 | 3-B6 | P820 | 1:L4 | 8-M8 |
| C759 | 1:G4 | 7-G4 | D730 | 1:H3 | 7-H1 | L330 | 1:F5 | 3-E5 | P825 | 1:L4 | 8-M8 |
| C761 | 1:G3 | 7-J4 | D740 | 1:H3 | 7-J2 | L385 | 1:E8 | 3-G9 | P830 | 1:L4 | 8-M8 |
| C762 | 1:G3 | 7-J4 | D810 | 1:M2 | 8-B7 | L400 | 1:G7 | 4-C7 | P835 | 1:L4 | 8-M7 |
| C764 | 1:H3 | 7-H2 | | | | L401 | 1:G8 | 4-C7 | P840 | 1:L4 | 8-M7 |
| C765 | 1:G3 | 7-J2 | IC210 | 1:C7 | 2-C6 | L410 | 1:H8 | 4-D2 | | | |
| C767 | 1:H3 | 7-K3 | IC210 | 1:C7 | 2-J0 | L411 | 1:H8 | 4-E3 | PL100 | 1:P3 | 1-M0 |
| C769 | 1:J3 | 7-M4 | IC210 | 1:C7 | 2-L1 | L412 | 1:H8 | 4-E2 | PL205 | 1:C5 | 2-J8 |
| C770 | 1:H4 | 7-N4 | IC210 | 1:C7 | 2-K2 | L413 | 1:H9 | 4-E3 | PL210 | 1:C3 | 2-H4 |
| C772 | 1:G4 | 7-M2 | IC210 | 1:C7 | 2-Q0 | L414 | 1:J7 | 4-F5 | PL215 | 1:C4 | 2-K3 |
| C776 | 1:H3 | 7-L1 | IC220 | 1:C6 | 2-D5 | L415 | 1:J7 | 4-F5 | PL220 | 1:C4 | 2-H2 |
| C778 | 1:H4 | 7-M1 | IC220 | 1:C6 | 2-P0 | L416 | 1:J7 | 4-F4 | | | |
| C780 | 1:G2 | 7-N1 | IC220 | 1:C6 | 2-M3 | L425 | 1:J8 | 4-G3 | Q210 | 1:C6 | 2-J8 |
| C781 | 1:G2 | 7-P1 | IC230 | 1:B4 | 2-J0 | L426 | 2:K8 | 4-H3 | Q220 | 1:B3 | 2-L7 |
| C782 | 1:G2 | 7-P1 | IC230 | 1:B4 | 2-J0 | L427 | 1:J7 | 4-H2 | Q230 | 1:A4 | 2-M8 |
| C783 | 1:G3 | 7-P0 | IC230 | 1:B4 | 2-L5 | L428 | 1:M7 | 4-J5 | Q240 | 1:B7 | 2-Q7 |
| C784 | 1:G4 | 7-Q0 | IC230 | 1:B4 | 2-N6 | L440 | 1:L8 | 4-K4 | Q250 | 1:B7 | 2-R6 |
| C785 | 1:G3 | 7-Q1 | IC230 | 1:B4 | 2-G1 | L441 | 1:L8 | 4-L4 | Q260 | 1:C4 | 2-F3 |
| C786 | 1:G4 | 7-Q0 | IC240 | 1:D4 | 2-F3 | L442 | 1:G9 | 4-M5 | Q270 | 1:D2 | 2-D1 |
| C810 | 1:L3 | 8-K8 | IC250 | 1:D3 | 2-E1 | L443 | 1:M8 | 4-N4 | Q300 | 1:F5 | 3-B3 |
| C812 | 1:L2 | 8-F5 | IC260 | 1:D8 | 2-N0 | L444 | 1:N7 | 4-N3 | Q301 | 1:F4 | 3-C1 |
| C813 | 1:K2 | 8-J5 | IC260 | 1:D8 | 2-H0 | L445 | 1:G8 | 4-P3 | Q302 | 1:F5 | 3-C4 |
| C822 | 1:M2 | 8-B2 | IC260 | 1:D8 | 2-Q2 | L480 | 1:J9 | 4-P6 | Q303 | 1:E7 | 3-J5 |
| C823 | 1:M3 | 8-C2 | IC260 | 1:D8 | 2-Q3 | L520 | 1:H5 | 5-G3 | Q304 | 1:E7 | 3-F3 |
| C824 | 1:M2 | 8-C1 | IC260 | 1:D8 | 2-N3 | L535 | 1:K5 | 5-L2 | Q305 | 1:E8 | 3-H3 |
| C826 | 1:N3 | 8-C0 | IC300 | 1:F9 | 3-C7 | L600 | 1:L6 | 6-D8 | Q307 | 1:F4 | 3-J0 |
| C827 | 1:N3 | 8-D0 | IC300 | 1:F9 | 3-Q5 | L615 | 1:M6 | 6-R8 | Q308 | 1:F7 | 3-K6 |
| C828 | 1:N3 | 8-E0 | IC300 | 1:F9 | 3-C8 | L780 | 1:G3 | 7-Q0 | Q309 | 1:F8 | 3-M6 |
| C830 | 1:N3 | 8-R1 | IC310 | 1:E8 | 3-D6 | L900 | 1:P8 | 9-D6 | Q310 | 1:E5 | 3-L2 |
| C838 | 1:N4 | 8-F0 | IC310 | 1:E8 | 3-Q3 | L901 | 1:P7 | 9-E6 | Q311 | 1:F7 | 3-G5 |
| C841 | 1:N2 | 8-L2 | IC310 | 1:E8 | 3-H7 | L902 | 1:P7 | 9-F6 | Q312 | 1:F6 | 3-P0 |
| C844 | 1:M2 | 8-L2 | IC385 | 1:E9 | 3-J8 | L903 | 1:P6 | 9-H6 | Q315 | 1:F8 | 3-N6 |
| C900 | 1:N8 | 9-D4 | IC610 | 1:L5 | 6-G8 | L904 | 1:P7 | 9-F5 | Q360 | 1:E7 | 3-K5 |
| C901 | 1:P7 | 9-E4 | IC630 | 1:N5 | 6-K5 | | | | Q415 | 2:J8 | 4-F3 |
| C902 | 1:P8 | 9-E4 | IC640 | 1:M5 | 6-M5 | LINK1 | 2:B2 | 2-E9 | Q425 | 2:K8 | 4-J3 |
| C903 | 1:P7 | 9-F4 | IC640 | 1:M5 | 6-Q6 | LINK2 | 2:A2 | 2-E8 | Q510 | 1:J5 | 5-D1 |
| C904 | 1:P7 | 9-F4 | IC640 | 1:M5 | 6-F1 | | | | Q520 | 1:J5 | 5-G3 |
| C905 | 1:P6 | 9-G4 | IC650 | 1:L5 | 6-F4 | P100 | 1:Q6 | 1-R8 | Q530 | 1:J5 | 5-G0 |
| C906 | 1:P7 | 9-H4 | =IC700 | 1:K3 | 7-A8 | P150 | 1:P2 | 1-Q4 | Q540 | 1:J5 | 5-L2 |
| C907 | 1:P6 | 9-H4 | IC710 | 1:J2 | 7-D8 | P160 | 1:P2 | 1-Q4 | Q550 | 1:K5 | 5-L4 |
| %D111 | 1:P5 | 1-R1 | IC710 | 1:J2 | 7-C6 | P170 | 1:P2 | 1-Q3 | Q610 | 1:L6 | 6-D8 |
| %D111A | 1:P5 | 1-Q1 | IC710 | 1:J2 | 7-C5 | P204 | 1:D1 | 2-A8 | Q620 | 1:N6 | 6-P8 |
| %D205 | 1:B2 | 2-D9 | IC710 | 1:J2 | 7-D6 | P208 | 1:D1 | 2-A8 | Q630 | 1:M6 | 6-P5 |
| %D210 | 1:B2 | 2-D9 | IC710 | 1:J2 | 7-D7 | P210 | 1:D3 | 2-A3 | Q660 | 1:L5 | 6-N1 |
| D220 | 1:B4 | 2-P7 | IC710 | 1:J2 | 7-D6 | P215 | 1:D4 | 2-A2 | Q670 | 1:L6 | 6-Q2 |
| D220 | 1:B4 | 2-P6 | IC710 | 1:J2 | 7-C6 | P217 | 1:D4 | 2-A2 | Q710 | 1:J3 | 7-K8 |
| D230 | 1:B7 | 2-R5 | IC720 | 1:J3 | 7-P6 | P219 | 1:D2 | 2-A1 | Q720 | 1:J3 | 7-K8 |
| D240 | 1:D4 | 2-C4 | IC720 | 1:J3 | 7-G0 | P225 | 1:D2 | 2-A0 | Q730 | 1:H3 | 7-N8 |
| D240 | 1:D4 | 2-B2 | IC720 | 1:J3 | 7-N7 | P230 | 1:C5 | 2-B0 | Q740 | 1:H3 | 7-N8 |
| D250 | 1:D3 | 2-E2 | IC720 | 1:J3 | 7-M7 | P231 | 1:D8 | 2-B0 | Q750 | 1:G4 | 7-F3 |
| D250 | 1:D3 | 2-D3 | IC720 | 1:J3 | 7-K7 | P233 | 1:C1 | 2-R9 | Q760 | 1:H3 | 7-H3 |
| D260 | 1:C3 | 2-C2 | IC720 | 1:J3 | 7-E8 | P235 | 1:C1 | 2-R9 | Q770 | 1:H3 | 7-H1 |
| D260 | 1:C3 | 2-C2 | IC720 | 1:J3 | 7-G0 | P237 | 1:B7 | 2-R8 | Q775 | 1:H3 | 7-K3 |
| D270 | 1:C2 | 2-C1 | IC730 | 1:J4 | 7-H8 | P239 | 1:C7 | 2-R8 | Q780 | 1:H3 | 7-K3 |
| D270 | 1:C2 | 2-C1 | IC730 | 1:J4 | 7-G7 | P240 | 1:C7 | 2-R8 | Q785 | 1:H3 | 7-K2 |
| D300 | 1:F4 | 3-B0 | IC740 | 1:H2 | 7-D1 | P243 | 1:B7 | 2-R7 | Q790 | 1:H3 | 7-L3 |
| D301 | 1:F4 | 3-C0 | IC750 | 1:H4 | 7-M3 | P244 | 1:B7 | 2-R7 | Q795 | 1:G3 | 7-P0 |
| D302 | 1:F4 | 3-C0 | IC750 | 1:H4 | 7-H5 | P245 | 1:B8 | 2-R6 | Q810 | 1:M2 | 8-E7 |
| D303 | 1:E6 | 3-M0 | IC820 | 1:L4 | 8-N2 | P247 | 1:B8 | 2-R6 | Q820 | 1:L2 | 8-D5 |
| D303 | 1:E6 | 3-L0 | IC830 | 1:N3 | 8-J0 | P248 | 1:B7 | 2-R6 | Q830 | 1:L2 | 8-D5 |
| D440 | 1:M8 | 4-M5 | IC830 | 1:N3 | 8-Q1 | P249 | 1:C7 | 2-R5 | Q840 | 1:L2 | 8-F5 |
| D441 | 1:N7 | 4-P3 | IC830 | 1:N3 | 8-J0 | P251 | 1:C7 | 2-R5 | Q850 | 1:M2 | 8-G5 |
| D610 | 1:N6 | 6-K6 | IC830 | 1:N3 | 8-J1 | P255 | 1:D4 | 2-R4 | Q860 | 1:L4 | 8-B3 |
| | | | | | | P257 | 1:C2 | 2-R4 | | | |

| Device | PCB | Circuit | Device | PCB | Circuit | Device | PCB | Circuit | Device | PCB | Circuit |
|--------|------|---------|--------|------|---------|--------|------|---------|--------|------|---------|
| %R150 | 1:P2 | 1-R4 | R285 | 1:C8 | 2-M0 | R362 | 1:E5 | 3-K2 | R653 | 1:M5 | 6-P5 |
| R160 | 1:P2 | 1-R3 | R286 | 1:C7 | 2-M0 | R363 | 1:E5 | 3-K1 | R655 | 1:L4 | 6-D4 |
| %R200 | 1:B2 | 2-C9 | R287 | 1:D9 | 2-M0 | R364 | 1:F8 | 3-M7 | R656 | 1:L4 | 6-D4 |
| R201 | 1:B3 | 2-E9 | R288 | 1:C6 | 2-M2 | R365 | 1:F7 | 3-M6 | R657 | 1:M5 | 6-D1 |
| R202 | 1:C1 | 2-F9 | R289 | 1:D9 | 2-M0 | R369 | 1:F7 | 3-M5 | R661 | 1:M5 | 6-E3 |
| %R203 | 1:B3 | 2-C8 | &R290 | 1:C8 | 2-N2 | R370 | 1:E5 | 3-L1 | R665 | 1:M5 | 6-E2 |
| R204 | 1:C7 | 2-B6 | R291 | 1:C8 | 2-N1 | R371 | 1:E5 | 3-L1 | R669 | 1:M5 | 6-E2 |
| R205 | 1:C7 | 2-D6 | R292 | 1:D8 | 2-Q2 | R372 | 1:E6 | 3-L1 | R673 | 1:M5 | 6-E0 |
| R206 | 1:B7 | 2-G8 | R293 | 1:D9 | 2-Q2 | R373 | 1:F5 | 3-M0 | R677 | 1:M4 | 6-F4 |
| R207 | 1:B6 | 2-G8 | R294 | 1:D9 | 2-Q1 | R374 | 1:F7 | 3-N5 | R681 | 1:L5 | 6-L2 |
| R208 | 1:B6 | 2-G8 | R295 | 1:D8 | 2-R1 | R375 | 1:F7 | 3-N5 | R685 | 1:L5 | 6-N2 |
| R209 | 1:C6 | 2-H8 | R296 | 1:D6 | 2-P0 | R376 | 1:E6 | 3-M1 | R689 | 1:L6 | 6-Q3 |
| R210 | 1:B6 | 2-H7 | R297 | 1:D7 | 2-P1 | R377 | 1:F6 | 3-N1 | R693 | 1:L5 | 6-Q1 |
| R211 | 1:B2 | 2-D9 | %R298 | 1:D7 | 2-Q0 | R378 | 1:F6 | 3-N0 | R696 | 1:L5 | 6-Q1 |
| R212 | 1:D4 | 2-F6 | R299 | 1:C7 | 2-R0 | R380 | 1:E6 | 3-P2 | R701 | 1:K4 | 7-A9 |
| R213 | 1:C4 | 2-G6 | R300 | 1:F4 | 3-B0 | R385 | 1:E8 | 3-G9 | R702 | 1:K4 | 7-C9 |
| R214 | 1:D4 | 2-G6 | R301 | 1:F9 | 3-B9 | R386 | 1:E9 | 3-K8 | R703 | 1:J3 | 7-C8 |
| R215 | 1:C4 | 2-H6 | R302 | 1:F9 | 3-B8 | R387 | 1:E9 | 3-L7 | =R705 | 1:K3 | 7-A7 |
| R216 | 1:C3 | 2-K7 | R303 | 1:F4 | 3-B1 | R388 | 1:E8 | 3-L8 | R705 | 1:J3 | 7-C5 |
| R217 | 1:A4 | 2-M8 | R304 | 1:F5 | 3-B0 | R389 | 1:E8 | 3-L8 | R706 | 1:H3 | 7-C5 |
| R218 | 1:A5 | 2-N7 | R305 | 1:F3 | 3-B2 | R392 | 1:F8 | 3-Q5 | R708 | 1:J3 | 7-B5 |
| R219 | 1:B4 | 2-N8 | R306 | 1:F8 | 3-C6 | R395 | 1:F8 | 3-Q4 | R710 | 1:H2 | 7-E7 |
| R220 | 1:B2 | 2-E9 | R307 | 1:F8 | 3-B8 | R410 | 1:G8 | 4-C2 | R711 | 1:J2 | 7-B6 |
| R221 | 1:B7 | 2-R7 | R308 | 1:F9 | 3-B7 | R411 | 1:G8 | 4-C3 | R712 | 1:J2 | 7-D8 |
| R223 | 1:B4 | 2-K6 | R309 | 1:F4 | 3-B0 | R412 | 1:G8 | 4-C2 | R713 | 1:J3 | 7-F8 |
| R224 | 1:C4 | 2-K5 | R310 | 1:F5 | 3-B4 | R413 | 1:H7 | 4-E5 | R714 | 1:J3 | 7-D9 |
| R225 | 1:B4 | 2-L5 | R311 | 1:F8 | 3-B6 | R414 | 1:J9 | 4-F4 | %R715 | 1:K4 | 7-H6 |
| R226 | 1:B4 | 2-L4 | R312 | 1:F8 | 3-B6 | R415 | 1:J7 | 4-F5 | R717 | 1:J4 | 7-H7 |
| R227 | 1:B4 | 2-M4 | R313 | 1:F8 | 3-C5 | R416 | 1:H8 | 4-F2 | R718 | 1:J4 | 7-H7 |
| R228 | 1:A2 | 2-E9 | R314 | 1:F4 | 3-C0 | R425 | 1:L7 | 4-H5 | R719 | 1:J4 | 7-J6 |
| R229 | 1:B4 | 2-M7 | R315 | 1:E7 | 3-E7 | R426 | 1:K7 | 4-H3 | R720 | 1:J3 | 7-K7 |
| R230 | 1:B4 | 2-M6 | R316 | 1:F4 | 3-C1 | R427 | 1:J7 | 4-H2 | R721 | 1:J3 | 7-K9 |
| R231 | 1:B4 | 2-M6 | R317 | 1:E8 | 3-E7 | R428 | 1:L7 | 4-H5 | R722 | 1:J3 | 7-K8 |
| R232 | 1:B4 | 2-M5 | R318 | 1:E8 | 3-E6 | R429 | 1:K7 | 4-H4 | R723 | 1:H3 | 7-M7 |
| R233 | 1:B4 | 2-M6 | R319 | 1:E8 | 3-E6 | R440 | 1:M9 | 4-L4 | R725 | 1:J4 | 7-N7 |
| R235 | 1:B4 | 2-P6 | %R320 | 1:F8 | 3-C5 | R441 | 1:M8 | 4-N4 | %R726 | 1:J3 | 7-N6 |
| R237 | 1:B7 | 2-Q7 | R321 | 1:F7 | 3-F5 | R442 | 1:M7 | 4-N3 | R727 | 1:H3 | 7-N9 |
| R238 | 1:B7 | 2-R7 | R322 | 1:F7 | 3-F4 | R443 | 1:N8 | 4-N4 | R728 | 1:H3 | 7-N8 |
| R239 | 1:B8 | 2-R6 | R323 | 1:F5 | 3-D4 | R444 | 1:N7 | 4-P3 | R734 | 1:K2 | 7-A2 |
| R241 | 1:B8 | 2-Q6 | R324 | 1:F5 | 3-C3 | R445 | 1:N7 | 4-P2 | R735 | 1:K2 | 7-A2 |
| R242 | 1:B7 | 2-Q5 | R325 | 1:E8 | 3-F6 | R480 | 1:J8 | 4-N6 | R736 | 1:K2 | 7-A2 |
| R244 | 1:C6 | 2-A5 | R326 | 1:F8 | 3-D8 | R504 | 1:K6 | 5-K9 | R742 | 1:H2 | 7-B4 |
| R245 | 1:D4 | 2-D4 | R327 | 1:F8 | 3-D7 | R505 | 1:K6 | 5-L8 | R743 | 1:H2 | 7-C5 |
| R247 | 1:D3 | 2-E4 | %R328 | 1:E8 | 3-D5 | R510 | 1:K6 | 5-L7 | R744 | 1:G2 | 7-D4 |
| R248 | 1:C3 | 2-E3 | R329 | 1:F5 | 3-D3 | R514 | 1:K5 | 5-M5 | R746 | 1:H3 | 7-E4 |
| R249 | 1:D4 | 2-F3 | R330 | 1:F5 | 3-D4 | R515 | 1:H6 | 5-J5 | R747 | 1:H3 | 7-E5 |
| R251 | 1:C4 | 2-G4 | R331 | 1:E7 | 3-H5 | R517 | 1:G5 | 5-E2 | R748 | 1:J2 | 7-A1 |
| R253 | 1:C6 | 2-J2 | R332 | 1:E7 | 3-H5 | R518 | 1:G5 | 5-F2 | R749 | 1:J2 | 7-B1 |
| R254 | 1:C7 | 2-K3 | R333 | 1:F5 | 3-E5 | R519 | 1:G5 | 5-F2 | R750 | 1:H4 | 7-Q7 |
| R255 | 1:C7 | 2-K2 | R334 | 1:E7 | 3-E3 | R520 | 1:H5 | 5-C1 | R752 | 1:G4 | 7-F5 |
| R256 | 1:D8 | 2-M3 | R335 | 1:F3 | 3-F2 | R522 | 1:H5 | 5-H3 | R753 | 1:G4 | 7-F3 |
| R257 | 1:D8 | 2-N5 | R336 | 1:E7 | 3-F4 | R525 | 1:H5 | 5-D1 | R754 | 1:G3 | 7-F3 |
| R258 | 1:D8 | 2-N4 | R337 | 1:E7 | 3-F2 | R530 | 1:J5 | 5-D0 | R756 | 1:G3 | 7-G5 |
| R259 | 1:D6 | 2-P4 | R338 | 1:E7 | 3-F3 | R533 | 1:K5 | 5-L2 | R757 | 1:G4 | 7-G4 |
| R260 | 1:D8 | 2-N4 | R339 | 1:E7 | 3-F3 | R535 | 1:J5 | 5-F1 | R758 | 1:H3 | 7-H4 |
| R262 | 1:D8 | 2-N3 | R340 | 1:E8 | 3-G6 | R540 | 1:J5 | 5-H3 | R759 | 1:H3 | 7-H4 |
| R263 | 1:C8 | 2-P3 | R341 | 1:E7 | 3-G3 | R545 | 1:J5 | 5-H0 | R760 | 1:H3 | 7-K4 |
| &R264 | 1:C8 | 2-P3 | R342 | 1:E8 | 3-G4 | %R550 | 1:J5 | 5-J2 | R762 | 1:H3 | 7-K4 |
| &R265 | 1:C8 | 2-P3 | R343 | 1:E7 | 3-J5 | %R553 | 1:J5 | 5-J2 | R763 | 1:H3 | 7-L4 |
| &R266 | 1:C8 | 2-P3 | R344 | 1:E8 | 3-G5 | R555 | 1:J5 | 5-K3 | R765 | 1:H3 | 7-H2 |
| R267 | 1:C8 | 2-R2 | R345 | 1:E4 | 3-H1 | R560 | 1:K5 | 5-K4 | R766 | 1:G3 | 7-J3 |
| R268 | 1:D2 | 2-C0 | R346 | 1:F4 | 3-G0 | R609 | 1:L6 | 6-B8 | R767 | 1:H3 | 7-K2 |
| R269 | 1:D3 | 2-C1 | R347 | 1:F4 | 3-H0 | R613 | 1:L6 | 6-C8 | R769 | 1:H3 | 7-K3 |
| R270 | 1:D3 | 2-D1 | R348 | 1:E8 | 3-H4 | R615 | 1:M5 | 6-F9 | R771 | 1:H4 | 7-L3 |
| R271 | 1:C3 | 2-E1 | R349 | 1:E7 | 3-J5 | R617 | 1:M5 | 6-J8 | R772 | 1:G4 | 7-M2 |
| R272 | 1:C4 | 2-F2 | R350 | 1:F4 | 3-H0 | R619 | 1:N6 | 6-K8 | R774 | 1:H4 | 7-M3 |
| R273 | 1:B5 | 2-G2 | R351 | 1:E4 | 3-H0 | R621 | 1:N6 | 6-K8 | R775 | 1:H3 | 7-L2 |
| R274 | 1:C4 | 2-G1 | R352 | 1:F4 | 3-H0 | R625 | 1:N6 | 6-K7 | R777 | 1:H4 | 7-R2 |
| R275 | 1:C4 | 2-H0 | R353 | 1:E4 | 3-H1 | R629 | 1:M6 | 6-P6 | R780 | 1:G2 | 7-N2 |
| R277 | 1:B5 | 2-J1 | R354 | 1:E8 | 3-H6 | R633 | 1:M5 | 6-P8 | R781 | 1:G2 | 7-N2 |
| R278 | 1:B5 | 2-J0 | R355 | 1:E4 | 3-H1 | R637 | 1:M5 | 6-J6 | R782 | 1:G3 | 7-P1 |
| R279 | 1:B5 | 2-K0 | R356 | 1:E8 | 3-J6 | R638 | 1:M5 | 6-J6 | R783 | 1:G3 | 7-P0 |
| R280 | 1:B5 | 2-K0 | R358 | 1:E4 | 3-J0 | R640 | 1:M5 | 6-Q6 | R784 | 1:G3 | 7-Q2 |
| R282 | 1:D7 | 2-K1 | R359 | 1:E7 | 3-K5 | R641 | 1:N5 | 6-K5 | R785 | 1:G3 | 7-Q1 |
| R283 | 1:D7 | 2-L1 | R360 | 1:E7 | 3-K5 | R645 | 1:N5 | 6-L5 | R786 | 1:G3 | 7-R1 |
| R284 | 1:D7 | 2-L0 | R361 | 1:E4 | 3-J0 | R649 | 1:M5 | 6-M5 | R787 | 1:G4 | 7-R0 |

| <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> |
|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|
| R801 | 1:M2 | 8-D7 | SK805 | 1:K3 | 8-Q9 | | | | | | |
| R802 | 1:M2 | 8-D7 | SK805 | 1:K3 | 8-Q6 | | | | | | |
| R808 | 1:L2 | 8-B4 | SK805 | 1:K3 | 8-Q9 | | | | | | |
| R809 | 1:L2 | 8-D5 | SK805 | 1:K3 | 8-Q7 | | | | | | |
| R810 | 1:L3 | 8-D6 | SK805 | 1:K3 | 8-Q8 | | | | | | |
| R811 | 1:L2 | 8-E6 | SK805 | 1:K3 | 8-Q6 | | | | | | |
| R812 | 1:L2 | 8-D5 | SK805 | 1:K3 | 8-Q5 | | | | | | |
| R813 | 1:L2 | 8-D4 | SK805 | 1:K3 | 8-Q7 | | | | | | |
| R815 | 1:L2 | 8-F4 | SK805 | 1:K3 | 8-Q8 | | | | | | |
| R816 | 1:L2 | 8-F4 | SK805 | 1:K3 | 8-Q7 | | | | | | |
| R818 | 1:M2 | 8-F5 | SK805 | 1:K3 | 8-Q8 | | | | | | |
| R819 | 1:M2 | 8-F5 | SK805 | 1:K3 | 8-Q6 | | | | | | |
| R821 | 1:M4 | 8-B3 | SK805 | 1:K3 | 8-Q8 | | | | | | |
| R822 | 1:M4 | 8-E3 | SK810 | 1:M3 | 8-H5 | | | | | | |
| R824 | 1:L4 | 8-L8 | | | | | | | | | |
| R825 | 1:L4 | 8-L8 | SL201 | 2:D1 | 2-B9 | | | | | | |
| R826 | 1:L4 | 8-L8 | SL202 | 2:D1 | 2-B8 | | | | | | |
| R827 | 1:L4 | 8-L7 | SL203 | 2:D2 | 2-B1 | | | | | | |
| R828 | 1:L4 | 8-L7 | SL204 | 2:D2 | 2-B1 | | | | | | |
| R829 | 1:L4 | 8-P9 | SL480 | 1:H9 | 4-P6 | | | | | | |
| R830 | 1:L3 | 8-P9 | SL501 | 2:J5 | 5-E0 | | | | | | |
| R831 | 1:L3 | 8-P9 | SL810 | 1:M2 | 8-C7 | | | | | | |
| R832 | 1:L3 | 8-P8 | | | | | | | | | |
| R833 | 1:L3 | 8-P8 | SW230 | 1:B8 | 2-A3 | | | | | | |
| R835 | 1:L3 | 8-P8 | | | | | | | | | |
| R836 | 1:L3 | 8-P8 | T210 | 1:B2 | 2-C8 | | | | | | |
| R837 | 1:L3 | 8-P7 | T610 | 1:L6 | 6-N2 | | | | | | |
| R840 | 1:L3 | 8-P7 | | | | | | | | | |
| R841 | 1:L3 | 8-P7 | TP206 | 1:C5 | 2-H7 | | | | | | |
| R842 | 1:L3 | 8-P6 | TP300 | 1:F5 | 3-A5 | | | | | | |
| R843 | 1:L3 | 8-P6 | TP301 | 1:F3 | 3-A2 | | | | | | |
| R845 | 1:M4 | 8-Q5 | TP303 | 1:F7 | 3-P3 | | | | | | |
| R847 | 1:L2 | 8-Q4 | TP310 | 1:F5 | 3-B3 | | | | | | |
| R848 | 1:L2 | 8-J4 | TP315 | 1:F3 | 3-D1 | | | | | | |
| R849 | 1:L2 | 8-Q4 | TP601 | 1:N5 | 6-K9 | | | | | | |
| R850 | 1:K2 | 8-Q4 | TP602 | 1:M6 | 6-Q9 | | | | | | |
| R853 | 1:M4 | 8-N3 | TP603 | 1:L5 | 6-J2 | | | | | | |
| R854 | 1:M4 | 8-N3 | TP604 | 1:L4 | 6-L6 | | | | | | |
| R855 | 1:M2 | 8-B0 | TP607 | 1:L5 | 6-J9 | | | | | | |
| R859 | 1:N2 | 8-C1 | TP710 | 1:G4 | 7-H5 | | | | | | |
| R861 | 1:N2 | 8-D1 | TP715 | 1:J2 | 7-C6 | | | | | | |
| R863 | 1:N3 | 8-E1 | | | | | | | | | |
| R865 | 1:N4 | 8-E0 | | | | | | | | | |
| R867 | 1:N3 | 8-E1 | | | | | | | | | |
| R871 | 1:N3 | 8-G2 | | | | | | | | | |
| R872 | 1:M4 | 8-H1 | | | | | | | | | |
| R873 | 1:N3 | 8-G1 | | | | | | | | | |
| R874 | 1:N3 | 8-H0 | | | | | | | | | |
| R875 | 1:N3 | 8-G0 | | | | | | | | | |
| R876 | 1:N3 | 8-H0 | | | | | | | | | |
| R877 | 1:M2 | 8-K2 | | | | | | | | | |
| R879 | 1:N2 | 8-L3 | | | | | | | | | |
| RV210 | 1:B7 | 2-F9 | | | | | | | | | |
| RV220 | 1:A4 | 2-M6 | | | | | | | | | |
| RV301 | 1:E8 | 3-E6 | | | | | | | | | |
| RV302 | 1:F7 | 3-G5 | | | | | | | | | |
| RV805 | 1:N4 | 8-F1 | | | | | | | | | |
| SK200 | 1:D5 | 2-F0 | | | | | | | | | |
| SK205 | 1:B5 | 2-A5 | | | | | | | | | |
| SK501 | 1:G6 | 5-D6 | | | | | | | | | |
| SK502 | 1:G6 | 5-D5 | | | | | | | | | |
| SK503 | 1:G6 | 5-D4 | | | | | | | | | |
| SK504 | 1:G5 | 5-D3 | | | | | | | | | |
| SK505 | 1:G5 | 5-D2 | | | | | | | | | |
| SK513 | 1:H5 | 5-G3 | | | | | | | | | |
| SK522 | 1:H6 | 5-K5 | | | | | | | | | |
| SK531 | 1:K6 | 5-N6 | | | | | | | | | |
| SK532 | 1:K5 | 5-N5 | | | | | | | | | |
| SK533 | 1:K5 | 5-N4 | | | | | | | | | |
| SK534 | 1:K5 | 5-N3 | | | | | | | | | |
| SK535 | 1:K5 | 5-N2 | | | | | | | | | |
| =SK710 | 1:K3 | 7-A7 | | | | | | | | | |
| SK805 | 1:K3 | 8-Q9 | | | | | | | | | |
| SK805 | 1:K3 | 8-Q7 | | | | | | | | | |
| SK805 | 1:K3 | 8-Q6 | | | | | | | | | |

6.3 T827 Exciter PCB

This section contains the following information.

| IPN | Section | Page |
|---------------------------------|---|--------|
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| | Mechanical & Miscellaneous Parts | 6.3.9 |
| | Grid Reference Index | 6.3.11 |
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| | PCB Layout - Bottom Side | 6.3.16 |
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| | Audio Processor Circuit Diagram | 6.3.18 |
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| | 13.8V Supply Filter Circuit Diagram (PA Cavity) | 6.3.20 |
| | VCO Section Circuit Diagram | 6.3.21 |
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| | Synthesiser Circuit Diagram | 6.3.23 |
| | Microcontroller Circuit Diagram | 6.3.24 |
| Harmonic Filter Circuit Diagram | 6.3.25 | |

T827 Parts List (IPN 220-01447-04)

How To Use This Parts List

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

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

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

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

Parts List Amendments

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

Parts List Amendments - Continued

This page is provided for entering future amendments to the parts list.

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|---|-----|-----|-------------|-------|-----|--------------|--------------------------------|
| Note: %D205 and %D210 are optional level limiting diodes for special applications. =R705 (47 ohm) and =SK710 are fitted in place of =IC700 when an external frequency reference is used. These two components are supplied with the auxiliary D-range kits (T800-06-0000 & T800-06-0001). | | | | C337 | | 015-22220-01 | CAP CER 0805 22P 5% NPO 50V |
| | | | | C338 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C339 | | 014-07470-01 | CAP 4U7 'B'CASE 25V +-10% 267 |
| | | | | C340 | | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V |
| | | | | C341 | | 015-04100-06 | CAP CER 1210 1NF NPO200V GRM42 |
| | | | | C342 | | 015-04100-06 | CAP CER 1210 1NF NPO200V GRM42 |
| | | | | C343 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C344 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C350 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C351 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C352 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C353 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM |
| | | | | C354 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C355 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C356 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C357 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C365 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C366 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C367 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| | | | | C368 | | 015-25220-08 | CAP CER 0805 22N 10% X7R 50V |
| | | | | C369 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C370 | | 015-06100-08 | CAP CER 1206 100N 10% X7R 50V |
| | | | | C380 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C381 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C382 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C383 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C384 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C385 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C386 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C390 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| | | | | C391 | | 014-08100-03 | CAP TANT SMD 10U 35V 20% |
| | | | | C392 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C393 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C394 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM |
| | | | | C395 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C396 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM |
| | | | | C397 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C400 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C401 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C402 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C403 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C503 | | 015-24220-08 | CAP CER 0805 2N2 10% X7R 50V |
| | | | | C505 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V |
| | | | | C510 | | 015-25220-08 | CAP CER 0805 22N 10% X7R 50V |
| | | | | C513 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 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 |
| | | | | C520 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C535 | | 015-06100-08 | CAP CER 1206 100N 10% X7R 50V |
| | | | | C536 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C537 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C542 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C545 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C546 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C550 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER |
| | | | | C600 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C601 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C605 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V |
| | | | | C610A | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| | | | | C610B | | 014-09100-00 | CAP TANT SMD 100U 16V 20% |
| | | | | C611A | | 014-09100-00 | CAP TANT SMD 100U 16V 20% |
| | | | | C611B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| | | | | C615 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C616 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C623 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V |
| | | | | C625 | | 020-09470-07 | CAPEL470M16V20%V 8*20 3.5L.ESR |
| | | | | C626 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V |
| | | | | C628 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C630 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C631A | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C634 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +-20% |
| | | | | C636 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C638 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V |
| | | | | C640 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C655 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C660 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C665 | | 014-08100-03 | CAP TANT SMD 10U 35V 20% |
| | | | | C670 | | 014-07330-10 | CAP TANT SMD 3U3 35V 10% |
| | | | | C673 | | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V |
| | | | | C677 | | 014-07100-02 | CAP TANT CHIP 1U0 3.2 X 1.6MM |
| | | | | C681 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C684 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +-20% |
| | | | | C687 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V |
| | | | | C690 | | 015-26100-08 | CAP CER 0805 100N 10% X7R 50V |
| | | | | C693 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +-20% |
| | | | | C700 | | 015-06100-08 | CAP CER 1206 100N 10% X7R 50V |
| | | | | C703 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V |
| | | | | C706 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V |
| | | | | C708 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM |
| | | | | C709 | | 015-06100-08 | CAP CER 1206 100N 10% X7R 50V |
| | | | | C710 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V |
| | | | | C711 | | 015-06100-08 | CAP CER 1206 100N 10% X7R 50V |
| | | | | C712 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V |
| | | | | C714 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM |
| | | | | C719 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM |
| | | | | C720 | | 015-06100-08 | CAP CER 1206 100N 10% X7R 50V |
| | | | | C722 | | 015-06100-08 | CAP CER 1206 100N 10% X7R 50V |

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-----------|-----|--------------|--------------------------------|-------|-----|--------------|---------------------------------|
| C724 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | IC720 | | 002-74910-04 | S) IC SMD 74HCU04 6X INV |
| C725 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | IC730 | | 002-10045-20 | S) IC SMD 74HC4520T 2XCTR 4BIT |
| C726 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | IC740 | | 002-14519-10 | S) IC MC145191F SMD SYNTH |
| C727 | | 015-23220-01 | CAP CER 0805 220P 5% NPO 50V | IC750 | | 002-10330-78 | S) IC MC33078D 2X AMP LO NOISE |
| C729 | | 015-23220-01 | CAP CER 0805 220P 5% NPO 50V | IC820 | | 002-12416-00 | S) IC SMD AT24C16N-10SC EEPROM |
| %C733 10 | | 015-23470-08 | CAP CER 0805 470P 10% X7R 50V | IC830 | | 002-10003-24 | S) IC SMD 324 4X O-AMP SO14 |
| %C733 15 | | 015-23470-08 | CAP CER 0805 470P 10% X7R 50V | | | | |
| C735 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | L320 | | 056-10820-02 | (L) IND SMD 820NH |
| C736 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | L321 | | 056-10820-02 | (L) IND SMD 820NH |
| C740A | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L322 | | 056-10820-02 | (L) IND SMD 820NH |
| C740B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L323 | | 052-08345-60 | COIL A/W 6T/4.5mm SMD 0.8mm |
| C741A | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | L324 | | 052-08340-50 | COIL A/W 5T/4.0MM SMD 0.8MM |
| C741B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L325 | | 052-08330-50 | COIL A/W 5T/3.0MM SMD 0.8MM |
| C742A | | 015-06100-08 | CAP CER 1206 100N 10% X7R 50V | L326 | | 056-10820-02 | (L) IND SMD 820NH |
| C742B | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L327 | | 065-10009-20 | BEAD FER SMD BDS 3/3.8.9-4S2 |
| C743 | | 015-22470-01 | CAP CER 0805 47P 5% NPO 50V | L328 | | 056-10102-12 | IND SMD 1u2 1812CS 5% |
| C745 | | 015-23120-01 | CAP CER 0805 120P 5% NPO 50V | L329 | | 052-08340-50 | COIL A/W 5T/4.0MM SMD 0.8MM |
| C750 | | 014-08100-03 | CAP TANT SMD 10U 35V 20% | L380 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C757 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L381 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C759 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L390 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C761 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L400 | | 065-10009-20 | BEAD FER SMD BDS 3/3.8.9-4S2 |
| C762 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | L510 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C764 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | L535 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C765 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | L600 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C767 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L615 | | 057-10120-03 | IND 805 EMI SUP 120E@100M 0.2A |
| C769 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | L780 | | 056-10330-02 | (L) IND SMD 330NH |
| C770 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | L900 | | 052-08135-85 | COIL A/W 8.5T/3.5MM HOR 0.8MM |
| C772 | | 014-08220-01 | (L)CAP TANT 22UF10V276MSER | L901 | | 052-08155-45 | COIL A/W 4.5T/5.5MM HOR 0.8MM |
| C776 | | 015-25220-08 | CAP CER 0805 22N 10% X7R 50V | L902 | | 052-08155-45 | COIL A/W 4.5T/5.5MM HOR 0.8MM |
| C778 | | 022-07100-05 | CAP METAL PPS 1U 20% 63V 5MM | L903 | | 052-08135-85 | COIL A/W 8.5T/3.5MM HOR 0.8MM |
| C780 | | 015-06100-08 | CAP CER 1206 100N 10% X7R 50V | L904 | | 052-08155-15 | COIL A/W 1.5T/5.5MM HOR 0.8MM |
| C781 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | PL100 | | 070-01001-00 | D-RANGE 15 WAY COMPL T800 |
| C782 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | PL205 | | 240-00020-67 | HEADER 6W 2X3 PCB MTG STD |
| C783 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | PL210 | | 240-00020-67 | HEADER 6W 2X3 PCB MTG STD |
| C784 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V | PL215 | | 240-00020-44 | HEADER 10W X2R PCB MTG 5*2 |
| C785 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | PL220 | | 240-00020-67 | HEADER 6W 2X3 PCB MTG STD |
| C786 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | Q210 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| C810 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | Q220 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 |
| C812 | | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V | Q230 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| C813 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | Q240 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| C822 | | 014-07470-00 | CAP TANT CHIP 4U7 3.5 X 2.8MM | Q250 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 |
| C823 | | 015-25220-08 | CAP CER 0805 22N 10% X7R 50V | Q260 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| C824 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | Q270 | | 000-10004-10 | S) XSTR SMD MJD41C NPN SW DPAK |
| C826 | | 015-23220-01 | CAP CER 0805 220P 5% NPO 50V | Q300 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| C827 | | 015-22330-01 | CAP CER 0805 33P 5% NPO 50V | Q301 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| C828 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | Q302 | | 000-00033-12 | XSTR BD242 TO-220 PNP ISOLDT |
| C830 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | Q320 | | 000-10095-10 | S) XSTR SMD BR951 NPN UHF |
| C838 | | 014-09100-00 | CAP TANT SMD 100U 16V 20% | Q321 | | 000-10938-20 | L)XSTR MRF9382T1 HI FRQ PWRFFET |
| C841 | | 014-09100-00 | CAP TANT SMD 100U 16V 20% | Q350 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| C844 | | 015-25100-08 | CAP CER 0805 10N 10% X7R 50V | Q351 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| C900 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 | Q365 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| C901 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 | Q366 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| C902 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 | Q367 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| C903 | | 015-02220-06 | CAP CER 1210 22P 5% 500V GRM42 | Q368 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| C904 | | 015-02270-06 | CAP CER 1210 27P NPO500VGRM42 | Q380 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| C905 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 | Q381 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| C906 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 | Q510 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| C907 | | 015-02330-06 | CAP CER 1210 33P 500V GRM42 | Q520 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| %D111A 10 | | 001-10015-50 | DIODE SMD ZENER 1.5SMC22AT3 | Q530 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| %D111A 15 | | 001-10015-50 | DIODE SMD ZENER 1.5SMC22AT3 | Q540 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| D220 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 | Q550 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D230 | | 001-10010-40 | DIODE SMD ZENER 33V BZG03-C33 | Q610 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| D240 | | 001-10000-56 | S) DIODE SMD BAW56 D-SW SOT23 | Q620 | | 000-00033-12 | XSTR BD242 TO-220 PNP ISOLDT |
| D250 | | 001-10000-56 | S) DIODE SMD BAW56 D-SW SOT23 | Q630 | | 000-10003-00 | S) XSTR BSR30 PNP AF SOT-89 |
| D260 | | 001-10000-56 | S) DIODE SMD BAW56 D-SW SOT23 | Q660 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 |
| D270 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 | Q670 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| D320 | | 001-10000-18 | S) DIODE SMD BAT18 S-SW SOT23 | Q710 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D321 | | 001-10000-18 | S) DIODE SMD BAT18 S-SW SOT23 | Q720 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| D322 | | 001-10000-18 | S) DIODE SMD BAT18 S-SW SOT23 | Q730 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D351 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 | Q740 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| D610 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 | Q750 | | 000-10008-07 | S) XSTR SMD BC807 PNP SOT23 AF |
| D620 | | 001-10000-70 | S) DIODE SMD BAV70 D-SW SOT23 | Q760 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D630 | | 001-10000-70 | S) DIODE SMD BAV70 D-SW SOT23 | Q770 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| D635 | | 001-10165-00 | DIODE BAT165 SCHOTTKY SOD-323 | Q775 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| D640 | | 001-10000-70 | S) DIODE SMD BAV70 D-SW SOT23 | Q780 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D645 | | 001-10010-40 | DIODE SMD ZENER 33V BZG03-C33 | Q785 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| D710 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 | Q790 | | 000-10003-12 | S) XSTR SMD BFR31 N JFET SOT23 |
| D720 | | 001-10000-99 | S) DIODE SMD BAV99 D-SW SOT23 | Q795 | | 000-10057-10 | S) XSTR SMD BR571 NPN SOT23 |
| D730 | | 001-10165-00 | DIODE BAT165 SCHOTTKY SOD-323 | Q810 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| D740 | | 001-10165-00 | DIODE BAT165 SCHOTTKY SOD-323 | Q820 | | 000-10008-17 | S) XSTR SMD BC817-25 NPN SOT23 |
| D810 | | 001-10165-00 | DIODE BAT165 SCHOTTKY SOD-323 | Q830 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| IC210 | | 002-10003-24 | S) IC SMD 324 4X O-AMP SO14 | Q840 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS |
| IC220 | | 002-10126-70 | S) IC SMD DS1267S10K 2XDIG POT | Q850 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| IC230 | | 002-10003-24 | S) IC SMD 324 4X O-AMP SO14 | Q860 | | 000-10008-48 | S) XSTR SMD BCW60 NPN SOT23 SS |
| IC240 | | 002-10040-53 | S)MC14053B SMD BREAK B4 MAKE | R160 | | 036-12100-00 | RES M/F 0805 10E 5% |
| IC250 | | 002-10020-50 | IC SMD 4N25A OPTOCOUPLER | R201 | | 036-13560-00 | RES M/F 0805 560E 5% |
| IC260 | | 002-10003-24 | S) IC SMD 324 4X O-AMP SO14 | R202 | | 036-14100-10 | RES M/F 0805 1K 1% |
| IC300 | | 002-10003-58 | S) IC SMD LM358 DUAL O-AMP | R204 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| IC310 | | 002-12951-00 | IC SMD LP2951CM ADJ VLTGE REG | R205 | | 036-13220-10 | RES 0805 220E 1% |
| IC610 | | 002-10078-05 | S) IC SMD 78L05 5V REG | R206 | | 036-14100-10 | RES M/F 0805 1K 1% |
| IC630 | | 002-12523-17 | (S)IC LM317L REG TO-252 0.5A | R207 | | 036-14390-10 | RES M/F 0805 3K9 1% |
| IC640 | | 002-10003-58 | S) IC SMD LM358 DUAL O-AMP | R208 | | 036-13560-00 | RES M/F 0805 560E 5% |
| IC650 | | 002-10012-32 | SMD DS1232LPS-2 LP RESET&W-D0G | R209 | | 036-15100-10 | RES M/F 0805 10K 1% |
| =IC700 10 | | 539-00010-41 | TCXO 12.8MHZ +2.5PPM -30 +70C | R210 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| =IC700 15 | | 539-00010-41 | TCXO 12.8MHZ +2.5PPM -30 +70C | RV210 | | 040-05100-23 | POT 10K LOG PCB 15MM SLOT SFT |
| IC710 | | 002-74900-04 | S) IC SMD 74HC04D 6X INV BUFFD | | | | |

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-------|-----|--------------|-------------------------------|-------|-----|--------------|--------------------------------|
| R211 | | 036-13470-00 | RES M/F 0805 470E 5% | R313 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R212 | | 036-16100-00 | RES M/F 0805 100K 5% | R319 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R213 | | 036-15100-10 | RES M/F 0805 10K 1% | R320 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R214 | | 036-14820-10 | RES M/F 0805 8K2 1% | R321 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| R215 | | 036-16100-00 | RES M/F 0805 100K 5% | R322 | | 036-12470-00 | RES M/F 0805 47E 5% |
| R216 | | 036-16100-00 | RES M/F 0805 100K 5% | R323 | | 036-13560-00 | RES M/F 0805 560E 5% |
| R217 | | 036-14100-10 | RES M/F 0805 1K 1% | R324 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R218 | | 036-16150-00 | RES M/F 0805 150K 5% | R325 | | 036-12270-00 | RES M/F 0805 27E 5% |
| R219 | | 036-14220-00 | RES M/F 0805 2K2 5% | R326 | | 036-13330-00 | RES M/F 0805 330E 5% |
| R220 | | 036-13470-00 | RES M/F 0805 470E 5% | R327 | | 036-14100-10 | RES M/F 0805 1K 1% |
| RV220 | | 042-05500-05 | RES PRESET SMD 50K CER 4MM SQ | R328 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R221 | | 036-14150-10 | RES M/F 0805 1K5 1% | R329 | | 036-03150-07 | LJRES 150E 0.5W 5% 2010 PWRCHP |
| R223 | | 036-17100-10 | RES M/F 0805 1M 1% | R330 | | 036-03150-07 | LJRES 150E 0.5W 5% 2010 PWRCHP |
| R224 | | 036-14680-10 | RES M/F 0805 6K8 1% | R331 | | 036-16150-00 | RES M/F 0805 150K 5% |
| R225 | | 036-17100-10 | RES M/F 0805 1M 1% | R332 | | 036-16150-00 | RES M/F 0805 150K 5% |
| R226 | | 036-15100-10 | RES M/F 0805 10K 1% | R333 | | 036-12270-00 | RES M/F 0805 27E 5% |
| R227 | | 036-14220-00 | RES M/F 0805 2K2 5% | R334 | | 036-12470-00 | RES M/F 0805 47E 5% |
| R228 | | 036-13120-00 | RES M/F 0805 120E 5% | R335 | | 036-03130-10 | RES 30E 1W SMD 2512 |
| R229 | | 036-16470-00 | RES M/F 0805 470K 5% | R336 | | 036-03130-10 | RES 30E 1W SMD 2512 |
| R230 | | 036-16100-00 | RES M/F 0805 100K 5% | R337 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| R231 | | 036-15100-10 | RES M/F 0805 10K 1% | R338 | | 036-03033-10 | RES 3E3 1W SMD 2512 |
| R232 | | 036-16330-00 | RES M/F 0805 330K 5% | R339 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| R233 | | 036-16100-00 | RES M/F 0805 100K 5% | R350 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| R235 | | 036-14470-10 | RES M/F 0805 4K7 1% | R351 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R237 | | 036-15470-10 | RES M/F 0805 47K 1% | R352 | | 036-15150-00 | RES M/F 0805 15K 5% |
| R238 | | 036-15470-10 | RES M/F 0805 47K 1% | R353 | | 036-15150-00 | RES M/F 0805 15K 5% |
| R239 | | 036-14150-10 | RES M/F 0805 1K5 1% | R354 | | 036-11330-00 | RES M/F 0805 3E3 5% |
| R241 | | 036-14470-10 | RES M/F 0805 4K7 1% | R355 | | 036-15180-00 | RES M/F 0805 18K 5% |
| R242 | | 036-14220-00 | RES M/F 0805 2K2 5% | R356 | | 036-14330-10 | RES M/F 0805 3K3 1% |
| R244 | | 036-15100-10 | RES M/F 0805 10K 1% | R357 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| R245 | | 036-16100-00 | RES M/F 0805 100K 5% | R358 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R247 | | 036-15100-10 | RES M/F 0805 10K 1% | R359 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R248 | | 036-16100-00 | RES M/F 0805 100K 5% | R365 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R249 | | 036-16100-00 | RES M/F 0805 100K 5% | R367 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R251 | | 036-16100-00 | RES M/F 0805 100K 5% | R368 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R253 | | 036-16100-00 | RES M/F 0805 100K 5% | R369 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R254 | | 036-16100-00 | RES M/F 0805 100K 5% | R371 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R255 | | 036-15100-10 | RES M/F 0805 10K 1% | R372 | | 036-15150-00 | RES M/F 0805 15K 5% |
| R256 | | 036-15470-10 | RES M/F 0805 47K 1% | R373 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R257 | | 036-16560-00 | RES M/F 0805 560K 5% | R374 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R258 | | 036-16150-00 | RES M/F 0805 150K 5% | R380 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R259 | | 036-15220-00 | RES M/F 0805 22K 5% | R381 | | 036-15150-00 | RES M/F 0805 15K 5% |
| R260 | | 036-15470-10 | RES M/F 0805 47K 1% | R382 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R262 | | 036-15470-10 | RES M/F 0805 47K 1% | R383 | | 036-15150-00 | RES M/F 0805 15K 5% |
| R263 | | 036-14470-10 | RES M/F 0805 4K7 1% | R384 | | 036-12680-00 | RES M/F 0805 68E 5% |
| &R264 | 10 | 036-15220-00 | RES M/F 0805 22K 5% | R385 | | 036-12680-00 | RES M/F 0805 68E 5% |
| &R264 | 15 | 036-15270-10 | RES M/F 0805 27K 1% | R390 | | 036-12220-00 | RES M/F 0805 22E 5% |
| &R265 | 10 | 036-15150-00 | RES M/F 0805 15K 5% | R391 | | 036-13100-10 | RES M/F 0805 100E 1% |
| &R265 | 15 | 036-15180-00 | RES M/F 0805 18K 5% | R392 | | 036-16100-00 | RES M/F 0805 100K 5% |
| &R266 | 10 | 036-15470-10 | RES M/F 0805 47K 1% | R393 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| &R266 | 15 | 036-15560-10 | RES M/F 0805 56K 1% | R394 | | 036-14680-10 | RES M/F 0805 6K8 1% |
| R267 | | 036-14220-00 | RES M/F 0805 2K2 5% | R395 | | 036-14270-00 | RES M/F 0805 2K7 5% |
| R268 | | 036-13100-10 | RES M/F 0805 100E 1% | R504 | | 036-13330-00 | RES M/F 0805 330E 5% |
| R269 | | 036-15100-10 | RES M/F 0805 10K 1% | R505 | | 036-15270-10 | RES M/F 0805 27K 1% |
| R270 | | 036-14120-00 | RES M/F 0805 1K2 5% | R510 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| R271 | | 036-17100-10 | RES M/F 0805 1M 1% | R514 | | 036-12180-00 | RES M/F 0805 18E 5% |
| R272 | | 036-13560-00 | RES M/F 0805 560E 5% | R515 | | 036-12560-00 | RES M/F 0805 56E 5% |
| R273 | | 036-15120-00 | RES M/F 0805 12K 5% | R517 | | 036-13330-00 | RES M/F 0805 330E 5% |
| R274 | | 036-15150-00 | RES M/F 0805 15K 5% | R518 | | 036-12180-00 | RES M/F 0805 18E 5% |
| R275 | | 036-14270-00 | RES M/F 0805 2K7 5% | R519 | | 036-13330-00 | RES M/F 0805 330E 5% |
| R277 | | 036-16100-00 | RES M/F 0805 100K 5% | R520 | | 036-16120-00 | RES M/F 0805 120K 5% |
| R278 | | 036-16120-00 | RES M/F 0805 120K 5% | R525 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R279 | | 036-17100-10 | RES M/F 0805 1M 1% | R530 | | 036-15220-00 | RES M/F 0805 22K 5% |
| R280 | | 036-15100-10 | RES M/F 0805 10K 1% | R535 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R282 | | 036-15560-10 | RES M/F 0805 56K 1% | R537 | | 036-12680-00 | RES M/F 0805 68E 5% |
| R283 | | 036-15560-10 | RES M/F 0805 56K 1% | R540 | | 036-14220-00 | RES M/F 0805 2K2 5% |
| R284 | | 036-17100-10 | RES M/F 0805 1M 1% | R545 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R285 | | 036-10000-00 | RES M/F 0805 ZERO OHM | %R550 | 10 | 036-14470-10 | RES M/F 0805 4K7 1% |
| R286 | | 036-14220-00 | RES M/F 0805 2K2 5% | %R550 | 15 | 036-14470-10 | RES M/F 0805 4K7 1% |
| R287 | | 036-15100-10 | RES M/F 0805 10K 1% | R555 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R288 | | 036-15120-00 | RES M/F 0805 12K 5% | R560 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R289 | | 036-16100-00 | RES M/F 0805 100K 5% | R565 | | 036-12680-00 | RES M/F 0805 68E 5% |
| &R290 | 10 | 036-13560-00 | RES M/F 0805 560E 5% | R609 | | 036-14100-10 | RES M/F 0805 1K 1% |
| &R290 | 15 | 036-13560-00 | RES M/F 0805 560E 5% | R613 | | 036-13560-00 | RES M/F 0805 560E 5% |
| R291 | | 036-10000-00 | RES M/F 0805 ZERO OHM | R615 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R292 | | 036-14470-10 | RES M/F 0805 4K7 1% | R617 | | 036-10000-00 | RES M/F 0805 ZERO OHM |
| R293 | | 036-15470-10 | RES M/F 0805 47K 1% | R619 | | 036-01100-10 | RES 1 OHM 1 WATT 2512 CHIP |
| R294 | | 036-14470-10 | RES M/F 0805 4K7 1% | R621 | | 036-01100-10 | RES 1 OHM 1 WATT 2512 CHIP |
| R295 | | 036-14270-00 | RES M/F 0805 2K7 5% | R625 | | 036-14100-10 | RES M/F 0805 1K 1% |
| R296 | | 036-14100-10 | RES M/F 0805 1K 1% | R629 | | 036-03270-10 | RES 270 OHM 1 WATT 2512 CHIP |
| R297 | | 036-14560-00 | RES M/F 0805 5K6 5% | R633 | | 036-14680-10 | RES M/F 0805 6K8 1% |
| %R298 | 10 | 036-16100-00 | RES M/F 0805 100K 5% | R637 | | 036-12220-00 | RES M/F 0805 22E 5% |
| %R298 | 15 | 036-16100-00 | RES M/F 0805 100K 5% | R638 | | 036-12220-00 | RES M/F 0805 22E 5% |
| R299 | | 036-14270-00 | RES M/F 0805 2K7 5% | R640 | | 036-12100-00 | RES M/F 0805 10E 5% |
| R300 | | 036-15220-00 | RES M/F 0805 22K 5% | R641 | | 036-14150-10 | RES M/F 0805 1K5 1% |
| RV300 | | 042-04220-05 | RES PRESET SMD 2K CER 4MM SQ | R645 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R301 | | 036-14270-00 | RES M/F 0805 2K7 5% | R649 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R302 | | 036-15100-10 | RES M/F 0805 10K 1% | R653 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R303 | | 036-16100-00 | RES M/F 0805 100K 5% | R655 | | 036-10000-00 | RES M/F 0805 ZERO OHM |
| R304 | | 036-15220-00 | RES M/F 0805 22K 5% | R656 | | 036-10000-00 | RES M/F 0805 ZERO OHM |
| R305 | | 036-14150-10 | RES M/F 0805 1K5 1% | R657 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R306 | | 036-13150-00 | RES M/F 0805 150E 5% | R661 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R307 | | 036-15100-10 | RES M/F 0805 10K 1% | R665 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R308 | | 036-14220-00 | RES M/F 0805 2K2 5% | R669 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R309 | | 036-14100-10 | RES M/F 0805 1K 1% | R673 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R310 | | 036-12220-00 | RES M/F 0805 22E 5% | R677 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R311 | | 036-13680-00 | RES M/F 0805 680E 5% | R681 | | 036-13100-10 | RES M/F 0805 100E 1% |
| R312 | | 036-13680-00 | RES M/F 0805 680E 5% | R685 | | 036-15150-00 | RES M/F 0805 15K 5% |

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-------|-----|--------------|-------------------------------|-------|-----|--------------|--------------------------------|
| R689 | | 036-12100-00 | RES M/F 0805 10E 5% | R845 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R693 | | 036-16100-00 | RES M/F 0805 100K 5% | R847 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R696 | | 036-15560-10 | RES MF 0805 56K 1% | R848 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R701 | | 036-12220-00 | RES M/F 0805 22E 5% | R849 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R702 | | 036-17100-10 | RES M/F 0805 1M 1% | R850 | | 036-13470-00 | RES M/F 0805 470E 5% |
| R703 | | 036-17100-10 | RES M/F 0805 1M 1% | R853 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R705 | | 036-15100-10 | RES M/F 0805 10K 1% | R854 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R706 | | 036-12100-00 | RES M/F 0805 10E 5% | R855 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R708 | | 036-17100-10 | RES M/F 0805 1M 1% | R859 | | 036-16150-00 | RES M/F 0805 150K 5% |
| R710 | | 036-13100-10 | RES M/F 0805 100E 1% | R861 | | 036-16150-00 | RES M/F 0805 150K 5% |
| R711 | | 036-13100-10 | RES M/F 0805 100E 1% | R863 | | 036-16150-00 | RES M/F 0805 150K 5% |
| R712 | | 036-12100-00 | RES M/F 0805 10E 5% | R865 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R713 | | 036-10000-00 | RES M/F 0805 ZERO OHM | R867 | | 036-16100-00 | RES M/F 0805 100K 5% |
| R714 | | 036-12100-00 | RES M/F 0805 10E 5% | R871 | | 036-15470-10 | RES M/F 0805 47K 1% |
| %R715 | 10 | 036-14100-10 | RES M/F 0805 1K 1% | R872 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| %R715 | 15 | 036-14100-10 | RES M/F 0805 1K 1% | R873 | | 036-15330-00 | RES M/F 0805 33K 5% |
| R717 | | 036-14270-00 | RES M/F 0805 2K7 5% | R874 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R718 | | 036-15150-00 | RES M/F 0805 15K 5% | R875 | | 036-15470-10 | RES M/F 0805 47K 1% |
| R719 | | 036-15150-00 | RES M/F 0805 15K 5% | R876 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R720 | | 036-15390-00 | RES M/F 0805 39K 5% | R877 | | 036-14470-10 | RES M/F 0805 4K7 1% |
| R721 | | 036-15100-10 | RES M/F 0805 10K 1% | R879 | | 036-15100-10 | RES M/F 0805 10K 1% |
| R722 | | 036-15100-10 | RES M/F 0805 10K 1% | | | | |
| R723 | | 036-14270-00 | RES M/F 0805 2K7 5% | SK200 | | 240-10000-05 | CONN SMD SKT 8W 2R M-MATCH |
| R725 | | 036-15390-00 | RES M/F 0805 39K 5% | SK205 | | 240-02020-05 | SKT STEREO PHONE JACK PCB MTG |
| %R726 | 10 | 036-13100-10 | RES M/F 0805 100E 1% | SK805 | | 240-10000-07 | CONN SMD SKT 16W 2R M-MATCH |
| %R726 | 15 | 036-13100-10 | RES M/F 0805 100E 1% | SK810 | | 240-04020-42 | SKT 44 PIN SMD PLCC |
| R727 | | 036-15100-10 | RES M/F 0805 10K 1% | | | | |
| R728 | | 036-15100-10 | RES M/F 0805 10K 1% | SW230 | | 232-00010-26 | SWITCH PUSH SPDT R-ANG PCB MTG |
| R734 | | 036-13470-00 | RES M/F 0805 470E 5% | | | | |
| R735 | | 036-13470-00 | RES M/F 0805 470E 5% | T210 | | 053-00010-17 | XFMR T4030 LINE MATCH POTCORE |
| R736 | | 036-13470-00 | RES M/F 0805 470E 5% | T610 | | 050-15119-52 | COIL SMD 680uH XFMR 5119-T052 |
| R742 | | 036-13150-00 | RES M/F 0805 150E 5% | | | | |
| R743 | | 036-13150-00 | RES M/F 0805 150E 5% | | | | |
| R744 | | 036-12220-00 | RES M/F 0805 22E 5% | | | | |
| R746 | | 036-12220-00 | RES M/F 0805 22E 5% | | | | |
| R747 | | 036-12220-00 | RES M/F 0805 22E 5% | | | | |
| R748 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R749 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R750 | | 036-12220-00 | RES M/F 0805 22E 5% | | | | |
| R752 | | 036-12220-00 | RES M/F 0805 22E 5% | | | | |
| R753 | | 036-17100-10 | RES M/F 0805 1M 1% | | | | |
| R754 | | 036-14100-10 | RES M/F 0805 1K 1% | | | | |
| R756 | | 036-15120-00 | RES M/F 0805 12K 5% | | | | |
| R757 | | 036-15120-00 | RES M/F 0805 12K 5% | | | | |
| R758 | | 036-14120-00 | RES M/F 0805 1K2 5% | | | | |
| R759 | | 036-13330-00 | RES M/F 0805 330E 5% | | | | |
| R760 | | 036-13180-00 | RES M/F 0805 180E 5% | | | | |
| R762 | | 036-13100-10 | RES M/F 0805 100E 1% | | | | |
| R763 | | 036-13100-10 | RES M/F 0805 100E 1% | | | | |
| R765 | | 036-13680-00 | RES M/F 0805 680E 5% | | | | |
| R766 | | 036-14100-10 | RES M/F 0805 1K 1% | | | | |
| R767 | | 036-13680-00 | RES M/F 0805 680E 5% | | | | |
| R769 | | 036-13180-00 | RES M/F 0805 180E 5% | | | | |
| R771 | | 036-14820-10 | RES M/F 0805 8K2 1% | | | | |
| R772 | | 036-15220-00 | RES M/F 0805 22K 5% | | | | |
| R774 | | 036-14820-10 | RES M/F 0805 8K2 1% | | | | |
| R775 | | 036-14270-00 | RES M/F 0805 2K7 5% | | | | |
| R777 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R780 | | 036-12100-00 | RES M/F 0805 10E 5% | | | | |
| R781 | | 036-12100-00 | RES M/F 0805 10E 5% | | | | |
| R782 | | 036-12680-00 | RES M/F 0805 68E 5% | | | | |
| R783 | | 036-13220-10 | RES 0805 220E 1% | | | | |
| R784 | | 036-14330-10 | RES M/F 0805 3K3 1% | | | | |
| R785 | | 036-13100-10 | RES M/F 0805 100E 1% | | | | |
| R786 | | 036-14100-10 | RES M/F 0805 1K 1% | | | | |
| R787 | | 036-12560-00 | RES M/F 0805 56E 5% | | | | |
| R801 | | 036-16150-00 | RES M/F 0805 150K 5% | | | | |
| R802 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| RV805 | | 042-05200-05 | RES PRESET SMD 20K CER 4MM SQ | | | | |
| R808 | | 036-12100-00 | RES M/F 0805 10E 5% | | | | |
| R809 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R810 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R811 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R812 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R813 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R815 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R816 | | 036-16150-00 | RES M/F 0805 150K 5% | | | | |
| R818 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R819 | | 036-14470-10 | RES M/F 0805 4K7 1% | | | | |
| R821 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R822 | | 036-15470-10 | RES M/F 0805 47K 1% | | | | |
| R824 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R825 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R826 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R827 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R828 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R829 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R830 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R831 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R832 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R833 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R835 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R836 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R837 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R840 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R841 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R842 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |
| R843 | | 036-14220-00 | RES M/F 0805 2K2 5% | | | | |

T827 Mechanical & Miscellaneous Parts (220-01447-04)

| IPN | Legend | Description | IPN | Legend | Description |
|--------------|---------------|--------------------------------|------------|---------------|--------------------|
| 002-08951-20 | | S) IC AT89C51 PLCC44 MIC 12MHZ | | | |
| 008-00014-79 | | S)LED 3MM RED WITH WIRE | | | |
| 008-00014-80 | | S)LED 3MM GREEN WITH WIRE | | | |
| 220-01447-04 | | PCB T827 EX SII | | | |
| 240-02100-06 | | SKT COAX N TYPE PNL MTG OP-TER | | | |
| 240-04020-62 | | SKT 2 W RECEP SHORTING LINK | | | |
| 240-04021-77 | | SKT JACK 1.3 PCB MT 64W | | | |
| 240-10000-05 | | CONN SMD SKT 8W 2R M-MATCH | | | |
| 303-11169-04 | | CHASSIS PAINTED T800 SER II | | | |
| 303-23118-00 | | COVER A3M2247 D RANGE T855/7 | | | |
| 303-50074-00 | | CLIP A3M2246 SPRING CLAMP T857 | | | |
| 308-01007-01 | | HANDLE BS SII 2 WASHERS INC | | | |
| 312-01052-02 | | LID TOP T800 SER II PTND | | | |
| 312-01053-02 | | LID BOTTOM T800 SER II PNTD | | | |
| 316-06619-00 | | PNL FRT EX, NO EX OUT SER II | | | |
| 349-00020-36 | | SCREW TT M3X8m PANTORX BLK | | | |
| 349-00020-36 | | SCREW TT M3X8m PANTORX BLK | | | |
| 349-00020-43 | | SCRW T/T M4X12MM P/POZ BZ | | | |
| 349-00020-45 | | SCRW T/T M4X20MM P/POZ BZ | | | |
| 349-00020-55 | | SCRW M3*8 P/P T/T BLCKZNC CHRM | | | |
| 352-00010-08 | | NUT M3 COLD FORM HEX ST BZ | | | |
| 352-00010-29 | | NUT M4 NYLOC HEX | | | |
| 353-00010-13 | | WSHR M3 S/PROOF INT BZ | | | |
| 353-00010-24 | | WSHR M4x8mm Flat | | | |
| 362-00010-33 | | GROMMET LED MTG 3MM | | | |
| 365-00100-20 | | LABEL WHITE S/A 28X11MM | | | |

T827 Grid Reference Index (IPN 220-01447-04)**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 |
|--------|------|---------|--------|------|---------|--------|------|---------|--------|------|---------|
| C201 | 1:C1 | 2-B8 | C305 | 1:F8 | 3-D8 | C402 | 1:H8 | 4-E4 | C720 | 1:J3 | 7-F8 |
| C202 | 1:C1 | 2-C8 | C306 | 1:F8 | 3-E8 | C403 | 1:H7 | 4-F4 | C722 | 1:J4 | 7-G8 |
| C204 | 1:B3 | 2-E8 | C307 | 1:F8 | 3-E8 | C503 | 1:K6 | 5-L9 | C724 | 1:J4 | 7-H6 |
| C205 | 1:A3 | 2-E8 | C320 | 1:F5 | 3-C4 | C505 | 1:K5 | 5-M6 | C725 | 1:J4 | 7-J6 |
| C207 | 1:C7 | 2-B6 | C321 | 1:F4 | 3-C5 | C510 | 1:H5 | 5-C0 | C726 | 1:K4 | 7-J6 |
| C209 | 1:C6 | 2-D6 | C322 | 1:F5 | 3-D4 | C513 | 1:H5 | 5-G2 | C727 | 1:J3 | 7-J8 |
| C210 | 1:C7 | 2-K0 | C323 | 1:F4 | 3-E5 | C515 | 1:H5 | 5-G2 | C729 | 1:H3 | 7-M8 |
| C211 | 1:B7 | 2-F8 | C324 | 1:F4 | 3-F4 | C516 | 1:J5 | 5-H1 | %C733 | 1:H2 | 7-E3 |
| C213 | 1:B6 | 2-G8 | C325 | 1:F4 | 3-G4 | C517 | 1:J5 | 5-F1 | C735 | 1:J2 | 7-A1 |
| C215 | 1:B6 | 2-G8 | C326 | 1:E4 | 3-H6 | C520 | 1:J5 | 5-H0 | C736 | 1:J2 | 7-B1 |
| C217 | 1:C6 | 2-H8 | C327 | 1:F4 | 3-H6 | C535 | 1:K5 | 5-M2 | C740A | 1:H2 | 7-B4 |
| C219 | 1:B6 | 2-H7 | C328 | 1:F3 | 3-H5 | C536 | 1:K5 | 5-L2 | C740B | 1:H2 | 7-B3 |
| C221 | 1:D5 | 2-G6 | C329 | 1:F4 | 3-J4 | C537 | 1:J5 | 5-L2 | C741A | 1:H2 | 7-C4 |
| C223 | 1:C5 | 2-J6 | C330 | 1:F4 | 3-J4 | C542 | 1:J5 | 5-J1 | C741B | 1:G2 | 7-C3 |
| C225 | 1:C3 | 2-K7 | C331 | 1:E5 | 3-J4 | C545 | 1:J5 | 5-K1 | C742A | 1:H2 | 7-D4 |
| C227 | 1:B4 | 2-K7 | C332 | 1:F5 | 3-K4 | C546 | 1:K5 | 5-K0 | C742B | 1:H3 | 7-D3 |
| C229 | 1:B3 | 2-L7 | C333 | 1:F5 | 3-L4 | C550 | 1:K5 | 5-L0 | C743 | 1:H2 | 7-B1 |
| C230 | 1:B4 | 2-J0 | C334 | 1:F5 | 3-M4 | C600 | 1:L6 | 6-D8 | C745 | 1:G3 | 7-D1 |
| C232 | 1:A4 | 2-M7 | C335 | 1:F6 | 3-M4 | C601 | 1:L6 | 6-D8 | C750 | 1:H4 | 7-Q7 |
| C233 | 1:B5 | 2-N7 | C336 | 1:E6 | 3-N5 | C605 | 1:L6 | 6-C8 | C757 | 1:G4 | 7-F5 |
| C235 | 1:B5 | 2-K5 | C337 | 1:F6 | 3-N4 | C610A | 1:M5 | 6-F8 | C759 | 1:G4 | 7-G4 |
| C237 | 1:C4 | 2-K5 | C338 | 1:E6 | 3-P6 | C610B | 1:L5 | 6-F8 | C761 | 1:G3 | 7-J4 |
| C239 | 1:C4 | 2-L4 | C339 | 1:F7 | 3-P5 | C611A | 1:M6 | 6-H8 | C762 | 1:G3 | 7-J4 |
| C241 | 1:B4 | 2-M6 | C340 | 1:F7 | 3-P4 | C611B | 1:M5 | 6-H8 | C764 | 1:H3 | 7-H2 |
| C242 | 1:B4 | 2-L6 | C341 | 1:F7 | 3-P5 | C615 | 1:M6 | 6-R8 | C765 | 1:G3 | 7-J2 |
| C243 | 1:B4 | 2-P6 | C342 | 1:F7 | 3-Q5 | C616 | 1:M6 | 6-R8 | C767 | 1:H3 | 7-K3 |
| C245 | 1:C5 | 2-A4 | C343 | 1:E7 | 3-M7 | C623 | 1:N6 | 6-M8 | C769 | 1:J3 | 7-M4 |
| C247 | 1:C6 | 2-B4 | C344 | 1:E7 | 3-M6 | C625 | 1:M6 | 6-Q8 | C770 | 1:H4 | 7-N4 |
| C249 | 1:D4 | 2-C4 | C350 | 1:F4 | 3-E3 | C626 | 1:M6 | 6-Q8 | C772 | 1:G4 | 7-M2 |
| C251 | 1:C3 | 2-E4 | C351 | 1:E5 | 3-F3 | C628 | 1:M6 | 6-Q8 | C776 | 1:H3 | 7-L1 |
| C253 | 1:D3 | 2-E3 | C352 | 1:E6 | 3-J3 | C630 | 1:M5 | 6-J5 | C778 | 1:H4 | 7-M1 |
| C255 | 1:D3 | 2-D2 | C353 | 1:E6 | 3-K2 | C631A | 1:N5 | 6-L6 | C780 | 1:G2 | 7-N1 |
| C257 | 1:D3 | 2-F2 | C354 | 1:E5 | 3-K3 | C634 | 1:N5 | 6-L5 | C781 | 1:G2 | 7-P1 |
| C259 | 1:C6 | 2-J2 | C355 | 1:E6 | 3-K2 | C636 | 1:M5 | 6-M5 | C782 | 1:G2 | 7-P1 |
| C260 | 1:D8 | 2-H0 | C356 | 1:E6 | 3-L2 | C638 | 1:M5 | 6-N6 | C783 | 1:G3 | 7-P0 |
| C261 | 1:C6 | 2-K2 | C357 | 1:F6 | 3-M2 | C640 | 1:M5 | 6-Q6 | C784 | 1:G4 | 7-Q0 |
| C263 | 1:D6 | 2-L3 | C365 | 1:E5 | 3-B1 | C655 | 1:M4 | 6-C1 | C785 | 1:G3 | 7-Q1 |
| C265 | 1:D6 | 2-N4 | C366 | 1:E4 | 3-C1 | C660 | 1:L5 | 6-K1 | C786 | 1:G4 | 7-Q0 |
| C267 | 1:C8 | 2-P3 | C367 | 1:E3 | 3-C0 | C665 | 1:L5 | 6-K1 | C810 | 1:L3 | 8-K8 |
| &C269 | 1:C8 | 2-P3 | C368 | 1:E4 | 3-D1 | C670 | 1:L5 | 6-L1 | C812 | 1:L2 | 8-F5 |
| &C271 | 1:C8 | 2-Q3 | C369 | 1:E4 | 3-D1 | C673 | 1:L5 | 6-P2 | C813 | 1:K2 | 8-J5 |
| C273 | 1:C8 | 2-Q4 | C370 | 1:E4 | 3-E2 | C677 | 1:L6 | 6-P1 | C822 | 1:M2 | 8-B2 |
| C275 | 1:C3 | 2-E1 | C380 | 1:E3 | 3-P2 | C681 | 1:L6 | 6-R3 | C823 | 1:M3 | 8-C2 |
| C277 | 1:C4 | 2-G1 | C381 | 1:E3 | 3-P1 | C684 | 1:L6 | 6-R3 | C824 | 1:M2 | 8-C1 |
| C279 | 1:B4 | 2-G1 | C382 | 1:F5 | 3-Q2 | C687 | 1:L6 | 6-Q1 | C826 | 1:N3 | 8-C0 |
| C281 | 1:B5 | 2-J1 | C383 | 1:F3 | 3-Q1 | C690 | 1:L6 | 6-R1 | C827 | 1:N3 | 8-D0 |
| C283 | 1:B5 | 2-K0 | C384 | 1:F5 | 3-Q2 | C693 | 1:L6 | 6-R1 | C828 | 1:N3 | 8-E0 |
| C285 | 1:D7 | 2-L0 | C385 | 1:F3 | 3-Q1 | C700 | 1:K4 | 7-A8 | C830 | 1:N3 | 8-R1 |
| C287 | 1:C6 | 2-M1 | C386 | 1:F7 | 3-R1 | C703 | 1:J3 | 7-B7 | C838 | 1:N4 | 8-F0 |
| &C289 | 1:C8 | 2-N1 | C390 | 1:F8 | 3-J8 | C706 | 1:J2 | 7-B5 | C841 | 1:N2 | 8-L2 |
| C291 | 1:D7 | 2-P1 | C391 | 1:F8 | 3-J8 | #C707 | 1:K4 | 7-C8 | C844 | 1:M2 | 8-L2 |
| C293 | 1:D7 | 2-Q1 | C392 | 1:E9 | 3-K8 | C708 | 1:J2 | 7-C9 | C900 | 1:N8 | 9-D4 |
| %C294 | 1:D7 | 2-Q0 | C393 | 1:E8 | 3-K8 | C709 | 1:K4 | 7-D9 | C901 | 1:P8 | 9-E4 |
| %C295 | 1:C6 | 2-Q0 | C394 | 1:E8 | 3-L8 | C710 | 1:J3 | 7-D8 | C902 | 1:P7 | 9-E4 |
| C300 | 1:E8 | 3-A8 | C395 | 1:E9 | 3-N8 | C711 | 1:J3 | 7-C5 | C903 | 1:P7 | 9-F4 |
| C301 | 1:E7 | 3-B8 | C396 | 1:E8 | 3-P8 | C712 | 1:H2 | 7-E7 | C904 | 1:P7 | 9-F4 |
| C302 | 1:E8 | 3-B8 | C397 | 1:E8 | 3-P8 | %C713 | 1:H2 | 7-E6 | C905 | 1:P7 | 9-G4 |
| C303 | 1:E8 | 3-C8 | C400 | 1:H8 | 4-D4 | C714 | 1:J3 | 7-E8 | C906 | 1:P6 | 9-H4 |
| C304 | 1:F8 | 3-D7 | C401 | 1:H8 | 4-D4 | C719 | 1:J3 | 7-F8 | C907 | 1:P6 | 9-H4 |

| Device | PCB | Circuit | Device | PCB | Circuit | Device | PCB | Circuit | Device | PCB | Circuit |
|--------|------|---------|--------|------|---------|--------|------|---------|--------|------|---------|
| %D111 | 1:P5 | 1-R1 | IC720 | 1:J3 | 7-P6 | P259 | 1:B8 | 2-R3 | R201 | 1:B3 | 2-E9 |
| %D111A | 1:P5 | 1-Q1 | IC720 | 1:J3 | 7-G0 | P261 | 1:B8 | 2-R3 | R202 | 1:C1 | 2-F9 |
| %D205 | 1:B2 | 2-D9 | IC720 | 1:J3 | 7-N7 | P263 | 1:B1 | 2-R2 | %R203 | 1:B3 | 2-C8 |
| %D210 | 1:B2 | 2-D9 | IC720 | 1:J3 | 7-M7 | P267 | 1:C8 | 2-N2 | R204 | 1:C7 | 2-B6 |
| D220 | 1:B4 | 2-P7 | IC720 | 1:J3 | 7-K7 | P269 | 1:D8 | 2-P2 | R205 | 1:C7 | 2-D6 |
| D220 | 1:B4 | 2-P6 | IC720 | 1:J3 | 7-E8 | P271 | 1:C9 | 2-N1 | R206 | 1:B7 | 2-G8 |
| D230 | 1:B7 | 2-R5 | IC720 | 1:J3 | 7-G0 | P273 | 1:D9 | 2-P0 | R207 | 1:B6 | 2-G8 |
| D240 | 1:D4 | 2-C4 | IC730 | 1:J4 | 7-H8 | P275 | 1:D7 | 2-Q0 | R208 | 1:B6 | 2-G8 |
| D240 | 1:D4 | 2-B2 | IC730 | 1:J4 | 7-G7 | P290 | 1:D5 | 2-E0 | R209 | 1:C6 | 2-H8 |
| D250 | 1:D3 | 2-E2 | IC740 | 1:H2 | 7-D1 | P291 | 1:D5 | 2-G0 | R210 | 1:B6 | 2-H7 |
| D250 | 1:D3 | 2-D3 | IC750 | 1:H4 | 7-M3 | P805 | 1:M2 | 8-A7 | R211 | 1:B2 | 2-D9 |
| D260 | 1:C3 | 2-C2 | IC750 | 1:H4 | 7-H5 | P810 | 1:L3 | 8-A5 | R212 | 1:D4 | 2-F6 |
| D260 | 1:C3 | 2-C2 | IC750 | 1:H4 | 7-Q7 | P820 | 1:L4 | 8-M8 | R213 | 1:C4 | 2-G6 |
| D270 | 1:C2 | 2-C1 | IC820 | 1:L4 | 8-N2 | P825 | 1:L4 | 8-M8 | R214 | 1:D4 | 2-G6 |
| D270 | 1:C2 | 2-C1 | IC830 | 1:N3 | 8-J0 | P830 | 1:L4 | 8-M8 | R215 | 1:C4 | 2-H6 |
| D320 | 1:F5 | 3-D4 | IC830 | 1:N3 | 8-Q1 | P835 | 1:L4 | 8-M7 | R216 | 1:C3 | 2-K7 |
| D321 | 1:F5 | 3-D4 | IC830 | 1:N3 | 8-J0 | P840 | 1:L4 | 8-M7 | R217 | 1:A4 | 2-M8 |
| D322 | 1:F5 | 3-D4 | IC830 | 1:N3 | 8-J1 | | | | R218 | 1:A5 | 2-N7 |
| D351 | 1:E6 | 3-L1 | IC830 | 1:N3 | 8-C0 | PL100 | 1:P3 | 1-M0 | R219 | 1:B4 | 2-N8 |
| D351 | 1:E6 | 3-L2 | | | | PL205 | 1:C5 | 2-J8 | R220 | 1:B2 | 2-E9 |
| D610 | 1:N6 | 6-L6 | L320 | 1:F5 | 3-D4 | PL210 | 1:C3 | 2-H4 | R221 | 1:B7 | 2-R7 |
| D610 | 1:N6 | 6-K6 | L321 | 1:F4 | 3-E4 | PL215 | 1:C4 | 2-K3 | R223 | 1:B4 | 2-K6 |
| D620 | 1:N4 | 6-B2 | L322 | 1:E4 | 3-H7 | PL220 | 1:C4 | 2-H2 | R224 | 1:C4 | 2-K5 |
| D620 | 1:N4 | 6-B1 | L323 | 1:F3 | 3-H5 | | | | R225 | 1:B4 | 2-L5 |
| D630 | 1:M5 | 6-G3 | L324 | 1:F4 | 3-J4 | Q210 | 1:C6 | 2-J8 | R226 | 1:B4 | 2-L4 |
| D630 | 1:M5 | 6-G2 | L325 | 1:F5 | 3-K4 | Q220 | 1:B3 | 2-L7 | R227 | 1:B4 | 2-M4 |
| D635 | 1:M4 | 6-G3 | L326 | 1:F5 | 3-L4 | Q230 | 1:A4 | 2-M8 | R228 | 1:A2 | 2-E9 |
| D640 | 1:L5 | 6-M1 | L327 | 1:E7 | 3-N7 | Q240 | 1:B7 | 2-Q7 | R229 | 1:B4 | 2-M7 |
| D640 | 1:L5 | 6-M2 | L328 | 1:E6 | 3-N5 | Q250 | 1:B7 | 2-R6 | R230 | 1:B4 | 2-M6 |
| D645 | 1:M5 | 6-R6 | L329 | 1:F6 | 3-P5 | Q260 | 1:C4 | 2-F3 | R231 | 1:B4 | 2-M6 |
| D710 | 1:J3 | 7-L8 | L380 | 1:F5 | 3-Q2 | Q270 | 1:D2 | 2-D1 | R232 | 1:B4 | 2-M5 |
| D710 | 1:J3 | 7-L8 | L381 | 1:F3 | 3-Q1 | Q300 | 1:E8 | 3-B7 | R233 | 1:B4 | 2-M6 |
| D720 | 1:H3 | 7-P8 | %L382 | 1:F7 | 3-R1 | Q301 | 1:F8 | 3-E8 | R235 | 1:B4 | 2-P6 |
| D720 | 1:H3 | 7-P8 | L390 | 1:E9 | 3-K9 | Q302 | 1:F8 | 3-F8 | R237 | 1:B7 | 2-Q7 |
| D730 | 1:H3 | 7-H1 | L400 | 1:H8 | 4-E5 | Q320 | 1:F4 | 3-H4 | R238 | 1:B7 | 2-R7 |
| D740 | 1:H3 | 7-J2 | L510 | 1:H5 | 5-H2 | Q321 | 1:F6 | 3-N4 | R239 | 1:B8 | 2-R6 |
| D810 | 1:M2 | 8-B7 | L535 | 1:K5 | 5-L2 | Q350 | 1:E5 | 3-K3 | R241 | 1:B8 | 2-Q6 |
| | | | L600 | 1:L6 | 6-D8 | Q351 | 1:E5 | 3-L3 | R242 | 1:B7 | 2-Q5 |
| IC210 | 1:C7 | 2-C6 | L615 | 1:M6 | 6-R8 | Q365 | 1:E5 | 3-B1 | R244 | 1:C6 | 2-A5 |
| IC210 | 1:C7 | 2-J0 | L780 | 1:G3 | 7-Q0 | Q366 | 1:E5 | 3-C1 | R245 | 1:D4 | 2-D4 |
| IC210 | 1:C7 | 2-L1 | L900 | 1:P8 | 9-D6 | Q367 | 1:E4 | 3-C0 | R247 | 1:D3 | 2-E4 |
| IC210 | 1:C7 | 2-K2 | L901 | 1:P7 | 9-E6 | Q368 | 1:E4 | 3-D1 | R248 | 1:C3 | 2-E3 |
| IC210 | 1:C7 | 2-Q0 | L902 | 1:P7 | 9-F6 | Q380 | 1:E3 | 3-P3 | R249 | 1:D4 | 2-F3 |
| IC220 | 1:C6 | 2-D5 | L903 | 1:P6 | 9-H6 | Q381 | 1:E3 | 3-P2 | R251 | 1:C4 | 2-G4 |
| IC220 | 1:C6 | 2-P0 | L904 | 1:P7 | 9-F5 | Q510 | 1:J5 | 5-D1 | R253 | 1:C6 | 2-J2 |
| IC220 | 1:C6 | 2-M3 | | | | Q520 | 1:J5 | 5-H2 | R254 | 1:C7 | 2-K3 |
| IC230 | 1:B4 | 2-J0 | LINK1 | 2:B2 | 2-E9 | Q530 | 1:J5 | 5-H0 | R255 | 1:C7 | 2-K2 |
| IC230 | 1:B4 | 2-J0 | LINK2 | 2:A2 | 2-E8 | Q540 | 1:J5 | 5-L2 | R256 | 1:D8 | 2-M3 |
| IC230 | 1:B4 | 2-L5 | | | | Q550 | 1:K5 | 5-L0 | R257 | 1:D8 | 2-N5 |
| IC230 | 1:B4 | 2-N6 | P100 | 1:Q6 | 1-R8 | Q610 | 1:L6 | 6-D8 | R258 | 1:D8 | 2-N4 |
| IC230 | 1:B4 | 2-G1 | P150 | 1:P2 | 1-Q4 | Q620 | 1:N6 | 6-P8 | R259 | 1:D6 | 2-P4 |
| IC240 | 1:D4 | 2-F3 | P160 | 1:P2 | 1-Q4 | Q630 | 1:M6 | 6-P5 | R260 | 1:D8 | 2-N4 |
| IC250 | 1:D3 | 2-E1 | P170 | 1:P2 | 1-Q3 | Q660 | 1:L5 | 6-N1 | R262 | 1:D8 | 2-N3 |
| IC260 | 1:D8 | 2-N0 | P204 | 1:D1 | 2-A8 | Q670 | 1:L6 | 6-Q2 | R263 | 1:C8 | 2-P3 |
| IC260 | 1:D8 | 2-H0 | P208 | 1:D1 | 2-A8 | Q710 | 1:J3 | 7-K8 | &R264 | 1:C8 | 2-P3 |
| IC260 | 1:D8 | 2-Q2 | P210 | 1:D3 | 2-A3 | Q720 | 1:J3 | 7-K8 | &R265 | 1:C8 | 2-P3 |
| IC260 | 1:D8 | 2-Q3 | P215 | 1:D4 | 2-A2 | Q730 | 1:H3 | 7-N8 | &R266 | 1:C8 | 2-P3 |
| IC260 | 1:D8 | 2-N3 | P217 | 1:D4 | 2-A2 | Q740 | 1:H3 | 7-N8 | R267 | 1:C8 | 2-R2 |
| IC300 | 1:E8 | 3-H8 | P219 | 1:D2 | 2-A1 | Q750 | 1:G4 | 7-F3 | R268 | 1:D2 | 2-C0 |
| IC300 | 1:E8 | 3-E0 | P225 | 1:D2 | 2-A0 | Q760 | 1:H3 | 7-H3 | R269 | 1:D3 | 2-C1 |
| IC300 | 1:E8 | 3-C8 | P230 | 1:C5 | 2-B0 | Q770 | 1:H3 | 7-H1 | R270 | 1:D3 | 2-D1 |
| IC310 | 1:E8 | 3-L8 | P231 | 1:D8 | 2-B0 | Q775 | 1:H3 | 7-K3 | R271 | 1:C3 | 2-E1 |
| IC610 | 1:L5 | 6-G8 | P233 | 1:C1 | 2-R9 | Q780 | 1:H3 | 7-K3 | R272 | 1:C4 | 2-F2 |
| IC630 | 1:N5 | 6-K5 | P235 | 1:C1 | 2-R9 | Q785 | 1:H3 | 7-K2 | R273 | 1:B5 | 2-G2 |
| IC640 | 1:M5 | 6-M5 | P237 | 1:B7 | 2-R8 | Q790 | 1:H3 | 7-L3 | R274 | 1:C4 | 2-G1 |
| IC640 | 1:M5 | 6-Q6 | P239 | 1:C7 | 2-R8 | Q795 | 1:G3 | 7-P0 | R275 | 1:C4 | 2-H0 |
| IC640 | 1:M5 | 6-F1 | P240 | 1:C7 | 2-R8 | Q810 | 1:M2 | 8-E7 | R277 | 1:B5 | 2-J1 |
| IC650 | 1:L5 | 6-F4 | P243 | 1:B7 | 2-R7 | Q820 | 1:L2 | 8-D5 | R278 | 1:B5 | 2-J0 |
| =IC700 | 1:K3 | 7-A8 | P244 | 1:B7 | 2-R7 | Q830 | 1:L2 | 8-D5 | R279 | 1:B5 | 2-K0 |
| IC710 | 1:J2 | 7-D8 | P245 | 1:B8 | 2-R6 | Q840 | 1:L2 | 8-F5 | R280 | 1:B5 | 2-K0 |
| IC710 | 1:J2 | 7-C6 | P247 | 1:B8 | 2-R6 | Q850 | 1:M2 | 8-G5 | R282 | 1:D7 | 2-K1 |
| IC710 | 1:J2 | 7-C5 | P248 | 1:B7 | 2-R6 | Q860 | 1:L4 | 8-B3 | R283 | 1:D7 | 2-L1 |
| IC710 | 1:J2 | 7-D6 | P249 | 1:C7 | 2-R5 | | | | R284 | 1:D7 | 2-L0 |
| IC710 | 1:J2 | 7-D7 | P251 | 1:C7 | 2-R5 | %R150 | 1:P2 | 1-R4 | R285 | 1:C8 | 2-M0 |
| IC710 | 1:J2 | 7-D6 | P255 | 1:D4 | 2-R4 | R160 | 1:P2 | 1-R3 | R286 | 1:C7 | 2-M0 |
| IC710 | 1:J2 | 7-C6 | P257 | 1:C2 | 2-R4 | %R200 | 1:B2 | 2-C9 | R287 | 1:D9 | 2-M0 |

| <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> |
|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|
| R288 | 1:C6 | 2-M2 | R394 | 1:E9 | 3-N8 | R735 | 1:K2 | 7-A2 | R859 | 1:N2 | 8-C1 |
| R289 | 1:D9 | 2-M0 | R395 | 1:E9 | 3-N8 | R736 | 1:K2 | 7-A2 | R861 | 1:N2 | 8-D1 |
| &R290 | 1:C8 | 2-N2 | R504 | 1:K6 | 5-K9 | R742 | 1:H2 | 7-B4 | R863 | 1:N3 | 8-E1 |
| R291 | 1:C8 | 2-N1 | R505 | 1:K6 | 5-L8 | R743 | 1:H2 | 7-C5 | R865 | 1:N4 | 8-E0 |
| R292 | 1:D8 | 2-Q2 | R510 | 1:K6 | 5-L7 | R744 | 1:G2 | 7-D4 | R867 | 1:N3 | 8-E1 |
| R293 | 1:D9 | 2-Q2 | R514 | 1:K5 | 5-M5 | R746 | 1:H3 | 7-E4 | R871 | 1:N3 | 8-G2 |
| R294 | 1:D9 | 2-Q1 | R515 | 1:H6 | 5-J5 | R747 | 1:H3 | 7-E5 | R872 | 1:M4 | 8-H1 |
| R295 | 1:D8 | 2-R1 | R517 | 1:G5 | 5-E2 | R748 | 1:J2 | 7-A1 | R873 | 1:N3 | 8-G1 |
| R296 | 1:D6 | 2-P0 | R518 | 1:G5 | 5-F2 | R749 | 1:J2 | 7-B1 | R874 | 1:N3 | 8-H0 |
| R297 | 1:D7 | 2-P1 | R519 | 1:G5 | 5-F2 | R750 | 1:H4 | 7-Q7 | R875 | 1:N3 | 8-G0 |
| %R298 | 1:D7 | 2-Q0 | R520 | 1:H5 | 5-C1 | R752 | 1:G4 | 7-F5 | R876 | 1:N3 | 8-H0 |
| R299 | 1:C7 | 2-R0 | R525 | 1:H5 | 5-D1 | R753 | 1:G4 | 7-F3 | R877 | 1:M2 | 8-K2 |
| R300 | 1:E8 | 3-A7 | R530 | 1:J5 | 5-D0 | R754 | 1:G3 | 7-F3 | R879 | 1:N2 | 8-L3 |
| R301 | 1:E8 | 3-A7 | R535 | 1:J5 | 5-E1 | R756 | 1:G3 | 7-G5 | | | |
| R302 | 1:E8 | 3-A8 | R537 | 1:H5 | 5-G2 | R757 | 1:G4 | 7-G4 | RV210 | 1:B7 | 2-F9 |
| R303 | 1:E8 | 3-B8 | R540 | 1:J5 | 5-H2 | R758 | 1:H3 | 7-H4 | RV220 | 1:A4 | 2-M6 |
| R304 | 1:F8 | 3-B8 | R545 | 1:J5 | 5-J1 | R759 | 1:H3 | 7-H4 | RV300 | 1:E8 | 3-C6 |
| R305 | 1:E8 | 3-C7 | %R550 | 1:J5 | 5-J2 | R760 | 1:H3 | 7-K4 | RV805 | 1:N4 | 8-F1 |
| R306 | 1:E8 | 3-C6 | %R553 | 1:J5 | 5-J1 | R762 | 1:H3 | 7-K4 | | | |
| R307 | 1:F8 | 3-D7 | R555 | 1:J5 | 5-K1 | R763 | 1:H3 | 7-L4 | SK200 | 1:D5 | 2-F0 |
| R308 | 1:F8 | 3-D8 | R560 | 1:K5 | 5-M0 | R765 | 1:H3 | 7-H2 | SK205 | 1:B5 | 2-A5 |
| R309 | 1:F8 | 3-E8 | R565 | 1:K5 | 5-L2 | R766 | 1:G3 | 7-J3 | SK501 | 1:G6 | 5-D6 |
| R310 | 1:F8 | 3-E8 | R609 | 1:L6 | 6-B8 | R767 | 1:H3 | 7-K2 | SK502 | 1:G6 | 5-D5 |
| R311 | 1:F8 | 3-F8 | R613 | 1:L6 | 6-C8 | R769 | 1:H3 | 7-K3 | SK503 | 1:G6 | 5-D4 |
| R312 | 1:F8 | 3-F7 | R615 | 1:M5 | 6-F9 | R771 | 1:H4 | 7-L3 | SK504 | 1:G5 | 5-D3 |
| R313 | 1:F8 | 3-F8 | R617 | 1:M5 | 6-J8 | R772 | 1:G4 | 7-M2 | SK505 | 1:G5 | 5-D2 |
| R319 | 1:E4 | 3-H6 | R619 | 1:N6 | 6-K8 | R774 | 1:H4 | 7-M3 | SK513 | 1:H5 | 5-H3 |
| R320 | 1:F4 | 3-C5 | R621 | 1:N6 | 6-K8 | R775 | 1:H3 | 7-L2 | SK522 | 1:H6 | 5-K5 |
| R321 | 1:F5 | 3-C4 | R625 | 1:N6 | 6-K7 | R777 | 1:H4 | 7-R2 | SK531 | 1:K6 | 5-N6 |
| R322 | 1:F5 | 3-D5 | R629 | 1:M6 | 6-P6 | R780 | 1:G2 | 7-N2 | SK532 | 1:K5 | 5-N5 |
| R323 | 1:F4 | 3-D5 | R633 | 1:M5 | 6-P8 | R781 | 1:G2 | 7-N2 | SK533 | 1:K5 | 5-N4 |
| R324 | 1:F4 | 3-F4 | R637 | 1:M5 | 6-J6 | R782 | 1:G3 | 7-P1 | SK534 | 1:K5 | 5-N3 |
| R325 | 1:F4 | 3-G4 | R638 | 1:M5 | 6-J6 | R783 | 1:G3 | 7-P0 | SK535 | 1:K5 | 5-N2 |
| R326 | 1:F4 | 3-G4 | R640 | 1:M5 | 6-Q6 | R784 | 1:G3 | 7-Q2 | =SK710 | 1:K3 | 7-A7 |
| R327 | 1:F3 | 3-G5 | R641 | 1:N5 | 6-K5 | R785 | 1:G3 | 7-Q1 | SK805 | 1:K3 | 8-Q9 |
| R328 | 1:F4 | 3-G4 | R645 | 1:N5 | 6-L5 | R786 | 1:G3 | 7-R1 | SK805 | 1:K3 | 8-Q7 |
| R329 | 1:E3 | 3-G6 | R649 | 1:M5 | 6-M5 | R787 | 1:G4 | 7-R0 | SK805 | 1:K3 | 8-Q6 |
| R330 | 1:F3 | 3-H6 | R653 | 1:M5 | 6-P5 | R801 | 1:M2 | 8-D7 | SK805 | 1:K3 | 8-Q9 |
| R331 | 1:F4 | 3-H4 | R655 | 1:L4 | 6-D4 | R802 | 1:M2 | 8-D7 | SK805 | 1:K3 | 8-Q6 |
| R332 | 1:F4 | 3-H4 | R656 | 1:L4 | 6-D4 | R808 | 1:L2 | 8-B4 | SK805 | 1:K3 | 8-Q9 |
| R333 | 1:F5 | 3-L4 | R657 | 1:M5 | 6-D1 | R809 | 1:L2 | 8-D5 | SK805 | 1:K3 | 8-Q7 |
| R334 | 1:F6 | 3-M4 | R661 | 1:M5 | 6-E3 | R810 | 1:L3 | 8-D6 | SK805 | 1:K3 | 8-Q8 |
| R335 | 1:E7 | 3-N6 | R665 | 1:M5 | 6-E2 | R811 | 1:L2 | 8-E6 | SK805 | 1:K3 | 8-Q6 |
| R336 | 1:E7 | 3-N6 | R669 | 1:M5 | 6-E2 | R812 | 1:L2 | 8-D5 | SK805 | 1:K3 | 8-Q8 |
| R337 | 1:F7 | 3-P4 | R673 | 1:M5 | 6-E0 | R813 | 1:L2 | 8-D4 | SK805 | 1:K3 | 8-Q5 |
| R338 | 1:F7 | 3-Q5 | R677 | 1:M4 | 6-F4 | R815 | 1:L2 | 8-F4 | SK805 | 1:K3 | 8-Q7 |
| R339 | 1:F7 | 3-Q4 | R681 | 1:L5 | 6-L2 | R816 | 1:L2 | 8-F4 | SK805 | 1:K3 | 8-Q8 |
| R350 | 1:F4 | 3-F3 | R685 | 1:L5 | 6-N2 | R818 | 1:M2 | 8-F5 | SK805 | 1:K3 | 8-Q7 |
| R351 | 1:E5 | 3-J3 | R689 | 1:L6 | 6-Q3 | R819 | 1:M2 | 8-F5 | SK805 | 1:K3 | 8-Q8 |
| R352 | 1:E5 | 3-K3 | R693 | 1:L5 | 6-Q1 | R821 | 1:M4 | 8-B3 | SK805 | 1:K3 | 8-Q6 |
| R353 | 1:E5 | 3-K3 | R696 | 1:L5 | 6-Q1 | R822 | 1:M4 | 8-E3 | SK810 | 1:M3 | 8-H5 |
| R354 | 1:E5 | 3-L2 | R701 | 1:K4 | 7-A9 | R824 | 1:L4 | 8-L8 | | | |
| R355 | 1:E6 | 3-L2 | R702 | 1:K4 | 7-C9 | R825 | 1:L4 | 8-L8 | SL201 | 2:D1 | 2-B9 |
| R356 | 1:E6 | 3-L2 | R703 | 1:J3 | 7-C8 | R826 | 1:L4 | 8-L8 | SL202 | 2:D1 | 2-B8 |
| R357 | 1:E6 | 3-M2 | =R705 | 1:K3 | 7-A7 | R827 | 1:L4 | 8-L7 | SL203 | 2:D2 | 2-B1 |
| R358 | 1:F6 | 3-M2 | R705 | 1:J3 | 7-C5 | R828 | 1:L4 | 8-L7 | SL204 | 2:D2 | 2-B1 |
| R359 | 1:E6 | 3-L2 | R706 | 1:H3 | 7-C5 | R829 | 1:L4 | 8-P9 | SL360 | 1:E3 | 3-C0 |
| R365 | 1:E5 | 3-B1 | R708 | 1:J3 | 7-B5 | R830 | 1:L3 | 8-P9 | SL501 | 2:J5 | 5-F0 |
| %R366 | 1:E4 | 3-C0 | R710 | 1:H2 | 7-E7 | R831 | 1:L3 | 8-P9 | SL810 | 1:M2 | 8-C7 |
| R367 | 1:E3 | 3-C0 | R711 | 1:J2 | 7-B6 | R832 | 1:L3 | 8-P8 | | | |
| R368 | 1:E4 | 3-C1 | R712 | 1:J2 | 7-D8 | R833 | 1:L3 | 8-P8 | SW230 | 1:B8 | 2-A3 |
| R369 | 1:E3 | 3-C0 | R713 | 1:J3 | 7-F8 | R835 | 1:L3 | 8-P8 | | | |
| R371 | 1:E4 | 3-D1 | R714 | 1:J3 | 7-D9 | R836 | 1:L3 | 8-P8 | T210 | 1:B2 | 2-C8 |
| R372 | 1:E4 | 3-D1 | %R715 | 1:K4 | 7-H6 | R837 | 1:L3 | 8-P7 | T610 | 1:L6 | 6-N2 |
| R373 | 1:E4 | 3-D2 | R717 | 1:J4 | 7-H7 | R840 | 1:L3 | 8-P7 | | | |
| R374 | 1:E4 | 3-E1 | R718 | 1:J4 | 7-H7 | R841 | 1:L3 | 8-P7 | TP206 | 1:C5 | 2-H7 |
| R380 | 1:E3 | 3-P1 | R719 | 1:J4 | 7-J6 | R842 | 1:L3 | 8-P6 | TP310 | 1:F8 | 3-G8 |
| R381 | 1:E3 | 3-P3 | R720 | 1:J3 | 7-K7 | R843 | 1:L3 | 8-P6 | TP320 | 1:E4 | 3-C5 |
| R382 | 1:E3 | 3-Q2 | R721 | 1:J3 | 7-K9 | R845 | 1:M4 | 8-Q5 | TP340 | 1:E5 | 3-E3 |
| R383 | 1:F3 | 3-Q2 | R722 | 1:J3 | 7-K8 | R847 | 1:L2 | 8-Q4 | TP380 | 1:E3 | 3-P1 |
| R384 | 1:F5 | 3-Q3 | R723 | 1:H3 | 7-M7 | R848 | 1:L2 | 8-J4 | TP381 | 1:E3 | 3-P3 |
| R385 | 1:F3 | 3-Q2 | R725 | 1:J4 | 7-N7 | R849 | 1:L2 | 8-Q4 | TP382 | 1:F3 | 3-Q2 |
| R390 | 1:E8 | 3-H9 | %R726 | 1:J3 | 7-N6 | R850 | 1:K2 | 8-Q4 | TP601 | 1:N5 | 6-K9 |
| R391 | 1:E9 | 3-K9 | R727 | 1:H3 | 7-N9 | R853 | 1:M4 | 8-N3 | TP602 | 1:M6 | 6-Q9 |
| R392 | 1:E8 | 3-M8 | R728 | 1:H3 | 7-N8 | R854 | 1:M4 | 8-N3 | TP603 | 1:L5 | 6-J2 |
| R393 | 1:E9 | 3-N7 | R734 | 1:K2 | 7-A2 | R855 | 1:M2 | 8-B0 | TP604 | 1:L4 | 6-L6 |

| <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> |
|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|
| TP607 | 1:L5 | 6-J9 | | | | | | | | | |
| TP710 | 1:G4 | 7-H5 | | | | | | | | | |
| TP715 | 1:J2 | 7-C6 | | | | | | | | | |

Part D T828 Power Amplifier



Caution: There are no user serviceable components in these power amplifiers. Refer all servicing to your nearest Tait Dealer or Customer Service Organisation.

This part of the manual is divided into five 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 | Initial Adjustment |
| 4 | Fault Finding |
| 5 | PCB Information |

1 T828 General Information

This section provides a brief description of the T828 power amplifier, along with detailed specifications and a list of types available.

The following topics are covered in this section.

| Section | Title | Page |
|------------|---|------------|
| 1.1 | Introduction | 1.3 |
| 1.2 | Specifications | 1.4 |
| 1.2.1 | Introduction | 1.4 |
| 1.2.2 | General | 1.4 |
| 1.2.3 | Test Standards | 1.5 |
| 1.2.3.1 | European Telecommunication Standard | 1.5 |
| 1.2.3.2 | DTI CEPT Recommendation T/R-24-01 | 1.6 |
| 1.2.3.3 | Telecommunications Industry Association | 1.6 |
| 1.3 | Product Codes | 1.7 |
| 1.4 | Standard Product Range | 1.8 |

1.1 Introduction

The T828 is an FM base station power amplifier designed for single or multichannel operation within the frequency range 66 to 88MHz. The output power capability is 10 to 60W.

The PA comprises a broad band, two stage drive amplifier whose output is split to drive two separate output stages. The outputs from these final stages are then recombined and filtered before being fed to the output socket. This type of balanced output stage offers two advantages over single ended types:

- improved intermodulation performance in the presence of high signal levels from adjacent transmitters;
- enhanced reliability: if one of the two output stages fails, the transmitter can still produce one quarter of its rated power.

VSWR and thermal protection are incorporated into the basic design, while monitoring and alarm signals are available for both forward and reverse power. The output power is adjustable from the front panel.

The circuitry is built on a single PCB which is mounted directly on a die-cast chassis/ heatsink. Extensive use is made of surface mount technology.

The T828 has a width of 60mm and occupies a single space in a Tait rack frame, which has the ability to accommodate up to seven standard modules.

1.2 Specifications

1.2.1 Introduction

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

Where applicable, the test methods used to obtain the following performance figures are those described in the ETS specification. Refer to Section 1.2.3 for details of test standards.

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

Power Output:

| | |
|---------------------|------------------------|
| Rated Power | .. 50W |
| Maximum Power | .. 60W |
| Range Of Adjustment | .. 10 to 60W (typical) |

Note: Actual power used will depend on regulatory requirements.

Input Power .. 1W ±300mW

Duty Cycle Rating .. 50W continuous to +60°C without fan¹
 (@ 13.8V supply) .. 60W continuous to +40°C without fan¹

Intermodulation .. -70dBc or -40dBi² with 25dB isolation
 (PA with output isolator) & interfering signal of -30dBc

Mismatch Capability:

| | |
|------------|---|
| Ruggedness | .. refer to your nearest Tait Dealer or Customer Service Organisation |
| Stability | .. 5:1 VSWR (all phase angles) |

Supply Voltage:

| | |
|-----------------------|------------------------|
| Operating Voltage | .. 10.8 to 16V DC |
| Standard Test Voltage | .. 13.8V DC |
| Polarity | .. negative earth only |
| Polarity Protection | .. crowbar diode |

-
1. The use of a fan is to be preferred at high temperatures. Adequate ventilation must always be provided through base station equipment cabinets.
 2. dBi denotes the level of intermodulation product relative to the interfering signal.

Maximum Supply Current (@ 50W):

| | | |
|----------|----|------|
| Standby | .. | 50mA |
| Transmit | .. | 11A |

Spurious Emissions:

| | | | |
|-----------|------------|----|----------------|
| Conducted | - Transmit | .. | -36dBm to 1GHz |
| | | | -30dBm to 4GHz |
| | - Standby | .. | -57dBm to 1GHz |
| | | | -47dBm to 4GHz |
| Radiated | - Transmit | .. | -36dBm to 1GHz |
| | | | -30dBm to 4GHz |
| | - Standby | .. | -57dBm to 1GHz |
| | | | -47dBm to 4GHz |

| | | |
|-----------------------------|----|----------------|
| Operating Temperature Range | .. | -30°C to +60°C |
|-----------------------------|----|----------------|

Dimensions:

| | | |
|--------|----|-------|
| Height | .. | 183mm |
| Width | .. | 60mm |
| Length | .. | 340mm |

| | | |
|--------|----|-------|
| Weight | .. | 3.1kg |
|--------|----|-------|

1.2.3 Test Standards

Where applicable, this equipment is tested in accordance with the following standards.

1.2.3.1 European Telecommunication Standard

ETS 300 086 January 1991

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment with an internal or external RF connector intended primarily for analogue speech.

ETS 300 113 March 1996

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment intended for the transmission of data (and speech) and having an antenna connector.

ETS 300 219 October 1993

Radio equipment and systems; land mobile service; technical characteristics and test conditions for radio equipment transmitting signals to initiate a specific response in the receiver.

ETS 300 279 February 1996

Radio equipment and systems; electromagnetic compatibility (EMC) standard for private land mobile radio (PMR) and ancillary equipment (speech and/or non-speech).

1.2.3.2 DTI CEPT Recommendation T/R-24-01

Annex I: 1988

Technical characteristics and test conditions for radio equipment in the land mobile service intended primarily for analogue speech.

Annex II: 1988

Technical characteristics of radio equipment in the land mobile service with regard to quality and stability of transmission.

1.2.3.3 Telecommunications Industry Association

ANSI/TIA/EIA-603-1992

Land mobile FM or PM communications equipment measurement and performance standards.

1.3 Product Codes

The three groups of digits in the T820 Series II product code provide information about the model, type and options fitted, according to the conventions described below.

The following explanation of T820 Series II product codes is not intended to suggest that any combination of features is necessarily available in any one product. Consult your nearest Tait Dealer or Customer Service Organisation for more information regarding the availability of specific models, types and options.

Model

The Model group indicates the basic function of the product, as follows:

| | |
|----------------------|--------------------------|
| <u>T82X</u> -XX-XXXX | T825 receiver |
| | T826 25W transmitter |
| | T827 exciter |
| | T828 50W power amplifier |

Type

The Type group uses two digits to indicate the basic RF configuration of the product.

The first digit in the Type group designates the frequency range:

| | |
|-----------------------|------------------|
| T82X- <u>1</u> X-XXXX | '1' for 66-88MHz |
|-----------------------|------------------|

The second digit in the Type group indicates the channel spacing:

| | |
|-----------------------|------------------------------------|
| T82X- <u>0</u> X-XXXX | '0' for wide bandwidth (25kHz) |
| | '5' for narrow bandwidth (12.5kHz) |

Options

| | |
|----------------------|---|
| T82X-XX- <u>XXXX</u> | The Options group uses four digits and/or letters to indicate any options that may be fitted to the product. This includes standard options and special options for specific customers. '0000' indicates a standard Tait product with no options fitted. The large number of options precludes listing them here. |
|----------------------|---|

1.4 Standard Product Range

The following table lists the range of standard T828 types (i.e. no options fitted and no cyclic keying) available at the time this manual was published. Consult your nearest Tait Dealer or Customer Service Organisation for more information.

| | |
|-----------------------|---------|
| Frequency Range (MHz) | 66-88 |
| PA Type: T828- | 10-0500 |

You can identify the PA type by checking the product code printed on a label on the rear of the heatsink (Figure 1.1 in Part A shows typical labels).

2 T828 Circuit Operation

This section provides a basic description of the circuit operation of the T828 power amplifier.

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

The following topics are covered in this section.

| Section | Title | Page |
|---------|------------------------------------|------|
| 2.1 | Introduction | 2.3 |
| 2.2 | RF Circuitry | 2.4 |
| 2.3 | Control Circuitry | 2.5 |
| 2.3.1 | Power Control | 2.5 |
| 2.3.2 | Thermal Protection | 2.6 |
| 2.3.3 | Forward And Reverse Power Alarms | 2.6 |
| 2.3.4 | Forward And Reverse Power Metering | 2.6 |

| Figure | Title | Page |
|--------|--------------------------------------|------|
| 2.1 | T828 High Level Block Diagram | 2.3 |
| 2.2 | T828 RF Circuitry Block Diagram | 2.4 |
| 2.3 | T828 Control Circuitry Block Diagram | 2.5 |

2.1 Introduction

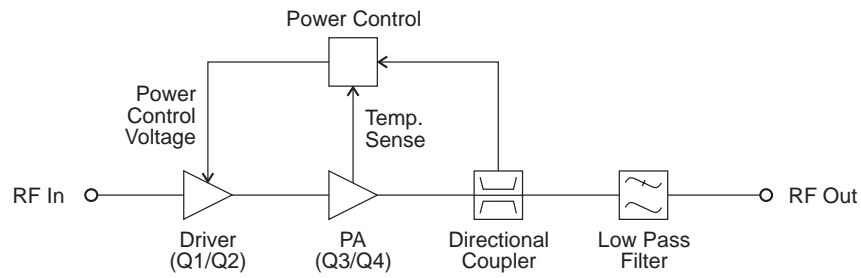


Figure 2.1 T828 High Level Block Diagram

The T828 comprises a four-stage RF power amplifier, the final two stages of which are combined, and extensive control circuitry.

The configuration of each of the main circuit blocks may be seen on a functional level in Figure 2.1.

2.2 RF Circuitry

(Refer to the RF section circuit diagram in Section 5.)

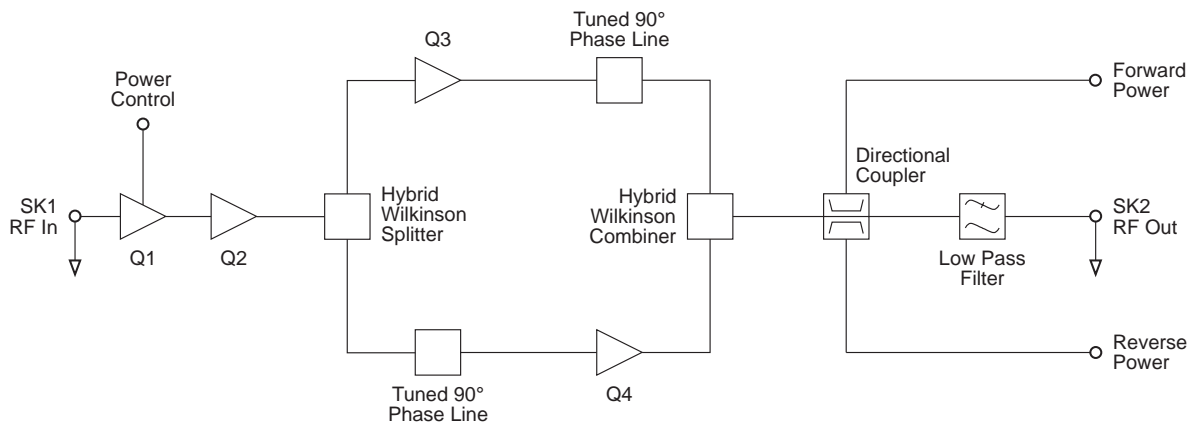


Figure 2.2 T828 RF Circuitry Block Diagram

The driver stage of the T828 consists of a two-stage transistor amplifier (Q1, Q2) which delivers 20W. This signal is split via a hybrid Wilkinson splitter (L220, L221) and used to drive the two final amplifiers (Q3, Q4). The outputs from the finals are combined with a hybrid Wilkinson combiner (L250, L251) and passed to the antenna socket via a directional coupler and a low pass filter.

The directional coupler senses forward and reflected power, which is rectified (D201, D200) and passed to the control circuitry for metering, alarm and power control purposes.

Power control is via a series pass transistor (Q16), which controls the supply voltage on the collector of the driver transistor (Q1).

2.3 Control Circuitry

(Refer to the control section circuit diagram in Section 5.)

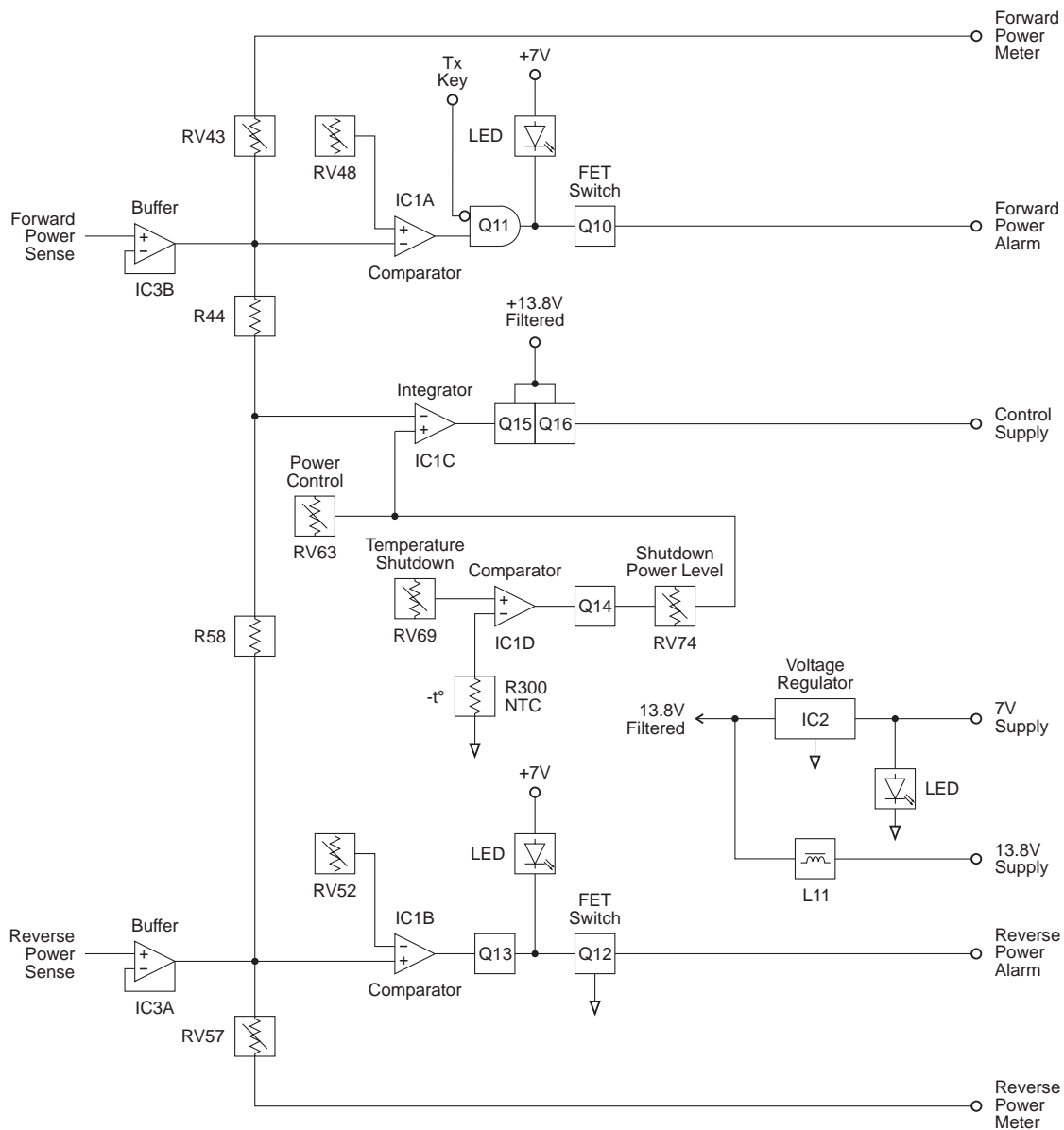


Figure 2.3 T828 Control Circuitry Block Diagram

2.3.1 Power Control

The DC voltages from the directional coupler representing forward and reflected power are buffered by the voltage followers IC3b and IC3a respectively. Their outputs are summed at an integrator (IC1c), which drives the series pass control element (Q16).

Forward and reflected power are summed so that, under high output VSWR, the power control turns the PA down. This is because the control loop adjusts for the same DC voltage from the directional coupler that would have been present if there were no reflected power.

2.3.2 Thermal Protection

At excessively high temperatures, the output power will automatically reduce to a pre-set level, thus preventing the PA from overheating.

A thermistor controlled voltage divider (R68, R300) applies a voltage to a comparator with hysteresis (IC1d). The threshold of the comparator is independently set by RV69. This sets the shutdown temperature.

The output from the comparator and driver Q14 is summed into the power control network via RV74 so that the power level to which the PA must turn down may be set.

2.3.3 Forward And Reverse Power Alarms

If forward power drops below, or reverse power rises above, presettable limits, alarms may be triggered.

The alarm outputs are open drain configuration and are low under normal conditions (i.e. forward and reverse power levels are normal).

IC1a and IC1b form comparators with thresholds adjusted via RV48 (forward power) and RV52 (reverse power) respectively. The inputs are from the forward and reverse power signals from the directional coupler, buffered by IC3b and IC3a. Thus, the power levels at which the forward and reverse power alarms are triggered are defined by RV48 and RV52 respectively.

2.3.4 Forward And Reverse Power Metering

Forward and reverse power signals from buffers IC3b and IC3a are available for metering purposes. The output currents are adjustable via RV43 (forward power) and RV57 (reverse power).

3 T828 Initial Adjustment



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

The following section describes the full adjustment procedure to be carried out before operating the T828.

Note: The T828 requires no RF tuning or alignment.

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

The following topics are covered in this section.

| Section | Title | Page |
|---------|--|------|
| 3.1 | Test Equipment Required | 3.3 |
| 3.2 | Optimising Intermodulation Performance | 3.4 |
| 3.2.1 | Trimming | 3.4 |
| 3.2.2 | Fitting | 3.4 |
| 3.3 | Preliminary Checks | 3.6 |
| 3.4 | Setting The Output Power | 3.6 |
| 3.5 | High Temperature Shutdown Power Level | 3.7 |
| 3.6 | Remote Forward Power Meter Calibration | 3.7 |
| 3.7 | Remote Reverse Power Meter Calibration | 3.8 |
| 3.8 | Setting Alarm Levels | 3.8 |
| 3.8.1 | Forward Power | 3.8 |
| 3.8.2 | Reverse Power | 3.8 |

| Figure | Title | Page |
|--------|---------------------------------------|------|
| 3.1 | T828 Test Equipment Set-up | 3.3 |
| 3.2 | T828 Phasing Section Trimming Detail | 3.4 |
| 3.3 | T828 Phasing Section Location | 3.5 |
| 3.4 | T828 Phasing Section Soldering Detail | 3.5 |

3.1 Test Equipment Required

- DC power supply capable of delivering 15A at 13.8V (e.g. Tait T807).
- Multimeter or DMM (e.g. Fluke 77).
- RF power meter usable 66-88MHz (e.g. HP 435 series or Bird Wattmeter).
- Thru-line wattmeter with 5W element.
- 150W 30dB 50 ohm attenuator.
- 150W 3dB 50 ohm pad.
- 'BNC' to 'N' type adaptors (e.g. Amphenol, Greenpar).
- Appropriate trimming tools.

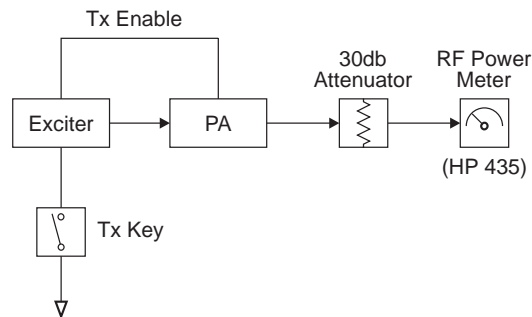


Figure 3.1 T828 Test Equipment Set-up

3.2 Optimising Intermodulation Performance

Note: If the T828 is to be used in countries where intermodulation performance is a Type Approval requirement (e.g. Europe, UK), or if intermodulation performance is of particular concern, the two 50 ohm Teflon coax phasing sections provided must be fitted.

3.2.1 Trimming

The Teflon phasing sections supplied are cut for 66MHz. If the required operating frequency is greater than 66MHz, you must trim both sections to the correct length according to the following formula:

$$\text{length of centre conductor (cm)} = \frac{5250}{\text{frequency (MHz)}}$$

Note: If the T828 is to be used over a band of frequencies, trim both sections for the centre operating frequency.

Trim the ends of the Teflon coax as shown in Figure 3.2 (dimensions shown in mm).

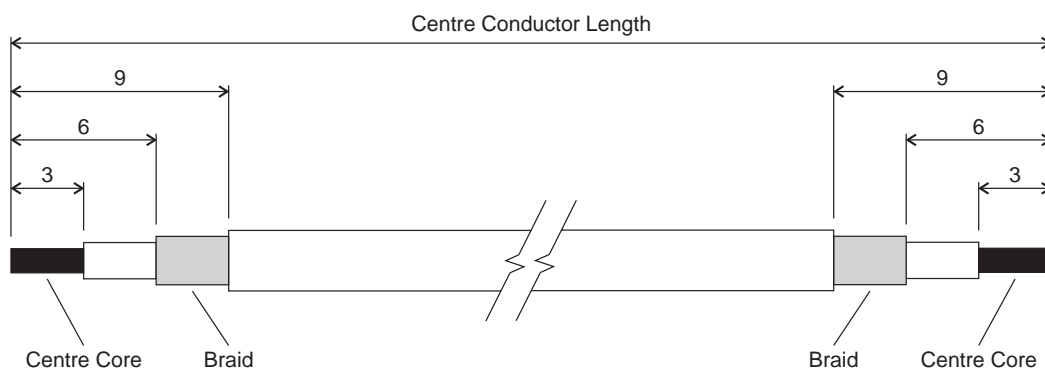


Figure 3.2 T828 Phasing Section Trimming Detail

3.2.2 Fitting

Note: If the Teflon phasing sections have been unbound for trimming, they must be rebound in the same way as the original components.

Remove the wire links fitted in locations TL1 and TL2 (refer to Figure 3.3).

Fit the Teflon phasing sections as shown in Figure 3.3 and solder the terminations as shown in Figure 3.4.

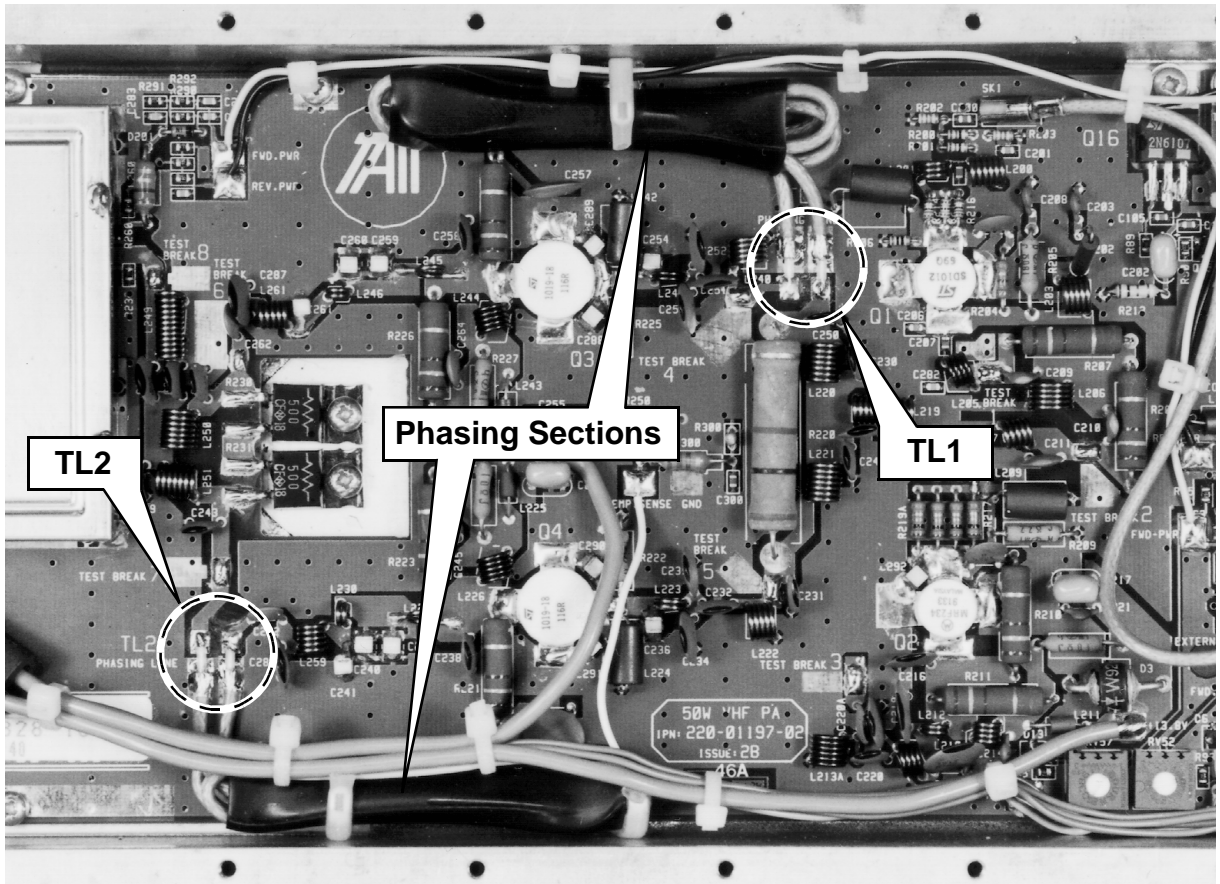


Figure 3.3 T828 Phasing Section Location

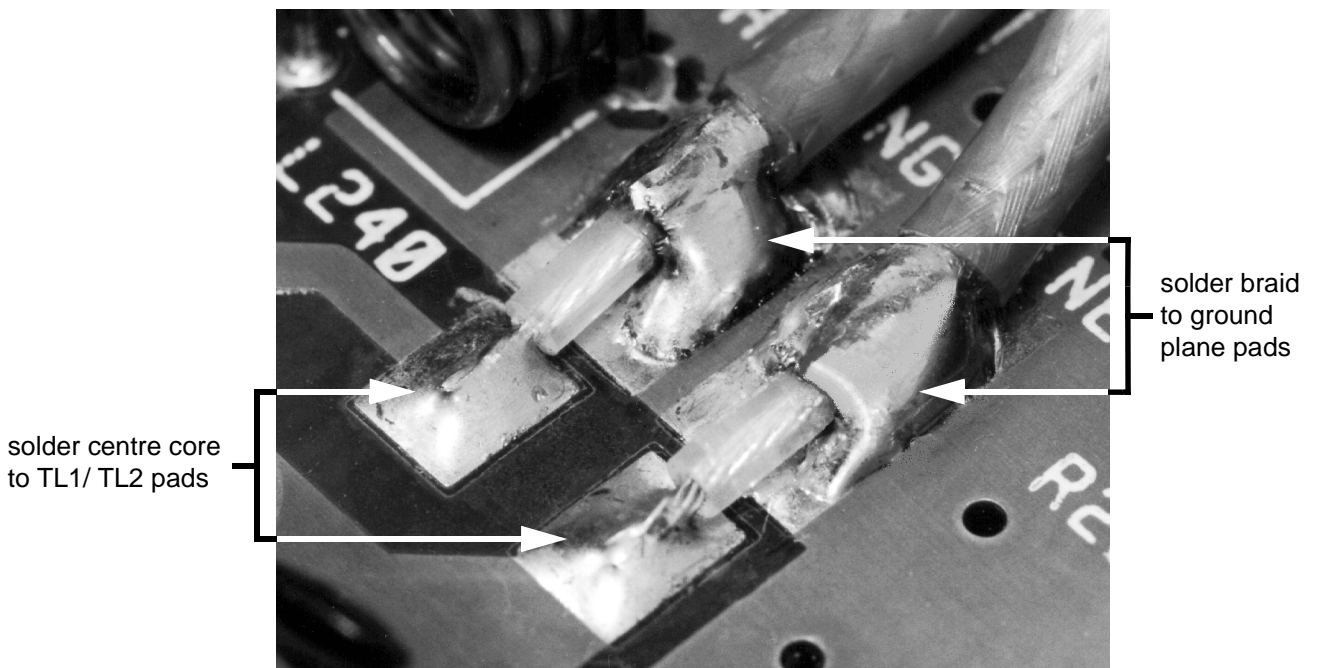


Figure 3.4 T828 Phasing Section Soldering Detail

3.3 Preliminary Checks

Check for short circuits between the positive rail and earth.

Set up the test equipment as in Figure 3.1.

Connect the T828 to a 13.8V DC supply.

Check that the quiescent current is approximately 45mA.

To key the transmitter, earth the key line (D-range 1 pin 13) on the exciter.

Check that the power supply is still at 13.8V under load.

Check that the regulated power control supply is approximately 7V.

Note: The output power and alarm levels should be set with the cover shield on. If the cover is removed for other adjustment procedures, make a final check of the output power and alarm levels with the cover shield on.

3.4 Setting The Output Power



Caution: If the temperature shutdown power level has not yet been set or is unknown, check that the unit does not overheat while setting the output power.

Note 1: Cables and connectors can easily cause a power loss of several watts if either too long or poorly terminated. Always use the shortest possible lead between the T828 and power meter.

Note 2: You will need appropriate extension leads if you wish to carry out the adjustment procedures with the T828 withdrawn from the rack in the latched position. Alternatively, disconnect and withdraw the T828 and reconnect it behind the rack.

Note 3: The actual power used may be limited by regulatory requirements.

Connect the exciter output to the PA input via a thru-line wattmeter with a 5W full scale reading. Special SMC/BNC leads will be required.

Connect an RF power meter to the PA output. Set the front panel power control preset (RV63) fully clockwise.

Key on the drive source.

Check that the power output exceeds 60W.

Adjust RV63 to reduce the power output to the required level (e.g. 50W).

3.5 High Temperature Shutdown Power Level

Note: The temperature shutdown circuit is factory set to approximately 130°C and 20W. RV69 and RV74 should not be readjusted if normal operation is required.

Power up the T828 and adjust the power control pot. (RV63) for the normal operating power level.

Turn the temperature set pot. (RV69) fully anticlockwise to avoid RF power cycling between the levels set by RV63 and RV74.

Apply heat to the NTC (R300) with the tip of a soldering iron.

Adjust the shutdown power level pot. (RV74) to the desired level. For continuous operation during fault conditions, set the shutdown power in the range 10 to 20W.

For normal operation, i.e. shutdown under extreme PA internal temperatures (approx. 130°C) or excessive dissipation in the splitter balance resistor (R220), adjust the temperature set pot. (RV69) for a voltage reading of 150mV at TP1 (pin 12 of the LM324D [IC1]).

3.6 Remote Forward Power Meter Calibration

If a remote meter is connected, adjust the forward power meter calibration control (RV43) for the remote reading to agree with the RF power meter reading.

3.7 Remote Reverse Power Meter Calibration

If a remote meter is connected, connect a 50 ohm 3dB pad (with the output open circuit) to the PA output.

Apply RF drive and Tx key.

Adjust the reverse power meter calibration control (RV57) for a quarter of the forward power reading.

3.8 Setting Alarm Levels

Note: If forward and reverse power metering is being used, set up their calibration (Section 3.6 and Section 3.7) before setting the alarm levels.

3.8.1 Forward Power

Power up the T828 and adjust the front panel power control (RV63) so that the output power is at the alarm level required (e.g. 40W if the PA normally operates at 50W).

Adjust the forward power alarm set control (RV48) so that the forward power alarm LED lights.

Check the alarm level setting by adjusting the power up and down and observing the alarm LED. A few watts hysteresis can be expected.

Readjust RV63 for the normal operating level.

Note: Remote indication is available at D-range pin 3.

3.8.2 Reverse Power

Power up the T828 and adjust the front panel power control (RV63) for the normal operating power level.

Place a known mismatch of the required value (e.g. 3:1 VSWR) and adjust the reverse power alarm set control (RV52) so that the reverse power alarm LED lights.

Example: A VSWR of 3:1 can be simulated by connecting an unterminated 3dB pad (100W) to the PA output. This will result in a return loss of 6dB.

Note: Remote indication is available at D-range pin 4.

4 T828 Fault Finding



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

The following test procedures and fault finding flow charts may be used to help locate a hardware problem, however they are by no means a complete fault finding procedure. If you still cannot trace the fault after progressing through them in a logical manner, contact your nearest Tait Dealer or Customer Service Organisation. If necessary, you can get additional technical help from Customer Support, Radio Systems Division, Tait Electronics Ltd, Christchurch, New Zealand (full contact details are on page 2).

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

The following topics are covered in this section.

| Section | Title | Page |
|---------|------------------------------------|------|
| 4.1 | Visual Checks | 4.3 |
| 4.2 | Component Checks | 4.3 |
| 4.3 | DC Checks | 4.3 |
| 4.4 | RF Checks | 4.4 |
| 4.4.1 | General | 4.4 |
| 4.4.2 | PA Faults | 4.4 |
| 4.5 | Voltage Chart | 4.5 |
| 4.6 | Fault Finding Charts | 4.6 |
| 4.6.1 | PA | 4.6 |
| 4.6.2 | Power Control | 4.7 |
| 4.7 | Replacing RF Power Transistors | 4.8 |
| 4.8 | Removing The PCB From The Heatsink | 4.9 |

| Figure | Title | Page |
|--------|--------------------------------|------|
| 4.1 | T828 Test Break Point Location | 4.4 |

4.1 Visual Checks

Remove the side cover from the T828 and inspect the PCB for damaged or broken components, paying particular attention to the surface mounted devices (SMDs). Also check for defective solder joints.

Refer to Section 4.7, Section 4.8 and Section 3 of Part A for more details on repair and replacement of components.

4.2 Component Checks

If you suspect a transistor is faulty, you can assess its performance by measuring the forward and reverse resistance of the junctions. Unless the device is completely desoldered, first make sure that the transistor is not shunted by some circuit resistance. Use a good quality EVM (e.g. Fluke 75) for taking the measurements (or a 20k ohm/V or better multimeter, using only the medium or low resistance ranges).

The collector current drawn by multi-junction transistors is a further guide to their performance.

If an IC is suspect, the most reliable check is to measure the DC operating voltages. Due to the catastrophic nature of most IC failures, the pin voltages will usually be markedly different from the recommended values in the presence of a fault. The recommended values can be obtained from either the circuit diagram or the component data catalogue.

4.3 DC Checks

Note: No RF power is to be applied during these checks.

Check that +13.8V is present on the collectors of Q1, Q2, Q3 and Q4. Make this measurement when the transmitter is not keyed.

Check that +13.8V is present at pin 4 of IC1 and pin 8 of IC3.

Check that 7.0V is present at the output of regulator IC2.

4.4 RF Checks

4.4.1 General

You can measure in-circuit RF levels around Q1 and Q2 with an RF probe on which the earth lead has been shortened to a minimum (i.e. 13mm); refer to the PA Fault Finding Chart (Section 4.6.1). You must measure all other stages with a power meter at the 50Ω points in the circuit.

For problems with the power control circuitry, refer to the Power Control Fault Finding Chart (Section 4.6.2).

4.4.2 PA Faults

If a PA fault has occurred, or is suspected, it is easier to find if the various stages are isolated by use of the test breaks (refer to Figure 4.1) and each stage analysed individually. Eight 50 ohm test break points have been included throughout the RF circuitry to enable individual transistor stages to be tested.

Testing may be performed by removing the solder short across the test break and soldering a 50 ohm test lead to the appropriate signal and earth pads.

Note 1: Use good quality 50Ω coax for the "flying" test leads.

Note 2: Ensure each output is terminated in a 50Ω load of the correct power rating.

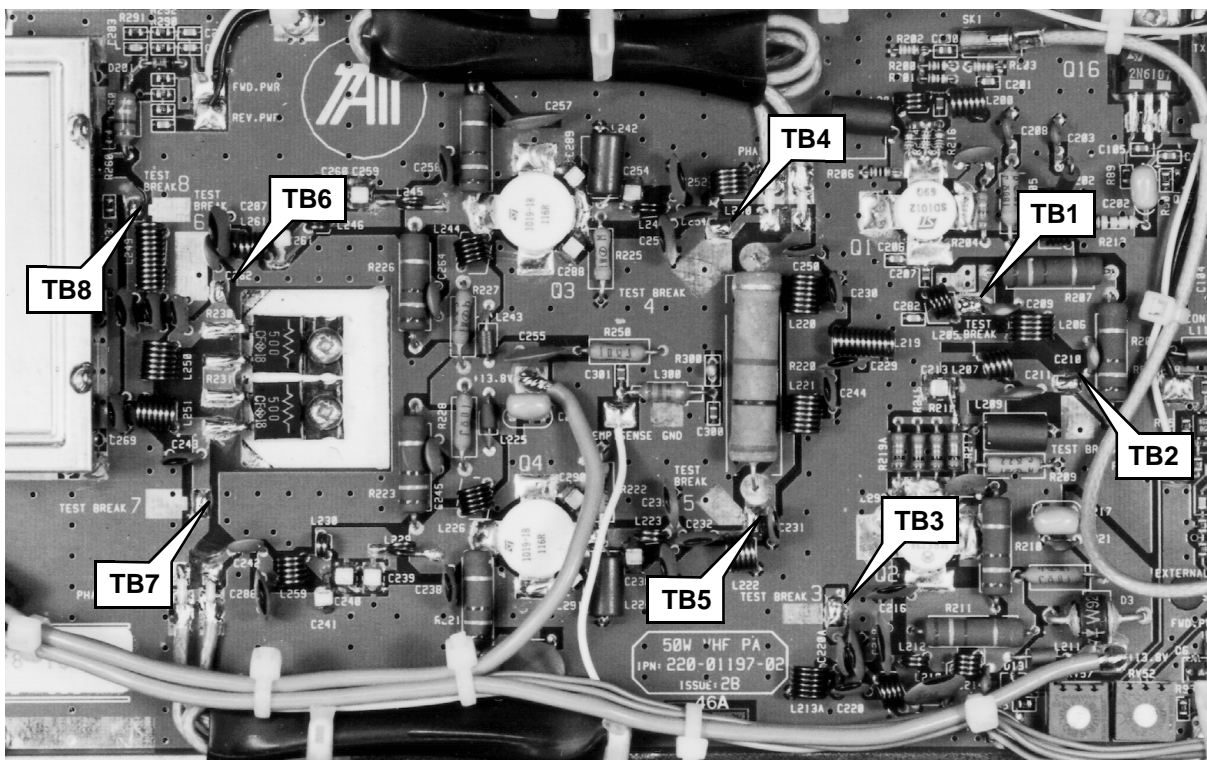


Figure 4.1 T828 Test Break Point Location

4.5 Voltage Chart

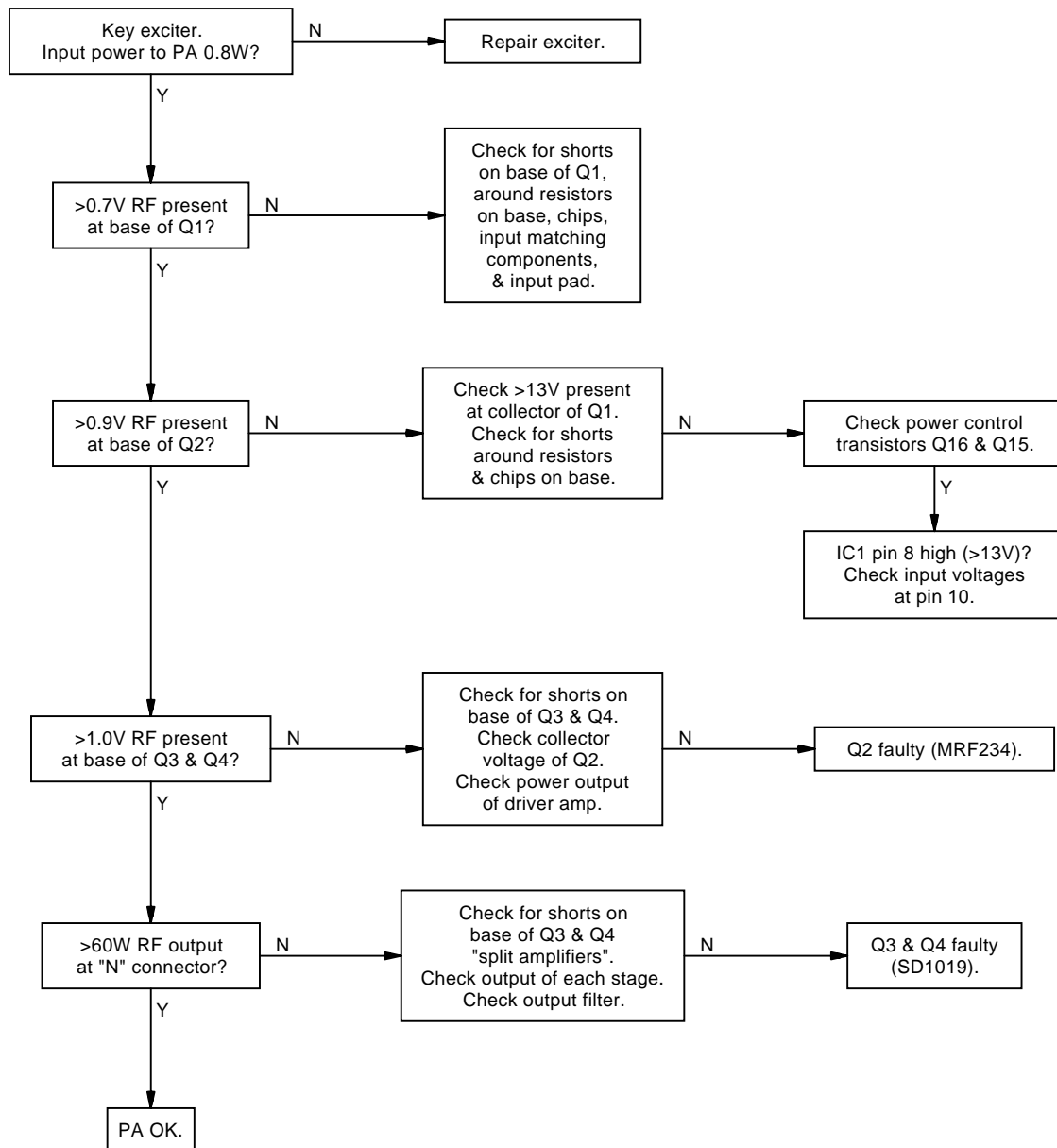
Test conditions:

- typical DC voltages measured with Fluke 77 DVM
- supply voltage 13.8V at socket
- transmitter unkeyed
- allow $\pm 20\%$ for spread of transistor characteristics.

| Device | Emitter | Base | Collector |
|--------|---------|-------|-----------|
| Q1 | 0.0V | 0.0V | 13.0V |
| Q2 | 0.0V | 0.0V | 13.8V |
| Q3 | 0.0V | 0.0V | 13.8V |
| Q4 | 0.0V | 0.0V | 13.8V |
| Q11 | 1.8V | 2.2V | 5.9V |
| Q13 | 0.0V | 0.0V | 5.9V |
| Q15 | 13.0V | 13.6V | 13.6V |
| Q16 | 13.8V | 13.6V | 13.0V |

4.6 Fault Finding Charts

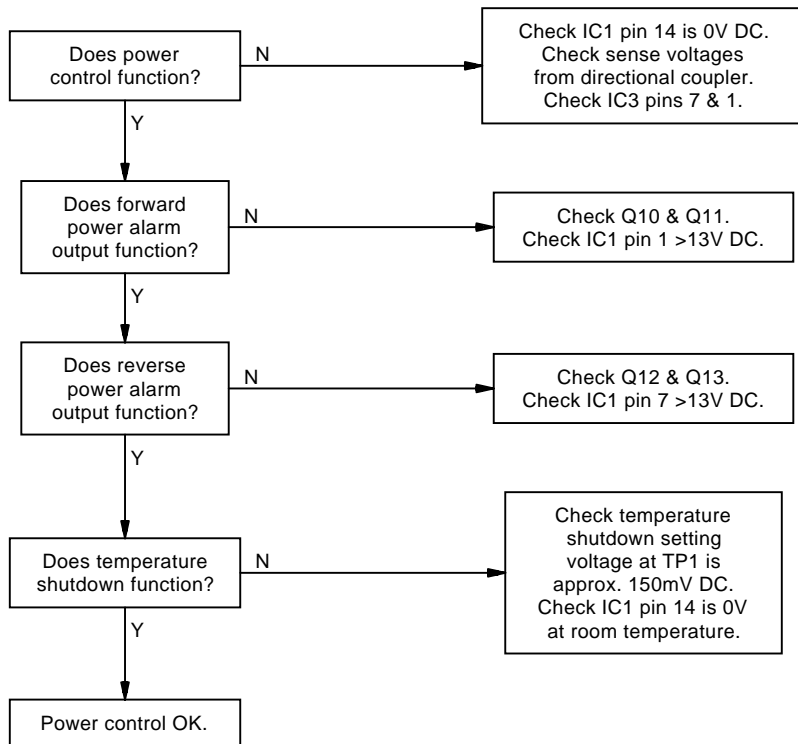
4.6.1 PA



4.6.2 Power Control

Normal operating conditions:

| Measurement | Output Power | |
|---|--------------|------|
| | 10W | 50W |
| forward power at "FWD-PWR" pad (beside IC3) | 1V | 2.6V |
| reverse power at "REV-PWR" pad (beside IC3) | <10mV | 50mV |
| IC1 pin 8 | 4.8V | 6.8V |
| RV63/R64 (RV63 wiper) | 7V | 7V |
| L202 | 4.13V | 6.2V |



4.7 Replacing RF Power Transistors

**Caution:**

Failure to comply with the following procedure can result in failure of the device due to poor heatsinking, or worse, can endanger the health of the assembler if the beryllium oxide die carrier is smashed during assembly.

**Caution:**

As the location of certain components in the PA is critical to performance, it is important that any components removed or disturbed are refitted in *exactly* the same position. Before attempting to remove a transistor, note the location of any other components that will also need to be removed. Replacing each component in its original location will help to maintain the performance of the PA.

**Caution:**

Do not apply too much heat or pressure to the PCB pads and tracks as you may damage them or lift them from the PCB, causing permanent damage to the PA.

Desolder and remove the components from around the transistor.

Desolder the transistor tabs by heating with a soldering iron and lifting away from the PCB with a screwdriver or thin stainless steel spike. Unscrew the transistor stud nut and remove the device.

Remove any excess solder from the PCB pads with solder wick.

Trim the tabs of the replacement transistor so that the device sits neatly on the PCB pads provided.

Lightly tin the underside of the transistor tabs.

Apply a small amount of heatsink compound (Dow-Corning 340 or equivalent) to the transistor mounting surface. Sufficient compound should be used to ensure an even film over the entire mounting surface.

Place the transistor on the PCB in the correct orientation and ensure the tabs are flush to the surface.

Lightly solder one tab to the PCB, then torque down the retaining nut to the correct torque (0.7Nm/6in.lbf.).

**Caution:**

Do not solder all the tabs before torquing down otherwise the device may be broken.

Solder all transistor tabs to the PCB.

Replace each component in exactly the same position as noted previously.

4.8 Removing The PCB From The Heatsink

Note: This is a lengthy procedure and should be considered only after all other checks have been carried out. There are no components on the bottom of the PCB.

Remove the harmonic filter shield lid.

Remove the 50 ohm output N-type connector by unscrewing it from the heatsink casting and desoldering it from the PCB.

Unplug the 50 ohm input coaxial cable from the PCB, unscrew the BNC connector from the heatsink, and remove the connector and cable (cutting cable ties as required).

Desolder the positive and negative power feed wires from the PCB.

Desolder the alarm and metering wires from the PCB.

Remove the 2 screws securing the D-range connector and PCB to the heatsink and withdraw the assembly and wires from the heatsink (cutting cable ties as required).

Remove the transistor stud nuts.

Remove the mounting screws for the TO-220 devices: R230, R231 and Q16.

Remove the 10 PCB retaining screws.

Push the three LEDs out of their front panel grommets.

Lift the PCB gently from the heatsink to gain access to the underside of the board.

Note: R230/231 and Q1-Q4 may be stuck down with heatsink compound. You may need to carefully prise them away from the heatsink with a small screwdriver.



Caution: Keep the heatsink compound clean while the PCB is detached. Any objects caught in the heatsink compound underneath the device which prevent effective earthing and/or heatsinking may cause the device to fail.



Caution: Do not operate the PA with the PCB detached as the heatsink is used for earthing and heat dissipation.

To replace the PCB, reverse the order of removal, taking care that the wiring is correctly positioned and not 'pinched'.

Q1-Q4: Torque down the retaining nut to the correct torque (0.7Nm/6in.lbf.).

Make sure that the heatsink compound has stayed clean, and that the insulating pad for Q16 is not damaged.

If you have difficulty refitting the LEDs, try pushing the body of the LED back into the grommet with a thin screwdriver or spike.

5 T828 PCB Information

**Caution:**

This equipment contains CMOS devices which are susceptible to damage from static charges. Refer to Section 1.2 in Part A for more information on anti-static procedures when handling these devices.

This section provides the following information on the T828 power amplifier:

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

| Section | Title | IPN | Page |
|---------|--------------|--------------|-------|
| 5.1 | Introduction | | 5.1.3 |
| 5.2 | T828 PA PCB | 220-01197-02 | 5.2.1 |

5.1 Introduction

Product Type Identification

You can identify the PA type by checking the product code printed on a label on the rear of the chassis/heatsink (product codes are explained in Section 1.3 in this Part of the manual, and Figure 1.1 in Part A shows typical labels).

PCB Identification

All PCBs are identified by a unique 10 digit “internal part number” (IPN), e.g. 220-01390-02, 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.

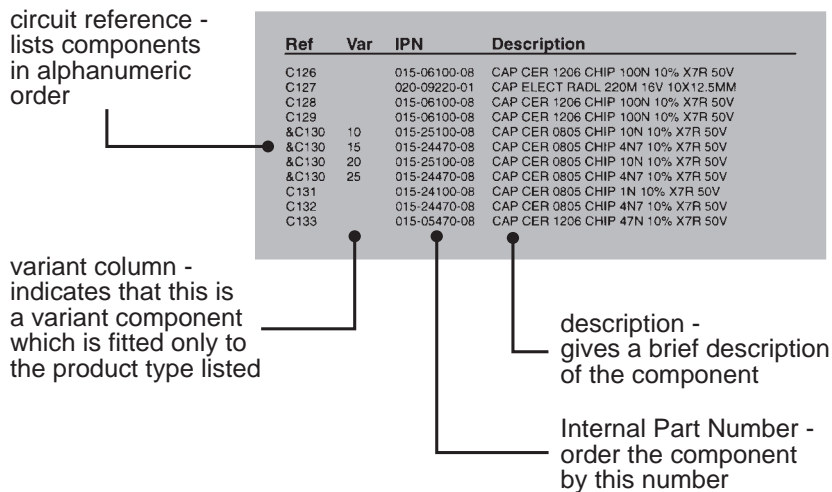
Note: It is important that you identify which issue PCB you are working on so that you can refer to the appropriate set of PCB information.

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).

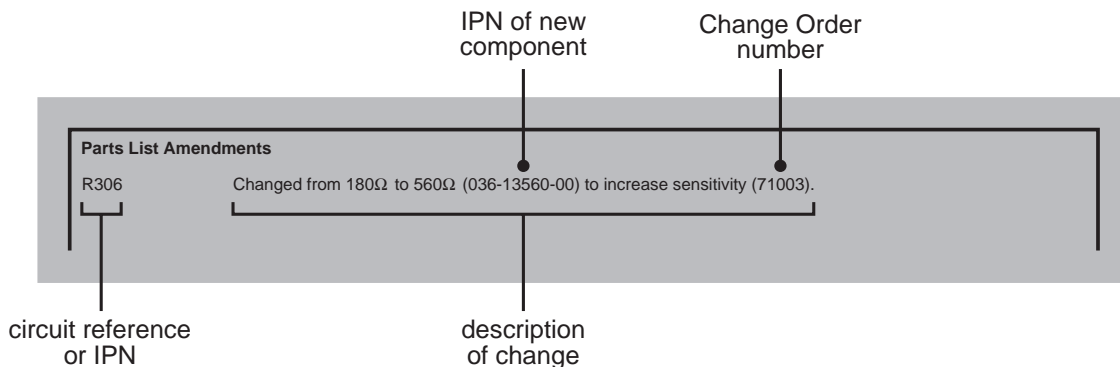
Those with a circuit reference are grouped in alphabetical order and then in numerical order within each group. Each component entry comprises three or four columns, as shown below:



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

Parts List Amendments

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



Variant Components

A variant component is one that has the same circuit reference but different value or specification in different product types. Where two products share the same PCB, the term “variant” is also used to describe components unplaced in one product. Variant components have a character prefix, such as “&”, “=” or “#”, before the circuit reference (e.g. &R100).

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:

The diagram shows a table with three columns: Device, PCB, and Circuit. The table lists components in alphanumeric order. Callouts point to specific parts of the table to explain the grid reference format:

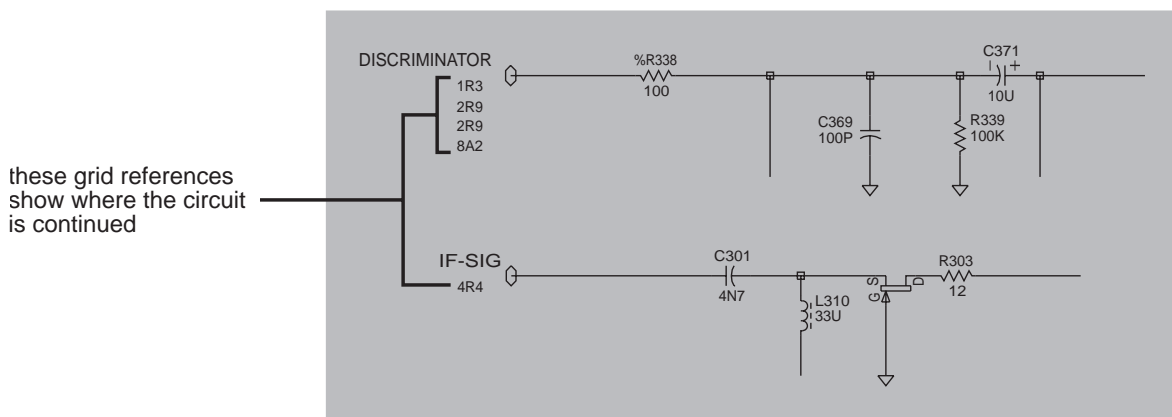
- components listed in alphanumeric order**: Points to the entire table.
- PCB layout reference**: Points to the PCB column.
- circuit diagram reference**: Points to the Circuit column.
- component location on the sheet**: Points to the PCB reference '2:A6'.
- sheet number**: Points to the layer number '2' in '2:A6'.
- component location on the layer**: Points to the grid coordinates 'A6' in '2:A6'.
- layer number - 1 = top side layer, 2 = bottom side layer**: Points to the layer number '2' in '2:A6'.

| Device | PCB | Circuit |
|--------|-------|---------|
| C126 | 2:A6 | 2-R7 |
| C127 | 1:A8 | 2-P4 |
| C128 | 2:B7 | 2-P2 |
| C129 | 2:C12 | 2-E3 |
| &C130 | 2:D8 | 2-B8 |
| C131 | 2:C9 | 2-H6 |
| C132 | 2:D8 | 2-B8 |
| C133 | 2:D6 | 2-E1 |

Using CAD Circuit Diagrams

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

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



5.2 T828 Power Amplifier PCB

This section contains the following information.

| IPN | Section | Page |
|--------------|----------------------------------|--------|
| 220-01197-02 | Parts List | 5.2.3 |
| | Mechanical & Miscellaneous Parts | 5.2.6 |
| | Grid Reference Index | 5.2.7 |
| | PCB Layout - Bottom Side | 5.2.9 |
| | PCB Layout - Top Side | 5.2.10 |
| | RF Section Circuit Diagram | 5.2.11 |
| | Control Section Circuit Diagram | 5.2.12 |

T828 Parts List (IPN 220-01197-02)

How To Use This Parts List

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

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

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

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

Parts List Amendments

RV63 2k 10 turn pot (IPN 044-04200-03) replaced with better quality 2k 15 turn pot (IPN 044-04200-06) and pot cover (IPN 044-04200-07) (710800).

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-------|-----|--------------|---|-------|-----|--------------|---|
| C76 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | C287 | | 010-02680-00 | CAP CER 68P 5% NPO 500V 9.5MM OD DD09 |
| C77 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | C288 | | 015-03560-03 | CAP CER CHIP 560P 5% NPO 100V HIQ GRH11 |
| C78 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | C289 | | 015-03560-03 | CAP CER CHIP 560P 5% NPO 100V HIQ GRH11 |
| C80 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | C290 | | 015-03560-03 | CAP CER CHIP 560P 5% NPO 100V HIQ GRH11 |
| C81 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | C291 | | 015-03560-03 | CAP CER CHIP 560P 5% NPO 100V HIQ GRH11 |
| C84 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | C292 | | 015-03560-03 | CAP CER CHIP 560P 5% NPO 100V HIQ GRH11 |
| C85 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | C300 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V |
| C86 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | C301 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V |
| C87 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | | | | |
| C90 | | 015-06100-08 | CAP CER 1206 CHIP 100N 10% X7R 50V | D3 | | 001-00011-60 | (S) DIODE SR2607 6A/30V |
| C91 | | 025-08100-02 | CAP TANT BEAD 10M 10% 16V | D5 | | 008-00013-32 | (S) LED 3MM RED LO CURRENT NO MTG |
| C92 | | 015-25100-08 | CAP CER 0805 CHIP 10N 10% X7R 50V | D6 | | 001-10000-70 | (S) DIODE SMD BAV70 DUAL SWITCH SOT-23 CO |
| C93 | | 015-23150-01 | CAP CER 0805 CHIP 150P 5% NPO 50V | D10 | | 008-00013-35 | (S) LED 3MM GREEN LO CURRENT NO MTG |
| C95 | | 015-06100-08 | CAP CER 1206 CHIP 100N 10% X7R 50V | D11 | | 008-00013-32 | (S) LED 3MM RED LO CURRENT NO MTG |
| C96 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | D13 | | 001-10000-70 | (S) DIODE SMD BAV70 DUAL SWITCH SOT-23 C |
| C99 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | D200 | | 001-00013-45 | (S) DIODE SCHOTTKY 1SS97/2 |
| C100 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | D201 | | 001-00013-45 | (S) DIODE SCHOTTKY 1SS97/2 |
| C101 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | | | | |
| C103 | | 015-25100-08 | CAP CER 0805 CHIP 10N 10% X7R 50V | IC1 | | 002-10003-24 | (S) IC SMD 324 QUAD OP AMP SO14 |
| C104 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | IC2 | | 002-00014-62 | (S) IC 317L 100MA REG 3 TERMINAL TO-92 |
| C105 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | IC3 | | 002-10003-58 | (S) IC SMD LM358 DUAL OP AMP |
| C107 | | 015-06100-08 | CAP CER 1206 CHIP 100N 10% X7R 50V | | | | |
| C108 | | 015-23150-01 | CAP CER 0805 CHIP 150P 5% NPO 50V | L11 | | 065-00010-04 | BEAD FERRITE F8 4X2X5MM |
| C109 | | 015-23150-01 | CAP CER 0805 CHIP 150P 5% NPO 50V | L200 | | 052-08135-55 | COIL A/W 5.5T/3.5MM HOR 0.8MM WIRE |
| C111 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | L201 | | 052-08135-25 | COIL A/W 2.5T/3.5MM HOR 0.8MM WIRE |
| C112 | | 015-24100-08 | CAP CER 0805 CHIP 1N 10% X7R 50V | L202 | | 065-00010-08 | BEAD FERRITE 4S3 3*0.7*10MM RED |
| C200 | | 015-24470-08 | CAP CER 0805 CHIP 4N7 10% X7R 50V | L203 | | 052-08145-45 | COIL A/W 4.5T/4.5MM HOR 0.8MM WIRE |
| C201 | | 015-22560-01 | CAP CER 0805 CHIP 56P 5% NPO 50V | L204 | | 065-00010-01 | BEAD FERRITE 3B 6 HOLE |
| C202 | | 020-07470-04 | CAP ELECT RADL 4M7 25V 20% 8X13MM SOLID | L205 | | 052-08140-35 | COIL A/W 3.5T/4.0MM HOR 0.8MM WIRE |
| C203 | | 011-54100-01 | CAP CER AI 1N 10% T/C B 63V | L206 | | 052-08160-35 | COIL A/W 3.5T/3.0MM HOR 0.8MM WIRE |
| C204 | | 011-54470-03 | CAP CER AI 4N7 10% T/C B 50V | L207 | | 052-08130-45 | COIL A/W 4.5T/6.0MM HOR 0.8MM WIRE |
| C205 | | 015-23120-01 | CAP CER 0805 CHIP 120P 5% NPO 50V | L209 | | 065-00010-01 | BEAD FERRITE 3B 6 HOLE |
| C206 | | 015-22270-01 | CAP CER 0805 CHIP 27P 5% NPO 50V | L210 | | 052-08130-35 | COIL A/W 3.5T/3.0MM HOR 0.8MM WIRE |
| C207 | | 015-24470-08 | CAP CER 0805 CHIP 4N7 10% X7R 50V | L211 | | 065-00010-11 | BEAD FERRITE 4S3 3*1*4MM RED |
| C208 | | 011-54100-01 | CAP CER AI 1N 10% T/C B 63V | L212 | | 052-08130-15 | COIL A/W 1.5T/3.0MM HOR 0.8MM WIRE |
| C209 | | 011-52390-01 | CAP CER AI 39P 5% N150 50/63V | L213 | | 052-08140-35 | COIL A/W 3.5T/4.0MM HOR 0.8MM WIRE |
| C210 | | 011-52390-01 | CAP CER AI 39P 5% N150 50/63V | L213A | | 052-08145-65 | COIL A/W 5.5T/4.5MM HOR 0.8MM WIRE |
| C211 | | 011-53120-01 | CAP CER AI 120P 5% N150 50/63V | L219 | | 052-08131-05 | COIL A/W 10.5T/3.0MM HOR 0.8MM WIRE |
| C213 | | 015-03470-03 | CAP CER CHIP 470P 5% NPO 200V HIQ GRH11 | L220 | | 052-08140-65 | COIL A/W 6.5T/4.0MM HOR 0.8MM WIRE |
| C214 | | 011-54100-01 | CAP CER AI 1N 10% T/C B 63V | L221 | | 052-08140-65 | COIL A/W 6.5T/4.0MM HOR 0.8MM WIRE |
| C215 | | 011-54470-03 | CAP CER AI 4N7 10% T/C B 50V | L222 | | 052-08145-45 | COIL A/W 4.5T/4.5MM HOR 0.8MM WIRE |
| C216 | | 010-02680-00 | CAP CER 68P 5% NPO 500V 9.5MM OD DD09 | L223 | | 052-08140-15 | COIL A/W 1.5T/4.0MM HOR 0.8MM WIRE |
| C217 | | 020-07470-04 | CAP ELECT RADL 4M7 25V 20% 8X13MM SOLID | L224 | | 065-00010-01 | BEAD FERRITE 3B 6 HOLE |
| C218 | | 010-03150-01 | CAP CER 150P 5% NPO 500V | L225 | | 065-00010-11 | BEAD FERRITE 4S3 3*1*4MM RED |
| C219 | | 010-02680-00 | CAP CER 68P 5% NPO 500V 9.5MM OD DD09 | L226 | | 052-08140-45 | COIL A/W 4.5T/4.0MM HOR 0.8MM WIRE |
| C220 | | 010-02390-00 | CAP CER 39P 5% NPO 500V 7.5MM OD DD07 | L229 | | 052-08335-10 | COIL A/W 1T/3.5MM SMD 0.8MM WIRE |
| C220A | | 010-02390-00 | CAP CER 39P 5% NPO 500V 7.5MM OD DD07 | L230 | | 052-08125-15 | COIL A/W 1.5T/2.5MM HOR 0.8MM WIRE |
| C221 | | 011-54100-01 | CAP CER AI 1N 10% T/C B 63V | L240 | | 052-08145-45 | COIL A/W 4.5T/4.5MM HOR 0.8MM WIRE |
| C223 | | 010-03150-01 | CAP CER 150P 5% NPO 500V | L241 | | 052-08140-15 | COIL A/W 1.5T/4.0MM HOR 0.8MM WIRE |
| C229 | | 010-02820-00 | CAP CER 82P 5% NPO 500V 9.5MM OD DD09 | L242 | | 065-00010-01 | BEAD FERRITE 3B 6 HOLE |
| C230 | | 010-02390-00 | CAP CER 39P 5% NPO 500V 7.5MM OD DD07 | L243 | | 065-00010-11 | BEAD FERRITE 4S3 3*1*4MM RED |
| C231 | | 010-02390-00 | CAP CER 39P 5% NPO 500V 7.5MM OD DD07 | L244 | | 052-08140-45 | COIL A/W 4.5T/4.0MM HOR 0.8MM WIRE |
| C232 | | 010-02560-00 | CAP CER 56P 5% NPO 500V 8.0MM OD DD08 | L245 | | 052-08335-10 | COIL A/W 1T/3.5MM SMD 0.8MM WIRE |
| C234 | | 010-02680-00 | CAP CER 68P 5% NPO 500V 9.5MM OD DD09 | L246 | | 052-08125-15 | COIL A/W 1.5T/2.5MM HOR 0.8MM WIRE |
| C235 | | 010-02680-00 | CAP CER 68P 5% NPO 500V 9.5MM OD DD09 | L249 | | 052-08131-15 | COIL A/W 11.5T/3.0MM HOR 0.8MM WIRE |
| C236 | | 015-03470-03 | CAP CER CHIP 470P 5% NPO 200V HIQ GRH11 | L250 | | 052-08140-65 | COIL A/W 6.5T/4.0MM HOR 0.8MM WIRE |
| C237 | | 017-15470-01 | CAP CER SURFACE BARRIER 47N 20% 50V | L251 | | 052-08140-65 | COIL A/W 6.5T/4.0MM HOR 0.8MM WIRE |
| C238 | | 010-02560-00 | CAP CER 56P 5% NPO 500V 8.0MM OD DD08 | L254 | | 052-08135-85 | COIL A/W 8.5T/3.5MM HOR 0.8MM WIRE |
| C239 | | 015-03150-03 | CAP CER CHIP 150P 5% NPO 300V HIQ GRH11 | L255 | | 052-08155-45 | COIL A/W 4.5T/5.5MM HOR 0.8MM WIRE |
| C240 | | 015-03150-03 | CAP CER CHIP 150P 5% NPO 300V HIQ GRH11 | L256 | | 052-08140-25 | COIL A/W 2.5T/4.0MM HOR 0.8MM WIRE |
| C241 | | 015-02680-03 | CAP CER CHIP 68P 5% NPO 500V HIQ GRH11 | L257 | | 052-08155-45 | COIL A/W 4.5T/5.5MM HOR 0.8MM WIRE |
| C242 | | 010-04100-01 | CAP CER 1N 10% T/C B 50V | L258 | | 052-08135-85 | COIL A/W 8.5T/3.5MM HOR 0.8MM WIRE |
| C243 | | 010-02390-00 | CAP CER 39P 5% NPO 500V 7.5MM OD DD07 | L259 | | 052-08130-45 | COIL A/W 4.5T/3.0MM HOR 0.8MM WIRE |
| C244 | | 010-02390-00 | CAP CER 39P 5% NPO 500V 7.5MM OD DD07 | L260A | | 056-00021-52 | IND FXD 820NH 10% NON MAGNETIC |
| C245 | | 010-04100-01 | CAP CER 1N 10% T/C B 50V | L260B | | 056-00021-60 | IND FXD 330NH 6.6X2.7MM AXIAL NON MAGN |
| C250 | | 010-02390-00 | CAP CER 39P 5% NPO 500V 7.5MM OD DD07 | L300 | | 052-08130-45 | COIL A/W 4.5T/3.0MM HOR 0.8MM WIRE |
| C251 | | 010-02560-00 | CAP CER 56P 5% NPO 500V 8.0MM OD DD08 | | | 056-00021-00 | IND FXD 3.3UH AXIAL |
| C252 | | 010-02680-00 | CAP CER 68P 5% NPO 500V 9.5MM OD DD09 | Q1 | | 000-00021-65 | (S) XSTR SD1012-9 NPN STUD MTG VHF PWR |
| C253 | | 010-02680-00 | CAP CER 68P 5% NPO 500V 9.5MM OD DD09 | Q2 | | 000-00030-74 | (S) XSTR MRF234 STUD MTG RF PWR 25W 90MH |
| C254 | | 015-03470-03 | CAP CER CHIP 470P 5% NPO 200V HIQ GRH11 | Q3 | | 000-00022-66 | (S) XSTR SD1019-18 VHF PWR 40W STUD MTD |
| C255 | | 017-15470-01 | CAP CER SURFACE BARRIER 47N 20% 50V | Q4 | | 000-00022-66 | (S) XSTR SD1019-18 VHF PWR 40W STUD MTD |
| C256 | | 020-07470-04 | CAP ELECT RADL 4M7 25V 20% 8X13MM SOLID | Q10 | | 000-00020-70 | (S) XSTR BS170 JFET TO-92 SMALL SIG |
| C257 | | 017-15470-01 | CAP CER SURFACE BARRIER 47N 20% 50V | Q11 | | 000-10008-17 | (S) XSTR SMD BC817-25 NPN SOT-23 AF LO P |
| C258 | | 010-02560-00 | CAP CER 56P 5% NPO 500V 8.0MM OD DD08 | Q12 | | 000-00020-70 | (S) XSTR BS170 JFET TO-92 SMALL SIG |
| C259 | | 015-03150-03 | CAP CER CHIP 150P 5% NPO 300V HIQ GRH11 | Q13 | | 000-10008-17 | (S) XSTR SMD BC817-25 NPN SOT-23 AF LO P |
| C260 | | 015-03150-03 | CAP CER CHIP 150P 5% NPO 300V HIQ GRH11 | Q14 | | 000-10008-48 | (S) XSTR SMD BCW60/BC848B215 NPN SOT23 A |
| C261 | | 010-02680-03 | CAP CER CHIP 68P 5% NPO 500V HIQ GRH11 | Q15 | | 000-10008-17 | (S) XSTR SMD BC817-25 NPN SOT-23 AF LO P |
| C262 | | 010-04100-01 | CAP CER 1N 10% T/C B 50V | Q16 | | 000-00030-95 | (S) XSTR 2N6107 PNP TO-220 AF PWR |
| C263 | | 010-02390-00 | CAP CER 39P 5% NPO 500V 7.5MM OD DD07 | | | | |
| C264 | | 010-04100-01 | CAP CER 1N 10% T/C B 50V | R36 | | 036-13680-00 | RES M/F 0805 CHIP 680E 5% |
| C265 | | 010-02390-00 | CAP CER 39P 5% NPO 500V 7.5MM OD DD07 | R38 | | 036-17100-00 | RES M/F 0805 CHIP 1M 5% |
| C269 | | 010-02390-00 | CAP CER 39P 5% NPO 500V 7.5MM OD DD07 | R39 | | 036-16100-00 | RES M/F 0805 CHIP 100K 5% |
| C270 | | 010-02820-00 | CAP CER 82P 5% NPO 500V 9.5MM OD DD09 | R42 | | 036-15100-00 | RES M/F 0805 CHIP 10K 5% |
| C271 | | 015-23150-01 | CAP CER 0805 CHIP 150P 5% NPO 50V | R44 | | 036-14470-00 | RES M/F 0805 CHIP 4K7 5% |
| C271A | | 015-21680-01 | CAP CER 0805 CHIP 6P8 +/-0.25P NPO 50V | R47 | | 036-15270-00 | RES M/F 0805 CHIP 27K 5% |
| C272 | | 015-23150-01 | CAP CER 0805 CHIP 150P 5% NPO 50V | R49 | | 036-13680-00 | RES M/F 0805 CHIP 680E 5% |
| C273 | | 015-23150-01 | CAP CER 0805 CHIP 150P 5% NPO 50V | R50 | | 036-13680-00 | RES M/F 0805 CHIP 680E 5% |
| C274 | | 015-23150-01 | CAP CER 0805 CHIP 150P 5% NPO 50V | R55 | | 036-17100-00 | RES M/F 0805 CHIP 1M 5% |
| C275 | | 015-02330-03 | CAP CER CHIP 33P 5% NPO 500V HIQ GRH11 | R56 | | 036-15100-00 | RES M/F 0805 CHIP 10K 5% |
| C276 | | 015-02470-03 | CAP CER CHIP 47P 5% NPO 500V HIQ GRH11 | R58 | | 036-14470-00 | RES M/F 0805 CHIP 4K7 5% |
| C277 | | 015-02220-03 | CAP CER CHIP 22P 5% NPO 500V HIQ GRH11 | R61 | | 036-13220-00 | RES M/F 0805 CHIP 220E 5% |
| C278 | | 015-02470-03 | CAP CER CHIP 47P 5% NPO 500V HIQ GRH11 | R62 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% |
| C279 | | 015-02220-03 | CAP CER CHIP 22P 5% NPO 500V HIQ GRH11 | R64 | | 036-14470-00 | RES M/F 0805 CHIP 4K7 5% |
| C280 | | 015-02470-03 | CAP CER CHIP 47P 5% NPO 500V HIQ GRH11 | R67 | | 036-15100-00 | RES M/F 0805 CHIP 10K 5% |
| C281 | | 015-02330-03 | CAP CER CHIP 33P 5% NPO 500V HIQ GRH11 | R68 | | 036-14470-00 | RES M/F 0805 CHIP 4K7 5% |
| C282 | | 015-22680-01 | CAP CER 0805 CHIP 68P 5% NPO 50V | R73 | | 036-16220-00 | RES M/F 0805 CHIP 220K 5% |
| C283 | | 015-21680-01 | CAP CER 0805 CHIP 6P8 +/-0.25P NPO 50V | R74 | | 036-14470-00 | RES M/F 0805 CHIP 4K7 5% |
| C286 | | 010-02680-00 | CAP CER 68P 5% NPO 500V 9.5MM OD DD09 | | | | |

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|-------|-----|--------------|---|-----|-----|-----|-------------|
| R75 | | 036-14470-00 | RES M/F 0805 CHIP 4K7 5% | | | | |
| R76 | | 036-14220-00 | RES M/F 0805 CHIP 2K2 5% | | | | |
| R77 | | 036-14220-00 | RES M/F 0805 CHIP 2K2 5% | | | | |
| R78 | | 036-14270-00 | RES M/F 0805 CHIP 2K7 5% | | | | |
| R79 | | 036-13220-00 | RES M/F 0805 CHIP 220E 5% | | | | |
| R80 | | 036-13100-00 | RES M/F 0805 CHIP 100E 5% | | | | |
| R81 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R82 | | 036-14470-00 | RES M/F 0805 CHIP 4K7 5% | | | | |
| R83 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R84 | | 036-14470-00 | RES M/F 0805 CHIP 4K7 5% | | | | |
| R85 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R86 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R87 | | 036-12100-00 | RES M/F 0805 CHIP 10E 5% | | | | |
| R89 | | 036-13100-00 | RES M/F 0805 CHIP 100E 5% | | | | |
| R90 | | 036-15100-00 | RES M/F 0805 CHIP 10K 5% | | | | |
| R92 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R93 | | 036-14560-00 | RES M/F 0805 CHIP 5K6 5% | | | | |
| R94 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R95 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R96 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R97 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R98 | | 036-12100-00 | RES M/F 0805 CHIP 10E 5% | | | | |
| R99 | | 036-14270-00 | RES M/F 0805 CHIP 2K7 5% | | | | |
| R100 | | 036-14470-00 | RES M/F 0805 CHIP 4K7 5% | | | | |
| R200 | | 030-02120-20 | RES FILM 12E 5% 0.4W 4X1.6MM | | | | |
| R201 | | 030-02120-20 | RES FILM 12E 5% 0.4W 4X1.6MM | | | | |
| R202 | | 030-53820-20 | RES FILM AI 820E 5% 0.4W 4X1.6MM | | | | |
| R203 | | 030-53820-20 | RES FILM AI 820E 5% 0.4W 4X1.6MM | | | | |
| R204 | | 030-03270-10 | RES FILM 270E 5% 0.5W 7X2.5MM | | | | |
| R205 | | 032-33180-00 | RES M/F PWR 180E 5% 1W 12X4.5MM | | | | |
| R206 | | 030-52100-20 | RES FILM AI 10E 5% 0.4W 4X1.6MM | | | | |
| R207 | | 032-33180-01 | RES M/F PWR 180E 5% 2.5W 17X5MM | | | | |
| R208 | | 032-33180-01 | RES M/F PWR 180E 5% 2.5W 17X5MM | | | | |
| R209 | | 032-32220-00 | RES M/F PWR 22E 5% 1W 12X4.5MM | | | | |
| R210 | | 032-33180-01 | RES M/F PWR 180E 5% 2.5W 17X5MM | | | | |
| R211 | | 032-33180-01 | RES M/F PWR 180E 5% 2.5W 17X5MM | | | | |
| R212 | | 032-32100-00 | RES M/F PWR 10E 5% 1W 10X4MM | | | | |
| R213 | | 030-01100-00 | RES FILM 1E 5% 0.25W 7X2.5MM | | | | |
| R214 | | 030-52180-20 | RES FILM AI 18E 5% 0.4W 4X1.6MM | | | | |
| R215 | | 030-52180-20 | RES FILM AI 18E 5% 0.4W 4X1.6MM | | | | |
| R216 | | 030-52180-20 | RES FILM AI 18E 5% 0.4W 4X1.6MM | | | | |
| R217 | | 030-01100-10 | RES FILM 1E 5% 0.5W 7X2.5MM | | | | |
| R218 | | 030-01100-10 | RES FILM 1E 5% 0.5W 7X2.5MM | | | | |
| R219 | | 030-01100-10 | RES FILM 1E 5% 0.5W 7X2.5MM | | | | |
| R219A | | 030-01100-10 | RES FILM 1E 5% 0.5W 7X2.5MM | | | | |
| R220 | | 032-33100-02 | RES M/F PWR 100E 5% 6W 33X9MM | | | | |
| R221 | | 032-33180-01 | RES M/F PWR 180E 5% 2.5W 17X5MM | | | | |
| R222 | | 032-32220-00 | RES M/F PWR 22E 5% 1W 12X4.5MM | | | | |
| R223 | | 032-33180-01 | RES M/F PWR 180E 5% 2.5W 17X5MM | | | | |
| R224 | | 032-33180-01 | RES M/F PWR 180E 5% 2.5W 17X5MM | | | | |
| R225 | | 032-32220-00 | RES M/F PWR 22E 5% 1W 12X4.5MM | | | | |
| R226 | | 032-33180-01 | RES M/F PWR 180E 5% 2.5W 17X5MM | | | | |
| R227 | | 032-32100-00 | RES M/F PWR 10E 5% 1W 10X4MM | | | | |
| R228 | | 032-32100-00 | RES M/F PWR 10E 5% 1W 10X4MM | | | | |
| R230 | | 039-02500-01 | RES DUMP LOAD 50E 1% 10W TO-220 NIKKOHM | | | | |
| R231 | | 039-02500-01 | RES DUMP LOAD 50E 1% 10W TO-220 NIKKOHM | | | | |
| R232 | | 036-13100-00 | RES M/F 0805 CHIP 100E 5% | | | | |
| R233 | | 036-13100-00 | RES M/F 0805 CHIP 100E 5% | | | | |
| R250 | | 032-32100-00 | RES M/F PWR 10E 5% 1W 10X4MM | | | | |
| R260 | | 036-13270-00 | RES M/F 0805 CHIP 270E 5% | | | | |
| R290 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R291 | | 036-15470-00 | RES M/F 0805 CHIP 47K 5% | | | | |
| R292 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R293 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R294 | | 036-15470-00 | RES M/F 0805 CHIP 47K 5% | | | | |
| R295 | | 036-14100-00 | RES M/F 0805 CHIP 1K 5% | | | | |
| R300 | | 045-04470-01 | RES NTC 4K7 5% 5MM DISC | | | | |
| RV43 | | 042-05470-09 | RES PRESET 50K CERMET 9.5MM SQ FLAT | | | | |
| RV48 | | 042-04500-08 | RES PRESET 5K CERMET 9.5MM SQ FLAT | | | | |
| RV52 | | 042-04500-08 | RES PRESET 5K CERMET 9.5MM SQ FLAT | | | | |
| RV57 | | 042-05470-09 | RES PRESET 50K CERMET 9.5MM SQ FLAT | | | | |
| RV63 | | 044-04200-03 | RES PRESET MULTITURN 2K 10T PNL MTG | | | | |
| RV69 | | 042-04220-02 | RES PRESET 2K CERMET 9.5MM SQ FLAT TOP | | | | |
| RV74 | | 042-05470-09 | RES PRESET 50K CERMET 9.5MM SQ FLAT | | | | |
| SK1 | | 240-02100-44 | SKT COAX MINI JACK PCB MTG ANGLED | | | | |

T828 Mechanical & Miscellaneous Parts (220-01197-02)

| IPN | Description | IPN | Description |
|--------------|---|--------------|--------------------------------------|
| 008-00014-79 | S)LED 3MM RED WITH WIRE | 349-00020-09 | SCRW T/T 4-40X3/8 IN P/POZ BLK |
| 008-00014-80 | S)LED 3MM GREEN WITH WIRE | 349-00020-36 | SCREW TT M3X8m PANTORX BLK |
| 065-00010-08 | BEAD FERR 4S3 3*0.7*10MM RED | 352-00010-29 | NUT M4 NYLOC HEX |
| 065-00010-20 | BEAD FERRITE BALUN 4B1 PHILIPS | 352-00010-35 | NUT 8-32 UNC HEX XSTR MTG Q1 & Q2 |
| 070-01001-00 | D-RANGE 15 WAY COMPL T800 | 352-00010-36 | NUT 10-32 UNF LARGE STUD Q3 & Q4 |
| 201-00030-01 | WIRE #1 T/C WIRE 7/0.2MM PVC BROWN 1x 410mm | 353-00010-10 | WSHR M3 FLAT 7MM*0.6MM ST BZ Q16 |
| 201-00030-02 | WIRE #1 T/C WIRE 7/0.2MM PVC RED 3x 20mm | 356-00010-03 | TAG SOLDER 3MM LONG M614/3.2 |
| 201-00030-03 | WIRE #1 T/C WIRE 7/0.2MM PVC ORANGE 1x 235mm | 360-00010-41 | BUSH SHORTY BLK |
| 201-00030-04 | WIRE #1 T/C WIRE 7/0.2MM PVC YELLOW 1x 325mm | 362-00010-07 | GASKET SIL INSULATING TO-220 Q16 |
| 201-00030-05 | WIRE #1 T/C WIRE 7/0.2MM PVC GREEN 1x 265mm | 362-00010-13 | BUSH INSULATING 1.1MM TOP HAT Q16 |
| 201-00030-06 | WIRE #1 T/C WIRE 7/0.2MM PVC BLUE 1x 410mm | 362-00010-33 | GROMMET LED MTG 3MM |
| 201-00030-07 | WIRE #1 T/C WIRE 7/0.2MM PVC VIOLET 1x 410mm | 365-00011-53 | LABEL 104*37MM |
| 201-00030-09 | WIRE #1 T/C WIRE 7/0.2MM PVC WHITE 1x 285mm | 365-01540-00 | LABEL PA TYPE APPL/SERIAL NO |
| 201-00030-10 | WIRE #1 T/C WIRE 7/0.2MM PVC BLACK 1x 310mm, 3x 25mm-FOR LEDS | 369-00010-14 | TIE CABLE NYLON 100*2.6MM |
| 201-00050-12 | CABLE AUTO 152 RED 28/0.3MM PVC 1x 290mm, 1x 220mm | 399-00010-56 | BAG PLASTIC 200*250MM |
| 201-00050-20 | CABLE AUTO 152 BLACK 28/0.3MM PVC 1x 40mm | 400-00020-69 | HEATSHRINK 12.7MM |
| 206-00010-11 | CABLE COAX 50 OHM RG316-U PTFE 2x 790mm (90 deg phase section) | 410-01081-00 | CRTN T800 PRNTD 402X192X66MM |
| 209-00010-25 | STRIP CU 3*0.35 SLOT CAR TRACK | | |
| 219-02609-00 | COAX 190MM 1 MINI PIN 1 PNL JK | | |
| 220-01197-02 | PCB T828 PA | | |
| 240-02010-54 | SKT 15W DRANGE PNL MTG 125 C | | |
| 240-02100-06 | SKT COAX N TYPE PNL MTG OPEN TERMN | | |
| 240-06010-14 | CLAMP LATCHING 15 W D RANGE | | |
| 240-06010-15 | BLOCK LATCHING 15W D RANGE | | |
| 303-23117-00 | COVER SIDE COMPL A2M2223 | | |
| 303-50005-00 | CONTACT A4M2311 SPRING EARTH | | |
| 308-01007-01 | HANDLE BASE STATION SERIES II | | |
| 308-13068-01 | HSINK DIECAST A1M2274 | | |
| 316-06617-00 | PNL PA NO INP DRV SER II SNGL | | |
| 316-85018-00 | PIN A4M1397 COAX CONDUCTOR N-type connector extension | | |
| 319-01147-00 | SHIELD A3M2224 WALL T859 PA | | |
| 319-01148-00 | SHIELD A3M2225 LID T859 PA | | |
| 345-00040-06 | SCRW M3*8MM P/POZ ST BZ | | |
| 345-00040-16 | SCRW M3X20MM P/POZ ST BZ | | |
| 349-00020-07 | SCRW 4-40 X 5/16 P/POZ T/T BLK | | |

T828 Grid Reference Index (IPN 220-01197-02)**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 |
|--------|------|---------|--------|------|---------|--------|------|---------|--------|------|---------|
| C76 | 1:N7 | 2-B6 | C240 | 1:E3 | 1-G1 | IC1 | 1:N3 | 2-H0 | Q2 | 1:K3 | 1-L8 |
| C77 | 1:N7 | 2-C6 | C241 | 1:E3 | 1-H1 | | | 2-F7 | Q3 | 1:G6 | 1-F3 |
| C78 | 1:N7 | 2-D5 | C242 | 1:E3 | 1-H2 | | | 2-E4 | Q4 | 1:G3 | 1-F1 |
| C80 | 1:N3 | 2-F6 | C243 | 1:D4 | 1-J1 | | | 2-N4 | Q10 | 1:N7 | 2-B7 |
| C81 | 1:N2 | 2-G5 | C244 | 1:J4 | 1-A2 | | | 2-N1 | Q11 | 1:N7 | 2-D6 |
| C84 | 1:N6 | 2-C4 | C245 | 1:F4 | 1-F2 | IC2 | 1:N6 | 2-K4 | Q12 | 1:N6 | 2-C4 |
| C85 | 1:N6 | 2-C4 | C250 | 1:J5 | 1-B3 | IC3 | 1:M4 | 2-J7 | Q13 | 1:N6 | 2-D4 |
| C86 | 1:N4 | 2-E3 | C251 | 1:H6 | 1-C3 | | | 2-H6 | Q14 | 1:P3 | 2-P1 |
| C87 | 1:L2 | 2-G3 | C252 | 1:H6 | 1-D3 | | | 2-H3 | Q15 | 1:M6 | 2-Q4 |
| C90 | 1:N5 | 2-K4 | C253 | 1:H5 | 1-D3 | | | | Q16 | 1:M7 | 2-R4 |
| C91 | 1:P6 | 2-N4 | C254 | 1:H6 | 1-E3 | L11 | 1:N4 | 1-N9 | | | |
| C92 | 1:N3 | 2-P5 | C255 | 1:G4 | 1-E4 | L200 | 1:K7 | 1-C7 | R36 | 1:P6 | 2-C5 |
| C93 | 1:M3 | 2-N5 | C256 | 1:G4 | 1-F4 | L201 | 1:K6 | 1-C7 | R38 | 1:N4 | 2-E6 |
| C95 | 1:N3 | 2-H0 | C257 | 1:G6 | 1-F3 | L202 | 1:L6 | 1-D9 | R39 | 1:N4 | 2-E5 |
| C96 | 1:N3 | 2-N2 | C258 | 1:F6 | 1-G3 | L203 | 1:L5 | 1-D9 | R42 | 1:N3 | 2-G6 |
| C99 | 1:N3 | 2-M0 | C259 | 1:F6 | 1-G3 | L204 | 1:J6 | 1-D7 | R44 | 1:M3 | 2-H6 |
| C100 | 1:N3 | 2-N4 | C260 | 1:E6 | 1-H3 | L205 | 1:K5 | 1-E8 | R47 | 1:N4 | 2-F5 |
| C101 | 1:P3 | 2-P1 | C261 | 1:E5 | 1-H3 | L206 | 1:L5 | 1-G7 | R49 | 1:P7 | 2-C5 |
| C103 | 1:M6 | 2-Q4 | C262 | 1:D5 | 1-J4 | L207 | 1:L4 | 1-J7 | R50 | 1:P6 | 2-D5 |
| C104 | 1:N5 | 2-R5 | C263 | 1:D5 | 1-J3 | L209 | 1:L4 | 1-L7 | R55 | 1:N4 | 2-E3 |
| C105 | 1:M6 | 2-R5 | C264 | 1:F5 | 1-G4 | L210 | 1:K2 | 1-L8 | R56 | 1:N4 | 2-F4 |
| C107 | 1:N4 | 2-H7 | C265 | 1:D5 | 1-L2 | L211 | 1:L2 | 1-L9 | R58 | 1:N4 | 2-H5 |
| C108 | 1:M3 | 2-J6 | C269 | 1:D4 | 1-L2 | L212 | 1:K2 | 1-M8 | R61 | 1:N6 | 2-L4 |
| C109 | 1:N4 | 2-J4 | C270 | 1:D5 | 1-L3 | L213 | 1:K2 | 1-N8 | R62 | 1:N5 | 2-L4 |
| C111 | 1:N7 | 2-A7 | C271 | 1:C5 | 1-N3 | L213A | 1:J2 | 1-P7 | R64 | 1:N3 | 2-N4 |
| C112 | 1:N6 | 2-B4 | C271A | 1:C5 | 1-M3 | L219 | 1:K4 | 1-A2 | R67 | 1:N3 | 2-M2 |
| C200 | 1:K7 | 1-B7 | C272 | 1:D6 | 1-P3 | L220 | 1:J5 | 1-B3 | R68 | 1:N3 | 2-L2 |
| C201 | 1:L7 | 1-B7 | C273 | 1:D7 | 1-M1 | L221 | 1:J4 | 1-B2 | R73 | 1:N3 | 2-N2 |
| C202 | 1:M6 | 1-C9 | C274 | 1:D7 | 1-N1 | L222 | 1:J3 | 1-C1 | R74 | 1:N3 | 2-N1 |
| C203 | 1:L6 | 1-D9 | C275 | 1:C4 | 1-N2 | L223 | 1:H3 | 1-D1 | R75 | 1:N3 | 2-P1 |
| C204 | 1:L6 | 1-D8 | C276 | 1:B4 | 1-P2 | L224 | 1:H2 | 1-F1 | R76 | 1:P3 | 2-P1 |
| C205 | 1:K6 | 1-C7 | C277 | 1:B4 | 1-P2 | L225 | 1:G4 | 1-F2 | R77 | 1:N3 | 2-P5 |
| C206 | 1:K5 | 1-E7 | C278 | 1:B5 | 1-P2 | L226 | 1:F3 | 1-F2 | R78 | 1:N6 | 2-Q4 |
| C207 | 1:K5 | 1-E8 | C279 | 1:B5 | 1-Q2 | L229 | 1:F3 | 1-G2 | R79 | 1:N3 | 2-N5 |
| C208 | 1:L6 | 1-E9 | C280 | 1:B5 | 1-Q2 | L230 | 1:E3 | 1-H2 | R80 | 1:M6 | 2-Q5 |
| C209 | 1:L5 | 1-G8 | C281 | 1:B6 | 1-R2 | L240 | 1:J6 | 1-C3 | R81 | 1:N4 | 2-D6 |
| C210 | 1:L4 | 1-G8 | C282 | 1:K5 | 1-E7 | L241 | 1:H6 | 1-D3 | R82 | 1:N4 | 2-D6 |
| C211 | 1:L4 | 1-J8 | C283 | 1:D7 | 1-M2 | L242 | 1:H6 | 1-F3 | R83 | 1:N4 | 2-D3 |
| C213 | 1:K4 | 1-J7 | C286 | 1:E3 | 1-H1 | L243 | 1:G4 | 1-F4 | R84 | 1:N4 | 2-D4 |
| C214 | 1:L2 | 1-L9 | C287 | 1:E5 | 1-H3 | L244 | 1:F5 | 1-F4 | R85 | 1:M4 | 2-F3 |
| C215 | 1:L3 | 1-L8 | C288 | 1:G5 | 1-E3 | L245 | 1:F6 | 1-G4 | R86 | 1:M3 | 2-G6 |
| C216 | 1:K2 | 1-M7 | C289 | 1:G6 | 1-F3 | L246 | 1:E5 | 1-H4 | R87 | 1:N3 | 2-P5 |
| C217 | 1:L3 | 1-M8 | C290 | 1:G3 | 1-E1 | L249 | 1:D5 | 1-L2 | R89 | 1:M6 | 2-R4 |
| C218 | 1:K2 | 1-M7 | C291 | 1:G3 | 1-F1 | L250 | 1:D4 | 1-K3 | R90 | 1:M6 | 2-Q3 |
| C219 | 1:K2 | 1-N7 | C292 | 1:K3 | 1-L7 | L251 | 1:D4 | 1-K2 | R92 | 1:L2 | 2-D3 |
| C220 | 1:K2 | 1-N8 | C300 | 1:H4 | 1-C2 | L254 | 1:C4 | 1-N3 | R93 | 1:M2 | 2-F5 |
| C220A | 1:J2 | 1-P8 | C301 | 1:H4 | 1-D2 | L255 | 1:B4 | 1-P3 | R94 | 1:N2 | 2-F7 |
| C221 | 1:L3 | 1-M8 | | | | L256 | 1:B4 | 1-P2 | R95 | 1:N3 | 2-M1 |
| C223 | 1:K2 | 1-M7 | D3 | 1:M2 | 2-A1 | L257 | 1:B5 | 1-Q3 | R96 | 1:M3 | 2-K7 |
| C229 | 1:K4 | 1-A2 | D5 | 1:P7 | 2-C6 | L258 | 1:B6 | 1-R3 | R97 | 1:M4 | 2-K4 |
| C230 | 1:J5 | 1-A2 | D6 | 1:M2 | 2-G5 | L259 | 1:E3 | 1-H2 | R98 | 1:N5 | 2-M5 |
| C231 | 1:J3 | 1-B1 | | | | L260 | 1:D6 | 1-M2 | R99 | 1:N5 | 2-M4 |
| C232 | 1:H3 | 1-C1 | D10 | 1:P7 | 2-C4 | L260A | 1:C5 | 1-N3 | R100 | 1:N5 | 2-M4 |
| C234 | 1:H3 | 1-D1 | D11 | 1:P6 | 2-D4 | L261 | 1:E5 | 1-H4 | R200 | 1:K7 | 1-B7 |
| C235 | 1:H3 | 1-D1 | D13 | 1:L2 | 2-F2 | L300 | 1:H4 | 1-C2 | R201 | 1:K7 | 1-B7 |
| C236 | 1:H3 | 1-E1 | | | | | | | R202 | 1:K7 | 1-B7 |
| C237 | 1:G2 | 1-F2 | D200 | 1:C5 | 1-N3 | PL1 | 1:E5 | 2-B0 | R203 | 1:L7 | 1-B7 |
| C238 | 1:F3 | 1-G1 | D201 | 1:D7 | 1-M2 | | | | R204 | 1:L6 | 1-D8 |
| C239 | 1:F3 | 1-G1 | | | | Q1 | 1:K6 | 1-D7 | R205 | 1:L6 | 1-D9 |

| <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> |
|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|
| R206 | 1:K6 | 1-D7 | | | | | | | | | |
| R207 | 1:L5 | 1-G7 | | | | | | | | | |
| R208 | 1:M5 | 1-G7 | | | | | | | | | |
| R209 | 1:L3 | 1-L7 | | | | | | | | | |
| R210 | 1:L3 | 1-L8 | | | | | | | | | |
| R211 | 1:L2 | 1-L8 | | | | | | | | | |
| R212 | 1:L3 | 1-L9 | | | | | | | | | |
| R213 | 1:L5 | 1-C8 | | | | | | | | | |
| R214 | 1:K6 | 1-D8 | | | | | | | | | |
| R215 | 1:K6 | 1-D7 | | | | | | | | | |
| R216 | 1:K6 | 1-D7 | | | | | | | | | |
| R217 | 1:K4 | 1-K8 | | | | | | | | | |
| R218 | 1:K4 | 1-K8 | | | | | | | | | |
| R219 | 1:K4 | 1-K8 | | | | | | | | | |
| R219A | 1:K4 | 1-K7 | | | | | | | | | |
| R220 | 1:J5 | 1-B2 | | | | | | | | | |
| R221 | 1:G2 | 1-F2 | | | | | | | | | |
| R222 | 1:H3 | 1-F1 | | | | | | | | | |
| R223 | 1:F4 | 1-G2 | | | | | | | | | |
| R224 | 1:G7 | 1-F4 | | | | | | | | | |
| R225 | 1:H6 | 1-F3 | | | | | | | | | |
| R226 | 1:F5 | 1-G4 | | | | | | | | | |
| R227 | 1:F4 | 1-G4 | | | | | | | | | |
| R228 | 1:F4 | 1-G2 | | | | | | | | | |
| R230 | 1:E4 | 1-K3 | | | | | | | | | |
| R231 | 1:E4 | 1-K2 | | | | | | | | | |
| R232 | 1:C6 | 1-N2 | | | | | | | | | |
| R233 | 1:D6 | 1-M3 | | | | | | | | | |
| R250 | 1:G4 | 1-E4 | | | | | | | | | |
| R260 | 1:D6 | 1-M2 | | | | | | | | | |
| R290 | 1:D7 | 1-M2 | | | | | | | | | |
| R291 | 1:D7 | 1-N1 | | | | | | | | | |
| R292 | 1:D7 | 1-N2 | | | | | | | | | |
| R293 | 1:D7 | 1-N4 | | | | | | | | | |
| R294 | 1:D7 | 1-P3 | | | | | | | | | |
| R295 | 1:D6 | 1-P4 | | | | | | | | | |
| R300 | 1:H4 | 1-C2 | | | | | | | | | |
| RV43 | 1:N1 | 2-G6 | | | | | | | | | |
| RV48 | 1:P1 | 2-F5 | | | | | | | | | |
| RV52 | 1:M1 | 2-F5 | | | | | | | | | |
| RV57 | 1:L1 | 2-F3 | | | | | | | | | |
| RV63 | 1:N5 | 2-M4 | | | | | | | | | |
| RV69 | 1:N2 | 2-M2 | | | | | | | | | |
| RV74 | 1:P2 | 2-P2 | | | | | | | | | |
| SK1 | 1:L7 | 1-A7 | | | | | | | | | |
| TL1 | 1:J5 | 1-C3 | | | | | | | | | |
| TL2 | 1:D3 | 1-J2 | | | | | | | | | |
| TP1 | 1:N2 | 2-N2 | | | | | | | | | |
| TP2 | 1:N3 | 2-P1 | | | | | | | | | |

Part E T820 VCO PCB Information

This part of the manual provides the parts list, grid reference index, PCB layouts and circuit diagram for the T820 VCO PCB. There is a detailed table of contents at the start of Section 2.

| Section | Title | IPN | Page |
|---------|--------------|--------------|------|
| 1 | Introduction | | 1.1 |
| 2 | T820 VCO PCB | 220-01180-05 | 2.1 |

1 Introduction

PCB Identification

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



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

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

Parts Lists

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

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

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

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

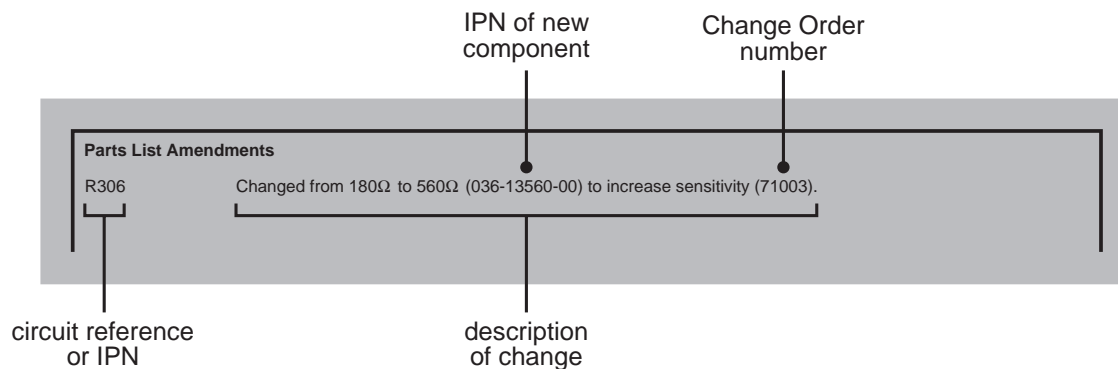
Annotations:

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

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

Parts List Amendments

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



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).

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:

| Device | PCB | Circuit |
|--------|-------|---------|
| C126 | 2:A6 | 2-R7 |
| C127 | 1:A8 | 2-P4 |
| C128 | 2:B7 | 2-P2 |
| C129 | 2:C12 | 2-E3 |
| &C130 | 2:D8 | 2-B8 |
| C131 | 2:C9 | 2-H6 |
| C132 | 2:D8 | 2-B8 |
| C133 | 2:D6 | 2-E1 |

components listed in alphanumeric order

PCB layout reference

circuit diagram reference

component location on the sheet

sheet number

component location on the layer

layer number -
1 = top side layer
2 = bottom side layer

2 T820 VCO PCB

This section contains the following information.

| IPN | Section | Page |
|--------------|----------------------------------|------|
| 220-01180-05 | Parts List | 2.3 |
| | Mechanical & Miscellaneous Parts | 2.5 |
| | Grid Reference Index | 2.6 |
| | PCB Layout - Bottom Side | 2.7 |
| | PCB Layout - Top Side | 2.8 |
| | Circuit Diagram | 2.9 |

T820 VCO Parts List (IPN 220-01180-05)

How To Use This Parts List

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

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

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

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

Parts List Amendments

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

| Ref | Var | IPN | Description | Ref | Var | IPN | Description |
|---------|-----|--------------|--------------------------------|-----|-----|-----|-------------|
| C1 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| &C2 | RX | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V | | | | |
| &C2 | TX | 015-23100-01 | CAP CER 0805 100P 5% NPO 50V | | | | |
| &C3 | RX | 015-22100-01 | CAP CER 0805 10P+-1/2P NPO 50V | | | | |
| &C3 | TX | 015-21820-02 | LJCAP 0805 8P2 15 NPO 50V | | | | |
| &C4 | RX | 015-22180-01 | CAP CER 0805 18P 5% NPO 50V | | | | |
| &C4 | TX | 015-22120-01 | CAP CER 0805 12P 5% NPO 50V | | | | |
| C5 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C6 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C8 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C9 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C10 | | 015-21100-01 | CAP CER 0805 1PO+-1/4P NPO 50V | | | | |
| C11 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C12 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C13 | | 015-22390-01 | CAP CER 0805 39P 5% NPO 50V | | | | |
| C14 | | 015-22820-01 | CAP CER 0805 82P 5% NPO 50V | | | | |
| C15 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C16 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C17 | | 015-25470-08 | CAP CER 0805 47N 10% X7R 50V | | | | |
| C18 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C19 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C20 | | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C21 | RX | 015-21330-01 | CAP CER 0805 3P3+-1/4P NPO 50V | | | | |
| C21 | TX | 015-22560-01 | CAP CER 0805 56P 5% NPO 50V | | | | |
| C22 | RX | 015-21470-01 | CAP CER 0805 4P7+-1/4P NPO 50V | | | | |
| C22 | TX | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V | | | | |
| C23 | RX | 015-24470-08 | CAP CER 0805 4N7 10% X7R 50V | | | | |
| C23 | TX | 015-24100-08 | CAP CER 0805 1N 10% X7R 50V | | | | |
| C24 | | 014-08100-00 | CAP TANT CHIP 10M 16VW +-20% | | | | |
| &C25 | RX | 015-22180-01 | CAP CER 0805 18P 5% NPO 50V | | | | |
| &C25 | TX | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V | | | | |
| &C26 | RX | 015-22270-01 | CAP CER 0805 27P 5% NPO 50V | | | | |
| &C26 | TX | 015-22390-01 | CAP CER 0805 39P 5% NPO 50V | | | | |
| D1 | | 001-10043-90 | S) DIODE SMD BB439 VCAP SOD323 | | | | |
| D2 | | 001-10043-90 | S) DIODE SMD BB439 VCAP SOD323 | | | | |
| D3 | | 001-10043-90 | S) DIODE SMD BB439 VCAP SOD323 | | | | |
| D4 | | 001-10043-90 | S) DIODE SMD BB439 VCAP SOD323 | | | | |
| D5 | | 001-10043-90 | S) DIODE SMD BB439 VCAP SOD323 | | | | |
| D6 | | 001-10043-90 | S) DIODE SMD BB439 VCAP SOD323 | | | | |
| L1 | | 056-14330-02 | (L) IND SMD 3.3UH | | | | |
| L2 | | 056-14330-02 | (L) IND SMD 3.3UH | | | | |
| L3 | | 056-14330-02 | (L) IND SMD 3.3UH | | | | |
| L4 | | 056-14330-02 | (L) IND SMD 3.3UH | | | | |
| L5 | | 056-10100-02 | (L) IND SMD 100NH | | | | |
| L6 | | 056-10033-00 | IND FXD SMD 33NH 3.2*2.5*1.6 | | | | |
| L7 | RX | 056-10330-02 | (L) IND SMD 330NH | | | | |
| L7 | TX | 056-10100-02 | (L) IND SMD 100NH | | | | |
| L8 | RX | 056-10068-02 | (L) IND SMD 68NH | | | | |
| L8 | TX | 056-10100-02 | (L) IND SMD 100NH | | | | |
| &L9 | RX | 055-01005-00 | COIL TROID 280NH 22P 18T T82X | | | | |
| &L9 | TX | 055-01005-00 | COIL TROID 280NH 22P 18T T82X | | | | |
| Q1 | | 000-10003-10 | S) XSTR SMD BFJ310 JFET UHF | | | | |
| Q2 | | 000-10057-10 | S) XSTR SMD BR571 NPN SOT23 | | | | |
| Q3 | | 000-10057-10 | S) XSTR SMD BR571 NPN SOT23 | | | | |
| Q4 | | 000-10008-57 | S) XSTR SMD BCW70 PNP SOT23 SS | | | | |
| Q5 | | 000-10050-00 | S) XSTR SMD BLT50 UHF SOT22 | | | | |
| R1 | | 036-12220-00 | RES M/F 0805 22E 5% | | | | |
| R2 | | 036-12560-00 | RES M/F 0805 56E 5% | | | | |
| R3 | | 036-13560-00 | RES M/F 0805 560E 5% | | | | |
| R4 | | 036-14270-00 | RES M/F 0805 2K7 5% | | | | |
| R5 | | 036-14100-10 | RES M/F 0805 1K 1% | | | | |
| R6 | | 036-14100-10 | RES M/F 0805 1K 1% | | | | |
| R7 | | 036-12220-00 | RES M/F 0805 22E 5% | | | | |
| R8 | | 036-12220-00 | RES M/F 0805 22E 5% | | | | |
| R9 | | 036-13180-00 | RES M/F 0805 180E 5% | | | | |
| R10 | | 036-12100-00 | RES M/F 0805 10E 5% | | | | |
| R11 | | 036-12560-00 | RES M/F 0805 56E 5% | | | | |
| R12 | | 036-13180-00 | RES M/F 0805 180E 5% | | | | |
| R13 | | 036-12270-00 | RES M/F 0805 27E 5% | | | | |
| R14 | | 036-13180-00 | RES M/F 0805 180E 5% | | | | |
| R15 | RX | 036-14560-00 | RES M/F 0805 5K6 5% | | | | |
| R15 | TX | 036-14680-10 | RES M/F 0805 6K8 1% | | | | |
| R16 | | 036-14120-00 | RES M/F 0805 1K2 5% | | | | |
| R17 | | 036-14100-10 | RES M/F 0805 1K 1% | | | | |
| R18 | | 036-12100-00 | RES M/F 0805 10E 5% | | | | |
| R19 | | 036-12100-00 | RES M/F 0805 10E 5% | | | | |
| R20 | | 036-13330-00 | RES M/F 0805 330E 5% | | | | |
| R21 | | 036-12560-00 | RES M/F 0805 56E 5% | | | | |
| R22 | | 036-13470-00 | RES M/F 0805 470E 5% | | | | |
| R23 | | 036-12560-00 | RES M/F 0805 56E 5% | | | | |
| &VC1-RX | RX | 028-02341-08 | CAP TRIM 1-30P PISTON TRONSER | | | | |
| &VC1-TX | TX | 028-02400-02 | CAP TRM SMD 5/40P JZ400 | | | | |

T820 VCO Mechanical & Miscellaneous Parts (220-01180-05)

| IPN | Description |
|--------------|--------------------------------|
| 220-01180-05 | PCB T820 VCO SI/SII |
| 240-00026-32 | PLUG 32WAY 1ROW PC MTG HARWIN |
| 345-00040-10 | SCRW M3*6MM P/POZ ST BZ |
| 345-00060-08 | SCRW M5 X 16 CH SLOT PLASTIC |
| 350-00016-42 | SPACER 5MM HI 8MM ST 2.5MM HO |
| 352-00010-14 | NUT M5 HEX PLASTIC T800 TOROID |
| 353-00010-10 | WSHR M3 FLAT 7MM*0.6MM ST BZ |
| 353-00010-13 | WSHR M3 S/PROOF INT BZ |
| 353-00010-41 | WSHR M6 NYLON BULTE LOCK |

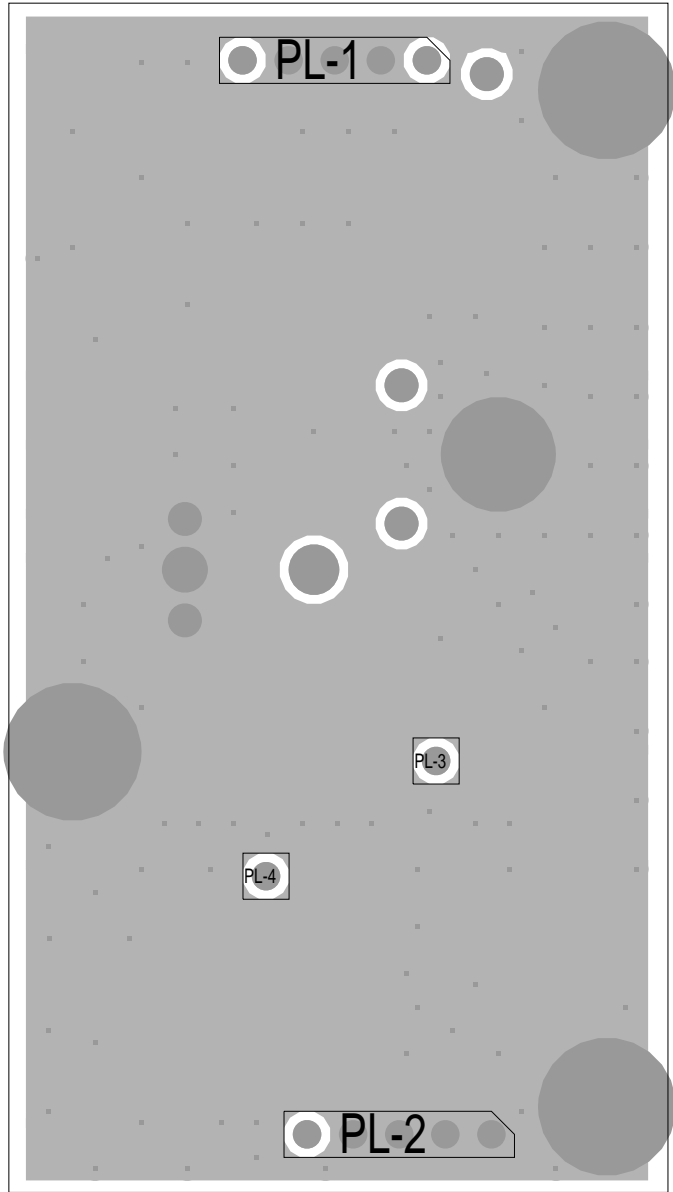
T820 VCO Grid Reference Index (IPN 220-01180-05)

How To Use This Grid Reference Index

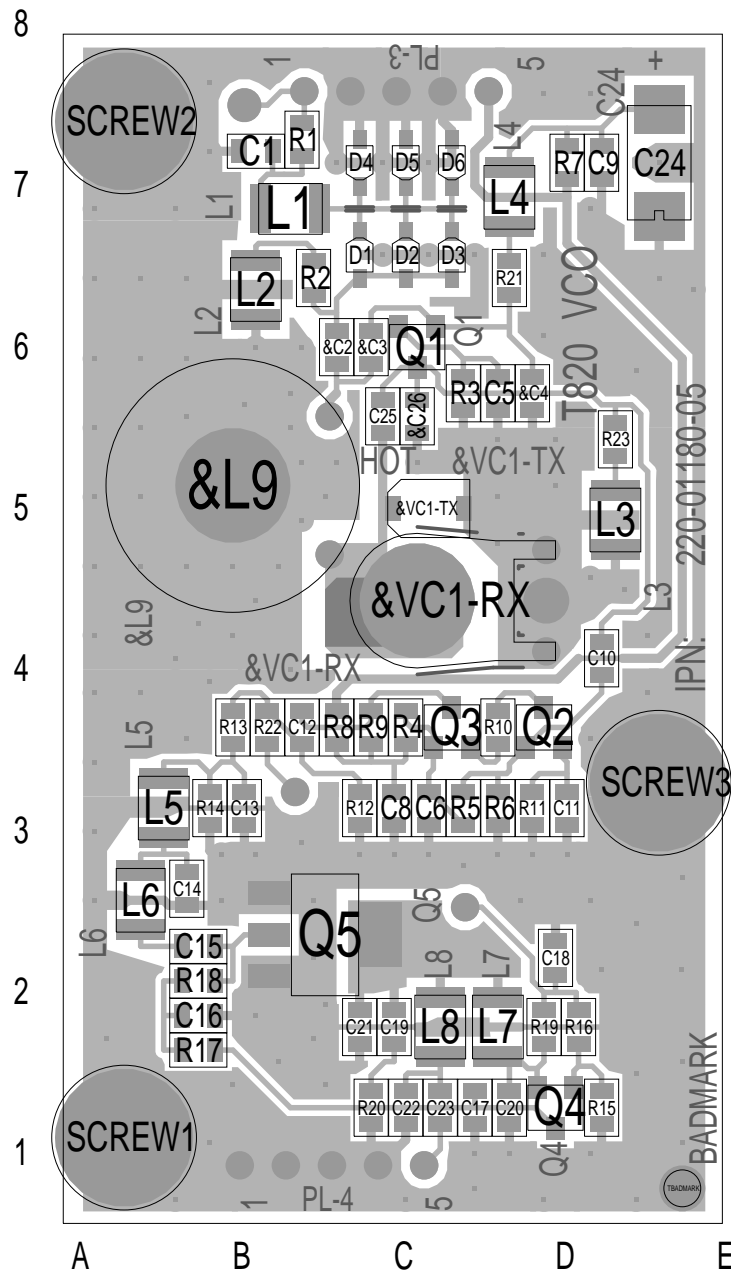
The first digit in the PCB layout reference is a "1" or "2", indicating the top or bottom side layout respectively, and the last two characters give the location of the component on that diagram.

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.

| <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> | <u>Device</u> | <u>PCB</u> | <u>Circuit</u> |
|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|---------------|------------|----------------|
| C1 | 1:B7 | 1-B2 | R6 | 1:D3 | 1-G2 | | | | | | |
| &C2 | 1:C6 | 1-D3 | R7 | 1:D7 | 1-F6 | | | | | | |
| &C3 | 1:C6 | 1-D3 | R8 | 1:C4 | 1-G5 | | | | | | |
| &C4 | 1:D6 | 1-D2 | R9 | 1:C4 | 1-G5 | | | | | | |
| C5 | 1:D6 | 1-F3 | R10 | 1:D4 | 1-G3 | | | | | | |
| C6 | 1:C3 | 1-G3 | R11 | 1:D3 | 1-G2 | | | | | | |
| C8 | 1:C3 | 1-G5 | R12 | 1:C3 | 1-H3 | | | | | | |
| C9 | 1:D7 | 1-F5 | R13 | 1:B4 | 1-H4 | | | | | | |
| C10 | 1:D4 | 1-G2 | R14 | 1:B3 | 1-H3 | | | | | | |
| C11 | 1:D3 | 1-H2 | R15 | 1:D1 | 1-J5 | | | | | | |
| C12 | 1:B4 | 1-H4 | R16 | 1:D2 | 1-J6 | | | | | | |
| C13 | 1:B3 | 1-J3 | R17 | 1:B2 | 1-K5 | | | | | | |
| C14 | 1:B3 | 1-J3 | R18 | 1:B2 | 1-K5 | | | | | | |
| C15 | 1:B2 | 1-J4 | R19 | 1:D2 | 1-K6 | | | | | | |
| C16 | 1:B2 | 1-J5 | R20 | 1:C1 | 1-K5 | | | | | | |
| C17 | 1:D1 | 1-J5 | R21 | 1:D6 | 1-F5 | | | | | | |
| C18 | 1:D2 | 1-J6 | R22 | 1:B4 | 1-H5 | | | | | | |
| C19 | 1:C2 | 1-K5 | R23 | 1:D5 | 1-E3 | | | | | | |
| C20 | 1:D1 | 1-K5 | | | | | | | | | |
| C21 | 1:C2 | 1-K3 | &VC1-RX | 1:D4 | 1-D2 | | | | | | |
| C22 | 1:C1 | 1-L3 | &VC1-TX | 1:C5 | 1-E2 | | | | | | |
| C23 | 1:C1 | 1-L4 | | | | | | | | | |
| C24 | 1:E7 | 1-G5 | | | | | | | | | |
| C25 | 1:C6 | 1-E3 | | | | | | | | | |
| &C26 | 1:C6 | 1-E3 | | | | | | | | | |
| D1 | 1:C7 | 1-B3 | | | | | | | | | |
| D2 | 1:C7 | 1-C3 | | | | | | | | | |
| D3 | 1:C7 | 1-C3 | | | | | | | | | |
| D4 | 1:C7 | 1-B2 | | | | | | | | | |
| D5 | 1:C7 | 1-C2 | | | | | | | | | |
| D6 | 1:C7 | 1-C2 | | | | | | | | | |
| L1 | 1:B7 | 1-B2 | | | | | | | | | |
| L2 | 1:B6 | 1-C2 | | | | | | | | | |
| L3 | 1:D5 | 1-E2 | | | | | | | | | |
| L4 | 1:D7 | 1-F5 | | | | | | | | | |
| L5 | 1:B3 | 1-J4 | | | | | | | | | |
| L6 | 1:A3 | 1-J4 | | | | | | | | | |
| L7 | 1:D2 | 1-K5 | | | | | | | | | |
| L8 | 1:C2 | 1-L4 | | | | | | | | | |
| &L9 | 1:B5 | 1-D3 | | | | | | | | | |
| PL-1 | 2:C8 | 2-G4 | | | | | | | | | |
| PL-2 | 2:C1 | 2-G4 | | | | | | | | | |
| PL-3 | 2:B3 | 2-G3 | | | | | | | | | |
| PL-4 | 2:C3 | 2-H3 | | | | | | | | | |
| Q1 | 1:C6 | 1-F3 | | | | | | | | | |
| Q2 | 1:D4 | 1-G3 | | | | | | | | | |
| Q3 | 1:C4 | 1-G4 | | | | | | | | | |
| Q4 | 1:D1 | 1-K6 | | | | | | | | | |
| Q5 | 1:C2 | 1-K4 | | | | | | | | | |
| R1 | 1:B7 | 1-B2 | | | | | | | | | |
| R2 | 1:C6 | 1-C3 | | | | | | | | | |
| R3 | 1:C6 | 1-F3 | | | | | | | | | |
| R4 | 1:C4 | 1-G5 | | | | | | | | | |
| R5 | 1:C3 | 1-G3 | | | | | | | | | |



T820 VCO PCB (IPN 220-01180-05) - Bottom Side



T820 VCO PCB (IPN 220-01180-05) - Top Side