Part C T800-22-0000 Base Station/Repeater Rack Frame

This part of the manual is divided into three 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	T800-22-0000 PCB Information

1 T800-22-0000 General Information

This section provides a description and specification of the T800-22-0000 base station/ repeater rack frame.

The following topics are covered in this section.

Section	Title	Page
1.1	**The T800-22-0000 Rack Frame**	**1.3**
1.1.1	Panels	1.3
1.1.2	Guides	1.4
1.1.3	Backplane PCB	1.5
1.1.4	Series II Optional Kits	1.6
1.2	**Specifications**	**1.8**

1.1 The T800-22-0000 Rack Frame

The T800-22-0000 is a standard 5U high, 19″ wide base station/repeater rack frame. The rack frame houses the range of T800 Series II modules within the frequency range 66-960MHz, with power outputs ranging from 1-100W. It can be configured as a base station or repeater by changing links on the backplane PCB.

Figure 1.1 shows the mechanical layout of the T800-22-0000 rack frame. This is shown in more detail, along with specific components and parts lists, in Section 3.3.

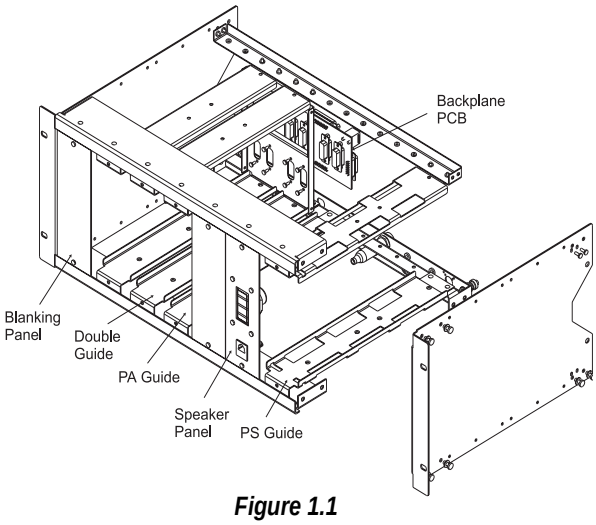


Figure 1.1

A brief description of each component is given below.

1.1.1 Panels

The T800-22-0000 rack frame comes complete with two blank panels and a speaker panel. The placement of these panels is shown above in Figure 1.1, with a front view shown in Figure 1.2.

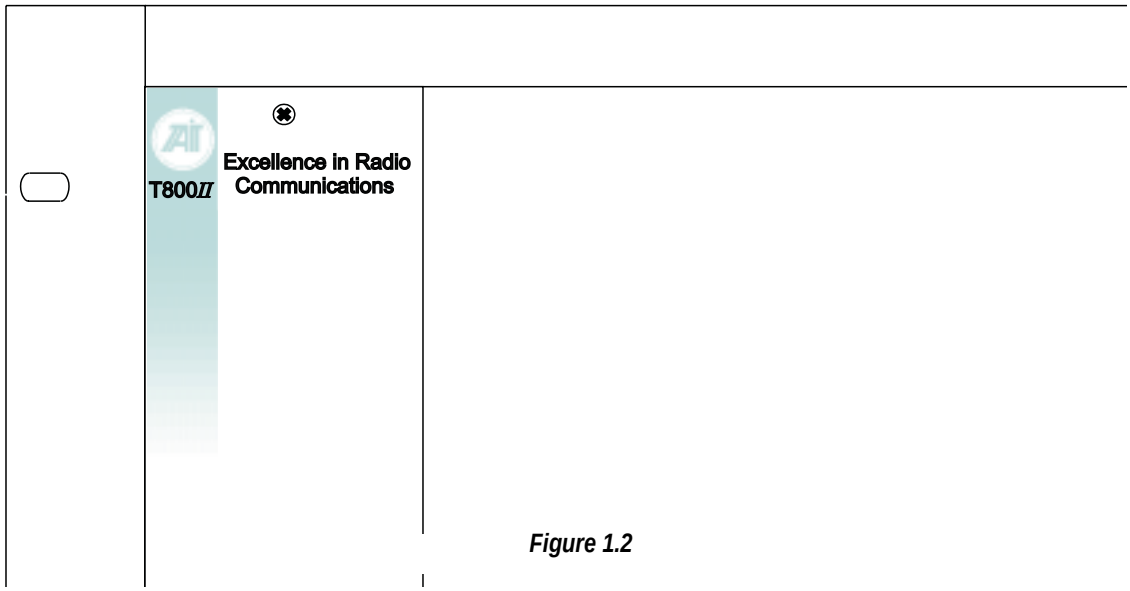


Figure 1.2

Blank Panels

Blank panels are optional, and are used to cover up empty spaces in a rack frame.

Speaker Panel

The speaker panel, shown right, is fitted with an RJ11 connector for programming T800 Series II modules via a programming lead. If the speaker panel needs to be removed, a mirror RJ11 programming port connector is provided on the backplane PCB.

The speaker panel is described further in Section 2.4.

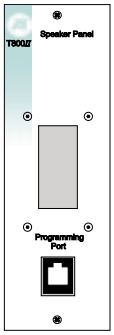


Figure 1.3

1.1.2 Guides

The guide kits listed below are available for the T800-22-0000 rack frame. They are illustrated in Figure 1.1 in this section, and more information can be found in Section 1.1.4 and in Section 3.3.

- **Double guide kit**
  This kit fits into a T800 Series II rack frame and accepts two T800 Series II modules (except for power supplies and power amplifiers which must use their own guides). Refer to Sections 1.1.4 & 3.3 for more information and illustrations.

- **Power Supply (T807/8) guide kit**
  This kit fits into a T800 Series II rack frame and accepts one T800 Series II power supply (refer to Sections 1.1.4 & 3.3 for more information and illustrations).

- **PA (50W) guide kit**
  This kit fits into a T800 Series II rack frame and accepts one T800 Series II 50W power amplifier (refer to Sections 1.1.4 & 3.3 for more information and illustrations).

- **PA (100W) guide kit**
  This kit fits into a T800 Series II rack frame and accepts one T800 Series II 100W power amplifier (refer to Sections 1.1.4 & 3.3 for more information and illustrations).

1.1.3 Backplane PCB

The backplane PCB has been laid out with OEM (Original Equipment Manufacturer) products in mind. The T800-22-0000 rack frame can be configured as either a base station or repeater by means of five link jumpers.

The main components of the backplane PCB are listed below.

- RJ11 connector - used for module programming whenever the speaker panel has been removed
- Two 25-way D-ranges - supplying all Rx and Tx/Ex/PA module pinouts.
- Two channel select DIP switches (SW1 and SW2) - can be operated separately for Rx or Tx/Ex, or combined for a single channel selection across both Rx and Tx/Ex modules. The DIP switches will only work when DR2 is connected to the module.
- A coaxial relay driver (CN1) - used in base station mode.
- A cooling fan driver (CN2) - activated off the Tx key line.

These components are all described further in Section 2.

- A programming connector (CN3) - used for looping the serial programming port from backplane to backplane.

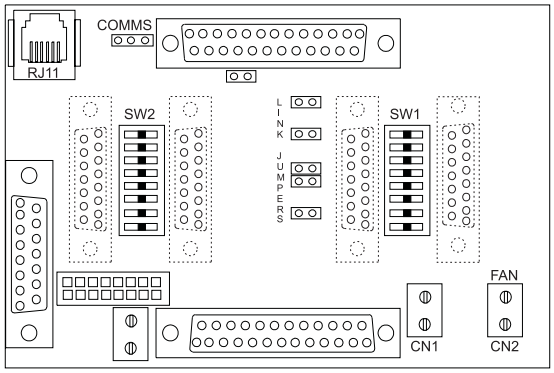


Figure 1.4 Layout Of Backplane PCB 220-01409-01

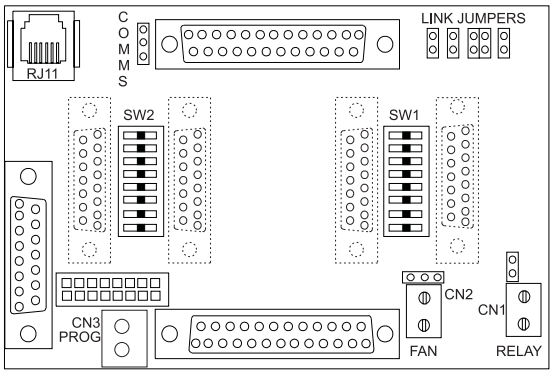


Figure 1.5 Layout Of Backplane PCB 220-01409-03

1.1.4 Series II Optional Kits

There are several Series II optional kits available for the T800-22-0000 rack frame. These are listed below with their appropriate Product Codes which should be used for ordering purposes from your nearest Tait Dealer or Subsidiary.

General Ancillary Kits

- **T004-72** **RF Coaxial relay kit**
  An assembly fitted with three female N-type connectors, complete with a mounting bracket and two coaxial cables terminated in male N-type connectors (refer to Section 2 for more information).

- **T800-03-0000** **Auxiliary D-range kit**
  An additional D-range kit, normally fitted as D-range 2, comprising one D-range plug assembly complete with connecting loom and mounting screws. The ribbon cable loom connects the D-range PCB to the Micromatch socket (SK805) in the microcontroller compartment. This kit is typically used in paging applications and where external channel control is needed.

Front Panel Kits

- **T800-15-0000** **Speaker/Programming port kit**
  A 60mm speaker panel fitted with a 4Ω speaker and complete with mounting hardware (refer to page 1.4 in this section, and Sections 2 & 3 for illustrations and more information).

- **T800-40-0001** **Blank panel with fitting kit**
  The blank panel is used to cover up empty spaces in a rack frame. The kit comprises the blanking guide, blank panel and mounting screws (refer to Section 3 for illustration).

Rack Ancillaries

- **T800-19-0000** **Rack fan kit - rail mounted**
  This kit features a rack mounting fan which is designed to fit into the base of any standard 483mm rack frame without affecting its ability to house seven modules. The kit contains all mounting hardware.

- **T800-19-0010** **Rack fan kit - Series II guide mounted**
  This kit features a guide mounting fan, and includes all mounting hardware.

Guide Kits

- **T800-41-0002** **Double guide kit**
  This kit fits into a T800 Series II rack frame and accepts two T800 Series II modules (except for power supplies and power amplifiers which must use their own guides). It is supplied disassembled and comprises a top and bottom rail, a double width rear panel, four D-range sockets and mounting screws (refer to Section 3.3 for an illustration and more information).

- **T800-44-0000** **Power Supply (T807/8) guide kit**
  This kit fits into a T800 Series II rack frame and accepts one T800 Series II power supply. It comprises a top and bottom rail and mounting screws (refer to Section 3.3 for an illustration and more information).

- **T800-45-0000** **PA (50W) guide kit**
  This kit fits into a T800 Series II rack frame and accepts one T800 Series II 50W power amplifier. It comprises a top guide stop, a bottom guide rail and mounting screws (refer to Section 3.3 for an illustration and more information).

- **T800-45-0001** **PA (100W) guide kit**
  This kit fits into a T800 Series II rack frame and accepts one T800 Series II 100W power amplifier. It comprises a top guide stop, a bottom guide rail, extra mounting brackets for the double width front panel and mounting screws (refer to Section 3.3 for an illustration and more information).

Rack PCBs

- **T800-50-0000** **Standard rack backplane PCB**
  This PCB is described in detail in Section 1.1.3. Refer to Section 3.2 for illustrations and more information.

- **T800-60-0000** **Personality PCB for monitor and channel select**

1.2 Specifications

The performance figures given are minimum figures, unless otherwise indicated.

Details of test methods and the conditions that apply for safety and EMC testing can be obtained from Tait Electronics Ltd.

General:

Frequency Range	.. base station .. repeater
Coaxial Relay Driver	.. negative volts switched
Cooling Fan Driver	.. negative volts switched
Channel Selection	.. single DIP switches for both Rx and Tx/Ex modules plus parallelled external select line via SK6
Speaker Output	.. 4 Ohm nominal 2W
Programming Port	.. 5V logic levels
Fuse:	
T8x6/T8x8 or 25/50W	.. 15A slow blow
T8x9 100W	.. 30A slow blow
OEM Output Connectors	.. via two 25-way D-range sockets

Wire:

Power supply wire consists of red and black 154 auto cable (41/0.3 PVC). All other wire consists of tinned Copper 7/0.2 PVC coated wire.

Tri-rated cable	.. 56/0.3mm (4.0mm) - 12 AWG
Max. operating temperature	.. 105°C
Voltage rating	.. 600V
Nominal outside dia	.. 4.3mm
Current rating at 30°C	.. 41 amps

Note: Optional Tri-rated cable for power supply feeds is available on request.

Dimensions:

Height	.. 222mm (5U high)
Width	.. 482mm (19″ rack mount)
Length	.. 322mm plus clearance space of 50mm

Weight: .. 4.5kg

2 T800-22-0000 Circuit Operation

This section provides a basic description of the circuit operation of the T800-22-0000 base station/repeater rack frame.

The following topics are covered in this section.

Section	Title	Page
2.1	Channel Select Lines And DIP Switch Operation	2.3
2.2	PGM800Win DIP Switch Assignment	2.4
2.3	Link Configuration	2.5
2.4	Speaker And Programming Port	2.6
2.5	Cooling Fan Driver	2.7
2.6	Coaxial Relay Driver	2.8
2.7	Power Supply Configuration For Backplane PCB	2.9

2.1 Channel Select Lines And DIP Switch Operation

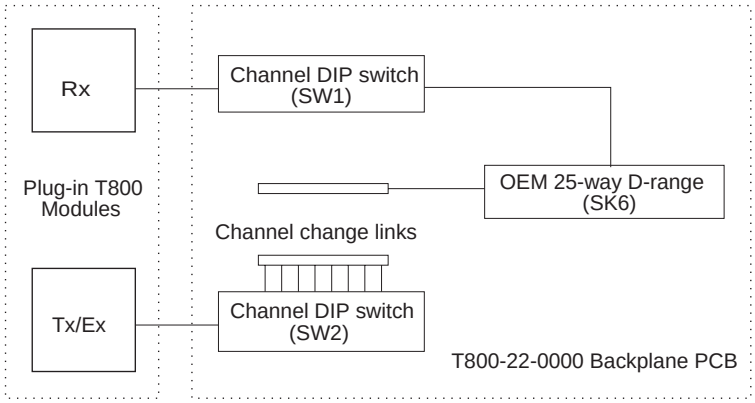


Figure 2.1 Channel Select Lines And DIP Switch Operation

Refer to the above Figure.

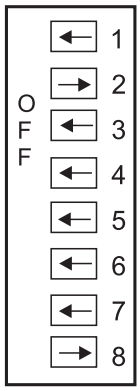
External channel selection is only available if an optional D-range (T800-03-0000) has been fitted to one or both T800 Series II modules.

The channel selection lines need to be set to ground to change their states, as they pull up to 5V normally.

Both Rx and Tx/Ex T800 Series II modules have a separate 8-way DIP switch available on the backplane PCB. You can use this switch to select one channel from any of the channels already programmed into the module by PGM800Win.

Note: Channels 1-128 must be programmed using PGM800Win.

PGM800Win can provide the user with a DIP switch code for each channel address, for example channel 125 will be assigned a switch code of 10000010 (1-128 numbering). In this case the DIP switches should be set as shown at right. (See Section 2.2 for switch assignment).



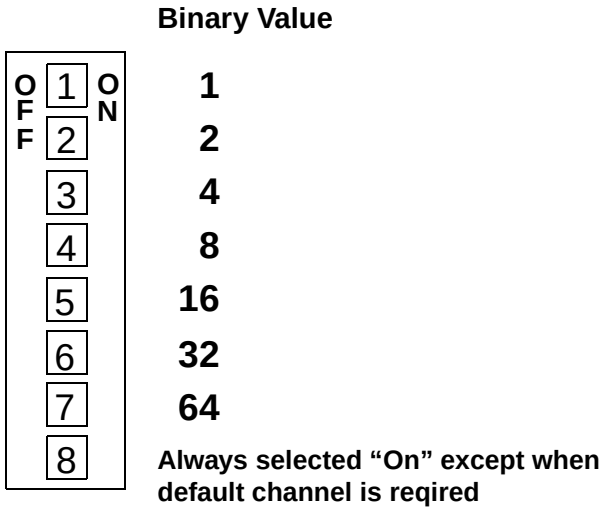
Note: The DIP switch settings override the default channel programmed by PGM800Win. To set a default channel via the software, all DIP switches must be set to "off" (i.e. 00000000).

The channel select DIP switches may also be parallelled for single channel operation across both Rx and Tx/Ex modules. To do this, solder bridge the channel change links, shorting them out. Then set all 8 switches on SW2 to off, and use SW1 for the master channel selection across both modules.

When the two modules have been linked via the channel change links, the channel select lines may also be accessed via the OEM 25-way D-range (SK6 - refer to Figure 2.6).

2.2 PGM800Win DIP Switch Assignment

The DIP switches are a form of binary counting to select channel numbers. The binary value of each DIP switch is shown below.

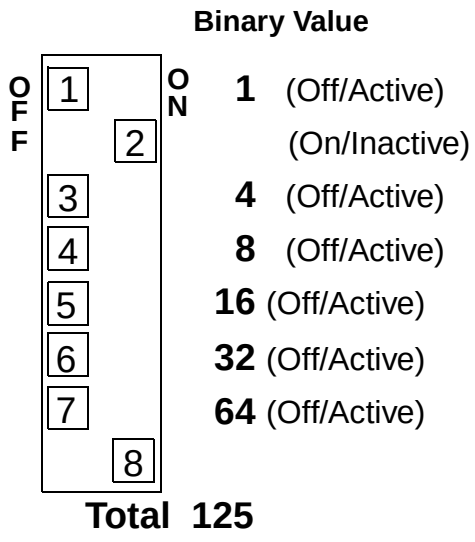


When a switch is "Off" its binary count is active, when a switch is "On" its binary count is inactive.

The various combinations of switching a DIP switch on or off provide a total, which is then the channel number.

To select a channel, set the appropriate DIP switch or switches to "Off" to make the binary count total the channel number you want. Set all other switches to "On".

Example: To select channel 125, the DIP switch settings are as shown below.



2.3 Link Configuration

The backplane PCB has link jumpers which are used for configuring rack frame functions as described in the table below.

Link	Description	Function
1	Audio 1	Fitted for repeater function.
2	Audio 2	Normally fitted LN2-1 to LN3-1 LN2-2 to LN3-2 (centre taps). Only changes for special applications. Contact your nearest Tait Dealer or Subsidiary for more information.
3	Audio 3	
4	Audio 4	Fitted for repeater function.
5	Rx Gate/Tx Key	Fitted for repeater function.
6	Serial Comms	Fitted 1-2 - program through D-range 2. Fitted 2-3 - program through D-range 1.
7	Optional	Link normally fitted.
8 (Backplane PCB 220-01409-03 Only)	Fan Drive	If the link is not fitted there is no fan operation. Fitted 1-2 - fan runs when Tx is keyed. Fitted 2-3 - fan runs continuously.

Note 1: Link LN2-1 to LN3-1
LN2-2 to LN3-2 to set the configuration for a base station.

Note 2: Link LN1 to LN5 to set the configuration for a repeater.

2.4 Speaker and Programming Port

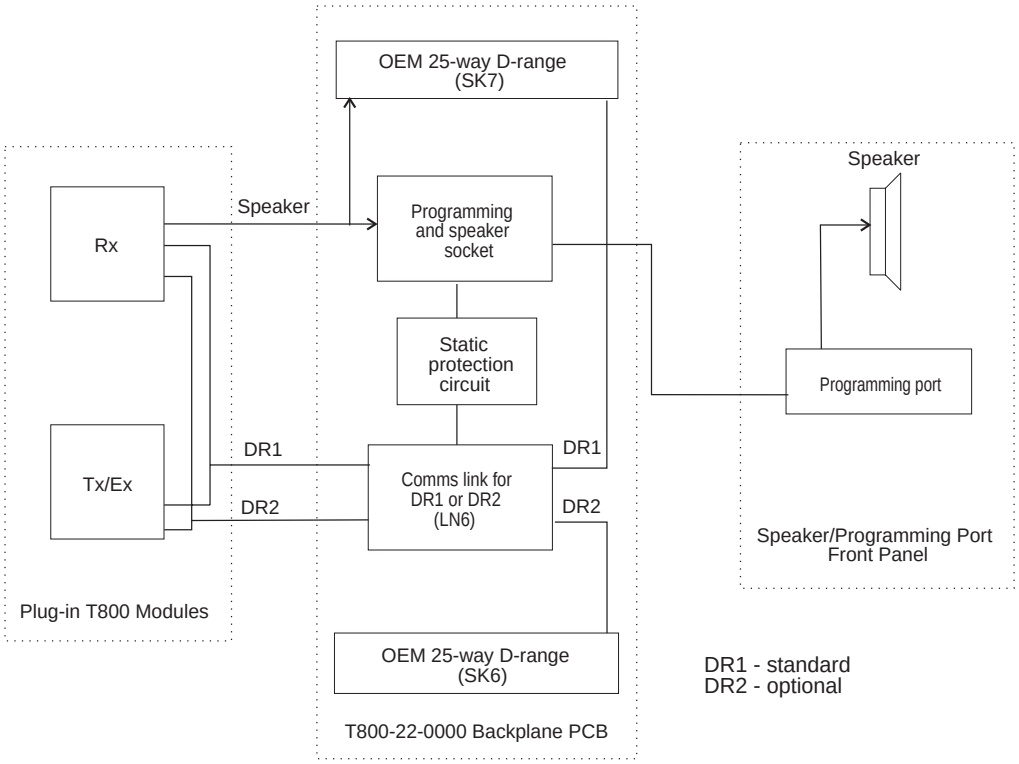


Figure 2.2 Speaker and Programming Port Configuration

The T800-22-0000 has a standard Series II speaker/programming port front panel fitted (T800-15-0000). This panel has an RJ11 connector for programming via the programming lead (T800-01-0002). If the speaker/programming port front panel needs to be removed, a mirror RJ11 programming port connector is provided on the backplane PCB.

There is a static protection circuit for EMC requirements which will dissipate spikes of greater than ±5.6V to ground via both the speaker/programming port front panel socket and the backplane PCB programming socket.

LN6 is used to select the communications link to the module via either DR1 or DR2.

SK/Pin Connections	LN6 Link	Programming Via	D-range Fitted
SK7, Pin 7	Rx1/Tx1, Pins 7/7	DR1, Pin 7	DR1
SK6, Pin 24	Rx2/Tx2, Pins 12/24	DR2 Pin 12 or DR1 Pin 7	DR1 & DR2

2.5 Cooling Fan Driver

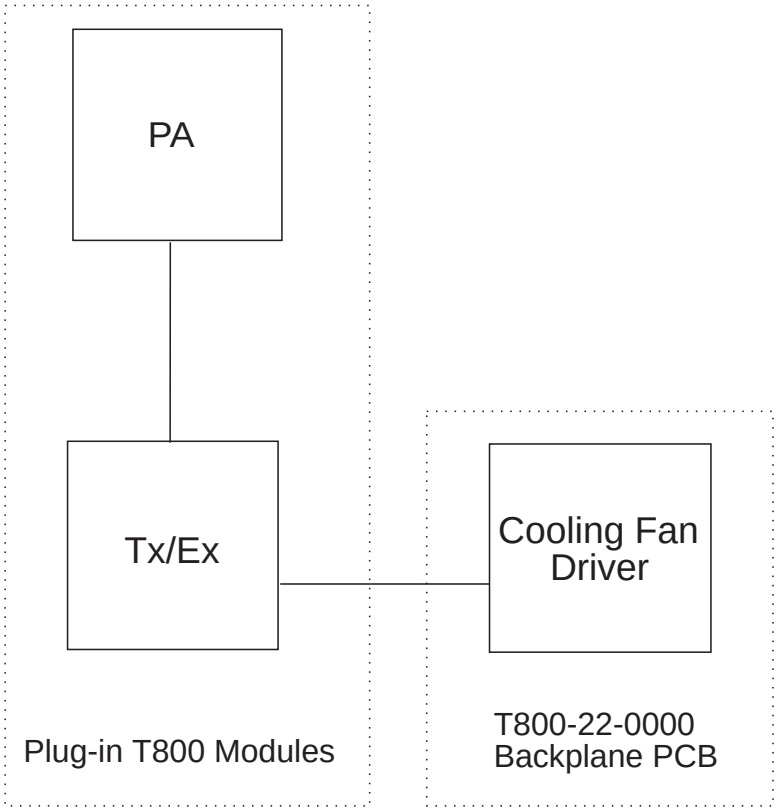


Figure 2.3 Cooling Fan Driver

The fan driver is supplied via a BC327 PNP transistor (Q1), which is switched by the Tx key line (DR1 pin 5 of Tx/Ex) to supply negative volts on CN2 pin 2. (Refer to Section 3.2 for the backplane PCB layout and the location of CN2.) CN2 pin 1 is supplied continuously by +13.8V. The fan and mounting hardware is supplied as optional kits (T800-19-0000 Series II fan mounted underneath the rack frame, T800-19-0010 Series II guide mounted fan.).

The side panels of the rack also provide mounting holes for the old Series I fan assembly. The fan may be fitted in a front, middle or rear mounted position on the guide rails. This hardware is supplied as an optional kit (T800-19).

2.6 Coaxial Relay Driver

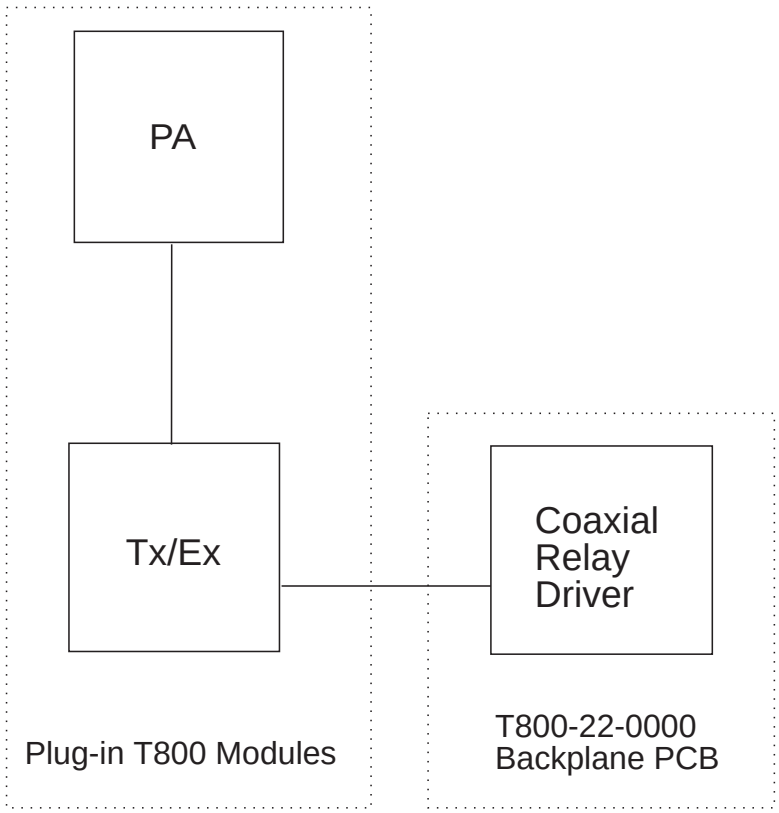


Figure 2.4 Coaxial Relay Driver

The coaxial relay driver connector (CN1) has +13.8V continuously supplied on pin 1. (Refer to Section 3.2 for the backplane PCB layout and the location of CN1.) Negative volts are supplied via CN1 pin 2 from DR2 pin 9 when the optional D-Range (T800-03-0000) is fitted. Modifications to Rx disable should be carried out on the Rx module. The module is linked in via LN7 on the backplane PCB.

The coaxial relay kit (T004-72) is available from your nearest Tait Dealer or Subsidiary.

2.7 Power Supply Configuration For Backplane PCB

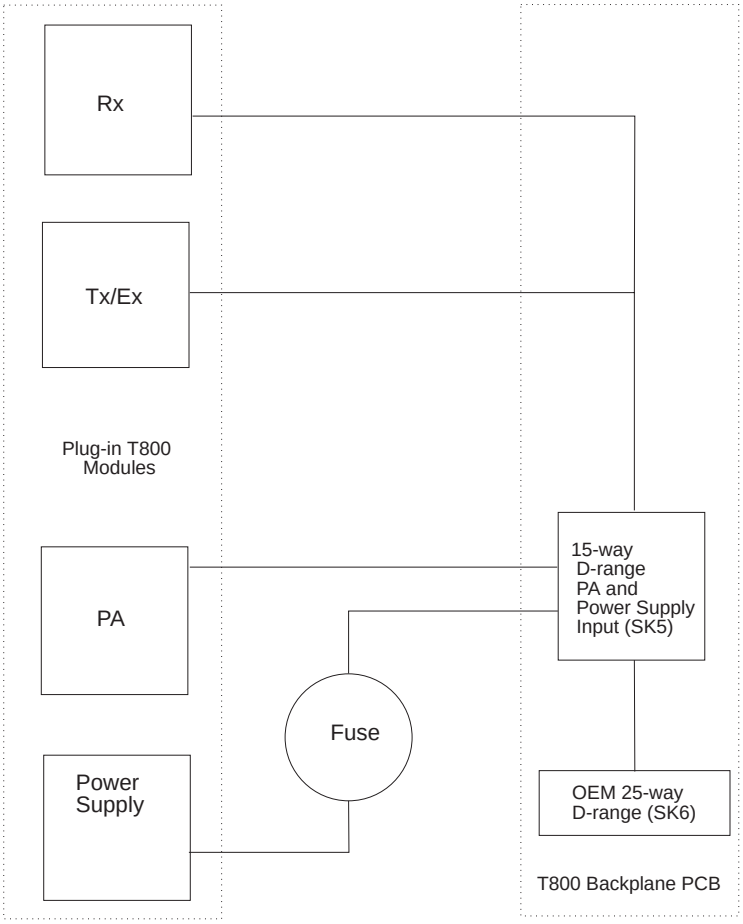


Figure 2.5 Power supply configuration for backplane PCB

The power supply feed is arranged so that maximum voltage and current is supplied to 50/100W PAs (when fitted) and 25W PAs (when higher power modules are not fitted).

The supply is fused between the power supply and high powered PA modules by a Bussmann fuse holder on the rear bottom rail. The following fuses should be used:

- 15A slow blow for T8X6, T8X8
- 30A slow blow for T8X9.

Supply to the backplane PCB is via a 15-way D-range (SK5) which supplies both Rx and Tx/Ex modules. It also provides an OEM power supply on SK6 of +13.8V, 6A.

3 T800-22-0000 PCB Information

This section provides parts lists, mechanical assembly drawings, PCB layouts and circuit diagrams for the base station/repeater rack frame, backplane PCB and personality PCB.

Note: The backplane PCB is available separately under the product code T800-50-0000.

This section contains the following information.

Section	Title	Page
3.1	Introduction	3.1.3
3.2	T800-22-0000 PCB Information	3.2.1
3.3	T800-22-0000 Rack Frame Parts Lists	3.3.1

3.1 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.

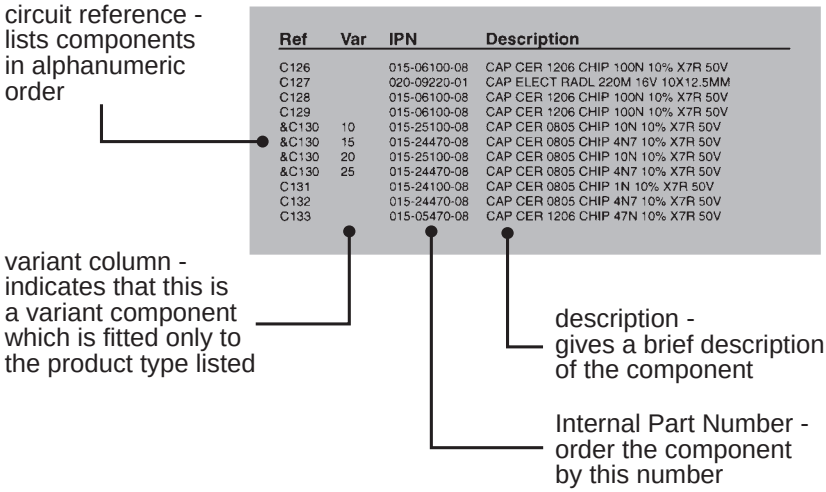
Note: It is important that you identify which issue PCB you are working on so that you can refer to the appropriate set of PCB information.

Parts Lists

The 10 digit numbers (000-00000-00) in this Parts List are "internal part numbers" (IPNs). Your spare parts orders can be handled more efficiently 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.

3.2 T800-22-0000 PCB Information

This section contains the following information on the T800-22-0000 backplane PCB.

Note: The backplane PCB is available separately under the product code T800-50-0000.

IPN	Section	Page
220-01409-00	Parts List For 220-01409-01 And 220-01409-03	3.2.3
	PCB Layout - Bottom Side	3.2.4
	PCB Layout - Top Side	3.2.5
	T800 Receiver Standard Inputs And Outputs	3.2.6
	Receiver Additional Inputs And Outputs	3.2.7
	Transmitter/Exciter Standard Inputs And Outputs	3.2.8
	Transmitter/Exciter Additional Inputs And Outputs	3.2.9
	Power Amplifier Standard Inputs and Outputs	3.2.10
	Circuit Diagram	3.2.11
	Input/Output Pins	3.2.12
	PCB Mechanical Layout	3.2.13
	Personality PCB Mechanical Layout	3.2.14

T800-22-0000 Parts List (IPN 220-01409-01 And IPN 220-01409-03)

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).

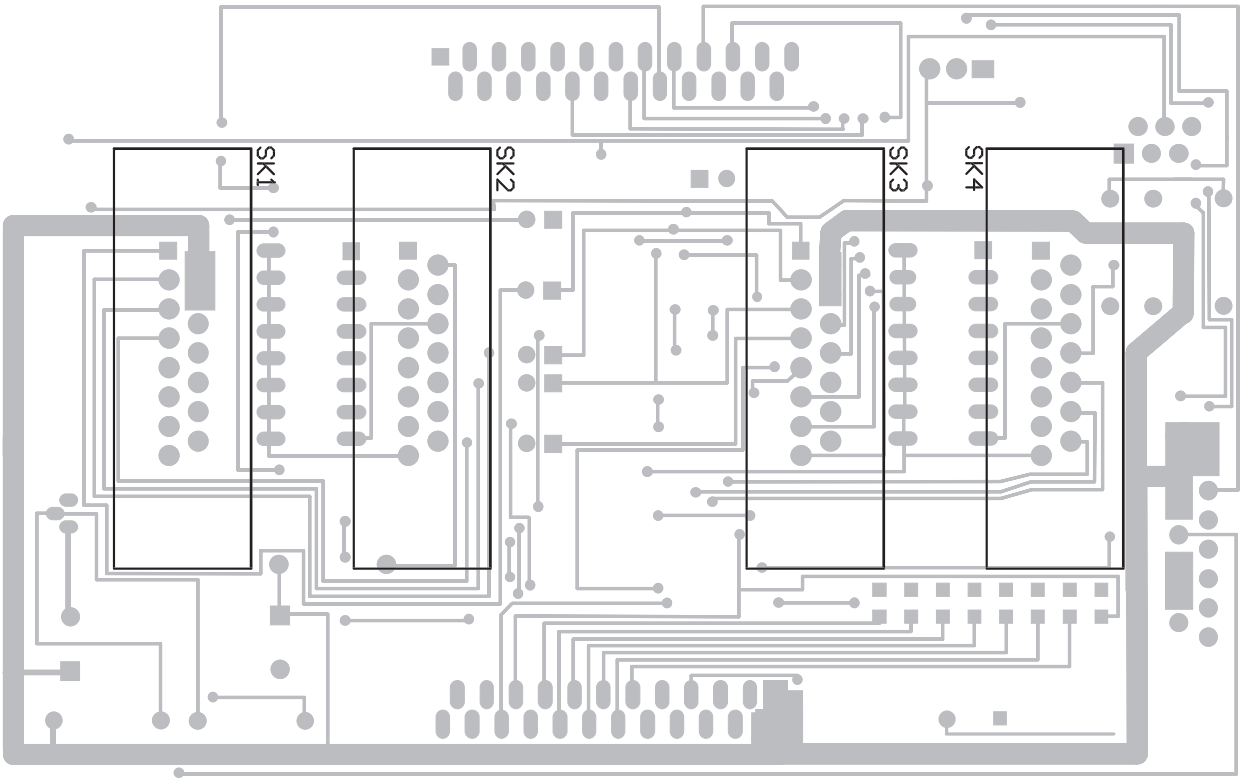
Those with a circuit reference are grouped in alphabetical order and then in numerical order within each group. Each component entry comprises three or four columns: the circuit reference, variant (if applicable), IPN and description. A number in the variant column indicates that this is a variant component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

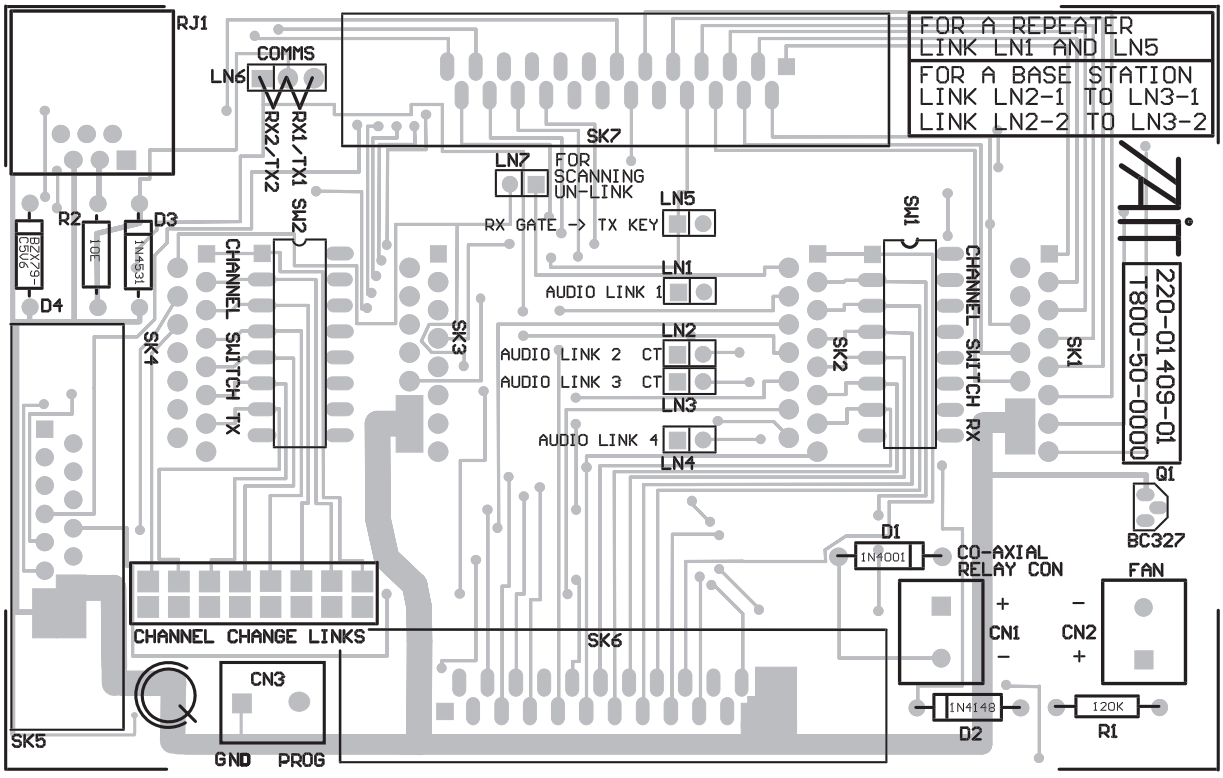
The miscellaneous and mechanical section lists the variant and common parts in IPN order.

Parts List Amendments

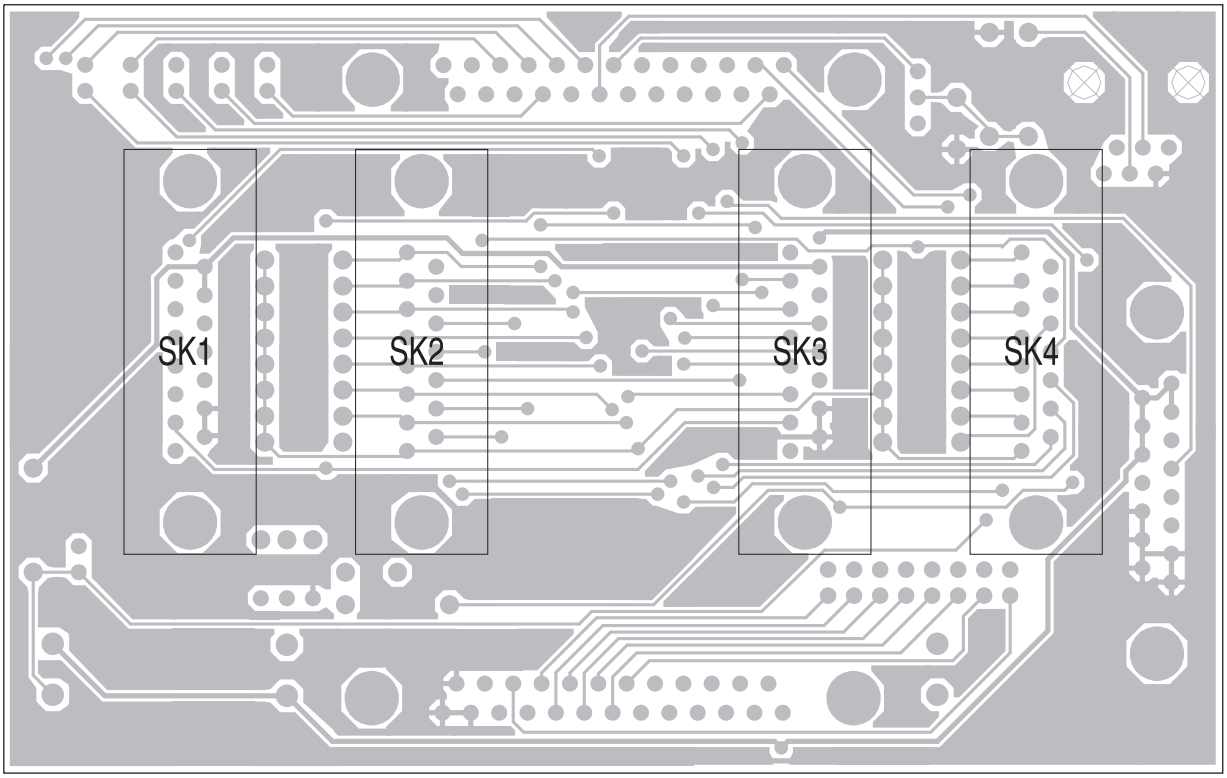
Ref	Var	IPN	Description
CN1		240-04030-09	TERMINAL BLK PCB MTG 2W 5MM LS
CN2		240-04030-09	TERMINAL BLK PCB MTG 2W 5MM LS
CN3		240-04030-09	TERMINAL BLK PCB MTG 2W 5MM LS
D1		001-00011-70	S) DIODE 1N4001 1A/50V
D2		001-50012-00	S) DIODE AI 1N4148 SI
D3		001-50012-05	S) DIODE AI 1N4531 SI S-SIG
D4		001-00015-19	S) DIODE ZEN 5V6 0.4W 2% BZX79
LN1		240-00020-68	HEADER 2W PCB MTG STD
LN2		240-00020-68	HEADER 2W PCB MTG STD
LN3		240-00020-68	HEADER 2W PCB MTG STD
LN4		240-00020-68	HEADER 2W PCB MTG STD
LN5		240-00020-68	HEADER 2W PCB MTG STD
LN6		240-00020-59	HEADER 3W 1R PCB MTG STD
LN7		240-00020-68	HEADER 2W PCB MTG STD
LN8		240-00020-59	HEADER 3W 1R PCB MTG STD
Q1		000-00010-60	S) XSTR BC327 PNP AF PWR TO92
R1		030-56120-20	RES FILM AI 120K 5% 0.4W 4X1.6
R2		030-02100-00	RES FILM 10E 5% 0.25W 7X2.5
RJ1		240-04021-60	SKT P/JACK 6-WAY VER 69254-001
SW1		230-00010-19	SWITCH*8 SPST DIP PKG
SW2		230-00010-19	SWITCH*8 SPST DIP PKG

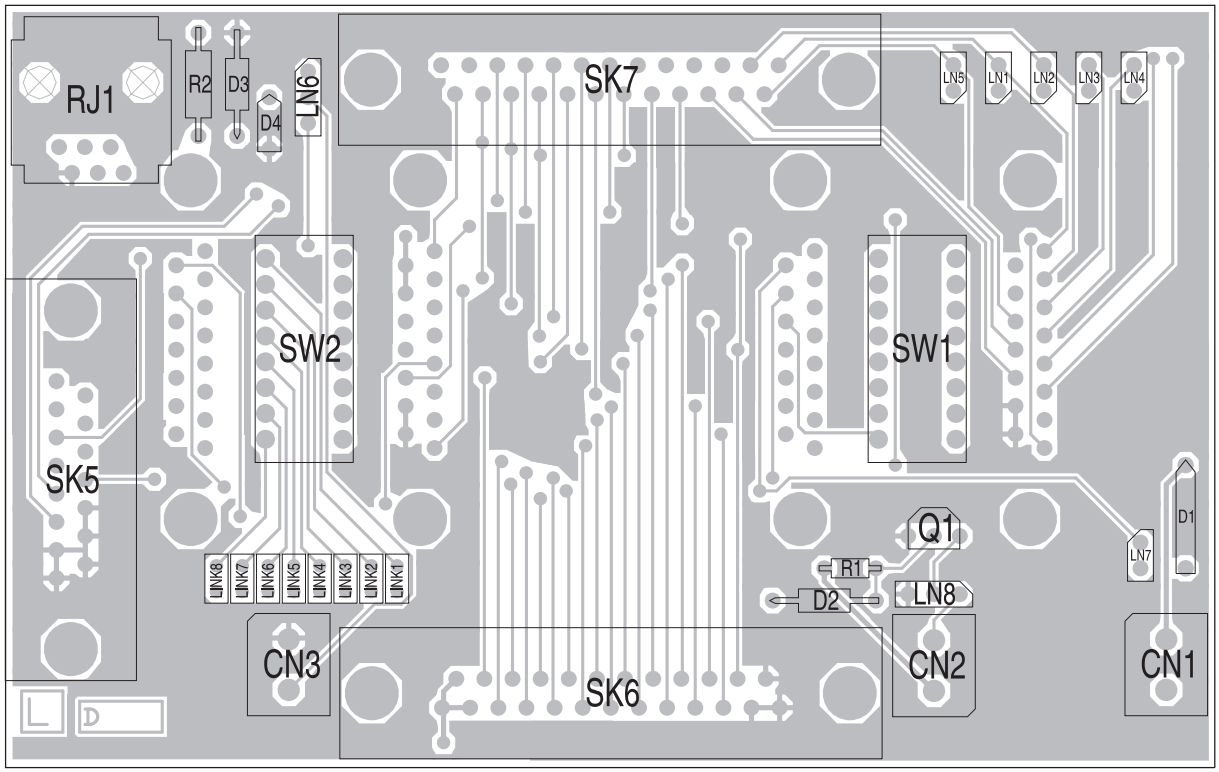
IPN	Legend	Description
220-01409-01		PCB BACKPLANE T800-22-000
220-01409-03		PCB BACKPLANE T800-22-0000
240-02020-15		SKT 15 DRANGE PCB PLUS PCB HW SK5
240-02020-20		SKT 25 DRANGE PCB PLUS FULL HW SK6/7
240-04020-62		SKT 2 W RECEP SHORTING LINK Links LN1-8





T800-22-0000 PCB (IPN 220-01409-01) - Bottom And Top Sides





T800-22-0000 PCB (IPN 220-01409-03) - Bottom And Top Sides

T800 Series II Module Inputs And Outputs

Receiver : Standard Inputs And Outputs

The table below shows standard inputs and outputs for the T800 receiver and corresponding inputs and outputs on the backplane PCB (SK7).

Signal	DR1 Pin	BKPL (SK7)	I/P O/P	Function
Line O/P	1-4	1-4	O/P	Audio output from a 600Ω balanced line transformer. Output level adjustable from -50 to +10dBm via a potentiometer on the front panel. Pins 2 & 3 are usually linked for normal operation.
RSSI	5	5	O/P	Receiver Strength Signal Indicator. Provides a DC voltage proportional to the signal strength of the received signal. Values are: VHF 4.5V @ -100dBm; 1V/15dB (-115 to -70dBm) UHF 2V @ -110dBm; 1V/10dB (-115 to -70dBm). For UHF, optional board must be fitted.
Audio 1	6	6	O/P	Audio 1 allows access to audio before it passes through the squelch circuitry. The output will provide frequencies down to 5Hz when the audio processor is linked for flat response. From Audio 1, audio can be passed to external CTCSS and signalling decoders.
Serial Com/ Audio 2	7	7	I/O	Serial programming input for programming the module. Can be configured as Audio 2 by internal link resistors if required. Audio 2 is an input and when used in conjunction with Audio 1 allows the audio path to be broken so that external audio processing can be used.
Speaker	8	19	O/P	Provides up to 1W into a 4Ω speaker.
Supply Voltage	9-10	-	I/P	DC Supply Voltage input. Nominal 13.8V, can operate from 10.8 to 16V DC.
Gate O/P	11	14	O/P	Pulls low when a signal is received. In a repeater, configuration can be used to key the transmitter by directly connecting it to the Tx Key pin.
Receiver Gate Relay	12 13	15 16	O/P	Relay Common Relay Normally Open A normally open relay contact that closes when a signal is received. The relay will only operate when PL270 is linked.
Ground	14-15	-	I/P	Power supply earth, negative ground.

Receiver : Additional Inputs And Outputs

The table below shows additional inputs and outputs for the T800 receiver and corresponding inputs and outputs on the backplane PCB (SK6).

Signal	DR2 Pin	BKPL (SK6)	I/P O/P	Function
Channel Select 0-6	1 2 3 4 5 6 7	22 9 21 8 20 7 19	I/P	External channel select pins (including Channel Select 7 on pin 11). Normally high, these pins are pulled low to select logic 0. To select a channel the binary equivalent must be applied to the pins. when all pins are left floating (i.e. high) then the selected channel is determined by software (PGM800Win). Note: When using external channel selection, pin 11 must be pulled low.
Ground	8	6	I/P	Power supply earth, negative ground.
Rx Disable	9	18	I/P	When pulled low disables receiver audio output. Usually used in a base station application to ensure there is no interference when the transmitter is operating.
CTCSS Disable	10	5	I/P	Disables CTCSS (Continuous Tone Controlled Squelch System).
Channel Select 7	11	23	I/P	Function as for other channel select lines. Must be pulled low when using external channel selection.
Serial Comm	12	24	I/O	Serial programming input for programming the module. Can be used if it is not possible to program the radio from D-range 1.
Aux-Out 0-2	13 14 15	15 10 11	O/P	Open drain type; capable of sinking 2.25mA via 2k2Ω; V_{ds} max.=5V. Logic state can change when the channel is changed. User definable by using PGM800Win software.

Transmitter/Exciter : Standard Inputs And Outputs

The table below shows standard inputs and outputs for the T800 transmitter/exciter and corresponding inputs and outputs on the backplane PCB (SK7).

Signal	DR1 Pin	BKPL (SK7)	I/P O/P	Function
Line I/P	1-4	22-25	I/P	Audio input to a 600Ω balanced line transformer. For an unbalanced line connect the line I/P 4 to ground. Accepts audio levels as low as -30 dBm. Pins 2 & 3 are usually linked for normal operation.
Tx Enable	5	21	O/P	Pulls low when the transmitter is keyed. Usually connected directly to Tx Key on the PA to activate the PA alarm circuitry.
Audio 2	6	20	I/P	Audio 2 allows audio to be input to the audio processor bypassing the 600Ω line transformer. Ideal place to re-inject audio such as a voice scrambler after external processing.
Serial Com/ Audio 1	7	7	I/O O/P	Serial programming input for programming the module. Can be configured as Audio 1 by internal link resistors if required. Audio 1 allows access to the audio directly after the 600Ω line transformer. When used in conjunction with Audio 2 it allows the audio path to be broken so that external audio processing can be used.
CTCSS	8	18	I/P	An external input for CTCSS or DCS (Digital Coded Squelch).
Supply Voltage	9-10	-	I/P	DC Supply Voltage input. Nominal 13.8V, can operate from 10.8 to 16V DC.
Opto Keys	11 (+) 12 (-)	9 8	I/P	A high isolation keying option. A DC voltage between 6V and 50V applied to these inputs will key the transmitter. The inputs may be used to key the transmitter via a DC remote.
Tx Key	13	17	I/P	A high impedance input which is pulled low to key the transmitter. Must be <0.7V or connected directly to Ground.
Ground	14-15	-	I/P	Power supply earth, negative ground

Transmitter/Exciter : Additional Inputs And Outputs

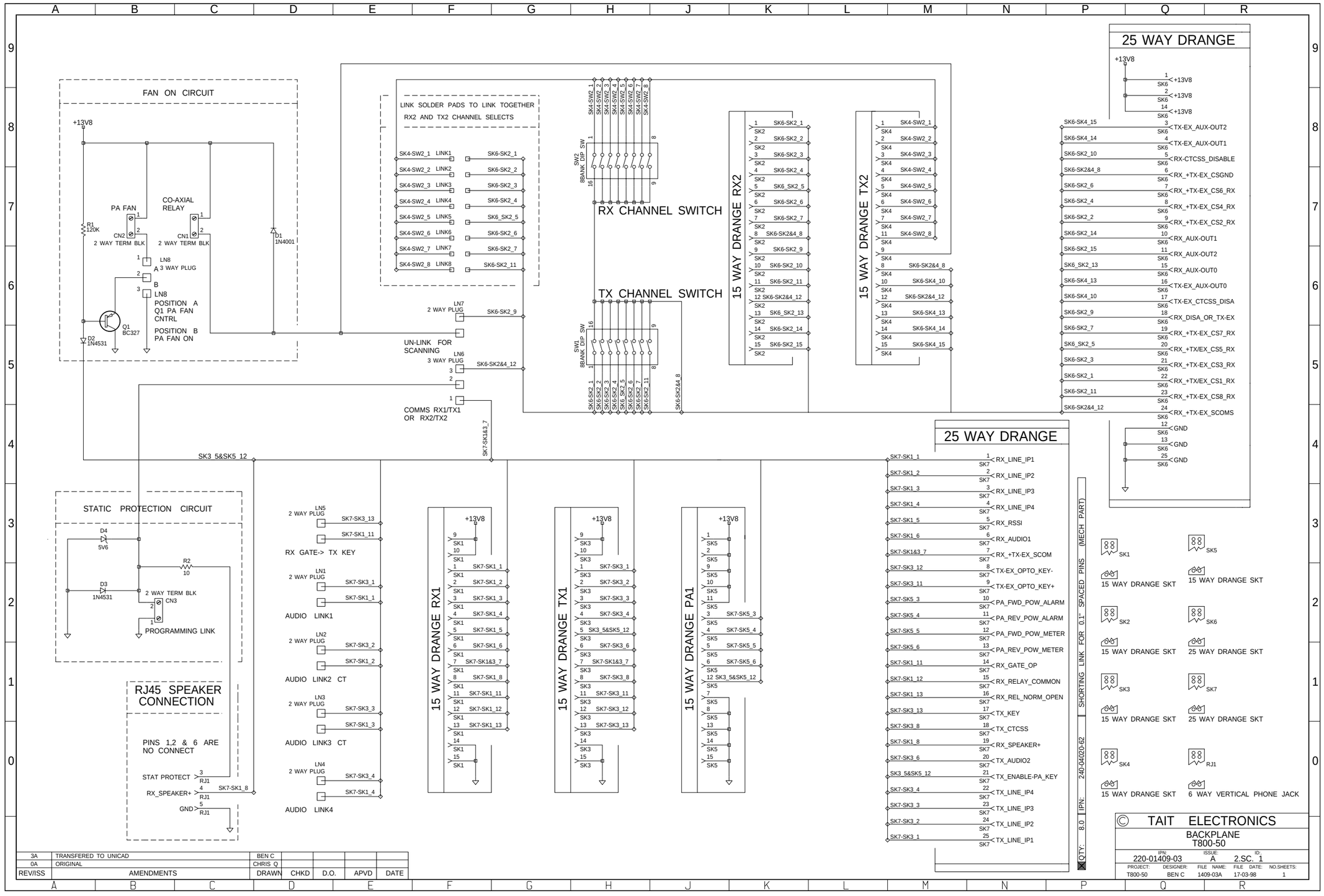
The table below shows the additional pin inputs and outputs for the T800 transmitter/exciter and corresponding inputs and outputs on the backplane PCB (SK6).

Signal	DR2 Pin	BKPL (SK6)	I/P O/P	Function
Channel Select 0-6	1 2 3 4 5 6 7	22 9 21 8 20 7 19	I/P	External channel select pins (including Channel Select 7 on pin 11). Normally high, these pins are pulled low to select logic 0. To select a channel the binary equivalent must be applied to the pins. When all pins are left floating (i.e. high) then the selected channel is determined by software (PGM800Win). Note: When using external channel selection, pin 11 must be pulled low.
Ground	8	6	I/P	Power supply earth, negative ground.
Tx Relay Drive	9	18	I/P	Used for coaxial relay switching. Pulls to ground when the transmitter is keyed.
CTCSS Disable	10	17	I/P	Disables CTCSS (Continuous Tone Controlled Squelch System).
Channel Select 7	11	23	I/P	Function as for other channel select lines. Must be pulled low when using external channel selection.
Serial Comm	12	24	I/O	Serial programming input for programming the module. Can be used if it is not possible to program the radio from D-range 1.
Aux-Out 0-2	13 14 15	16 4 3	O/P	Open drain type; capable of sinking 2.25mA via 2k2Ω; V_{ds} max.=5V. Logic state can change when the channel is changed. User definable by using PGM800Win software.

Power Amplifier : Standard Inputs And Outputs

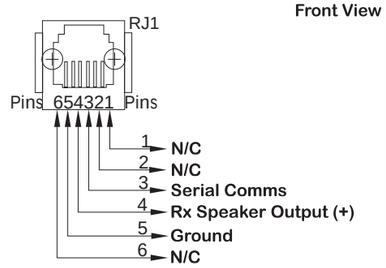
The table below shows the additional pin inputs and outputs for the T800 power amplifier.

Signal	DR1 Pin	BKPL (SK7)	I/P O/P	Function
Supply Voltage	1-2	-	I/P	DC Supply Voltage input. Nominal 13.8V, can operate from 10.8V to 16V DC. Connected to pins 9, 10 and 11.
Forward Power Alarm	3	10	O/P	These are normally low and float if forward power drops below, or reverse power rises above, pre-set limits. They have a 500mA sink capability. A signal is only provided when the Tx Key line on the PA is being pulled low.
Reverse Power Alarm	4	11	O/P	
Forward Power Metering	5	12	O/P	Voltage outputs proportional to the levels of forward and reverse power are available at these pins for metering purposes. There is enough output to drive a coil meter.
Reverse Power Metering	6	13	O/P	
Ground	7-8	-	I/P	Power supply earth, negative ground. Connected to pins 13, 14 and 15.
Supply Voltage	9-11	-	I/P	Function as for Pins 1 and 2.
Tx Key	12	21	I/P	Keys the PA when ground is applied. This line is usually taken to the Tx Enable line on the Exciter.
Ground	13-15	-	O/P	Power supply earth, negative earth.

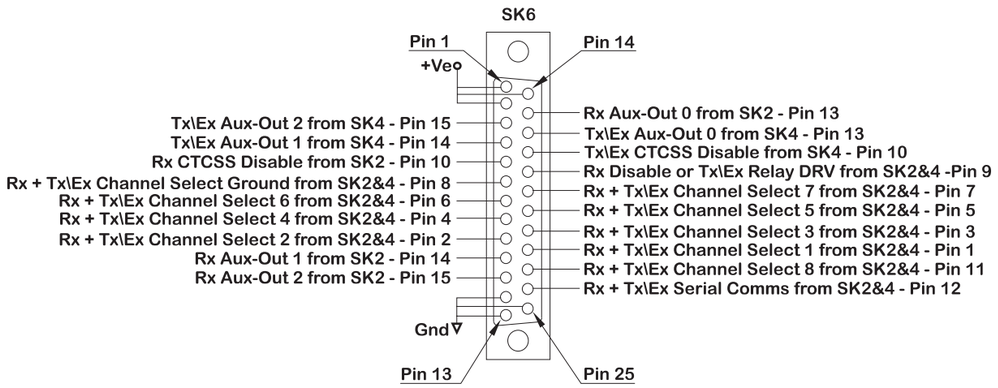


Backplane PCB Circuit Diagram

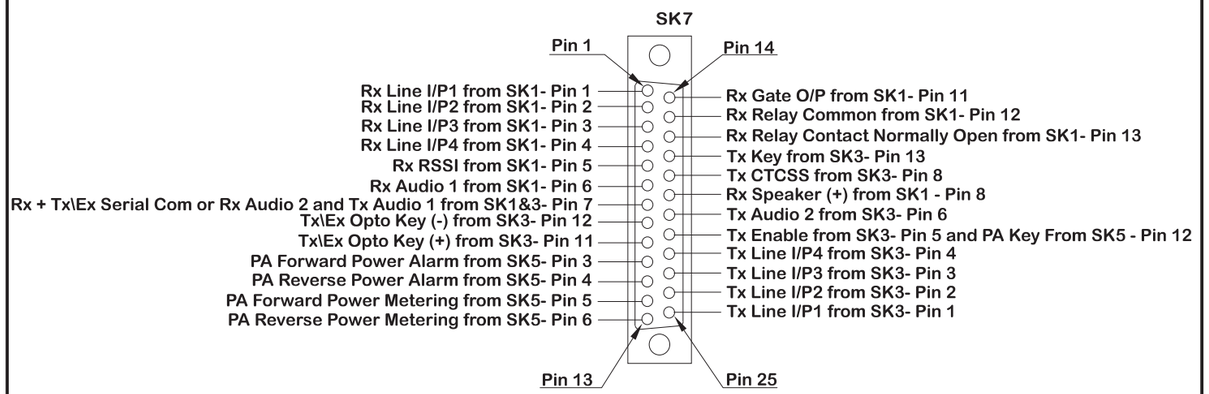
RJ1 Serial Comms and Speaker Output Connector
Front View

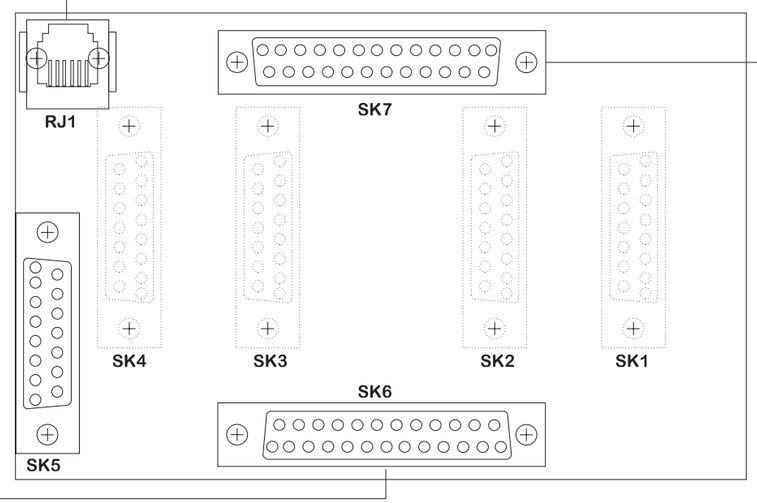


SK6 = Output Pins From Rx and Tx\Ex Modules DR2 Plus 13.8 Volts Output - Front View

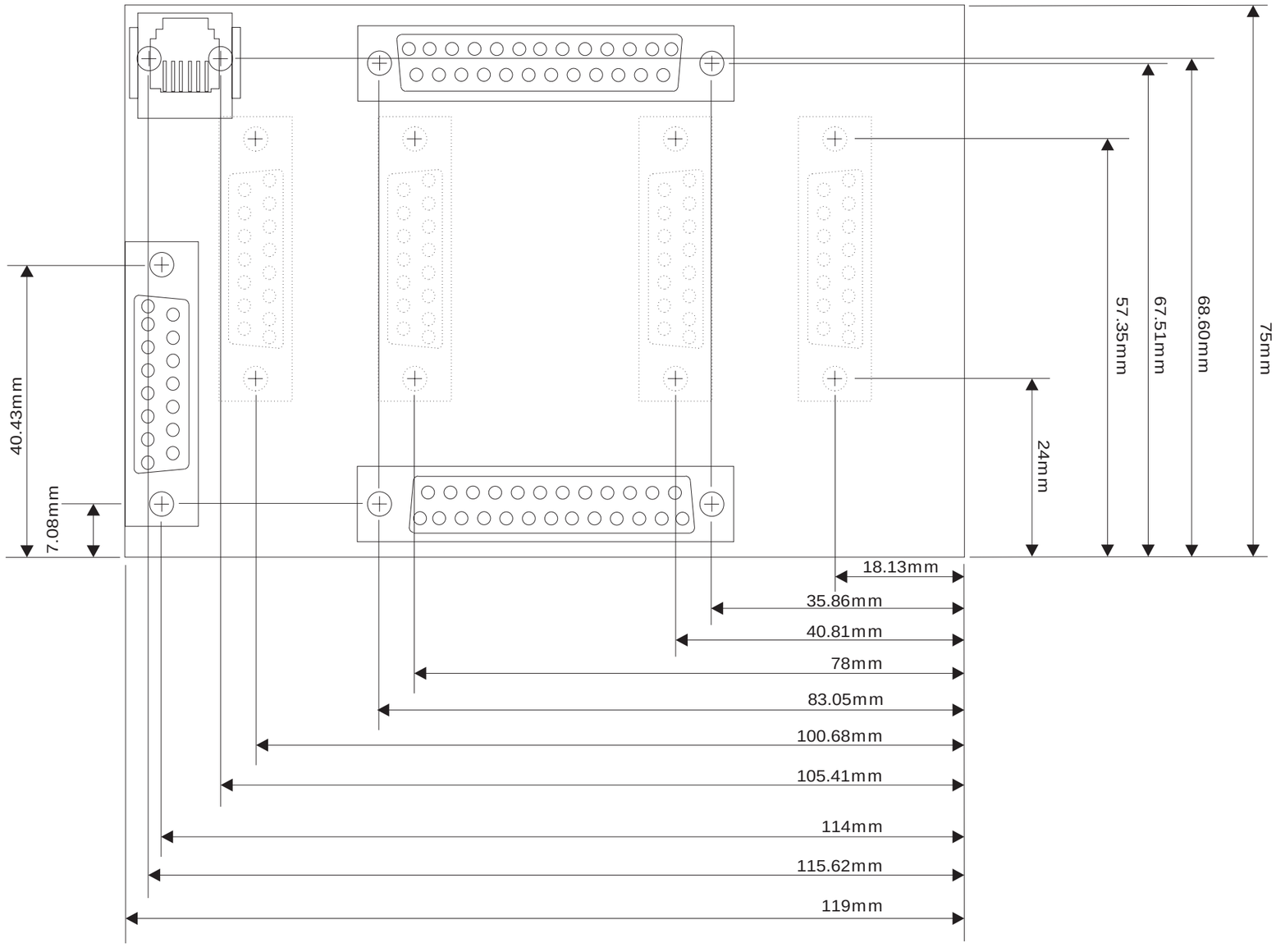


SK7 = Output Pins From Rx and Tx/Ex and PA Modules DR1 - Front View





Backplane PCB Input/Output Pins



Backplane PCB Mechanical Layout

3.3 T800-22-0000 Rack Frame Parts Lists

This section contains the following information.

Section	Page
Mechanical And Miscellaneous Parts	3.3.3
T800-22-0000 Base Station/Repeater Rack Frame	3.3.5
Standard T800-22-0000 Rack Frame With Backplane PCB Mechanical Assembly	3.3.6
Standard T800-22-0002 Rack Frame Without Backplane PCB Mechanical Assembly	3.3.7
Blank Guide Kit Mechanical Assembly (T800-40-0001)	3.3.8
Double Guide Kit Mechanical Assembly (T800-41-0002)	3.3.9
PA Guide Kit Mechanical Assembly (T800-45-0000 & T800-45-0001)	3.3.10
Power Supply Guide Kit Mechanical Assembly (T800-44-0000)	3.3.11
Speaker/Programming Port Mechanical Assembly (T800-15-0000)	3.3.12

T800-22-0000 Mechanical & Miscellaneous Parts

IPN	Legend	Description
001-00011-60		S)DIODE SR2607 Soldered to plug 15way D-Range 240-00020-55
201-00030-03		WIRE T/C 7/0.2 PVC ORANGE 295mm PA to Backplane
201-00030-04		WIRE T/C 7/0.2 PVC YEL 297mm PA to Backplane
201-00030-05		WIRE T/C 7/0.2 PVC GRN 295mm PA to Backplane
201-00030-06		WIRE T/C 7/0.2 PVC BLUE 293mm PA to Backplane
201-00030-07		WIRE T/C 7/0.2 PVC VIOLET 297mm PA to Backplane
201-00030-08		WIRE T/C 7/0.2 PVC GREY Speaker to programming port connector
201-00030-10		WIRE T/C 7/0.2 PVC BLACK Speaker to programming port connector
201-00050-25		AUTO 154 RED 41/0.3 PVC 350mm PS to Fuse 350mm Fuse to PA socket 300mm PA to Backplane
201-00050-26		AUTO 154 BLACK 41/0.3 PVC 550mm PS to PA socket 300mm PA to Backplane
205-00010-42		CABLE 6W OVAL TELE INT COLOURS Progamming port to backplane PCB connector
220-01410-00		PCB RJ11 B/HD RACK SER II Connects cable from programming port to backplane PCB
240-00020-08		PLUG MODUL PHONE 6W OVAL CABLE Connects cable to backplane PCB
240-00020-53		PLUG 6 W 2*3 FLAT CABLE TERMN Programming port/speaker to backplane PCB connector
240-00020-55		PLUG 15 W D RANGE PNL MTG105 C Connects to SK5
240-02010-54		SKT 15W DRANGE PNL MTG 125 C PA/SK5 cable
240-04020-53		SKT 6 W 2 R (3X2) PCB MTG Speaker panel/programming socket/ PCB connector
240-04023-00		SOCKET RJ11 BULK HEAD Connects programming cable
240-06010-14		CLAMP LATCHING 15 W D RANGE D-range cover
250-00010-19		SPKR A3M2520
265-00010-67		FUSE 30A 6X32MM SLOW BLOW
307-01015-01		GRILLE SPKR 307-01015-00 BLK
316-06616-00		PNL FRT SPKR SINGLE SER II
316-80002-00		PACKING A4M1752 PROTECT FOAM
345-00040-11		SCRW M3X10MM P/POZ ST BZ Holds backplane PCB onto rack frame
345-00040-20		SCRW M3*8MM BUTTON SKT HD Holds speaker grill onto front panel
352-00010-08		NUT M3 COLD FORM HEX ST BZ Speaker front panel
353-00010-13		WSHR M3 S/PROOF INT BZ Speaker front panel
353-00010-16		WSHR M3 FIBRE 8MM OD X 1.5MM Speaker front panel
365-00011-54		LABEL R1556/2 90*24MM
365-01371-00		LABEL RACKFRAME 110X145MM
369-00010-14		TIE CABLE NYLON 100*2.6MM
369-00010-14		TIE CABLE NYLON 100*2.6MM
369-00010-20		TIE CABLE NYLON SPIRAL 6MM ST6
369-00010-24		BASE CABLE TIE MTG S/AD
399-00010-51		BAG PLASTIC 75*100MM
399-00010-53		PLASTIC BAG 150X250MM
410-00002-10		PKG T291/2 OUTER CARTON
410-00002-21		PKG POLYST T800 RACK-FRAMES

Note 1: This parts list contains all those parts not listed on the drawings which follow.

Note 2:

Replace 345-00040-11 Screw M3x10 mm p/poz
With 349-00020-36 Screw TT M3x8 mm Pan Torx
Reason Smaller screw now required.

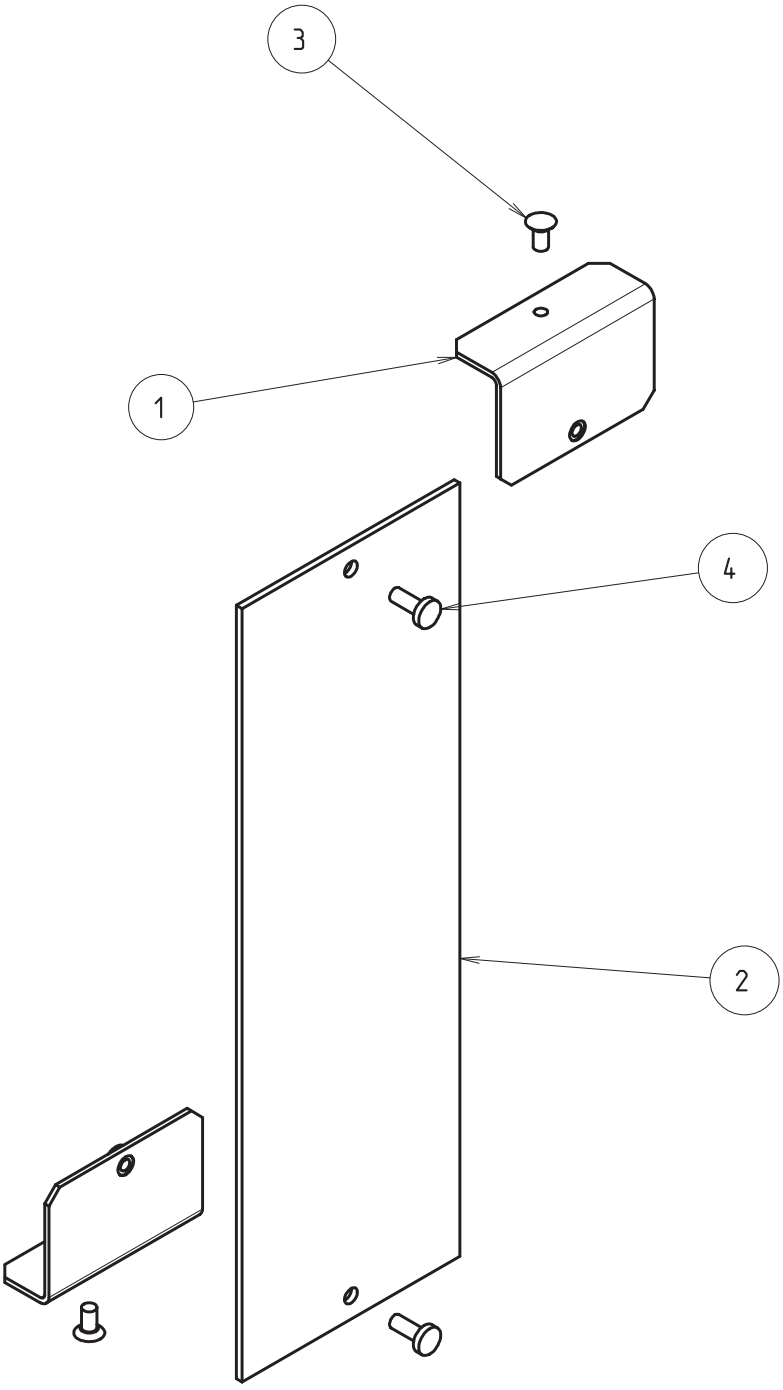
Add 360-00010-05 Grommet 5/8 inch plastic
Reason Not previously included

Insert A3 T800-22-0000 Base Station/Repeater Rack Frame A3

Insert A3 T800-22-0000 With PCB drawing

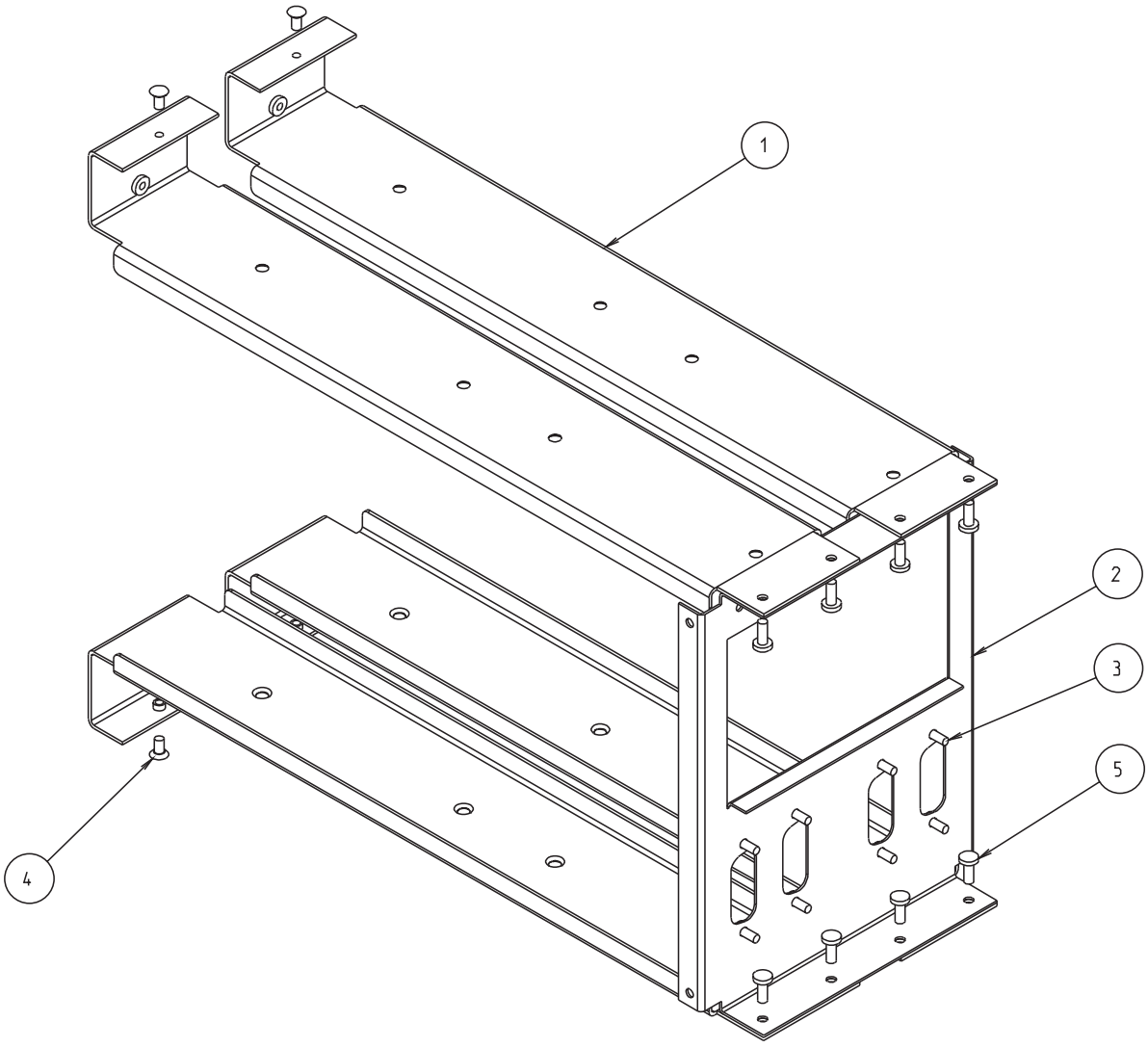
Insert A3 T800-22-0000 Without PCB drawing

IPN/ Product Code	Legend	Description
307-02046-00	1	Guide, Blanking
316-06615-00	2	Blank Panel
349-00020-33	3	M3x6 CSK Pozi Taptite
349-00020-36	4	M3x8 Pan Torx Taptite



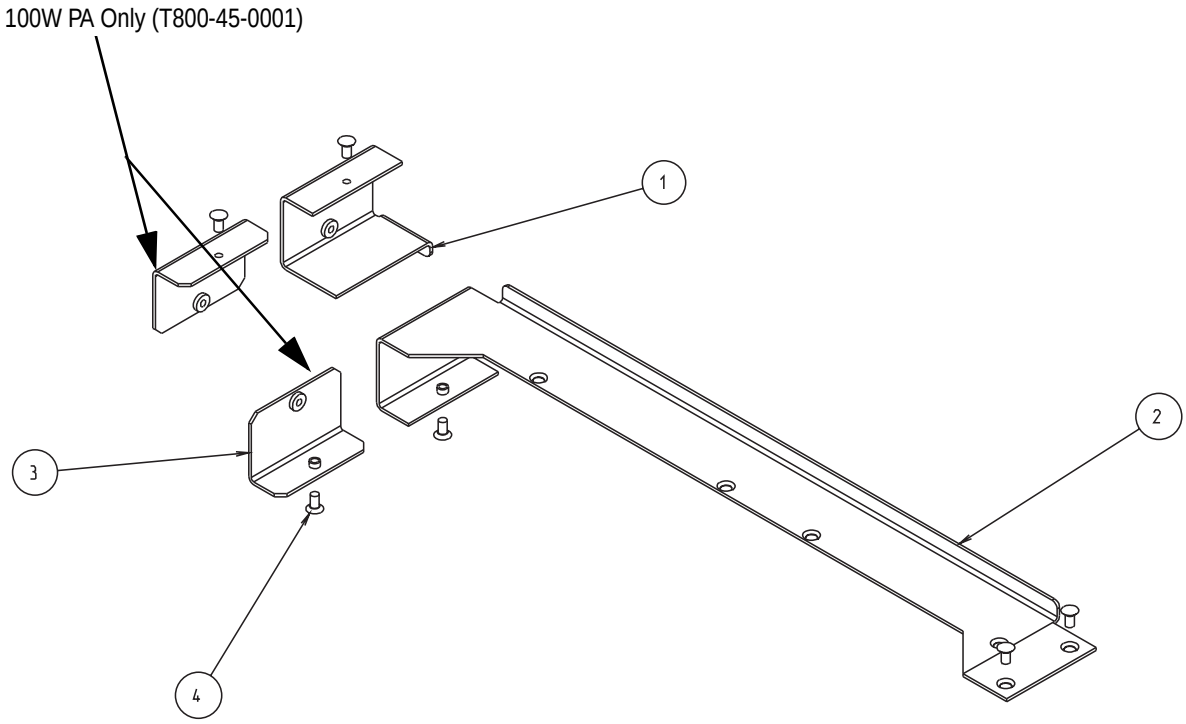
T800-40-0001 Blank Guide Kit
Mechanical Assembly

IPN/ Product Code	Legend	Description
307-02045-00	1	Guide, T800 Module
316-21189-00	2	Rear Panel, Double
349-00020-06	3	4-40x1/4 Pan Pozi Taptite
349-00020-33	4	M3x6 CSK Pozi Taptite
349-00020-36	5	M3x8 Pan Torx Taptite



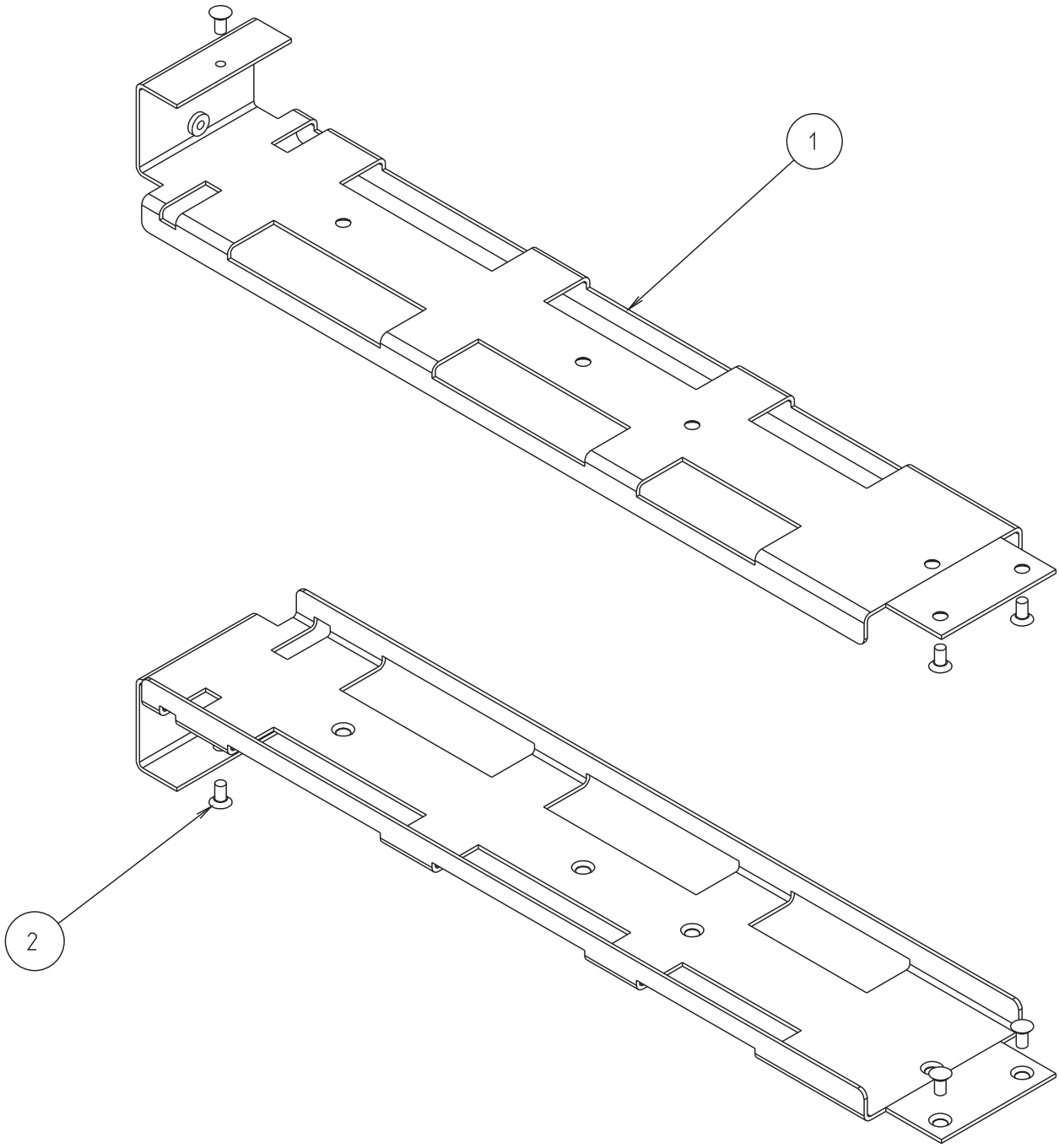
T800-41-0002 Double Guide Kit
Mechanical Assembly

IPN/ Product Code	Legend	Description
307-02042-00	1	Guide, PA Stop
307-02043-00	2	PA Guide Rail
307-02046-00	3	Guide, Blanking
349-00020-33	4	M3x6 CSK Pozi Taptite



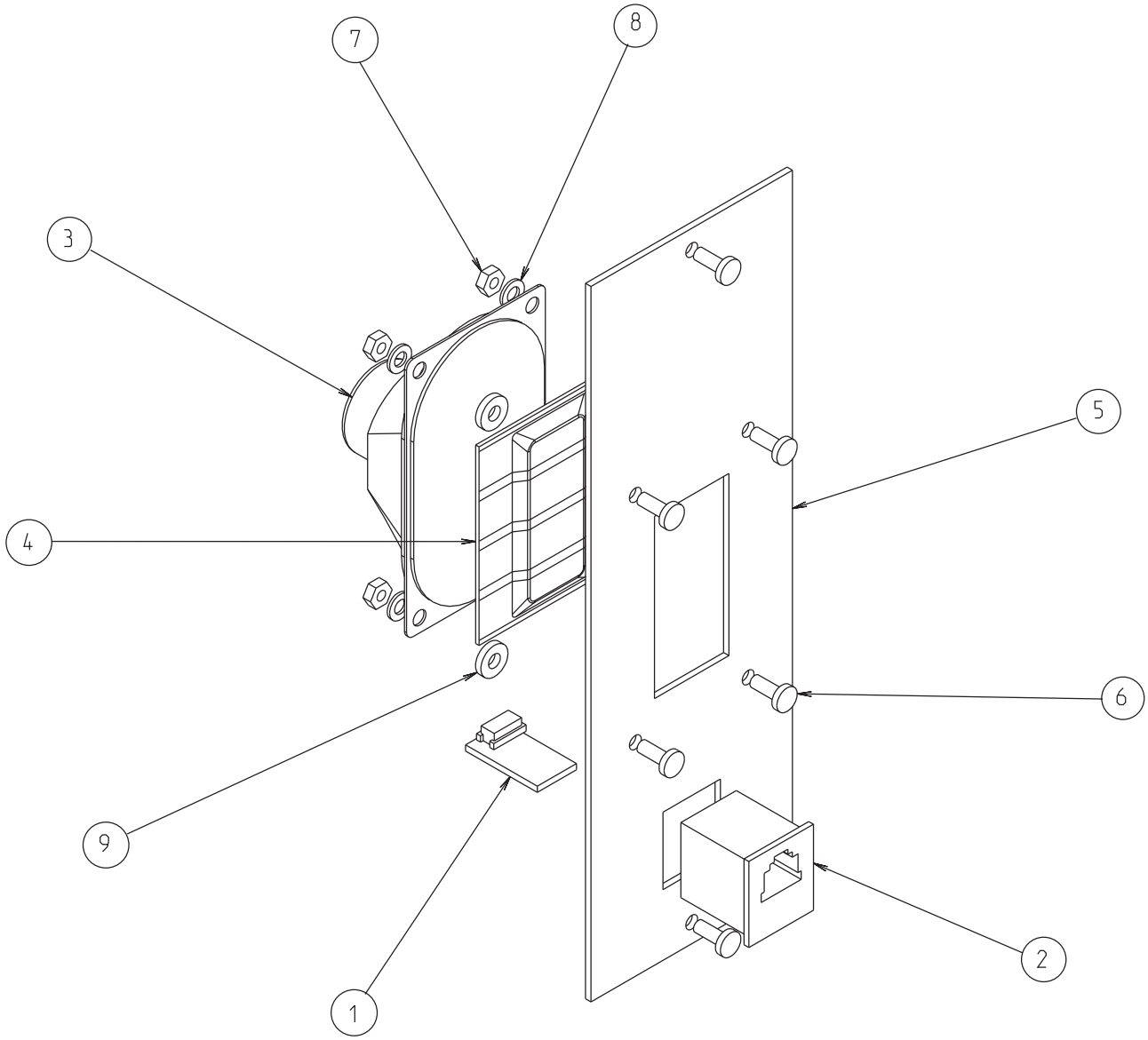
T800-45-0000 PA Guide Kit
Mechanical Assembly

IPN/ Product Code	Legend	Description
307-02044-00	1	Guide, Power Supply
345-00040-09	2	M3x6 CSK Pozi

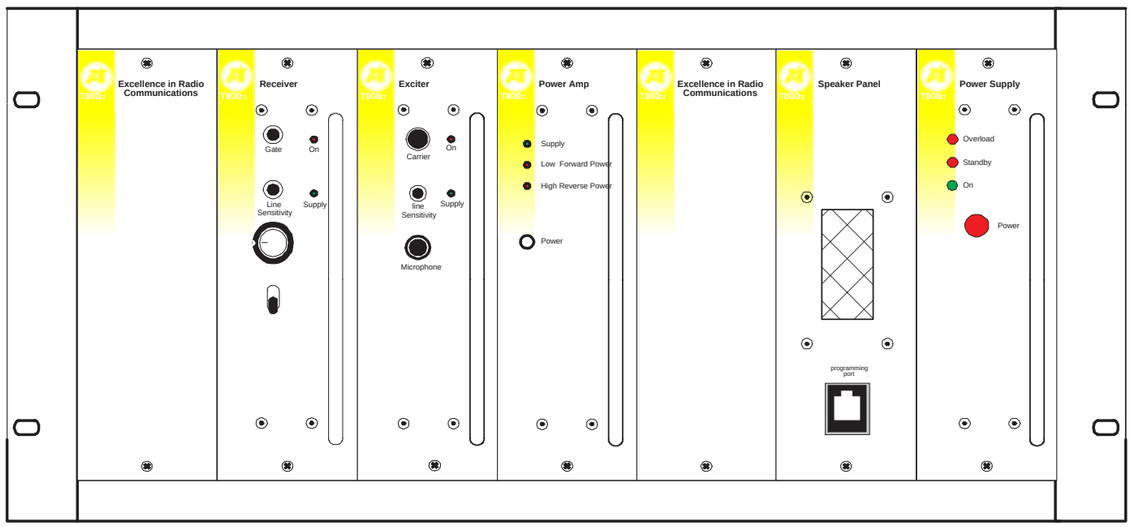


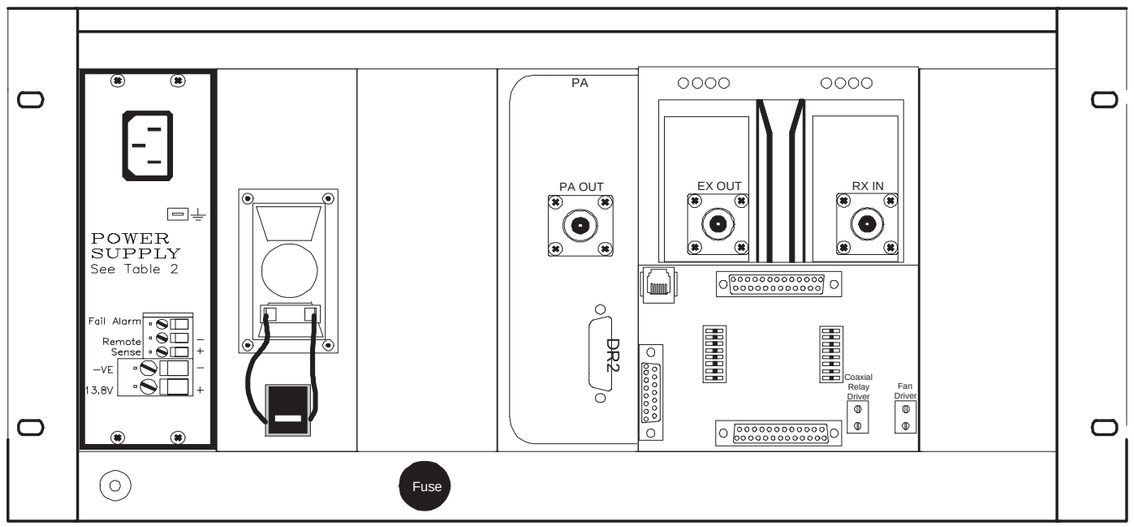
T800-44-0000 Power Supply Guide Kit
Mechanical Assembly

IPN/ Product Code	Legend	Description
220-01410-00	1	PCB RJ11 Bulkhead
240-04023-00	2	Socket RJ11 Bulkhead
250-00010-19	3	Speaker, 4 Ohm 5 Watt
307-01015-01	4	Speaker Grille, Metal
316-06616-00	5	Speaker Panel
349-00020-36	6	M3x8 Pan Torx Taptite
352-00010-08	7	M3 Cold Form
353-00010-13	8	M3 Shakeproof Int
353-00010-16	9	M3 Fibre Washer 1.5T



T800-15-0000 Speaker/Programming Port Mechanical Assembly



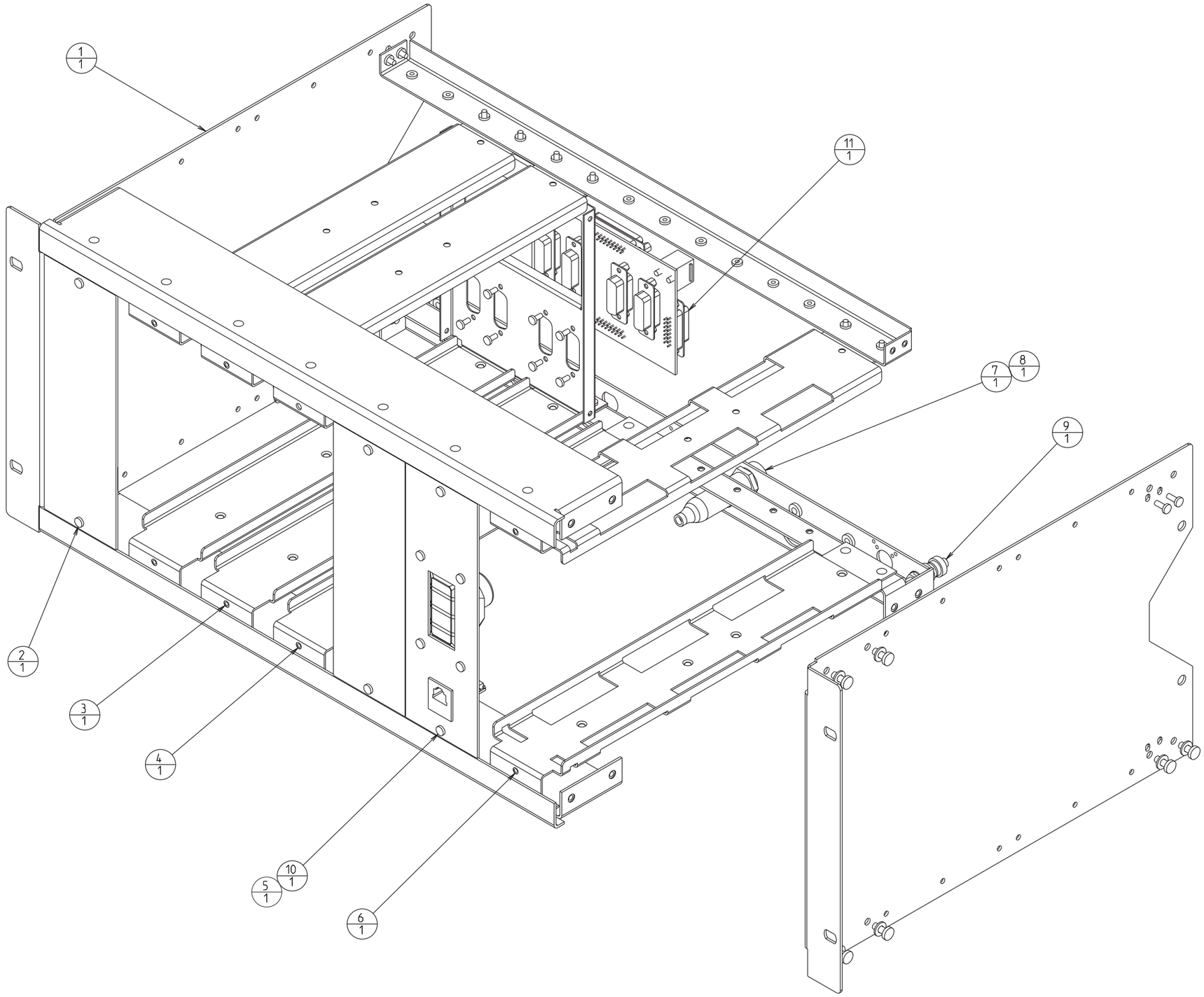


T800-22-0000 Standard

x2 Blank Front Panels
x1 T800-15-0000 Speaker Programming Panel
x1 Fuseholder
x1 Earthing Terminal
x2 Channel Selection Dip Switches
x1 Coaxial Relay Driver
x1 Coolant Fan Driver

T800-22-0000 Options

316-06615-00	Blank Front Panel
T800-01-0000	T800 Standard Programming Kit with PGM800WIN and Lead
T800-15-0001	Speaker Front Panel
T800-13-0000	Extender Rail Kit with x2 D-ranges Fitted.
T800-19-0000	Fan Kit - Rail Mounted (As SeriesI)
T800-19-0010	Fan Kit - Guide Mounted
T800-60-0000	Personality PCB for Monitor or Channel Selection Panels
T818-01-0000	Rx/Tx Metering and Monitor Unit
T800-43-0000	T300/T1500 Guide Kit for (T818-01-0000)
T991-06	Cabinet 6U, with Door and Lock
T004-72	Coaxial Relay
TA087-01	Channel Selection Panel, Programmable 1 to 100 channels
TA387-01	Channel Selection Panel, 1 to 10 Channels.



Key

33/2

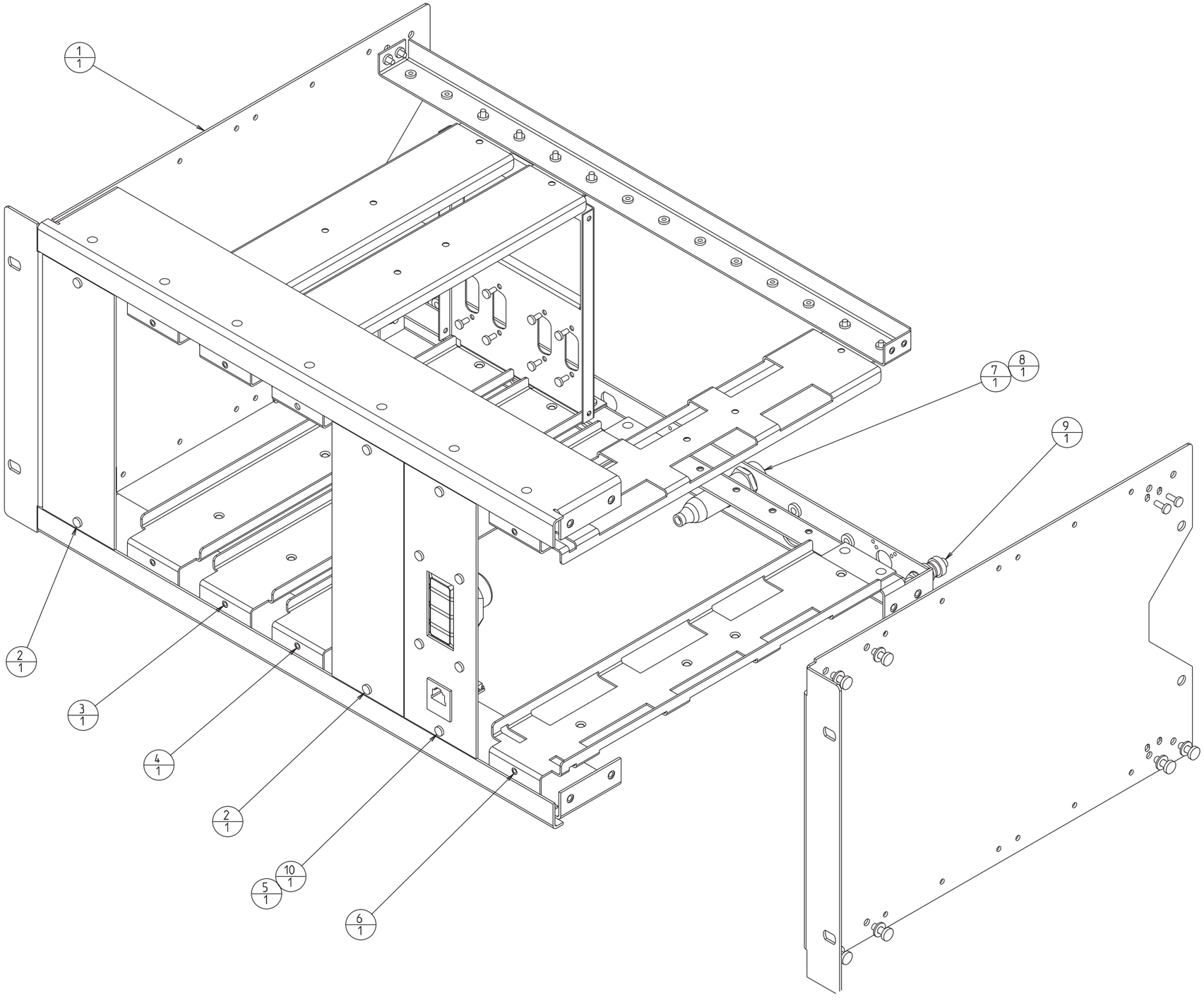
The upper number is the component identification number which appears in the "Legend" column of the Mechanical & Miscellaneous Parts table shown below (and on each of the followng drawings).

The lower number indicates how many of this component are used in this location or function.

Note that some nuts and washers, normally hidden behind other components, have been moved into view to improve the clarity of the drawing.

IPN/ Product Code	Legend	Description
T800-22-0004	1	Rack, Loom Option
T800-40-0001	2	T800 Blank Panel With Fitting Kit
T800-41-0002	3	T800 Double Guide Kit
T800-45-0000	4	T800 PA Guide Kit
T800-40-0000	5	T800 Fitting Kit Only For Blank Panel
T800-44-0000	6	T800 PS Guide Kit
340-00010-22	7	Fuseholder 30A Panel Mtg
340-00011-50	8	Cover, Fuseholder, Insulating
356-00010-61	9	Earthing Terminal
T800-15-0000	10	Speaker Panel
T800-50-0000	11	Standard Rack Backplane PCB Assembly

Standard Rack Frame With Backplane PCB
T800-22-0000 Mechanical Assembly



Key

33/2

The upper number is the component identification number which appears in the "Legend" column of the Mechanical & Miscellaneous Parts table shown below (and on each of the followng drawings).

The lower number indicates how many of this component are used in this location or function.

Note that some nuts and washers, normally hidden behind other components, have been moved into view to improve the clarity of the drawing.

IPN/ Product Code	Legend	Description
T800-22-0004	1	Rack, Loom Option
T800-40-0001	2	T800 Blank Panel With Fitting Kit
T800-41-0002	3	T800 Double Guide Kit
T800-45-0000	4	T800 PA Guide Kit
T800-40-0000	5	T800 Fitting Kit Only For Blank Panel
T800-44-0000	6	T800 PS Guide Kit
340-00010-22	7	Fuseholder 30A Panel Mtg
340-00011-50	8	Cover, Fuseholder, Insulating
356-00010-61	9	Earthing Terminal
T800-15-0000	10	Speaker Panel

Standard Rack Frame Without Backplane PCB
T800-22-0002 Mechanical Assembly