Part D T858 & T859 Power Amplifiers

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. These sections describe both the older design T858/859 without RF power modules, and the newer design T858/859 with RF power modules. Figure 1.1 shows how to identify your PA design without having to remove the side cover. 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 T858/859 General Information

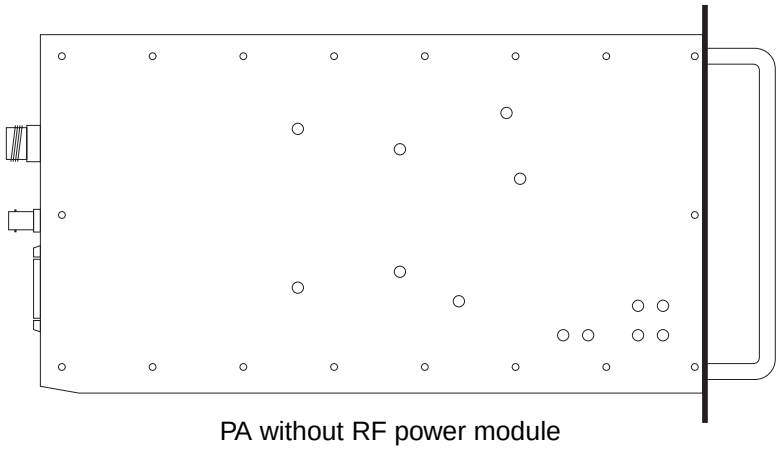
This section provides a brief description of the T858 & T859 power amplifiers, both with and without RF power modules, along with detailed specifications and a list of types available. Figure 1.1 shows how to identify whether your PA was built with or without RF power modules.

The following topics are covered in this section.

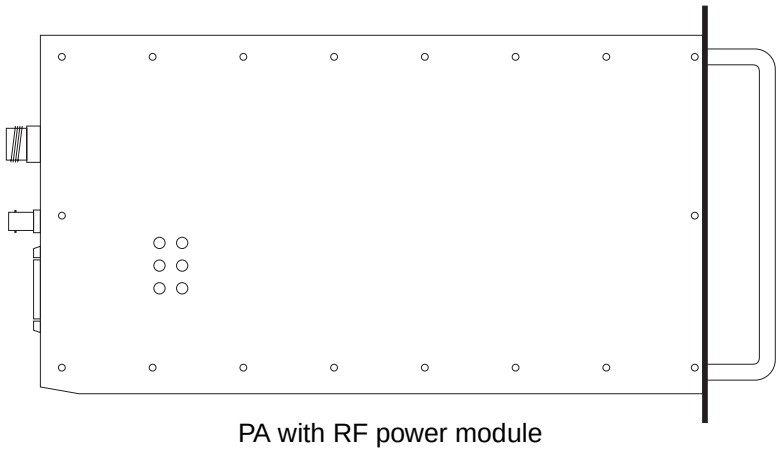
1.1 Identifying T858/859 PAs With Or Without RF Power Modules

The newer design T858/859 PAs use both RF power modules and RF power transistors, whereas the older design T858/859 PAs used RF power transistors only.

If the side cover is still fitted to your PA, you can quickly identify which type you have by checking the number of access holes in the side cover. As shown in Figure 1.1 below, the older design PAs have numerous holes spread over the side cover, whereas the newer design PAs have only six in a group near the rear of the chassis.



PA without RF power module



PA with RF power module

Figure 1.1 Identifying T858/859 PAs With Or Without RF Power Modules

replace A4 pages D1.5/D1.6 with A3 pages D1.5/D1.6

replace A4 pages D1.5/D1.6 with A3 pages D1.5/D1.6

replace A4 pages D1.7/D1.8 with A3 pages D1.7/D1.8

replace A4 pages D1.7/D1.8 with A3 pages D1.7/D1.8

replace A4 pages D1.9/D1.10 with A3 pages D1.9/D1.10

replace A4 pages D1.9/D1.10 with A3 pages D1.9/D1.10

replace A4 pages D1.11/D1.12 with A3 pages D1.11/D1.12

replace A4 pages D1.11/D1.12 with A3 pages D1.11/D1.12

1.2 Introduction

The T858 and T859 are FM base station power amplifiers designed for single or multichannel operation in the 400 to 520MHz frequency range. The output power capabilities are as follows:

T858 - 10 to 60W
T859 - 20 to 110W.

The older design T858/859 PAs (without RF power modules) comprise a broad band, three 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.

The newer design T858 PA (with RF power module) comprises a broad band, two stage drive amplifier whose output is filtered before being fed to the output connector.

The newer design T859 PA (with RF power module) 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 of all T858/859 PAs, while monitoring and alarm signals are available for both forward and reverse power. The output power is adjustable from the front panel.

The main PCB is mounted directly on a die-cast chassis/heatsink. Extensive use is made of the latest surface mount technology. Effective RF isolation between the PA control circuitry and RF stages in the newer design T858/859 PAs is achieved by internal metal shields.

Forced air cooling for the heatsink is provided on the T859 by a fan, which is activated whenever the transmitter is keyed. Thermal sensors will also activate the fan automatically if the internal temperature reaches an unacceptable level.

The T858 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. The T859 has a width of 120mm and occupies a double space.

1.3 Specifications

1.3.1 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).

Ambient temperature is defined as the temperature of the air at the input to the cooling fan mounted on the heatsink, or immediately surrounding the heatsink if a fan is not fitted.

Where applicable, the test methods used to obtain the following performance figures are those described in the ETS specification. Refer to Section 1.3.3 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.

1.3.2 General

Power Output:

T858	- Rated Power	.. 50W
	- Range Of Adjustment	.. 10 to 60W (typical)
T859	- Rated Power	.. 100W
	- Range Of Adjustment	.. 20 to 110W (typical)

Input Power .. 700 to 1300mW

Duty Cycle Rating:

T858	.. 50W continuous to +60°C ambient temperature
	.. 60W continuous to +40°C ambient temperature
T859	.. 100W continuous to +60°C ambient temperature

Intermodulation (PA with output isolator) .. -70dBc or -40dBi[1] with 25dB isolation & interfering signal of -30dBc

Mismatch Capability:

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

1. dBi denotes the level of intermodulation product relative to the interfering signal.

Supply Voltage:

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

Maximum Supply Current (T858 @ 50W, T859 @ 100W):

Standby		..	50mA
Transmit	- T858 without power module	..	11A
	- T858 with power module	..	12A (11A typical)
	- T859 without power module	..	22A
	- T859 with power module	..	23A (21A typical)

Spurious Emissions:

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

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

Dimensions:

Height		..	183mm
Width	- T858	..	60mm
	- T859	..	120mm
Length		..	340mm

Weight:

T858	..	3.1kg
T859	..	3.5kg

1.3.3 Test Standards

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

1.3.3.1 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).

1.3.3.2 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.

1.3.3.3 Telecommunications Industry Association

ANSI/TIA/EIA-603-1992

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

1.4 Product Codes

The three groups of digits in the T850 Series II product code provide information about the model, type and options fitted, according to the conventions described below.

The following explanation of T850 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:

T85X-XX-XXXX
T855 receiver
T856 25W transmitter
T857 exciter
T858 50W power amplifier
T859 100W 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:

T85X-**X**X-XXXX
'1' for 400-440MHz
'2' for 440-480MHz
'3' for 480-520MHz

The second digit in the Type group indicates the channel spacing and is not applicable to power amplifiers:

T85X-X**X**-XXXX '0' for all power amplifiers

Options

T85X-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.

1.5 Standard Product Range

The following table lists the range of standard T858 and T859 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.

Output Power (W)	50			100		
Frequency Range (MHz)	400-440	440-480	480-520	400-440	440-480	480-520
PA Type: T858-	10-0000	20-0000	30-0000			
PA Type: T859-				10-0000	20-0000	30-0000

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).

The photograph in Figure 1.2 on the next page will help you to identify the main circuit blocks in the T858 without RF power module.

There is a similar photograph in Figure 3.4 which shows the main adjustment controls.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph in Figure 1.6 shows the T858/859 front panel controls.

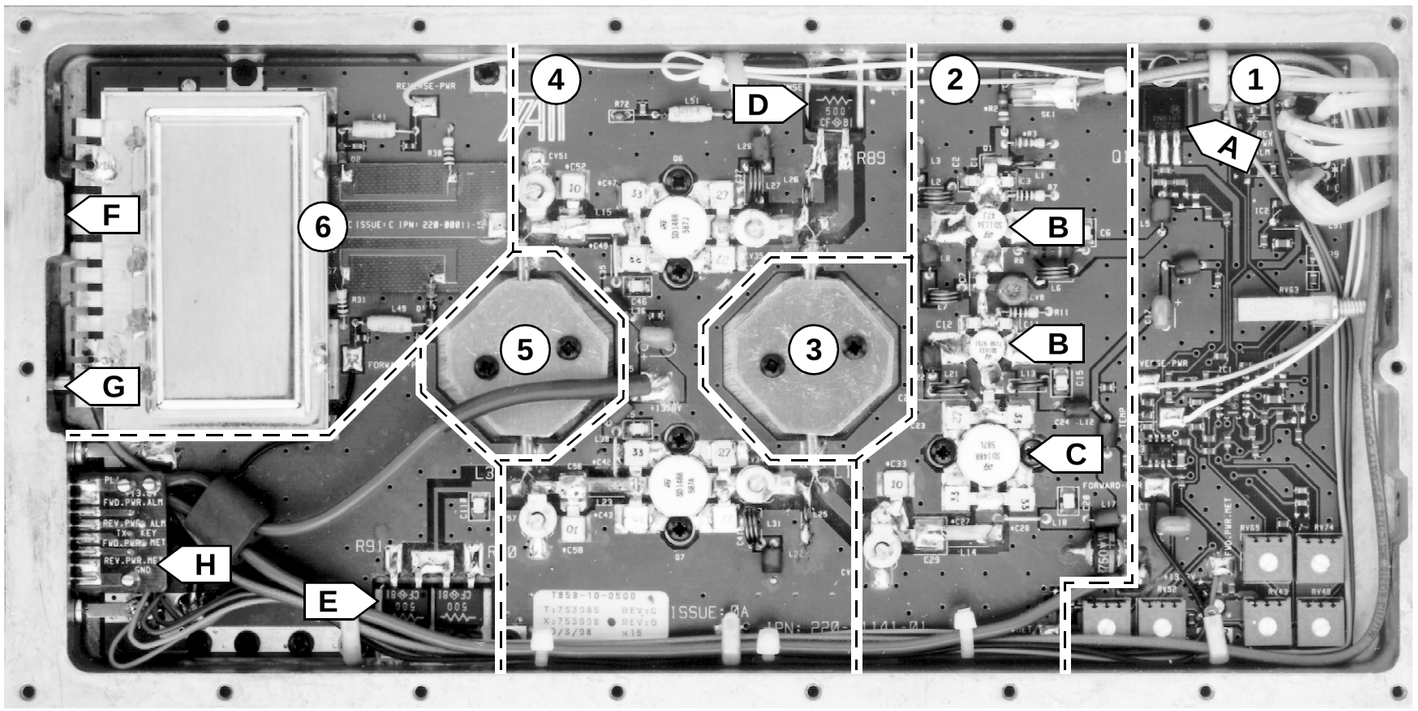


Figure 1.2 T858 Main Circuit Block Identification (Without RF Power Module)

Key:

1 power control & alarms circuitry
2 drive amplifier
3 input power splitter
4 final amplifiers
5 output power combiner
6 low pass filter & directional coupler

A power control transistor (Q16)
B pre-driver
C driver
D input combiner termination (R89)
E output combiner termination (R90/R91)
F RF output
G RF input
H D-range connector (incl. DC in, alarm & metering outputs - refer to Section 3.2 in Part F)

The photograph in Figure 1.3 on the next page will help you to identify the main circuit blocks in the T858 with RF power module.

There is a similar photograph in Figure 3.5 which shows the main adjustment controls.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph in Figure 1.6 shows the T858/859 front panel controls.

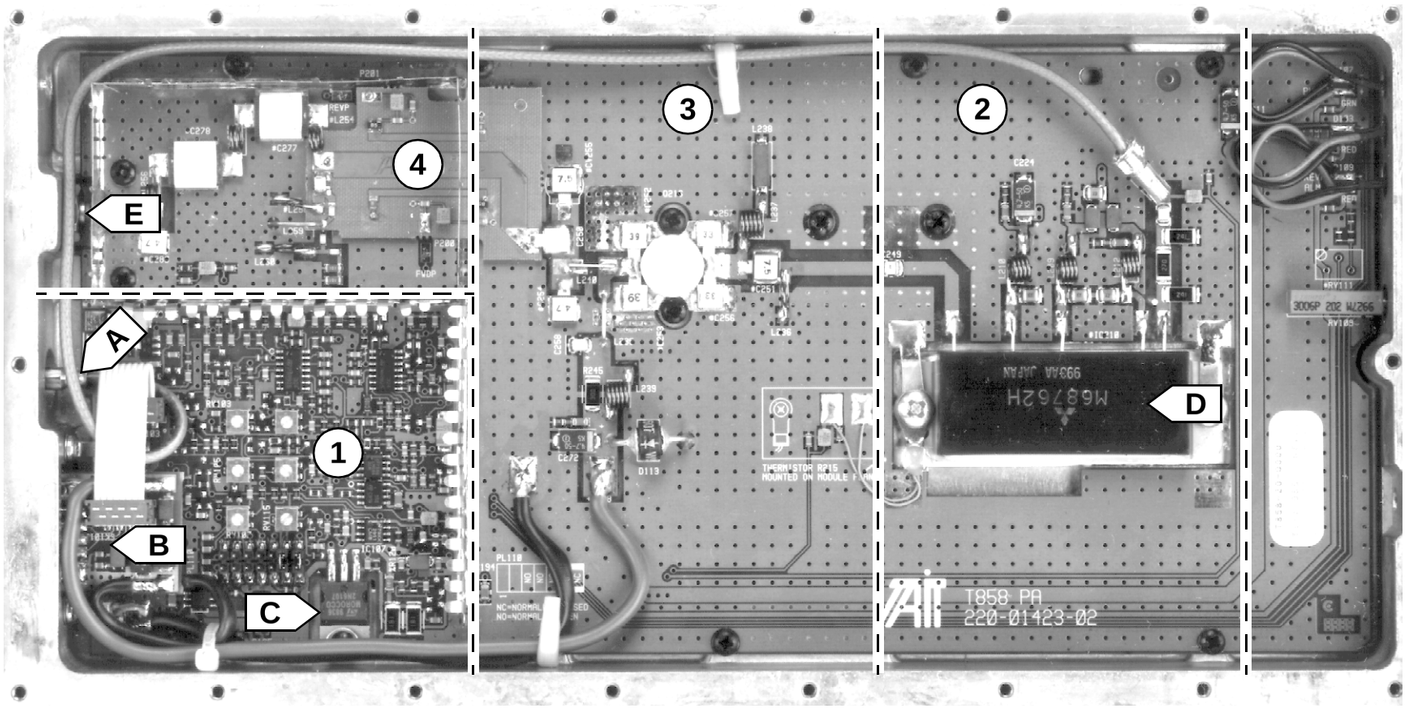


Figure 1.3 T858 Main Circuit Block Identification (With RF Power Module)

Key:

1 power control & alarms circuitry
2 drive amplifier
3 final amplifier
4 low pass filter & directional coupler

A RF input
B D-range connector (incl. DC in, alarm & metering outputs - refer to Section 3.2 in Part F)
C power control transistor (Q137)
D RF power module (#IC210)
E RF output

The photograph in Figure 1.4 on the next page will help you to identify the main circuit blocks in the T859 without RF power module.

There is a similar photograph in Figure 3.6 which shows the main adjustment controls.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph in Figure 1.6 shows the T858/859 front panel controls.

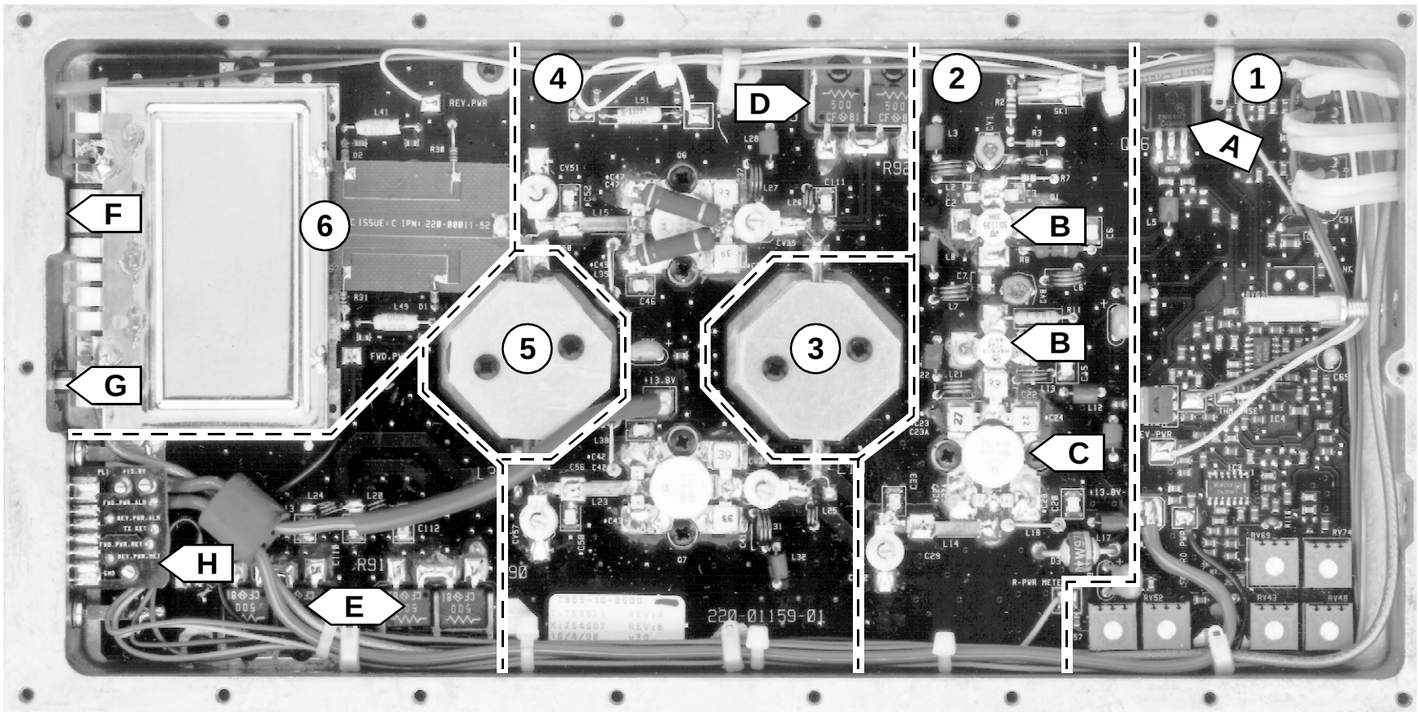


Figure 1.4 T859 Main Circuit Block Identification (Without RF Power Module)

Key:

1 power control & alarms circuitry
2 drive amplifier
3 input power splitter
4 final amplifiers
5 output power combiner
6 low pass filter & directional coupler

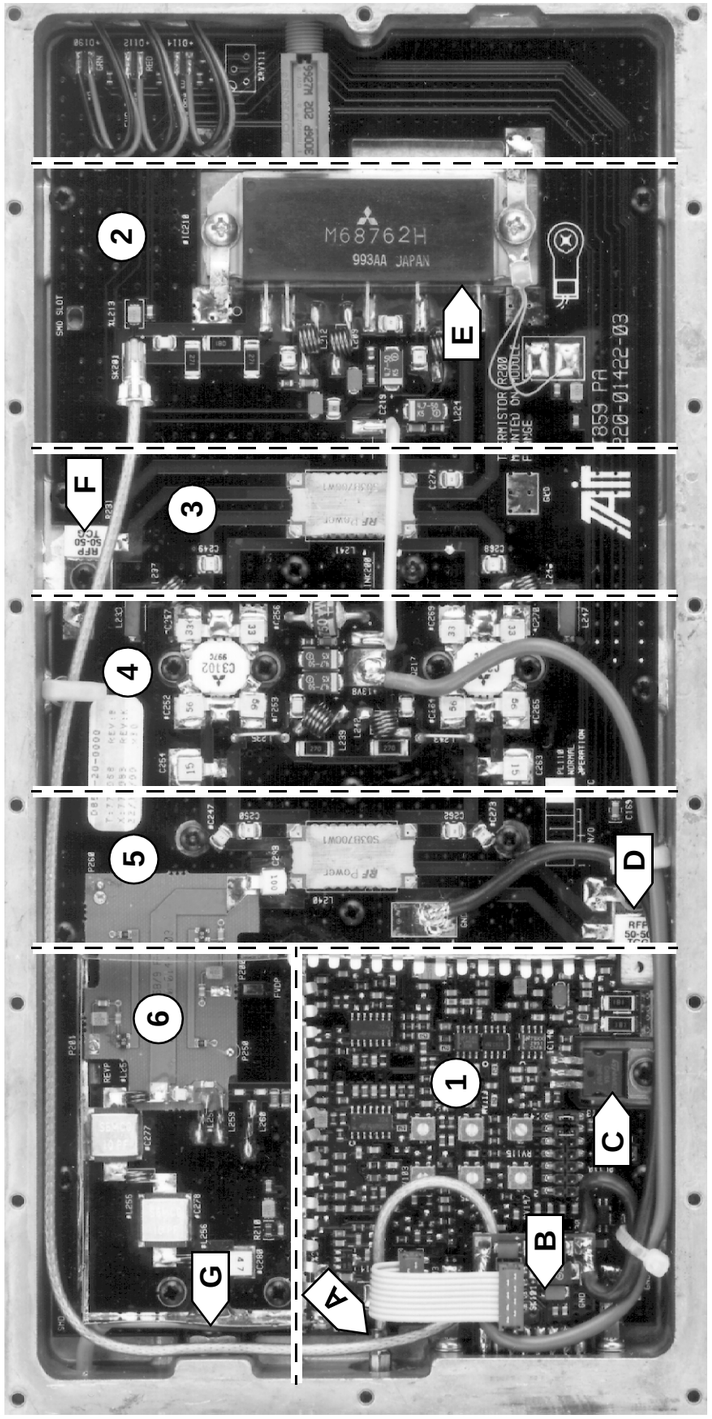
A power control transistor (Q16)
B pre-driver
C driver
D input combiner termination (R89/R92)
E output combiner termination (R90/R91/R93/R94)
F RF output
G RF input
H D-range connector (incl. DC in, alarm & metering outputs - refer to Section 3.2 in Part F)

The photograph in Figure 1.5 on the next page will help you to identify the main circuit blocks in the T859 with RF power module.

There is a similar photograph in Figure 3.7 which shows the main adjustment controls.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph in Figure 1.6 on the next page shows the T858/859 front panel controls.



Key:

A RF input
B D-range connector (incl. DC in, alarm & metering outputs - refer to Section 3.2 in Part F)
C power control transistor (Q128)
D output combiner termination (R240)
E RF power module (#IC210)
F input splitter termination (R231)
G RF output

1 power control & alarms circuitry
2 drive amplifier
3 input power splitter
4 final amplifier
5 output power combiner
6 low pass filter & directional coupler

Figure 1.5 T859 Main Circuit Block Identification (With RF Power Module)

Figure 1.6 T858/859 Front Panel Controls - T858 Shown With T857 Exciter
(The T859 has the same controls as the T858 but has a double-width front panel.)

2 T858/859 Circuit Operation

This section provides a basic description of the circuit operation of the T858 and T859 power amplifiers, both with and without RF power modules.

Section 2.1 describes the older design T858/859 without RF power modules, while Section 2.2 describes the newer design T858/859 with RF power modules. Figure 1.1 shows how to identify your PA design without having to remove the side cover.

The following topics are covered in this section.

2.1 T858/859 Without RF Power Modules

Refer to Section 5 where the parts lists, grid reference index and diagrams will provide detailed information on identifying and locating components. Refer also to Figure 3.4 and Figure 3.6 which show the location of the main tuning and adjustment controls.

2.1.1 Introduction

T858	0.7-1W	2-3dB	2W	8-10W	20-30W	35-40W	60-70W
T859	0.7-1W	2dB	5W	15-20W	40-50W	60-70W	105-120W
T878	0.7-1.8W	4dB	5W		20-35W	35-40W	60-80W

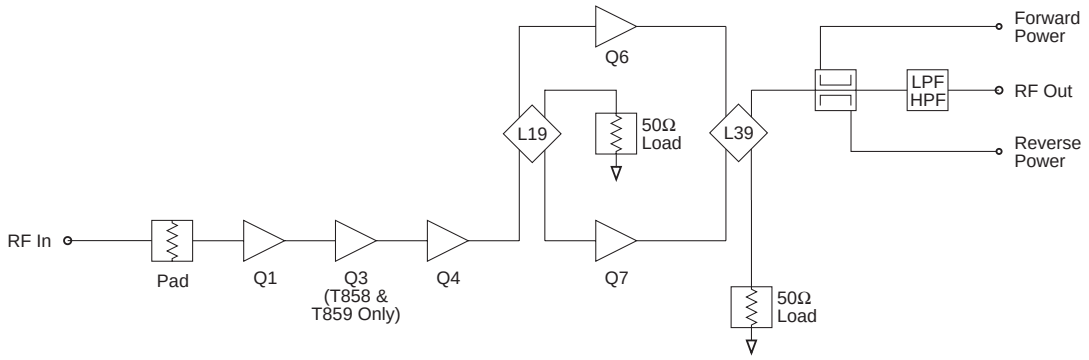


Figure 2.1 T858/859 High Level Block Diagram

The T858 and T859 comprise a five-stage RF power amplifier, the final two stages of which are combined, and extensive control circuitry.

Figure 2.1 shows the configuration of each of the main circuit blocks on a functional level, while the fold-outs Figure 1.2 and Figure 1.4 show their location on the PCB.

2.1.2 RF Circuitry

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

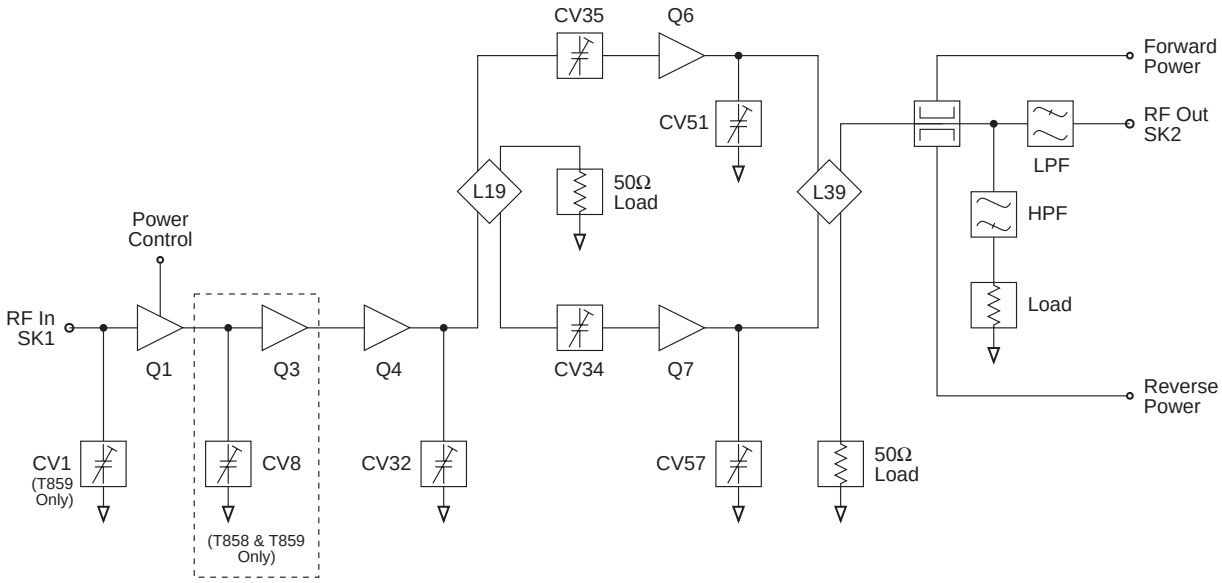


Figure 2.2 T858/859 RF Circuitry Block Diagram

The driver stage of the T858/859 consists of a three-stage transistor amplifier (Q1, Q3 & Q4) which delivers 30W in the T858 and 50W in the T859. This signal is split via a 3dB coupler (L19) and used to drive the two final amplifiers (Q6 & Q7). The outputs from the finals are passed to the antenna socket via the harmonic filter.

The diplexer presents the final amplifiers with a good load at harmonic frequencies, which helps to achieve the expected harmonic attenuation in the output filter.

The directional coupler senses forward and reflected power, which is rectified (D1 & D2) 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).

2.1.3 Control Circuitry

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

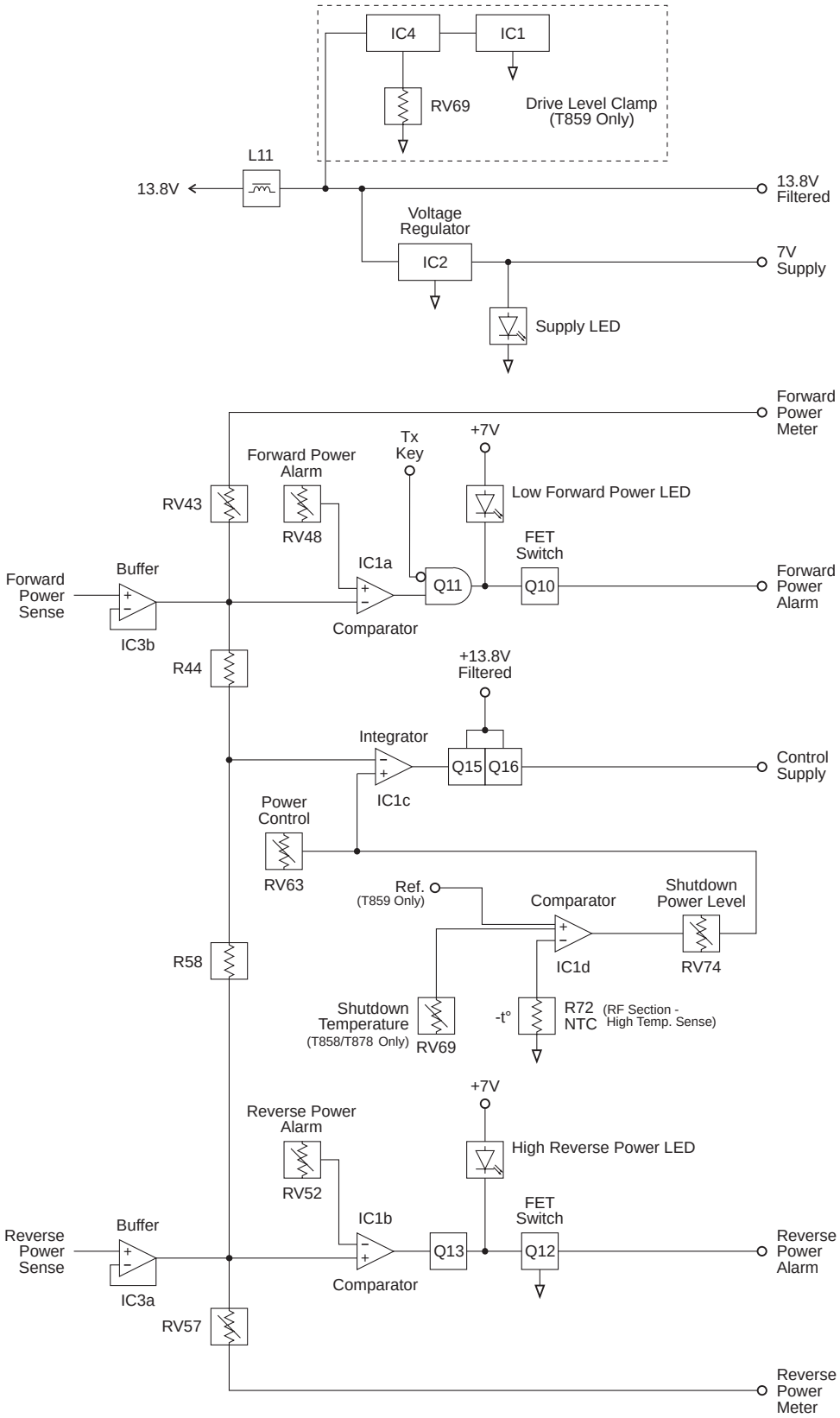


Figure 2.3 T858/859 Control Circuitry Block Diagram

2.1.3.1 Power Control

The DC voltages from the directional coupler representing forward and reflected power are buffered by the two voltage followers IC3 pins 1, 2 & 3 and pins 5, 6 & 7. Their outputs are summed at an integrator (IC1 pins 8, 9 & 10), 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.

2.1.3.2 T859 Driver Power Level

A ceiling is placed on the output power available from driver stages Q1, Q3 and Q4 to ensure final stages Q6 and Q7 are not overdriven. This is achieved by RV69 and IC4 controlling the reference voltage of power control error amplifier IC1c, which in turn limits the maximum supply voltage that can be applied to driver Q4 by power control transistor Q16.

Note: T859 PAs with serial numbers prior to 217262 do not have this feature.

Caution: **The driver power level clamp (RV69) is factory set to give a maximum power output of 110W in the T859. The unit may be damaged if this level is increased.**

2.1.3.3 Thermal Protection

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

A thermistor controlled voltage divider (R68, R72) applies a voltage to a comparator with hysteresis (IC1 pins 12, 13 & 14).

Note: In all T858 PAs and T859 PAs with serial numbers prior to 217262, the threshold of the comparator is independently set by RV69 which sets the shutdown temperature. On later model T859 PAs this threshold is fixed.

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

2.1.3.4 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).

IC1 pins 1, 2 & 3 and pins 5, 6 & 7 form comparators with thresholds adjusted via RV48

(forward power) and RV52 (reverse power) respectively. The inputs are from the forward and reverse power signals generated by the directional coupler, buffered by IC3 pins 1, 2 & 3 and pins 5, 6 & 7. Thus, the power levels at which the forward and reverse power alarms are triggered are defined by RV48 and RV52 respectively.

2.1.3.5 Forward And Reverse Power Metering

Forward and reverse power signals from the two IC3 buffers are available for metering purposes. The output currents are adjustable via RV43 (forward power) and RV57 (reverse power).

2.1.3.6 T859 Fan Control Circuitry

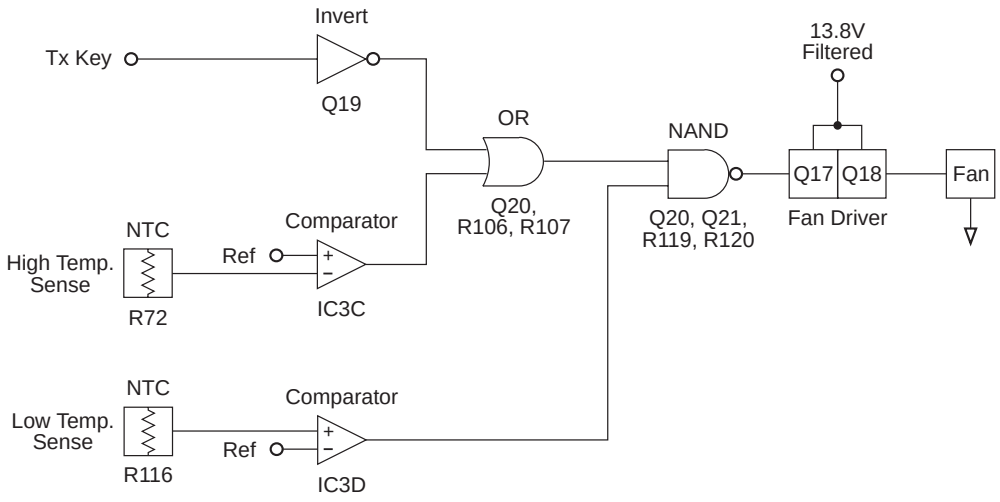


Figure 2.4 T859 Fan Control Logic Diagram

Comparator IC3 pins 8, 9 & 10 are set to trigger at heatsink temperatures greater than +70°C, and pins 12, 13 & 14 at temperatures greater than -10°C.

A logic AND function is applied to the comparator outputs by Q20 and Q21, thereby turning on the fan unconditionally (via Q17 and Q18) if the heatsink temperature exceeds +70°C.

A logic OR function is applied to the comparator IC3 pins 8, 9 & 10 and Tx-Key signals, thereby turning on the fan when the transmitter is keyed and the temperature is between -10°C and +70°C.

If the temperature drops below -10°C, Q21 is turned off, preventing either Q19 or Q20 from activating the fan.

Fan operation may be summarised as follows:

T < -10°C	- fan unconditionally turned off
-10°C < T < +70°C	- fan turned on only when transmitter keyed
T > +70°C	- fan unconditionally turned on.

2.1.4 Power Supply & Regulator Circuits

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

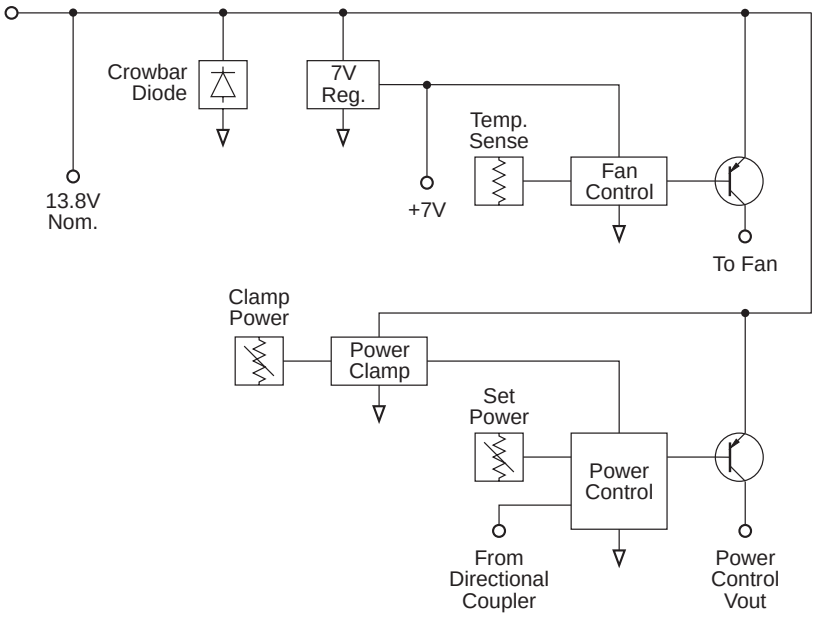


Figure 2.5 T858/859 Power Supply & Regulator Circuitry Block Diagram

The T858/859 are designed to operate off a 10.8-16V DC supply (13.8V nominal). A 7V supply runs directly off the 13.8V rail, driving the fan control, power control and alarm circuitry.

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.

2.2 T858/859 With RF Power Modules

Refer to Section 5 where the parts lists, grid reference index and diagrams will provide detailed information on identifying and locating components. Refer also to Figure 3.5 and Figure 3.7 which show the location of the main adjustment controls.

Note: Where the same component has different circuit references in the T858 and T859, in this and following sections the T858 circuit reference is given first, followed by the T859 circuit reference in brackets, e.g. Q137 [Q128].

2.2.1 Introduction

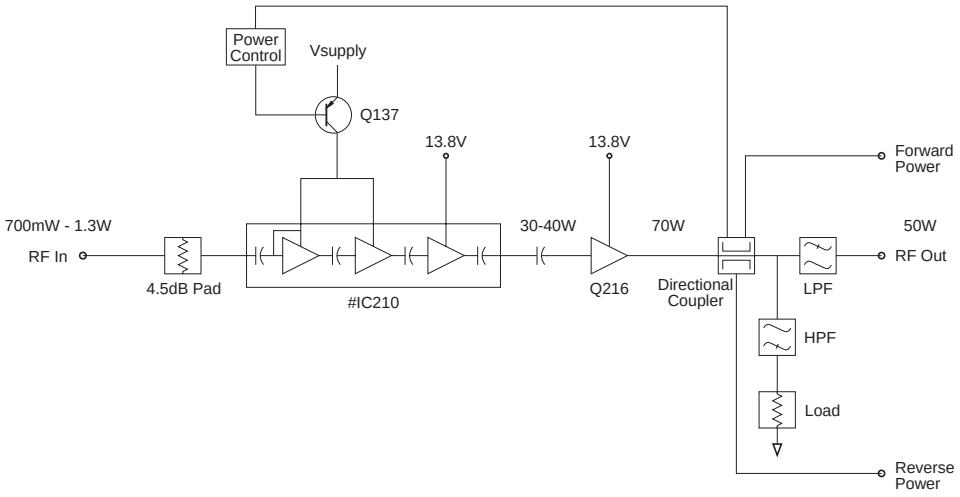


Figure 2.6 T858 High Level Block Diagram

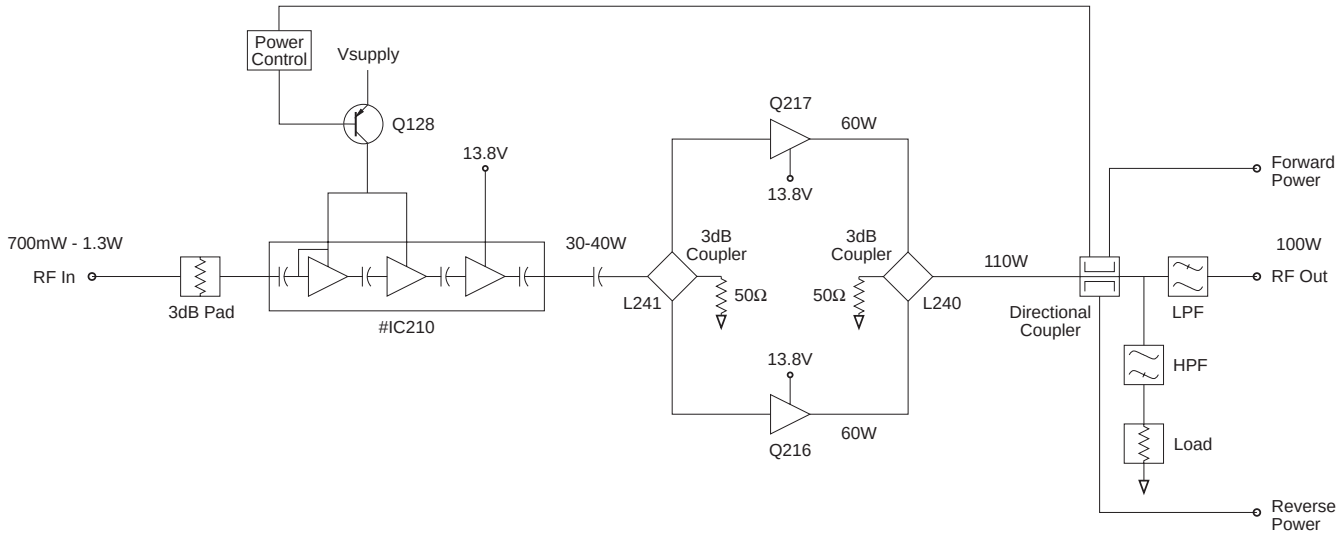


Figure 2.7 T859 High Level Block Diagram

The T858 and T859 comprise a two-stage RF power amplifier with extensive control circuitry:

- the input stage consists of a single, three-stage RF power module which increases the drive level to approx. 30W (40W typical);

- the final stage in the T858 is composed of a single transistor (Q216) which provides the rated output power; the final stage in the T859 is composed of two transistors (Q216, Q217) whose outputs are combined to provide the rated output power.

Figure 2.6 and Figure 2.7 show the configuration of each of the main circuit blocks on a functional level, while fold-outs Figure 1.3 and Figure 1.5 show their location on the PCB.

2.2.2 RF Circuitry

(Refer to Figure 2.6, Figure 2.7 and the RF section circuit diagrams in Section 5.)

The driver stage of the T858 consists of a three-stage RF power module (#IC210) which delivers 30-40W to the final amplifier (Q216). The output from the final is passed to the antenna socket via the harmonic filter.

The driver stage of the T859 consists of a three-stage RF power module (#IC210) which delivers 30-40W to the final transistors. The signal is split via a 3dB quadrature hybrid (L241) and used to drive the two final amplifiers (Q216, Q217). The outputs from these final stages are recombined by L240 and passed to the antenna socket via the harmonic filter.

The diplexer presents the final amplifiers with a good load at harmonic frequencies, which helps to achieve the expected harmonic attenuation in the output filter.

The directional coupler senses forward and reflected power, which is rectified (D205 & D206) and passed to the control circuitry for metering, alarm and power control purposes.

Power control is via a series pass transistor (Q137 [Q128]), which controls the supply voltage on the first two-stage of #IC210.

2.2.3 Control Circuitry

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

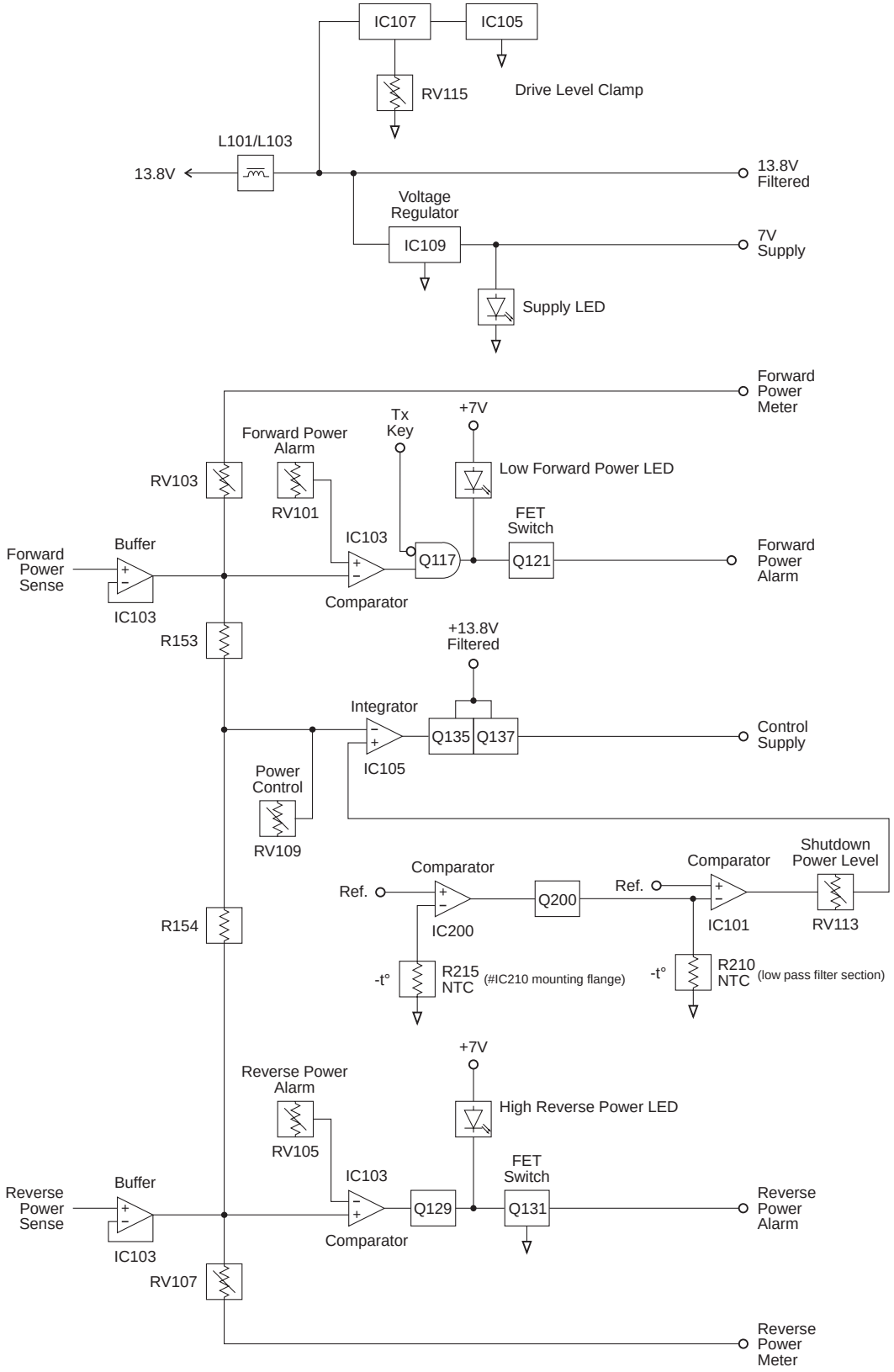


Figure 2.8 T858 Control Circuitry Block Diagram

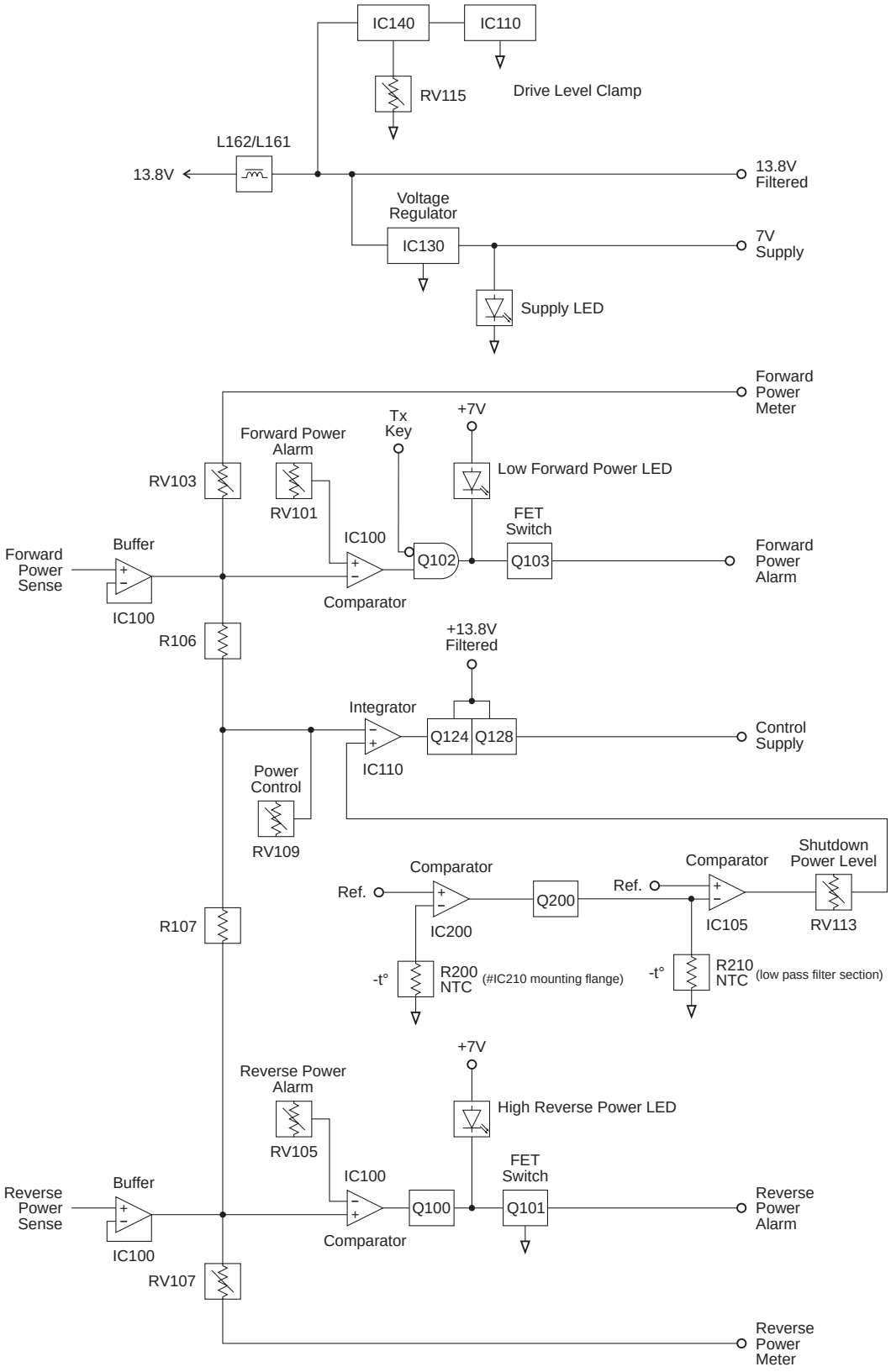


Figure 2.9 T859 Control Circuitry Block Diagram

2.2.3.1 Power Control

The DC voltages from the directional coupler representing forward and reflected power are buffered by the two voltage followers, IC103 [IC100] pins 1, 2 & 3 and pins 12, 13 & 14. Their outputs are summed at an integrator (IC105 [IC110] pins 1, 2 & 3), which drives the series pass control elements (Q135 & Q137 [Q124 & Q128]).

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.

2.2.3.2 Driver Power Level

The maximum output power of the T858/859 can be limited by placing a ceiling on the driver output power level using RV115 (accessible through the side cover). For example, if RV115 is set for a maximum output power of 50W, the range of adjustment using RV109 (front panel power adjust) will be 20 to 50W.

Caution: **The driver power level clamp (RV115) is factory set to give a maximum power output at room temperature of 60W for the T858 and 110W for the T859. The unit may be damaged if this level is increased.**

2.2.3.3 Thermal Protection

At excessively high temperatures, the output power will automatically reduce to a preset level (set by RV113), thus preventing the PA from overheating.

Ambient temperature within the PA is measured by a thermistor controlled voltage divider (R168 [R177], R210) which applies a voltage to a comparator with hysteresis (IC101 [IC105] pins 8, 9 & 10). This thermistor is located on the PCB in the low pass filter cavity.

Thermal protection is also provided for the RF power module to prevent the module itself from overheating. This protection consists of a thermistor controlled voltage divider (R203, R215 [R200]) which sets a voltage on a comparator with hysteresis (IC200 pins 1, 2 & 3). The thermistor is located on the module flange.

The output current from all comparators is summed into the power control network via RV113 so that the power level to which the PA must turn down may be set.

2.2.3.4 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).

IC103 [IC100] pins 5, 6 & 7 and pins 8, 9 & 10 form comparators with thresholds

adjusted via RV101 (forward power) and RV105 (reverse power) respectively. The inputs are from the forward and reverse power signals from the directional coupler, buffered by IC103 [IC100] pins 1, 2 & 3 and pins 12, 13 & 14. Thus, the power levels at which the forward and reverse power alarms are triggered are defined by RV101 and RV105 respectively.

2.2.3.5 Forward And Reverse Power Metering

Forward and reverse power signals from the two IC103 [IC100] buffers are available for metering purposes. The output currents are adjustable via RV103 (forward power) and RV107 (reverse power).

2.2.3.6 T859 Fan Control Circuitry

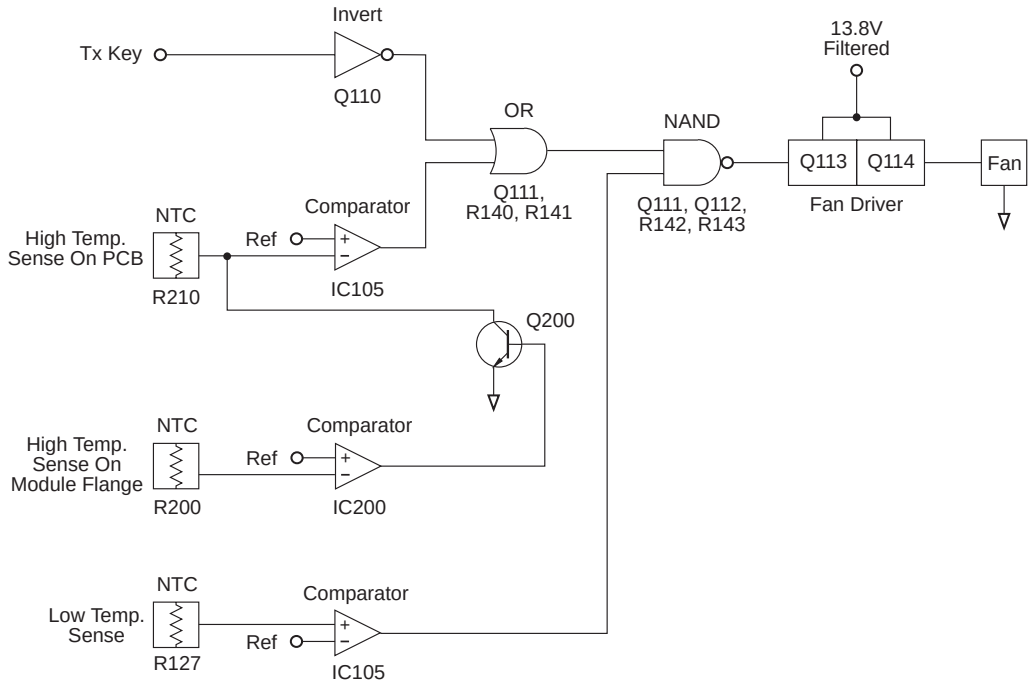


Figure 2.10 T859 Fan Control Logic Diagram

Comparator IC105 pins 12, 13 & 14 are set to switch at heatsink temperatures greater than +90°C or RF power module flange temperatures greater than +110°C, and pins 1, 2 & 3 at temperatures less than -10°C.

A logic AND function is applied to the comparator outputs by Q111 and Q112, thereby turning on the fan unconditionally (via Q113 and Q114) if the heatsink temperature exceeds +90°C or the module flange temperatures exceed +110°C.

A logic OR function is applied to comparator IC105 pins 12, 13 & 14 and Tx KEY signals, thereby turning on the fan when the transmitter is keyed and the temperature is between -10°C and +90°C (or +110°C for the module flanges).

If the temperature drops below -10°C, Q112 is turned off, preventing Q111 from activating the fan.

2.2.4 Power Supply & Regulator Circuits

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

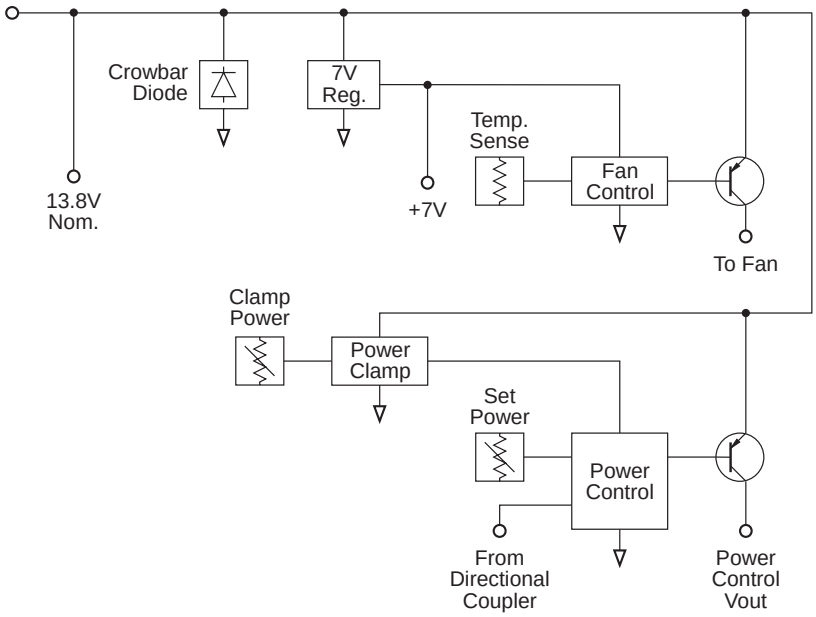


Figure 2.11 T858/859 Power Supply & Regulator Circuitry Block Diagram

The T858/859 are designed to operate off a 10.8-16V DC supply (13.8V nominal). A 7V supply runs directly off the 13.8V rail, driving the fan control, power control and alarm circuitry.

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.

3 T858/859 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 T858/859, both with and without RF power modules.

Section 3.1 describes the older design T858/859 without RF power modules, while Section 3.2 describes the newer design T858/859 with RF power modules. Figure 1.1 shows how to identify your PA design without having to remove the side cover.

The following topics are covered in this section.

3.1 T858/859 Without RF Power Modules

Refer to Section 5 where the parts lists, grid reference index and diagrams will provide detailed information on identifying and locating components. Refer also to Figure 3.4 and Figure 3.6 which show the location of the main tuning and adjustment controls.

3.1.1 Test Equipment Required

- DC power supply capable of delivering the following at 13.8V:

  T858 >16A (e.g. Tait T807)
  T859 >25A (e.g. Tait T808).

- Multimeter or DMM (e.g. Fluke 77).
- RF power meter (e.g. HP 435 series or Bird Wattmeter).
- 250W 30dB 50 ohm pad (e.g. Weinschel 40-20-34), or other suitable load.
- 300W 3dB 50 ohm pad (e.g. Weinschel 40-3-34).
- 'BNC' to 'N' type adaptors (e.g. Amphenol, Greenpar).
- Appropriate trimming tools.

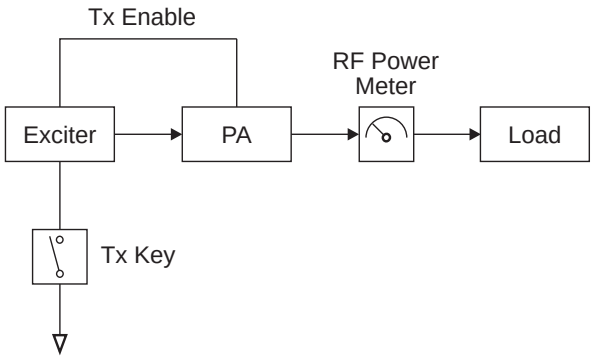


Figure 3.1 T858/859 Test Equipment Set-up

3.1.2 Preliminary Checks

Check for short circuits between the positive rail and earth.

Set up the test equipment as in Figure 3.1.

Connect the T858/859 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 (pin 1 of IC2).

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.

3.1.3 RF Alignment

3.1.3.1 Standard Tuning Procedure

T859 Only: For sets with serial numbers following 217262, set RV69 (driver power level) fully clockwise.

Preset the tuning controls as shown in Figure 3.2.

Set RV63 (front panel power control) fully clockwise.

Key on the drive source.

T859 Only: Adjust CV1 for maximum output.

Adjust CV8 for maximum output.

Adjust CV32 for maximum output.

Adjust CV51 and CV57 for maximum output.

Adjust CV34 and CV35 for maximum output.

Recheck all settings. The power output should exceed:

T858	60W
T859	110W.

T859 Only: For sets with serial numbers following 217262, adjust RV69 (driver power level) until the output power drops to 110W.

Adjust RV63 to reduce the power output to the required level (e.g. 50W for T858, 100W for T859).

3.1.3.2 Tuning Control Settings

After alignment the settings of the tuning controls should approximate those shown in Figure 3.2

	450MHz	485MHz	520MHz
CV32, CV51, CV57			
CV34, CV35			
CV8, CV1			

Figure 3.2 T858/859 Tuning Control Settings

3.1.3.3 Tuning For Best Efficiency

Retune CV32, CV51 and CV57 towards maximum capacitance to obtain minimum supply current, but do not exceed a maximum drop of 0.5A per control.

Check that the supply current is:

T858 <12A for 50W output power
T859 <22A for 100W output power.

Note: These control settings are normally very close to minimum supply current. If the current is reduced too far, maximum power output will drop and 2f rejection may degrade.

3.1.4 Setting The Output Power

Caution: **If the high 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 leads (or connectors instead of leads) between the T858/859 and power meter set-up.

Note 2: You will need appropriate extension leads if you wish to carry out the adjustment procedures with the T858/859 withdrawn from the rack in the latched position. Alternatively, disconnect and withdraw the T858/859 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 BNC/N leads will be required.

Connect an RF power meter to the PA output.

Set RV63 (front panel power control) fully clockwise.

Key on the drive source.

Check that the exciter power is 700mW to 1.3W.

Check that the power output exceeds:

T858	60W
T859	110W.

Adjust RV63 to reduce the power output to the required level (e.g. 50W for T858, 100W for T859).

3.1.5 T858 High Temperature Shutdown Power Level

Note 1: 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.

Note 2: This Section applies ***only*** to T858 PAs, and T859 PAs with serial numbers prior to 217262.

Power up the T858 and adjust RV63 (front panel power control) for the normal operating power level.

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

Apply heat to the NTC (R72) with the tip of a soldering iron.

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

Adjust RV69 so that the voltage at IC1 pin 13 is 380mV.

3.1.6 T859 High Temperature Shutdown Power Level

Note 1: The temperature shutdown circuit is factory set to approximately 130°C and 40W. RV74 should not be readjusted if normal operation is required. Temperature adjustment is not provided on the T859.

Note 2: This Section applies ***only*** to T859 PAs with serial numbers from 217263 onwards. For T859s with serial numbers prior to this refer to Section 3.1.5 above.

Power up the T859 and adjust RV69 (driver power level) and RV63 (front panel power control) for the normal operating power level.

Apply heat to the NTC (R72) with the tip of a soldering iron.

Adjust RV74 (shutdown power level) to the desired level. For continuous operation during fault conditions, set the shutdown power to 40W

3.1.7 Remote Forward Power Meter Calibration

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

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

3.1.9 Setting Alarm Levels

Note: If forward and reverse power metering is being used, set up their calibration (Section 3.1.7 and Section 3.1.8) before setting the alarm levels.

3.1.9.1 Forward Power

Power up the T858/859 and adjust RV63 (front panel power control) so that the output power is at the alarm level required (e.g. 40W if the PA normally operates at 50W).

Adjust RV48 (forward power alarm set) 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.

3.1.9.2 Reverse Power

Power up the T858/859 and adjust RV63 (front panel power control) for the normal operating power level.

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

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

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

3.2 T858/859 With RF Power Modules

Refer to Section 5 where the parts lists, grid reference index and diagrams will provide detailed information on identifying and locating components. Refer also to Figure 3.5 and Figure 3.7 which show the location of the main adjustment controls.

Note 1: The T858/859 with RF power modules require no RF tuning or alignment.

Note 2: Where the same component has different circuit references in the T858 and T859, in this and following sections the T858 circuit reference is given first, followed by the T859 circuit reference in brackets, e.g. Q137 [Q128].

3.2.1 Test Equipment Required

- DC power supply capable of delivering >16A (T858) or >20A (T859) at 13.8V.
- Multimeter or DMM (e.g. Fluke 77).
- RF power meter (e.g. HP 435 series or Bird Wattmeter).
- 150W 30dB attenuator (T858) or 250W 50dB attenuator (T859).
- 150W 3dB 50 ohm pad.
- 'BNC' to 'N' type adaptors (e.g. Amphenol, Greenpar).
- Appropriate trimming tools.

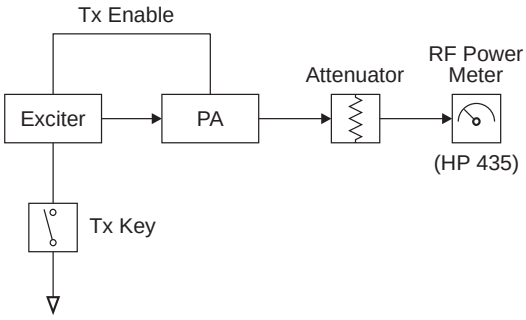


Figure 3.3 T858/859 Test Equipment Set-up

Caution: **Do not connect attenuators or DC blocks between the T857 and T858/859 or the cyclic keying circuitry will not function correctly.**

3.2.2 Shorting Links

There are seven shorting links on PL110 in the control section circuitry, as described in the table below. Ensure that these links are set as standard before starting and after completing the adjustment procedure.

Link Pins	Standard Setting	Function
1-2, 3-4, 7-8, 9-10	not linked	Not used.
5-6	not linked	Pins 5-6 are provided for simulating high operating temperatures during initial adjustment. Bridging this link shorts out R215 [R200] and R210 (NTCs), thus turning on the thermal protection circuitry. They should not be linked for normal operation.
11-12 13-14	linked	Pins 11-12 and 13-14 are provided for factory testing only. The PA will not function correctly if these settings are changed.

3.2.3 Preliminary Checks

Check for short circuits between the positive rail and earth.

Set up the test equipment as in Figure 3.3.

Connect the T858/859 to a 13.8V DC supply.

Check that the quiescent current is <50mA.

To key the transmitter, earth the key line (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 side cover on. If the cover is removed for other adjustment procedures, make a final check of the output power and alarm levels with the side cover on.

3.2.4 Setting The Output Power

Caution: **If the high 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: You must set up the T858/859 according to the following instructions ***before*** operation in a radio system. ***Do not*** use the factory default settings as they may not suit your operating frequency.

To obtain optimum performance from the T858/859, ensure that the exciter used in this set-up procedure is the one that will be used with the PA in the radio system.

Note 2: Cables and connectors can easily cause a power loss of several watts if either too long or poorly terminated. Always use the shortest possible leads (or connectors instead of leads) between the T858/859 and power meter set-up.

You will need appropriate extension leads if you wish to carry out the adjustment procedures with the T858/859 withdrawn from the rack in the latched position. Alternatively, disconnect and withdraw the T858/859 and reconnect it behind the rack.

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

Set the exciter to the required operating frequency.

Connect the exciter output to the PA input via a thru-line wattmeter with a 1W full scale reading. Special BNC/N leads will be required.

Connect an RF power meter to the PA output connector via a suitable attenuator:

T858 - 30dB
T859 - 50dB.

With the exciter ***not*** keyed, remove the label over the adjustment hole for RV115 (driver power clamp) and set RV115 to maximum (fully clockwise).

Set %RV109 (front panel power control) to maximum (fully clockwise).

Key on the exciter.

Quickly (within 30 seconds) adjust RV115 until the output power is:

T858 - 60W
T859 - 110W.

Adjust %RV109 to set the power output to the following levels (or less if required):

T858 - 50W
T859 - 100W.

Caution: ***Do not*** **allow the output power to exceed these levels as this will seriously reduce the reliability of the PA.**

Do not **use RV115 to set the output power as this will disable the thermal protection circuitry. The power clamp must always be 10W (T858)/ 20W (T859) above the set output power.**

Replace the label over the adjustment hole for RV115.

3.2.5 High Temperature Shutdown Power Level

Set %RV109 (front panel power control) to the required output power.

Simulate high operating temperatures by placing a shorting link on PL110 pins 5-6 (***do not*** use either of the links from PL110 pins 11-12 or 13-14 to do this).

Adjust RV113 (shutdown power level) for an output power of:

T858 - 20W
T859 - 40W.

Remove the shorting link from PL110 pins 5-6 to return the PA to normal operation.

3.2.6 Remote Forward Power Meter Calibration

If a remote meter is connected, adjust RV103 (forward power meter calibration) for the remote reading to agree with the RF power meter reading.

3.2.7 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 RV107 (reverse power meter calibration) for a quarter of the forward power reading.

3.2.8 Setting Alarm Levels

Note: If forward and reverse power metering is being used, set up their calibration (Section 3.2.6 and Section 3.2.7) before setting the alarm levels.

3.2.8.1 Forward Power

Power up the T858/859 and adjust %RV109 (front panel power control) so that the output power is at the alarm level required (e.g. 40W if the T858 normally operates at 50W).

Adjust RV101 (forward power alarm set) 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 %RV109 for the normal operating level.

Note: Remote indication is available at pin 3 of D-range 1.

3.2.8.2 Reverse Power

Power up the T858/859 and adjust %RV109 (front panel power control) for the normal operating power level.

Place a known mismatch of the required value (e.g. 3:1 VSWR) and adjust RV105 (reverse power alarm set) so that the reverse power alarm LED lights.

Example: A VSWR of 3:1 can be simulated by connecting an unterminated 3dB pad (50W) to the PA output. This will result in a return loss of 6dB.

Note: Remote indication is available at pin 4 of D-range 1.

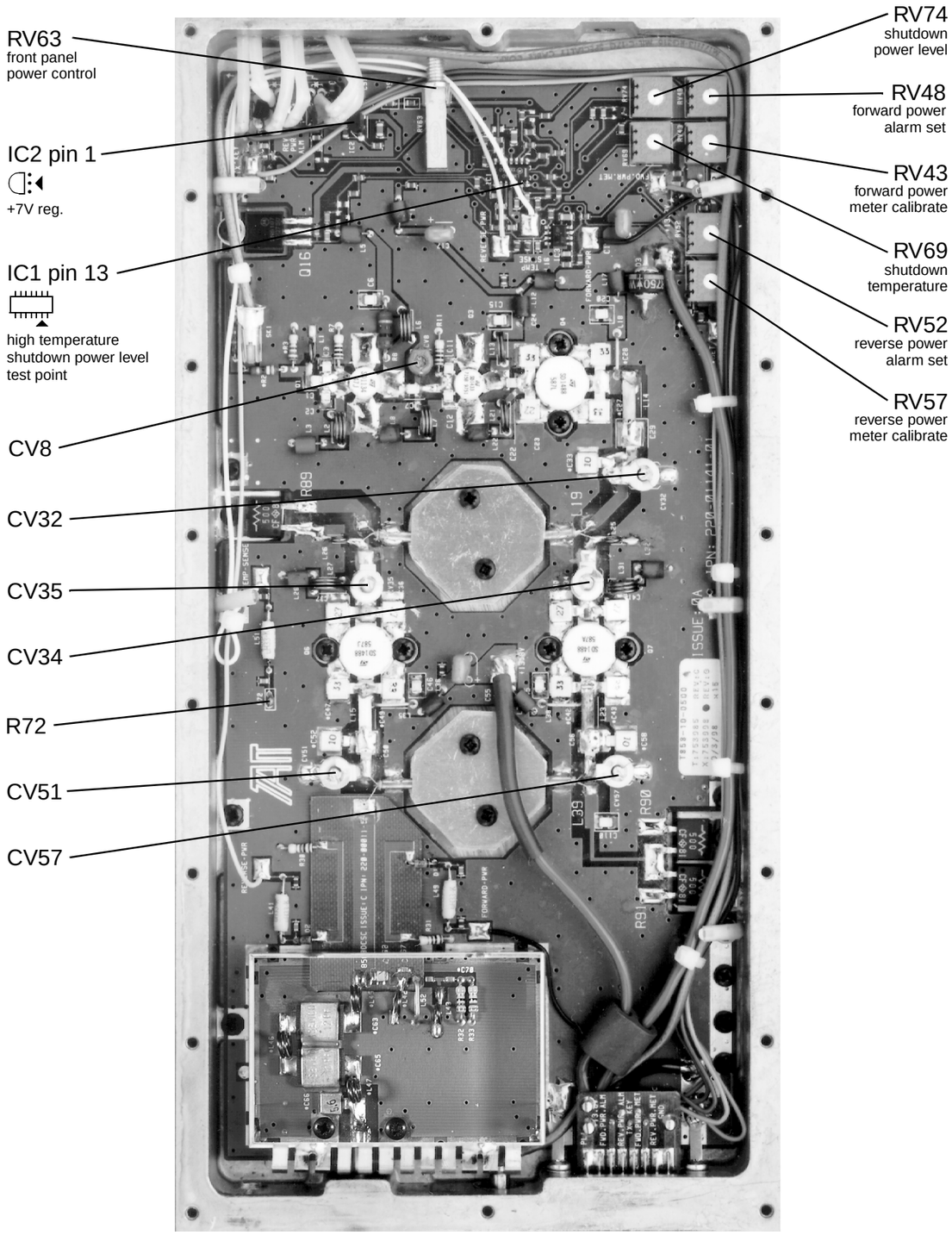


Figure 3.4 T858 Main Adjustment Controls (Without RF Power Module)

The photograph printed at right will help you to identify the main controls used in tuning and adjusting the T858 without RF power module.

There is a similar photograph in Figure 1.2 which shows the main circuit blocks.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph printed at right will help you to identify the main controls used in adjusting the T858 with RF power module.

There is a similar photograph in Figure 1.3 which shows the main circuit blocks.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

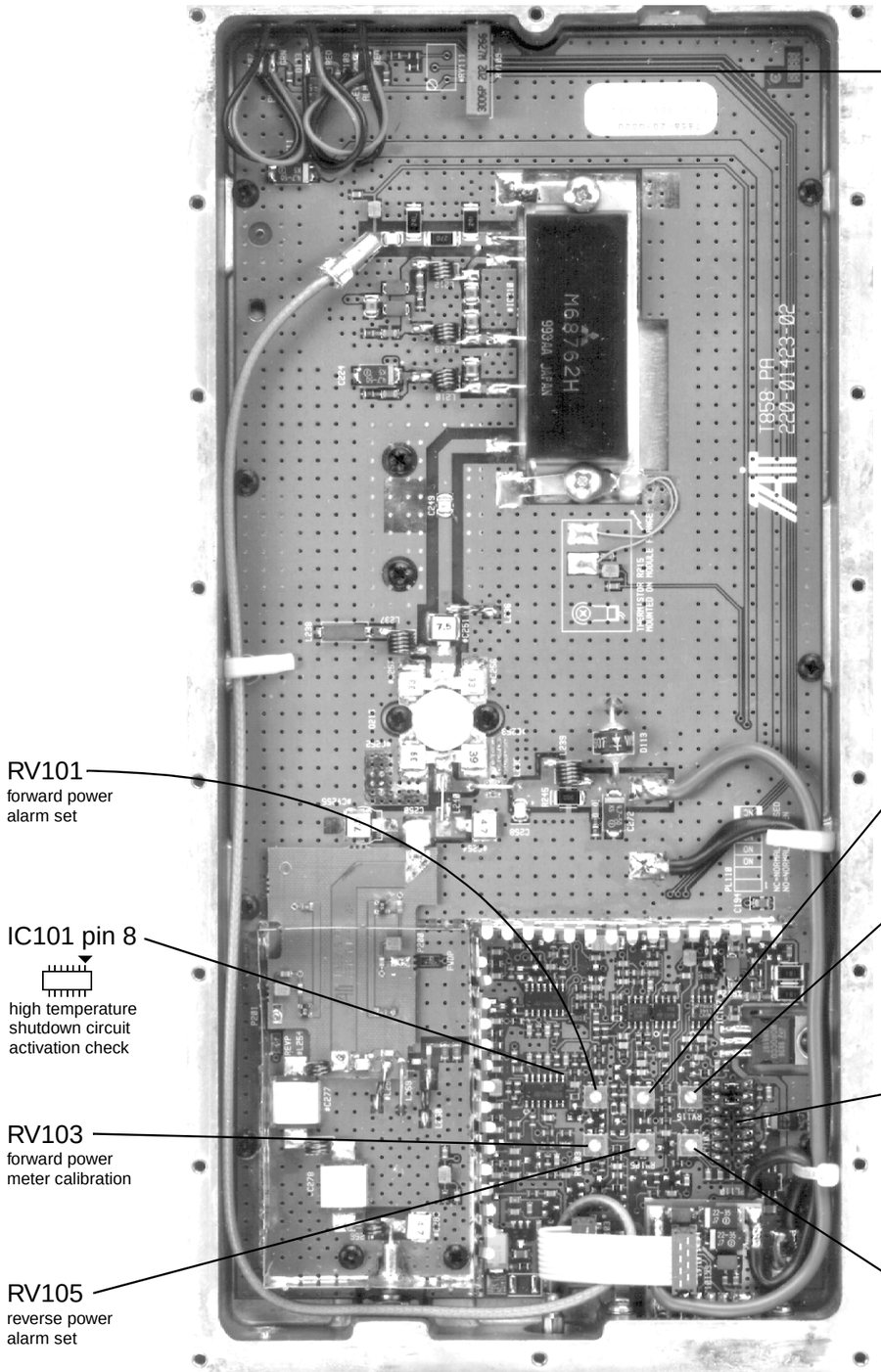


Figure 3.5 T858 Main Adjustment Controls (With RF Power Module)

The photograph printed at right will help you to identify the main controls used in tuning and adjusting the T859 without RF power module.

There is a similar photograph in Figure 1.4 which shows the main circuit blocks.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

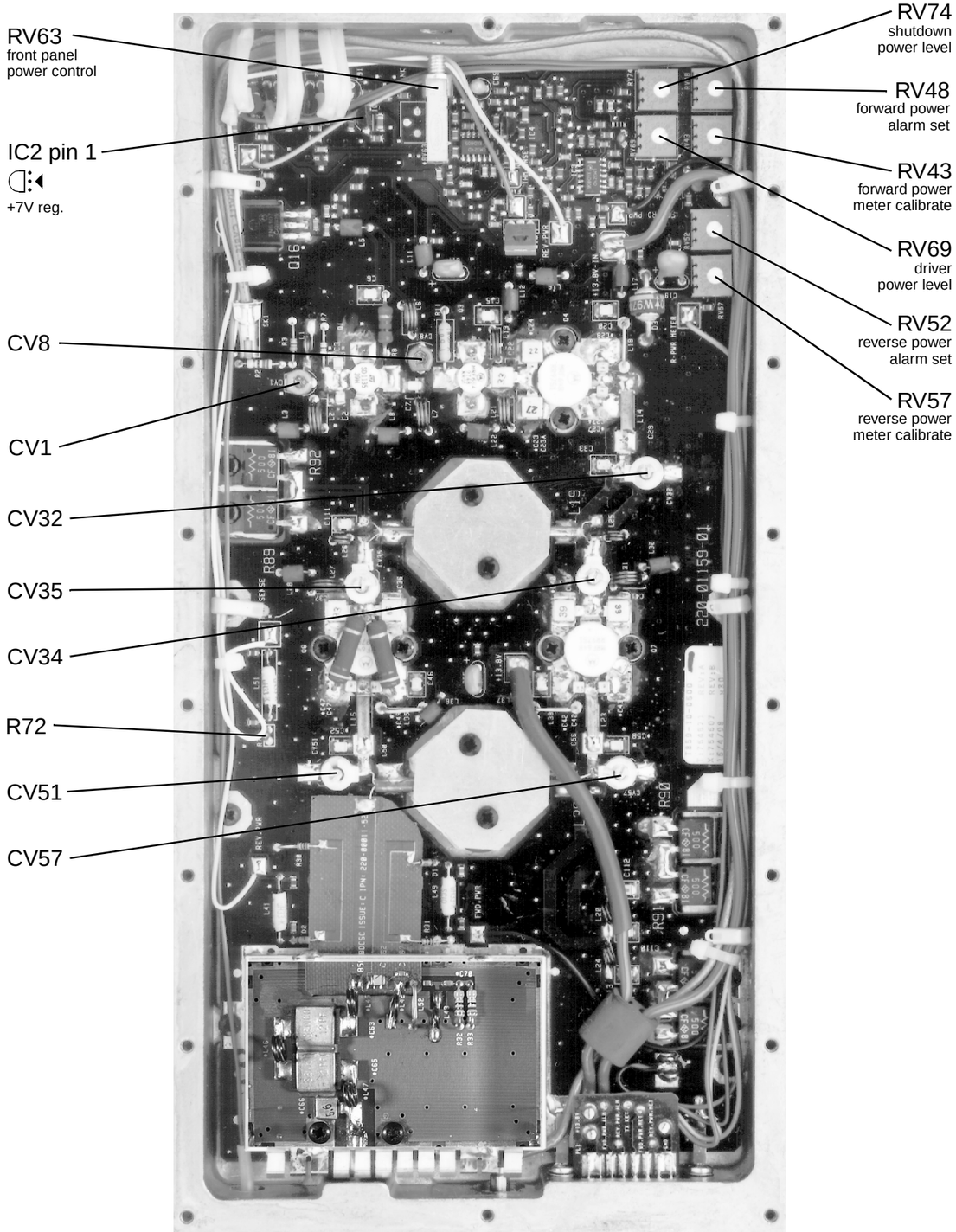


Figure 3.6 T859 Main Adjustment Controls (Without RF Power Module)

The photograph printed at right will help you to identify the main controls used in adjusting the T859 with RF power module.

There is a similar photograph in Figure 1.5 which shows the main circuit blocks.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

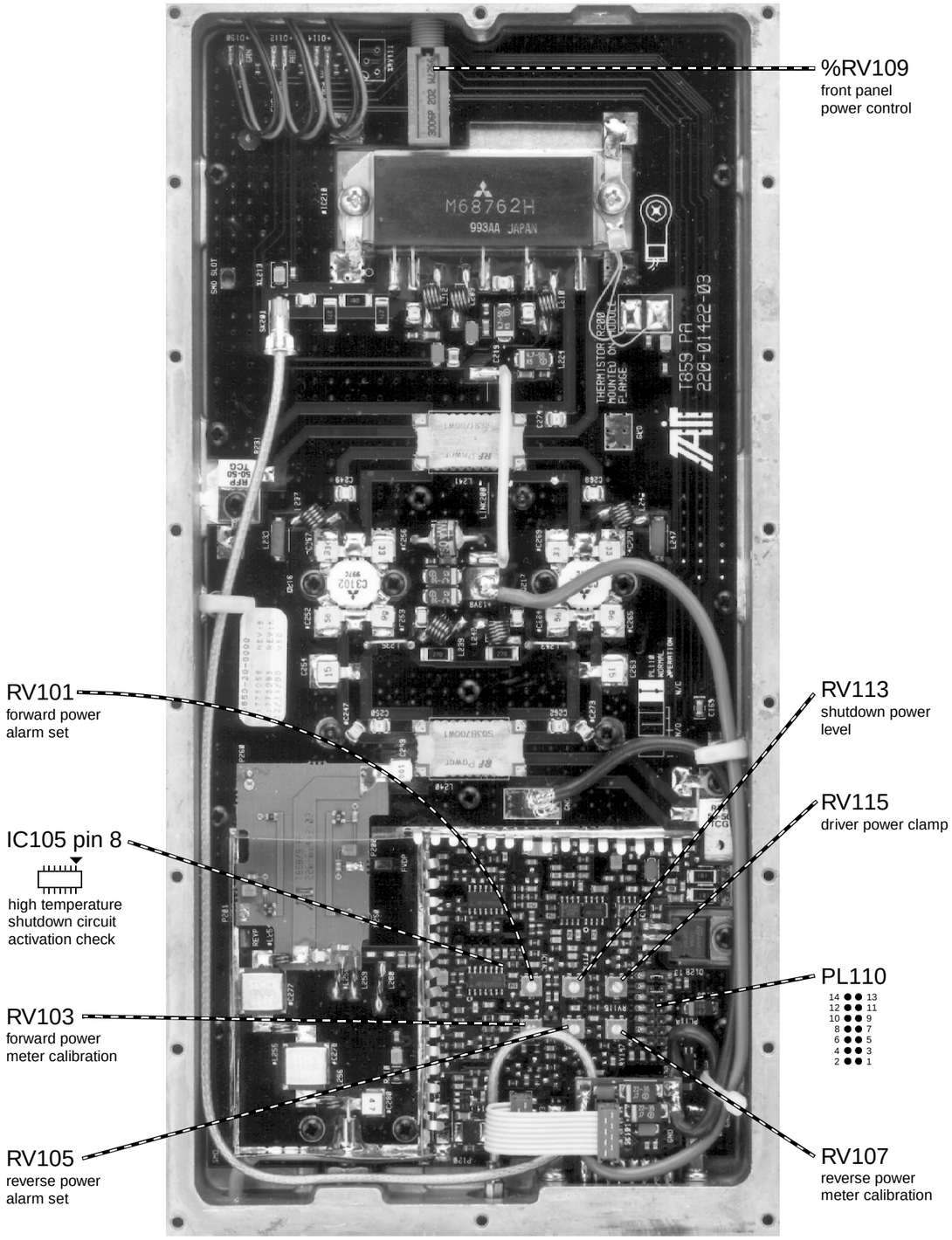


Figure 3.7 T859 Main Adjustment Controls (With RF Power Module)

4 T858/859 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).

Section 4.1 describes the older design T858/859 without RF power modules, while Section 4.2 describes the newer design T858/859 with RF power modules. Figure 1.1 shows how to identify your PA design without having to remove the side cover.

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.

4.1 T858/859 Without RF Power Modules

4.1.1 Visual Checks

Remove the side cover from the T858/859 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 4.1.7, Section 4.1.8 and Section 3 of Part A for more details on repair and replacement of components.

4.1.2 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.

4.1.3 DC Checks

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

Check that +13.8V is present on the collectors of Q3, Q4, Q5, Q6 and Q7. Make this measurement when the transmitter is not keyed.

Check that approximately 12-13V is present on the collector of Q1 (in the T859 the level is dependent on RV69 being set to maximum).

T858 Only Check that +13.8V is present at pin 4 of IC1 and pin 8 of IC3.

T859 Only Check that +13.8V is present at pin 4 of IC3.

Check that approximately +12V is present at pin 4 of IC1 (the level is dependent on RV69 being set to maximum).

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

4.1.4 RF Checks

4.1.4.1 General

You can measure in-circuit RF levels around Q1 and Q3 with an RF probe on which the earth lead has been shortened to a minimum (i.e. 13mm); refer to the PA Fault Finding Charts (Section 4.1.6.1 or Section 4.1.6.3 as appropriate). 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 Charts (Section 4.1.6.2 or Section 4.1.6.4 as appropriate).

4.1.4.2 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. These 50Ω test break points have been included throughout the RF circuitry to enable individual transistor stages to be tested.

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.

replace A4 pages D4.5/D4.6 with A3 pages D4.5/D4.6

Figure 4.1 T858/859 Test Break Point Location

replace A4 pages D4.5/D4.6 with A3 pages D4.5/D4.6

4.1.5 Voltage Chart

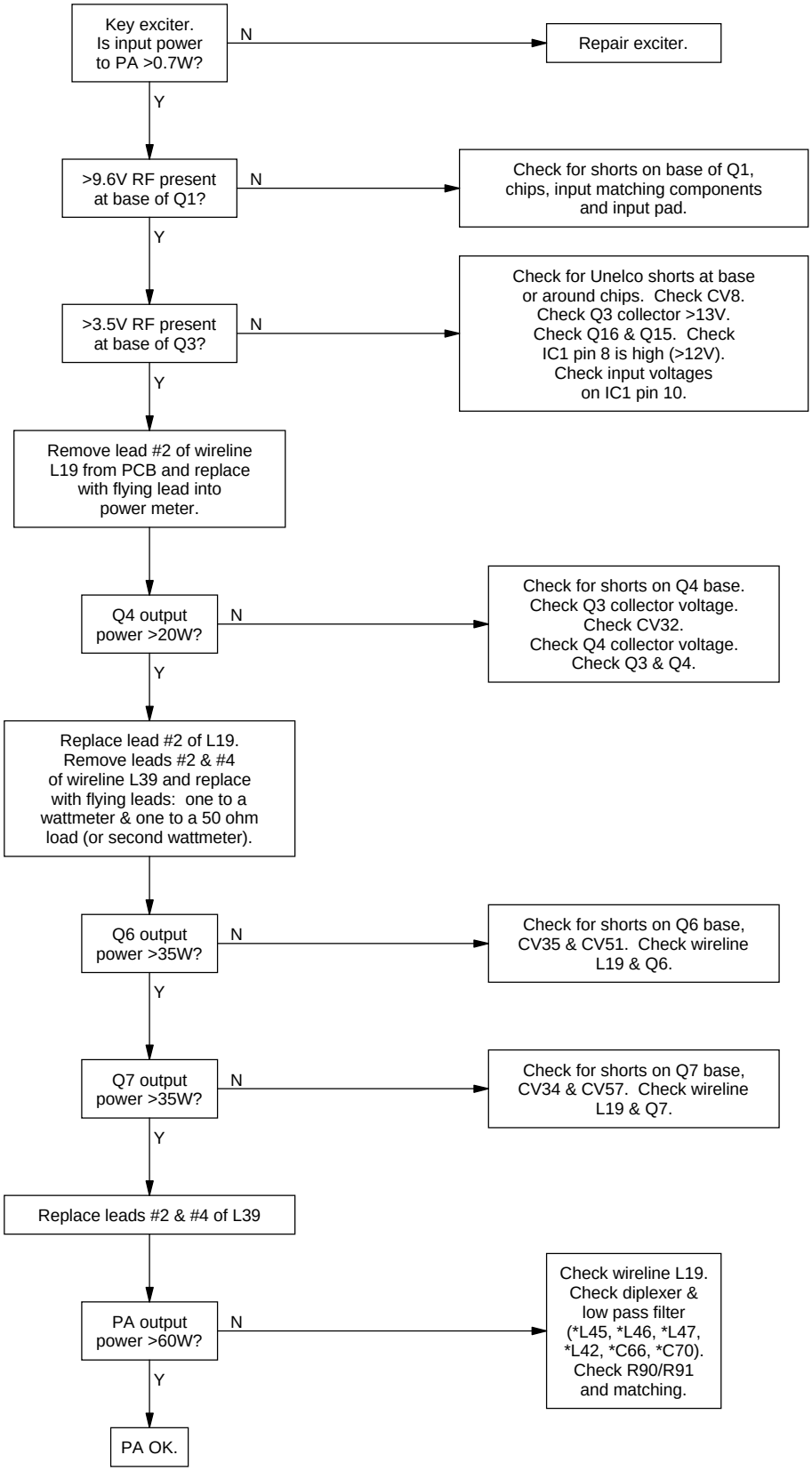
Test conditions:

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

Device	Emitter	Base	Collector
Q1	0.0V	0.0V	13.0V
Q3	0.0V	0.0V	13.8V
Q4	0.0V	0.0V	13.8V
Q6	0.0V	0.0V	13.8V
Q7	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

4.1.6 Fault Finding Charts

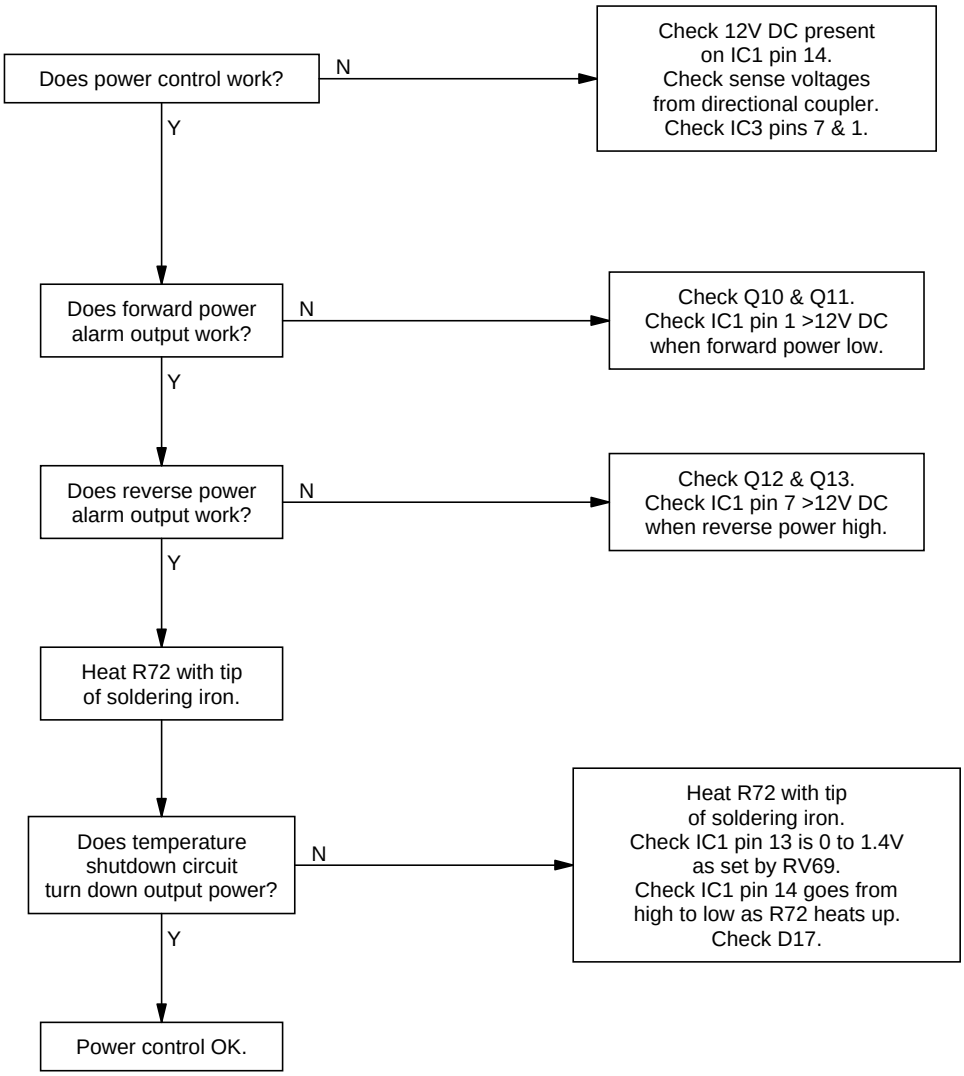
4.1.6.1 T858 PA



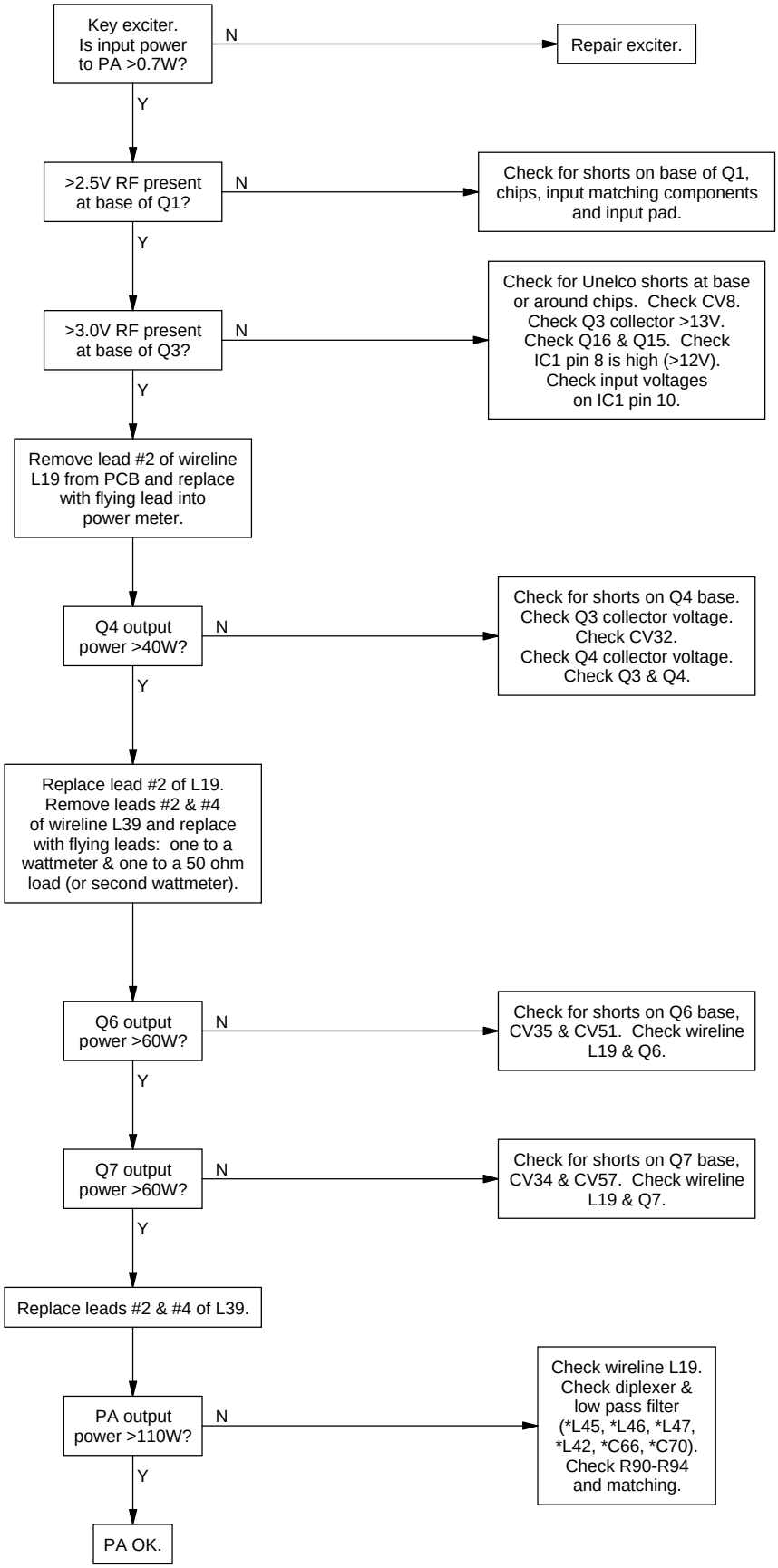
4.1.6.2 T858 Power Control

Approximate voltages under normal operating conditions:

Measurement	Output Power	
	20W	50W
forward power at "FWD-PWR" pad (beside IC3)	2.5V	4V
RV63/R64 (RV63 wiper)	1.4V	2.1V



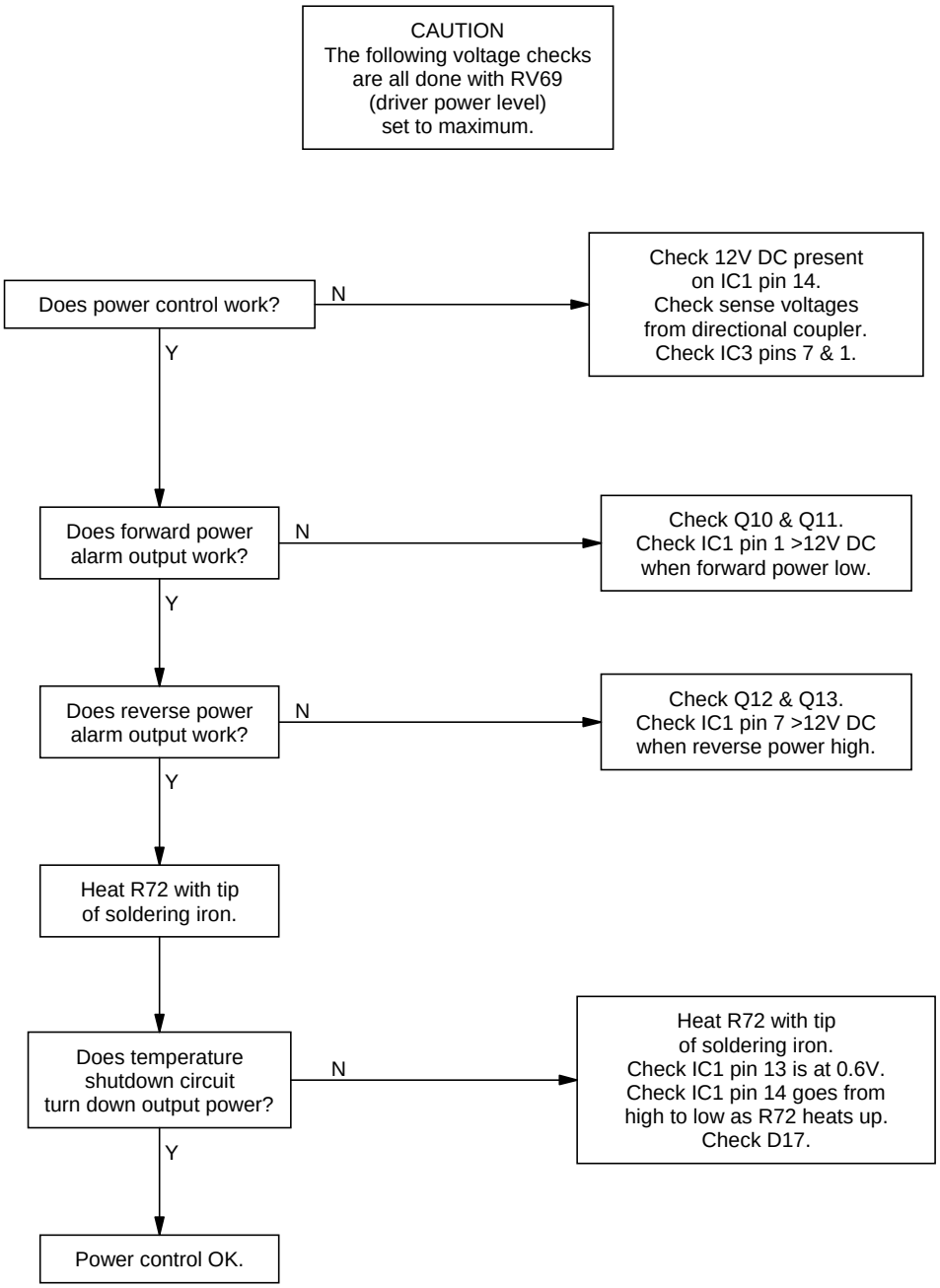
4.1.6.3 T859 PA



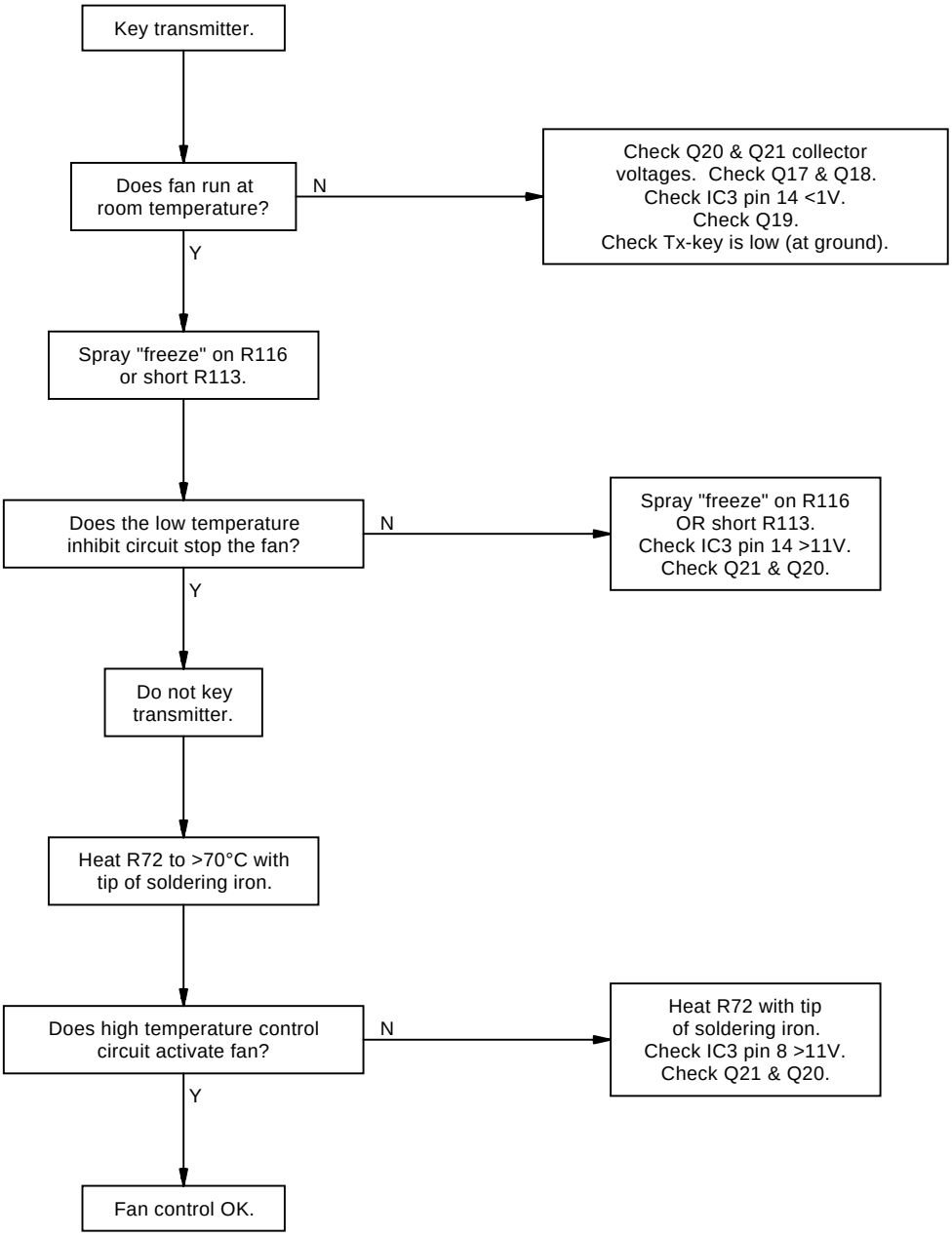
4.1.6.4 T859 Power Control

Approximate voltages under normal operating conditions:

Measurement	Output Power	
	20W	50W
forward power at "FWD-PWR" pad (beside IC3)	2.5V	4V
RV63/R64 (RV63 wiper)	1.4V	2.1V



4.1.6.5 T859 Fan Control Circuitry



4.1.7 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, measure the distance between the capacitors and transistor body to the nearest 0.5mm (measurement "A" in Figure 4.2) so that the capacitors can be replaced in *exactly* the same position. These measurements are shown in Figure 4.2 for the 6LFL package, however the same procedure applies for the SOE (stud) package.

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.**

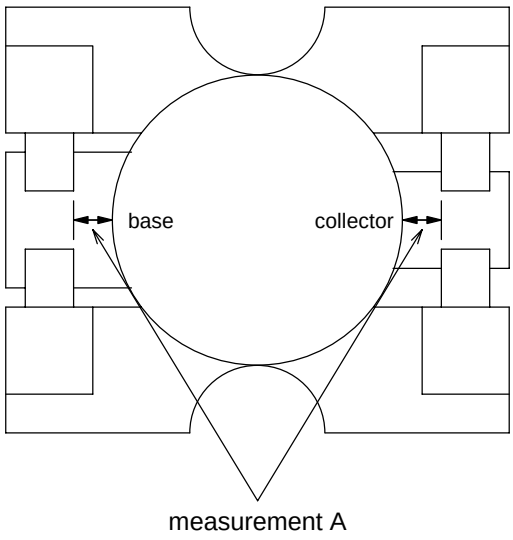


Figure 4.2 Typical Transistor/Capacitor Spacing (Not To Scale)

Desolder and remove the components from around the transistor.

Q4/Q6/Q7 Only: Desolder and remove the two solder tags.

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

Q1/Q3 Only: Unscrew the transistor stud nut and remove the device. In the T859 you will need to remove the fan to access the stud nuts.

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. Remove any excess solder to leave a thin, even layer on the 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.

Q1/Q3 Only: Lightly solder one tab to the PCB, then torque down the retaining nut to the correct torque (0.7Nm/6in.lbf.). Refit the fan to the T859.

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

Q4/Q6/Q7 Only: Refit the solder tags.

Solder all transistor tabs to the PCB.

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

4.1.8 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.

T859 Only: Desolder the power feed to the fan from the PCB.

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 and mounting screws. In the T859 you will need to remove the fan to access the stud nuts.

Remove the mounting screws for the TO-220 devices:

T858/859	Q16, R89, R90 and R91
T859	R92, R93 and R94.

Remove the retaining screws for the wireline couplers (L19 and L39).

Remove the PCB retaining screws:

T858	14
T859	11.

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: R89-94 and Q1-Q7 may be stuck down with heatsink compound. You may need to carefully prise them away from the heatsink with a small screw-driver.

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/Q3 Only: 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.

4.2 T858/859 With RF Power Modules

Note: Where the same component has different circuit references in the T858 and T859, in this and following sections the T858 circuit reference is given first, followed by the T859 circuit reference in brackets, e.g. Q137 [Q128].

4.2.1 Visual Checks

Remove the side cover from the T858/859 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 4.2.7, Section 4.2.8, Section 4.2.9 and Section 3 of Part A for more details on repair and replacement of components.

4.2.2 Shorting Links

There are seven shorting links on PL110 in the control section circuitry, as described in the table below. Ensure that these links are set as standard before starting and after completing the adjustment procedure.

Link Pins	Standard Setting	Function
1-2, 3-4, 7-8, 9-10	not linked	Not used.
5-6	not linked	Pins 5-6 are provided for simulating high operating temperatures during initial adjustment. Bridging this link shorts out R215 [R200] and R210 (NTCs), thus turning on the thermal protection circuitry. They should not be linked for normal operation.
11-12 13-14	linked	Pins 11-12 and 13-14 are provided for factory testing only. The PA will not function correctly if these settings are changed.

4.2.3 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 (e.g. a base choke). 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).

Caution: **Before operating the PA, replace any RF base chokes removed while making measurements.**

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.

4.2.4 DC Checks

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

Check that +13.8V is present on the collectors of Q216 (T858) or Q216 and Q217 (T859). Make this measurement when the transmitter is not keyed.

Check that approximately 8-13.8V is present on pin 2 of #IC210 (the level is dependent on RV115 being set to maximum).

Check that +13.8V is present at pin 4 of IC100.

Check that approximately +12V is present at pin 8 of IC110 (the level is dependent on RV115 being set to maximum).

Check that +7.0V is present at the output of regulator IC130.

4.2.5 RF Checks

4.2.5.1 T858

The T858 PA Fault Finding Chart (Section 4.2.6.1) provides a systematic approach for locating a fault in the RF circuitry. Use this chart in conjunction with Figure 4.3 on page 4.21, which shows the locations of the 50Ω input and output test points for RF module #IC210 and RF transistor Q216.

Device	Input Connection	Output Connection
#IC210	input BNC connector or SK201	C249
Q216	C249	C250

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.

For problems with the power control circuitry, refer to the T858 Power Control Fault Finding Chart (Section 4.2.6.3).

4.2.5.2 T859

The T859 PA Fault Finding Chart (Section 4.2.6.2) provides a systematic approach for locating a fault in the RF circuitry. Use this chart in conjunction with Figure 4.4 on page 4.22, which shows the locations of the 50Ω input and output test points for RF module #IC210 and RF transistors Q216 and Q217.

Device	Input Connection	Output Connection
#IC210	input BNC connector or SK201	C274
Q216 & Q217	L241	C250, C262

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.

For problems with the power control circuitry, refer to the T859 Power Control Fault Finding Chart (Section 4.2.6.4).

replace A4 pages D4.21/D4.22 with A3 pages D4.21/D4.22

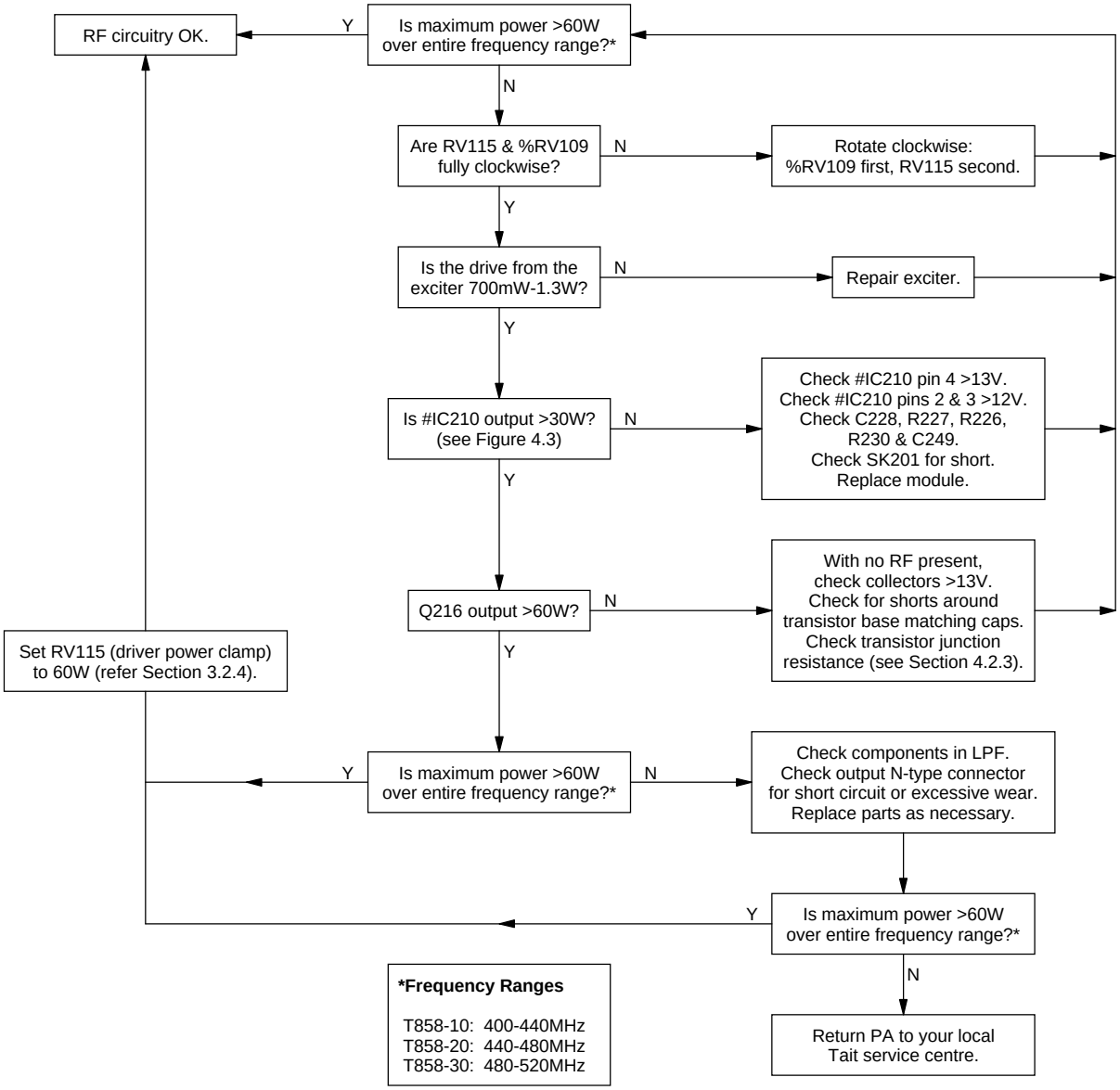
Figure 4.3 T858 Test Break Point Location

replace A4 pages D4.21/D4.22 with A3 pages D4.21/D4.22

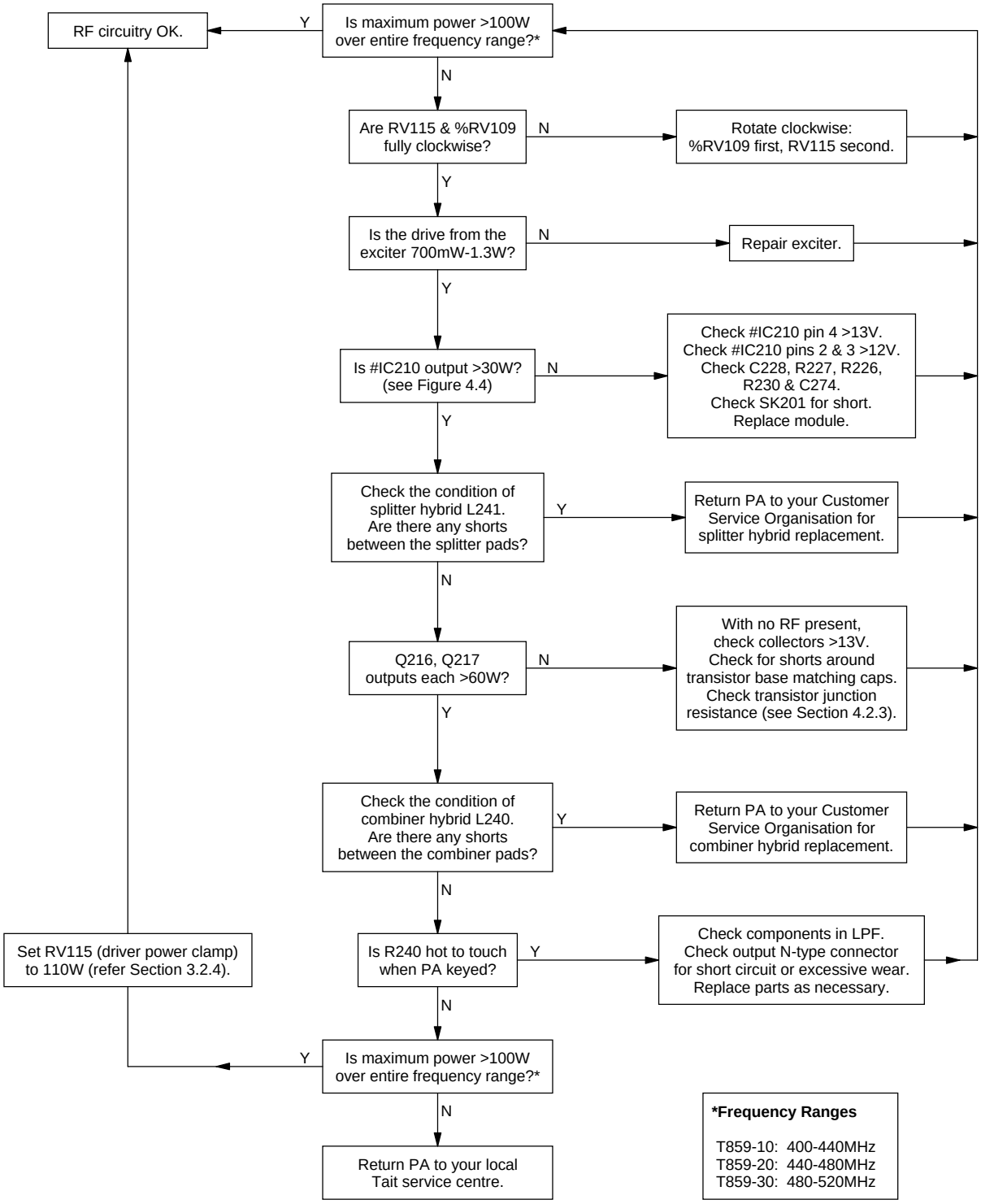
Figure 4.4 T859 Test Break Point Location

4.2.6 Fault Finding Charts

4.2.6.1 T858 PA



4.2.6.2 T859 PA



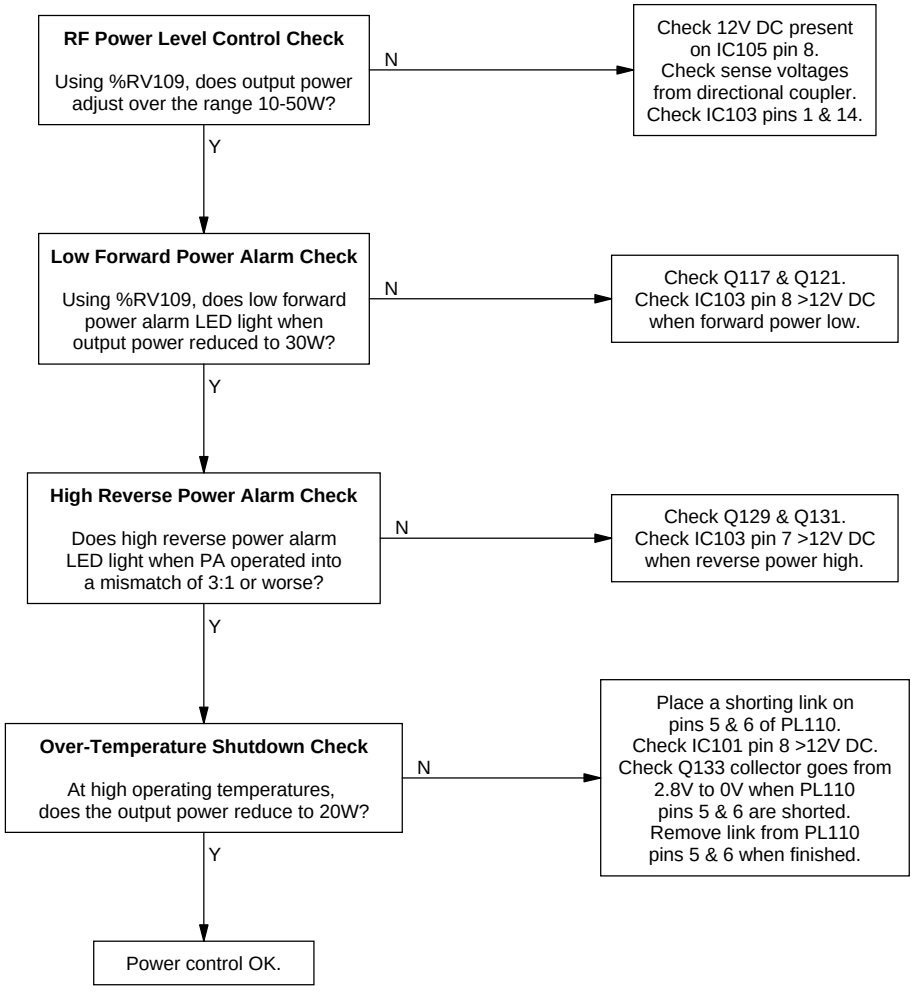
4.2.6.3 T858 Power Control

Approximate voltages (@ 480MHz) under normal operating conditions:

Forward & Reverse Power Measurement	Output Power	
	20W	50W
forward power at IC100 pin 14	1.8V	2.9V
reverse power at IC100 pin 1	0.6V	0.6V

Caution

The following voltage checks are all done with RV115 (driver power clamp) set to maximum. When these tests are finished, reset RV115 to 60W.



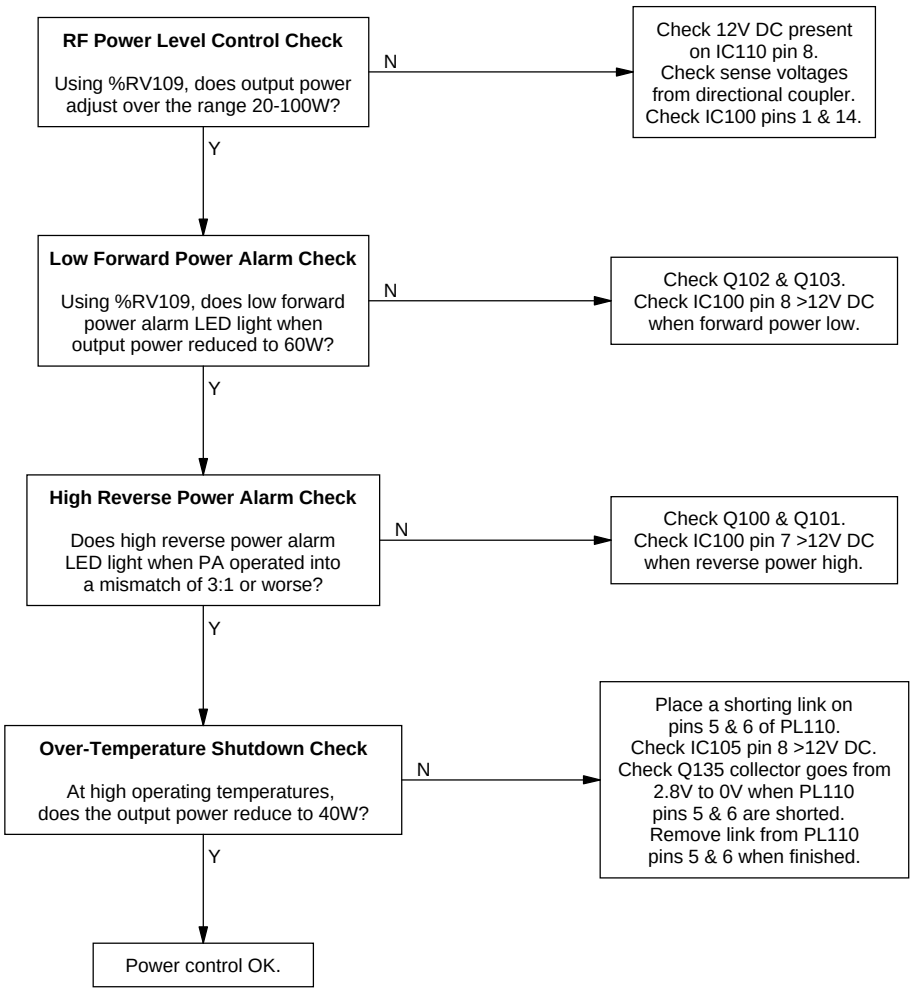
4.2.6.4 T859 Power Control

Approximate voltages (@ 480MHz) under normal operating conditions:

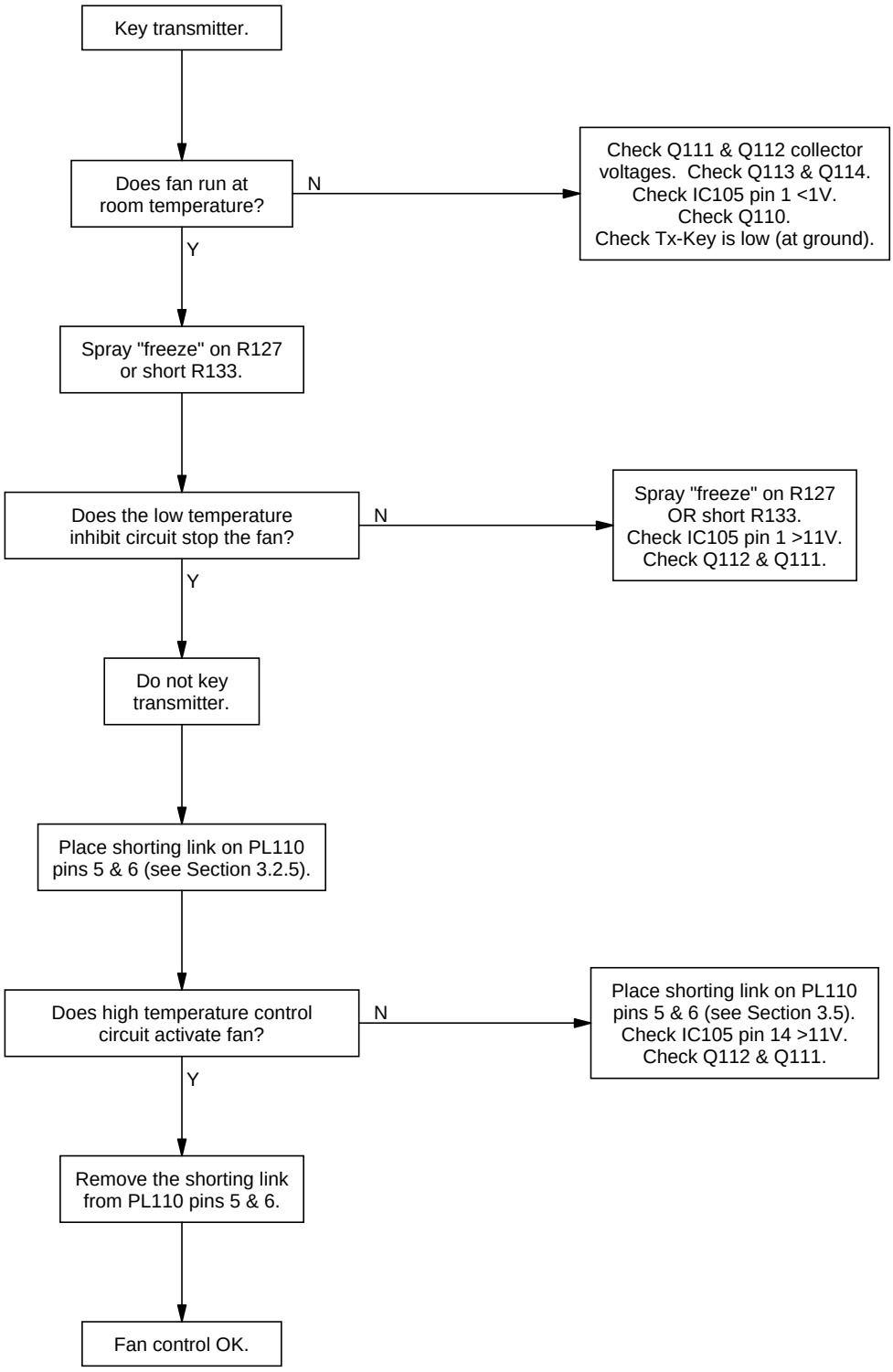
Forward & Reverse Power Measurement	Output Power	
	40W	100W
forward power at IC100 pin 14	2.5V	4.2V
reverse power at IC100 pin 1	0.6V	0.6V

Caution

The following voltage checks are all done with RV115 (driver power clamp) set to maximum. When these tests are finished, reset RV115 to 110W.



4.2.6.5 T859 Fan Control Circuitry



4.2.7 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 position, type and value of each capacitor. Measure the distance between each capacitor and the transistor body to the nearest 0.5mm (measurement "A" in Figure 4.5) so that it can be replaced in *exactly* the same position. These measurements are shown for the T858, however the same procedure applies for the T859.

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.**

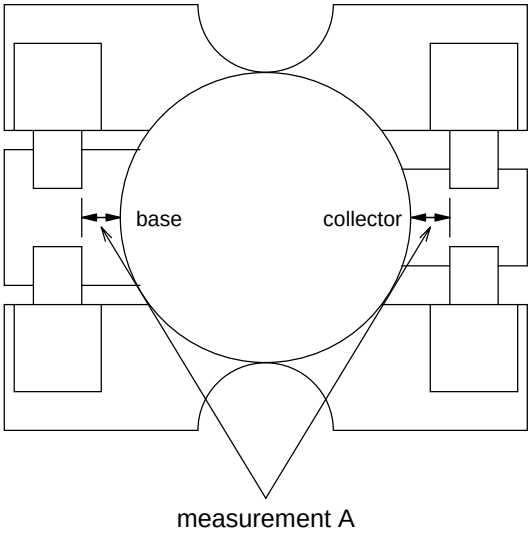


Figure 4.5 Typical Capacitor Positioning On T858/859 RF Power Transistors (Not To Scale)

Desolder and remove the capacitors from around the transistor.

Remove the two mounting screws, then desolder and remove the two solder tags.

Desolder the transistor tabs by heating with a soldering iron and lifting away from the PCB with a screwdriver or thin stainless steel spike, then 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. Remove any excess solder to leave a thin, even layer on the 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.

Solder all transistor tabs to the PCB.

Refit the solder tags and mounting screws. Tighten the screws to a torque of 90N.cm/8in.lbf.

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

4.2.8 Replacing RF Power Modules

Caution: **Follow these instructions carefully, otherwise the module can fail because of poor heatsinking or cracked substrates.**

Desolder the module legs by heating with a soldering iron and lifting away from the PCB with a screwdriver or thin stainless steel spike.

Undo the module screws and remove the thermistor assembly.

Desolder and remove both earth tags.

Gently lift the module away from the heatsink.

Note: The module may be stuck down quite firmly with heatsink compound. You may need to carefully prise it away from the heatsink with a small screwdriver. Keep the heatsink compound clean while the module is detached.

Apply a small amount of heatsink compound (Dow-Corning 340 or equivalent) to the replacement module mounting surface. Use enough compound to ensure an even film over the entire mounting surface.

Reposition the module in the correct orientation and ensure it is well pasted to the heatsink.

Replace the earth tags and thermistor assembly in their original positions and hand-tighten the screws, ensuring the tags and thermistor remain in place. Alternately tighten each screw evenly, finally torquing them down to 56N.cm/5in.lbf. with an accurate torque driver.

Caution: **It is essential that you apply the correct torque to these screws to allow the module flange to expand and contract under temperature cycling. Also, do not solder any module legs before torquing down otherwise the device may be broken.**

Solder the earth tags and all module legs to the PCB.

4.2.9 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.

T859 Only: Desolder the power feed to the fan from the PCB.

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.

Desolder the positive and negative power feed wires from the D-range PCB.

Disconnect the ribbon cable from the D-range PCB.

Remove the two screws securing the D-range connector and PCB to the heatsink and withdraw the assembly from the heatsink.

Remove the mounting screws for the TO-220 devices:

T858	Q137
T859	Q128, R231 and R240.

Remove the two screws securing the power module (#IC210).

Remove the mounting screws for the power transistors:

T858	Q216
T859	Q216 and Q217.

Remove the PCB retaining screws:

T858	13
T859	17.

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: R231, R240 and #IC210 may be stuck down with heatsink compound. You may need to carefully prise them away from the heatsink with a small screwdriver.

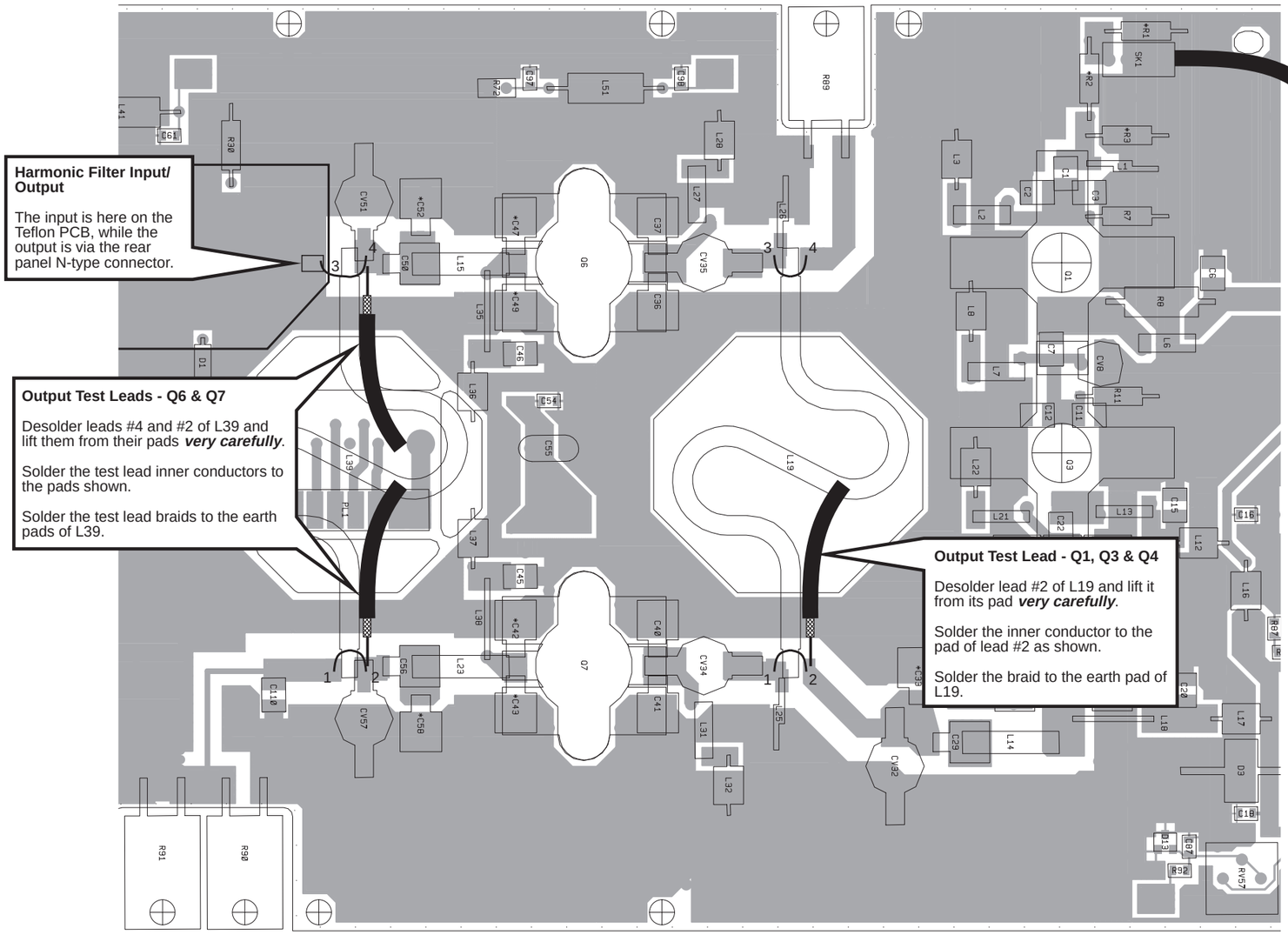
Caution: **Keep the heatsink compound clean while the PCB is detached. Any objects caught in the heatsink compound underneath the device which prevent effective earthing and/or heatsinking may cause the device to fail.**

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'.

Make sure that the heatsink compound has stayed clean, and that the insulating pad for Q137 [Q128] 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.



Caution: L19/L39 Inner Conductors

The inner conductors of L19 and L39 are silver wire and are very fragile. Take care not to damage them when desoldering and lifting them off the pads.

When resoldering, make sure each inner conductor curves onto the pad (as shown in the drawing) to protect it from thermal stress or shorts. Do not pull the wire tight.

Figure 4.1 T858/859 Test Break Point Location

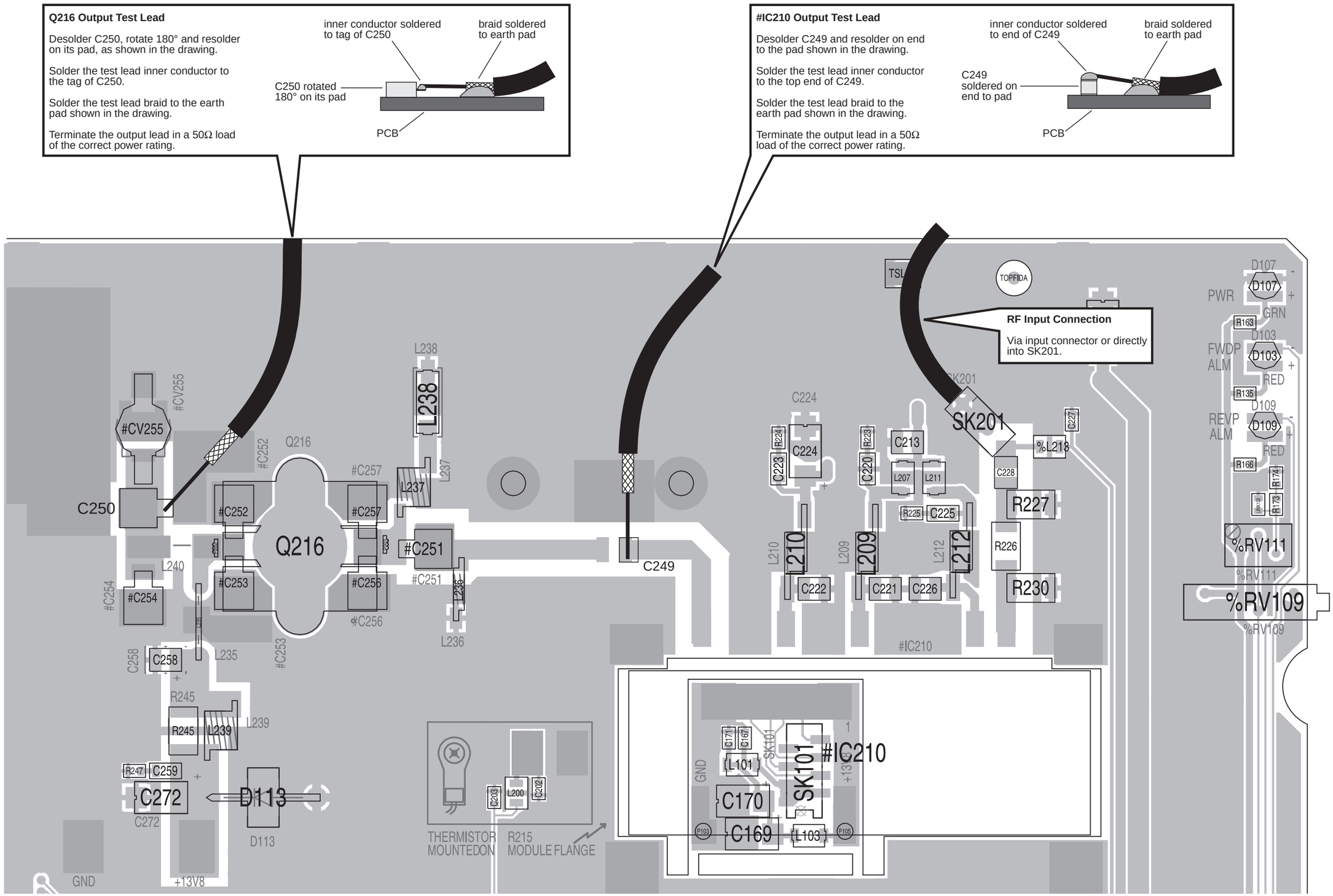


Figure 4.3 T858 Test Break Point Location

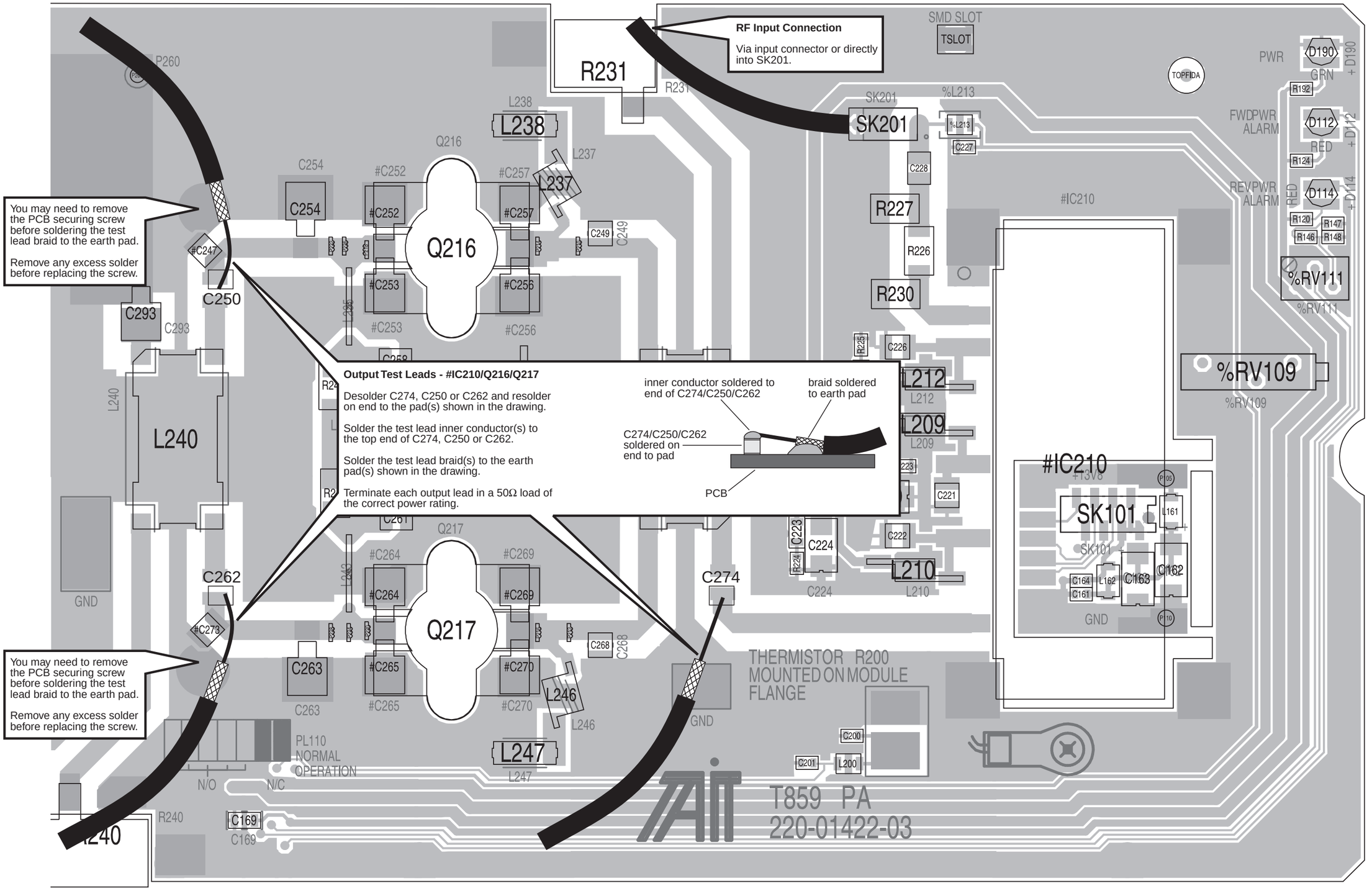


Figure 4.4 T859 Test Break Point Location

5 T858/859 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 T858 and T859 power amplifiers:

- parts lists
- grid reference indexes
- mechanical assembly drawings
- PCB layouts
- circuit diagrams.

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 1.4 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.

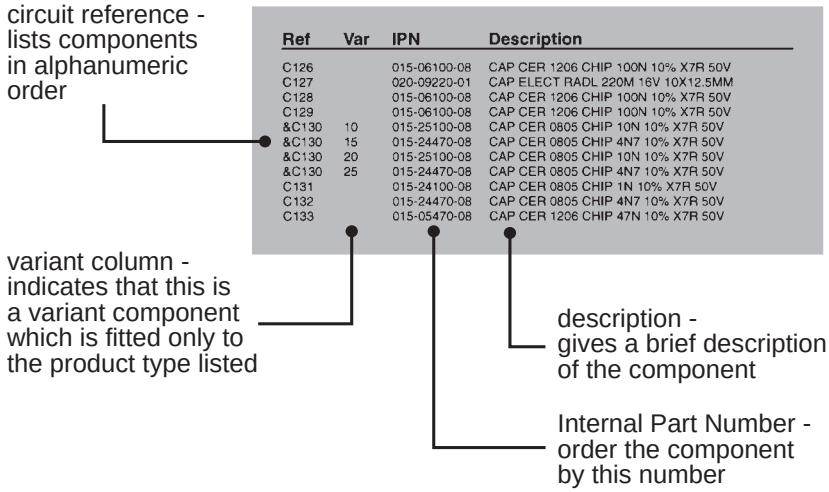
Note: It is important that you identify which issue PCB you are working on so that you can refer to the appropriate set of PCB information.

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).

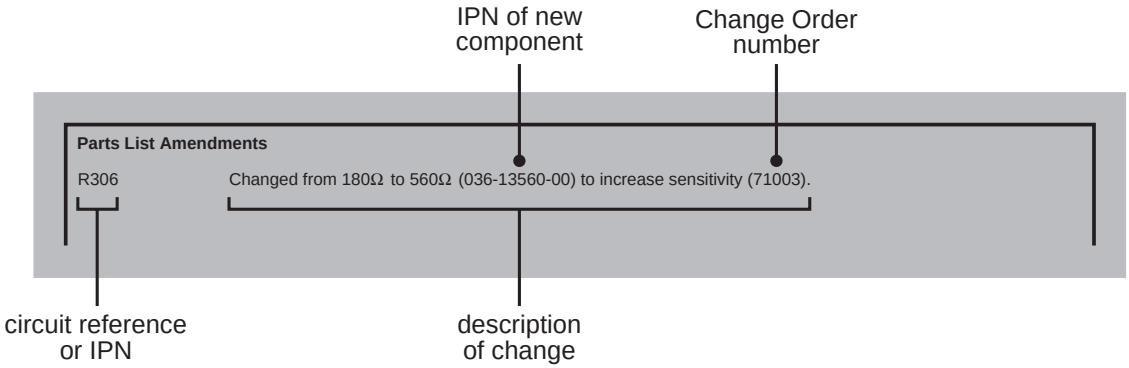
Those with a circuit reference are grouped in alphabetical order and then in numerical order within each group. Each component entry comprises three or four columns, as shown below:



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

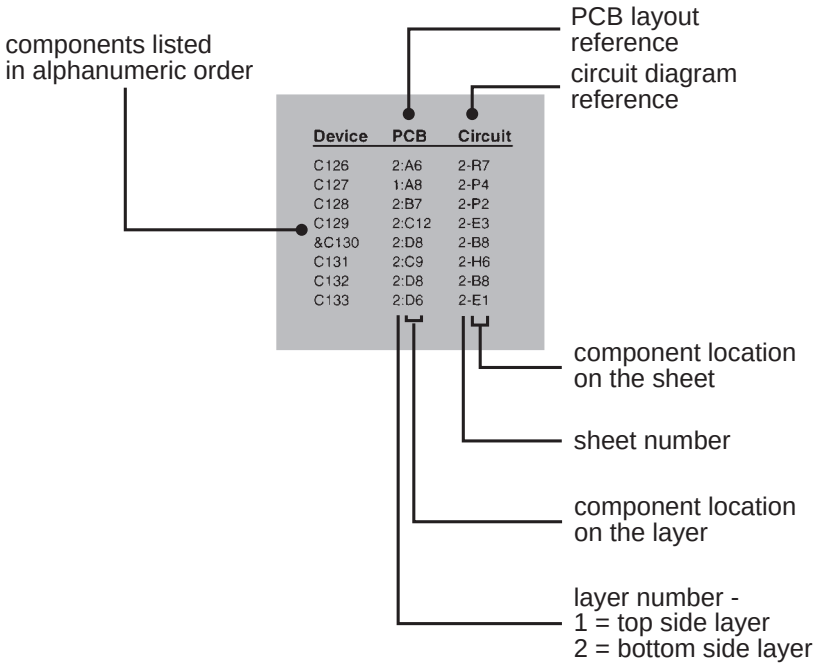
A variant component is one that has the same circuit reference but different value or specification in different product types. Where two products share the same PCB, the term "variant" is also used to describe components unplaced in one product. Variant components have a character prefix, such as "&",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

The table below explains how these variant prefixes are used in the latest model T858 and T859 PAs fitted with RF power modules. Note that the earlier transistor-based T858 and T859 PAs may not conform to this table.

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

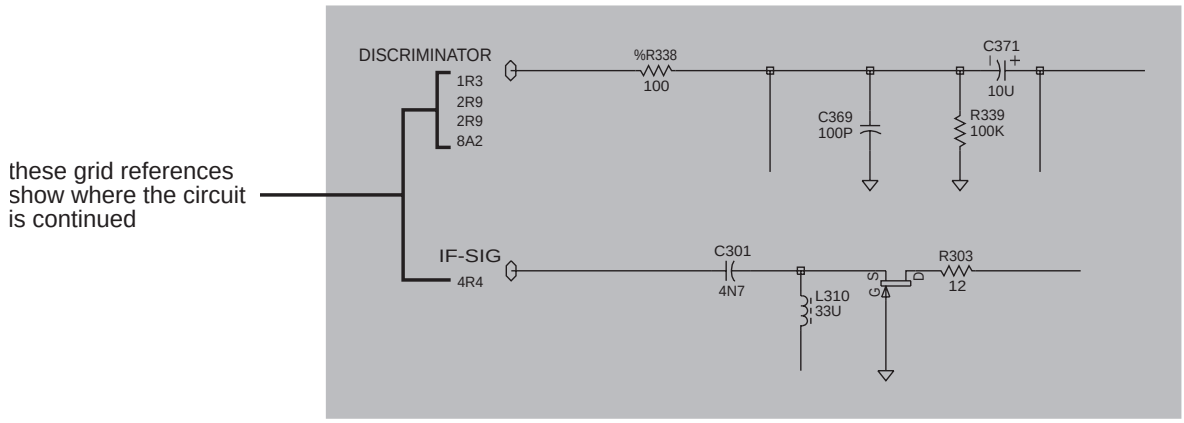
This section contains a component grid reference index to help you find components and labelled pads on the PCB layouts and circuit diagrams. This index lists the components and pads in alpha-numeric order, along with the appropriate alphanumeric grid references, as shown below:



Using CAD Circuit Diagrams

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

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



5.2 T858 Power Amplifier PCB

This section contains the following information.

T858 Parts List (IPN 220-01141-01)

How To Use This Parts List

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

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

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

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

Parts List Amendments

C6	100n mylar capacitor (IPN 022-56100-10) and 10Ω resistor (IPN 030-52100-20) - no circuit references - added in series across C6 to inhibit power control instabilities (710813).
C33, C52 & C58	(Low Band) changed from 8p2 (029-01820-02) to 10p (89/06-341). (Mid Band) changed from 3p3 (015-01330-02) to 3p9 Case Mica type (89/08-460).
C62	(Low Band) changed from 3p3 (015-01330-02) to 3p9 (89/07-411).
C63 & C65	(Low Band) changed from 10p (029-02100-01) to 12p (89/07-411).
C66	(Low Band) changed from 4p7 (029-01470-02) to 5p6 (89/07-411).
C70	(Low Band) changed from 3p9 (015-01390-02) to 4p7 (89/07-411).
C80 & C86	150p deleted. To prevent 800kHz instability (94/05-234).
D3	Changed from MR750/SR2607 (IPN 001-00011-60) to MR2520L (IPN 001-00012-90) to provide overvoltage transient suppression (750087/88/89/90/91/92).
L1	(Low Band) changed from 1T/3.0mm (052-08330-10) to 1T/4.0mm. To meet rated power (90/10-534).
L14, L15 & L23	Inductor Tait No.545 added. To remove heat sources from PCB (89/08-438).
L27 & L31	Changed from 1.5T/6.0mm (052-08160-15) to 2.5T/6.0mm. To reduce heating in base ferrite beads (89/10-568).
L42	(Low Band) changed from 1T/3.0mm (052-08330-10) to 1T/4.0mm (89/07-411).
L45	(Low Band) changed from 2T/3.5mm (052-08335-20) to 2T/4.5mm (89/07-411).
L46	(Low Band) changed from 2T/4.0mm (052-08330-10) to 2T/4.5mm (89/07-411).
L47	(Low Band) changed from 2T/3.5mm (052-08335-20) to 2T/4.0mm (89/07-411).
R1 & R3	(Low Band) changed from 270e (030-03270-00) to 150e. To reduce power into the driver (90/07-341).
R2	(Low Band) changed from 18e (030-02180-00) to 39e. To reduce power into the driver (90/07-341).
R11	Changed from 100e (030-03100-00) to SOT (Min value 22e). To reduce gain in drive stage (96/07-7104).
R47	Changed from 100k (036-16100-00) to 47k. To improve control range of forward power alarm (89/09-506).
R67	Changed from 4k7 (036-14470-00) to 10k (89/06-341).
R93	Change from 10k (036-15100-00) to 4k7. To raise limits of reverse power alarm switching point (3/10/89).
R99	2k7 added in series with RV63 (89/06-341).
R100	4k7 added in series with RV63 (89/06-341).

Parts List Amendments - Continued

349-00020-36	The two M3x8 Torx screws which secure the module into the rack frame have been replaced by M3x8 Pozidriv screws (IPN 349-00020-55) (750101/2/3/5/6).

Note

LOW = 400-440MHZ
MID = 440-480MHZ
HI = 480-520MHZ

Ref	Var	IPN	Description
C1		015-02120-02	CAP CER HIQ 1210 CHIP 12P 5% NPO 200V
C2		015-02180-02	CAP CER HIQ 1210 CHIP 18P 5% NPO 200V
C3		015-02220-02	CAP CER HIQ 1210 CHIP 22P 5% NPO 200V
C6		015-03100-02	CAP CER HIQ 1210 CHIP 100P 5% NPO 200V
C7		015-02150-02	CAP CER HIQ 1210 CHIP 15P 5% NPO 200V
CV8		028-02200-01	CAP TRIM 4/20P N750 TOP ADJ RED MUR TZ
C11		015-02220-02	CAP CER HIQ 1210 CHIP 22P 5% NPO 200V
C12		015-02180-02	CAP CER HIQ 1210 CHIP 18P 5% NPO 200V
C15		015-03100-02	CAP CER HIQ 1210 CHIP 100P 5% NPO 200V
C16		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C17		020-07470-04	CAP ELECT RADL 4M7 25V 20% 8X13MM SOLID
C18		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C19		020-07470-04	CAP ELECT RADL 4M7 25V 20% 8X13MM SOLID
C20		015-03100-02	CAP CER HIQ 1210 CHIP 100P 5% NPO 200V
C22		015-02680-02	CAP CER HIQ 1210 CHIP 68P 5% NPO 200V
C23		029-02270-02	CAP MICA 5MM CASE 27P 5%
C24		029-02330-02	CAP MICA 5MM CASE 33P 5%
*C27	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C27	MID	029-02270-02	CAP MICA 5MM CASE 27P 5%
*C27	HI	029-02270-02	CAP MICA 5MM CASE 27P 5%
*C28	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C28	MID	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C28	HI	029-02220-02	CAP MICA 5MM CASE 22P 5%
C29		029-03100-02	CAP MICA 5MM CASE 100P 5%
CV32		028-02100-03	CAP TRIM 2/10P JOHNSON 187-0106-175
*C33	LOW	029-02100-02	CAP MICA 5MM CASE 10P 5%
*C33	MID	029-01390-02	CAP MICA 5MM CASE 3P9 5%
*C33	HI		NOT FITTED
CV34		028-02100-03	CAP TRIM 2/10P JOHNSON 187-0106-175
CV35		028-02100-03	CAP TRIM 2/10P JOHNSON 187-0106-175
C36		029-02270-02	CAP MICA 5MM CASE 27P 5%
C37		029-02270-02	CAP MICA 5MM CASE 27P 5%
C40		029-02270-02	CAP MICA 5MM CASE 27P 5%
C41		029-02270-02	CAP MICA 5MM CASE 27P 5%
*C42	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C42	MID	029-02270-02	CAP MICA 5MM CASE 27P 5%
*C42	HI	029-02220-02	CAP MICA 5MM CASE 22P 5%
*C43	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C43	MID	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C43	HI	029-02270-02	CAP MICA 5MM CASE 27P 5%
C45		015-03100-02	CAP CER HIQ 1210 CHIP 100P 5% NPO 200V
C46		015-03100-02	CAP CER HIQ 1210 CHIP 100P 5% NPO 200V
*C47	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C47	MID	029-02270-02	CAP MICA 5MM CASE 27P 5%
*C47	HI	029-02220-02	CAP MICA 5MM CASE 22P 5%
*C49	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C49	MID	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C49	HI	029-02270-02	CAP MICA 5MM CASE 27P 5%
C50		029-03100-02	CAP MICA 5MM CASE 100P 5%
CV51		028-02100-03	CAP TRIM 2/10P JOHNSON 187-0106-175
*C52	LOW	029-02100-02	CAP MICA 5MM CASE 10P 5%
*C52	MID	029-01390-02	CAP MICA 5MM CASE 3P9 5%
*C52	HI		NOT FITTED
C54		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C55		020-07470-04	CAP ELECT RADL 4M7 25V 20% 8X13MM SOLID
C56		029-03100-02	CAP MICA 5MM CASE 100P 5%
CV57		028-02100-03	CAP TRIM 2/10P JOHNSON 187-0106-175
*C58	LOW	029-02100-02	CAP MICA 5MM CASE 10P 5%
*C58	MID	029-01390-02	CAP MICA 5MM CASE 3P9 5%
*C58	HI		NOT FITTED
C60		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C61		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
*C62	LOW	015-01390-02	CAP CER HIQ 1210 CHIP 3P9 5% NPO 200V
*C62	MID	015-01330-02	CAP CER HIQ 1210 CHIP 3P3 5% NPO 200V
*C62	HI	015-01330-02	CAP CER HIQ 1210 CHIP 3P3 5% NPO 200V
*C63	LOW	029-02120-01	CAP MICA 10MM CASE 12P 5%
*C63	MID	029-02100-01	CAP MICA 10MM CASE 10P 10%
*C63	HI	029-02100-01	CAP MICA 10MM CASE 10P 10%
*C65	LOW	029-02120-01	CAP MICA 10MM CASE 12P 5%
*C65	MID	029-02100-01	CAP MICA 10MM CASE 10P 10%
*C65	HI	029-02100-01	CAP MICA 10MM CASE 10P 10%
*C66	LOW	029-01560-02	CAP MICA 5MM CASE 5P6 5%
*C66	MID	029-01470-02	CAP MICA 5MM CASE 4P7 5%
*C66	HI	029-01470-02	CAP MICA 5MM CASE 4P7 5%
C67		015-21220-01	CAP CER 0805 CHIP 2P2 +/-0.25P NPO 50V
C68		015-21220-01	CAP CER 0805 CHIP 2P2 +/-0.25P NPO 50V
*C70	LOW	015-21470-01	CAP CER 0805 CHIP 4P7 +/-0.25P NPO 50V
*C70	MID	015-21390-01	CAP CER 0805 CHIP 3P9 +/-0.25P NPO 50V
*C70	HI	015-21390-01	CAP CER 0805 CHIP 3P9 +/-0.25P NPO 50V
C72		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C73		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C76		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C77		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C78		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C81		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C84		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C85		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C87		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C90		015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C91		025-08100-02	CAP TANT BEAD 10M 10% 16V
C92		015-25100-08	CAP CER 0805 CHIP 10N 10% X7R 50V
C93		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C95		015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C96		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C97		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C98		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C99		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C100		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C101		015-25100-08	CAP CER 0805 CHIP 10N 10% X7R 50V
C102		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C103		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C104		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C105		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C106		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C107		015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C108		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C109		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C110		015-01470-02	CAP CER HIQ 1210 CHIP 4P7 5% NPO 200V
C111		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C112		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C113		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
D1		001-00013-45	(S) DIODE SCHOTTKY 1SS97/2
D2		001-00013-45	(S) DIODE SCHOTTKY 1SS97/2
D3		001-00011-60	(S) DIODE SR2607 6A/30V
D5		008-00013-32	(S) LED 3MM RED LO CURRENT NO MTG
D6		001-10000-70	(S) DIODE SMD BAV70 DUAL SW SOT-23 COMCTH
D10		008-00013-35	(S) LED 3MM GREEN LO CURRENT NO MTG
D11		008-00013-32	(S) LED 3MM RED LO CURRENT NO MTG
D13		001-10000-70	(S) DIODE SMD BAV70 DUAL SW SOT-23 COMCTH
D17		001-10000-70	(S) DIODE SMD BAV70 DUAL SW SOT-23 COMCTH
IC1		002-10003-24	(S) IC SMD 324 QUAD OP AMP SO14
IC2		002-00014-62	(S) IC 317L 100MA REG 3 TERMINAL TO-92
IC3		002-10003-58	(S) IC SMD LM358 DUAL OP AMP
*L1	LOW	052-08340-10	COIL A/W 1T/4.0MM SMD 0.8MM WIRE
*L1	MID	052-08330-10	COIL A/W 1T/3.0MM SMD 0.8MM WIRE
*L1	HI	052-08330-10	COIL A/W 1T/3.0MM SMD 0.8MM WIRE
L2		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L3		065-00010-04	BEAD FERRITE F8 4X2X5MM
L5		065-00010-04	BEAD FERRITE F8 4X2X5MM
L6		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L7		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L8		065-00010-04	BEAD FERRITE F8 4X2X5MM
L11		065-00010-04	BEAD FERRITE F8 4X2X5MM
L12		065-00010-04	BEAD FERRITE F8 4X2X5MM
L13		052-08160-15	COIL A/W 1.5T/6.0MM HOR 0.8MM WIRE
L14		051-00005-45	COIL IND 18MM FORMED COPPER STRIP
L15		051-00005-45	COIL IND 18MM FORMED COPPER STRIP
L16		065-00010-04	BEAD FERRITE F8 4X2X5MM
L17		065-00010-04	BEAD FERRITE F8 4X2X5MM
L18		051-00005-53	COIL TAIT NO 553 A/W 10MM LINK T858/9
L19		051-00005-39	COUPLER WIRELINE TAIT COIL DWG NO 539
L21		052-08160-15	COIL A/W 1.5T/6.0MM HOR 0.8MM WIRE
L22		065-00010-04	BEAD FERRITE F8 4X2X5MM
L23		051-00005-45	COIL IND 18MM FORMED COPPER STRIP
L25		052-08330-10	COIL A/W 1T/3.0MM SMD 0.8MM WIRE
L26		052-08330-10	COIL A/W 1T/3.0MM SMD 0.8MM WIRE
L27		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L28		065-00010-04	BEAD FERRITE F8 4X2X5MM
L31		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L32		065-00010-04	BEAD FERRITE F8 4X2X5MM
L35		051-00005-53	COIL TAIT NO 553 A/W 10MM LINK T858/9
L36		065-00010-04	BEAD FERRITE F8 4X2X5MM
L37		065-00010-04	BEAD FERRITE F8 4X2X5MM
L38		051-00005-53	COIL TAIT NO 553 A/W 10MM LINK T858/9
L39		051-00005-39	COUPLER WIRELINE TAIT COIL DWG NO 539
L41		056-00021-04	IND FXD 330NH AXIAL
*L42	LOW	052-08340-10	COIL A/W 1T/4.0MM SMD 0.8MM WIRE
*L42	MID	052-08330-10	COIL A/W 1T/3.0MM SMD 0.8MM WIRE
*L42	HI	052-08330-10	COIL A/W 1T/3.0MM SMD 0.8MM WIRE
L43		052-08335-10	COIL A/W 1T/3.5MM SMD 0.8MM WIRE
*L45	LOW	052-08345-20	COIL A/W 2T/4.5MM SMD 0.8MM WIRE
*L45	MID	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM WIRE
*L45	HI	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM WIRE
*L46	LOW	052-08345-20	COIL A/W 2T/4.5MM SMD 0.8MM WIRE
*L46	MID	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM WIRE
*L46	HI	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM WIRE
*L47	LOW	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM WIRE
*L47	MID	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM WIRE
*L47	HI	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM WIRE
L49		056-00021-04	IND FXD 330NH AXIAL
L51		056-00021-04	IND FXD 330NH AXIAL
L52		051-00005-53	COIL TAIT NO 553 A/W 10MM LINK T858/9
Q1		000-00022-70	(S) XSTR SD1134 NPN STUD MTG UHF PWR 2W
Q3		000-00022-75	(S) XSTR SD1433 NPN STUD MTG UHF PWR 10W
Q4		000-00022-80	(S) XSTR SD1488 NPN 6LFL UHF PWR 40W
Q6		000-00022-80	(S) XSTR SD1488 NPN 6LFL UHF PWR 40W
Q7		000-00022-80	(S) XSTR SD1488 NPN 6LFL UHF PWR 40W
Q10		000-00020-70	(S) XSTR BS170 JFET TO-92 SMALL SIG
Q11		000-10008-17	(S) XSTR SMD BC817-25 NPN SOT-23 AF LO PWR
Q12		000-00020-70	(S) XSTR BS170 JFET TO-92 SMALL SIG
Q13		000-10008-17	(S) XSTR SMD BC817-25 NPN SOT-23 AF LO PWR
Q15		000-10008-17	(S) XSTR SMD BC817-25 NPN SOT-23 AF LO PWR
Q16		000-00030-95	(S) XSTR 2N6107 PNP TO-220 AF PWR

Ref	Var	IPN	Description
*R1	LOW	032-33150-02	RES M/F PWR 150E 5% 1W 8X2.5MM 12MML/S
*R1	MID	030-03270-00	RES FILM 270E 5% 0.25W 7X2.5MM
*R1	HI	030-03470-00	RES FILM 470E 5% 0.25W 7X2.5MM
*R2	LOW	032-32390-02	RES M/F PWR 39E 5% 1W 8X2.5MM 12MML/S
*R2	MID	030-02180-00	RES FILM 18E 5% 0.25W 7X2.5
*R2	HI	030-02120-00	RES FILM 12E 5% 0.25W 7X2.5W
*R3	LOW	030-03150-00	RES FILM 150E 5% 0.25W 7X2.5MM
*R3	MID	030-03270-00	RES FILM 270E 5% 0.25W 7X2.5MM
*R3	HI	030-03470-00	RES FILM 470E 5% 0.25W 7X2.5MM
R7		030-02100-00	RES FILM 10E 5% 0.25W 7X2.5MM
R8		032-33100-00	RES M/F PWR 100E 5% 1W 10X4MM
R11		030-03100-00	RES FILM 100E 5% 0.25W 7X2.5MM
R30		030-03100-00	RES FILM 100E 5% 0.25W 7X2.5MM
R31		030-03100-00	RES FILM 100E 5% 0.25W 7X2.5MM
R32		030-02820-00	RES FILM 82E 5% 0.25W 7X2.5MM
R33		030-02820-00	RES FILM 82E 5% 0.25W 7X2.5MM
R36		036-13680-00	RES M/F 0805 CHIP 680E 5%
R38		036-17100-00	RES M/F 0805 CHIP 1M 5%
R39		036-16100-00	RES M/F 0805 CHIP 100K 5%
R42		036-15100-00	RES M/F 0805 CHIP 10K 5%
RV43		042-05470-09	RES PRESET 50K CERMET 9.5MM SQ FLAT
R44		036-14470-00	RES M/F 0805 CHIP 4K7 5%
R47		036-15470-00	RES M/F 0805 CHIP 47K 5%
RV48		042-04500-08	RES PRESET 5K CERMET 9.5MM SQ FLAT
R49		036-13680-00	RES M/F 0805 CHIP 680E 5%
R50		036-13680-00	RES M/F 0805 CHIP 680E 5%
RV52		042-04500-08	RES PRESET 5K CERMET 9.5MM SQ FLAT
R55		036-17100-00	RES M/F 0805 CHIP 1M 5%
R56		036-15100-00	RES M/F 0805 CHIP 10K 5%
RV57		042-05470-09	RES PRESET 50K CERMET 9.5MM SQ FLAT
R58		036-14470-00	RES M/F 0805 CHIP 4K7 5%
R61		036-13220-00	RES M/F 0805 CHIP 220E 5%
R62		036-14100-00	RES M/F 0805 CHIP 1K 5%
RV63		044-04200-03	RES PRESET MULTITURN 2K 10T PNL MTG
R64		036-14470-00	RES M/F 0805 CHIP 4K7 5%
R67		036-15100-00	RES M/F 0805 CHIP 10K 5%
R68		036-14470-00	RES M/F 0805 CHIP 4K7 5%
RV69		042-04220-02	RES PRESET 2K CERMET 9.5MM SQ FLAT
R72		045-04470-01	RES NTC 4K7 20% 5MM DISC
R73		036-16220-00	RES M/F 0805 CHIP 220K 5%
RV74		042-05100-10	RES PRESET 10K CERMET 9.5MM SQ FLAT
R77		036-14220-00	RES M/F 0805 CHIP 2K2 5%
R78		036-14100-00	RES M/F 0805 CHIP 1K 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		036-15100-00	RES M/F 0805 CHIP 10K 5%
R88		036-15100-00	RES M/F 0805 CHIP 10K 5%
R89		039-02500-01	DUMMY LOAD 50E 1% 10W TO-220 NIKKOHM
R90		039-02500-01	DUMMY LOAD 50E 1% 10W TO-220 NIKKOHM
R91		039-02500-01	DUMMY LOAD 50E 1% 10W TO-220 NIKKOHM
R92		036-14100-00	RES M/F 0805 CHIP 1K 5%
R93		036-15100-00	RES M/F 0805 CHIP 10K 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%
SK1		240-02100-44	SKT COAX MINI JACK PCB MTG ANGLED

T858 Mechanical & Miscellaneous Parts (220-01141-01)

IPN	Legend	Description
065-00010-20		BEAD FERRITE BALUN 4B1 PHILIPS Placed on DC+ power cables.
070-01001-00	22	D-RANGE 15 WAY COMPL T800
070-02003-00		LED RED COMPL T800 PA “High Rev/Low Fwd Power” LEDs - D11/D5
070-02004-00		LED GREEN COMPL T800 PA “Supply” LED - D10
201-00030-01		WIRE T/C 7/0.2 PVC BROWN Forward power alarm.
201-00030-03		WIRE T/C 7/0.2 PVC ORANGE Reverse power meter.
201-00030-04		WIRE T/C 7/0.2 PVC YEL Reverse power.
201-00030-05		WIRE T/C 7/0.2 PVC GRN Forward power meter.
201-00030-06		WIRE T/C 7/0.2 PVC BLUE Tx-Key.
201-00030-07		WIRE T/C 7/0.2 PVC VIOLET Reverse power alarm.
201-00030-09		WIRE T/C 7/0.2 PVC WHITE Temperature sense.
201-00030-10		WIRE T/C 7/0.2 PVC BLACK Forward power.
201-00050-12		AUTO 152 RED 28/0.3 PVC DC+ from D-range PCB.
201-00050-20		AUTO 152 BLACK 28/0.3 PVC DC- from D-range PCB.
219-02592-00		CABLE ASSY RG223/U N TO BNC Exciter/PA connecting cable.
219-02599-00		CABLE ASSY PA INPUT REAR DRIVE RF input cable/connector assembly.
220-01141-01	1	PCB T858 50W PA
220-01152-00	2	PCB T858/859 DIRNL COUPLER
240-02100-06	25	SKT COAX N TYPE PNL MTG OP-TER
240-02100-17	27	SKT COAX BNC PNL JAC CRP RG316 Part of 219-02599-00 sub-assembly.
240-06010-15	24	BLOCK LATCHING 15W D RANGE
303-23117-00	38	COVER SIDE COMPL A2M2223
303-23120-00	28	COVER A3M2288 HOLE BLANKING
303-50005-00	30	CONTACT A4M2311 SPRING EARTH
308-01007-01	32	HANDLE BASE STATION SERIES II
308-13085-01	4	HSINK DIECAST T858 50W PA
308-13086-00	19	HSINK A3M2271 2MM W/LINE PA
316-06617-00	31	PNL PA NO INP DRV SER II SNGL
316-85018-00	26	PIN A4M1397 COAX CONDUCTOR
319-01147-00	3	SHIELD A3M2224 WALL T859 PA
319-01148-00	29	SHIELD A3M2225 LID T859 PA
319-30033-00	13	SPACER A4M1339 UHF PA
345-00040-16	23	SCRW M3X20MM P/POZ ST BZ

IPN	Legend	Description
349-00020-07	6	SCRW 4-40 X 5/16 P/POZ T/T BLK
349-00020-09	11	SCRW T/T 4-40X3/8 IN P/POZ BLK
349-00020-36	37	LIM)SCREW TT M3X8m PANTORX BLK
349-00020-50	21	SCRW T/T 4-40x5/8 P/POZ BLK
352-00010-29	34	NUT M4 NYLOC HEX
352-00010-35	15	NUT 8-32 UNC HEX XSTR MTG
353-00010-10	10	WSHR M3 FLAT 7MMx0.6MM ST BZ
353-00010-24	33	WSHR M4x8mm Flat
356-00010-01	18	TAG SOLDER 3MM SHORT M6132/3.2
356-00010-03	5	TAG SOLDER 3MM LONG M614/3.2
360-00010-41	36	BUSH SHORTY BLK
362-00010-07	7	GASKET SIL INSULATING TO-220
362-00010-13	9	BUSH INSULATING 1.1MM TOP HAT
362-00010-33	35	GROMMET LED MTG 3MM
365-00100-20		LABEL WHITE S/A 28X11MM
365-01540-00		LABEL PA TYPE APPL/SERIAL NO
369-00010-14		TIE CABLE NYLON 100*2.6MM
399-00010-51		BAG PLASTIC 75*100MM
400-00020-09		SLEEVING 3MM SIL RUBBER
410-01081-01		CRT T800 SERIES II

Note

The following electrical components are also included in the mechanical assembly drawing to help identify certain mechanical components.

000-00022-70	14	(S) XSTR SD1134 NPN STUD MTG UHF PWR 2W - Q1
000-00022-75	16	(S) XSTR SD1433 NPN STUD MTG UHF PWR 10W - Q3
000-00022-80	17	(S) XSTR SD1488 NPN 6LFL UHF PWR 40W - Q4, Q6, Q7
000-00030-95	8	(S) XSTR 2N6107 PNP TO-220 AF PWR Q16
039-02500-01	12	DUMMY LOAD 50E 1% 10W TO-220 NIKKOHM - R90, R91
051-00005-39	20	COUPLER WIRELINE TAIT COIL DWG NO 539 - L19, L39

replace A4 pages D5.2.9/D5.2.10 with A3 pages D5.2.9/D5.2.10

replace A4 pages D5.2.9/D5.2.10 with A3 pages D5.2.9/D5.2.10

T858 Grid Reference Index (IPN 220-01141-01)

How To Use This Grid Reference Index

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

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

Device	PCB	Circuit
C1	1:Q9	1-C7
C2	1:Q9	1-C6
C3	1:R9	1-C6
C6	1:S8	1-D7
C7	1:Q7	1-E7
CV8	1:R7	1-E7
C11	1:R6	1-A1
C12	1:Q6	1-A1
C15	1:S5	1-B2
C16	1:S5	1-C3
C17	1:T6	1-C3
C18	1:S2	1-D3
C19	1:T3	1-D3
C20	1:S3	1-E3
C22	1:Q5	1-B2
C23	1:Q5	1-C2
C24	1:R5	1-C2
*C27	1:Q3	1-D2
*C28	1:R3	1-D2
C29	1:P3	1-E2
CV32	1:P2	1-E2
*C33	1:P3	1-F2
CV34	1:M4	1-G2
CV35	1:M8	1-G5
C36	1:L8	1-G4
C37	1:L8	1-H4
C40	1:L4	1-G2
C41	1:L3	1-H2
*C42	1:K4	1-J2
*C43	1:K3	1-J2
C45	1:K4	1-J3
C46	1:K7	1-J4
*C47	1:K8	1-J4
*C49	1:K8	1-J4
C50	1:H8	1-K5
CV51	1:H8	1-L4
*C52	1:J8	1-K4
C54	1:K6	1-K3
C55	1:K6	1-K3
C56	1:H4	1-L2
CV57	1:H3	1-L2
*C58	1:J3	1-K2
C60	1:E9	1-N4
C61	1:F9	1-N4
*C62	See Note	1-P4
*C63	1:C9	1-P5
*C65	1:C9	1-Q5
*C66	1:B8	1-Q4
C67	See Note	1-P4
C68	1:D7	1-P4
*C70	1:D6	1-Q4
C72	1:E6	1-M6
C73	1:F6	1-M5
C76	1:V10	2-B7
C77	1:V10	2-C7
C78	1:U10	2-D6
C80	1:V5	2-F7
C81	1:U2	2-G6
C84	1:V9	2-C5
C85	1:V9	2-C5
C86	1:V5	2-F4
C87	1:S2	2-G3
C90	1:V7	2-K5
C91	1:W8	2-N5
C92	1:U5	2-N5
C93	1:U5	2-N5
C95	1:V5	2-H1
C96	1:U5	2-N3
C97	1:K10	1-J1
C98	1:L10	1-J1
C99	1:U5	2-M2
C100	1:T5	2-N4
C101	1:V3	2-P2
C102	1:U8	2-Q5
C103	1:U8	2-Q4
C104	1:U7	2-R6
C105	1:T9	2-R5
C106	1:T8	2-R5
C107	1:U4	2-H8
C108	1:T4	2-J7
C109	1:T4	2-J4
C110	1:G3	1-L3
C111	1:W10	2-A7
C112	1:V9	2-B5
C113	1:V3	2-N4
D1	1:F6	1-M5
D2	1:E9	1-N4
D3	1:T2	2-A2
D5	1:W9	2-C7
D6	1:U2	2-G6
		2-G6
D10	1:W10	2-C5
D11	1:W9	2-D5
D13	1:R2	2-F3
		2-F3
D17	1:V3	2-N4
		2-M4
IC1	1:U5	2-H1
		2-F7
		2-E5
		2-N5
		2-N3
IC2	1:V8	2-K5
IC3	1:T4	2-J8
		2-H7
		2-H4
* L1	1:R9	1-C6
L2	1:P8	1-D6
L3	1:P9	1-D5
L5	1:T8	1-D8
L6	1:R7	1-D7
L7	1:P7	1-E6
L8	1:P8	1-E6
L11	1:T7	1-B4
L12	1:S5	1-B3
L13	1:R5	1-B2
L14	1:Q3	1-E2
L15	1:K8	1-K5
L16	1:S4	1-D3
L17	1:S3	1-D3
L18	1:R3	1-D2
L19	1:N6	1-F3
L21	1:P5	1-C1
L22	1:P6	1-C1
L23	1:K4	1-K2
L25	1:M3	1-F2
L26	1:M9	1-F4
L27	1:L9	1-G4
L28	1:M9	1-G4
L31	1:M3	1-G2
L32	1:M2	1-G1
L35	1:J7	1-J4
L36	1:J6	1-J4
L37	1:J5	1-J3
L38	1:J4	1-J3
L39	1:H6	1-L4
L41	1:F9	1-N4
*L42	1:D7	1-P4
L43	1:C6	1-Q4
*L45	1:C8	1-P5
*L46	1:C9	1-P5
*L47	1:B8	1-Q5
L49	1:F6	1-M6
L51	1:L10	1-J1
L52	1:C7	1-P4
PL1	1:G5	2-A3
		2-A2
		2-A2
		2-A2
		2-A3
		2-A8
		2-A8
		2-A1
		2-A1
		2-A1
		2-A1
		2-A5
		2-A3
		2-A7
Q1	1:Q8	1-D7
Q3	1:Q6	1-B2
Q4	1:Q4	1-D2
Q6	1:K8	1-H5
Q7	1:K4	1-H2
Q10	1:V10	2-B7
Q11	1:V10	2-D7
Q12	1:V9	2-C5
Q13	1:V9	2-D5
Q15	1:U8	2-Q5
Q16	1:T10	2-R5
*R1	1:R10	1-B6
*R2	1:R10	1-B7
*R3	1:R9	1-B6
R7	1:R8	1-C6
R8	1:S7	1-D7
R11	1:R6	1-F7
R30	1:G9	1-M4
R31	1:E7	1-N5
R32	1:D6	1-Q4
R33	1:D6	1-Q4
R36	1:W9	2-C6
R38	1:V5	2-E7
R39	1:V5	2-E6
R42	1:V5	2-F7
RV43	1:V1	2-G7
R44	1:U4	2-H6
R47	1:V4	2-F6
RV48	1:W1	2-F6
R49	1:W10	2-C6
R50	1:W8	2-D6
RV52	1:T1	2-F5
R55	1:V5	2-E4
R56	1:V5	2-F4
RV57	1:S1	2-F4
R58	1:U5	2-H5
R61	1:V8	2-L5
R62	1:V8	2-L5
RV63	1:V6	2-M5
R64	1:T5	2-N5
R67	1:V3	2-M4
R68	1:U4	2-L3
RV69	1:V2	2-M3
R72	1:K10	1-H1
R73	1:U4	2-N2
RV74	1:W2	2-P2
R77	1:U6	2-P6
R78	1:U8	2-Q5
R80	1:U8	2-Q6
R81	1:V4	2-D7
R82	1:V4	2-D7
R83	1:V5	2-D4
R84	1:V5	2-D5
R85	1:U4	2-F4
R86	1:U4	2-G7
R87	1:T4	2-J7
R88	1:T5	2-J4
R89	1:N10	1-F3
R90	1:G1	1-M3
R91	1:F1	1-M3
R92	1:S1	2-D3
R93	1:U1	2-F6
R94	1:U2	2-F8
R95	1:U4	2-M2
R96	1:T4	2-K7
R97	1:T5	2-K5
R98	1:W8	2-M5
R99	1:W7	2-M5
R100	1:W7	2-M5
SK1	1:R10	1-A7

Note:
*C62 & C67 are mounted on the Directional Coupler PCB (220-01152-00).

T858 Parts List (IPN 220-01423-02)

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

C188	Deleted - not required for circuit performance (711141).
D113	Changed from MR750/SR2607 (IPN 001-00011-60) to MR2520L (IPN 001-00012-90) to provide overvoltage transient suppression (750087/88/89/90/91/92).
R146	Changed from 6k8 (IPN 036-14680-10) to 10k (IPN 036-15100-10) } to adjust the control voltage to slow down the release time for cyclic keying (711060).
R154	Changed from 6k8 (IPN 036-14680-10) to 4k7 (IPN 036-14470-10) }
R195	Changed to a variant component with values as listed below to decrease the control voltage of #IC210 to prevent Q216 being overdriven - circuit reference changed to #R195 (710991/92). T858-10-XXXX: value unchanged at 2k2 (IPN 036-14220-00) T858-20-XXXX: changed from 2k2 (IPN 036-14220-00) to 2k4 (IPN 036-14240-10) T858-30-XXXX: changed from 2k2 (IPN 036-14220-00) to 2k4 (IPN 036-14240-10)
R196	Changed from 100Ω (IPN 036-13100-10) to 150Ω (IPN 036-13150-10) to decrease the control voltage of #IC210 to prevent Q216 being overdriven (710991/92).
R226	Changed from 30Ω (IPN 036-02030-10) to 27Ω (IPN 036-03127-10) to increase #IC210 input drive (710993).
R227, R230	Changed from 180Ω (IPN 036-03180-10) to 240Ω (IPN 036-03224-10) to increase #IC210 input drive (710993).
N-type connector	The N-type connector (IPN 240-02100-06), hood (IPN 240-06010-44) and semi-rigid coax (IPN 051-00641-01) have been replaced by a single sub-assembly (IPN 219-02709-00) (711022).
349-00020-36	The two M3x8 Torx screws which secure the module into the rack frame have been replaced by M3x8 Pozidriv screws (IPN 349-00020-55) (750101/2/3/5/6).

Parts List Amendments - Continued

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

Ref	Var	IPN	Description
%C101		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C103		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C105		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C107		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C109		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C111		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C113		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C115		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C117		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C119		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C121		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C123		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C124		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C125		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C127		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C129		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C131		015-27100-10	CAP CER 0805 1M+80-20% Y5V 16V
C132		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C133		015-23100-01	CAP CER 0805 100P 5% NPO 50V
%C134		015-06100-08	CAP CER 1206 100N 10% X7R 50V
%C135		014-18220-02	L)CAP TANT SMD 22U 20% 35V
C137		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C138		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C139		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C141		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C143		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C145		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C146		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C147		015-25220-08	CAP CER 0805 22N 10% X7R 50V
C148		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C149		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C150		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C151		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C153		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C154		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C155		015-25680-08	CAP CER 0805 68N 10% X7R 50V
C159		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C161		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C162		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C164		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C165		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C167		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C169		014-18220-02	L)CAP TANT SMD 22U 20% 35V
C170		014-18220-02	L)CAP TANT SMD 22U 20% 35V
C171		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C172		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C173		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C174		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C176		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C177		014-07100-02	CAP TANT CHIP 1U0 3.2 X 1.6MM
C178		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C179		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C180		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C181		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C182		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C183		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C184		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C185		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C186		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C187		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C188		014-07100-02	CAP TANT CHIP 1U0 3.2 X 1.6MM
C189		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C190		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C191		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C192		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C193		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C194		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C195		014-08100-00	CAP TANT CHIP 10M 16VW +-20%
C196		014-07470-03	L) CAP TANT SMD 4U7 35V 20%
C197		015-22470-01	CAP CER 0805 47P 5% NPO 50V
C198		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C200		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C201		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C202		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C203		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C204		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C205		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C206		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C207		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C208		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C211		014-07470-04	CAP TANT SMD 4U7 50V 20%
C212		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C213		015-03100-06	CAP CER 1210 100P NPO500VGRM42
C215		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C216		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C220		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C221		015-03100-06	CAP CER 1210 100P NPO500VGRM42
C222		015-03100-06	CAP CER 1210 100P NPO500VGRM42
C223		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C224		014-07470-04	CAP TANT SMD 4U7 50V 20%
C225		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C226		015-03100-06	CAP CER 1210 100P NPO500VGRM42
C227		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C228		015-03100-02	CAP CER HIQ1210 100P 5%NPO200V
C249		015-03100-03	CAP CER 100P 5% NPO500V GRH111
C250		029-03100-02	CAP MICA 5 CASE 100P 5%
#C251	10	029-02100-02	CAP MICA 5 CASE 10P 5%
#C251	20	029-01750-02	CAP MICA 5 CASE 7P5 5%
#C251	30	029-01750-02	CAP MICA 5 CASE 7P5 5%
#C252	10	029-02470-02	CAP MICA 5 CASE 47P 5%
#C252	20	029-02390-02	CAP MICA 5 CASE 39P 5%
#C252	30	029-02360-02	CAP MICA 5 CASE 36P 5%
#C253	10	029-02560-02	CAP MICA 5 CASE 56P 5%
#C253	20	029-02390-02	CAP MICA 5 CASE 39P 5%
#C253	30	029-02360-02	CAP MICA 5 CASE 36P 5%
#C254	10	029-01390-02	CAP MICA 5 CASE 3P9 5%
#C254	20	029-01470-02	CAP MICA 5 CASE 4P7 5%
#C254	30	029-01470-02	CAP MICA 5 CASE 4P7 5%
#C256	10	029-02390-02	CAP MICA 5 CASE 39P 5%
#C256	20	029-02330-02	CAP MICA 5 CASE 33P 5%
#C256	30	029-02240-02	L) CAP MICA 5 CASE 24P 5%
#C257	10	029-02390-02	CAP MICA 5 CASE 39P 5%
#C257	20	029-02330-02	CAP MICA 5 CASE 33P 5%
#C257	30	029-02240-02	L) CAP MICA 5 CASE 24P 5%
C258		015-03100-02	CAP CER HIQ1210 100P 5%NPO200V
C259		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C272		014-07470-04	CAP TANT SMD 4U7 50V 20%
C275		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C276		015-23150-01	CAP CER 0805 150P 5% NPO 50V
#C277	10	029-02120-01	CAP MICA 10 CASE 12P 5%
#C277	20	029-02100-01	CAP MICA 10 CASE 10P 10%
#C277	30	029-02100-01	CAP MICA 10 CASE 10P 10%
#C278	10	029-02120-01	CAP MICA 10 CASE 12P 5%
#C278	20	029-02100-01	CAP MICA 10 CASE 10P 10%
#C278	30	029-02100-01	CAP MICA 10 CASE 10P 10%
#C280	10	029-01560-02	CAP MICA 5 CASE 5P6 5%
#C280	20	029-01470-02	CAP MICA 5 CASE 4P7 5%
#C280	30	029-01470-02	CAP MICA 5 CASE 4P7 5%
C282		015-21220-01	CAP CER 0805 2P2+-1/4P NPO 50V
#C283	10	015-21470-01	CAP CER 0805 4P7+-1/4P NPO 50V
#C283	20	015-21390-01	CAP CER 0805 3P9+-1/4P NPO 50V
#C283	30	015-21390-01	CAP CER 0805 3P9+-1/4P NPO 50V
C284		015-23150-01	CAP CER 0805 150P 5% NPO 50V
#C285	10	015-01390-02	CAP CER HIQ1210 3P9 5% NPO200V
#C285	20	015-01330-02	CAP CER HIQ1210 3P3 5% NPO200V
#C285	30	015-01330-02	CAP CER HIQ1210 3P3 5% NPO200V
C286		015-21220-01	CAP CER 0805 2P2+-1/4P NPO 50V
C287		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C291		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C292		015-06100-08	CAP CER 1206 100N 10% X7R 50V
#CV255	10	029-02120-02	CAP MICA 5 CASE 12P 5%
#CV255	20	029-01750-02	CAP MICA 5 CASE 7P5 5%
#CV255	30	029-01680-02	CAP MICA 5 CASE 6P8 5%
D101		001-10000-70	S) DIODE SMD BAV70 D-SW SOT23
D105		001-10000-70	S) DIODE SMD BAV70 D-SW SOT23
%D110		001-10000-70	S) DIODE SMD BAV70 D-SW SOT23
D113		001-00011-60	S) DIODE MR750 OR SR2607
%D115		001-10000-70	S) DIODE SMD BAV70 D-SW SOT23
D205		001-10066-00	DIODE SCHOTTKY HSMS2815
D206		001-10066-00	DIODE SCHOTTKY HSMS2815
IC101		002-10003-24	S) IC SMD 324 4X O-AMP SO14
IC103		002-10003-24	S) IC SMD 324 4X O-AMP SO14
IC105		002-10006-62	S)IC SMD LMC662CM 2X O-AMP
IC107		002-12951-00	IC SMD LP2951CM ADJ VLTGE REG
IC109		002-10003-17	(S) IC LM317L REG S0-8 100MA
IC200		002-10003-58	S) IC SMD LM358 DUAL O-AMP
#IC210	10	004-00687-62	MODULE M68762L 400-450MHZ 30W
#IC210	20	004-00687-61	MODULE M68762H 440-490MHZ 30W
#IC210	30	004-00687-63	MODULE M68762SH 470-520MHZ 30W
L101		065-10004-20	BEAD FE SMD CBD 4.6/3/3-4S2
L103		065-10004-20	BEAD FE SMD CBD 4.6/3/3-4S2
L105		065-10004-20	BEAD FE SMD CBD 4.6/3/3-4S2
L200		056-10330-02	(L) IND SMD 330NH
L201		056-10330-02	(L) IND SMD 330NH
L202		056-10330-02	(L) IND SMD 330NH
L205		056-10330-02	(L) IND SMD 330NH
L207		065-10004-20	BEAD FE SMD CBD 4.6/3/3-4S2
L209		052-08340-40	COIL A/W 4T/4.0MM SMD 0.8MM
L210		052-08340-40	COIL A/W 4T/4.0MM SMD 0.8MM
L211		065-10004-20	BEAD FE SMD CBD 4.6/3/3-4S2
L212		052-08340-40	COIL A/W 4T/4.0MM SMD 0.8MM
%L213		056-10330-02	(L) IND SMD 330NH
L235		051-00005-60	IND HAIRPIN 10MM TALL T859
#L236	10	052-08340-10	COIL A/W 1T/4.0MM SMD 0.8MM
#L236	20	052-08340-10	COIL A/W 1T/4.0MM SMD 0.8MM
#L236	30	052-08330-10	COIL A/W 1T/3.0MM SMD 0.8MM
L237		052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM
L238		065-10009-20	BEAD FER SMD BDS 3/3/8.9-4S2
L239		052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM
L240		051-00653-00	FLAT STRIP INDUCTOR
L253		056-10330-02	(L) IND SMD 330NH
#L254	10	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM
#L254	20	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM
#L254	30	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM
#L255	10	052-08345-20	COIL A/W 2T/4.5MM SMD 0.8MM
#L255	20	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM
#L255	30	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM
#L256	10	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM
#L256	20	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM
#L256	30	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM
L257		056-10330-02	(L) IND SMD 330NH
#L258	10	052-08325-10	COIL A/W 1T/2.5MM SMD 0.8MM

Ref	Var	IPN	Description
#L258	20	052-08320-10	COIL A/W 1T/2.0MM SMD 0.8MM
#L258	30	052-08320-10	COIL A/W 1T/2.0MM SMD 0.8MM
L259		051-00005-53	COIL TAIT NO553 A/W 10MM LINK
L260		052-08335-10	COIL A/W 1T/3.5MM SMD 0.8MM
LINK102		036-10000-00	RES M/F 0805 ZERO OHM
P200		356-00010-26	PIN TRACK HARWIN FOR 1.6MM PCB
P201		356-00010-26	PIN TRACK HARWIN FOR 1.6MM PCB
PL101		070-01001-00	D-RANGE 15 WAY COMPL T800
PL110		240-00021-03	LIM) HEADER 2X7 WAY SMD
%Q101		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
%Q103		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
%Q105		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
%Q107		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
%Q109		000-10008-69	S) XSTR SMD BC869 PNP 1W SOT89
Q111		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q113		000-10008-48	S) XSTR SMD BCW60 NPN SOT23 SS
Q115		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q117		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
Q119		000-10008-48	S) XSTR SMD BCW60 NPN SOT23 SS
Q121		000-10017-00	LS) XSTR SMD BF170LT1 SOT23
Q123		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q125		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q127		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q129		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
Q131		000-10017-00	LS) XSTR SMD BF170LT1 SOT23
Q133		000-10008-48	S) XSTR SMD BCW60 NPN SOT23 SS
Q135		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
Q136		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
Q137		000-00030-95	S) XSTR 2N6107 PNP TO220 AF
Q200		000-10008-48	S) XSTR SMD BCW60 NPN SOT23 SS
Q216		000-00006-58	S)XSTR MRF658 UHF 65W 6FL
R101		036-14100-10	RES M/F 0805 1K 1%
%R102		036-16220-00	RES M/F 0805 220K 5%
R103		036-15330-00	RES M/F 0805 33K 5%
R104		036-16470-00	RES M/F 0805 470K 5%
%R105		036-15150-00	RES M/F 0805 15K 5%
%R106		036-15150-00	RES M/F 0805 15K 5%
%R107		036-14390-10	RES M/F 0805 3K9 1%
%R108		036-14330-10	RES M/F 0805 3K3 1%
%R109		036-15100-10	RES M/F 0805 10K 1%
%R111		036-14820-10	RES M/F 0805 8K2 1%
%R112		036-14680-10	RES M/F 0805 6K8 1%
%R113		036-14100-10	RES M/F 0805 1K 1%
%R114		036-16100-00	RES M/F 0805 100K 5%
%R115		036-16220-00	RES M/F 0805 220K 5%
%R116		045-04470-00	RES NTC SMD 4K7 5% 20MW
R117		036-16220-00	RES M/F 0805 220K 5%
R118		036-15270-00	RES M/F 0805 27K 5%
R119		036-16470-00	RES M/F 0805 470K 5%
%R120		036-10000-00	RES M/F 0805 ZERO OHM
%R121		036-15150-00	RES M/F 0805 15K 5%
%R122		036-14390-10	RES M/F 0805 3K9 1%
R123		036-14100-10	RES M/F 0805 1K 1%
R124		036-16100-00	RES M/F 0805 100K 5%
R125		036-15100-10	RES M/F 0805 10K 1%
R126		036-14100-10	RES M/F 0805 1K 1%
R127		036-15100-10	RES M/F 0805 10K 1%
R128		036-15220-00	RES M/F 0805 22K 5%
R129		036-17100-10	RES M/F 0805 1M 1%
R130		036-14220-00	RES M/F 0805 2K2 5%
R131		036-16180-00	RES M/F 0805 180K 5%
R132		036-14100-10	RES M/F 0805 1K 1%
R133		036-15100-10	RES M/F 0805 10K 1%
R134		036-13470-00	RES M/F 0805 470E 5%
R135		036-13680-00	RES M/F 0805 680E 5%
R136		036-15100-10	RES M/F 0805 10K 1%
R137		036-13470-00	RES M/F 0805 470E 5%
R138		036-15100-10	RES M/F 0805 10K 1%
%R139		036-10000-00	RES M/F 0805 ZERO OHM
%R140		036-10000-00	RES M/F 0805 ZERO OHM
R141		036-15100-10	RES M/F 0805 10K 1%
R142		036-15100-10	RES M/F 0805 10K 1%
R143		036-15100-10	RES M/F 0805 10K 1%
R144		036-15220-00	RES M/F 0805 22K 5%
R145		036-15470-10	RES M/F 0805 47K 1%
R146		036-14680-10	RES M/F 0805 6K8 1%
%R147		036-10000-00	RES M/F 0805 ZERO OHM
R148		036-14820-10	RES M/F 0805 8K2 1%
R149		036-13470-00	RES M/F 0805 470E 5%
R150		036-12220-00	RES M/F 0805 22E 5%
R151		036-15100-10	RES M/F 0805 10K 1%
R152		036-15100-10	RES M/F 0805 10K 1%
R153		036-14680-10	RES M/F 0805 6K8 1%
R154		036-14680-10	RES M/F 0805 6K8 1%
R155		036-13220-00	RES M/F 0805 220E 5%
R156		036-13100-10	RES M/F 0805 100E 1%
R157		036-12220-00	RES M/F 0805 22E 5%
R158		036-14100-10	RES M/F 0805 1K 1%
R159		036-15100-10	RES M/F 0805 10K 1%
R160		036-14470-10	RES M/F 0805 4K7 1%
R161		036-14100-10	RES M/F 0805 1K 1%
R162		036-17100-10	RES M/F 0805 1M 1%
R163		036-13680-00	RES M/F 0805 680E 5%

Ref	Var	IPN	Description
R164		036-14220-00	RES M/F 0805 2K2 5%
R165		036-14100-10	RES M/F 0805 1K 1%
R166		036-13680-00	RES M/F 0805 680E 5%
R167		036-14220-00	RES M/F 0805 2K2 5%
R168		036-15100-10	RES M/F 0805 10K 1%
R169		036-14100-10	RES M/F 0805 1K 1%
R170		036-14100-10	RES M/F 0805 1K 1%
R171		036-14100-10	RES M/F 0805 1K 1%
R172		036-15100-10	RES M/F 0805 10K 1%
R173		036-13470-00	RES M/F 0805 470E 5%
R174		036-13220-00	RES M/F 0805 220E 5%
R175		036-16220-00	RES M/F 0805 220K 5%
R176		036-15100-10	RES M/F 0805 10K 1%
R177		036-14470-10	RES M/F 0805 4K7 1%
R178		036-16100-00	RES M/F 0805 100K 5%
R179		036-15100-10	RES M/F 0805 10K 1%
R180		036-16150-00	RES M/F 0805 150K 5%
R181		036-14560-00	RES M/F 0805 5K6 5%
R182		036-16100-00	RES M/F 0805 100K 5%
R183		036-14470-10	RES M/F 0805 4K7 1%
R184		036-14220-00	RES M/F 0805 2K2 5%
R185		036-03100-02	RES 100E 1206 200V 250MW RC01
R186		036-13100-10	RES M/F 0805 100E 1%
R187		036-03180-10	RES 180R 1W SMD 2512
R188		036-16100-00	RES M/F 0805 100K 5%
R189		036-12220-00	RES M/F 0805 22E 5%
R190		036-14150-00	RES M/F 0805 1K5 5%
R191		036-14100-10	RES M/F 0805 1K 1%
R192		036-13220-00	RES M/F 0805 220E 5%
R193		036-12100-00	RES M/F 0805 10E 5%
R194		036-03180-10	RES 180R 1W SMD 2512
R195		036-14220-00	RES M/F 0805 2K2 5%
R196		036-13100-10	RES M/F 0805 100E 1%
R198		036-14100-10	RES M/F 0805 1K 1%
R200		036-14470-10	RES M/F 0805 4K7 1%
R201		036-14680-10	RES M/F 0805 6K8 1%
R202		036-13390-00	RES M/F 0805 390E 5%
R203		036-14470-10	RES M/F 0805 4K7 1%
R204		036-13390-00	RES M/F 0805 390E 5%
R205		036-13100-10	RES M/F 0805 100E 1%
R207		036-15100-10	RES M/F 0805 10K 1%
R209		036-14470-10	RES M/F 0805 4K7 1%
R210		045-04470-00	RES NTC SMD 4K7 5% 20MW
R211		036-13560-00	RES M/F 0805 560E 5%
R215		045-05100-02	RES NTC 10K 2% Metal tagged
R223		036-11330-00	RES M/F 0805 3E3 5%
R224		036-11330-00	RES M/F 0805 3E3 5%
R225		036-11330-00	RES M/F 0805 3E3 5%
R226		036-02030-10	RES 30E 1W SMD 2512
R227		036-03180-10	RES 180R 1W SMD 2512
R230		036-03180-10	RES 180R 1W SMD 2512
R235		036-13100-10	RES M/F 0805 100E 1%
R236		036-13100-10	RES M/F 0805 100E 1%
R237		036-03100-02	RES 100E 1206 200V 250MW RC01
R238		036-03100-02	RES 100E 1206 200V 250MW RC01
R245		036-02030-10	RES 30E 1W SMD 2512
R247		036-11330-00	RES M/F 0805 3E3 5%
RV101		042-04500-05	RES PRESET SMD 5K CER 4MM SQ
RV103		042-05500-05	RES PRESET SMD 50K CER 4MM SQ
RV105		042-04500-05	RES PRESET SMD 5K CER 4MM SQ
RV107		042-05500-05	RES PRESET SMD 50K CER 4MM SQ
RV109		044-04200-06	RES PRE MULT 2K 15T PNL MTG
*RV111		044-04200-02	RES PRE MULT 2K VERT CER 10MM
RV113		042-06500-05	RES PRESET SMD 500K CER 4MM SQ
RV115		042-05200-05	RES PRESET SMD 20K CER 4MM SQ
SK101		240-10000-05	CONN SMD SKT 8W 2R M-MATCH
SK103		240-10000-05	CONN SMD SKT 8W 2R M-MATCH
SK201		240-02100-44	SKT COAX MINI JACK PCB MT ANG.

T858 Mechanical & Miscellaneous Parts (220-01423-02)

IPN	Legend	Description
008-00014-79		S)LED 3MM RED WITH WIRE
008-00014-80		S)LED 3MM GREEN WITH WIRE
051-00641-01	2	COAX T859 SEMI-RIG N-TYPE EXTN
070-01001-00	3	D-RANGE 15 WAY COMPL T800 PL101
201-00050-25		AUTO 154 RED 41/0.3 PVC DC+ from D-range PCB.
201-00050-26		AUTO 154 BLACK 41/0.3 PVC DC- from D-range PCB.
219-02591-01	4	LOOM RIBBON 8 WAY FOR T839PA
219-02599-00		CABLE ASSY PA INPUT REAR DRIVE
219-02612-00		RG316 CABLE ASSY T869PA BNC to SK201 cable assembly with connectors.
219-02639-00		CABLE ASSEMBLY RG223/U N TO BNC Exciter/PA connecting cable assembly.
219-02709-00		T858/T859 N-TYPE CONNECTOR SUB
220-01423-02	5	PCB T858 PA SERIES II
220-01442-03	6	PCB T858SII DRNL COUPLER
240-02100-06	7	SKT COAX N TYPE PNL MTG OP-TER
240-02100-17	8	SKT COAX BNC PNL JAC CRP RG316
240-06010-15	9	BLOCK LATCHING 15W D RANGE
240-06010-44	10	HOOD CONN UHF & N-TYPE
303-23120-00	12	COVER A3M2288 HOLE BLANKING
303-23146-00	13	COVER SIDE T869 PA
308-01007-01	14	HANDLE BASE STATION SERIES II
308-13131-02	15	HEATSINK T859 PA DRILLED DCST
316-06617-00	16	PNL PA NO INP DRV SER II SNGL
319-01190-01	17	SHIELD WALL HARM. FILTER 869PA
319-01201-00	18	SHIELD LID HARM. FILTER 869PA
319-01202-00	19	SHIELD T869PA CONTROL CIRCUIT
319-30061-00	20	SPACER PLATE T889 WIRELINE
319-30064-00	21	SPACER HSINK RF MODULE 869PA
345-00040-16	22	SCRW M3X20MM P/POZ ST BZ
349-00010-59	23	SCRW 6-32 * 3/8 P/PH T/T ZP
349-00020-07	24	SCRW 4-40 X 5/16 P/POZ T/T BLK
349-00020-09	25	SCRW T/T 4-40X3/8 IN P/POZ BLK
349-00020-36	26	SCREW TT M3X8m PANTORX BLK
352-00010-29	27	NUT M4 NYLOC HEX
353-00010-10	28	WSHR M3 FLAT 7MM*0.6MM ST BZ
353-00010-24		WSHR M4x8MM FLAT Fits under M4 Nyloc nut securing handle.
356-00010-01	29	TAG SOLDER 3MM SHORT M6132/3.2
356-00010-03	30	TAG SOLDER 3MM LONG M614/3.2
356-00010-05	31	TAG SOLDER 4MM LONG M6144/4.2
356-00010-26		PIN TRACK HARWIN FOR 1.6MM PCB
360-00010-41	32	BUSH SHORTY BLK
362-00010-07	33	GASKET SIL INSULATING TO-220
362-00010-13	34	BUSH INSULATING 1.1MM TOP HAT
362-00010-33	35	GROMMET LED MTG 3MM
365-01538-00		LABEL WARNING 60W/PWR CLAMP
399-00010-51		BAG PLASTIC 75X100MM

Note

The following electrical components are also included in the mechanical assembly drawing.

000-00006-58	37	S)XSTR MRF658 UHF 65W 6FL Q216
000-00030-95	11	S) XSTR 2N6107 PNP TO220 AF Q137
004-00687-XX	36	#IC210
045-05100-02	1	RES NTC 10K 2% METAL TAGGED R215

replace A4 pages D5.2.23/D5.2.24 with A3 pages D5.2.23/D5.2.24

replace A4 pages D5.2.23/D5.2.24 with A3 pages D5.2.23/D5.2.24

T858 Grid Reference Index (IPN 220-01423-02)

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
%C101	1:D5	1-B8
%C103	1:D5	1-B9
%C105	1:B5	1-C8
%C107	1:B5	1-D9
%C109	1:B5	1-D8
%C111	1:B6	1-D8
%C113	1:B5	1-F8
%C115	1:B5	1-F8
%C117	1:B5	1-F9
%C119	1:A5	1-F8
%C121	1:C4	1-B6
%C123	1:D6	1-B6
C124	1:F2	1-C6
%C125	1:C5	1-D7
%C127	1:C6	1-D6
C129	1:B4	1-H5
C131	1:B4	1-J6
C132	1:B4	1-K7
C133	1:F5	1-K8
%C134	1:A5	1-M9
%C135	1:A6	1-M9
C137	1:F5	1-K8
C138	1:A3	1-L8
C139	1:B4	1-M6
C141	1:B3	1-L8
C143	1:D2	1-E7
C145	1:D2	1-E7
C146	1:B2	1-C5
C147	1:D3	1-F6
C148	1:F6	1-B5
C149	1:C3	1-F7
C150	1:E6	1-B3
C151	1:E6	1-D5
C153	1:E5	1-D3
C154	1:B1	1-C3
C155	1:D3	1-G3
C159	1:C3	1-H2
C161	1:E4	1-L4
C162	1:F4	1-L4
C164	1:B2	1-L4
C165	1:B3	1-M4
C167	1:Q4	1-P3
C169	1:Q3	1-P3
C170	1:Q4	1-Q3
C171	1:Q4	1-Q3
C172	1:D4	1-A0
C173	1:D4	1-B0
C174	1:D4	1-B0
C176	1:D3	1-E0
C177	1:E4	1-J5
C178	1:E5	1-E0
C179	1:D3	1-G2
C180	1:F1	1-H0
C181	1:F1	1-G0
C182	1:D1	1-H1
C183	1:B2	1-E2
C184	1:C5	1-G0
C185	1:E2	1-H1
C186	1:E2	1-J0
C187	1:F2	1-J1
C188	1:E2	1-J1
C189	1:D2	1-L1
C190	1:D2	1-M1
C191	1:F2	1-K0
C192	1:B1	1-N1
C193	1:B1	1-Q0
C194	1:G1	1-Q1
C195	1:C1	1-Q0
C196	1:F4	1-M1
C197	1:F3	1-N1
C198	1:E3	1-N0
C200	1:F3	2-J9
C201	1:E3	2-H8
C202	1:M4	2-E7
C203	1:M4	2-E7
C204	1:F2	2-F7
C205	1:E2	2-F7
C206	1:F3	2-L7
C207	1:B6	2-M7
C208	1:C6	2-N7
C211	1:U9	2-B3
C212	1:B2	2-H7
C213	1:S8	2-B3
C215	1:D6	2-N7
C216	1:C6	2-P7
C220	1:R7	2-C5
C221	1:R6	2-D5
C222	1:R6	2-E5
C223	1:Q7	2-F5
C224	1:Q7	2-F5
C225	1:S7	2-C3
C226	1:S6	2-C3
C227	1:T8	2-B2
C228	1:T7	2-B2
C249	1:N6	2-F5
C250	1:H7	2-M5
#C251	1:L6	2-G5
#C252	1:J7	2-J5
#C253	1:J6	2-K5
#C254	1:H6	2-L5
#C256	1:K6	2-H5
#C257	1:K7	2-H5
C258	1:H5	2-J4
C259	1:H4	2-L4
C272	1:H4	2-L4
C275	1:F7	2-J2
C276	1:F7	2-J1
#C277	1:C9	2-Q4
#C278	1:B8	2-R4
#C280	1:A7	2-R3
C282	1:D7	2-Q3
#C283	1:D7	2-R3
C284	1:E9	2-K0
#C285	2:D8	2-P3
C286	2:D7	2-Q3
C287	1:F9	2-L0
C291	1:D3	2-Q1
C292	1:E3	2-R1
#CV255	1:H8	2-L5
D101	1:C4	1-G4
D101	1:C4	1-G5
D103	1:V9	1-K9
D105	1:C3	1-J2
D105	1:C3	1-J2
D107	1:V9	1-K5
D109	1:V8	1-L5
%D110	1:F5	1-F5
%D110	1:F5	1-F5
D113	1:J4	1-R2
%D115	1:E5	1-G3
%D115	1:E5	1-G3
D205	1:G7	2-H1
D206	1:E9	2-K0
IC101	1:D5	1-B6
IC101	1:D5	1-N0
IC101	1:D5	1-B8
IC101	1:D5	1-C1
IC101	1:D5	1-F0
IC103	1:E5	1-D3
IC103	1:E5	1-H8
IC103	1:E5	1-F0
IC103	1:E5	1-J5
IC103	1:E5	1-D4
IC105	1:E3	1-F2
IC105	1:E3	1-N0
IC105	1:E3	1-P0
IC107	1:E2	1-K1
IC109	1:B1	1-P1
IC200	1:E3	2-J7
IC200	1:E3	2-R1
IC200	1:E3	2-P1
#IC210	1:R5	2-C2
L101	1:Q4	1-P3
%L102	1:A5	1-M9
L103	1:Q3	1-Q3
L105	1:F2	1-K0
L200	1:M4	2-E7
L201	1:F2	2-F7
L202	1:B6	2-N8
L205	1:D6	2-P8
L207	1:S7	2-C5
L209	1:R6	2-D5
L210	1:Q6	2-E5
L211	1:S7	2-C3
L212	1:S6	2-C3
%L213	1:T8	2-B2
L235	1:J6	2-K5
#L236	1:M6	2-G5
L237	1:L7	2-G5
L238	1:L8	2-G4
L239	1:J4	2-K4
L240	2:	2-L5
L253	1:F7	2-J2
#L254	1:D9	2-Q4
#L255	1:C8	2-Q4
#L256	1:A8	2-R4
L257	1:E9	2-K0
#L258	1:D7	2-P3
L259	1:D7	2-Q3
L260	1:C7	2-Q3
LINK102	1:V7	1-C1
P101	1:A6	1-R9
P103	1:P3	1-R0
P105	1:R3	1-R0
P200	1:F7	2-N4
P201	1:E9	2-P3
P202	1:J6	2-J5
P203	1:L6	2-J5
PL101	2:Q5	3-K3
PL110	1:C2	3-H2
%Q101	1:B5	1-C9
%Q103	1:B6	1-E8
%Q105	1:C6	1-D7
%Q107	1:B5	1-F8
%Q109	1:A5	1-G9
Q111	1:B3	1-J7
Q113	1:B4	1-K6
Q115	1:B4	1-L7
Q117	1:F5	1-K8
Q119	1:B4	1-L6
Q121	1:A3	1-L8
Q123	1:D2	1-E7
Q125	1:D3	1-F7
Q127	1:C4	1-G7
Q129	1:F4	1-L4
Q131	1:B3	1-M4
Q133	1:C4	1-D0
Q135	1:F1	1-H0
Q136	1:F1	1-G0
Q137	1:D2	1-J0
Q200	1:F3	2-L8
Q216	1:K6	2-J5
R101	1:D5	1-A8
%R102	1:D5	1-A9
R103	1:D5	1-A8
R104	1:D5	1-B9
%R105	1:D5	1-C8
%R106	1:B5	1-C8
%R107	1:B6	1-D7
%R108	1:B5	1-D9
%R109	1:B5	1-E9
%R111	1:B5	1-E8
%R112	1:B5	1-E9
%R113	1:A5	1-F9
%R114	1:C5	1-A6
%R115	1:E6	1-A6
%R116	1:C5	1-A7
R117	1:D6	1-A6

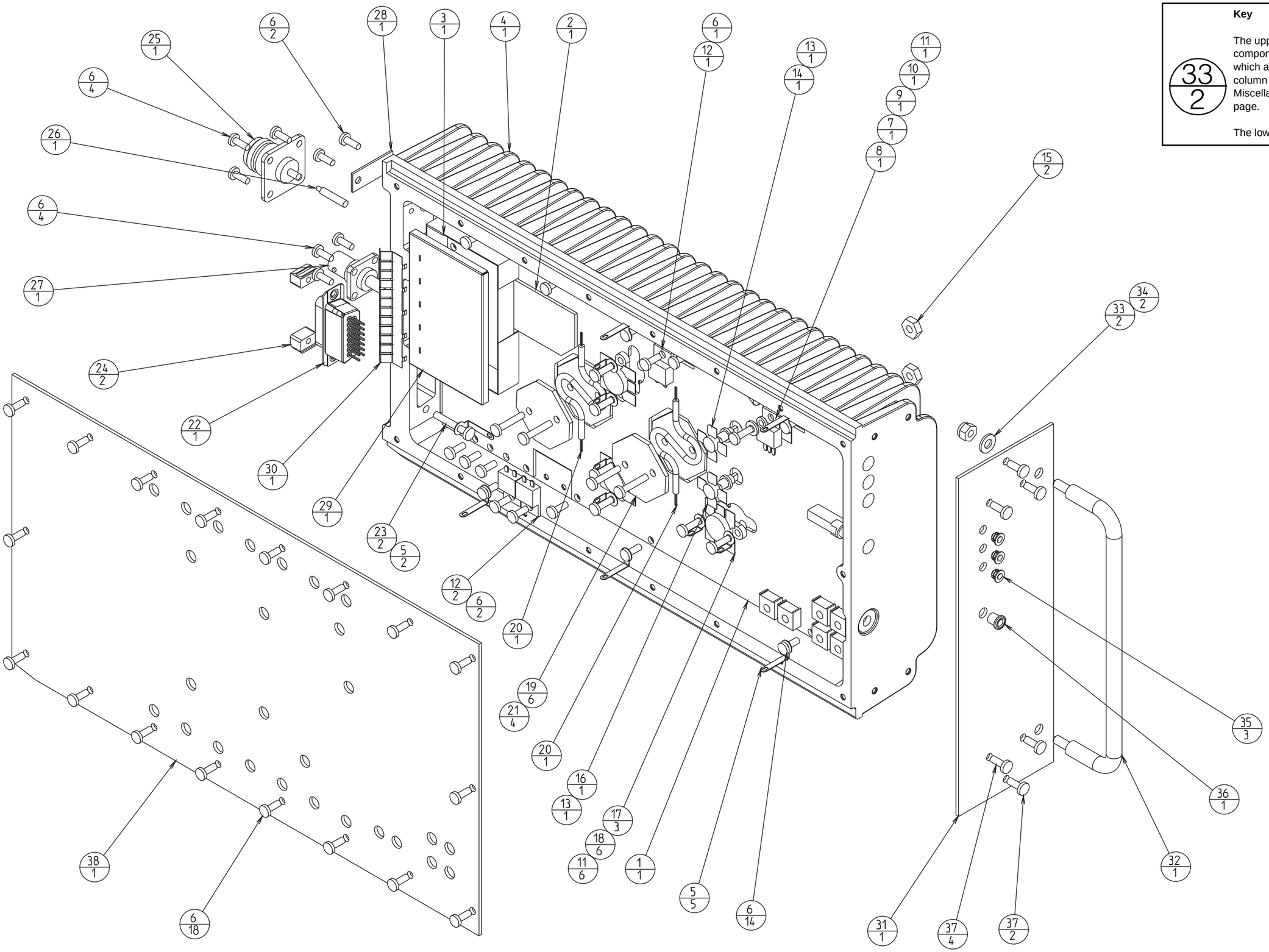
Device	PCB	Circuit
R118	1:C4	1-B6
R119	1:C5	1-C7
%R120	1:F2	1-H7
%R121	1:C5	1-C7
%R122	1:C6	1-C6
R123	1:F5	1-G7
R124	1:F4	1-H8
R125	1:E5	1-H8
R126	1:B4	1-H6
R127	1:B3	1-H7
R128	1:B3	1-J7
R129	1:F5	1-J9
R130	1:F4	1-J8
R131	1:B4	1-J7
R132	1:F5	1-J8
R133	1:B4	1-K7
R134	1:B4	1-K6
R135	1:V8	1-K9
R136	1:C4	1-K7
R137	1:B4	1-K6
R138	1:B4	1-L6
%R139	1:A5	1-M9
%R140	1:F5	1-E5
R141	1:D2	1-C6
R142	1:D2	1-E7
R143	1:D2	1-E6
R144	1:D4	1-F6
R145	1:D3	1-F7
R146	1:C4	1-G7
%R147	1:E6	1-G4
R148	1:F5	1-B5
R149	1:E5	1-B3
R150	1:E5	1-F0
R151	1:F6	1-C5
R152	1:E5	1-C3
R153	1:E4	1-F4
R154	1:E4	1-E3
R155	1:E4	1-F2
R156	1:D3	1-F3
R157	1:C5	1-F0
R158	1:C3	1-H3
R159	1:E4	1-H4
R160	1:E4	1-J5
R161	1:B3	1-J3
R162	1:E4	1-K4
R163	1:V9	1-K5
R164	1:E4	1-K4
R165	1:E4	1-K4
R166	1:V7	1-L5
R167	1:E4	1-G1
R168	1:D4	1-A1
R169	1:D4	1-A0
R170	1:D4	1-B1
R171	1:D4	1-B0
R172	1:D4	1-B1
R173	1:V7	1-C1
R174	1:V7	1-C1
R175	1:D5	1-C0
R176	1:C5	1-C0
R177	1:C4	1-D0
R178	1:C3	1-D1
R179	1:C3	1-E0
R180	1:C3	1-E0
R181	1:E4	1-E2
R182	1:D3	1-E0
R183	1:D3	1-E1
R184	1:E4	1-G1
R185	1:E1	1-H0
R186	1:E2	1-H1
R187	1:F1	1-H0
R188	1:D2	1-L1
R189	1:E3	1-N1
R190	1:E2	1-L0
R191	1:B1	1-P0
R192	1:B1	1-P1
R193	1:C1	1-Q1
R194	1:E1	1-H0
R195	1:E1	1-J0
R196	1:F1	1-J0
R198	1:D1	1-B4
R200	1:D3	2-H9
R201	1:F3	2-J8
R202	1:F3	2-H8
R203	1:D3	2-G8
R204	1:F3	2-H8
R205	1:D3	2-G7
R207	1:F3	2-K8
R209	1:F3	2-K7
R210	1:B6	2-M7
R211	1:D3	2-G7
R215	2:	2-D7
R223	1:R8	2-C4
R224	1:Q8	2-F4
R225	1:S7	2-C3
R226	1:T6	2-C2
R227	1:T7	2-B1
R230	1:T6	2-C1
R235	1:E7	2-L1
R236	1:G9	2-J0
R237	1:D6	2-R3
R238	1:D6	2-R3
R245	1:H4	2-K4
R247	1:H4	2-L3
RV101	1:C4	1-G8
RV103	1:C4	1-G6
RV105	1:C3	1-J5
RV107	1:C2	1-J3
RV109	1:V6	1-C2
*RV111	1:V6	1-C2
RV113	1:C3	1-D1
RV115	1:C2	1-L1
SK101	1:Q4	3-K2
SK103	1:A4	3-H3
SK201	1:S8	2-A2

Key

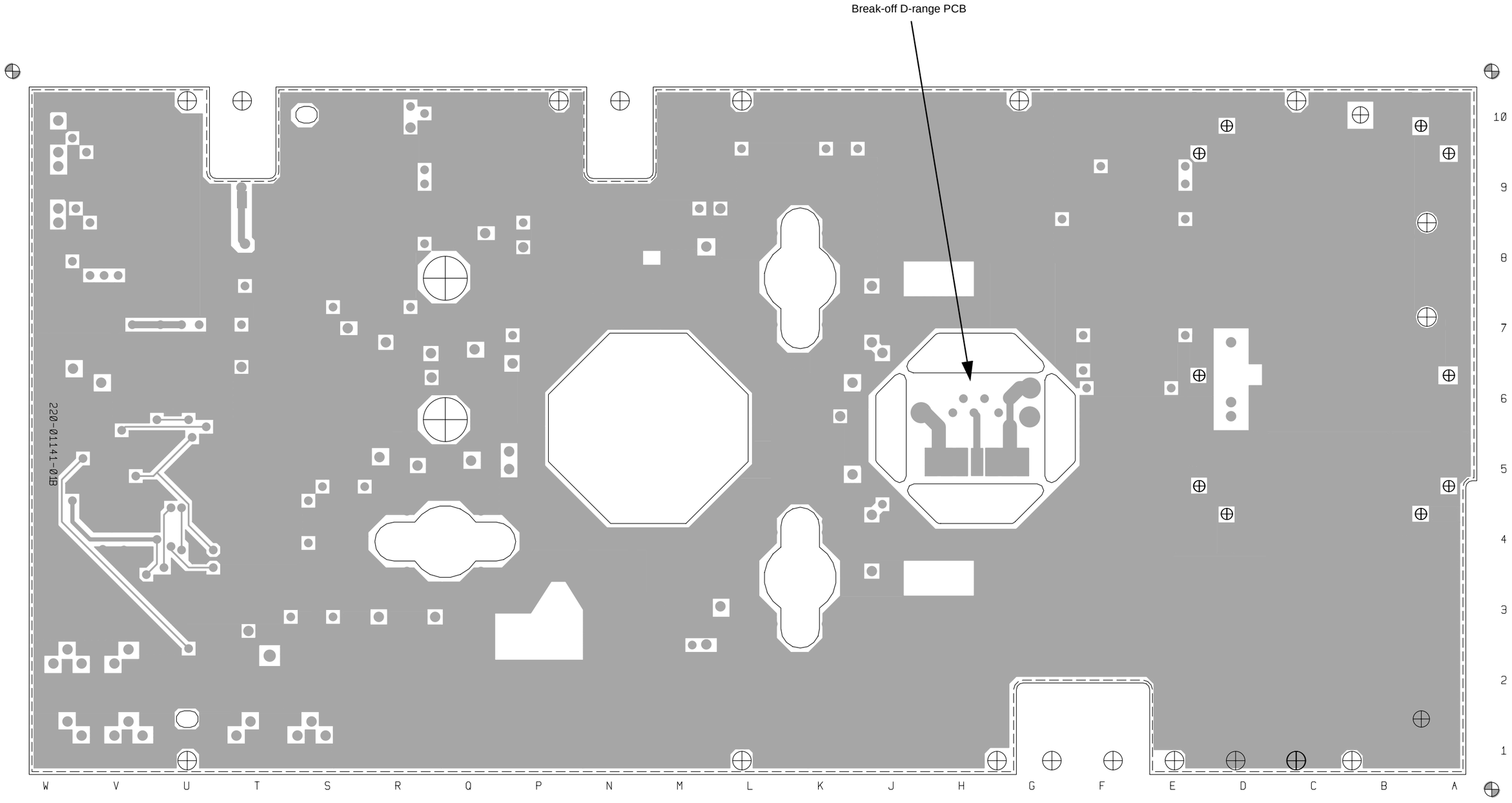
33/2

The upper number is the component identification number which appears in the “Legend” column of the Mechanical & Miscellaneous Parts on the facing page.

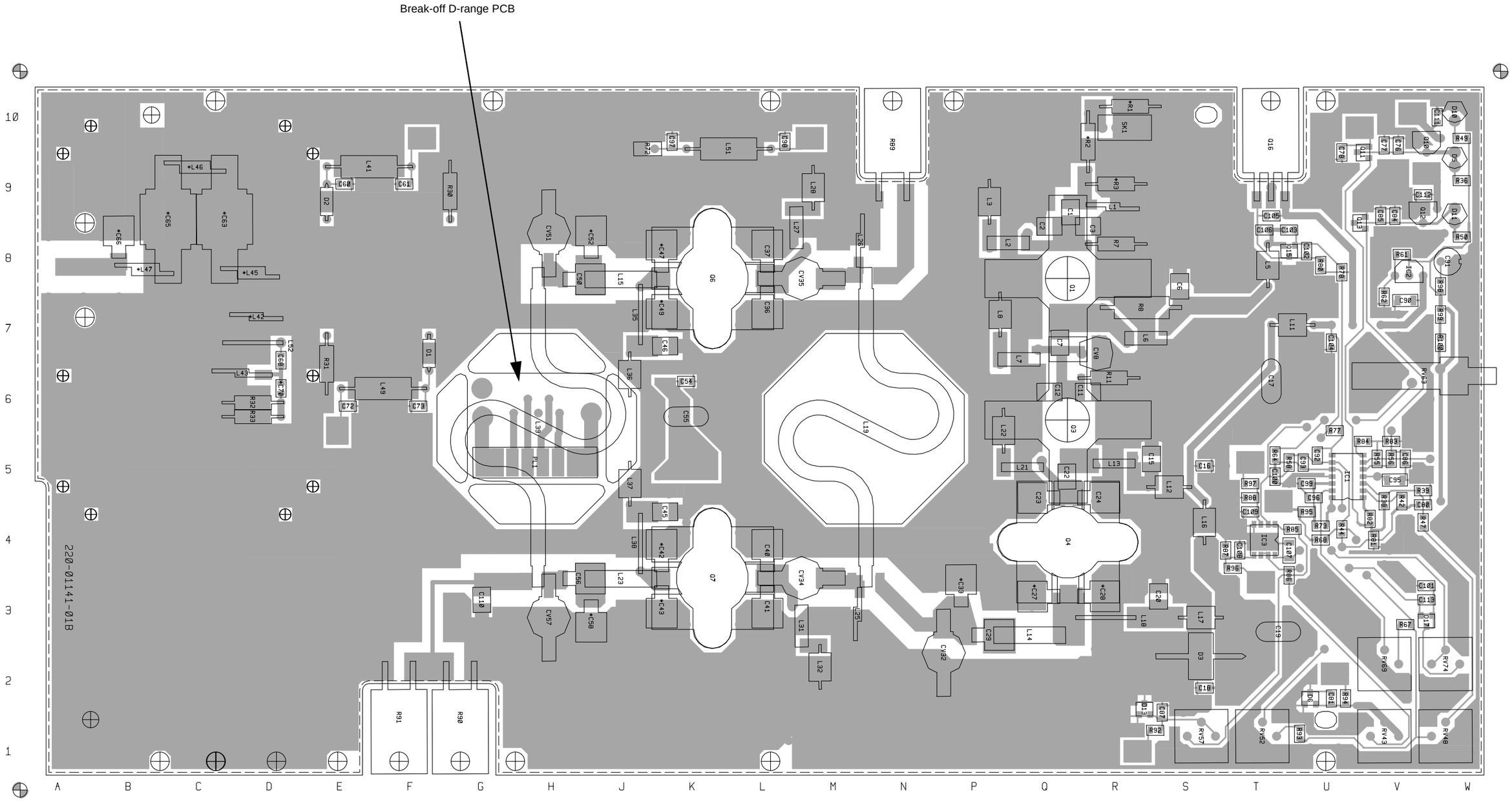
The lower number indicates how



T858 Mechanical Assembly
220-01141-01

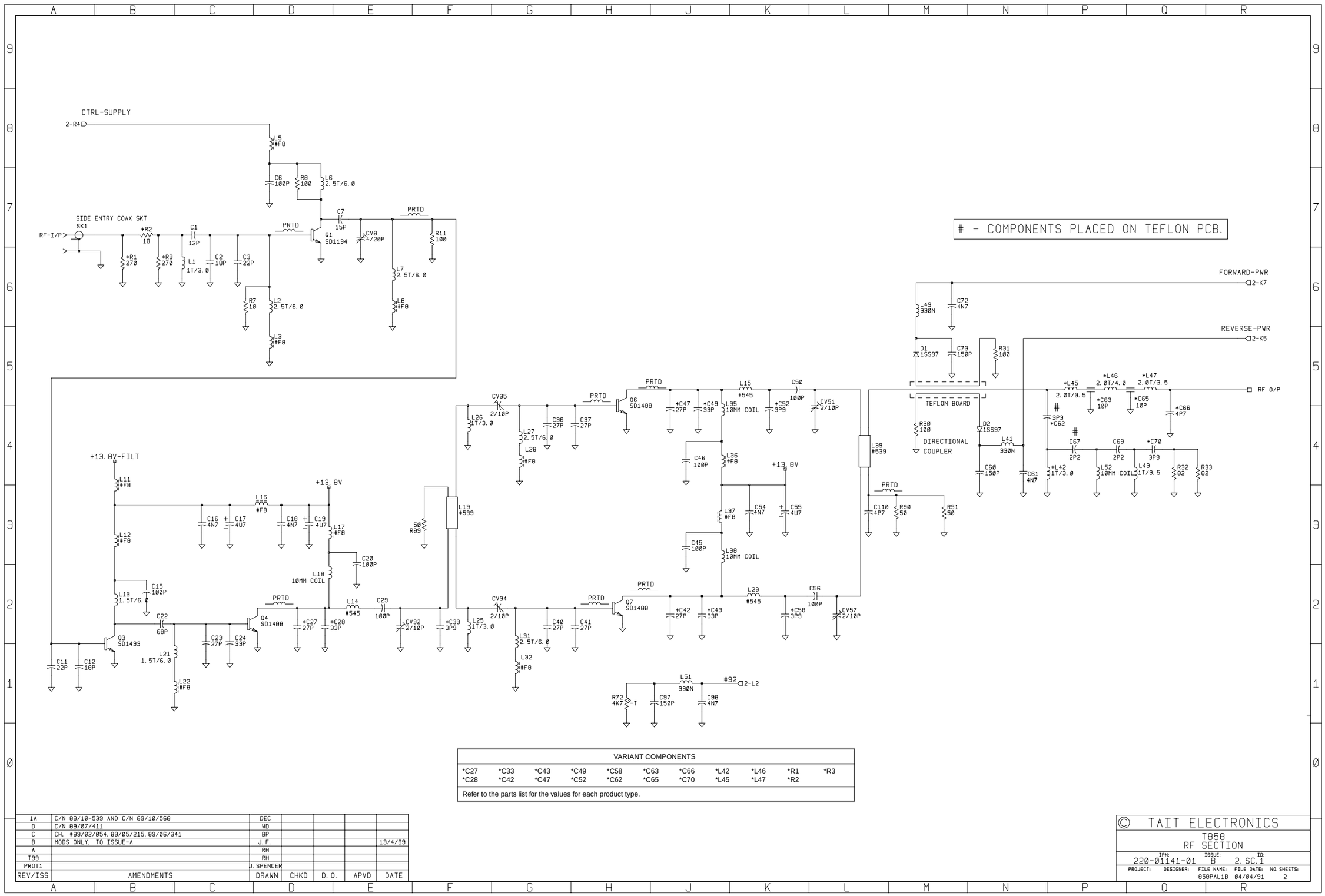


T858 PCB Layout - Bottom Side
220-01141-01



T858 PCB Layout - Top Side
220-01141-01

31/09/98



VARIANT COMPONENTS										
*C27	*C33	*C43	*C49	*C58	*C63	*C66	*L42	*L46	*R1	*R3
*C28	*C42	*C47	*C52	*C62	*C65	*C70	*L45	*L47	*R2	
Refer to the parts list for the values for each product type.										

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
1A	C/N 89/10-539 AND C/N 89/10/568	DEC				
D	C/N 89/07/411	WD				
C	CH. #89/02/054, 89/05/215, 89/06/341	BP				
B	MODS ONLY. TO ISSUE-A	J.F.				13/4/89
A		RH				
T99		RH				
PROT1		J.SPENCER				

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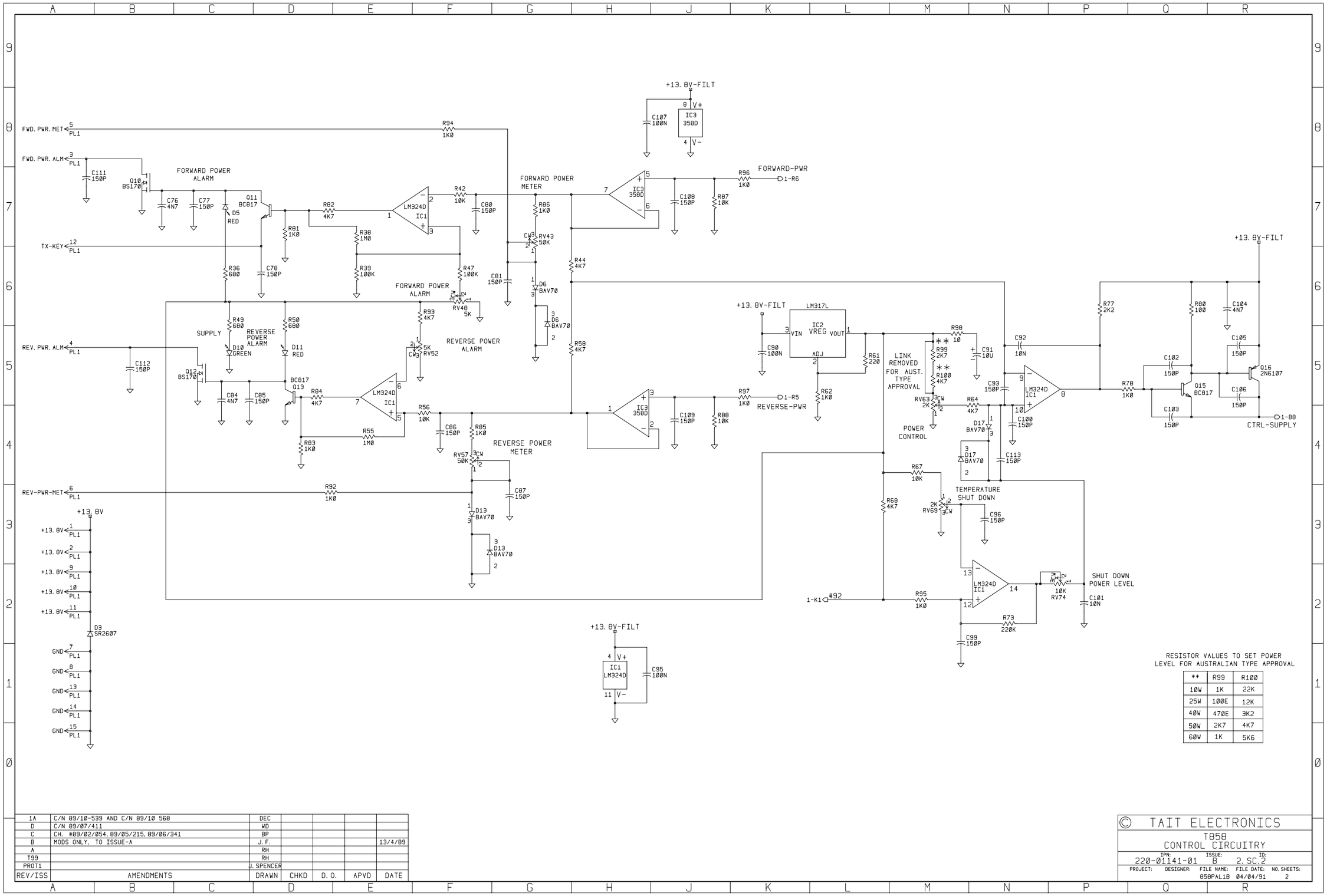
T858
RF SECTION

IPN:	ISSUE:	ID:
220-01141-01	B	2.SC.1

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO. SHEETS:
		858PAL1B	04/04/91	2

Sheet 1 - T858 RF Section
220-01141-01



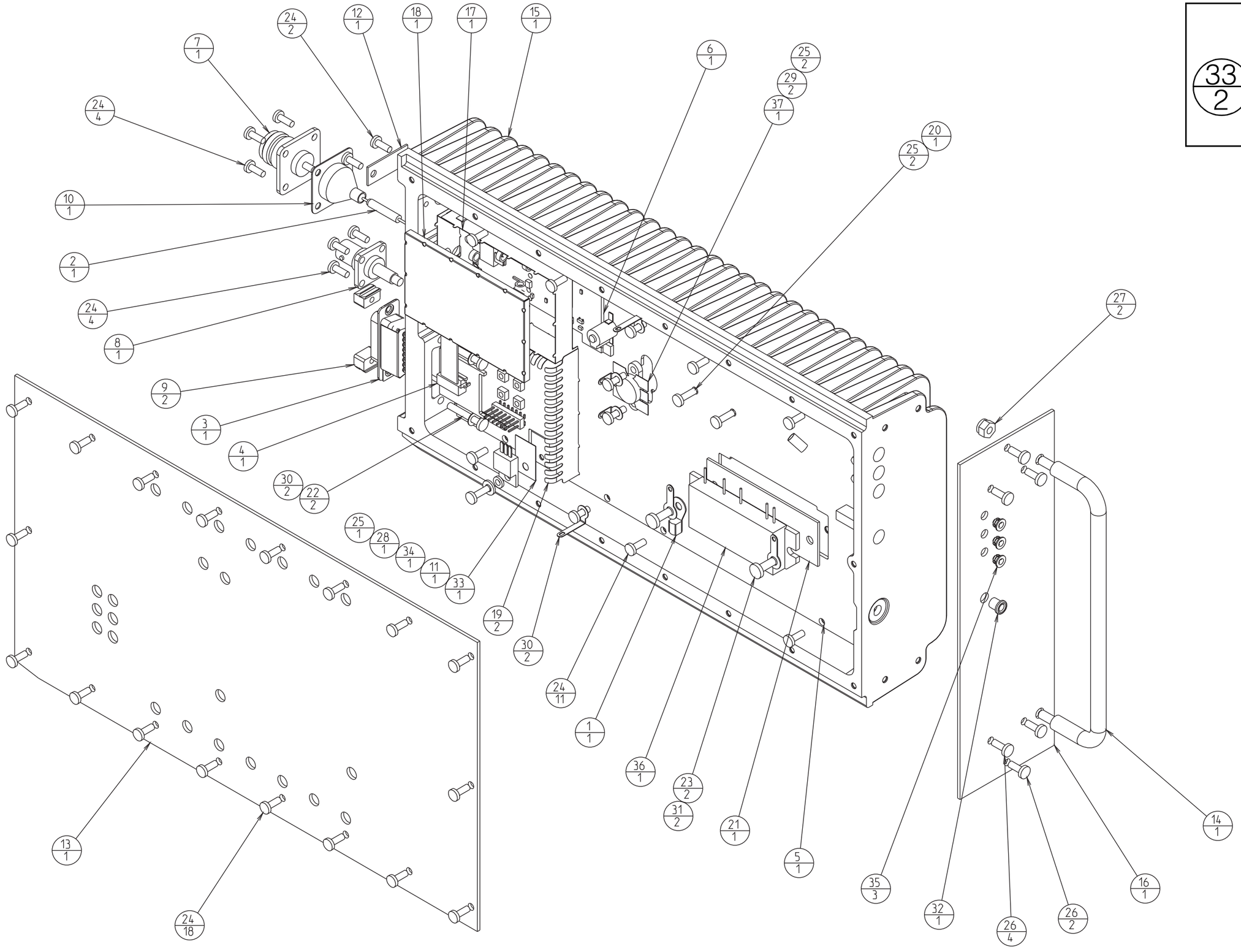
Sheet 2 - T858 Control Section
220-01141-01

Key

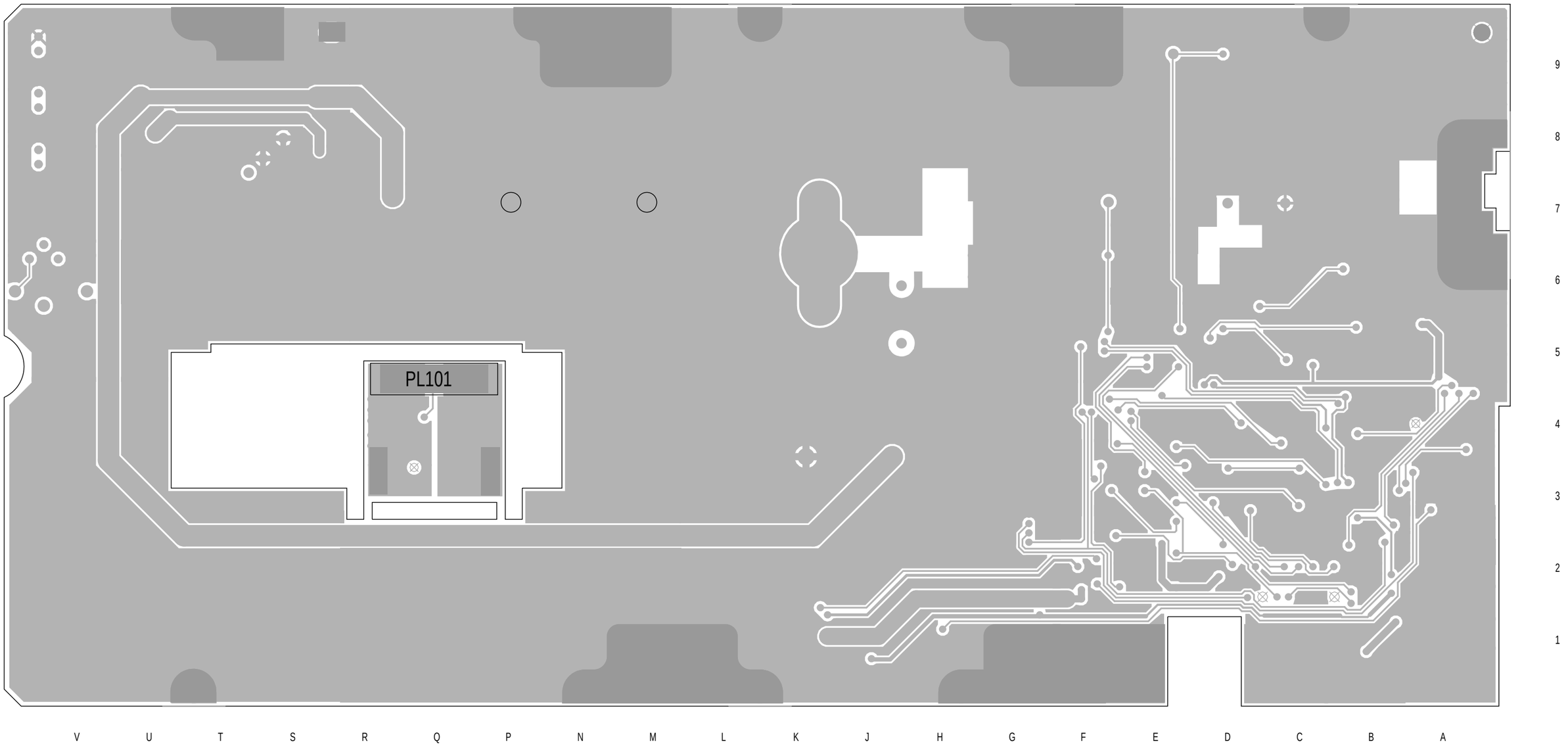
33/2

The upper number is the component identification number which appears in the "Legend" column of the Mechanical & Miscellaneous Parts on the facing page.

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



T858 Mechanical Assembly
220-01423-02

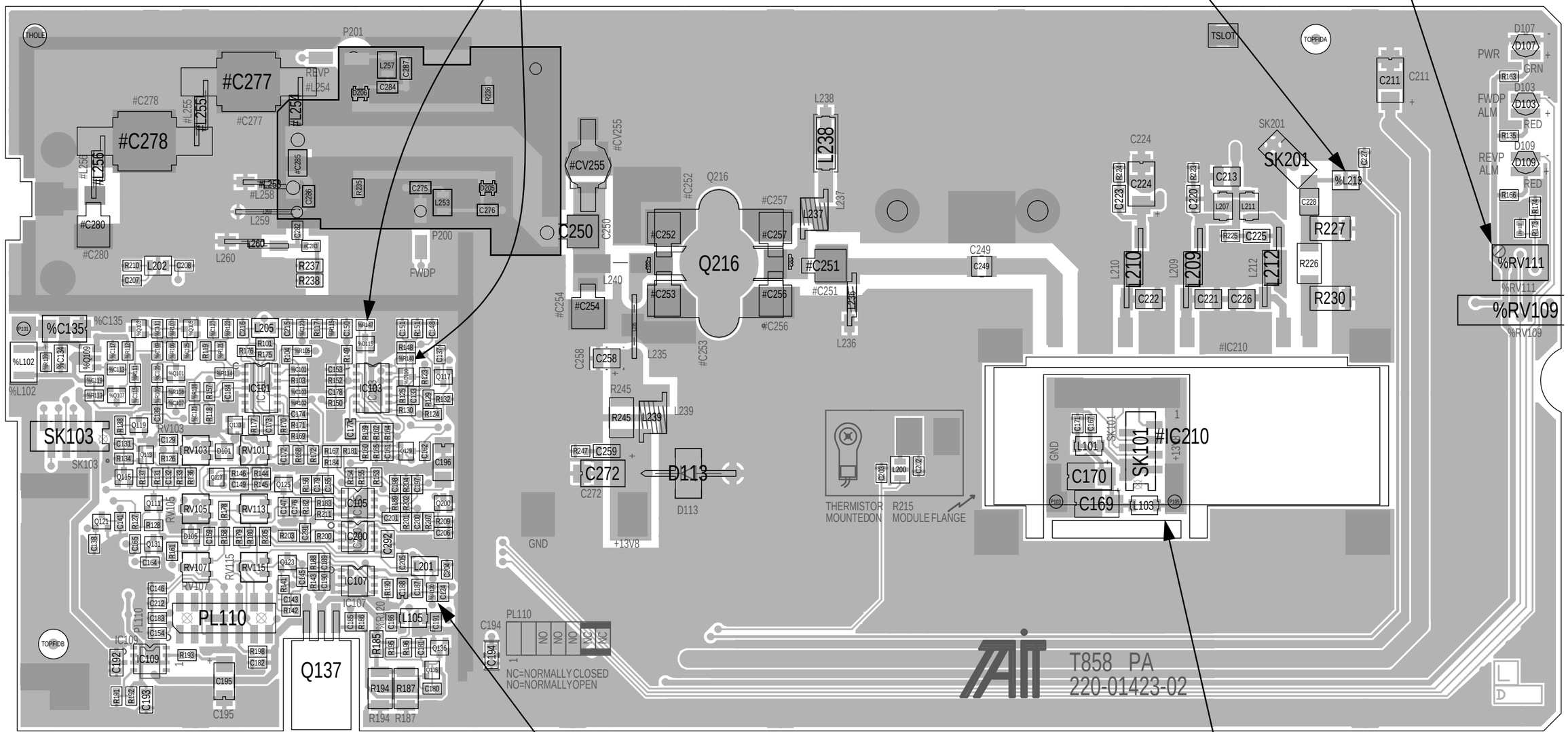


T858 PCB Layout - Bottom Side
220-01423-02

%R140 and %R147 are fitted to Series I compatible PAs only.

%L213 is fitted only when cyclic keying is required

%RV111 may be fitted instead of %RV109 to convert the output power adjustment to internal access only. Note that %RV111 and %RV109 may be incorrectly identified on the PCB as *RV111 and RV109 respectively.

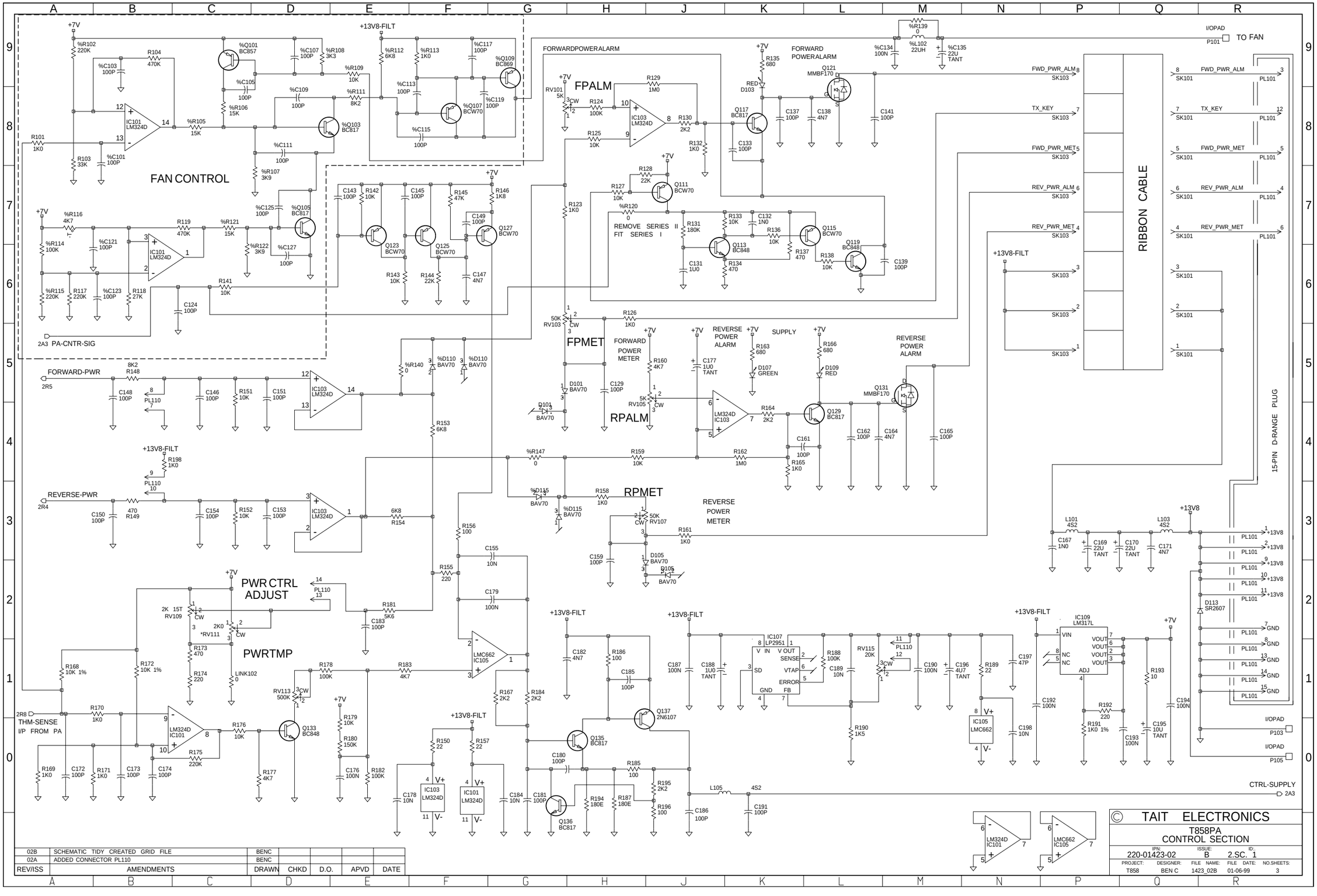


%R120 is fitted to Series I compatible PAs only.

The circuitry for the break-off D-range PCB is shown on the control section circuit diagram.

T858 PCB Layout - Top Side
220-01423-02

29/02/00



Sheet 1 - T858 Control Section
220-01423-02

+7V
R200 4K7 1%
C200 100P
C201 1N0
R201 6K8 1%
R202 390
R204 390
R203 4K7 1%
IC200 358D
L200 330NH
L201 330NH
R205 100
R215 10K
C202 4N7
C203 100P
C204 100P
C205 4N7
PL110
C212 100P
R211 560
R207 10K
R209 4K7
C206 100P
Q200 BC848
THM-SENSE 1A1
L202 330NH
L205 330NH
R210 4K7
C207 100P
C208 4N7
C215 100P
C216 1N0
FILTER TEMP SENSE

+13V8
L207 4S2
L209 4.0T/4.0
C220 100N
C221 100P
R223 3R3
L210 4.0T/4.0
C222 100P
C223 100N
C224 4U7 TANT
C249 100P
#C251 6P8
#L236 1.0T/4.5
L237 5.0T/4.0
L238 4S2-3T
#C256 33P
#C257 33P
P203 PRINTED
P202 PRINTED
Q216 MRF658
#C252 39P
#C253 47P
L240 #545
L235 10MM COIL
#C254 4P7
#CV255 2/10P
100P C250
C258 100P
R245 30E
L239 5.0T/4.0
+13V8
C259 100N
C272 4U7 TANT
R247 3R3
FORWARD-PWR 1A5
REVERSE-PWR 1A3
TRACK-PIN P200
TEFLON BOARD
TRACK-PIN P201
#L254 2.0T/3.5
#C277 12P
#L255 2.0T/4.0
#C278 10P
#L256 2.0T/3.5
RF O/P
3P3 #C285
#C280 4P7
C286 2P2
C282 2P2
#C283 3P9
#L258 1T/2.0
L259 10MM COIL
L260 1T/3.5
R237 100
R238 100

CTRL-SUPPLY 1R0
L211 4S2
L212 4.0T/4.0
C211 4U7 TANT
C213 100P
C225 100N
C226 100P
R225 3R3
PA-CNTR-SIG 1A5
%L213 330NH
C227 100P
C228 100P
R226 30E
R227 180E
R230 180E
SK201
SIDE ENTRY COAX SKT
VCONT
VS1
VS2
RF IN
RF OUT
M68706 #IC210

Directional Coupler PCB Circuit Diagram
P100 I/O PAD
L253 330NH
C275 4N7
D205 HSMS2815
D205 RF2815
C276 150P
R235 100
I/O PAD
P101
TEFLON BOARD
P102 I/O PAD
#C285 3P3
C286 2P2
P103 I/O PAD
D206 RF2815
D206 HSMS2815
R236 100
DIRECTIONAL COUPLER
P104 I/O PAD
L257 330NH
P105 I/O PAD
C284 150P
C287 4N7

PLATE SHIELD
+7V
IC200 358D
C291 100P
C292 100N

RF Power Module
12 3 4

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE

T858PA
PA

IPN:	ISSUE:	ID:
220-01423-02	B	2.SC. 2

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T858	BEN C	1423_02B	01-06-99	3

Sheet 2 - T858 RF & Thermistor Control Sections
220-01423-02

5.3 T859 Power Amplifier PCB

This section contains the following information.

T859 Parts List (IPN 220-01159-01)

How To Use This Parts List

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

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

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

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

Parts List Amendments

C2, C3	Changed from 27pF (IPN 015-02270-02) to 22pF (IPN 015-02220-06) to improve input matching and thus input sensitivity (710942).
C6	(Hi Band) 100n mylar capacitor and 10e resistor added in series across C6 to improve low power stability and eliminate 3MHz instabilities (710294).
C11 & C12	(Hi Band) 10p added across base & emitters of Q3. To ensure adequate drive power on hi band versions (90/08-390). (Hi Band) deleted to improve low power stability and eliminate 3MHz instabilities (710294).
C22	(Low Band) changed from 100p (015-03100-02) to 33p. To eliminate instability & improve power out (90/01-023). (Mid & Hi Bands) changed from 100p (015-03100-02) to 22p. To eliminate instability & improve power out (90/01-023).
C23	(Low Band) changed from 47p (029-02470-02) to 27p. To eliminate instability & improve power out (90/01-023). (Hi Band) changed from 47p (029-02470-02) to 39p. To accommodate power variations across the band (89/10-547) (Mid & Hi Bands) changed from 39p (029-02390-02) to 18p. To eliminate instability & improve power out (90/01-023).
C24	(Low Band) changed from 39p (029-02390-02) to 22p. To eliminate instability & improve power out (90/01-023). (Mid Band) changed from 39p (029-02390-02) to 18p. To eliminate instability & improve power out (90/01-023). (Hi Band) changed from 33p (029-02330-02) to 18p. To eliminate instability & improve power out (90/01-023).
C27,C43 & C47	(Hi Band) changed from 33p (029-02330-02) to 27p. To accommodate power variations across the band (89/10-547)
C28 & C49	(Mid & Hi Bands) changed from 33p (029-02330-02) to 27p. To eliminate instability & improve power out (90/01-023).
C27, C28, C42 C43, C47 & C49	Changed from mica case type to ceramic chip type. All values remain the same. To eliminate 3MHz & 90MHz instabilities (95/08-7040 & 96/07-7106)).
C42, C43, C47 & C49	(All Bands) changed from ceramic chip to cased mica. All values remain the same. To improve power output and reduce excessive heating around the collectors of the final transistors (710656, 711052).
C69	10u added. To eliminate instability & improve power out (90/01-023).
C70A	100n added. To eliminate instability & improve power out (90/01-023).
C80 & C86	150p deleted. To prevent 800kHz instability (93/03-155).
C102	150p deleted. To prevent 800kHz instability of Q15 & Q16 (95/08-7040 & 96/08-7113).
C130 & C131	150p added. To eliminate instability & improve power out (90/01-023).

Parts List Amendments

D3	Changed from MR750/SR2607 (IPN 001-00011-60) to MR2520L (IPN 001-00012-90) to provide overvoltage transient suppression (750087/88/89/90/91/92).
IC4	LM317L added. To eliminate instability & improve power out (90/01-023).
L18, L35 & L38	Changed from coil 1.5T/8.0mm (052-08180-15) to Inductor Hairpin 10mm Tall (89/10-566).
L21	Changed from coil 1.5T/6.0mm (052-08160-15) to 2.5T/6.0mm (90/01-023).
L27 & L31	Changed from coil 1.5T/6.0mm (052-08160-15) to 2.5T/6.0mm (89/10-566).
R7	(Hi Band) changed from 33e (030-02330-20) to 68e. To ensure adequate drive power on hi band versions (90/08-390).
R11	(Hi Band) changed from 10e (032-32100-00) to 22e. To improve power output from driver stages (90/06-240).
R34 & R35	(Low & Mid Bands) 180e added across base & emitter of Q6. To eliminate instability & improve power out (90/01-023).
R37	1k added. To eliminate instability & improve power out (90/01-023).
R69	10e added. To eliminate instability & improve power out (90/01-023).
R70	220e added. To eliminate instability & improve power out (90/01-023).
R81	1k deleted. To ensure forward power alarm operates under all expected conditions (97/01-0012).
R82 & R84	Changed from 4k7 (036-14470-00) to 2k2. To ensure proper operation of alarm circuits (92/07-501).
R96	Changed from 10k (036-15100-00) to 4k7. To raise limits of reverse power alarm switching point (3/10/89).
R98	Changed from 1k (036-14100-00) to 3k9. To provide adequate setting margin for forward power alarm (89/11-581).
349-00020-36	The two M3x8 Torx screws which secure the module into the rack frame have been replaced by M3x8 Pozidriv screws (IPN 349-00020-55) (750101/2/3/5/6).
356-00010-03	Solder tag fitted under R92 mounting screw and soldered to the PCB earth plane near R1/R2 junction to improve power alarm operation (710384).

Note

LOW = 400-440MHZ
MID = 440-480MHZ
HI = 480-520MHZ

Ref	Var	IPN	Description
BRKT		012-04100-05	CAP F/THRU 1N SUPPR FLTR STUD MTG
CV1		028-02100-06	CAP TRIM 3/10P NPO TOP ADJ BLUE MUR TZ
C2		015-02270-02	CAP CER HIQ 1210 CHIP 27P 5% NPO 200V
C3		015-02270-02	CAP CER HIQ 1210 CHIP 27P 5% NPO 200V
C6		015-03100-02	CAP CER HIQ 1210 CHIP 100P 5% NPO 200V
C7		015-02220-02	CAP CER HIQ 1210 CHIP 22P 5% NPO 200V
CV8		028-02200-01	CAP TRIM 4/20P N750 TOP ADJ RED MUR TZ
*C11	LOW		NOT FITTED
*C11	MID		NOT FITTED
*C11	HI	015-02100-02	CAP CER HIQ 1210 CHIP 10P 5% NPO 200V
*C12	LOW		NOT FITTED
*C12	MID		NOT FITTED
*C12	HI	015-02100-02	CAP CER HIQ 1210 CHIP 10P 5% NPO 200V
C15		015-03100-02	CAP CER HIQ 1210 CHIP 100P 5% NPO 200V
C16		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C17		020-07470-04	CAP ELECT RADL 4M7 25V 20% 8X13MM SOLID
C18		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C19		020-07470-04	CAP ELECT RADL 4M7 25V 20% 8X13MM SOLID
C20		015-03100-02	CAP CER HIQ 1210 CHIP 100P 5% NPO 200V
*C22	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C22	MID	029-02220-02	CAP MICA 5MM CASE 22P 5%
*C22	HI	029-02220-02	CAP MICA 5MM CASE 22P 5%
*C23	LOW	029-02270-02	CAP MICA 5MM CASE 27P 5%
*C23	MID	029-02180-02	CAP MICA 5MM CASE 18P 5%
*C23	HI	029-02180-02	CAP MICA 5MM CASE 18P 5%
*C24	LOW	029-02220-02	CAP MICA 5MM CASE 22P 5%
*C24	MID	029-02180-02	CAP MICA 5MM CASE 18P 5%
*C24	HI	029-02180-02	CAP MICA 5MM CASE 18P 5%
*C27	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C27	MID	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C27	HI	029-02270-02	CAP MICA 5MM CASE 27P 5%
*C28	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C28	MID	029-02270-02	CAP MICA 5MM CASE 27P 5%
*C28	HI	029-02270-02	CAP MICA 5MM CASE 27P 5%
C29		029-03100-02	CAP MICA 5MM CASE 100P 5%
CV32		028-02100-03	CAP TRIM 2/10P JOHNSON 187-0106-175
*C33	LOW	015-01560-02	CAP CER HIQ 1210 CHIP 5P6 5% NPO 200V
*C33	MID		NOT FITTED
*C33	HI		NOT FITTED
CV34		028-02100-03	CAP TRIM 2/10P JOHNSON 187-0106-175
CV35		028-02100-03	CAP TRIM 2/10P JOHNSON 187-0106-175
*C36	LOW	029-02390-02	CAP MICA 5MM CASE 39P 5%
*C36	MID	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C36	HI	029-02270-02	CAP MICA 5MM CASE 27P 5%
C37		029-02330-02	CAP MICA 5MM CASE 33P 5%
*C40	LOW	029-02390-02	CAP MICA 5MM CASE 39P 5%
*C40	MID	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C40	HI	029-02270-02	CAP MICA 5MM CASE 27P 5%
C41		029-02330-02	CAP MICA 5MM CASE 33P 5%
*C42	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C42	MID	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C42	HI	029-02270-02	CAP MICA 5MM CASE 27P 5%
*C43	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C43	MID	029-02270-02	CAP MICA 5MM CASE 27P 5%
*C43	HI	029-02270-02	CAP MICA 5MM CASE 27P 5%
C45		015-03100-02	CAP CER HIQ 1210 CHIP 100P 5% NPO 200V
C46		015-03100-02	CAP CER HIQ 1210 CHIP 100P 5% NPO 200V
*C47	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C47	MID	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C47	HI	029-02270-02	CAP MICA 5MM CASE 27P 5%
*C49	LOW	029-02330-02	CAP MICA 5MM CASE 33P 5%
*C49	MID	029-02270-02	CAP MICA 5MM CASE 27P 5%
*C49	HI	029-02270-02	CAP MICA 5MM CASE 27P 5%
C50		029-03100-02	CAP MICA 5MM CASE 100P 5%
CV51		028-02100-03	CAP TRIM 2/10P JOHNSON 187-0106-175
*C52	LOW	015-01560-02	CAP CER HIQ 1210 CHIP 5P6 5% NPO 200V
*C52	MID		NOT FITTED
*C52	HI		NOT FITTED
C54		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C55		020-07470-04	CAP ELECT RADL 4M7 25V 20% 8X13MM SOLID
C56		029-03100-02	CAP MICA 5MM CASE 100P 5%
CV57		028-02100-03	CAP TRIM 2/10P JOHNSON 187-0106-175
*C58	LOW	015-01560-02	CAP CER HIQ 1210 CHIP 5P6 5% NPO 200V
*C58	MID		NOT FITTED
*C58	HI		NOT FITTED
C60		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C61		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
*C62	LOW	015-01390-02	CAP CER HIQ 1210 CHIP 3P9 5% NPO 200V
*C62	MID	015-01330-02	CAP CER HIQ 1210 CHIP 3P3 5% NPO 200V
*C62	HI	015-01330-02	CAP CER HIQ 1210 CHIP 3P3 5% NPO 200V
*C63	LOW	029-02120-01	CAP MICA 10MM CASE 12P 5%
*C63	MID	029-02100-01	CAP MICA 10MM CASE 10P 10%
*C63	HI	029-02100-01	CAP MICA 10MM CASE 10P 10%
*C65	LOW	029-02120-01	CAP MICA 10MM CASE 12P 5%
*C65	MID	029-02100-01	CAP MICA 10MM CASE 10P 10%
*C65	HI	029-02100-01	CAP MICA 10MM CASE 10P 10%
*C66	LOW	029-01560-02	CAP MICA 5MM CASE 5P6 5%
*C66	MID	029-01470-02	CAP MICA 5MM CASE 4P7 5%
*C66	HI	029-01470-02	CAP MICA 5MM CASE 4P7 5%

Ref	Var	IPN	Description
C67		015-21220-01	CAP CER 0805 CHIP 2P2 +/-0.25P NPO 50V
C68		015-21220-01	CAP CER 0805 CHIP 2P2 +/-0.25P NPO 50V
C69		025-08100-02	CAP TANT BEAD 10M 10% 16V
*C70	LOW	015-21470-01	CAP CER 0805 CHIP 4P7 +/-0.25P NPO 50V
*C70	MID	015-21390-01	CAP CER 0805 CHIP 3P9 +/-0.25P NPO 50V
*C70	HI	015-21390-01	CAP CER 0805 CHIP 3P9 +/-0.25P NPO 50V
C70A		015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C72		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C73		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C76		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C77		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C78		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C81		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C84		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C85		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C87		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C90		015-06100-08	CAP CER 1206 CHIP 100N 10% X7R 50V
C91		025-08100-02	CAP TANT BEAD 10M 10% 16V
C92		015-25100-08	CAP CER 0805 CHIP 10N 10% X7R 50V
C93		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C96		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C97		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C98		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C99		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C100		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C101		015-25100-08	CAP CER 0805 CHIP 10N 10% X7R 50V
C102		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C103		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C104		015-24470-08	CAP CER 0805 CHIP 4N7 10% X7R 50V
C105		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C106		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C108		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C109		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C110		015-01680-02	CAP CER HIQ 1210 CHIP 6P8 5% NPO 200V
C111		015-01560-02	CAP CER HIQ 1210 CHIP 5P6 5% NPO 200V
C112		015-01820-06	CAP CER 1210 CHIP 8P2 NPO 500V GRM42-2
C113		015-01820-06	CAP CER 1210 CHIP 8P2 NPO 500V GRM42-2
C114		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C115		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C116		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C117		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C118		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C119		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C120		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C121		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C122		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C123		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C124		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C125		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C126		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C127		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C128		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C129		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C130		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
C131		015-23150-01	CAP CER 0805 CHIP 150P 5% NPO 50V
D1		001-00013-45	(S) DIODE SCHOTTKY 1SS97/2
D2		001-00013-45	(S) DIODE SCHOTTKY 1SS97/2
D3		001-00011-60	(S) DIODE SR2607 6A/30V
D5		008-00013-32	(S) LED 3MM RED LO CURRENT NO MTG
D6		001-10000-70	(S) DIODE SMD BAV70 DUAL SW SOT-23 COM CA
D10		008-00013-35	(S) LED 3MM GREEN LO CURRENT NO MTG
D11		008-00013-32	(S) LED 3MM RED LO CURRENT NO MTG
D13		001-10000-70	(S) DIODE SMD BAV70 DUAL SWSOT-23 COM CA
D17		001-10000-70	(S) DIODE SMD BAV70 DUAL SW SOT-23 COM CA
IC1		002-10003-24	(S) IC SMD 324 QUAD OP AMP SO14
IC2		002-00014-62	(S) IC 317L 100MA REG 3 TERMINAL TO-92
IC3		002-10003-24	(S) IC SMD 324 QUAD OP AMP SO14
IC4		002-00014-62	(S) IC 317L 100MA REG 3 TERMINAL TO-92
L1		052-08330-10	COIL A/W 1T/3.0MM SMD 0.8MM WIRE
L2		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L3		065-00010-04	BEAD FERRITE F8 4X2X5MM
L5		065-00010-04	BEAD FERRITE F8 4X2X5MM
L6		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L7		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L8		065-00010-04	BEAD FERRITE F8 4X2X5MM
L11		065-00010-04	BEAD FERRITE F8 4X2X5MM
L12		065-00010-04	BEAD FERRITE F8 4X2X5MM
L13		052-08160-15	COIL A/W 1.5T/6.0MM HOR 0.8MM WIRE
L14		051-00005-45	COIL IND 18MM FORMED COPPER STRIP
L15		051-00005-45	COIL IND 18MM FORMED COPPER STRIP
L16		065-00010-04	BEAD FERRITE F8 4X2X5MM
L17		065-00010-04	BEAD FERRITE F8 4X2X5MM
L18		051-00005-60	IND HAIRPIN 10MM TALL T859
L19		051-00005-39	COUPLER WIRELINE TAIT COIL DWG NO 539
L20		052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM WIRE
L21		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L22		065-00010-04	BEAD FERRITE F8 4X2X5MM
L23		051-00005-45	COIL IND 18MM FORMED COPPER STRIP
L24		052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM WIRE
L25		052-08130-15	COIL A/W 1.5T/3.0MM HOR 0.8MM WIRE
L26		052-08130-15	COIL A/W 1.5T/3.0MM HOR 0.8MM WIRE
L27		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L28		065-00010-04	BEAD FERRITE F8 4X2X5MM
L31		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L32		065-00010-04	BEAD FERRITE F8 4X2X5MM

Ref	Var	IPN	Description
L35		051-00005-60	IND HAIRPIN 10MM TALL T859
L36		065-00010-04	BEAD FERRITE F8 4X2X5MM
L37		065-00010-04	BEAD FERRITE F8 4X2X5MM
L38		051-00005-60	IND HAIRPIN 10MM TALL T859
L39		051-00005-54	COUPLER WIRELINE TAIT COIL DWG NO 554
L41		056-00021-04	IND FXD 330NH AXIAL
*L42	LOW	052-08340-10	COIL A/W 1T/4.0MM SMD 0.8MM WIRE
*L42	MID	052-08330-10	COIL A/W 1T/3.0MM SMD 0.8MM WIRE
*L42	HI	052-08330-10	COIL A/W 1T/3.0MM SMD 0.8MM WIRE
L43		052-08335-10	COIL A/W 1T/3.5MM SMD 0.8MM WIRE
*L45	LOW	052-08345-20	COIL A/W 2T/4.5MM SMD 0.8MM WIRE
*L45	MID	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM WIRE
*L45	HI	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM WIRE
*L46	LOW	052-08345-20	COIL A/W 2T/4.5MM SMD 0.8MM WIRE
*L46	MID	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM WIRE
*L46	HI	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM WIRE
*L47	LOW	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM WIRE
*L47	MID	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM WIRE
*L47	HI	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM WIRE
L49		056-00021-04	IND FXD 330NH AXIAL
L51		056-00021-04	IND FXD 330NH AXIAL
L52		051-00005-53	COIL TAIT NO 553 A/W 10MM LINK T858/9
Q1		000-00022-71	(S) XSTR SD1135 NPN STUD MTG UHF PWR 5W
Q3		000-00032-79	(S) XSTR MRF654 UHF PWR 15W STUD
Q4		000-00032-67	(S) XSTR MRF648 UHF PWR 60W 6LFL
Q6		000-00032-67	(S) XSTR MRF648 UHF PWR 60W 6LFL
Q7		000-00032-67	(S) XSTR MRF648 UHF PWR 60W 6LFL
Q10		000-00020-70	(S) XSTR BS170 JFET TO-92 SMALL SIG
Q11		000-10008-17	(S) XSTR SMD BC817-25 NPN SOT-23 AF LO PWR
Q12		000-00020-70	(S) XSTR BS170 JFET TO-92 SMALL SIG
Q13		000-10008-17	(S) XSTR SMD BC817-25 NPN SOT-23 AF LO PWR
Q15		000-10008-17	(S) XSTR SMD BC817-25 NPN SOT-23 AF LO PWR
Q16		000-00030-95	(S) XSTR 2N6107 PNP TO-220 AF PWR
Q17		000-10008-57	(S) XSTR SMD BCW70/BC857-215 PNP SOT23 AF
Q18		000-00011-70	(S) XSTR BD136 PNP AF PWR TO126
Q19		000-10008-57	(S) XSTR SMD BCW70/BC857-215 PNP SOT23 AF
Q20		000-10008-17	(S) XSTR SMD BC817-25 NPN SOT-23 AF LO PWR
Q21		000-10008-17	(S) XSTR SMD BC817-25 NPN SOT-23 AF LO PWR
R1		030-53470-20	RES FILM AI 470E 5% 0.4W 4X1.6MM
R2		030-02120-20	RES FILM 12E 5% 0.4W 4X1.6MM
R3		030-53470-20	RES FILM AI 470E 5% 0.4W 4X1.6MM
*R7	LOW	030-52330-20	RES FILM AI 33E 5% 0.4W 4X1.6MM
*R7	MID	030-52330-20	RES FILM AI 33E 5% 0.4W 4X1.6MM
*R7	HI	030-52680-20	RES FILM AI 68E 5% 0.4W 4X1.6MM
R8		032-33100-00	RES M/F PWR 100E 5% 1W 10X4MM
*R11	LOW	032-32100-00	RES M/F PWR 10E 5% 1W 10X4MM
*R11	MID	032-32100-00	RES M/F PWR 10E 5% 1W 10X4MM
*R11	HI	032-32220-00	RES M/F PWR 22E 5% 1W 12X4.5MM
R30		030-53100-20	RES FILM AI 100E 5% 0.4W 4X1.6MM
R31		030-53100-20	RES FILM AI 100E 5% 0.4W 4X1.6MM
R32		030-02820-20	RES FILM 82E 5% 0.4W 4X1.6MM
R33		030-02820-20	RES FILM 82E 5% 0.4W 4X1.6MM
*R34	LOW	032-33180-01	RES M/F PWR 180E 5% 2.5W 17X5MM
*R34	MID	032-33180-01	RES M/F PWR 180E 5% 2.5W 17X5MM
*R34	HI		NOT FITTED
*R35	LOW	032-33180-01	RES M/F PWR 180E 5% 2.5W 17X5MM
*R35	MID	032-33180-01	RES M/F PWR 180E 5% 2.5W 17X5MM
*R35	HI		NOT FITTED
R36		036-13680-00	RES M/F 0805 CHIP 680E 5%
R37		036-14100-00	RES M/F 0805 CHIP 1K 5%
R38		036-17100-00	RES M/F 0805 CHIP 1M 5%
R42		036-15100-00	RES M/F 0805 CHIP 10K 5%
RV43		042-05470-09	RES PRESET 50K CERMET 9.5MM SQ FLAT
R44		036-14470-00	RES M/F 0805 CHIP 4K7 5%
R47		036-16100-00	RES M/F 0805 CHIP 100K 5%
RV48		042-04500-08	RES PRESET 5K CERMET 9.5MM SQ FLAT
R49		036-13680-00	RES M/F 0805 CHIP 680E 5%
R50		036-13680-00	RES M/F 0805 CHIP 680E 5%
RV52		042-04500-08	RES PRESET 5K CERMET 9.5MM SQ FLAT
R55		036-17100-00	RES M/F 0805 CHIP 1M 5%
R56		036-15100-00	RES M/F 0805 CHIP 10K 5%
RV57		042-05470-09	RES PRESET 50K CERMET 9.5MM SQ FLAT
R58		036-14470-00	RES M/F 0805 CHIP 4K7 5%
R61		036-13220-00	RES M/F 0805 CHIP 220E 5%
R62		036-14100-00	RES M/F 0805 CHIP 1K 5%
*RV63	LOW	044-04200-03	RES PRESET MULTITURN 2K 10T PNL MTG
*RV63	MID	044-04200-03	RES PRESET MULTITURN 2K 10T PNL MTG
*RV63	HI	044-04200-03	RES PRESET MULTITURN 2K 10T PNL MTG
R64		036-14470-00	RES M/F 0805 CHIP 4K7 5%
R67		036-15100-00	RES M/F 0805 CHIP 10K 5%
R68		036-14470-00	RES M/F 0805 CHIP 4K7 5%
R69		036-12100-00	RES M/F 0805 CHIP 10E 5%
RV69		042-04220-02	RES PRESET 2K CERMET 9.5MM SQ FLAT
R70		036-13220-00	RES M/F 0805 CHIP 220E 5%
R72		045-04470-01	RES NTC 4K7 20% 5MM DISC
R73		036-16220-00	RES M/F 0805 CHIP 220K 5%
RV74		042-05100-10	RES PRESET 10K CERMET 9.5MM SQ FLAT
R77		036-14220-00	RES M/F 0805 CHIP 2K2 5%
R78		036-14100-00	RES M/F 0805 CHIP 1K 5%
R80		036-13100-00	RES M/F 0805 CHIP 100E 5%
R81		036-14100-00	RES M/F 0805 CHIP 1K 5%
R82		036-14220-00	RES M/F 0805 CHIP 2K2 5%
R83		036-14100-00	RES M/F 0805 CHIP 1K 5%
R84		036-14220-00	RES M/F 0805 CHIP 2K2 5%
R85		036-14100-00	RES M/F 0805 CHIP 1K 5%
R86		036-14100-00	RES M/F 0805 CHIP 1K 5%
R87		036-15100-00	RES M/F 0805 CHIP 10K 5%
R88		036-15100-00	RES M/F 0805 CHIP 10K 5%
R89		039-02500-01	DUMMY LOAD 50E 1% 10W TO-220 NIKKOHM
R90		039-02500-01	DUMMY LOAD 50E 1% 10W TO-220 NIKKOHM
R91		039-02500-01	DUMMY LOAD 50E 1% 10W TO-220 NIKKOHM
R92		039-02500-01	DUMMY LOAD 50E 1% 10W TO-220 NIKKOHM
R93		039-02500-01	DUMMY LOAD 50E 1% 10W TO-220 NIKKOHM
R94		039-02500-01	DUMMY LOAD 50E 1% 10W TO-220 NIKKOHM
R95		036-14100-00	RES M/F 0805 CHIP 1K 5%
R96		036-14470-00	RES M/F 0805 CHIP 4K7 5%
R97		036-14100-00	RES M/F 0805 CHIP 1K 5%
R98		036-14390-00	RES M/F 0805 CHIP 3K9 5%
R99		036-14100-00	RES M/F 0805 CHIP 1K 5%
R100		036-14100-00	RES M/F 0805 CHIP 1K 5%
R101		036-12100-00	RES M/F 0805 CHIP 10E 5%
R102		036-16220-00	RES M/F 0805 CHIP 220K 5%
R103		036-15330-00	RES M/F 0805 CHIP 33K 5%
R104		036-15150-00	RES M/F 0805 CHIP 15K 5%
R105		036-16470-00	RES M/F 0805 CHIP 470K 5%
R106		036-15150-00	RES M/F 0805 CHIP 15K 5%
R107		036-14390-00	RES M/F 0805 CHIP 3K9 5%
R108		036-15100-00	RES M/F 0805 CHIP 10K 5%
R109		036-14330-00	RES M/F 0805 CHIP 3K3 5%
R110		036-16100-00	RES M/F 0805 CHIP 100K 5%
R111		036-16220-00	RES M/F 0805 CHIP 220K 5%
R112		036-16220-00	RES M/F 0805 CHIP 220K 5%
R113		036-15270-00	RES M/F 0805 CHIP 27K 5%
R115		036-16470-00	RES M/F 0805 CHIP 470K 5%
R116		045-04470-01	RES NTC 4K7 20% 5MM DISC
R117		036-15150-00	RES M/F 0805 CHIP 15K 5%
R118		036-14390-00	RES M/F 0805 CHIP 3K9 5%
R119		036-14820-00	RES M/F 0805 CHIP 8K2 5%
R120		036-14680-00	RES M/F 0805 CHIP 6K8 5%
R121		036-14100-00	RES M/F 0805 CHIP 1K 5%
R122		036-14100-00	RES M/F 0805 CHIP 1K 5%
R123		036-13470-00	RES M/F 0805 CHIP 470E 5%
R124		036-13220-00	RES M/F 0805 CHIP 220E 5%
SK1		240-02100-44	SKT COAX MINI JACK PCB MTG ANGLED

T859 Mechanical & Miscellaneous Parts (220-01159-01)

IPN	Legend	Description
012-04100-05	30	CAP F/THRU 1N SUPPR FLTR S-MTG
065-00010-20		BEAD FERRITE BALUN 4B1 PHILIPS Placed on DC+ power cables.
070-01001-00	23	D-RANGE 15 WAY COMPL T800
070-02003-00		LED RED COMPL T800 PA “High Rev/Low Fwd Power” LEDs - D11/D5
070-02004-00		LED GREEN COMPL T800 PA “Supply” LED - D10
201-00030-01		WIRE T/C 7/0.2 PVC BROWN Forward power alarm.
201-00030-03		WIRE T/C 7/0.2 PVC ORANGE Reverse power meter.
201-00030-04		WIRE T/C 7/0.2 PVC YEL Reverse power.
201-00030-05		WIRE T/C 7/0.2 PVC GRN Forward power meter.
201-00030-06		WIRE T/C 7/0.2 PVC BLUE Tx-Key.
201-00030-07		WIRE T/C 7/0.2 PVC VIOLET Reverse power alarm.
201-00030-09		WIRE T/C 7/0.2 PVC WHITE Temperature sense.
201-00030-10		WIRE T/C 7/0.2 PVC BLACK Forward power.
201-00050-12		AUTO 152 RED 28/0.3 PVC DC+ from D-range PCB.
201-00050-20		AUTO 152 BLACK 28/0.3 PVC DC- from D-range PCB.
219-02592-00		CABLE ASSY RG223/U N TO BNC Exciter/PA connecting cable.
219-02599-00		CABLE ASSY PA INPUT REAR DRIVE RF input cable/connector assembly.
220-01152-00	2	PCB T858/859 DIRNL COUPLER
220-01159-01	1	PCB T859 100W PA A1C674
240-02100-06	26	SKT COAX N TYPE PNL MTG OP-TER
240-02100-17	27	SKT COAX BNC PNL JAC CRP RG316 Part of 219-02599-00 sub-assembly.
240-06010-15	25	BLOCK LATCHING 15W D RANGE
258-00010-03	31	FAN 12V 119X119X25MM TUBE AX
302-05204-00	29	BRKT A3M2314 F/THRU MTG T859
303-23117-00	44	COVER SIDE COMPL A2M2223
303-50005-00	36	CONTACT A4M2311 SPRING EARTH
308-01007-01	38	HANDLE BASE STATION SERIES II
308-13085-01	4	HSINK DIECAST T858 50W PA
308-13086-00	19	HSINK A3M2271 2MM W/LINE PA
316-06651-00	37	PNL PA NO INP DRV SER II DBL
316-85018-00	27	PIN A4M1397 COAX CONDUCTOR
319-01147-00	3	SHIELD A3M2224 WALL T859 PA
319-01148-00	35	SHIELD A3M2225 LID T859 PA
319-30033-00	13	SPACER A4M1339 UHF PA
345-00040-16	24	SCRW M3X20MM P/POZ ST BZ
349-00020-07	6	SCRW 4-40 X 5/16 P/POZ T/T BLK
349-00020-09	11	SCRW T/T 4-40X3/8 IN P/POZ BLK
349-00020-36	43	LIM)SCREW TT M3X8m PANTORX BLK
349-00020-43	34	SCRW T/T M4X12MM P/POZ BZ
349-00020-49	32	SCRW T/T M4X35MM P/POZ BZ
349-00020-50	21	SCRW T/T 4-40 * 5/8 P/POZ BLK
352-00010-29	40	NUT M4 NYLOC HEX
352-00010-35	15	NUT 8-32 UNC HEX XSTR MTG
353-00010-10	10	WSHR M3 FLAT 7MM*0.6MM ST BZ
353-00010-24	39	WSHR M4x8mm Flat
356-00010-01	18	TAG SOLDER 3MM SHORT M6132/3.2
356-00010-03	5	TAG SOLDER 3MM LONG M614/3.2
357-00010-45	33	CLAMP CABLE 4.8MM P CLIP
360-00010-41	42	BUSH SHORTY BLK
362-00010-07	7	GASKET SIL INSULATING TO-220
362-00010-13	9	BUSH INSULATING 1.1MM TOP HAT
362-00010-33	41	GROMMET LED MTG 3MM
365-00100-20		LABEL WHITE S/A 28X11MM
365-01540-00		LABEL PA TYPE APPL/SERIAL NO
369-00010-14		TIE CABLE NYLON 100*2.6MM
399-00010-51		BAG PLASTIC 75*100MM
400-00020-07		SLEEVING 2MM SIL RUBBER
400-00020-09		SLEEVING 3MM SIL RUBBER
400-00020-30		HEATSHRINK 3MM
410-00010-43		PKG T296 AMPAC REF 73-46

Note

The following electrical components are also included in the mechanical assembly drawing to help identify certain mechanical components.

000-00022-71	14	(S) XSTR SD1135 NPN STUD MTG UHF PWR 5W - Q1
000-00030-95	8	(S) XSTR 2N6107 PNP TO-220 AF PWR - Q16
000-00032-79	16	(S) XSTR MRF654 UHF PWR 15W STUD - Q3
000-00032-67	17	(S) XSTR MRF648 UHF PWR 60W 6LFL Q4, Q6, Q7
039-02500-01	12	DUMMY LOAD 50E 1% 10W TO-220 NIKKOHM - R89/90/91/92/93/94
051-00005-39	20	COUPLER WIRELINE TAIT COIL DWG NO 539 - L19
051-00005-54	22	COUPLER WIRELINE TAIT COIL DWG NO 554 - L39

replace A4 pages D5.3.9/D5.3.10 with A3 pages D5.3.9/D5.3.10

replace A4 pages D5.3.9/D5.3.10 with A3 pages D5.3.9/D5.3.10

T859 Grid Reference Index (IPN 220-01159-01)

How To Use This Grid Reference Index

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

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

Device	PCB	Circuit
CV1	1:Q9	1-E7
C2	1:Q8	1-E7
C3	1:R8	1-E7
C6	1:S8	1-B8
C7	1:Q7	1-C8
CV8	1:R7	1-B7
C15	1:S5	1-B2
C16	1:S5	1-B3
C17	1:S6	1-C3
C18	1:T3	1-C3
C19	1:S2	1-D3
C20	1:S3	1-E3
*C22	1:Q5	1-B2
*C23	1:Q5	1-C2
*C24	1:R5	1-C1
*C27	1:Q3	1-D2
*C28	1:R3	1-E2
C29	1:P3	1-E2
CV32	1:P2	1-E1
*C33	1:P3	1-F1
CV34	1:M4	1-G2
CV35	1:M8	1-G5
*C36	1:L8	1-G5
C37	1:L8	1-H5
*C40	1:L4	1-G1
C41	1:L3	1-H1
*C42	1:K4	1-J1
*C43	1:K3	1-J1
C45	1:K4	1-J3
C46	1:K7	1-J6
*C47	1:K8	1-J5
*C49	1:K8	1-J5
C50	1:H8	1-K5
CV51	1:H8	1-L5
*C52	1:J8	1-K5
C54	1:K6	1-K3
C55	1:K6	1-K3
C56	1:H4	1-L2
CV57	1:H3	1-L1
*C58	1:J3	1-K1
C60	1:E9	1-N5
C61	1:F9	1-N5
*C62	See Note	1-P5
*C63	1:C9	1-P5
*C65	1:C9	1-Q5
*C66	1:B8	1-R5
C67	See Note	1-P4
C68	1:D7	1-Q4
C69	1:W6	2-G1
*C70	1:D6	1-Q4
C70A	See Note	2-J1
C72	1:E6	1-L6
C73	1:F6	1-L6
C76	1:V10	2-B8
C77	1:V10	2-B8
C78	1:U10	2-C7
C80	1:U6	2-H8
C81	1:U2	2-F6
C84	1:V9	2-B4
C85	1:V9	2-B4
C86	1:W6	2-G3
C87	1:T2	2-E2
C90	1:V7	2-C0
C91	1:W8	2-M2
C92	1:U6	2-P2
C93	1:U6	2-N2
C96	1:U5	2-K0
C97	1:J10	1-Q8
C98	1:K10	1-R8
C99	1:U6	2-L0
C100	1:U6	2-N1
C101	1:V3	2-N0
C102	1:U8	2-Q2
C103	1:U8	2-Q1
C104	1:T6	2-R3
C105	1:T9	2-R2
C106	1:T8	2-R1
C108	1:T4	2-J8
C109	1:T4	2-H3
C110	1:E3	1-N3
C111	1:N8	1-F5
C112	1:F3	1-M1
C113	1:D3	1-P1
C114	1:V10	2-A8
C115	1:V9	2-A4
C116	1:V3	2-N1
C117	1:W5	2-P8
C118	1:V4	2-P8
C119	1:U4	2-P7
C120	1:U4	2-P6
C121	1:V4	2-P5
C122	1:V4	2-P5
C123	1:T5	2-Q7
C124	1:U5	2-Q7
C125	1:T5	2-R8
C126	1:U3	2-N6
C127	1:U3	2-M7
C128	1:V3	2-M4
C129	1:U3	2-N5
C130	1:V10	2-C8
C131	1:V9	2-C4
D1	1:F6	1-M6
D2	1:E9	1-N5
D3	1:S3	2-B1
D5	1:W9	2-C8
D6	1:U2	2-G6
D10	1:W10	2-B5
D11	1:W9	2-C5
D13	1:T2	2-E2
D17	1:V3	2-N1
		2-N1
IC1	1:V6	2-E8
		2-D5
		2-P2
		2-L1
		2-G1
IC2	1:V8	2-D0
IC3	1:U4	2-H8
		2-G4
		2-N6
		2-N5
		2-F1
IC4	1:V5	2-H1
L1	1:R9	1-E7
L2	1:P9	1-D7
L3	1:P9	1-D7
L5	1:T8	1-D9
L6	1:R7	1-C8
L7	1:P7	1-B7
L8	1:P8	1-B7
L11	1:S7	1-A4
L12	1:S5	1-A3
L13	1:R5	1-A2
L14	1:Q3	1-E2
L15	1:K8	1-K5
L16	1:S4	1-C3
L17	1:S3	1-D3
L18	1:R3	1-D2
L19	1:N6	1-F3
L20	1:F3	1-M2
L21	1:P5	1-B2
L22	1:P6	1-B1
L23	1:K4	1-K2
L24	1:D3	1-P2
L25	1:M3	1-F1
L26	1:M8	1-F5
L27	1:L9	1-G5
L28	1:M9	1-G5
L31	1:M3	1-G2
L32	1:M2	1-G1
L35	1:J7	1-J6
L36	1:J6	1-J6
L37	1:J5	1-J3
L38	1:J4	1-J2
L39	1:H6	1-L4
L41	1:F9	1-N5
*L42	1:D7	1-P4
L43	1:C7	1-Q4
*L45	1:C8	1-P5
*L46	1:C9	1-Q5
*L47	1:B8	1-Q5
L49	1:F6	1-M6
L51	1:K10	1-Q9
L52	1:C7	1-P4
PL1	1:J5	2-A2
		2-A1
		2-A2
		2-A2
		2-A1
		2-A9
		2-A6
		2-A0
		2-A0
		2-A1
		2-A1
		2-A0
		2-A5
		2-A3
		2-A8
Q1	1:Q8	1-C7
Q3	1:Q6	1-A2
Q4	1:Q4	1-D2
Q6	1:K8	1-H5
Q7	1:K4	1-H2
Q10	1:V10	2-B8
Q11	1:U10	2-C8
Q12	1:V9	2-B5
Q13	1:U9	2-C4
Q15	1:U8	2-Q2
Q16	1:T10	2-R2
Q17	1:T5	2-R7
Q18	1:T5	2-R8
Q19	1:V4	2-P8
Q20	1:U5	2-Q7
Q21	1:V4	2-Q5
R1	1:R10	1-F7
R2	1:R9	1-F7
R3	1:R9	1-F7
R7	1:R9	1-D7
R8	1:S7	1-C8
R11	1:R6	1-A7
R30	1:G9	1-M5
R31	1:E7	1-N6
R32	1:D6	1-Q4
R33	1:D6	1-R4
*R34	See Note	1-G5
*R35	See Note	1-H5
R36	1:W9	2-C7
R37	1:W4	2-K0
R38	1:W5	2-E8
R42	1:V5	2-F8
RV43	1:V1	2-G6
R44	1:U6	2-G6
R47	1:W5	2-F8
RV48	1:W1	2-F8
R49	1:W10	2-B6
R50	1:W8	2-C5
RV52	1:T1	2-F5
R55	1:V6	2-D4
R56	1:V6	2-E4
RV57	1:S1	2-E3
R58	1:U6	2-G5
R61	1:V8	2-E0
R62	1:V8	2-D0
*RV63	1:V6	2-M2
R64	1:U6	2-N2
R67	1:W5	2-K2
R68	1:U5	2-L2
R69	1:V6	2-G1
RV69	1:V2	2-H1
R70	1:V5	2-G1
R72	1:J10	1-Q8
R73	1:U5	2-L0
RV74	1:W2	2-M0
R77	1:V6	2-P3
R78	1:U8	2-Q2

Key

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The upper number is the component identification number which appears in the "Legend" column of the Mechanical & Miscellaneous Parts on the facing page.

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

T859 Mechanical Assembly
220-01159-01

Device	PCB	Circuit
R80	1:U8	2-Q3
R81	1:W5	2-D7
R82	1:V5	2-D8
R83	1:V6	2-C4
R84	1:V6	2-C4
R85	1:T6	2-E3
R86	1:W3	2-G7
R87	1:T3	2-J8
R88	1:T4	2-H3
R89	1:N10	1-E5
R90	1:G1	1-M1
R91	1:F1	1-N1
R92	1:P10	1-D5
R93	1:D1	1-P2
R94	1:C1	1-Q2
R95	1:S1	2-C3
R96	1:U2	2-F5
R97	1:U2	2-D6
R98	1:U3	2-J9
R99	1:T4	2-H4
R100	1:U5	2-L2
R101	1:W8	2-M2
R102	1:U2	2-N8
R103	1:U2	2-N6
R104	1:U4	2-P7
R105	1:U3	2-N7
R106	1:U4	2-P7
R107	1:U4	2-P6
R108	1:W4	2-N8
R109	1:V3	2-P9
R110	1:U3	2-M5
R111	1:U3	2-M4
R112	1:U2	2-M4
R113	1:U3	2-N4
R115	1:V3	2-N5
R116	1:V3	2-M5
R117	1:V3	2-P5
R118	1:V4	2-P4
R119	1:U5	2-Q7
R120	1:U5	2-Q8
R121	1:T5	2-Q8
R122	1:V5	2-M6
R123	1:W7	2-M3
R124	1:W7	2-M2
SK1	1:R10	1-G7

Device	PCB	Circuit

Device	PCB	Circuit

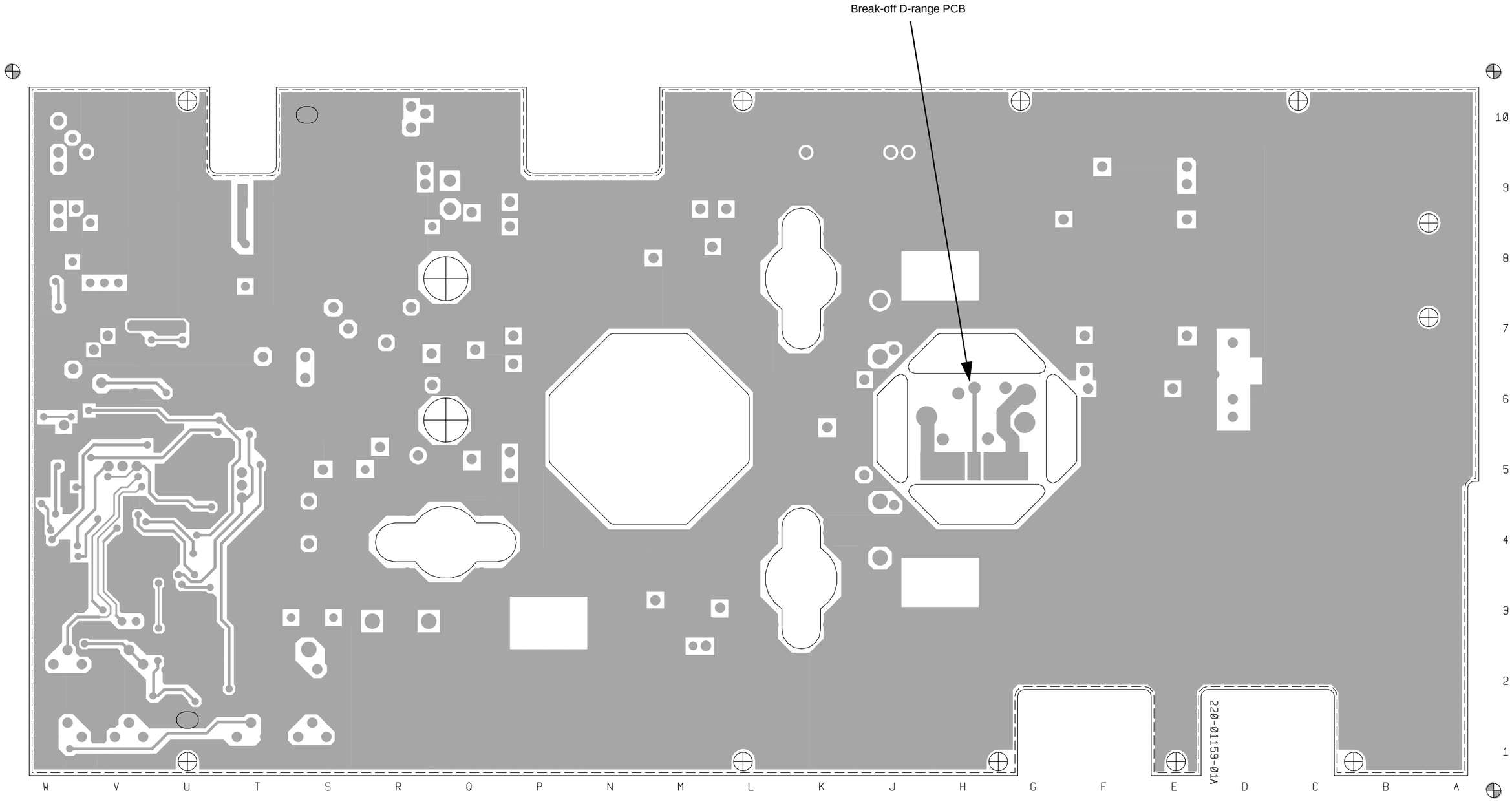
Device	PCB	Circuit

Note:

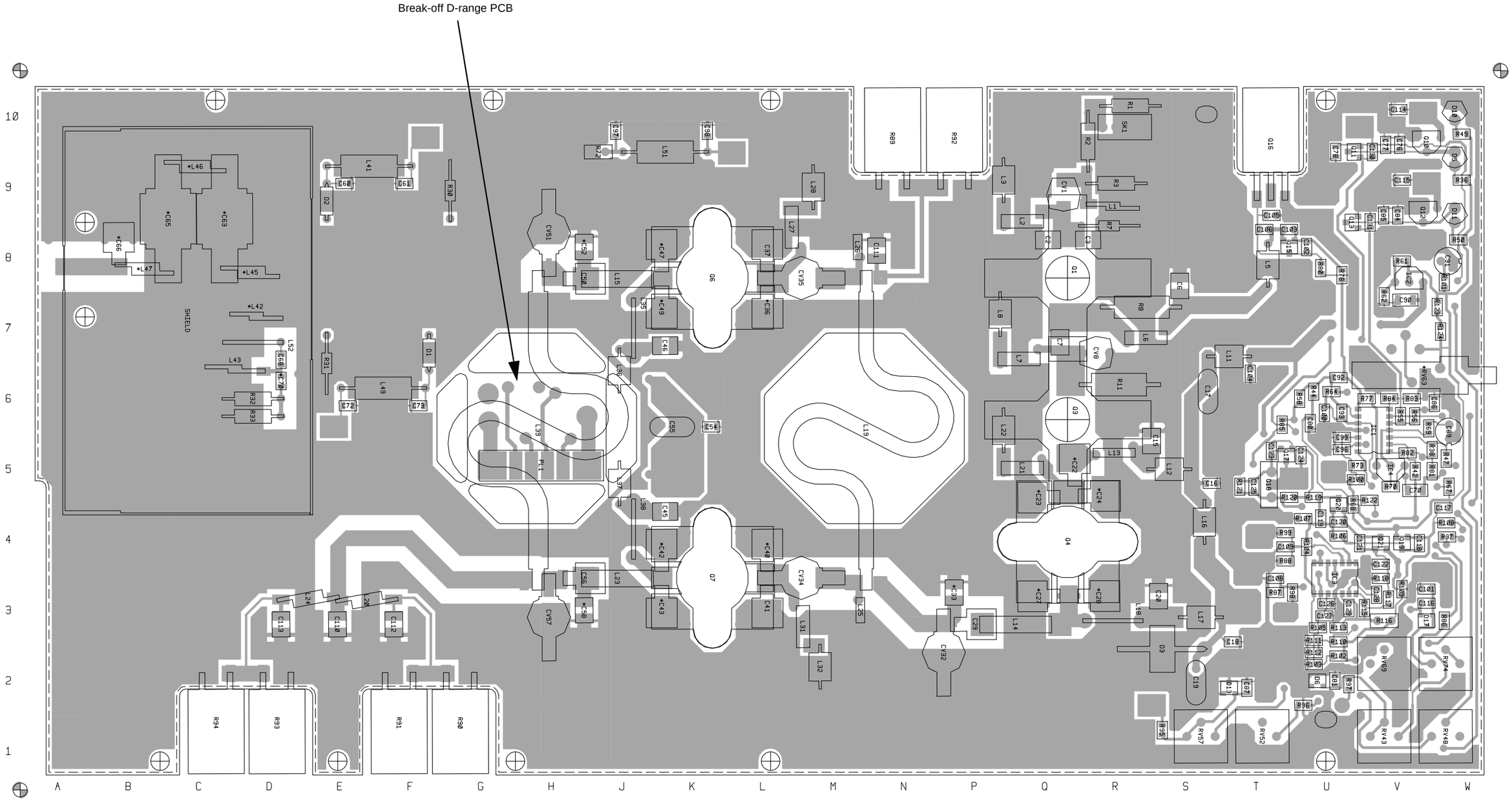
*C62 & C67 are mounted on the Directional Coupler PCB (220-01152-00).

C70A with the grid references of: **PCB** 1:V5 & **Circuit** 2-J1 is incorrectly shown in the artwork as C70.

*R34 & *R35 are mounted across the base and emitter of Q6.

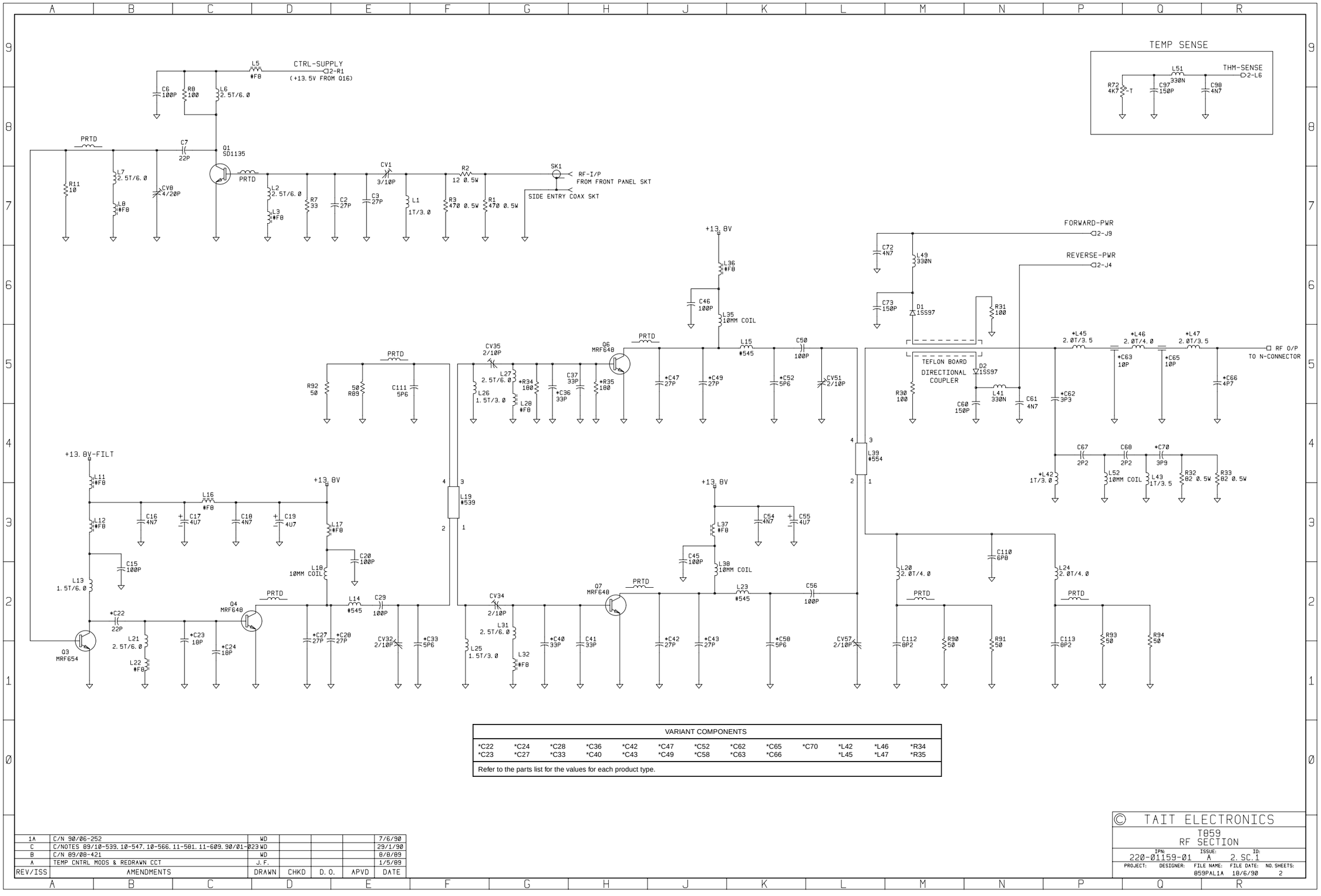


T859 PCB Layout - Bottom Side
220-01159-01



T859 PCB Layout - Top Side
220-01159-01

31/09/98



VARIANT COMPONENTS												
*C22	*C24	*C28	*C36	*C42	*C47	*C52	*C62	*C65	*C70	*L42	*L46	*R34
*C23	*C27	*C33	*C40	*C43	*C49	*C58	*C63	*C66		*L45	*L47	*R35
Refer to the parts list for the values for each product type.												

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
1A	C/N 90/06-252	WD				7/6/90
C	C/NOTES 89/10-539.10-547.10-566.11-581.11-609.90/01-023	WD				29/1/90
B	C/N 89/08-421	WD				8/8/89
A	TEMP CNTRL MODS & REDRAWN CCT	J.F.				1/5/89

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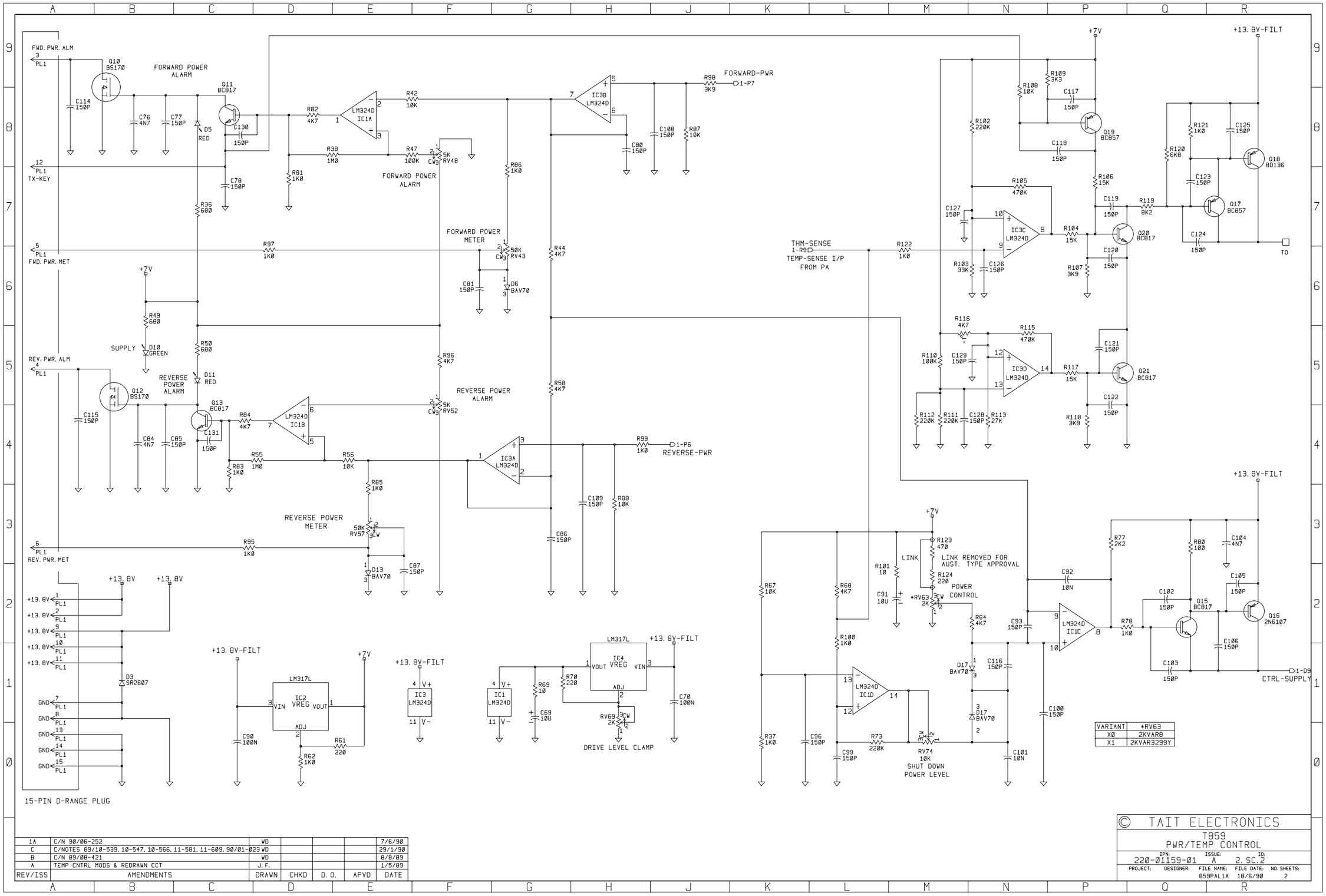
T859
RF SECTION

IPN:	ISSUE:	ID:
220-01159-01	A	2.SC.1

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO. SHEETS:
		859PAL1A	18/6/90	2

Sheet 1 - T859 RF Section
220-01159-01



Sheet 2 - T859 Control Section
220-01159-01

T859 Parts List (IPN 220-01422-03)

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

C142		Changed from 4n7 (IPN 015-24470-08) to 33nF (IPN 015-25330-08) to improve cyclic keying (711105).
C147		Changed from 1nF (IPN 015-24100-08) to 33nF (IPN 015-25330-08) to improve cyclic keying (711104).
C173		Deleted - not required for circuit performance (711141).
#C247, #C273	T859-10-0000:	changed from 15pF (IPN 015-02150-03) to 12pF (IPN 015-02120-03) to reduce the maximum output power and reduce excessive power at the top of the frequency band (711138).
#C256, #C257, #C269, #C270	T859-10-0000:	changed from 39pF (IPN 029-02390-02) to 47pF (IPN 029-02470-02) to reduce the maximum output power and reduce excessive power at the top of the frequency band (711138).
#C257, #C270	T859-30-0000:	changed from 22pF (IPN 029-02220-02) to 33pF (IPN 029-02330-02) to reduce the maximum output power and instabilities across the 480-520MHz frequency band (711140).
	T859-30-0000:	changed from 33pF (IPN 029-02330-02) to 27pF (IPN 029-02270-02) to reduce the maximum output power and instabilities across the 480-520MHz frequency band (711158).
D101		Changed from MR750/SR2607 (IPN 001-00011-60) to MR2520L (IPN 001-00012-90) to provide overvoltage transient suppression (750087/88/89/90/91/92 and 711129).
Resistors Added		Two 4E7 mylar film resistors (IPN 032-31470-01 - no circuit references) were added, one from Q217 base to ground (L247) and the other from Q216 base to ground (L238) to reduce the maximum output power and instabilities across the 400-520MHz frequency band (711158).
R144		Changed from 1k (IPN 036-14100-10) to 18k (IPN 036-15180-00) to improve cyclic keying (711104).
R158		Changed from 22k (IPN 036-15220-00) to 18k (IPN 036-15180-00) to improve cyclic keying (711105).
R168		Changed from 2k7 (IPN 036-14270-10) to 4k7 (IPN 036-14470-10) to reduce the maximum output power and reduce excessive power at the top of the frequency band (711138/39/40). Changed from 4k7 (IPN 036-14470-10) to 5k1 (IPN 036-14510-10) to limit the maximum output power and reduce instabilities (711181/82/83).
R170		Changed from 2k2 (IPN 036-14220-00) to 5k6 (IPN 036-14560-00) to reduce the maximum output power and reduce excessive power at the top of the frequency band (711138/39/40). T859-10-0000: changed from 5k6 (IPN 036-14560-00) to 4k7 (IPN 036-14470-10) T859-30-0000: changed from 5k6 (IPN 036-14560-00) to 5k1 (IPN 036-14510-10) } to limit the maximum output power and reduce instabilities - circuit reference changed to #R170 (711182/83). T859-20-0000: value unchanged; circuit reference changed to #R170
349-00020-36		The two M3x8 Torx screws which secure the module into the rack frame have been replaced by M3x8 Pozidriv screws (IPN 349-00020-55) (750101/2/3/5/6).

Parts List Amendments - Continued

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

Ref	Var	IPN	Description
C100		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C101		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C102		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C103		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C104		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C105		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C107		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C108		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C109		014-07100-02	CAP TANT CHIP 1U0 3.2 X 1.6MM
C110		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C111		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C112		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C113		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C114		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C115		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C116		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C117		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C119		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C120		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C121		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C122		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C123		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C124		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C125		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C126		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C127		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C128		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C129		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C130		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C131		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C132		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C133		015-06100-08	CAP CER 1206 100N 10% X7R 50V
%C134		014-18220-02	L)CAP TANT SMD 22U 20% 35V
C136		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C137		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C138		015-25220-08	CAP CER 0805 22N 10% X7R 50V
C139		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C140		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C141		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C142		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C143		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C144		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C145		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C146		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C147		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C148		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C149		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C150		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C151		015-27100-10	CAP CER 0805 1M+80-20% Y5V 16V
C152		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C153		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C154		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C156		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C157		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C158		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C159		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C161		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C162		014-18220-02	L)CAP TANT SMD 22U 20% 35V
C163		014-18220-02	L)CAP TANT SMD 22U 20% 35V
C164		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C166		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C167		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C168		014-08100-00	CAP TANT CHIP 10M 16VW +-20%
C169		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C172		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C173		014-07100-02	CAP TANT CHIP 1U0 3.2 X 1.6MM
C174		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C175		015-26100-08	CAP CER 0805 100N 10% X7R 50V
C176		014-07470-03	L) CAP TANT SMD 4U7 35V 20%
C177		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C178		015-22470-01	CAP CER 0805 47P 5% NPO 50V
C197		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C198		015-25100-08	CAP CER 0805 10N 10% X7R 50V
C200		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C201		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C202		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C203		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C204		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C205		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C206		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C207		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C208		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C209		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C210		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C211		015-24100-08	CAP CER 0805 1N 10% X7R 50V
C214		015-23680-08	CAP CER 0805 680P 10% X7R 50V
C215		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C218		015-03100-06	CAP CER 1210 100P NPO500VGRM42
C219		014-07470-04	CAP TANT SMD 4U7 50V 20%
C220		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C221		015-03100-03	CAP CER 100P 5% 500VHIQ GRH111
C222		015-03100-03	CAP CER 100P 5% 500VHIQ GRH111
C223		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C224		014-07470-04	CAP TANT SMD 4U7 50V 20%
C225		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C226		015-03100-03	CAP CER 100P 5% 500VHIQ GRH111
C227		015-23100-01	CAP CER 0805 100P 5% NPO 50V
C228		015-03100-02	CAP CER HIQ1210 100P 5%NPO200V
#C247	10	015-02150-03	CAP CER 15P 5% 500V HIQ GRH111
#C247	20	015-02120-03	CAP CER 12P 5% 500V HIQ GRH111
#C247	30	015-02120-03	CAP CER 12P 5% 500V HIQ GRH111
C249		015-02150-03	CAP CER 15P 5% 500V HIQ GRH111
C250		015-03100-03	CAP CER 100P 5% 500VHIQ GRH111
#C252	10	029-02560-02	CAP MICA 5 CASE 56P 5%
#C252	20	029-02560-02	CAP MICA 5 CASE 56P 5%
#C252	30	029-02470-02	CAP MICA 5 CASE 47P 5%
#C253	10	029-02560-02	CAP MICA 5 CASE 56P 5%
#C253	20	029-02560-02	CAP MICA 5 CASE 56P 5%
#C253	30	029-02470-02	CAP MICA 5 CASE 47P 5%
C254		029-02150-02	CAP MICA 5 CASE 15P 5%
#C256	10	029-02390-02	CAP MICA 5 CASE 39P 5%
#C256	20	029-02330-02	CAP MICA 5 CASE 33P 5%
#C256	30	029-02220-02	CAP MICA 5 CASE 22P 5%
#C257	10	029-02390-02	CAP MICA 5 CASE 39P 5%
#C257	20	029-02330-02	CAP MICA 5 CASE 33P 5%
#C257	30	029-02220-02	CAP MICA 5 CASE 22P 5%
C258		015-03100-02	CAP CER HIQ1210 100P 5%NPO200V
C259		015-06100-08	CAP CER 1206 100N 10% X7R 50V
C260		014-07470-04	CAP TANT SMD 4U7 50V 20%
C261		015-03100-02	CAP CER HIQ1210 100P 5%NPO200V
C262		015-03100-03	CAP CER 100P 5% 500VHIQ GRH111
C263		029-02150-02	CAP MICA 5 CASE 15P 5%
#C264	10	029-02560-02	CAP MICA 5 CASE 56P 5%
#C264	20	029-02560-02	CAP MICA 5 CASE 56P 5%
#C264	30	029-02470-02	CAP MICA 5 CASE 47P 5%
#C265	10	029-02560-02	CAP MICA 5 CASE 56P 5%
#C265	20	029-02560-02	CAP MICA 5 CASE 56P 5%
#C265	30	029-02470-02	CAP MICA 5 CASE 47P 5%
C268		015-02150-03	CAP CER 15P 5% 500V HIQ GRH111
#C269	10	029-02390-02	CAP MICA 5 CASE 39P 5%
#C269	20	029-02330-02	CAP MICA 5 CASE 33P 5%
#C269	30	029-02220-02	CAP MICA 5 CASE 22P 5%
#C270	10	029-02390-02	CAP MICA 5 CASE 39P 5%
#C270	20	029-02330-02	CAP MICA 5 CASE 33P 5%
#C270	30	029-02220-02	CAP MICA 5 CASE 22P 5%
C272		014-07470-04	CAP TANT SMD 4U7 50V 20%
#C273	10	015-02150-03	CAP CER 15P 5% 500V HIQ GRH111
#C273	20	015-02120-03	CAP CER 12P 5% 500V HIQ GRH111
#C273	30	015-02120-03	CAP CER 12P 5% 500V HIQ GRH111
C274		015-03100-03	CAP CER 100P 5% 500VHIQ GRH111
C275		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C276		015-23150-01	CAP CER 0805 150P 5% NPO 50V
#C277	10	029-02120-01	CAP MICA 10 CASE 12P 5%
#C277	20	029-02100-01	CAP MICA 10 CASE 10P 10%
#C277	30	029-02100-01	CAP MICA 10 CASE 10P 10%
#C278	10	029-02120-01	CAP MICA 10 CASE 12P 5%
#C278	20	029-02100-01	CAP MICA 10 CASE 10P 10%
#C278	30	029-02100-01	CAP MICA 10 CASE 10P 10%
#C280	10	029-01560-02	CAP MICA 5 CASE 5P6 5%
#C280	20	029-01470-02	CAP MICA 5 CASE 4P7 5%
#C280	30	029-01470-02	CAP MICA 5 CASE 4P7 5%
C282		015-21220-01	CAP CER 0805 2P2+-1/4P NPO 50V
#C283	10	015-21470-01	CAP CER 0805 4P7+-1/4P NPO 50V
#C283	20	015-21390-01	CAP CER 0805 3P9+-1/4P NPO 50V
#C283	30	015-21390-01	CAP CER 0805 3P9+-1/4P NPO 50V
C284		015-23150-01	CAP CER 0805 150P 5% NPO 50V
#C285	10	015-21390-01	CAP CER 0805 3P9+-1/4P NPO 50V
#C285	20	015-21330-01	CAP CER 0805 3P3+-1/4P NPO 50V
#C285	30	015-21330-01	CAP CER 0805 3P3+-1/4P NPO 50V
C286		015-21220-01	CAP CER 0805 2P2+-1/4P NPO 50V
C287		015-24470-08	CAP CER 0805 4N7 10% X7R 50V
C293		029-03100-02	CAP MICA 5 CASE 100P 5%
D101		001-00011-60	S) DIODE MR750 OR SR2607
D105		001-10000-70	S) DIODE SMD BAV70 D-SW SOT23
D110		001-10000-70	S) DIODE SMD BAV70 D-SW SOT23
D112		008-00014-79	S)LED 3MM RED WITH WIRE
D114		008-00014-79	S)LED 3MM RED WITH WIRE
D115		001-10000-70	S) DIODE SMD BAV70 D-SW SOT23
D120		001-10000-70	S) DIODE SMD BAV70 D-SW SOT23
D190		008-00014-80	S)LED 3MM GREEN WITH WIRE
D205		001-10066-00	DIODE SCHOTTKY HSMS2815
D206		001-10066-00	DIODE SCHOTTKY HSMS2815
IC100		002-10003-24	S) IC SMD 324 4X O-AMP SO14
IC105		002-10003-24	S) IC SMD 324 4X O-AMP SO14
IC110		002-10006-62	S)IC SMD LMC662CM 2X O-AMP
IC130		002-10003-17	(S) IC LM317L REG S0-8 100MA
IC140		002-12951-00	IC SMD LP2951CM ADJ VLTGE REG
IC200		002-10003-58	S) IC SMD LM358 DUAL O-AMP
#IC210	10	004-00687-62	MODULE M68762L 400-450MHZ 30W
#IC210	20	004-00687-61	MODULE M68762H 440-490MHZ 30W
#IC210	30	004-00687-63	MODULE M68762SH 470-520MHZ 30W
L120		065-10004-20	BEAD FE SMD CBD 4.6/3/3-4S2
L161		065-10004-20	BEAD FE SMD CBD 4.6/3/3-4S2
L162		065-10004-20	BEAD FE SMD CBD 4.6/3/3-4S2
L200		056-10330-02	(L) IND SMD 330NH
L201		056-10330-02	(L) IND SMD 330NH
L202		056-10330-02	(L) IND SMD 330NH
L203		056-10330-02	(L) IND SMD 330NH
L208		065-10004-20	BEAD FE SMD CBD 4.6/3/3-4S2
L209		052-08340-40	COIL A/W 4T/4.0MM SMD 0.8MM
L210		052-08340-40	COIL A/W 4T/4.0MM SMD 0.8MM
L211		065-10004-20	BEAD FE SMD CBD 4.6/3/3-4S2
L212		052-08340-40	COIL A/W 4T/4.0MM SMD 0.8MM

Ref	Var	IPN	Description
%L213		056-10330-02	(L) IND SMD 330NH
L235		051-00005-60	IND HAIRPIN 10MM TALL T859
L237		052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM
L238		065-10009-20	BEAD FER SMD BDS 3/3/8.9-4S2
L239		052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM
L240		051-00649-10	HYBRID COUPLER 0.4-1G 100W 3DB
L241		051-00649-10	HYBRID COUPLER 0.4-1G 100W 3DB
L242		052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM
L243		051-00005-60	IND HAIRPIN 10MM TALL T859
L246		052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM
L247		065-10009-20	BEAD FER SMD BDS 3/3/8.9-4S2
L253		056-10330-02	(L) IND SMD 330NH
#L254	10	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM
#L254	20	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM
#L254	30	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM
#L255	10	052-08345-20	COIL A/W 2T/4.5MM SMD 0.8MM
#L255	20	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM
#L255	30	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM
#L256	10	052-08340-20	COIL A/W 2T/4.0MM SMD 0.8MM
#L256	20	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM
#L256	30	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM
L257		056-10330-02	(L) IND SMD 330NH
#L258	10	052-08325-10	COIL A/W 1T/2.5MM SMD 0.8MM
#L258	20	052-08320-10	COIL A/W 1T/2.0MM SMD 0.8MM
#L258	30	052-08320-10	COIL A/W 1T/2.0MM SMD 0.8MM
L259		052-08320-10	COIL A/W 1T/2.0MM SMD 0.8MM
L260		052-08335-10	COIL A/W 1T/3.5MM SMD 0.8MM
LINK200		051-00640-02	LNK 65.5 COP STPL C/W SLCN SLV
P200		356-00010-26	PIN TRACK HARWIN FOR 1.6MM PCB
P201		356-00010-26	PIN TRACK HARWIN FOR 1.6MM PCB
P250		356-00010-26	PIN TRACK HARWIN FOR 1.6MM PCB
P260		356-00010-26	PIN TRACK HARWIN FOR 1.6MM PCB
P270		356-00010-26	PIN TRACK HARWIN FOR 1.6MM PCB
PL101		070-01001-00	D-RANGE 15 WAY COMPL T800
PL110		240-00021-03	LIM) HEADER 2X7 WAY SMD
Q100		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
Q101		000-10017-00	LS) XSTR SMD BF170LT1 SOT23
Q102		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
Q103		000-10017-00	LS) XSTR SMD BF170LT1 SOT23
Q110		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q111		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
Q112		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
Q113		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q114		000-10008-69	S) XSTR SMD BC869 PNP 1W SOT89
Q120		000-10008-48	S) XSTR SMD BCW60 NPN SOT23 SS
Q121		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q122		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
Q123		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q124		000-10008-17	S) XSTR SMD BC817-25 NPN SOT23
Q125		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q126		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q127		000-10008-48	S) XSTR SMD BCW60 NPN SOT23 SS
Q128		000-00030-95	S) XSTR 2N6107 PNP TO220 AF
Q129		000-10008-57	S) XSTR SMD BCW70 PNP SOT23 SS
Q135		000-10008-48	S) XSTR SMD BCW60 NPN SOT23 SS
Q200		000-10008-48	S) XSTR SMD BCW60 NPN SOT23 SS
Q216		000-00031-02	S)XSTR 2SC3102 UHF 60W 6LFL
Q217		000-00031-02	S)XSTR 2SC3102 UHF 60W 6LFL
R100		036-14820-10	RES M/F 0805 8K2 1%
R101		036-13470-00	RES M/F 0805 470E 5%
R102		036-14100-10	RES M/F 0805 1K 1%
R103		036-15100-10	RES M/F 0805 10K 1%
R104		036-15100-10	RES M/F 0805 10K 1%
R105		036-14100-10	RES M/F 0805 1K 1%
R106		036-14680-10	RES M/F 0805 6K8 1%
R107		036-14470-10	RES M/F 0805 4K7 1%
R109		036-14100-10	RES M/F 0805 1K 1%
R111		036-14100-10	RES M/F 0805 1K 1%
R112		036-15100-10	RES M/F 0805 10K 1%
R113		036-14100-10	RES M/F 0805 1K 1%
R114		036-14470-10	RES M/F 0805 4K7 1%
R115		036-17100-10	RES M/F 0805 1M 1%
R116		036-14100-10	RES M/F 0805 1K 1%
R117		036-14220-00	RES M/F 0805 2K2 5%
R118		036-16100-10	RES M/F 0805 100K 1%
R119		036-15100-10	RES M/F 0805 10K 1%
R120		036-13680-00	RES M/F 0805 680E 5%
R121		036-17100-10	RES M/F 0805 1M 1%
R122		036-14220-00	RES M/F 0805 2K2 5%
R123		036-14100-10	RES M/F 0805 1K 1%
R124		036-13680-00	RES M/F 0805 680E 5%
R125		036-16100-10	RES M/F 0805 100K 1%
R126		036-16220-00	RES M/F 0805 220K 5%
R127		045-04470-00	RES NTC SMD 4K7 5% 20MW
R128		036-16220-00	RES M/F 0805 220K 5%
R129		036-15100-10	RES M/F 0805 10K 1%
R130		036-16220-00	RES M/F 0805 220K 5%
R131		036-15330-10	RES M/F 0805 33K 1%
R132		036-14100-10	RES M/F 0805 1K 1%
R133		036-15270-10	RES M/F 0805 27K 1%
R134		036-14330-10	RES M/F 0805 3K3 1%
R135		036-16470-00	RES M/F 0805 470K 5%
R136		036-16470-00	RES M/F 0805 470K 5%

Ref	Var	IPN	Description
R137		036-15150-00	RES M/F 0805 15K 5%
R138		036-15150-00	RES M/F 0805 15K 5%
R139		036-14390-10	RES M/F 0805 3K9 1%
R140		036-15150-00	RES M/F 0805 15K 5%
R141		036-14390-10	RES M/F 0805 3K9 1%
R142		036-14820-10	RES M/F 0805 8K2 1%
R143		036-14680-10	RES M/F 0805 6K8 1%
R144		036-14100-10	RES M/F 0805 1K 1%
%R145		036-10000-00	RES M/F 0805 ZERO OHM
R146		036-13470-00	RES M/F 0805 470E 5%
R147		036-13220-10	RES 0805 220E 1%
R148		036-10000-00	RES M/F 0805 ZERO OHM
R149		036-14560-00	RES M/F 0805 5K6 5%
R150		036-14470-10	RES M/F 0805 4K7 1%
R151		036-13220-10	RES 0805 220E 1%
R152		036-13100-10	RES M/F 0805 100E 1%
R153		036-14220-00	RES M/F 0805 2K2 5%
R154		036-14220-00	RES M/F 0805 2K2 5%
R155		036-15100-10	RES M/F 0805 10K 1%
R156		036-14180-00	RES M/F 0805 1K8 5%
R157		036-15470-10	RES M/F 0805 47K 1%
R158		036-15220-00	RES M/F 0805 22K 5%
R159		036-13470-00	RES M/F 0805 470E 5%
R160		036-03180-10	RES 180R 1W SMD 2512
R161		036-15100-10	RES M/F 0805 10K 1%
R162		036-15100-10	RES M/F 0805 10K 1%
R163		036-13100-10	RES M/F 0805 100E 1%
R164		036-03180-10	RES 180R 1W SMD 2512
R165		036-03100-02	RES 100E 1206 200V 250MW RC01
R166		036-15100-10	RES M/F 0805 10K 1%
R167		036-13470-00	RES M/F 0805 470E 5%
R168		036-14270-10	RES M/F 0805 2K7 1%
R169		036-15100-10	RES M/F 0805 10K 1%
R170		036-14220-00	RES M/F 0805 2K2 5%
R171		036-13150-10	RES M/F 0805 150E 1%
R172		036-16180-00	RES M/F 0805 180K 5%
R173		036-15100-10	RES M/F 0805 10K 1%
R175		036-15220-00	RES M/F 0805 22K 5%
R176		036-15100-10	RES M/F 0805 10K 1%
R177		036-15100-10	RES M/F 0805 10K 1%
R178		036-14100-10	RES M/F 0805 1K 1%
R179		036-14100-10	RES M/F 0805 1K 1%
R180		036-14100-10	RES M/F 0805 1K 1%
R181		036-15100-10	RES M/F 0805 10K 1%
R182		036-16220-00	RES M/F 0805 220K 5%
R183		036-15100-10	RES M/F 0805 10K 1%
R184		036-14470-10	RES M/F 0805 4K7 1%
R185		036-16100-10	RES M/F 0805 100K 1%
R186		036-15100-10	RES M/F 0805 10K 1%
R187		036-16150-00	RES M/F 0805 150K 5%
R188		036-16100-10	RES M/F 0805 100K 1%
R189		036-14100-10	RES M/F 0805 1K 1%
R190		036-13220-10	RES 0805 220E 1%
R191		036-12100-10	RES M/F 0805 10E 1%
R192		036-13680-00	RES M/F 0805 680E 5%
R193		036-16100-10	RES M/F 0805 100K 1%
R194		036-14150-10	RES M/F 0805 1K5 1%
R195		036-12220-00	RES M/F 0805 22E 5%
R197		036-12220-00	RES M/F 0805 22E 5%
R198		036-12220-00	RES M/F 0805 22E 5%
R200		045-05100-02	RES NTC 10K 2% Metal tagged
R201		036-13100-10	RES M/F 0805 100E 1%
R202		036-13560-10	RES M/F 0805 560E 1%
R203		036-14470-10	RES M/F 0805 4K7 1%
R204		036-14470-10	RES M/F 0805 4K7 1%
R205		036-13390-10	RES M/F 0805 390E 1%
R206		036-13390-10	RES M/F 0805 390E 1%
R207		036-14680-10	RES M/F 0805 6K8 1%
R208		036-15100-10	RES M/F 0805 10K 1%
R209		036-14470-10	RES M/F 0805 4K7 1%
R210		045-04470-00	RES NTC SMD 4K7 5% 20MW
R223		036-11330-00	RES M/F 0805 3E3 5%
R224		036-11330-00	RES M/F 0805 3E3 5%
R225		036-11330-00	RES M/F 0805 3E3 5%
R226		036-03118-10	RES 18R 1W SMD 2512
R227		036-03270-10	RES 270 OHM 1 WATT 2512 CHIP
R230		036-03270-10	RES 270 OHM 1 WATT 2512 CHIP
R231		039-50500-00	RES TERM 50E 50W RFP50-50TCG
R235		036-13100-10	RES M/F 0805 100E 1%
R236		036-13100-10	RES M/F 0805 100E 1%
R237		036-03100-02	RES 100E 1206 200V 250MW RC01
R238		036-03100-02	RES 100E 1206 200V 250MW RC01
R240		039-50500-00	RES TERM 50E 50W RFP50-50TCG
R245		036-03130-10	RES 30E 1W SMD 2512
R246		036-03130-10	RES 30E 1W SMD 2512
R247		036-11330-00	RES M/F 0805 3E3 5%
RV101		042-04500-05	RES PRESET SMD 5K CER 4MM SQ
RV103		042-05500-05	RES PRESET SMD 50K CER 4MM SQ
RV105		042-04500-05	RES PRESET SMD 5K CER 4MM SQ
RV107		042-05500-05	RES PRESET SMD 50K CER 4MM SQ
%RV109		044-04200-06	RES PRE MULT 2K 15T PNL MTG
RV113		042-06500-05	RES PRESET SMD 500K CER 4MM SQ
RV115		042-05200-05	RES PRESET SMD 20K CER 4MM SQ
SK101		240-10000-05	CONN SMD SKT 8W 2R M-MATCH
SK103		240-10000-05	CONN SMD SKT 8W 2R M-MATCH
SK201		240-02100-44	SKT COAX MINI JACK PCB MT ANG.

T859 Mechanical & Miscellaneous Parts (220-01422-03)

IPN	Legend	Description
012-04100-05	1	CAP F/THRU 1N SUPPR FLTR S-MTG
044-04200-07	2	RES POT COVER H-83P
045-05100-02	3	RES NTC 10K 2% METAL TAGGED R200
070-01001-00	4	D-RANGE 15 WAY COMPL T800
201-00030-02		WIRE T/C WIRE 7/0.2 PVC RED Power feed for fan.
201-00050-25		AUTO 154 RED 41/0.3 PVC DC+ from D-range PCB.
201-00050-26		AUTO 154 BLACK 41/0.3 PVC DC- from D-range PCB.
219-02591-01	5	LOOM RIBBON 8 WAY FOR T839PA
219-02612-00		RG316 CABLE ASSY T869PA BNC to SK201 cable assembly with connectors.
219-02639-00		CABLE ASSEMBLY RG223/U N TO BNC Exciter/PA connecting cable assembly.
219-02709-00	6	T858/T859 N-TYPE CONNECTOR SUB
220-01422-03	7	PCB T859PA SERIES II
220-01442-03	41	PCB T858/T859 SII DRNL COUPLER
240-02100-17	8	SKT COAX BNC PNL JAC CRP RG316
240-04020-62		SKT 2 W RECEP SHORTING LINK PL110
240-06010-15	9	BLOCK LATCHING 15W D RANGE
258-00010-08	10	FAN 12V 119 x 119 x 25 (PAPST)
302-05204-00	11	BRKT A3M2314 F/THRU MTG T859
303-23146-00	12	COVER SIDE T869PA
308-01007-01	13	HANDLE BASE STATION SERIES II
308-13131-02	14	HEATSINK T859 PA DRILLED DCST
316-06651-00	15	PNL PA NO INP DRV SER II DBL
319-01190-01	16	SHIELD WALL HARM. FILTER 869PA
319-01201-00	17	SHIELD LID HARM. FILTER 869PA
319-01202-00	18	SHIELD T869PA CONTROL CIRCUIT
319-30061-00	19	SPACER PLATE T889 WIRELINE
319-30064-00	20	SPACER HSINK RF MODULE 869PA
319-30068-00	21	SPACER, T859 PCB HYBRID
345-00040-16	22	SCRW M3X20MM P/POZ ST BZ
349-00010-59	23	SCRW 6-32 X 3/8 P/PH T/T ZP
349-00020-07	24	SCRW 4-40 X 5/16 P/POZ T/T BLK
349-00020-09	25	SCRW T/T 4-40X3/8 IN P/POZ BLK
349-00020-36	26	SCREW TT M3X8m PANTORX BLK
349-00020-43	27	SCRW T/T M4X12MM P/POZ BZ
349-00020-49	28	SCRW T/T M4X35MM P/POZ BZ
349-00020-55	29	SCRW M3X8 P/P T/T BLCKZNC CHRM
352-00010-29	30	NUT M4 NYLOC HEX
353-00010-10	31	WSHR M3 FLAT 7MMX0.6MM ST BZ
353-00010-24	32	WSHR M4x8MM FLAT
356-00010-01	33	TAG SOLDER 3MM SHORT M6132/3.2
356-00010-03	34	TAG SOLDER 3MM LONG M614/3.2
356-00010-05	35	TAG SOLDER 4MM LONG M6144/4.2
357-00010-45	36	CLAMP CABLE 4.8MM P CLIP
360-00010-41	37	BUSH SHORTY BLK
362-00010-07	38	GASKET SIL INSULATING TO-220
362-00010-13	39	BUSH INSULATING 1.1MM TOP HAT
362-00010-33	40	GROMMET LED MTG 3MM
399-00010-51		BAG PLASTIC 75X100MM
400-00020-30		HEATSHRINK 3MM
410-00010-43		PKG T296 AMPAC REF 73-46

replace A4 pages D5.3.23/D5.3.24 with A3 pages D5.3.23/D5.3.24

replace A4 pages D5.3.23/D5.3.24 with A3 pages D5.3.23/D5.3.24

T859 Grid Reference Index (IPN 220-01422-03)

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
C100	1:F6	1-B7	C164	1:T3	1-C1	#C273	1:H3	2-L1	L209	1:R5	2-D4
C101	1:E6	1-B6	C166	1:B1	1-G0	C274	1:P3	2-E3	L210	1:R4	2-D4
C102	1:B2	1-C7	C167	1:B1	1-I0	C275	1:F7	2-C9	L211	1:Q6	2-C5
C103	1:B1	1-C6	C168	1:C1	1-I0	C276	1:F7	2-C8	L212	1:R6	2-C4
C104	1:E6	1-D7	C169	1:J1	1-J5	#C277	1:C9	2-Q3	%L213	1:S9	2-B3
C105	1:E5	1-D6	C172	1:F2	1-J0	#C278	1:B8	2-Q3	L235	1:K7	2-K4
C107	1:B4	1-E8	C173	1:E2	1-K0	#C280	1:A7	2-R3	L237	1:M8	2-H4
C108	1:C3	1-F5	C174	1:D2	1-L0	C282	1:D7	2-Q2	L238	1:M9	2-H4
C109	1:E4	1-G6	C175	1:D2	1-M0	#C283	1:D7	2-Q2	L239	1:K6	2-K3
C110	1:E4	1-H6	C176	1:F4	1-M0	C284	1:E9	2-D6	L240	1:H5	2-M3
C111	1:F4	1-I6	C177	1:E3	1-N0	#C285	1:D8	2-P3	L241	1:N5	2-F3
C112	1:B2	1-I6	C178	1:F3	1-N0	C286	1:D7	2-P2	L242	1:K5	2-K3
C113	1:F5	1-J8	C197	1:E5	1-P0	C287	1:F9	2-E6	L243	1:K4	2-K3
C114	1:B3	1-J6	C198	1:C5	1-Q0	C293	1:G7	2-M3	L246	1:M2	2-H1
C115	1:F5	1-K8	C200	1:Q2	2-H7				L247	1:M2	2-H1
C116	1:A3	1-K8	C201	1:Q1	2-H7	D101	1:M5	1-B0	L253	1:F7	2-C9
C117	1:B3	1-L8	C202	1:F2	2-K7	D105	1:C4	1-F8	#L254	1:D9	2-P3
C119	1:C4	1-O7	C203	1:E2	2-K7	D105	1:C4	1-F8	#L255	1:C8	2-Q3
C120	1:D6	1-O7	C204	1:B2	2-L7	D110	1:F5	1-G8	#L256	1:A8	2-R3
C121	1:D5	1-O8	C205	1:E3	2-M7	D110	1:F5	1-G8	L257	1:E9	2-D7
C122	1:D5	1-O8	C206	1:F3	2-M7	D112	1:V9	1-I4	#L258	1:D7	2-P2
C123	1:B5	1-P9	C207	1:F3	2-N7	D114	1:V8	1-I4	L259	1:D7	2-Q2
C124	1:B5	1-P9	C208	1:B6	2-P7	D115	1:E5	1-F5	L260	1:C7	2-Q2
C125	1:C5	1-Q7	C209	1:C6	2-Q7	D115	1:E5	1-F5			
C126	1:B5	1-Q8	C210	1:D6	2-Q7	D120	1:C3	1-F5	LINK200	1:N5	2-M0
C127	1:B6	1-Q8	C211	1:C6	2-Q7	D120	1:C3	1-G4			
C128	1:C6	1-Q7	C214	1:D3	1-Q0	D190	1:V9	1-J4	P105	1:U5	1-B1
C129	1:B5	1-R8	C215	1:E3	1-R0	D205	1:G7	2-C8	P110	1:U3	1-B0
C130	1:B5	1-R8	C218	1:Q5	2-C5	D206	1:E9	2-D7	P130	1:A6	1-U8
C131	1:A5	1-S8	C219	1:R4	2-B5				P200	1:F7	2-N3
C132	1:B5	1-S9	C220	1:R5	2-C4	IC100	1:E5	1-D7	P201	1:E9	2-P3
C133	1:A5	1-T8	C221	1:R4	2-C3	IC100	1:E5	1-I8	P210	1:M7	2-G4
%C134	1:A6	1-T8	C222	1:R4	2-E3	IC100	1:E5	1-D7	P212	1:M3	2-G1
C136	1:B2	1-M4	C223	1:Q4	2-E4	IC100	1:E5	1-O0	P214	1:M7	2-J4
C137	1:D3	1-M3	C224	1:Q4	2-E5	IC100	1:E5	1-H6	P216	1:M3	2-J1
C138	1:D3	1-M3	C225	1:Q6	2-C4	IC105	1:D5	1-O7	P218	1:K7	2-J5
C139	1:B4	1-N6	C226	1:R6	2-C3	IC105	1:D5	1-S0	P220	1:K3	2-J2
C140	1:F1	1-N2	C227	1:S8	2-A3	IC105	1:D5	1-P0	P222	1:K7	2-K5
C141	1:C3	1-O4	C228	1:R8	2-B3	IC105	1:D5	1-I2	P224	1:K3	2-K2
C142	1:D3	1-O4	#C247	1:H7	2-L4	IC105	1:D5	1-P8	P226	1:K7	2-L5
C143	1:E1	1-O2	C249	1:N7	2-G4	IC110	1:E3	1-T0	P228	1:K3	2-L2
C144	1:F1	1-O2	C250	1:H7	2-L4	IC110	1:E3	1-N0	P250	1:E7	2-N0
C145	1:D1	1-O3	#C252	1:K7	2-K4	IC110	1:E3	1-M3	P260	1:G9	2-P0
C146	1:D2	1-O4	#C253	1:K7	2-K4	IC130	1:B1	1-H0	P270	1:D7	2-Q2
C147	1:B4	1-P6	C254	1:J7	2-L4	IC140	1:E2	1-K0			
C148	1:E2	1-P3	#C256	1:M7	2-H4	IC200	1:E3	1-U0	PL101	2:S4	1-B0
C149	1:E1	1-P2	#C257	1:M7	2-J4	IC200	1:E3	1-Q0	PL110	1:C2	
C150	1:D2	1-P4	C258	1:K6	2-L3	IC200	1:E3	2-M8			
C151	1:B4	1-P5	C259	1:L5	2-K3	#IC210	1:S5	2-C3	Q100	1:F4	1-I6
C152	1:E2	1-Q2	C260	1:L6	2-J3				Q101	1:B3	1-J6
C153	1:F2	1-Q4	C261	1:K4	2-L3	%L100	1:A5	1-T8	Q102	1:F5	1-J8
C154	1:F2	1-Q2	C262	1:H3	2-L2	L120	1:F2	1-Q2	Q103	1:A3	1-K8
C156	1:D4	1-G1	C263	1:J3	2-L1	L161	1:U4	1-B1	Q110	1:B5	1-Q9
C157	1:D4	1-H1	#C264	1:K3	2-K1	L162	1:T3	1-C1	Q111	1:B6	1-Q8
C158	1:D4	1-I1	#C265	1:K3	2-K1	L200	1:Q1	2-H8	Q112	1:C6	1-Q7
C159	1:D3	1-K1	C268	1:N3	2-G1	L201	1:F2	2-K8	Q113	1:B5	1-R8
C161	1:T3	1-B1	#C269	1:M3	2-H1	L202	1:B6	2-P7	Q114	1:A5	1-S8
C162	1:U4	1-B1	#C270	1:M3	2-J1	L203	1:D6	2-Q7	Q120	1:B4	1-N6
C163	1:U3	1-C1	C272	1:L6	2-J3	L208	1:Q5	2-D5	Q121	1:C4	1-N4

Device	PCB	Circuit
Q122	1:F1	1-O2
Q123	1:B4	1-O6
Q124	1:F1	1-O3
Q125	1:D3	1-O4
Q126	1:D2	1-P4
Q127	1:B4	1-P5
Q128	1:D2	1-P3
Q129	1:B3	1-Q6
Q135	1:C4	1-K2
Q200	1:F3	2-P7
Q216	1:L7	2-J4
Q217	1:L3	2-J1
R100	1:F5	1-C7
R101	1:E5	1-C6
R102	1:D1	1-C7
R103	1:F6	1-D7
R104	1:E5	1-D6
R105	1:B4	1-E8
R106	1:E4	1-F7
R107	1:E4	1-F6
%R108	1:E6	1-F6
R109	1:F5	1-F8
%R110	1:F5	1-F8
R111	1:C3	1-F5
R112	1:E4	1-G6
R113	1:B3	1-G5
R114	1:E4	1-G6
R115	1:E4	1-H6
R116	1:E4	1-H5
R117	1:E4	1-H6
R118	1:F4	1-H8
R119	1:E5	1-H8
R120	1:V7	1-I5
R121	1:F5	1-I8
R122	1:F4	1-I8
R123	1:F5	1-I8
R124	1:V8	1-I5
R125	1:C5	1-N7
R126	1:E6	1-N7
R127	1:C5	1-N7
R128	1:D6	1-N7
R129	1:B5	1-O9
R130	1:D5	1-O8
R131	1:D5	1-O8
R132	1:D5	1-O8
R133	1:C4	1-O7
R134	1:B5	1-O9
R135	1:C5	1-P7
R136	1:D5	1-P8
R137	1:C5	1-P7
R138	1:D5	1-P8
R139	1:C6	1-P7
R140	1:B5	1-Q8
R141	1:B6	1-Q8
R142	1:B5	1-Q8
R143	1:B5	1-R9
R144	1:A5	1-R9
%R145	1:A5	1-T8
R146	1:V7	1-K4
R147	1:V7	1-K4
R148	1:V7	1-K4
R149	1:E4	1-M4
R150	1:D3	1-M2
R151	1:E4	1-M4
R152	1:D3	1-N4
R153	1:E4	1-N3
R154	1:E4	1-N2
R155	1:B4	1-O6
R156	1:C4	1-O4
R157	1:D3	1-O4
R158	1:D4	1-O4
R159	1:B4	1-O6
R160	1:E1	1-O2
R161	1:C4	1-O6
R162	1:D2	1-O4
R163	1:E2	1-P3
R164	1:E1	1-P2
R165	1:E1	1-P2
R166	1:B4	1-P6
R167	1:B4	1-P5
R168	1:E1	1-P2
R169	1:D2	1-P4
R170	1:E2	1-P2
R171	1:F1	1-P2
R172	1:B4	1-P6
R173	1:D2	1-Q4
%R174	1:F2	1-Q6
R175	1:B3	1-Q6
R176	1:B3	1-Q6
R177	1:D4	1-H2
R178	1:D4	1-H2
R179	1:D4	1-H1
R180	1:D4	1-I1
R181	1:D4	1-I2
R182	1:D5	1-J2
R183	1:C5	1-J2
R184	1:C4	1-J1
R185	1:C3	1-K2
R186	1:C3	1-K2
R187	1:C3	1-K2
R188	1:D3	1-L1
R189	1:B1	1-H0
R190	1:B1	1-H0
R191	1:C1	1-I0
R192	1:V9	1-J5
R193	1:D2	1-L0
R194	1:E2	1-L0
R195	1:E3	1-N0
R197	1:E5	1-O0
R198	1:C5	1-P0
R200	1:T2	2-H7
R201	1:D3	2-L8
R202	1:D3	2-L6
R203	1:D3	2-L8
R204	1:D3	2-L8
R205	1:F3	2-L7
R206	1:F3	2-L7
R207	1:F3	2-M7
R208	1:F3	2-N7
R209	1:F3	2-N7
R210	1:B6	2-P7
R223	1:R5	2-C4
R224	1:Q4	2-E4
R225	1:Q6	2-C4
R226	1:R7	2-B3
R227	1:R8	2-B2
R230	1:R7	2-B2
R231	1:N9	2-F3
R235	1:E7	2-E8
R236	1:G9	2-C7
R237	1:D6	2-R2
R238	1:D6	2-R2
R240	1:G1	2-M3
R245	1:K6	2-L3
R246	1:K4	2-L3
R247	1:L6	2-K3
RV101	1:C4	1-H8
RV103	1:C4	1-F8
RV105	1:C3	1-G6
RV107	1:C2	1-F5
%RV109	1:V6	1-K5
%RV111	1:V7	1-K4
RV113	1:C3	1-K2
RV115	1:C2	1-M0
SK101	1:T4	1-C0
SK103	1:A4	1-C0
SK201	1:R9	2-A3

Device	PCB	Circuit

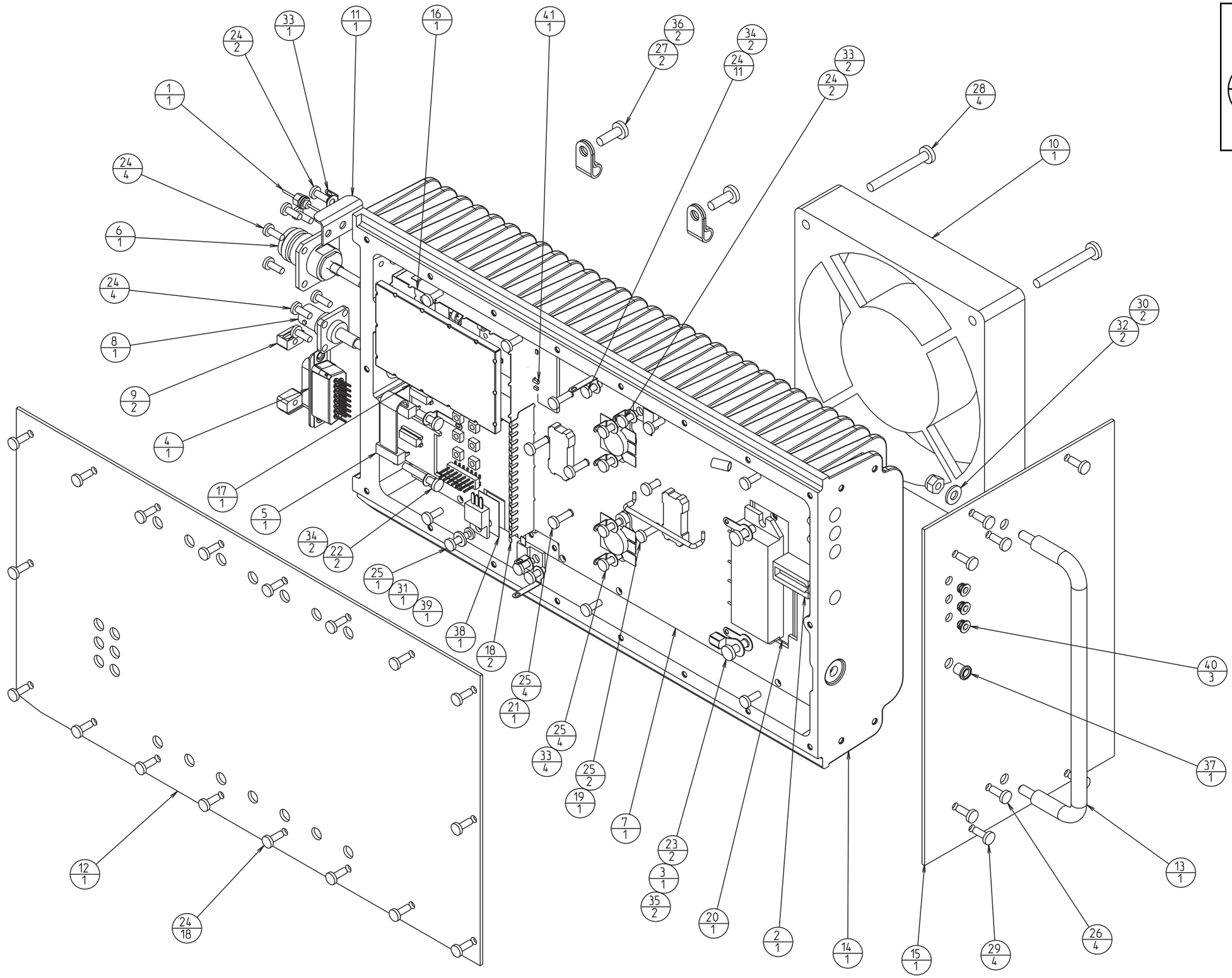
Device	PCB	Circuit

Key

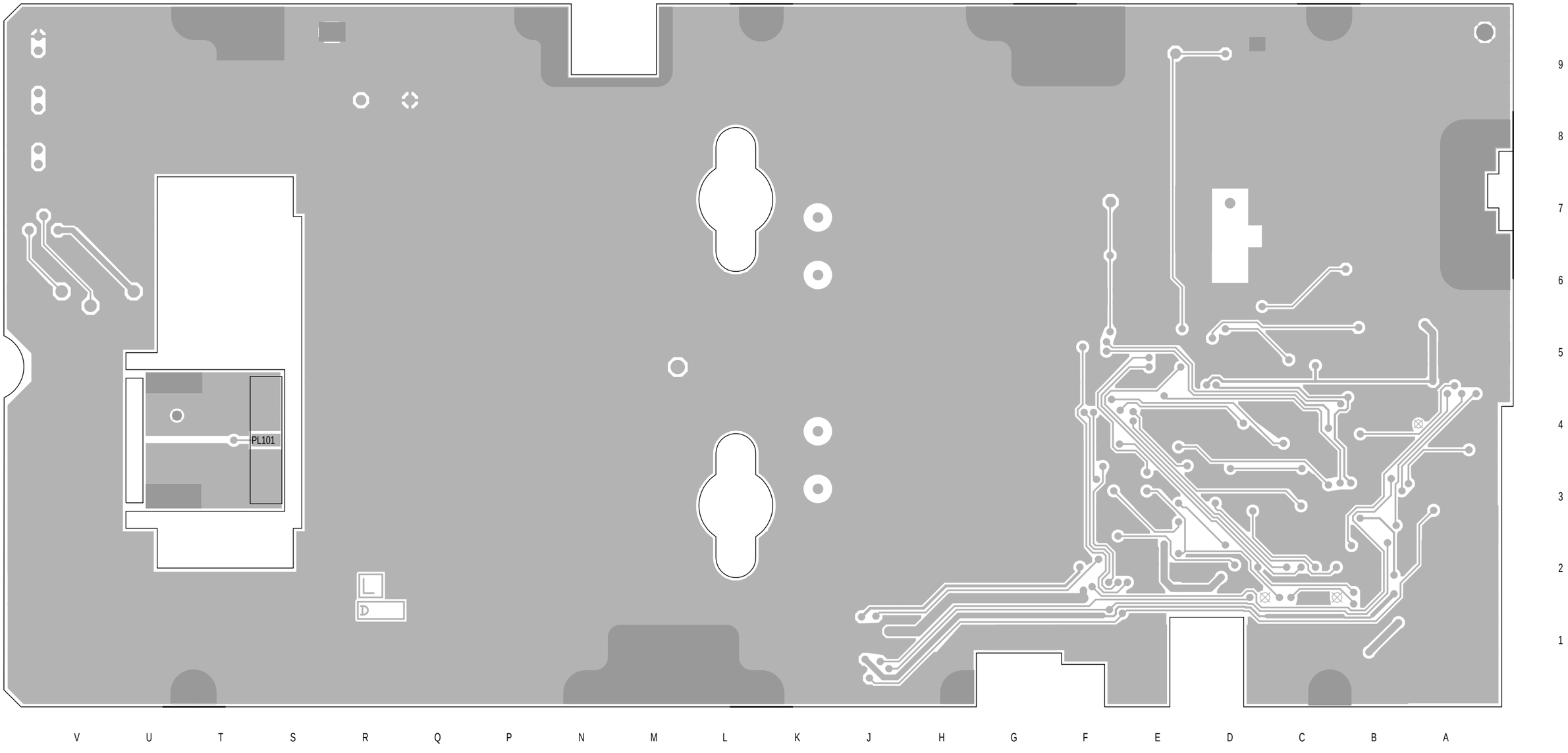
33/2

The upper number is the component identification number which appears in the "Legend" column of the Mechanical & Miscellaneous Parts on the facing page.

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



T859 Mechanical Assembly
220-01422-03



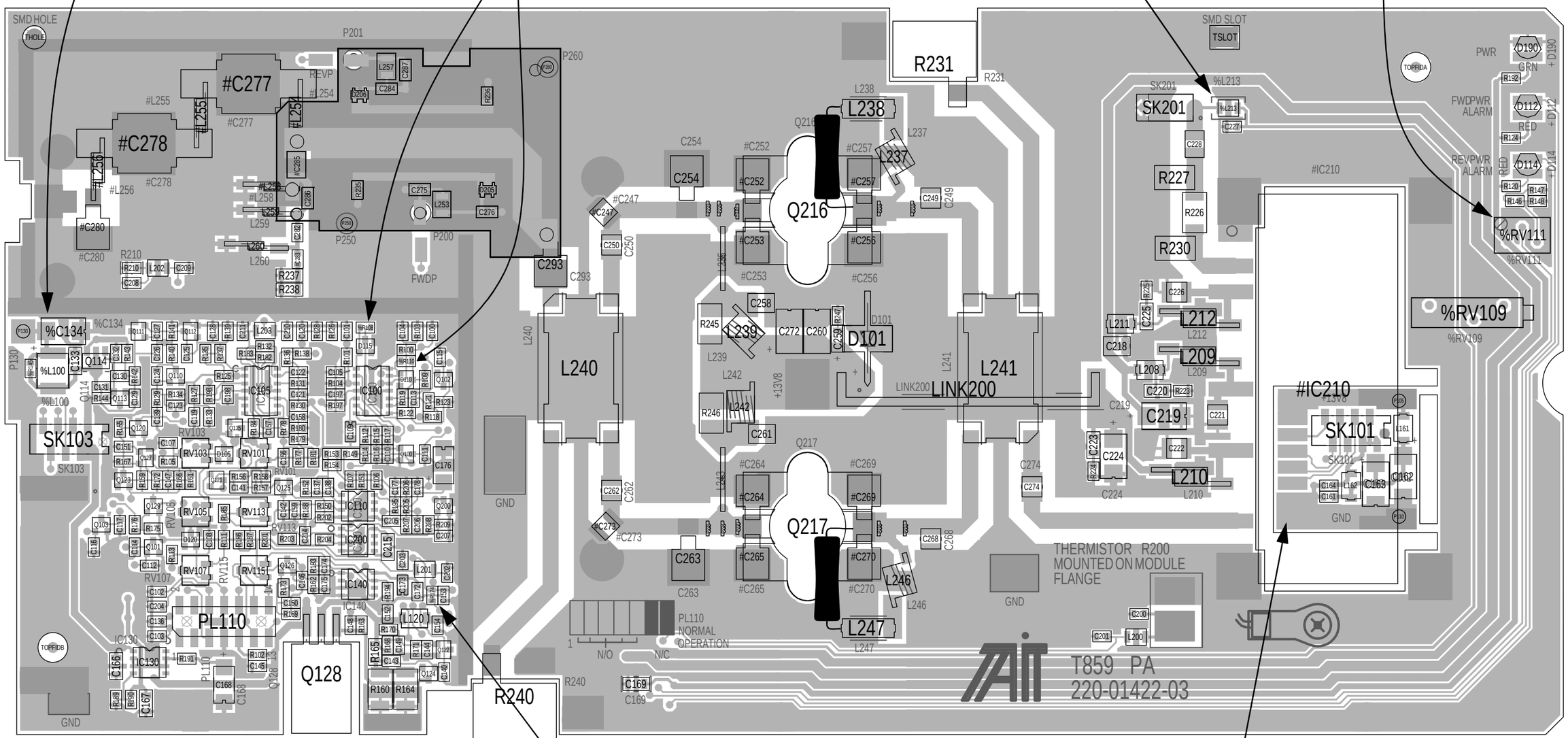
T859 PCB Layout - Bottom Side
220-01422-03

%C134 and %L100 are for the fan filter circuit and are fitted (in place of %R145) only if required.

%R108 and %R110 are fitted to Series I compatible PAs only.

%L213 is fitted to Series II compatible PAs only.

%RV111 may be fitted instead of %RV109 to convert the output power adjustment to internal access only.

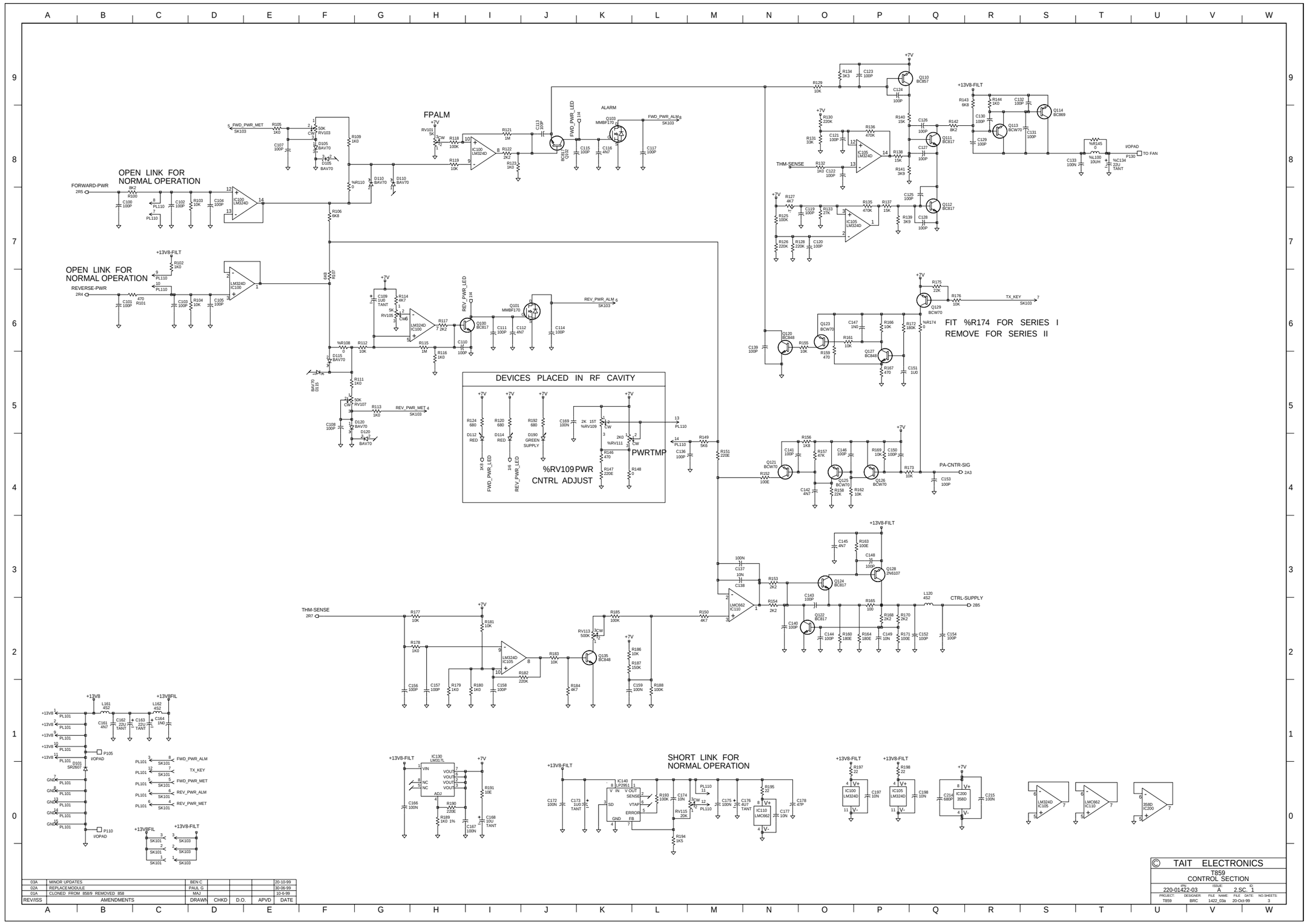


%R174 is fitted to Series I compatible PAs only.

The circuitry for the break-off D-range PCB is shown on the control section circuit diagram.

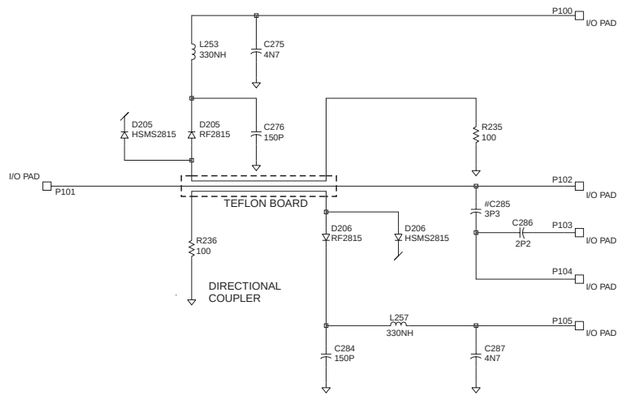
T859 PCB Layout - Top Side
220-01422-03

29/02/00

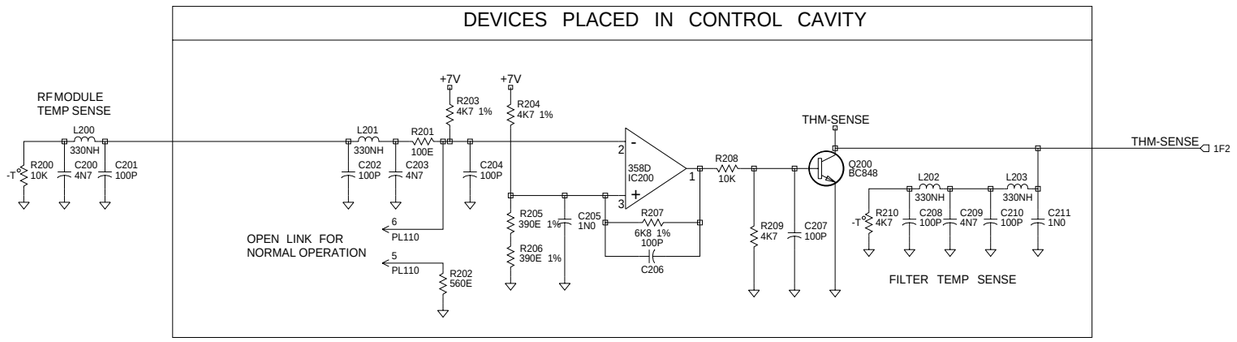


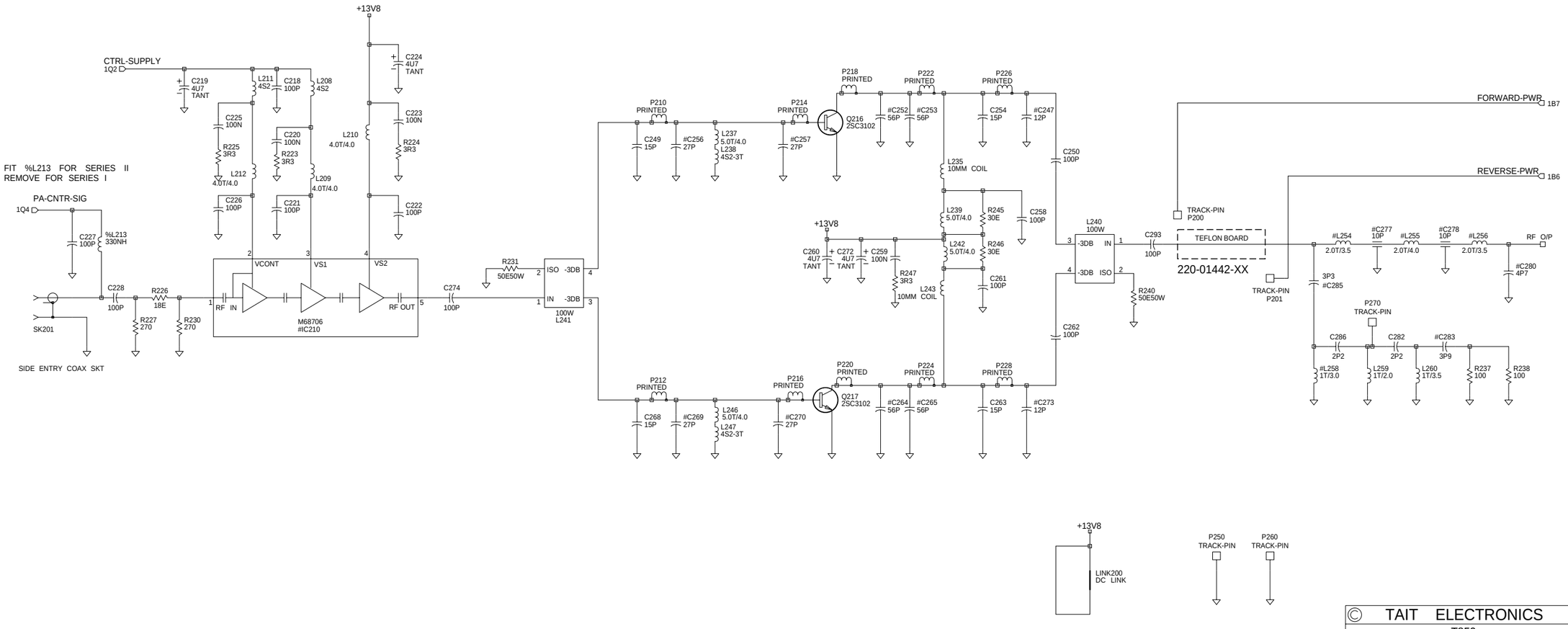
Sheet 1 - T859 Control Section
220-01422-03

Directional Coupler PCB Circuit Diagram



DEVICES PLACED IN CONTROL CAVITY





REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
03A	MINOR UPDATES	BEN C				20-10-99
02A	REPLACE MODULE	PAUL G				30-06-99
01A	CLONED FROM 858/9 REMOVED 858	MAJ				10-6-99

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T859
PA

IPN:	ISSUE:	ID:
220-01422-03	A	2.SC. 2

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T859	BRC	1422_03a	20-Oct-99	3

Sheet 2 - T859 RF & Thermistor Control Sections
220-01422-03