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T838 Power Amplifier

VHF FM 136-174MHz

(M838-00)

Issue A

TECHNICAL INFORMATION

For further information about this Manual, or the equipment it describes, contact the Product Distribution Group, Tait Electronics Ltd, at the above address.

UPDATING EQUIPMENT & SERVICE MANUALS

In the interests of improving performance, reliability or servicing, Tait Electronics Ltd reserve the right to update their equipment and/or Service Manuals without prior notice.

SCOPE OF MANUAL

This Manual covers general, technical and servicing information on the Tait T838 power amplifier.

Ordering Tait Service Manuals

When ordering Tait Service Manuals, quote the Tait Internal Part Number (IPN) and, where applicable, the version.

Date of Issue

IPN M838-00 T838 Service Manual (All Versions)

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ILLUSTRATIONS

DIAGRAMS

SECTION 1 GENERAL INFORMATION

1.1 INTRODUCTION

The T838 is an FM base station power amplifier designed for single or multichannel operation within the frequency range 136 to 174MHz, with an output power capability of between 10 and 60W.

The T838 PA comprises 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:

1. Improved intermodulation performance in the presence of high signal levels from adjacent transmitters;
2. 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 is incorporated into the basic design, while monitoring and alarm signals are available for both forward and reverse power. The output power is adjustable from the front panel.

The circuitry is built on a single PCB which is mounted directly on a die-cast chassis/heatsink.

The T838 has a width of 60mm, occupying a single module in a Tait rack shelf which will accomodate up to seven standard modules to give an attractive and convenient installation.

1.2 SPECIFICATIONS

1.2.1 INTRODUCTION

The performance figures given below are typical figures, unless otherwise indicated, for equipment operating under standard test conditions (13.8V DC supply and ambient temperature 22°C to 28°C); unless otherwise indicated, the figures apply to all versions.

Where applicable, the test methods used to obtain the following performance figures are those described in the EIA specification. However, there are several parameters for which performance according to the CEPT specification is given.

Details of test methods and the conditions which apply for Type Approvals can be obtained from Tait Electronics Ltd.

1.2.2 GENERAL

Power Output (at 13.8V):

Rated Power	.. 50W
Maximum Power	.. 60W
Range of Adjustment	.. 10W to 60W

Note: Actual power used will depend on regulatory requirements.

Duty Cycle Rating .. 50W continuous to +60°C without fan*

*The use of a fan is to be preferred at high temperatures. Adequate ventilation must always be provided through base station equipment cabinets.

Intermodulation (3rd order):

25dB External Isolation	.. -70dBc
40dB External Isolation	.. -85dBc

Mismatch Capability:

Ruggedness	.. infinity:1 VSWR at temperature and voltage extreme
Stability	.. 5:1 VSWR plus duplexer

Supply Voltage:

Operating Range	.. 10.8 to 16V DC
Standard Test Voltage	.. 13.8V DC
Polarity	.. negative earth only

Supply Current:

Transmit (50W)	.. 10.5A max, 9A typical
Standby	.. less than 50mA

Spurious Emissions:

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

Radiated-	
Transmit	.. -36dBm to 1GHz -30dBm to 4GHz
Standby	.. -57dBm to 1GHz -47dBm to 4GHz
Operating Temperature Range	.. -30°C to +60°C
Dimensions & Weight:	
Height	.. 191mm
Width	.. 60mm each
Length	.. 310mm
Weight	.. 3.40kg

1.3 VERSIONS

T838-10	FM 50 Watt Power Amplifier 136-174MHz Front panel power adjust Optimised IM performance

SECTION 2 CIRCUIT OPERATION

2.1 INTRODUCTION

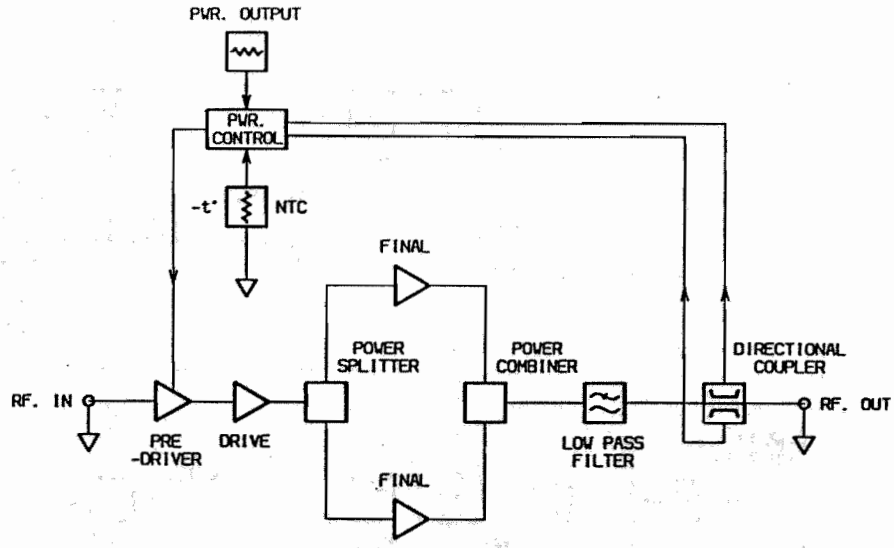


Figure 1 High Level Block Diagram

The T838 comprises a 4-stage RF power amplifier, the final two stages of which are combined, and extensive control circuitry.

The configuration of each of the main circuit blocks may be seen on a functional level in Figure 1.

2.2 RF POWER AMPLIFIER

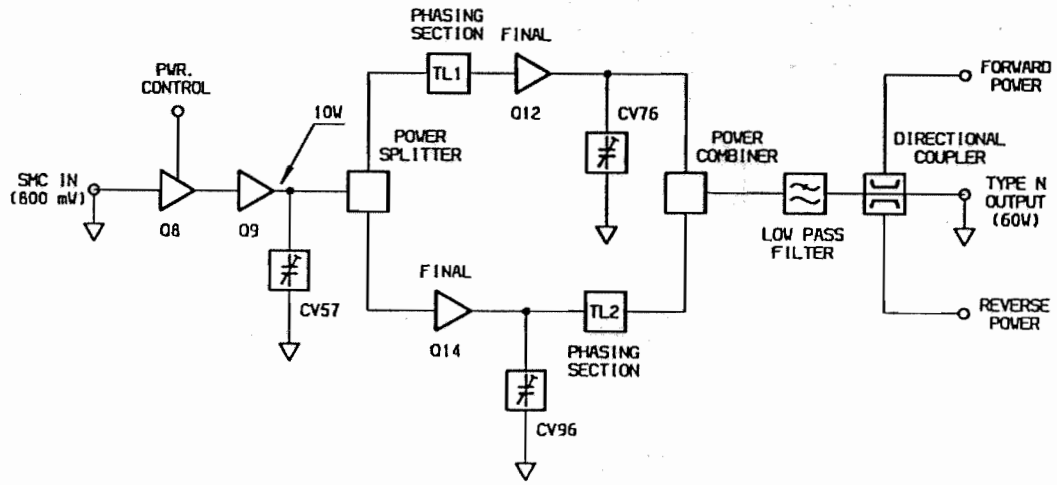


Figure 2 RF Circuitry Block Diagram

The RF from the exciter (approximately 800mW) is fed to the power controlled stage Q8. The following stage, Q9, boosts the power to greater than 10W. A power divider network feeds the two final devices, Q12 and Q14. The outputs of these devices are combined and passed via a harmonic filter to a 'wire-line' directional coupler. The final stages incorporate phasing sections to optimise intermodulation performance.

2.3 CONTROL CIRCUITRY

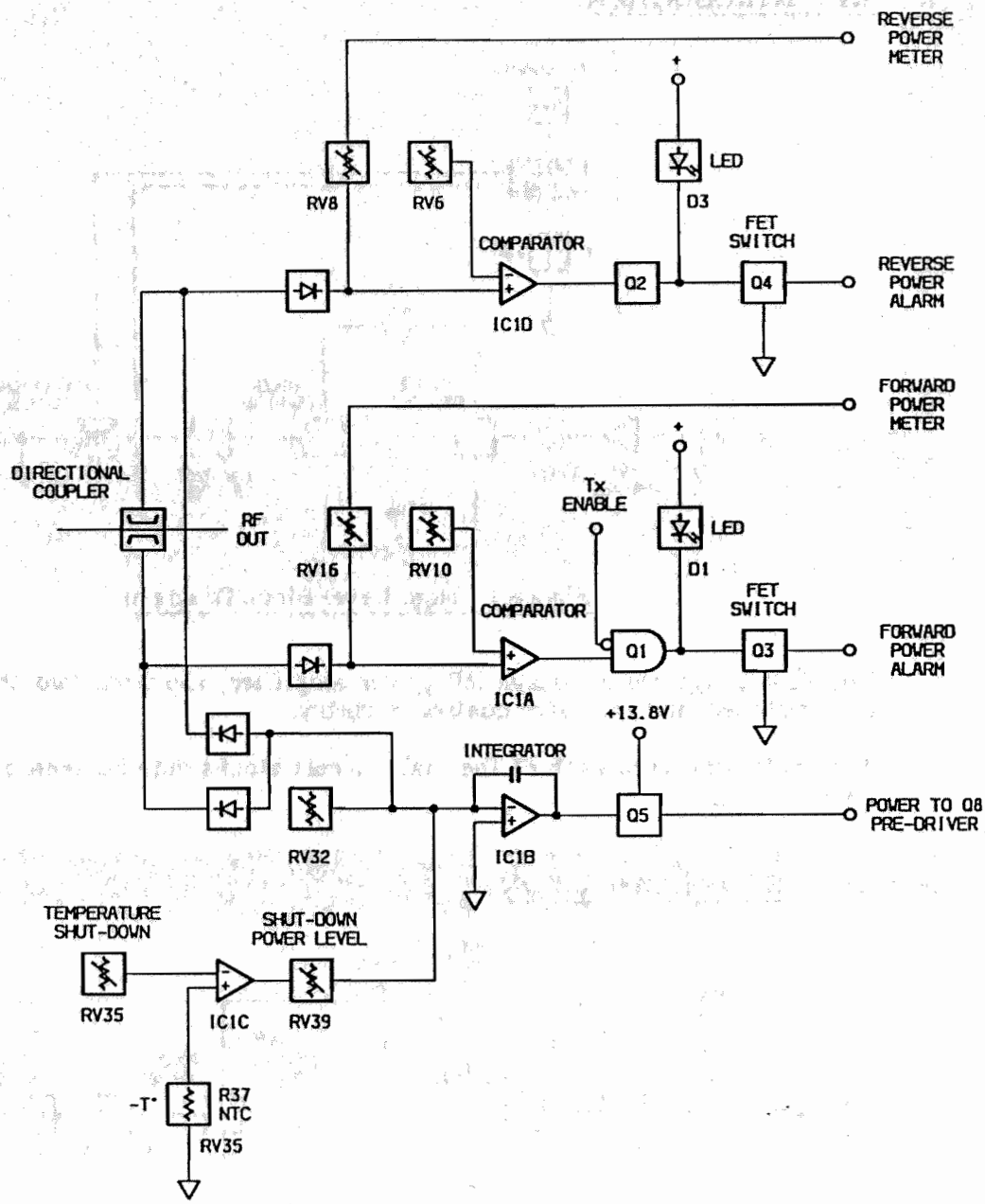


Figure 3 Control Circuitry Block Diagram

2.3.1 POWER CONTROL

Output power is maintained at a constant level via a power control loop. The forward and reverse power levels are sensed by the 'wire-line' directional coupler and summed at an integrator (IC1b, pin 6). This drives Q5 as a series pass to supply a control voltage to the pre-driver, Q8.

Forward and reflected power are summed so that, under high output VSWR, the power control will turn the PA down.

2.3.2 THERMAL PROTECTION

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

An NTC (R37), being part of a voltage divider (R36, R37), senses the internal temperature of the PA close to the output balance resistor (R69) and applies a voltage to a comparator (IC1c, pin 9). The threshold of the comparator is set by RV35, which sets the shutdown temperature.

The output from the comparator is summed into the power control network by RV39 so that the power level to which the PA will turn down can be set.

2.3.3 FORWARD AND REVERSE POWER ALARMS

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

The output from the 'wire-line' directional coupler is applied to the comparators (IC1a, pin 4 & IC1d, pin 11), with thresholds adjusted by RV10 and RV6 respectively. When activated, the comparators trigger the output stages (Q3 & Q4), which are open drain with 500mA sink capability (providing the internal power dissipation is kept below 500mW). Internal diode protection makes them suitable for driving relays.

To prevent damage to the unit, the maximum externally applied voltage must not exceed 50V.

Tx enable is applied to the forward power alarm stage to prevent an alarm indicating when the transmitter is not keyed.

2.3.4 FORWARD AND REVERSE POWER METERING

The levels of forward and reverse power applied to the comparators (IC1a, pin 4 and IC1d, pin 11) are available via RV16 and RV8 at the D-range connector for metering purposes.

SECTION 3 INTRODUCTION TO SERVICING

3.1 GENERAL

3.1.1 NOTES

If further information is required about the T838 or this Manual, it may be obtained from Tait Electronics Ltd or accredited agents. When requesting this information, please quote either the equipment serial number or works order number (found on a label at the back of the set). In the case of the Service Manual quote the Tait Internal Part Number (IPN) and Issue and for Circuit Diagrams quote the 'Title' and 'Issue'.

CAUTION: CMOS DEVICES

This equipment contains CMOS Devices which are highly susceptible to damage from static charges. Extreme care when handling these devices is essential. For correct handling procedures, refer to manufacturers' data books covering CMOS devices, e.g. Philips Data Handbook covering CMOS devices; Motorola CMOS Data Book, Section 5 (Handling Procedures).

CAUTION: AERIAL LOAD

The equipment has been designed to operate safely under a wide range of aerial loading conditions. However, it is strongly recommended that the transmitter should not be operated in the absence of a suitable load. Failure to observe this warning may result in damage to the transmitter output power stage.

CAUTION: BERYLLIUM OXIDE & POWER TRANSISTORS

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

3.1.2 TECHNICAL INSTRUCTIONS (TI's)

From time to time TI's are issued by Tait Electronics Engineering Division. These TI's may be used to update equipment or information, or to meet specific operational requirements.

3.2 MECHANICAL

3.2.1 POZIDRIV RECESS HEAD SCREWS

Pozidriv recess head screws are the preferred standard on all Tait manufactured equipment. The very real advantages of this type of screw will not be realised unless the correct screwdrivers are used by servicing personnel.

3.3 REPAIR

Whenever components are removed from or fitted to the PCB, care must be taken to avoid damage to the track. The two satisfactory methods of removing components from PTH PCB's are detailed below.

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

3.3.1 DESOLDERING IRON METHOD

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

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

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

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

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

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

3.3.2 COMPONENT CUTTING METHOD

Cut the leads on the component side of the PCB.

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

Fill the hole with solder and then clear with solderwick.

3.4 TO REPLACE THE PA TRANSISTORS

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

Trim the tabs of the replacement device to make them similar to the faulty device, and tin the underside lightly. Smear the face of the device with heatsink compound and tighten it securely (torque setting 5in.lbs or 0.55N.m) to the heatsink. Then solder the tabs.

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

3.5 TO REMOVE THE PCB FROM THE HEATSINK

Most components are soldered topside only, but in some cases access to the underside of the PCB is necessary.

Remove the 8 PCB retaining screws.

Remove the transistor stud nuts.

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

Disconnect the input 50 ohm coaxial cable from the heatsink casting.

Disconnect the battery positive and negative feed wires from the D-range connector.

Disconnect the alarm and metering wires from the D-range connector.

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

CAUTION: Do not operate the PA with the PCB detached as the heatsink is used for earthing and for the dissipation of heat generated within the transistors.

To replace the PCB, reverse the order of removal taking care that the wiring is correctly routed and is not subjected to 'pinching'.

3.6 TO REMOVE CASED MICA CAPACITORS

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

3.7 CAPACITOR POSITIONING

The position and spacing of cased mica and chip capacitors around the final transistors Q12 and Q14 is critical (refer to Figure 4).

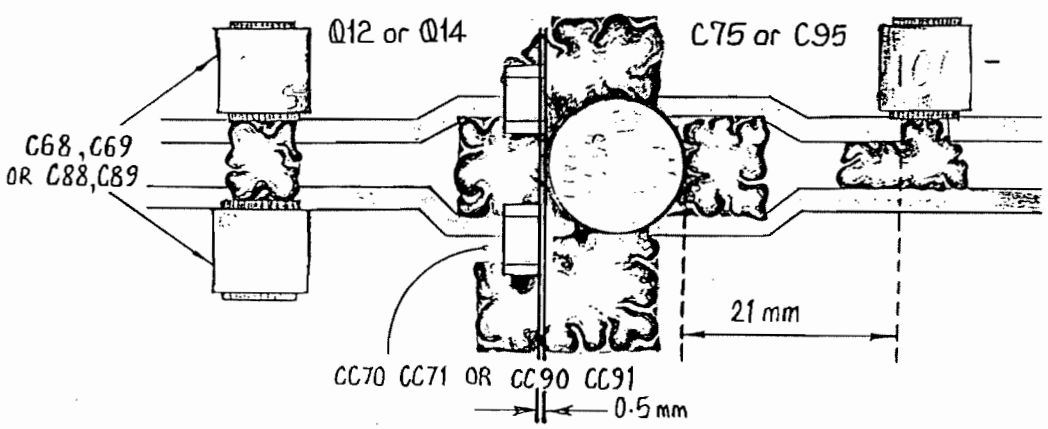


Figure 4 Final Transistor Capacitor Spacing

SECTION 4 INITIAL TUNING & ADJUSTMENT

4.1 TEST EQUIPMENT REQUIRED

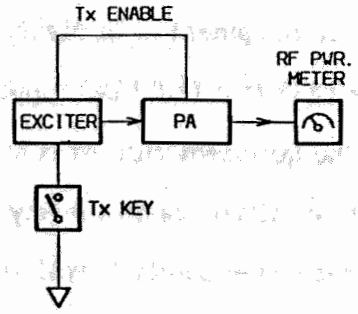


Figure 5 Test Equipment Set-Up

1. DC power supply capable of delivering 15A at 13.8V (e.g. Tait T807).
2. Multimeter or DMM (e.g. Fluke 77).
3. RF power meter usable 136-174MHz (e.g. Bird 43 with 5 & 100W elements).
4. Thru-line wattmeter with 5W element.
5. 100W 3dB 50 ohm pad.
6. 'BNC' to 'N' type adaptors (e.g. Amphenol, Greenpar).
7. Appropriate trimming tools.
8. Special connector 50 ohm BNC to SMC female.

4.2 OPTIMISING INTERMODULATION PERFORMANCE

TL1 and TL2 are phasing lines supplied cut to the maximum length at the bottom of the band.

If it is necessary to minimise IM products, TL1 and TL2 may be cut to suit the mid-switching range frequency, using the formula:

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

The stripping dimensions are as shown in Figure 6, with "length" being that of the centre conductor.

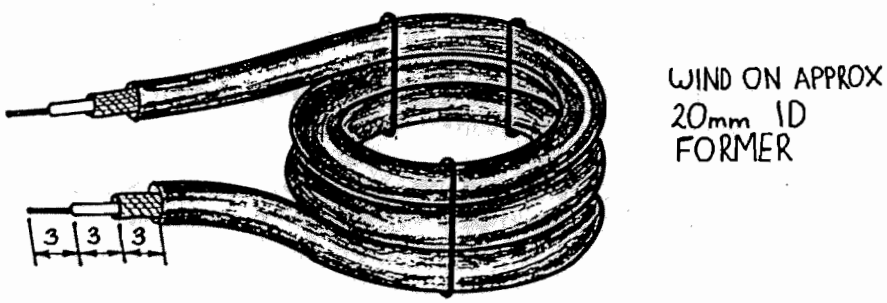


Figure 6 Phasing Line Details

4.3 PRELIMINARY CHECKS

Check for short circuits between the positive rail and earth.

Set up the test equipment as in Figure 5.

Connect the T838 to a 13.8V DC supply.

Check that the quiescent current is approximately 45mA.

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.

4.4 RF ALIGNMENT PROCEDURE

Refer to the Circuit Diagram at the rear of this Manual.

Note 1: The power amplifier circuit is 'broad band'. If the T838 is being retuned to a frequency less than 8MHz from the frequency already set up, there will be no need to retune the PA circuit.

For operation over a segment of the band, tune the PA to the centre frequency of the band of interest. If only two channels are programmed, use the highest frequency channel.

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 lead between the T838 and power meter.

Note 3: With the T838 partially withdrawn from the rack frame for tuning, the T006-80 (formerly TA-068) lead is required to connect the T838 to the T837 exciter.

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

Connect an RF power meter to the PA output. Set the front panel power control preset (RV32) fully clockwise.

Set CV57, CV76 and CV96 to the half-meshed position.

Key the transmitter.

Check that the input to the PA is at least 0.5W.

Tune CV76 & CV96 for maximum output power, then tune CV57 for maximum output power.

Readjust CV76 and CV96 for maximum output power (60 to 70W). Some slight readjustment of CV57 may be necessary.

4.5 SETTING THE OUTPUT POWER

Note: The PA cover shield should be in position when the metering and power controls are set up.

Once the PA has been tuned to full power, the output power may be set by adjusting RV32 (the front panel power adjust control) to any desired output power between 10 and 60W. The actual power used may be limited by regulatory requirements (e.g. NZ 33W, Australia 50W).

4.6 REMOTE FORWARD POWER METER CALIBRATION

If a remote meter is connected, adjust RV16 (forward power meter) for the remote reading to agree with the RF power meter reading.

4.7 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 RV8 (reverse power meter) for a quarter of the forward power reading.

4.8 SETTING ALARM LEVELS

Note 1: The PA cover shield should be in position when setting the forward and reverse power alarm levels.

Note 2: If forward and reverse power metering is being used, set up their calibration (Sections 4.6 & 4.7) before setting the alarm levels.

4.8.1 FORWARD POWER

Power up the T838 and adjust the power output pot. (RV32) so that the output power is at the alarm level required (e.g. 40W if the PA normally operates at 50W).

Adjust the forward power alarm set pot. (RV10) 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 the power control (RV32) for the normal operating level.

4.8.2 REVERSE POWER

Power up the T838 and adjust the power control pot. (RV32) for the normal operating power level.

Place a known mismatch of the required value (e.g. 5:1 VSWR) and adjust the reverse power alarm set pot. (RV6) so that the reverse power alarm LED lights.

4.9 TEMPERATURE SHUTDOWN

Note: The temperature shutdown circuit is factory set to approximately 130°C and 5W. RV35 and RV39 should not be readjusted if normal operation is required.

Power up the T838 and adjust the power control pot. (RV32) for the normal operating power level.

Turn the temperature set pot. (RV35) fully anticlockwise.

Apply heat to the NTC (R37) with the tip of a soldering iron.

Adjust the shutdown power level pot. (RV39) to the desired level.

For continuous operation during fault conditions, the shutdown power should be set in the range 0 to 5W.

For normal operation, i.e. shutdown under extreme PA internal temperatures (approx. 130°C) or excessive dissipation in the combiner balance resistor (R69), the temperature set pot. (RV35) should be adjusted for a voltage reading of 150mV on pin 8 of the LM339 (IC1).

SECTION 6 FAULT FINDING

6.1 GENERAL

If a fault is apparent, first check for simple causes such as shorts under the PCB, incorrect polarity or voltage, or trouble with the test set-up and ancillary equipment.

If a component failure is suspected, in most cases locating it will require little more than the usual systematic approach with the aid of the information given in this section. A voltage table is included giving the DC conditions around each transistor.

Refer to Section 3 before attempting the removal of any components.

6.2 COMPONENT CHECKS

If a transistor is suspected of faulty operation, an indication of its performance can be assessed by measuring the forward and reverse resistance of the junctions. First make sure that the transistor is not shunted by some circuit resistance (unless the device is completely unsoldered). A 20k ohm/V or better multimeter should be used for taking the measurements, 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 integrated circuit 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. These values can be found on the Circuit Diagrams or in the component data catalogue.

6.3 DC CHECKS

Check that +13.8V is present on the collectors of Q8, Q9, Q12 and Q14. Make this measurement when the transmitter is not keyed.

Check that 7.0V is present at the output of regulator IC2 and at pin 3 of IC1.

6.4 RF CHECKS

6.4.1 GENERAL

In circuit RF levels may be measured with an RF probe on which the earth lead has been shortened to a minimum (i.e. 13mm). Refer to the PA Fault Finding Chart (Section 6.6).

For problems with the power control circuitry, refer to the Power Control Fault Finding Chart (Section 6.7).

6.4.2 PA FAULTS

If a PA fault has occurred, or is suspected, it is easier to isolate if the PA is split into three separate amplifiers.

The first two stages can be observed by removing R56 and attaching a power meter via a flying lead.

Q12 and Q14 can be observed individually by using a flying lead input before L41 or L26 and a flying lead output after C97 or C77 (i.e. remove R69, L34 and L49).

The first two stages should produce 10W for 0.5W drive. Each of the SRFH1001's (Q12 & Q14) should produce approx. 40W for 4W drive.

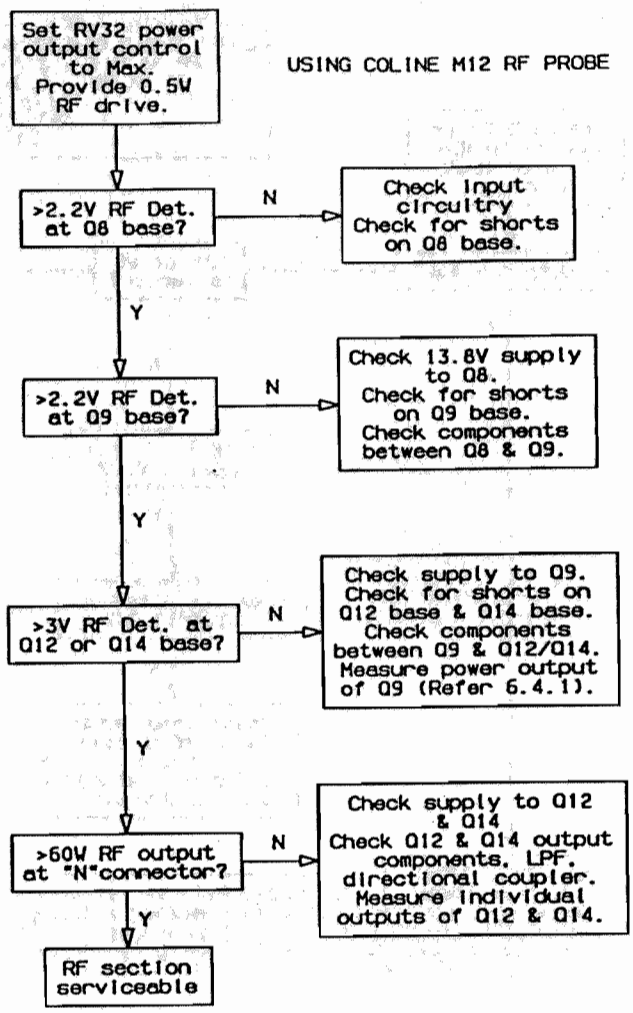
6.5 VOLTAGE CHART

Test Conditions:

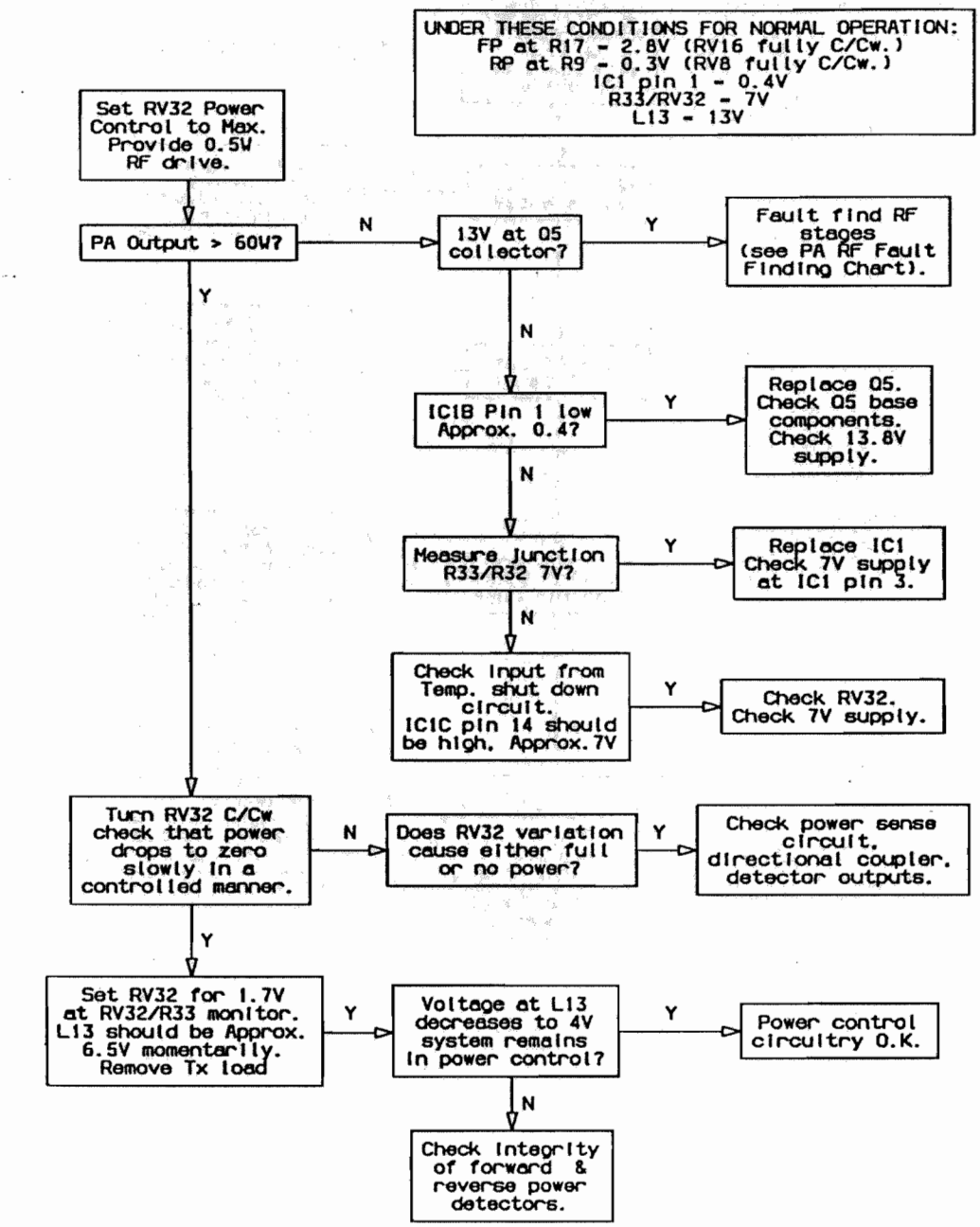
- typical DC voltages measured with Fluke 77 DVM
- supply voltage 13.8V at socket
- transmitter unkeyed
- allow ±20% for spread of transistor characteristics.

Device	Emitter	Base	Collector
Q1	8.7V	7.0V	6.6V
Q2	0.0V	0.5V	5.5V
Q5	13.8V	13.0V	13.8V
Q5A	13.8V	12.5V	13.8V
Q8	0.0V	0.0V	13.8V
Q9	0.0V	0.0V	13.8V
Q12	0.0V	0.0V	13.8V
Q14	0.0V	0.0V	13.8V

6.6 PA FAULT FINDING CHART



6.7 POWER CONTROL FAULT FINDING CHART



SECTION 7 INSTALLATION

7.1 RACK MOUNTING

The T838 base station 50W PA is designed for use in a standard 483mm rack frame using the supporting guide rails supplied with the unit (refer to Figure 7).

The lower guide rail is located in the rack frame with three screws, two at the rear and one at the front. The short upper guide rail is located with just one screw. The T838 is secured into the guide with two front panel mounting screws.

The RF input via the front panel SMC connector should be connected to an adjacent T837 exciter. The RF output is via the rear N-type connector, whilst all DC, audio and control connections are via the D-range connector.

The guide rails will allow the PA to be latched in the extended position (refer to Figure 9).

CAUTION: For continuous operation the rack module position immediately adjacent to the finned heatsink should be left vacant. Adequate airflow over the fins should be maintained at all times.

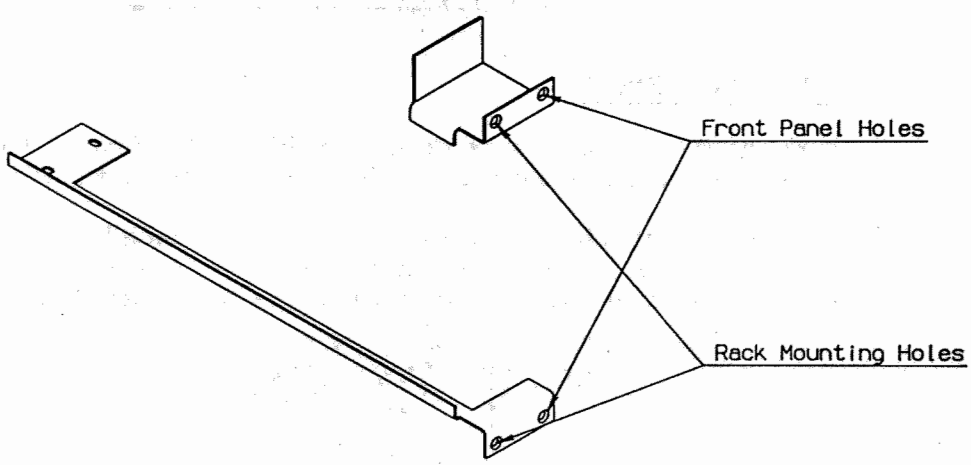


Figure 7 T838 Guide

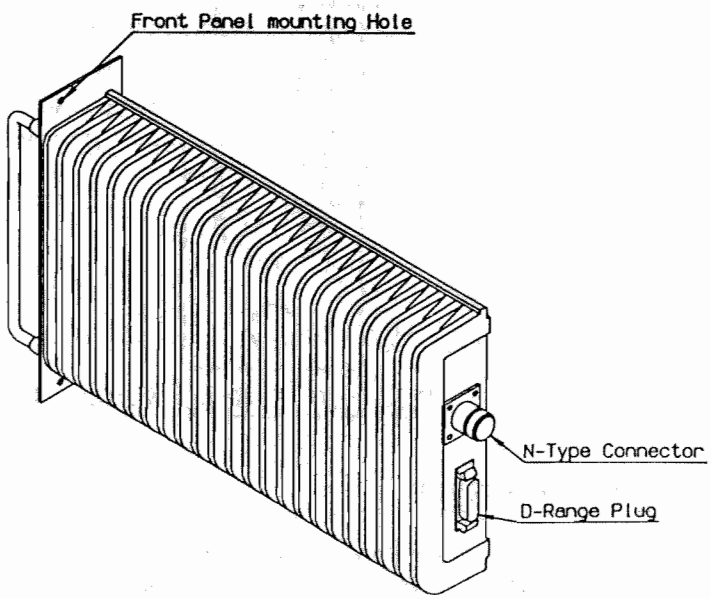


Figure 8 T838 Chassis Connectors

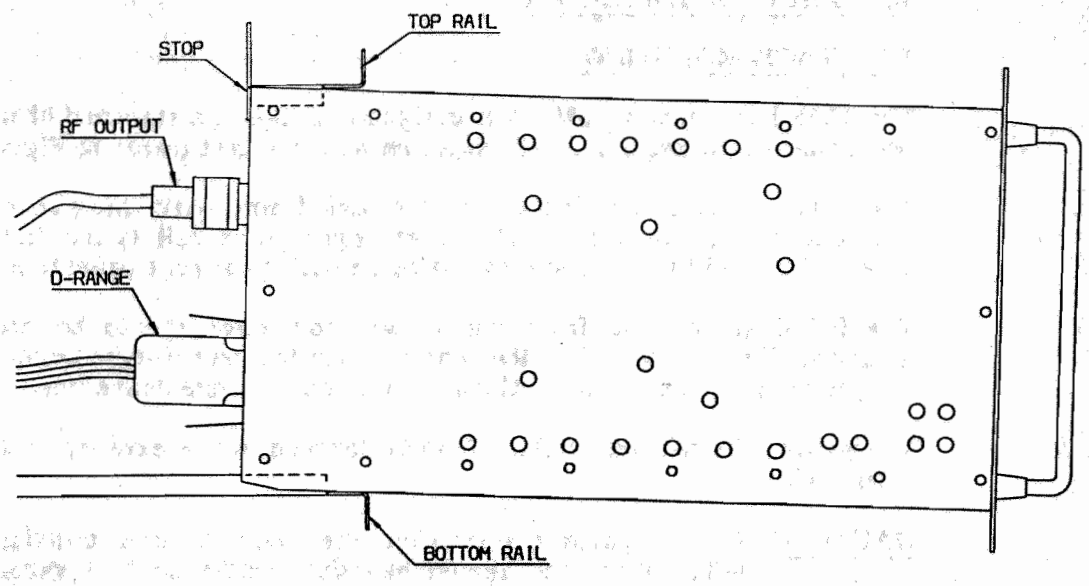


Figure 9 Latched Position

7.2 RACK WIRING

Wire the D-range connector as shown in Figure 10. Ensure that the cables are not subjected to any stresses due to tight bends or incorrect lengths.

The RF coaxial cable to the N-type connector should be free from acute bends or twists. If access to the rear of the rack frame is restricted, the cable should be long enough to permit full withdrawal of the chassis from the guide.

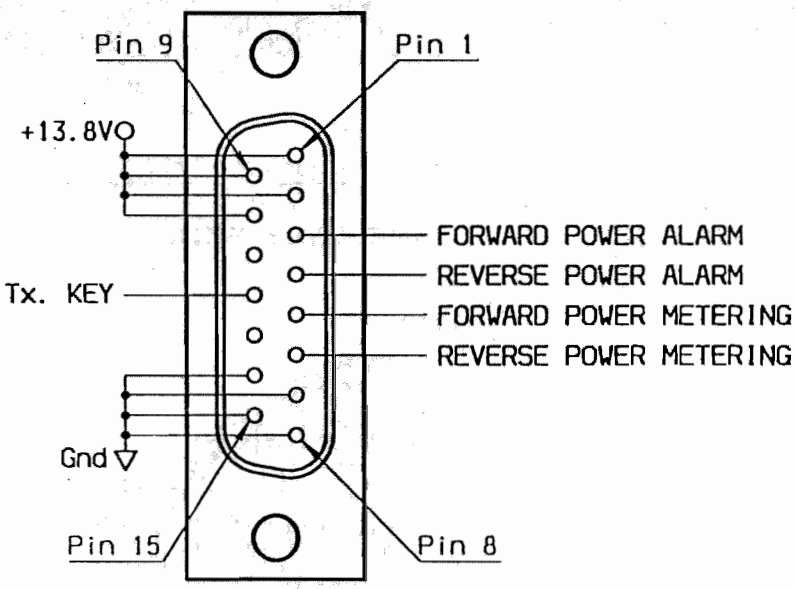


Figure 10 D-Range Wiring - Rear View

7.3 POWER SUPPLY

If a non-standard Tait power supply is used, ensure that it is capable of providing enough current to drive the T800 system and is also free from excessive ripple or noise.

SECTION 10 PARTS LIST

INTRODUCTION

The 10 digit numbers (000-00000-00) in this Parts List are "internal part numbers" (IPN's). Your spare parts orders can be handled more efficiently if you quote: equipment type, circuit reference and IPN, along with 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, D6, R12, etc) and those without (miscellaneous and mechanical).

Those with a circuit reference are grouped alphabetically by component type in numerical order. Each component entry comprises three columns: the circuit reference, IPN and description.

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

INDEX

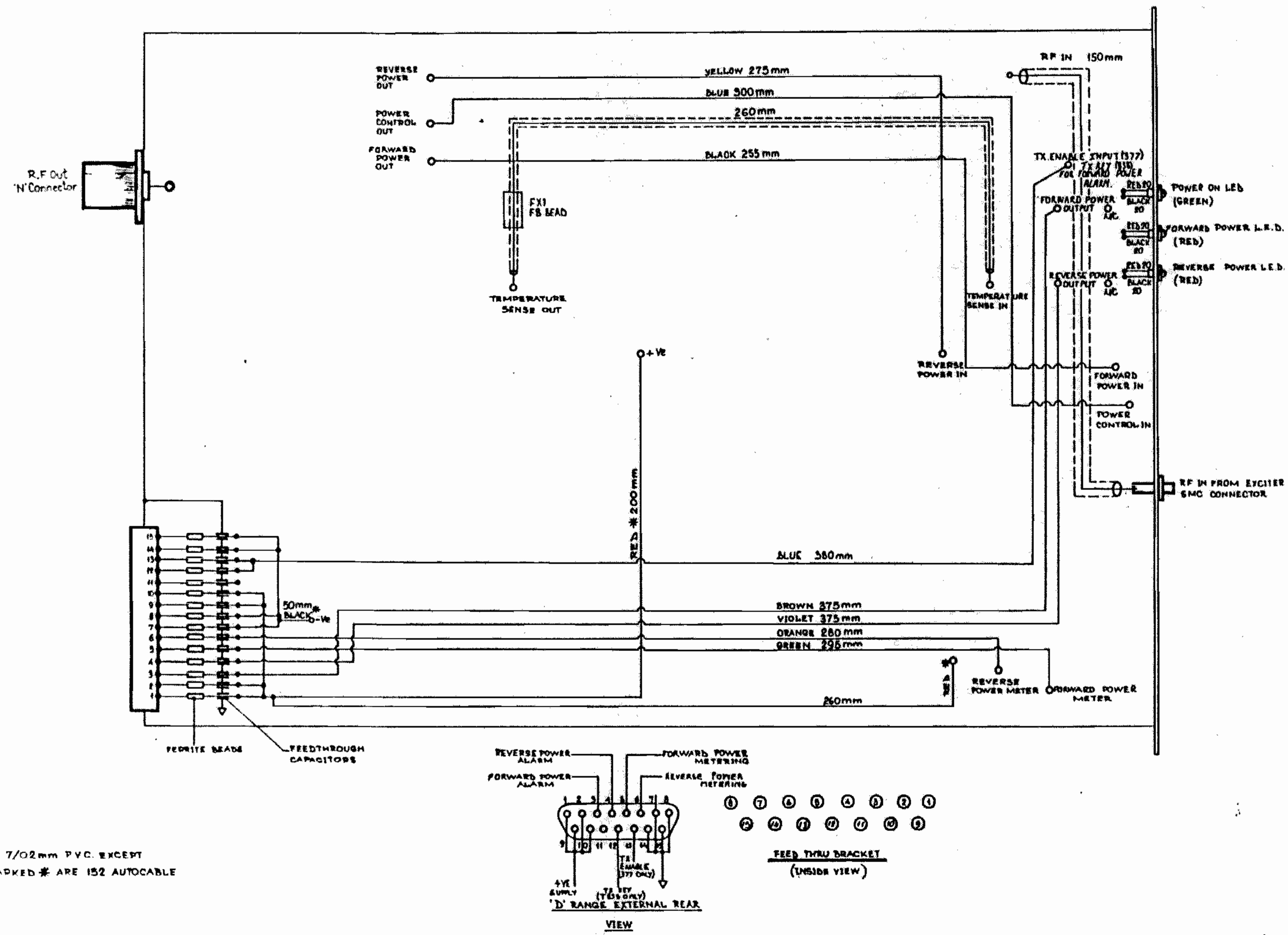
T838 PARTS LIST

REF	IPN	DESCRIPTION	
C1	022-04470-01	CAPACITOR MYLAR 4N7 10% 50V	
C2	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C3	022-04470-01	CAPACITOR MYLAR 4N7 10% 50V	
C4	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C5	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C6	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C7	022-05100-01	CAPACITOR MYLAR 10N 10% 50V	
C8	011-04100-01	CAPACITOR CERAMIC 1N0 10% T/C B 63V	
C9	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C10	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C11	022-05100-01	CAPACITOR MYLAR 10N 10% 50V	
C12	011-04100-01	CAPACITOR CERAMIC 1N0 10% T/C B 63V	
C13	011-04100-01	CAPACITOR CERAMIC 1N0 10% T/C B 63V	
C14	022-05100-01	CAPACITOR MYLAR 10N 10% 50V	
C15	011-04100-01	CAPACITOR CERAMIC 1N0 10% T/C B 63V	
C16	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C19	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C20	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
CC20A	015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V	
C21	020-07470-04	CAPACITOR ELECTRO RADIAL 4M7 25V 20% 8X13MM SOLID	
C22	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C23	022-04470-01	CAPACITOR MYLAR 4N7 10% 50V	
C24	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C25	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C26	022-05100-01	CAPACITOR MYLAR 10N 10% 50V	
C27	022-06100-10	CAPACITOR MYLAR 100N 10% 63V POTTED	
C28	022-05680-10	CAPACITOR MYLAR 68N 10% 63V POTTED 5MM LEAD SPACE	
C29	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C30	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C31	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C33	020-07470-04	CAPACITOR ELECTRO RADIAL 4M7 25V 20% 8X13MM SOLID	
C40	029-02220-02	CAPACITOR MICA 5MM CASE 22P 5%	
C41	029-02820-02	CAPACITOR MICA 5MM CASE 82P 5%	
C42	029-03180-02	CAPACITOR MICA 5MM CASE 180P 5%	
C43	017-15470-01	CAPACITOR CERAMIC SURFACE BARRIER 47N 20% 50V	
C44	022-05470-01	CAPACITOR MYLAR 47N 10% 50V	
C45	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C46	020-06470-07	CAPACITOR ELECTRO RADIAL 47M 16V 10X13MM HI TEMP	
C47	029-02390-02	CAPACITOR MICA 5MM CASE 39P 5%	
CC49	015-03680-02	CAPACITOR CERAMIC HIQ 1210 CHIP 680P 5% NPO 100V	
C50	029-03100-02	CAPACITOR MICA 5MM CASE 100P 5%	
C51	029-03220-02	CAPACITOR MICA 5MM CASE 220P 5%	
C52	017-15470-01	CAPACITOR CERAMIC SURFACE BARRIER 47N 20% 50V	
C53	022-05470-01	CAPACITOR MYLAR 47N 10% 50V	
C54	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C55	020-06470-07	CAPACITOR ELECTRO RADIAL 47M 16V 10X13MM HI TEMP	
C56	029-02680-02	CAPACITOR MICA 5MM CASE 68P 5%	
CV57	028-02600-01	CAPACITOR TRIMMER 5/60P FILM 3TAG PH 809	
CC58	015-03680-02	CAPACITOR CERAMIC HIQ 1210 CHIP 680P 5% NPO 100V	
C59	029-02270-02	CAPACITOR MICA 5MM CASE 27P 5%	
C65	029-02150-02	CAPACITOR MICA 5MM CASE 15P 5%	
C67	011-03150-01	CAPACITOR CERAMIC 150P 5% N150 50/63V	
C68	029-02680-02	CAPACITOR MICA 5MM CASE 68P 5%	
C69	029-02680-02	CAPACITOR MICA 5MM CASE 68P 5%	
CC70	015-03220-02	CAPACITOR CERAMIC HIQ 1210 CHIP 220P 5% NPO 100V	
CC71	015-03220-02	CAPACITOR CERAMIC HIQ 1210 CHIP 220P 5% NPO 100V	
C72	017-15470-01	CAPACITOR CERAMIC SURFACE BARRIER 47N 20% 50V	
C73	022-05100-01	CAPACITOR MYLAR 10N 10% 50V	
C74	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C75	029-03100-02	CAPACITOR MICA 5MM CASE 100P 5%	
CV76	028-02600-01	CAPACITOR TRIMMER 5/60P FILM 3TAG PH 809	
CC77	015-03680-02	CAPACITOR CERAMIC HIQ 1210 CHIP 680P 5% NPO 100V	
C78	029-02150-02	CAPACITOR MICA 5MM CASE 15P 5%	
C85	029-02150-02	CAPACITOR MICA 5MM CASE 15P 5%	
C87	011-03150-01	CAPACITOR CERAMIC 150P 5% N150 50/63V	
C88	029-02680-02	CAPACITOR MICA 5MM CASE 68P 5%	
C89	029-02680-02	CAPACITOR MICA 5MM CASE 68P 5%	
CC90	015-03220-02	CAPACITOR CERAMIC HIQ 1210 CHIP 220P 5% NPO 100V	
CC91	015-03220-02	CAPACITOR CERAMIC HIQ 1210 CHIP 220P 5% NPO 100V	
C92	017-15470-01	CAPACITOR CERAMIC SURFACE BARRIER 47N 20% 50V	
C93	022-05100-01	CAPACITOR MYLAR 10N 10% 50V	
C94	011-03220-01	CAPACITOR CERAMIC 220P 10% N750 50/63V	
C95	029-03100-02	CAPACITOR MICA 5MM CASE 100P 5%	
CV96	028-02600-01	CAPACITOR TRIMMER 5/60P FILM 3TAG PH 809	
CC97	015-03680-02	CAPACITOR CERAMIC HIQ 1210 CHIP 680P 5% NPO 100V	
C98	029-02150-02	CAPACITOR MICA 5MM CASE 15P 5%	
C99	020-08470-07	CAPACITOR ELECTRO RADIAL 47M 16V 10X13MM HI TEMP	
C105	029-02270-02	CAPACITOR MICA 5MM CASE 27P 5%	
C106	029-02120-03	CAPACITOR MICA 10MM CASE 12P 2%	
C106A	010-01330-01	CAPACITOR CERAMIC 3P3 +/-0.5P NPO 500V	
C107	029-02270-03	CAPACITOR MICA 10MM CASE 27P 2%	
C107A	010-01470-01	CAPACITOR CERAMIC 4P7+/-0.5P NPO 500V	
C108	029-02330-04	CAPACITOR MICA 10MM CASE 33P 2%	
C109	029-02270-03	CAPACITOR MICA 10MM CASE 27P 2%	
C109A	010-01470-01	CAPACITOR CERAMIC 4P7+/-0.5P NPO 500V	
C110	029-02120-03	CAPACITOR MICA 10MM CASE 12P 2%	
C110A	010-01330-01	CAPACITOR CERAMIC 3P3 +/-0.5P NPO 500V	
D1	008-00013-32	LED 3MM RED LOW CURRENT LESS MOUNTING	(S)
D2	008-00013-35	LED 3MM GREEN LOW CURRENT LESS MOUNTING	(S)
D3	008-00013-32	LED 3MM RED LOW CURRENT LESS MOUNTING	(S)
D4	001-00012-00	DIODE 1N4148 SILICON SMALL SIGNAL GENERAL PURPOSE	
D5	001-00012-00	DIODE 1N4148 SILICON SMALL SIGNAL GENERAL PURPOSE	
D6	001-00013-45	DIODE SCHOTTKY 1SS97/2	(S)
D7	001-00013-45	DIODE SCHOTTKY 1SS97/2	(S)
D8	001-00013-45	DIODE SCHOTTKY 1SS97/2	(S)
D9	001-00013-45	DIODE SCHOTTKY 1SS97/2	(S)
FX1	065-00010-04	BEAD FERRITE F8 4X2X5MM	
FT1	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT2	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT3	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT4	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT5	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT6	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT7	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT8	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT9	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT10	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT11	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT12	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT13	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT14	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
FT15	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD	
IC1	002-00010-60	INTEGRATED CCT LM339 QUAD COMPARITOR	(S)
IC2	002-00014-62	INTEGRATED CCT 317L 100MA REG 3 TERMINAL TO-92	
L1	056-00021-01	INDUCTOR FIXED 1.5UH AXIAL	
L2	056-00021-01	INDUCTOR FIXED 1.5UH AXIAL	
L5	056-00021-01	INDUCTOR FIXED 1.5UH AXIAL	
L6	065-00010-08	BEAD FERRITE 4S3 3*0.7*10MM RED	
L10	052-08130-25	COIL A/W 2.5T/3.0MM HOR 0.8MM WIRE	
L11	052-08335-10	COIL A/W 1T/3.5MM SMD 0.8MM WIRE	
L12	065-00010-08	BEAD FERRITE 4S3 3*0.7*10MM RED	
L13	065-00010-04	BEAD FERRITE F8 4X2X5MM	
L14	052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM WIRE	
L17	065-00010-08	BEAD FERRITE 4S3 3*0.7*10MM RED	
L18	065-00010-11	BEAD FERRITE 4S3 3*1*4MM RED	
L19	052-08140-55	COIL A/W 5.5T/4.0MM HOR 0.8MM WIRE	
L21	052-08130-25	COIL A/W 2.5T/3.0MM HOR 0.8MM WIRE	
L25	052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM WIRE	
L26	065-00010-22	BEAD FERRITE BALUN F14 NEOSID	
L28	065-00010-08	BEAD FERRITE 4S3 3*0.7*10MM RED	
L29	065-00010-11	BEAD FERRITE 4S3 3*1*4MM RED	
L30	065-00010-04	BEAD FERRITE F8 4X2X5MM	
L31	052-08135-65	COIL A/W 6.5T/3.5MM HOR 0.8MM WIRE	
L33	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM WIRE	
L34	052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM WIRE	
L40	052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM WIRE	
L41	065-00010-22	BEAD FERRITE BALUN F14 NEOSID	
L43	065-00010-08	BEAD FERRITE 4S3 3*0.7*10MM RED	
L44	065-00010-11	BEAD FERRITE 4S3 3*1*4MM RED	
L45	065-00010-04	BEAD FERRITE F8 4X2X5MM	
L46	052-08135-65	COIL A/W 6.5T/3.5MM HOR 0.8MM WIRE	
L48	052-08335-20	COIL A/W 2T/3.5MM SMD 0.8MM WIRE	
L49	052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM WIRE	
L52	052-08335-50	COIL A/W 5T/3.5MM SMD 0.8MM WIRE	
L53	052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM WIRE	
L54	052-08340-50	COIL A/W 5T/4.0MM SMD 0.8MM WIRE	
L55	052-08335-50	COIL A/W 5T/3.5MM SMD 0.8MM WIRE	
Q1	000-00011-05	TRANSISTOR BC547B NPN TO-92 AF SMALL SIG	
Q2	000-00011-05	TRANSISTOR BC547B NPN TO-92 AF SMALL SIG	
Q3	000-00020-70	TRANSISTOR BS170 JFET TO-92 SMALL SIG	(S)
Q4	000-00020-70	TRANSISTOR BS170 JFET TO-92 SMALL SIG	(S)
Q5	000-00030-95	TRANSISTOR 2N6107 PNP TO-220 AF POWER	
Q5A	000-00010-60	TRANSISTOR BC327 PNP TO-92 AF POWER	
Q8	000-00030-65	TRANSISTOR 2N6080 NPN STUD MTG VHF POWER 4W	
Q9	000-00030-53	TRANSISTOR 2N5590 NPN STUD MTG VHF POWER 10W	
Q12	000-00023-23	TRANSISTOR SRFH1001 NPN STUD MTG VHF POWER 30W	
Q14	000-00023-23	TRANSISTOR SRFH1001 NPN STUD MTG VHF POWER 30W	
R1	030-03680-00	RESISTOR FILM 680E 5% 0.25W 7X2.5MM	
R2	030-03680-00	RESISTOR FILM 680E 5% 0.25W 7X2.5MM	
R3	030-03680-00	RESISTOR FILM 680E 5% 0.25W 7X2.5MM	
R4	030-05100-00	RESISTOR FILM 10K 5% 0.25W 7X2.5MM	
R5	030-07100-00	RESISTOR FILM 1M 5% 0.25W 7X2.5MM	
RV6	042-05470-09	RESISTOR PRESET 50K CERMET 9.5MM SQ FLAT	
R7	030-05100-00	RESISTOR FILM 10K 5% 0.25W 7X2.5MM	
RV8	042-05470-09	RESISTOR PRESET 50K CERMET 9.5MM SQ FLAT	
R9	030-05470-00	RESISTOR FILM 47K 5% 0.25W 7X2.5MM	
RV10	042-05470-09	RESISTOR PRESET 50K CERMET 9.5MM SQ FLAT	
R11	030-07100-00	RESISTOR FILM 1M 5% 0.25W 7X2.5MM	
R12	030-07100-00	RESISTOR FILM 1M 5% 0.25W 7X2.5MM	
R13	030-05100-00	RESISTOR FILM 10K 5% 0.25W 7X2.5MM	
R14	030-06100-30	RESISTOR FILM 10M 10% 0.25W 7X2.5MM	
R15	030-05100-00	RESISTOR FILM 10K 5% 0.25W 7X2.5MM	
RV16	042-05470-09	RESISTOR PRESET 50K CERMET 9.5MM SQ FLAT	
R17	030-05470-00	RESISTOR FILM 47K 5% 0.25W 7X2.5MM	
R18	030-04470-00	RESISTOR FILM 4K7 5% 0.25W 7X2.5MM	
R20	030-03470-00	RESISTOR FILM 470E 5% 0.25W 7X2.5MM	
R21	030-02560-00	RESISTOR FILM 56E 5% 0.25W 7X2.5MM	
R22	030-05470-00	RESISTOR FILM 47K 5% 0.25W 7X2.5MM	
R23	030-04470-00	RESISTOR FILM 4K7 5% 0.25W 7X2.5MM	
R25	030-03470-00	RESISTOR FILM 470E 5% 0.25W 7X2.5MM	
R26	030-02560-00	RESISTOR FILM 56E 5% 0.25W 7X2.5MM	
R30	030-04100-00	RESISTOR FILM 1K 5% 0.25W 7X2.5MM	
R31	030-03220-00	RESISTOR FILM 220E 5% 0.25W 7X2.5MM	
RV32	044-04200-03	RESISTOR PRESET MULTITURN 2K 10T PNL MOUNTING	

REF	IPN	DESCRIPTION
R33	030-04470-00	RESISTOR FILM 4K7 5% 0.25W 7X2.5MM
R34	030-04470-00	RESISTOR FILM 4K7 5% 0.25W 7X2.5MM
RV35	042-04220-02	RESISTOR PRESET 2K CERMET 9.5MM SQ FLAT
R36	030-04470-00	RESISTOR FILM 4K7 5% 0.25W 7X2.5MM
R37	045-04470-01	RESISTOR NTC 4K7 20% 5MM DISC
R38	030-06100-00	RESISTOR FILM 100K 5% 0.25W 7X2.5MM
RV39	042-05100-10	RESISTOR PRESET 10K CERMET 9.5MM SQ FLAT
R40	030-04100-00	RESISTOR FILM 1K 5% 0.25W 7X2.5MM
R41	030-04100-00	RESISTOR FILM 1K 5% 0.25W 7X2.5MM
R47	032-32100-00	RESISTOR M/F POWER 10E 5% 1W 10X4MM
R48	032-32100-00	RESISTOR M/F POWER 10E 5% 1W 10X4MM
R49	032-32470-00	RESISTOR M/F POWER 47E 5% 1W 12X4.5MM
R50	032-31470-00	RESISTOR M/F POWER 4E7 5% 1W 12X4.5MM
R51	032-33180-00	RESISTOR M/F POWER 180E 5% 1W 12X4.5MM
R52	032-32100-00	RESISTOR M/F POWER 10E 5% 1W 10X4MM
R53	032-33180-00	RESISTOR M/F POWER 180E 5% 1W 12X4.5MM
R54	032-31470-00	RESISTOR M/F POWER 4E7 5% 1W 12X4.5MM
R55	032-33330-00	RESISTOR M/F POWER 330E 5% 1W 12X4.5MM
R56	032-31470-01	RESISTOR M/F POWER 4E7 5% 2.5W 17X5MM
R57	032-33820-01	RESISTOR M/F POWER 820E 5% 2.5W 17X5MM
R58	032-33820-01	RESISTOR M/F POWER 820E 5% 2.5W 17X5MM
R65	032-32470-00	RESISTOR M/F POWER 47E 5% 1W 12X4.5MM
R66	032-33330-00	RESISTOR M/F POWER 330E 5% 1W 12X4.5MM
R67	032-31470-00	RESISTOR M/F POWER 4E7 5% 1W 12X4.5MM
R68	032-33330-00	RESISTOR M/F POWER 330E 5% 1W 12X4.5MM
R69	032-33100-02	RESISTOR M/F POWER 100E 5% 6W 33X9MM
R74	032-33100-02	RESISTOR M/F POWER 100E 5% 6W 33X9MM
R75	032-32470-00	RESISTOR M/F POWER 47E 5% 1W 12X4.5MM
R76	032-33330-00	RESISTOR M/F POWER 330E 5% 1W 12X4.5MM
R77	032-31470-00	RESISTOR M/F POWER 4E7 5% 1W 12X4.5MM
R78	032-33330-00	RESISTOR M/F POWER 330E 5% 1W 12X4.5MM
TL3	051-00005-17	COIL TAIT NO 517 DIRECTIONAL COUPLER

T838 PARTS LIST MECHANICAL & MISCELLANEOUS

IPN	DESCRIPTION
065-00010-13	BEAD FERRITE 7D 1.9*0.9*3.8MM STACK POLE
200-00010-05	WIRE TINNED COPPER 0.5MM 9 x 55mm
201-00050-12	CABLE AUTO 152 RED 28/0.3MM PVC
201-00050-20	CABLE AUTO 152 BLACK 28/0.3MM PVC
206-00010-11	CABLE COAXIAL 50 OHM RG316-U PTFE 2x386mm TL1 & TL2
206-00010-11	CABLE COAXIAL 50 OHM RG316-U PTFE
206-00010-12	CABLE COAXIAL 50 OHM RG 178 PTFE MINIATURE
220-01100-01	PRINTED CIRCUIT BOARD T377 RF PWR AMP CCT A1C543
240-00010-55	PLUG 15 WAY D RANGE WIRE WRAP PINS PNL MTG
240-00100-46	PLUG COAXIAL BULKHEAD JACK SUHNER 24 SMC50-2-10C
240-02010-54	SOCKET 15WAY D RANGE PANEL MTG DAF15S
240-02100-06	SOCKET COAXIAL N TYPE PANEL MTG OPEN TERMINATION
240-04020-30	SOCKET 14 PIN DIL INTEGRATED CCT LOW PROFILE IC1
240-06010-14	CLAMP LATCHING 15 WAY D RANGE
240-06010-15	BLOCK LATCHING 15WAY D RANGE
302-05190-00	BRACKET A4M1892 ADJUSTABLE STOP T377 PA
303-23108-00	COVER SIDE COMPLETE A2A406 A2M1874 T377 PA
306-01010-00	FERRULE A4M948 HANDLE FXD EQUIP
308-01007-00	HANDLE A4M949 FXD EQUIP
308-13068-00	HEATSINK A1M2274(1M1869) CASTING COMPLETE T377 PA
316-06413-00	PANEL FRONT COMPLETE T838 PA A3M2219/6 A3M2219/1
316-85018-00	PIN A4M1397 COAXIAL CONDUCTOR T316 346 377PA 341A mtg to skt coax 'N' type.
318-01011-00	RAIL A2M1872 BOTTOM T377 PA
318-01012-00	RAIL A3M1873 TOP T377 PA
319-01152-00	SHIELD A3M2250 FEEDTHRU MTG T857
345-00040-06	SCREW M3*8MM PAN POZI ST BZ frnt pnl to rack (pack with each PA)
345-00040-09	SCREW M3*6MM CSK POZI ST BZ top/bottom rails (pack with each PA)
345-00040-11	SCREW M3X10MM PAN POZI ST BZ Q5 mtg
345-00040-16	SCREW M3X20MM PAN POZI ST BZ
345-00040-20	SCREW M3*8MM BUTTON SKT HD BLACK ZINC PHOS
349-00020-32	SCREW TAPTITE M3X8MM PAN POZI BZ mtg PCB to heatsink x 8 Coax to skt x 4 Q5 mtg x 1
349-00020-32	SCREW TAPTITE M3X8MM PAN POZI BZ cover x 18 brkt stop x 2
352-00010-29	NUT M4 NYLOC HEX
352-00010-35	NUT 8-32 UNC HEX RF POWER TRANSISTOR MOUNTING
353-00010-10	WASHER M3 FLAT ST BZ 6.75MM OD A4M1215 Q5 mtg
353-00010-10	WASHER M3 FLAT ST BZ 6.75MM OD A4M1215
356-00010-03	TAG SOLDER 3MM LONG M6249/3.2
360-00010-41	BUSH SHORTY BLACK HEYCO B-187-125
362-00010-07	GASKET SILICONE INSULATING TO-220 Q5 mtg
362-00010-13	BUSH INSULATING 1.1MM TOP HAT Q5 mtg
362-00010-21	GASKET SILICONE INSULATING TO-126 Q5 mtg
362-00010-33	GROMMET LED MTG 3MM LO CURRENT LEDS
365-00100-03	LABEL BLANK 10.8X30MM S/A METALISED POLYESTER
365-00100-20	LABEL WHITE S/A 28X11MM QUIKSTIK RW718/4
369-00010-14	TIE CABLE NYLON 100*2.6MM
369-00010-14	TIE CABLE NYLON 100*2.6MM
399-00010-65	BAG PLASTIC 375*500MM
400-00020-05	SLEEVING 1.5MM SILICONE RUBBER
410-00010-42	PACKAGING CARTON 60MM FXD EQUIP MODULE UEB 15096
410-00010-56	CARTON PRINTPAC STK 10
410-01076-00	PACKAGING 340X50X20MM POLYSTYRENE FOAM SL TYPE



NOTE: ALL WIRES 7/02mm P.V.C. EXCEPT WHERE MARKED # ARE 152 AUTOCABLE

SCALE:
MATERIAL:
FINISH:
GEN. LIMITS:

THIRD ANGLE PROJECTION

IPN

USED ON: T377/PA, T838

ISSUE	AMENDMENTS	DRN.	CHKD	APVD	DATE
A	ORIGINAL				
B	[illegible]				
C	[illegible]				
D	[illegible]				

TAIT ELECTRONICS Ltd.
Christchurch New Zealand

WIRING DIAGRAM 50W VHF PA

DRAWING NUMBER A2C541

ISSUE A B C D E

DO NOT SCALE OFF DRAWING

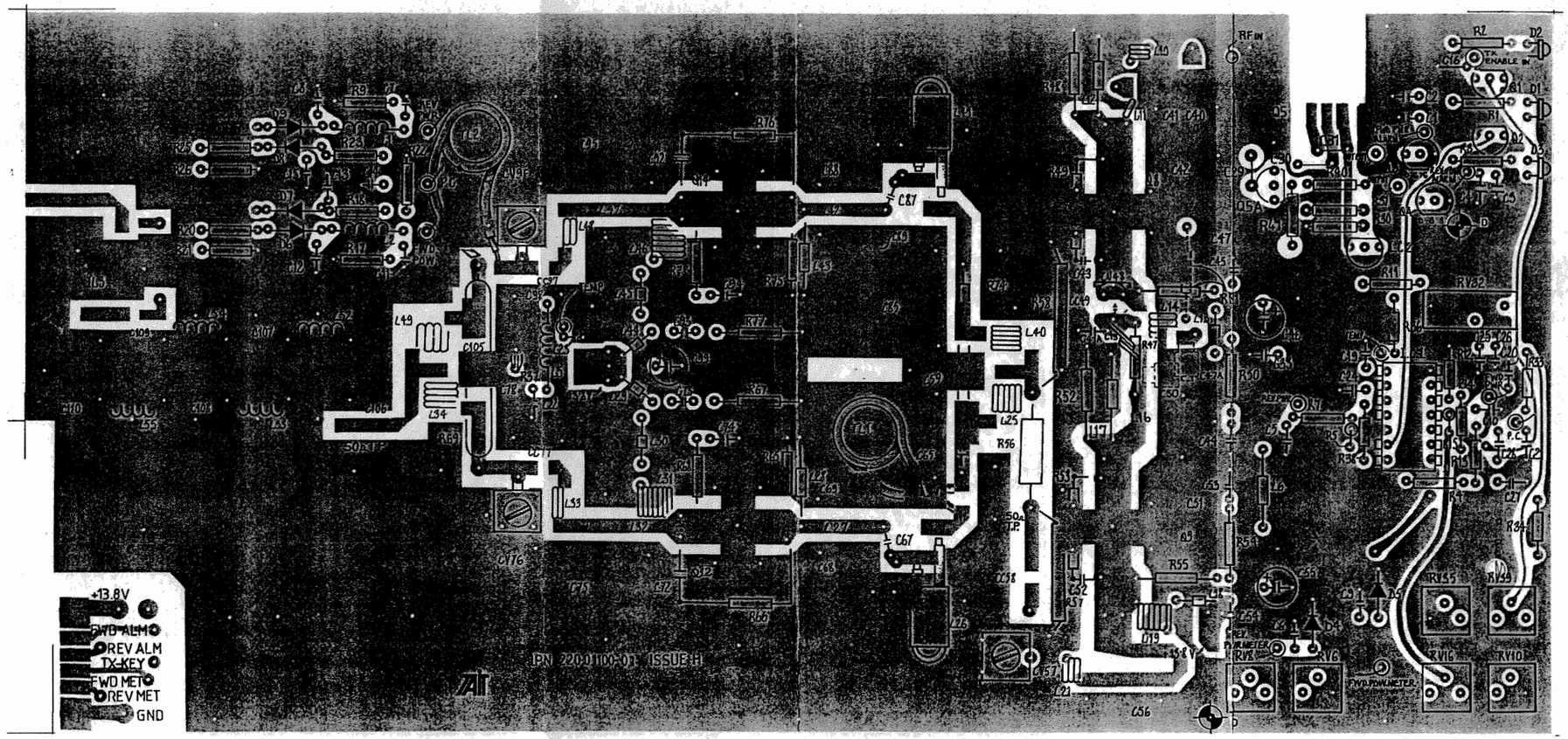


Diagram 1 T838 PCB Layout - Top Side

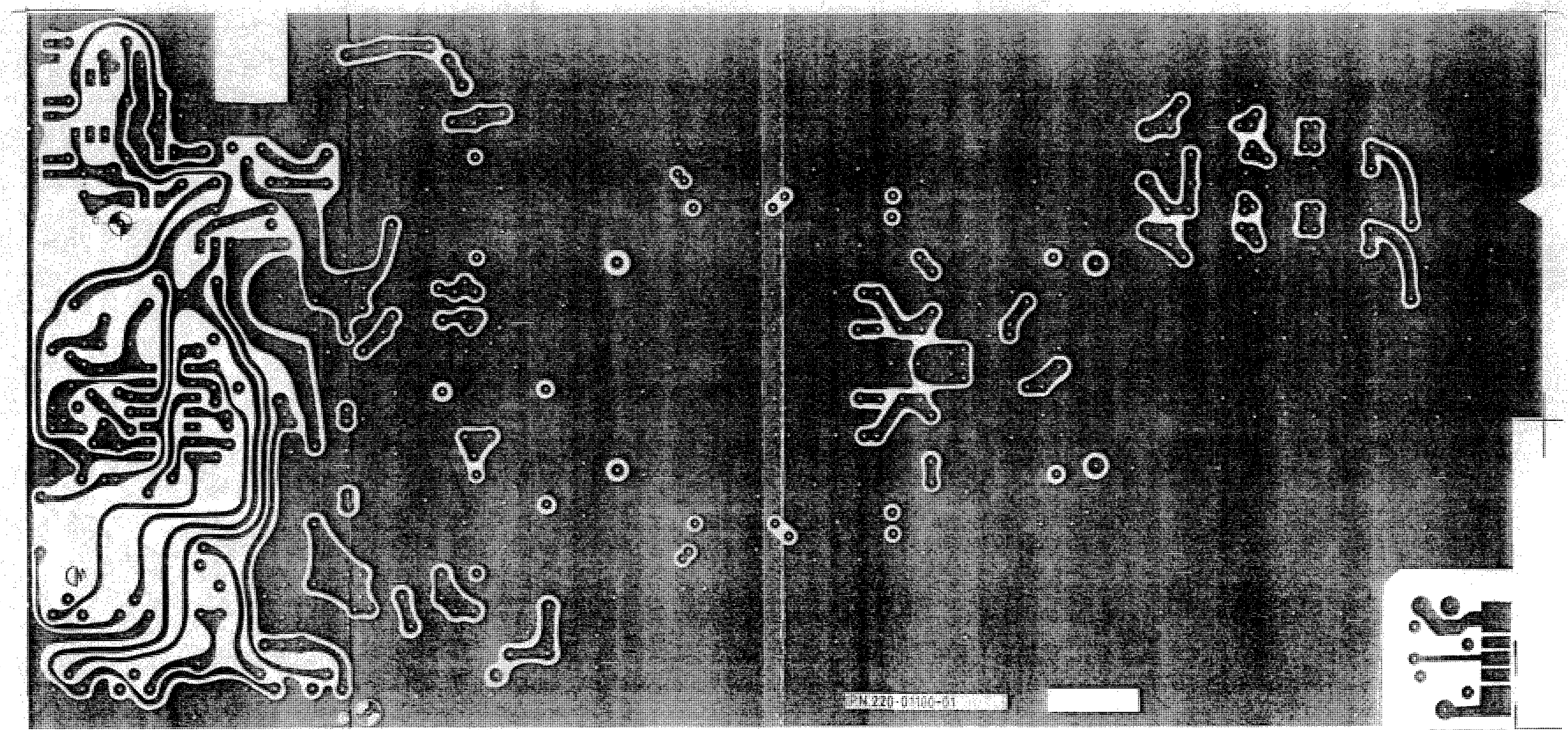
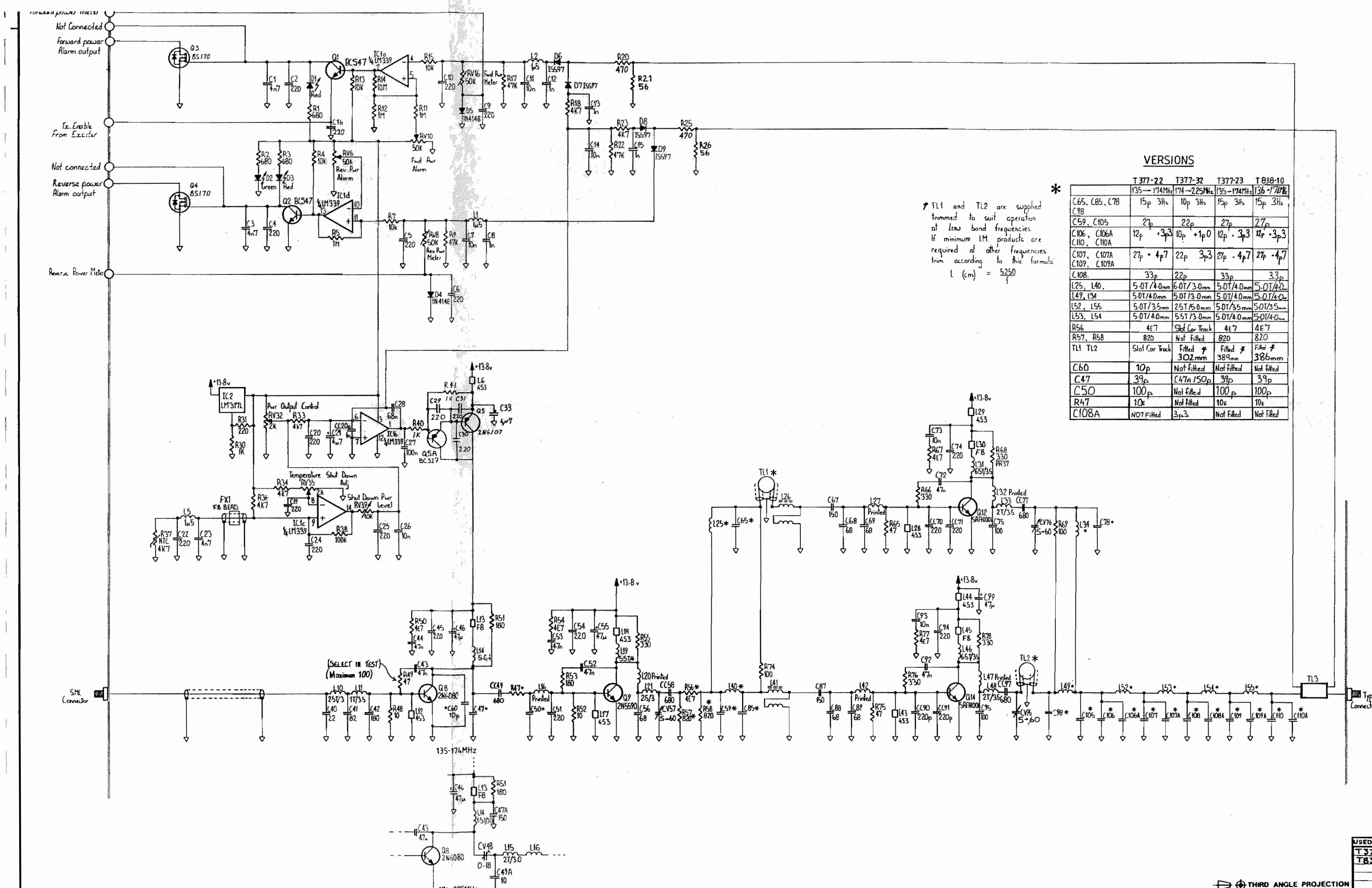


Diagram 2 T838 PCB Layout - Bottom Side



† TL1 and TL2 are supplied trimmed to suit operation at low band frequencies. If minimum IM products are required at other frequencies trim according to this formula L (cm) = $\frac{5250}{f}$

VERSIONS

*	T377-22	T377-32	T377-23	T838-10
	135→174MHz	174→225MHz	135→174MHz	136→174MHz
C65, C85, C78, C98	15p 3Hs	10p 3Hs	15p 3Hs	15p 3Hs
C59, C105	27p	22p	27p	27p
C106, C106A, C110, C110A	12p +3p3	10p +1p0	12p · 3p3	12p +3p3
C107, C107A, C109, C109A	27p + 4p7	22p 3p3	27p · 4p7	27p +4p7
C108	33p	22p	33p	33p
L25, L40.	5·0T/4·0mm	6·0T/3·0mm	5·0T/4·0mm	5·0T/4·0mm
L49, L34	5·0T/4·0mm	5·0T/3·0mm	5·0T/4·0mm	5·0T/4·0mm
L52, L55	5·0T/3·5mm	2·5T/5·0mm	5·0T/3·5mm	5·0T/3·5mm
L53, L54	5·0T/4·0mm	5·5T/3·0mm	5·0T/4·0mm	5·0T/4·0mm
R56	4E7	Slot Cor Track	4E7	4E7
R57, R58	820	Not Fitted	820	820
TL1 TL2	Slot Cor Track	Fitted † 302mm	Fitted † 389mm	Fitted † 386mm
C60	10p	Not fitted	Not fitted	Not fitted
C47	39p	C47A 150p	39p	39p
C50	100p	Not fitted	100p	100p
R47	10E	Not fitted	10E	10E
C108A	NOT Fitted	3p3	Not Fitted	Not Fitted

USED ON: T377, T838

THIRD ANGLE PROJECTION

PCB IPN 220-01100-01

SCALE:
MATERIAL:
FINISH:
GEN. LIMITS:

CIRCUIT DIAGRAM

50W VHF PA

TAIT ELECTRONICS LTD

DRAWING NUMBER A1C543

ISSUE K