Eclipse Series

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PA501Amplifier
Operation and Maintenance Manual

This manual is produced by RF Technology Pty Ltd
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Contents

WARNING

Changes or modifications not expressly approved by RF Technology could void your authority to operate this equipment. Specifications may vary from those given in this document in accordance with requirements of local authorities. RF Technology equipment is subject to continual improvement and RF Technology reserves the right to change performance and specification without further notice.

1 Operating Instructions

The PA501 is part of the Eclipse range of modular base station equipment. It is a broadband power amplifier capable of continuously delivering 100 Watts of power in the 400-512MHz frequency range. It is designed to complement the T500 transmitter, and mounts in a standard Eclipse sub-rack.

1.1 Installation

There are no front panel controls requiring adjustment on the PA501. In normal circumstances no alignment or setup is required. If mounted in a sub-rack that has not previously been wired for a power amplifier, the rack connector must be wired according to the guidelines in section 1.1.1 below.

1.1.1 Sub-rack Wiring Guidelines

When installing an Eclipse Power Amplifier in an Eclipse sub-rack, observe the following guidelines for sub-rack installation:

- The sub-rack power supply must be capable of delivering the full current requirements for all modules fitted in the sub-rack, typically 30 Amperes at 13.0 Volts for a complete repeater.

- Owing to the high current drain, power supply lines should be cabled to the power amplifier separately and using heavy gauge wire to minimise voltage drop and interference with the power supply to other modules in the rack.

- The ALC line from the power amplifier must be connected to the ALC input of the exciter. If this connection is not correctly made, no control of the output power level will be possible. This can result in excessive RF output power, and consequent breach of licensing authority regulations, or possible overload of the unit.

  With an Eclipse T500, join pin 8 on the exciter and the amplifier.

1.2 Front Panel Indicators

PWR LED The power (PWR) LED shows that the dc supply is connected to the transmitter.

RFO LED The RF output (RFO) LED indicates that the amplifier is being driven and that the forward output power is above a preset level. This preset indication level is generally set 1 - 3 dB below the preset output power level.

TEMP LED The temperature (TEMP) LED indicates (illuminates) should the amplifier's internal temperature become too high. The RF power is automatically reduced by 6-10 dB if the internal temperature rises above safe limits and the cooling fans run continuously until the temperature drops.

1.3 Internal Adjustments (Rev 05/9151)

All internal adjustments are factory set and should not need to be changed under normal conditions. A possible exception to this is the RF output power level which may need to be changed to comply with local licensing requirements. The low forward power warning circuit should be set at the same time as the forward power level. The controls are described below, and the recommended procedure for carrying out the alignment is set out in section 3.1.

WARNING

Ensure that the power setting complies with the requirements of your licensing authority. Failure to do so may result in penalties being imposed by the licensing authority.

Output Power The output power is set by VR136. This is nominally set to 100 Watts (+50dBm), but may be set to any value between 40 and 125 Watts depending upon local regulations in the destination country, and the model of power amplifier. VR136 determines the threshold affecting the ALC voltage that is fed back to the transmitter module to regulate RF output power.

RF Level Detector The forward RF power threshold associated with the RFO LED on the amplifier front panel is set by VR143. This is nominally set at half to three-quarters of the preset output power, 50 - 90 Watts.

1.4 Amplifier I/O Connections

The PA501 has three connectors on the rear panel.

1.4.1 RF Input

The RF drive is delivered via a BNC connector. The absolute maximum power that should be applied to this connector is 17 Watts.

1.4.2 RF Output

The RF output signal is available from an N-type connector.

Pins	Function
1, 2, 3, 4, 5, 14, 15, 16, 17	Positive supply
9, 10, 11, 12, 13, 22, 23, 24, 25	Ground (negative supply)
8	ALC output

Table 1: Pin connections for the 25 pin "D" connector on the rear panel

Note: The amplifier is capable of delivering as much as 120 Watts continuously. In certain conditions[1] an RF power of 180 Watts or more can be available via this connector. This power level can cause burns like any 180w power source. Appropriate care should be taken when working on the PA501 to avoid making or breaking connections when the amplifier is operating, and to avoid RF burns through close proximity to live connections, etc.

1.4.3 25 Pin Connector

The 25-pin "D" connector provides connection to ground and dc power, and from the automatic level control (ALC) circuit. The pin connections are given in table 1.

2 Circuit Description

The following descriptions should be read as an aid to understanding the block and schematic diagrams shown in figures 1 and 2.

2.1 Block Overview

The PA501 is comprised of two stages of RF amplification, a directional coupler sensing forward and reverse power flow, an output low-pass filter and sundry associated control and monitoring circuitry. The second RF amplifier employs two transistors operating in parallel, a power splitter following the first RF

[1]Excessive powers may be available, for example, in the event of a failure of the ALC loop, such as may arise if the ALC feedback connection is broken.

amplifier stage, and is followed by a lumped/distributed network that performs both impedance matching and power combining ahead of the output filter.

The PA501 design is very broad band and will not usually require adjustment once it has left the factory unless components are changed or the equipment is required to move frequency from one extreme end of the band to the other.

While it is often possible to achieve an adjustment that provides higher efficiency or higher output power at one particular frequency, such adjustment will almost certainly compromise operation in other parts of the band. Such adjustment is not recommended and voids the warranty. Owing to the risk of severe RF burns the PA501 should not be operated with its protective covers removed except by qualified personnel.

2.2 RF Amplifiers (Rev 05/9151)

The input to the PA501 is connected to the first RF amplifier stage, based around Q3, by a matching network consisting of C43/44, etc. Q3 has a gain of 7-8dB, raising the power level to about 35 Watts.

The main RF power amplification is provided by two single, class-C, transistor amplifiers centered around Q1 and Q2. Each amplifier contributes half the output power. The input and output impedances of the transistors are matched, and the power split before the second stage, and combined after it, by broad band matching networks employing both lumped and distributed (microstrip) components.

Variable capacitors are used in the input network to optimize the input match across the desired fequency range, between the two RF stages, and in the output network to optimize the output efficiency.

The dc supply is fed to the three RF power transistors through resistors to allow the collector current of each to be measured at the front panel test socket.

2.3 Directional Coupler

The forward and reverse power components are measured through a coupled line directional coupler. The output of the coupled line is frequency compensated and impedence matched by R100, R101, R102 and R103 before being detected by D101 and D101.

The dc output of the detectors is proportional to the forward and reflected RF power.

2.4 Low Pass Filter

A low pass filter consisting of L1 - 4 reduces the harmonic components to less than -70dBc. The filter uses a combination of lumped elements and printed components to obtain the required harmonic attenuation.

2.5 Power Control Circuits (Rev 05/9151)

The forward and reverse voltages from the directional coupler are amplified and inverted by Q103 and Q101. The amplified voltages are compared to preset reference levels and the comparison signals are combined in a logical fashion by Q109 and Q108 and used to produce the ALC signal. VR137 sets the maximum permitted reverse power level.

The ALC signal is filtered and supplied to the rear panel system connector for connection to the ALC control input of an exciter such as the model T500.

Equipment Type	**Key Specifications**
Power Supply	13.8Vdc, (<25A for 120W)
RF Source	15 Watt source, 450-512MHz, e.g. T500
RF Load / Attenuator	30 dB Attenuator, 50Ω, 150W, SWR<1.2:1
RF Power Meter	eg. HP437B or calibrated detector and voltmeter

Table 2: Standard test equipment for the PA501 Power Amplifier

2.6 RF Output Indicator

The forward power voltage is compared with the pre-set dc reference voltage from VR136 by Q106, Q107. The output of Q113 is used to turn on the RFO LED. The forward power voltage is buffered to Q116 to turn on the fans via Q6.

VR143 is normally set so that the RFO LED comes ON when output power is 1 - 3db below the nominal power output level.

2.7 Over Temperature Protection

Thermistor RT144 is mounted to the case of output transistor Q1. If the transistor case temperature rises above 90 Celsius (about 194^{o} F) the resistance of RT144 increases and Q117 is turned ON.

This causes the TEMP LED and the fans to come on and also reduces the dc output voltage of the ALC signal via Q109. The input power will then be reduced by the transmitter ALC circuits and the output transistor is kept within safe operating limits.

3 Field Alignment Procedures (Rev 05/9151)

Section 3.1 below describes how to adjust the PA501 amplifier for a particular output power level. Section 3.2 broadly describes how to align the PA501 matching circuits. This second procedure should not be necessary except after repair of a damaged unit, and requires specialised equipment. It should not be undertaken without appropriate tools and equipment.

3.1 Output Power Level

1. Set the unit up on a bench with the standard test equipment listed in table 2.

2. Set VR136 and VR137 both fully counter-clockwise.

3. Set the exciter to the desired operating frequency.

4. Adjust VR136 to set the output power on the meter to the level at which you want the RFO LED to indicate (allowing for load attenuation). Note that the meter should be calibrated to read the power at the connector of the power amplifier, not at the end of any cables or attenuators.

5. Adjust VR137 until the RFO LED just goes out.

6. Adjust VR136 for the desired output power.

3.2 Tuning Procedure

Adjustment of the matching circuits is carried out with the aim of:

- ensuring that the specified power of 100 Watts is available[2]
- balancing the load reasonably equally between the power transistors, and
- obtaining acceptable efficiency in the power transistors.

Note that the factory alignment procedure is complicated, but allows a given unit to operate across a full 450-512MHz band, without further adjustment. Alignment without appropriate equipment can leave the amplifier unstable or otherwise unable to meet specification.

The procedure calls for detection of the output power while sweeping the test frequency, preferably by means of a calibrated network analyser or spectrum analyser. If this is not possible, a rough approximation may be possible by observing the output of the unit's own ALC detector circuit with a swept stimulus.

[2] At some frequencies a continuous power level of 120W is possible.

1. Set the unit up on a bench with the test equipment as given in table 3

2. Disable the ALC loop

3. Connect the output of the 15 Watt source directly to the annenuator, bypassing the PA501 amplifier.

4. If you are using a network analyser, carry out calibration according to the instruments instructions so as to obtain a 0 dB display from about 425MHz to 525MHz. Set the sweep time to no less than 0.2s, and the stimulus power to +42 dBm (15W). If you are using a swept source etc., store the response of the test arrangement into a reference memory of the 'scope.

5. Connect the PA501 back in the circuit, and apply power.

6. The amplifier should have a gain of 10 dB across the frequency band, the collector currents of Q1/Q2 should be within 20% of each other, and less than 10A each, at each frequency in the sweep. The power delivered should exceed 125W across the whole band.

7. Adjust the variable capacitors to achieve the above conditions. Beware achieving higher gain across a narrow band. Also note that performance will change a little when the lid is bolted down.

8. Reconnect the ALC loop. Check that the power levelling is working to within a dB using a sweep speed of about 20MHz/second.

Power Supply	13.8V dc (<25A)
RF Source	15 Watt swept source, 450-512MHz e.g., Network Analyser, Spectrum Analyser and tracking generator, or sweep generator and RF amplifier
RF Load	Attenuator, 50Ω, 150W, SWR<1.2:1
RF Power Meter	e.g. Network Analyser, Spectrum Analyser, or HP532D calibrated detector and digital storage scope
Dc Power Monitor	Q1/Q2 collector current

Table 3: Swept-frequency test equipment and conditions for the PA501 Power Amplifier.

4 Specifications

4.1 Description

The PA501 power amplifier is designed for use with the T500 series transmitters to provide 120 Watts of RF output. Output power is regulated by connecting the ALC output to the ALC input of the T500. The drive from the transmitter module is then automatically adjusted to maintain the required output.

The regulated power level can be preset over a wide guaranteed range from 25 to 120 Watts or more, depending on the available driver power.

Sensing circuits are provided to protect the output transistors from excessive temperature. If the heat sink temperature rises to 90C, the input drive will be reduced to prevent damage.

4.2 Physical Configuration

The power amplifier is designed to fit in an RF Technology sub-rack within a 19" rack frame. The installed height is 4 Rack Units (RU), or 178mm, and the depth is 350mm. The amplifier is 158.75 mm or five Eclipse units wide. The amplifier uses an extruded aluminium heat sink with vertical fins and fan-assisted air circulation. Heatsink temperature rise is typically 30C.

4.3 Front Panel Indicators and Test Points

4.3.1 Indicators

Power: Green LED

RF Power: Yellow LED

Over Temperature: Red LED

4.3.2 Test Points

Forward Power: Voltage to ground, 0 - 5V, uncalibrated

Reverse Power: Voltage to ground, 0 - 5V, uncalibrated

Collector Currents: Voltage to positive supply, across 22mΩ, ±10%

4.4 Electrical Specifications

4.4.1 Power Requirements

Operating Voltage: 10.5 - 16 Volts, with reduced output power below 12.5V

Current Drain: 25 Amperes maximum (20 typical) at 120 Watts and 13.5 Volts, 100mA maximum standby

Polarity: Negative Ground

4.4.2 Frequency Range

Model	Frequency Range
PA501A	400-450MHz
PA501B	450-512MHz

4.5 Antenna Impedance

Nominal load impedance is 50Ω SWR 1.5:1 or better. The PA501 will operate with a VSWR of 2:1 at all phase angles. The forward power will reduce as reverse power rises above acceptable limits, typically at an SWR of about 2.5:1.

4.6 Output Power

Nominally 100 Watts, preset adjustable from 25 to 120, typically 125 Watts maximum. Gain is >8.5dB.

4.6.1 Transmit Duty Cycle

The transmitter is rated for 100% duty cycle (continuous operation) at 100W output for air temperature below 40C. Derate linearly above 40C to 50% at 60C. At 125W output, limit to 80% duty cycle or 2 minutes operation at 40C, derate to 40% at 60C.

4.7 Spurious and Harmonics

70dBc minimum at any harmonic of the transmit frequency.

4.8 Heatsink Temperature

The heatsink temperature can rise to 80C without affecting operation, except for derating based on air-temperature as noted in section 4.6.1 above. Shutdown will occur at heatsink temperatures exceeding approximately 90C.

4.9 ALC Output

The ALC is intended for connection to the T500. It supplies a voltage which decreases with increasing power or temperature. Voltages below 6V should reduce drive power, at a rate of approximately 6 dB/Volt, with voltages below 1V producing a minimum of 25 dB attenuation.

4.10 Connectors

4.10.1 RF Input

The RF drive is delivered via a BNC connector. The maximum power that should be applied to this connector is 17 Watts.

4.10.2 RF Output

The RF output signal is available from an N-type connector.

4.10.3 25-Pin Connector

A 25-pin, “D” connector provides connection to ground and dc power, and from the automatic level control (ALC) circuit. The pin connections are given in table 1.

A Engineering Diagrams

Where engineering diagrams are sufficiently complicated, large scale versions are included as inserts or fold-outs elsewhere in the manual for reading convenience. If inserts are missing or damaged, the information is identical to that presented in figures embedded in the text.

A.1 Block Diagram

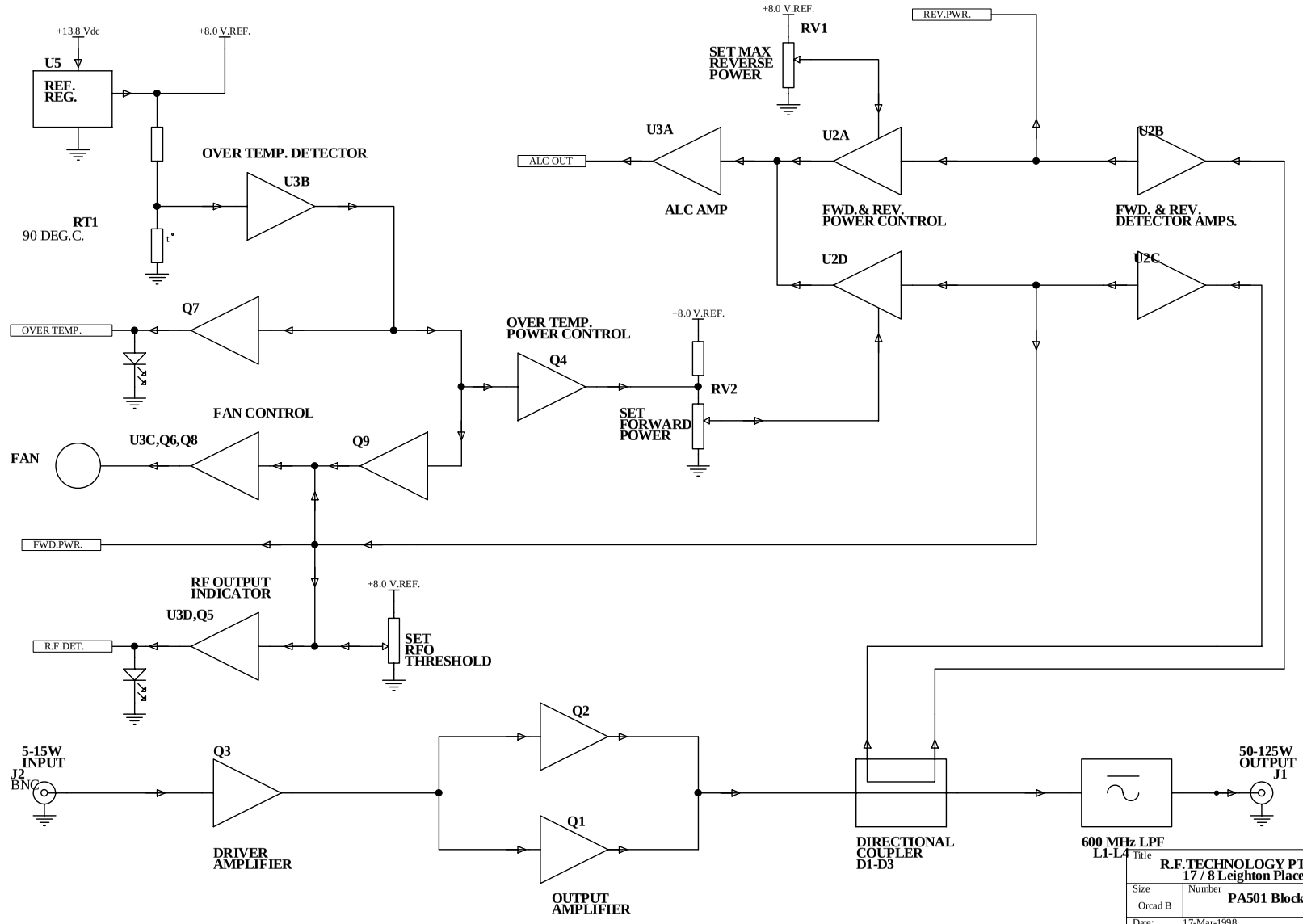
Figure 1 shows the block signal flow diagram of the PA501 amplifier.

A.2 Circuit Diagrams

Figure 2 shows the detailed circuit diagram of the PA501 amplifier with component desiquators and values.

A.3 Component Overlay Diagrams

Figure 3 shows the PCB overlay guide of the PA501 amplifier with component positions.



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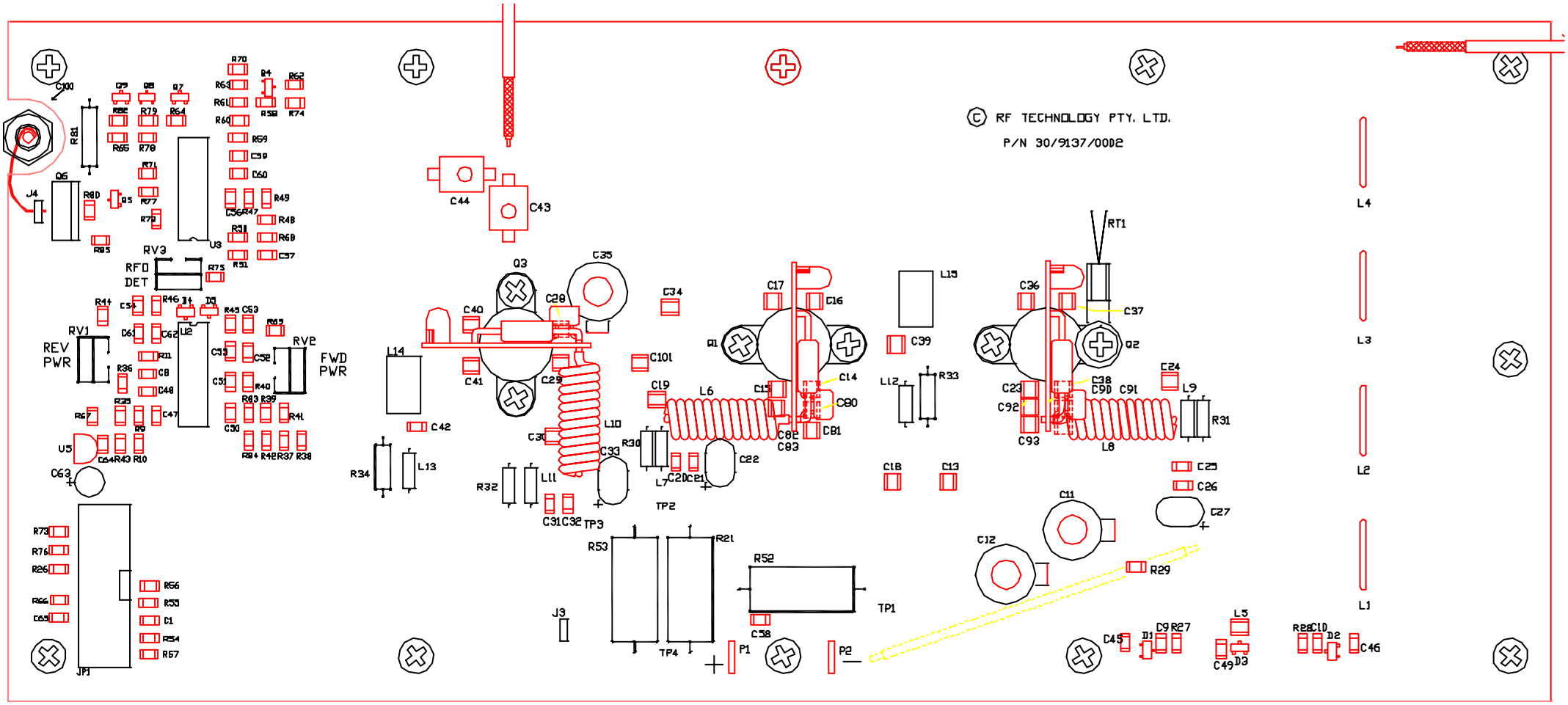
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P/N 30/9137/0002
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FWD PWR
RFD DET
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RV2
RV3
RT1
Q1
Q2
Q3
U3
U5
L1
L2
L3
L4
L6
L8
L9
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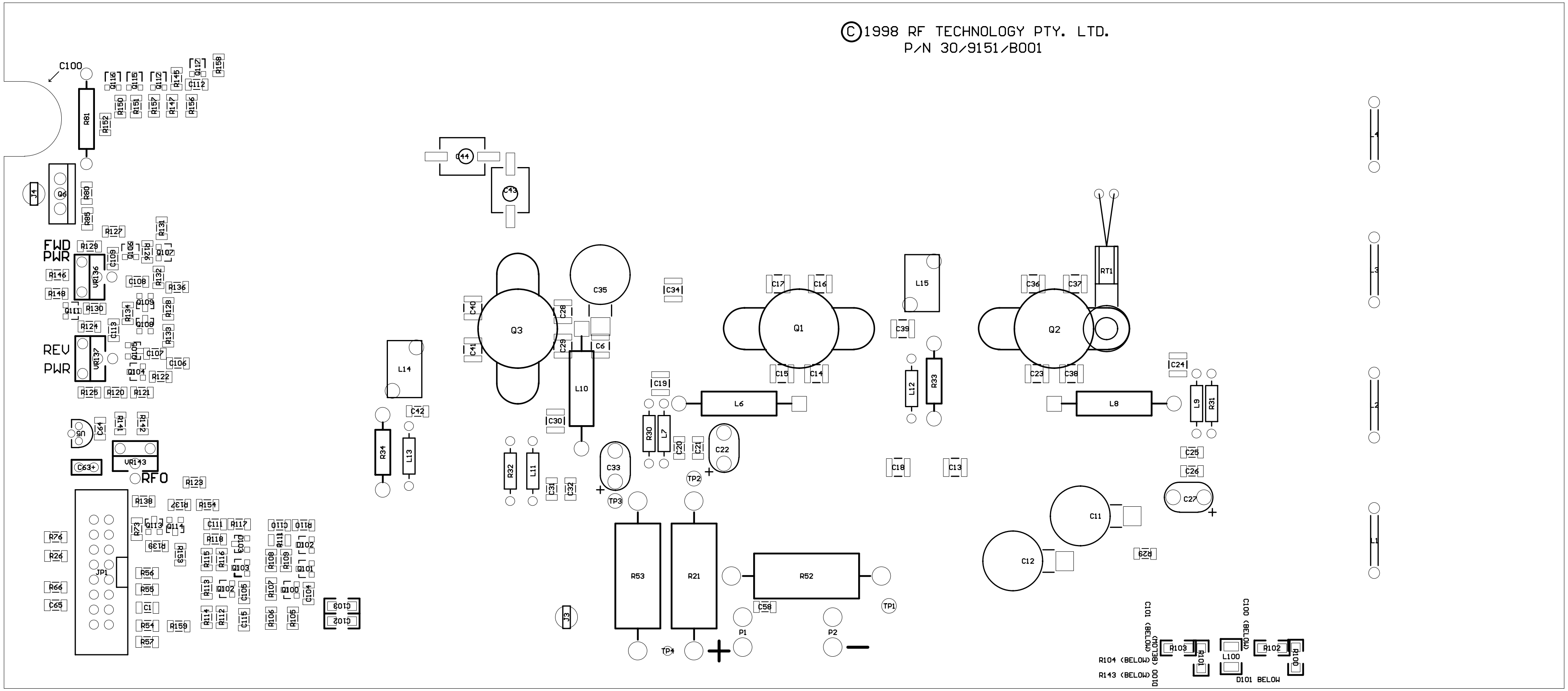
©1998 RF TECHNOLOGY PTY. LTD.
P/N 30/9151/B001
FWD PWR
REV PWR
RFO
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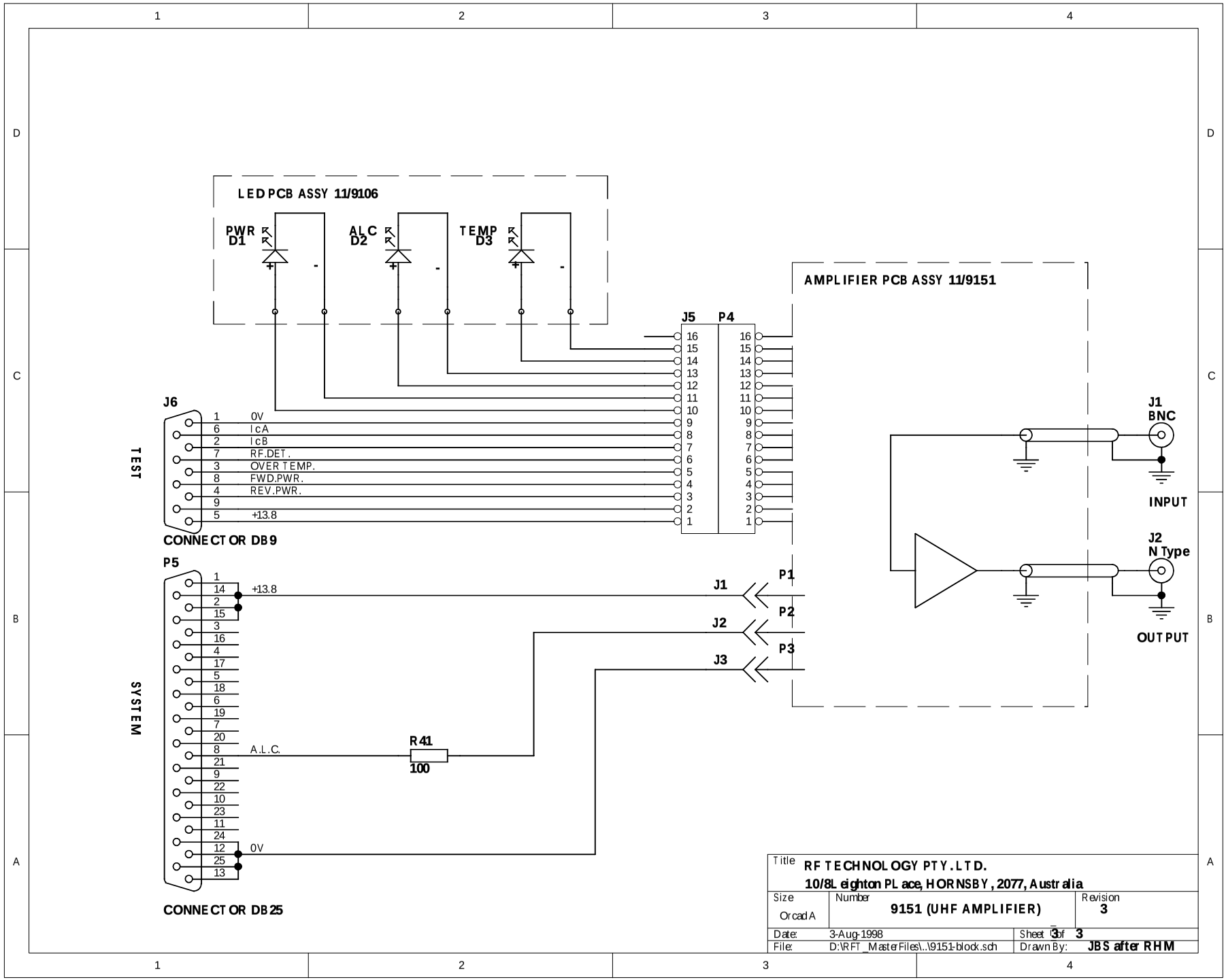
C101 (BELOW)
D100 (BELOW)
D101 BELOW
R104 (BELOW)
R143 (BELOW)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ALC D2
TEMP D3
AMPLIFIER PCB ASSY 11/9151
J5
P4
J6
1 0V
6 IcA
2 IcB
7 RF.DET.
3 OVER TEMP.
8 FWD.PWR.
4 REV.PWR.
9
5 +13.8
CONNECTOR DB9
TEST
SYSTEM
P5
+13.8
A.L.C.
R41
100
0V
CONNECTOR DB25
J1
P1
J2
P2
J3
P3
J1 BNC
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J2 N Type
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Revision 3
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Sheet 3 of 3
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B. PA501 Factory Alignment and Test (Rev 30/9137)

B.1 Equipment Required

- Spectrum Analyser and tracking generator (eg Tektronix 492 with TR503)
- 150W, 50Ω Attenuator/load, 40dB attenuation
- Calibrated test Load with 5db return loss
- Calibrated test Load with 8dB return loss
- 13.8 Volt, 30A power supply
- Rhode & Schwarz SMG 1GHz GPIB-programmable RF generator
- 15W 450-520MHz driving amplifier (minimum 13W at 515MHz)
- Directional Power meter
- HP437B GPIB-programmable Power Meter
- PC with PwrView test Software, GPIB cables, etc.
- Spectrol long insulated alignment tool
- Various 50Ω connection cables, adapters, etc.

B.2 Procedure

1. Adjust the DC power supply to 14 Volts (no load). Adjust the SMG generator for output off (Level OFF), centre frequency to 500MHz (RF 500 MHz), address 28 (IEC-addr, 2, 8, Enter). Connect the generator output to sweep amplifier input. Connect DC supply to sweep amplifier and the device under test (DUT). Connect the Sweep Amplifier to the Directional Power Meter, and the Directional Power Meter to the DUT input. Connect the 40dB attenuating load to the output. Set up and zero the HP437B power meter. The meter should be set for an operating frequency of 0.5GHz and a cal factor as indicated on the sensor head, typically 98.5%. Fix it to range 5, offset 40dB (1kW range). connect the Power meter to the load.

   Set the RFO pot for maximum output (RV2 to CW), REVPWR to Max (RV1 fully CW), and C12 and C35 to middle position, C43 and C44 to about 1/4 of range, and C11 near to the max (down) position.

2. Record serial number, etc., on the rest report sheet.

3. Inspect the module. Check the disposition of flying cables (clear of RF power components).

4. Switch the Generator output level to 3dBm (LEVEL 3 dBm/enter). Adjust C43, 44, 11, 12, 35 for output power of at least 100W on the power meter. Switch off the generator (LEVEL OFF). The purpose of this step is simply to get the adjustments approximately correct before moving to the swept alignment stage.

5. Remove the power meter and connect the spectrum analyser to the output of the attenuator. Remove the SMG and connect the tracking generator. Set the tracking generator output to 0dBm. Set the S.A. to a centre frequency of 485MHz and 10MHz/division. Set the reference level to 10dBm, and adjust the display for 2dB/div. Check that spectrum analyser "time/div" and "Res. Bw" are set to automatic. Adjust C43, C44, C11, C12 and C35 for flat response, as high as possible on the display (i.e. remove small notches in the trace). There should be less than 1 division of ripple for 3 divisions either side of the centre, preferably 3.5 to 4 divisions. Disconnect the tracking generator and the S.A.

6. With the equipment set up as it was for the measurement of power at 500MHz, and the generator output enabled, adjust the supply voltage to obtain 13.5 ± 0.25V dc on the inside connections of the 25-pin D-shell power connector.

7. With the equipment still set up for the measurement of power at 500MHz, using the HP power meter and the R&S generator, start the PwrView program. (You may use the command script ViewPA501, or the direct command "pwrview 450e6 512e6".) You should see a simple ASCII screen with two columns of numbers at the left, and an array of characters forming a horizontal bar graph across the rest of the screen. The graph will refresh about every 3 seconds.

   The display will have a horizontal row of characters for each frequency. At left, the frequency and power in MHz and Watts is printed, followed by groups of symbols. The symbol changes for power less that 100W, more than 100W but less than 120W, and more than 120W. With 15W drive, the power may well exceed 150W for all frequencies between 450MHz and 512MHz. Satisfactory performance consists of power above 125W at the required operating frequency, above 120W from 450-512MHz.

   When met, this can be recorded by printing one screen of data. This is conveniently achieved using the PrintPA501 script (batch file). Record the DUT serial number on the printout, and attach this to the test report sheets.

8. Set the RF generator to the frequency at which the greatest power was recorded in the PwrView test. Switch the generator on, reconfirm the RF power level. Measure and record the supply current, which should be below 30A.

9. Adjust the FWDPWR pot (RV2) to obtain the desired output power, or an output power of 120W if this is not specified, at the intended operating frequency, or 500MHz if this is not known. (ie.120W at 500MHz is the default alignment

point). Measure and record the supply current, which should be below 25A (typically 21A). Measure and record the voltage drop across the collector current sense resistors (R21, R52, R53). The calculated supply current to Q2 and Q3 should be within 1A of each other.

10. Measure the input RF (driving) power level. the forward power level should be less than 14W. The reflected power level should be less than 1/5 of the forward power. Measure and record the forward and reverse power voltages.

11. Continuing at the operating frequency (or 500MHz if not specified), connect the directional power meter to the output of the DUT. Connect the output from the directional power meter to a load providing an SWR of 2.0:1 (or -8dB return loss). Observe the forward power from the DUT to the load. Adjust the REVPWR pot (RV1) until the amplifier output just starts to reduce, and return the pot until the output returns to the set level. Attach the "5dB return loss" load (SWR of 3.5:1), and see that the amplifier output falls.

12. Replace the normal attenuator/load, and reconnect the power meter, or use the directional power meter if preferred. Reduce the FWDPWR pot (RV2) to obtain an output power of 2/3 the set level (nominally 80 Watts). Adjust the RFO pot to just extinguish the front panel RFO LED, and then return it slightly until the LED just comes back on. Reset the FWDPWR pot (RV2) to obtain the nominal 100 Watt output level.

13. Reconnect the spectrum analyser to the attenuating load, but continue to use the SMG generator rather than the tracking generator as the source. If the DUT is to be used with a specific transmitter in a specific customer arrangement, substitute the exciter for the generator and 15W sweep amplifier at this time.

    Set the SA to centre frequency equal to the operating frequency, and span to 100kHz/division. Check for sidebands on the carrier.

14. Reconnect the Power Meter to the attenuating load. Reduce the supply voltage and observe the output power. As the voltage falls, the current drawn should increase. Record the voltage and current level at which the output power falls below 100W (or the desired set level, if different).

15. Set the generator to 450MHz. (Minimum operating frequency). Measure the input RF (driving) power level. The forward power level should be less than 14W. The reflected power level should be less than 1/5 of the forward power. Measure and record the forward and reverse power voltages.

16. Set the generator to 512MHz. (Maximum operating frequency). Measure the input RF (driving) power level. The forward power level should be less than 14W. The reflected power level should be less than 1/5 of the forward power. Measure and record the forward and reverse power voltages.

This concludes the alignment and test procedure.

B3 Checking Mismatched Loads

The correct operation of the calibrated mismatch loads may be checked using the equipment available for other tests. Place the Directional Power Meter between the driving amplifier and the load to be tested. Adjust the generator to 500MHz, output on. Measure the forward and reverse powers. The return loss is calculated at
RL = 10 log (PR/PF).

C - PA501 Parts List for PCB - 30/9137/xxxx

Main PCB Assembly Parts, (common to all variants)

Ref.	Description	Part Number
C1	Capacitor 10N 10% 63V X7R 1206	46/3310/010N
C8	Capacitor 10N 10% 63V X7R 1206	46/3310/010N
C9	Capacitor 12P 5% 63V NPO SM1206	46/3300/012P
C10	Capacitor 12P 5% 63V NPO SM1206	46/3300/012P
C11	Capacitor Trim 14P JOH 15E85	49/3004/014P
C12	Capacitor Trim 14P JOH 15E85	49/3004/014P
C13	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C14	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C15	Capacitor Ceramic 39P 2% 500V 100B	46/3102/039P
C16	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C17	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C18	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C19	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C20	Capacitor 1N0 5% 63V NPO SM1206	46/3300/01N0
C21	Capacitor 100N 10% 63V X7R 1206	46/3310/100N
C23	Capacitor Ceramic 39P 2% 500V 100B	46/3102/039P
C24	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C25	Capacitor 1N0 5% 63V NPO SM1206	46/3300/01N0
C26	Capacitor 100N 10% 63V X7R 1206	46/3310/100N
C27	Capacitor 6.8U 20% 25V SOLID AL	41/2225/06U8
C28	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C29	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C30	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C31	Capacitor 1N0 5% 63V NPO SM1206	46/3300/01N0
C32	Capacitor 100N 10% 63V X7R 1206	46/3310/100N
C33	Capacitor 6.8U 20% 25V SOLID AL	41/2225/06U8
C34	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C35	Capacitor Trim 14P JOH 15E85	49/3004/014P
C36	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C37	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C38	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C39	Capacitor 56P 5% 63V NPO SM1206	46/3300/056P
C40	Capacitor Ceramic 27P 2% 500V 100B	46/3102/027P
C41	Capacitor Ceramic 27P 2% 500V 100B	46/3102/027P
C42	Capacitor 56P 5% 63V NPO SM1206	46/3300/056P
C43	Capacitor Trim 2-9P HI Temp	49/3001/010P
C44	Capacitor Trim 2-9P HI Temp	49/3001/010P
C45	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C46	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C47	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C48	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C49	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C50	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C51	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C52	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C53	Capacitor Ceramic 4N7 10% 63V X7R	46/3310/04N7
C54	Capacitor 100N 10% 63V X7R 1206	46/3310/100N
C55	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C56	Capacitor 10N 10% 63V X7R 1206	46/3310/010N
C57	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C58	Capacitor 1N0 5% 63V NPO SM1206	46/3300/01N0
C59	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C60	Capacitor 100P 5% 63V NPO 1206	46/3300/100P

Ref.	Description	Part Number
C61	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C62	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C63	Capacitor 10U 35V RAD Electro	41/2001/010U
C64	Capacitor 100N 10% 63V X7R 1206	46/3310/100N
C65	Capacitor 10N 10% 63V X7R 1206	46/3310/010N
C201	Capacitor 100N 10% 50V X7R RD.2	46/2001/100N
D1	Diode Shottkey BAT17 SOT23	21/3030/0017
D2	Diode Shottkey BAT17 SOT23	21/3030/0017
D3	Diode Shottkey BAT17 SOT23	21/3030/0017
D4	Diode Dual GP BAV99 SOT23	21/3010/AV99
D5	Diode Dual GP BAV99 SOT23	21/3010/AV99
J3	2.8mm QC TAB Vertical PCB Mount	35/0028/0001
J4	2.8mm QC TAB Vertical PCB Mount	35/0028/0001
JP1	Connector 16WAY Shroud Header	35/2502/0016
L1	Inductor Hair Pin 10mmIDx13.5L	37/3001/13D5
L2	Inductor Hair Pin 10mmIDx14.5L	37/3001/14D5
L3	Inductor Hair Pin 10mmIDx14.5L	37/3001/14D5
L4	Inductor Hair Pin 10mmIDx13.5L	37/3001/13D5
L5	Inductor 220N 10% Choke SM1008	37/3320/220N
L6	Inductor 11T UHF Collector	37/1401/0011
L7	Ferrite Bead 3x4x1 4S2	37/1022/0001
L8	Inductor 11T UHF Collector	37/1401/0011
L9	Ferrite Bead 3x4x1 4S2	37/1022/0001
L10	Inductor 11T UHF Collector	37/1401/0011
L11	Ferrite Bead 3x4x1 4S2	37/1022/0001
L12	Inductor 1uH Axial	37/2021/001U
L13	Inductor 1uH Axial	37/2021/001U
L14	Inductor Moulded 9.5 Turn	37/2021/0009
L15	Inductor Moulded 9.5 Turn	37/2021/0009
P1	6.35mm QC TAB Vertical PCB Mount	35/0635/0001
P2	6.35mm QC TAB Vertical PCB Mount	35/0635/0001
Q1	Transistor NPN RF Power MRF658	27/3020/MRF658
Q2	Transistor NPN RF Power MRF658	27/3020/MRF658
Q3	Transistor NPN 50W RF MRF650	27/3020/MRF650
Q4	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q5	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q6	Transistor PNP TIP32	27/2010/TP32
Q7	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q8	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q9	Transistor NPN MMBT3904 SOT23	27/3020/3904
R9	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R10	Resistor 1K0 5% 0.25W SM1206	51/3380/01K0
R11	Resistor 100 5% 0.25W SM1206	51/3380/0100
R21	Resistor 0.022 4W 5%	51/1350/R022
R26	Resistor 680 5% 0.25W SM1206	51/3380/0680
R27	Resistor 100 5% 0.25W SM1206	51/3380/0100
R28	Resistor 100 5% 0.25W SM1206	51/3380/0100
R29	Resistor 100K 5% 0.25W SM1206	51/3380/100K
R30	Resistor 10 5% 0.25W Axial	51/1040/0010
R31	Resistor 10 5% 0.25W Axial	51/1040/0010
R32	Resistor 10 5% 0.25W Axial	51/1040/0010
R33	Resistor 4R7 5% 0.25W Axial	51/1040/04R7
R34	Resistor 4R7 5% 0.25W Axial	51/1040/04R7
R35	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R36	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R37	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R38	Resistor 330K 5% 0.25W SM1206	51/3380/330K
R39	Resistor 10K 5% 0.25W SM1206	51/3380/010K

Ref.	Description	Part Number
R36	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R37	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R38	Resistor 330K 5% 0.25W SM1206	51/3380/330K
R39	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R40	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R41	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R42	Resistor 470K 5% 0.25W SM1206	51/3380/470K
R43	Resistor 470K 5% 0.25W SM1206	51/3380/470K
R44	Resistor 33K 5% 0.25W SM1206	51/3380/033K
R45	Resistor 1M0 5% 0.25W SM1206	51/3380/01M0
R46	Resistor 1M0 5% 0.25W SM1206	51/3380/01M0
R47	Resistor 100 5% 0.25W SM1206	51/3380/0100
R48	Resistor 100K 5% 0.25W SM1206	51/3380/100K
R49	Resistor 100K 5% 0.25W SM1206	51/3380/100K
R50	Resistor 47K 5% 0.25W SM1206	51/3380/047K
R51	Resistor 100 5% 0.25W SM1206	51/3380/0100
R52	Resistor 0.022 4W 5%	51/1350/R022
R53	Resistor 0.022 4W 5%	51/1350/R022
R54	Resistor 100 5% 0.25W SM1206	51/3380/0100
R55	Resistor 100 5% 0.25W SM1206	51/3380/0100
R56	Resistor 100 5% 0.25W SM1206	51/3380/0100
R57	Resistor 100 5% 0.25W SM1206	51/3380/0100
R58	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R59	Resistor 100K 5% 0.25W SM1206	51/3380/100K
R60	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R61	Resistor 47K 5% 0.25W SM1206	51/3380/047K
R62	Resistor 2K2 5% 0.25W SM1206	51/3380/02K2
R63	Resistor 47K 5% 0.25W SM1206	51/3380/047K
R64	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R65	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R66	Resistor 270 5% 0.25W SM1206	51/3380/0270
R67	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R68	Resistor 100K 5% 0.25W SM1206	51/3380/100K
R69	Resistor 33K 5% 0.25W SM1206	51/3380/033K
R70	Resistor 47K 5% 0.25W SM1206	51/3380/047K
R71	Resistor 1K0 5% 0.25W SM1206	51/3380/01K0
R72	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R73	Resistor 270 5% 0.25W SM1206	51/3380/0270
R74	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R75	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R76	Resistor 270 5% 0.25W SM1206	51/3380/0270
R77	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R78	Resistor 470K 5% 0.25W SM1206	51/3380/470K
R79	Resistor 4K7 5% 0.25W SM1206	51/3380/04K7
R80	Resistor 1K0 5% 0.25W SM1206	51/3380/01K0
R81	Resistor 270 5% 2W Axial	51/1052/0270
R82	Resistor 4K7 5% 0.25W SM1206	51/3380/04K7
R83	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R84	Resistor 1K0 5% 0.25W SM1206	51/3380/01K0
R85	Resistor 1R0 5% 0.25W SM1206	51/3380/01R0
RT1	Thermistor	54/0400/0080
RV1	Trimpot 10K 1 Turn Vertical	53/1020/010K
RV2	Trimpot 10K 1 Turn Vertical	53/1020/010K
RV3	Trimpot 10K 1 Turn Vertical	53/1020/010K
U2	IC Quad OP AMP TLC274	25/2050/274C
U3	IC Quad OP AMP TLC274	25/2050/274C
U5	IC Volt Regulator 78L08 TO92M	25/2040/78L08
L201	Inductor Moulded 9.5 Turn	37/2021/0009
R201	Resistor 68R 5% 2W Axial Lead	51/1052/0068

PA501 Parts List for PCB – 30/9151/xxxx

Main PCB Assembly Parts, (common to all variants)

Ref.	Description	Part Number
C1	Capacitor 1N0 5% 63V NPO SM1206	46/3300/01N0
C11	Capacitor Trim 14P JOH 15E85	49/3004/014P
C12	Capacitor Trim 14P JOH 15E85	49/3004/014P
C13	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C15	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C18	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C19	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C20	Capacitor 1N0 5% 63V NPO SM1206	46/3300/01N0
C21	Capacitor 100N 10% 63V X7R 1206	46/3310/100N
C22	Capacitor 6.8U 20% 25V SOLID AL	41/2225/06U8
C24	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C25	Capacitor 1N0 5% 63V NPO SM1206	46/3300/01N0
C26	Capacitor 100N 10% 63V X7R 1206	46/3310/100N
C27	Capacitor 6.8U 20% 25V SOLID AL	41/2225/06U8
C29	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C30	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C31	Capacitor 1N0 5% 63V NPO SM1206	46/3300/01N0
C32	Capacitor 100N 10% 63V X7R 1206	46/3310/100N
C33	Capacitor 6.8U 20% 25V SOLID AL	41/2225/06U8
C34	Capacitor Ceramic 220P 20%100V 100B	46/3100/220P
C35	Capacitor Trim 14P JOH 15E85	49/3004/014P
C38	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C39	Capacitor 56P 5% 63V NPO SM1206	46/3300/056P
C41	Capacitor Ceramic 27P 2% 500V 100B	46/3102/027P
C42	Capacitor 56P 5% 63V NPO SM1206	46/3300/056P
C43	Capacitor Trim 2-10P HI Temp	49/3001/010P
C44	Capacitor Trim 2-10P HI Temp	49/3001/010P
C58	Capacitor 1N0 5% 63V NPO SM1206	46/3300/01N0
C63	Capacitor 10U 35V RAD Electro	41/2001/010U
C64	Capacitor 100N 10% 63V X7R 1206	46/3310/100N
C65	Capacitor 1N0 5% 63V NPO SM1206	46/3300/01N0
C80	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C81	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C82	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C83	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C90	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C91	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C92	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C93	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C100	Capacitor 3P3 5% 63V NPO 1206	46/3300/03P3
C101	Capacitor 3P3 5% 63V NPO 1206	46/3300/03P3
C102	Capacitor 220P 5% 63V NPO 1206	46/3300/220P
C103	Capacitor 220P 5% 63V NPO 1206	46/3300/220P
C104	Capacitor 27P 5% 63V NPO SM1206	46/3300/027P
C105	Capacitor 27P 5% 63V NPO SM1206	46/3300/027P
C106	Capacitor 47P 5% 63V NPO SM1206	46/3300/047P
C107	Capacitor 47P 5% 63V NPO SM1206	46/3300/047P
C108	Capacitor 47P 5% 63V NPO SM1206	46/3300/047P
C109	Capacitor 100P 5% 63V NPO 1206	46/3300/100P
C110	Capacitor 27P 5% 63V NPO SM1206	46/3300/027P
C111	Capacitor 27P 5% 63V NPO SM1206	46/3300/027P
C112	Capacitor 27P 5% 63V NPO SM1206	46/3300/027P
C113	Capacitor 100P 5% 63V NPO 1206	46/3300/100P

Ref.	**Description**	**Part Number**
C115	Capacitor 1N0 5% 63V NPO SM1206	46/3300/01N0
D100	Diode Shottkey BAT17 SOT23	21/3030/0017
D101	Diode Shottkey BAT17 SOT23	21/3030/0017
D102	Diode Dual GP BAV99 SOT23	21/3010/AV99
D103	Diode Dual GP BAV99 SOT23	21/3010/AV99
J3	2.8mm QC TAB Vertical PCB Mount	35/0028/0001
J4	2.8mm QC TAB Vertical PCB Mount	35/0028/0001
JP1	Connector 16WAY Shroud Header	35/2502/0016
L1	Inductor Hair Pin 10mmIDx13.5L	37/3001/13D5
L2	Inductor Hair Pin 10mmIDx14.5L	37/3001/14D5
L3	Inductor Hair Pin 10mmIDx14.5L	37/3001/14D5
L4	Inductor Hair Pin 10mmIDx13.5L	37/3001/13D5
L6	Inductor 11T UHF Collector	37/1401/0011
L7	Ferrite Bead 3x4x1 4S2	37/1022/0001
L8	Inductor 11T UHF Collector	37/1401/0011
L9	Ferrite Bead 3x4x1 4S2	37/1022/0001
L10	Inductor 11T UHF Collector	37/1401/0011
L11	Ferrite Bead 3x4x1 4S2	37/1022/0001
L12	Inductor 1uH Axial	37/2021/001U
L13	Inductor 1uH Axial	37/2021/001U
L14	Inductor Moulded 9.5 Turn	37/2021/0009
L15	Inductor Moulded 9.5 Turn	37/2021/0009
L100	Inductor 220N 10% Choke SM1008	37/3320/220N
P1	6.35mm QC TAB Vertical PCB Mount	35/0635/0001
P2	6.35mm QC TAB Vertical PCB Mount	35/0635/0001
Q1	Transistor NPN RF Power MRF658	27/3020/MRF658
Q2	Transistor NPN RF Power MRF658	27/3020/MRF658
Q3	Transistor NPN 50W RF MRF650	27/3020/MRF650
Q6	Transistor PNP TIP32	27/2010/TP32
Q100	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q101	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q102	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q103	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q104	Transistor NPN MMBT3906 SOT23	27/3010/3906
Q105	Transistor NPN MMBT3906 SOT23	27/3010/3906
Q106	Transistor NPN MMBT3906 SOT23	27/3010/3906
Q107	Transistor NPN MMBT3906 SOT23	27/3010/3906
Q108	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q109	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q111	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q112	Transistor NPN MMBT3906 SOT23	27/3010/3906
Q113	Transistor NPN MMBT3906 SOT23	27/3010/3906
Q114	Transistor NPN MMBT3906 SOT23	27/3010/3906
Q115	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q116	Transistor NPN MMBT3904 SOT23	27/3020/3904
Q117	Transistor NPN MMBT3904 SOT23	27/3020/3904
R21	Resistor 0.022 4W 5%	51/1350/R022
R26	Resistor 680 5% 0.25W SM1206	51/3380/0680
R29	Resistor 100K 5% 0.25W SM1206	51/3380/100K
R30	Resistor 10 5% 0.25W Axial	51/1040/0010
R31	Resistor 10 5% 0.25W Axial	51/1040/0010
R32	Resistor 10 5% 0.25W Axial	51/1040/0010
R33	Resistor 4R7 5% 0.25W Axial	51/1040/04R7
R34	Resistor 4R7 5% 0.25W Axial	51/1040/04R7
R43	Resistor 470R 5% 0.25W SM1206	51/3380/0470
R52	Resistor 0.022 4W 5%	51/1350/R022
R53	Resistor 0.022 4W 5%	51/1350/R022
R54	Resistor 100R 5% 0.25W SM1206	51/3380/0100
R55	Resistor 100R 5% 0.25W SM1206	51/3380/0100
R56	Resistor 100R 5% 0.25W SM1206	51/3380/0100
R57	Resistor 100R 5% 0.25W SM1206	51/3380/0100

Ref.	Description	Part Number
R66	Resistor 470R 5% 0.25W SM1206	51/3380/0470
R73	Resistor 10R 5% 0.25W SM1206	51/3380/0010
R76	Resistor 270 5% 0.25W SM1206	51/3380/0270
R80	Resistor 1K0 5% 0.25W SM1206	51/3380/01K0
R81	Resistor 270 5% 2W Axial	51/1052/0270
R85	Resistor 1R0 5% 0.25W SM1206	51/3380/01R0
R100	Resistor 120R 5% 0.25W SM1206	51/3380/0120
R101	Resistor 120R 5% 0.25W SM1206	51/3380/0120
R102	Resistor 470R 5% 0.25W SM1206	51/3380/0470
R103	Resistor 470R 5% 0.25W SM1206	51/3380/0470
R104	Resistor 470R 5% 0.25W SM1206	51/3380/0470
R105	Resistor 470R 5% 0.25W SM1206	51/3380/0470
R107	Resistor 3K9 5% 0.25W SM1206	51/3380/03K9
R108	Resistor 1K5 5% 0.25W SM1206	51/3380/01K5
R109	Resistor 150R 5% 0.25W SM1206	51/3380/0150
R110	Resistor 1K0 5% 0.25W SM1206	51/3380/01K0
R111	Resistor 1K0 5% 0.25W SM1206	51/3380/01K0
R112	Resistor 470R 5% 0.25W SM1206	51/3380/0470
R113	Resistor 3K9 5% 0.25W SM1206	51/3380/03K9
R114	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R115	Resistor 1K5 5% 0.25W SM1206	51/3380/01K5
R116	Resistor 150R 5% 0.25W SM1206	51/3380/0150
R117	Resistor 1K0 5% 0.25W SM1206	51/3380/01K0
R118	Resistor 1K0 5% 0.25W SM1206	51/3380/01K0
R120	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R121	Resistor 470R 5% 0.25W SM1206	51/3380/0470
R122	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R123	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R124	Resistor 2K2 5% 0.25W SM1206	51/3380/02K2
R125	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R126	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R127	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R128	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R129	Resistor 2K2 5% 0.25W SM1206	51/3380/02K2
R130	Resistor 3K3 5% 0.25W SM1206	51/3380/03K3
R131	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R132	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R133	Resistor 100R 5% 0.25W SM1206	51/3380/0100
R134	Resistor 100R 5% 0.25W SM1206	51/3380/0100
R136	Resistor 100R 5% 0.25W SM1206	51/3380/0100
R137	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R138	Resistor 560R 5% 0.25W SM1206	51/3380/0560
R139	Resistor 47R 5% 0.25W SM1206	51/3380/0047
R141	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R142	Resistor 2K2 5% 0.25W SM1206	51/3380/02K2
R145	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R146	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R147	Resistor 10R 5% 0.25W SM1206	51/3380/0010
R148	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R150	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R151	Resistor 22K 5% 0.25W SM1206	51/3380/022K
R152	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R153	Resistor 100R 5% 0.25W SM1206	51/3380/0100
R154	Resistor 100R 5% 0.25W SM1206	51/3380/0100
R156	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R157	Resistor 10K 5% 0.25W SM1206	51/3380/010K
R158	Resistor 10R 5% 0.25W SM1206	51/3380/0010
R159	Resistor 100R 5% 0.25W SM1206	51/3380/0100
RT1	Thermistor	54/0400/0080

Ref.	Description	Part Number
VR136	Trimpot 10K 1 Turn Vertical	53/1020/010K
VR137	Trimpot 10K 1 Turn Vertical	53/1020/010K
VR143	Trimpot 10K 1 Turn Vertical	53/1020/010K
U5	IC Volt Regulator 78L08 TO92M	25/2040/78L08

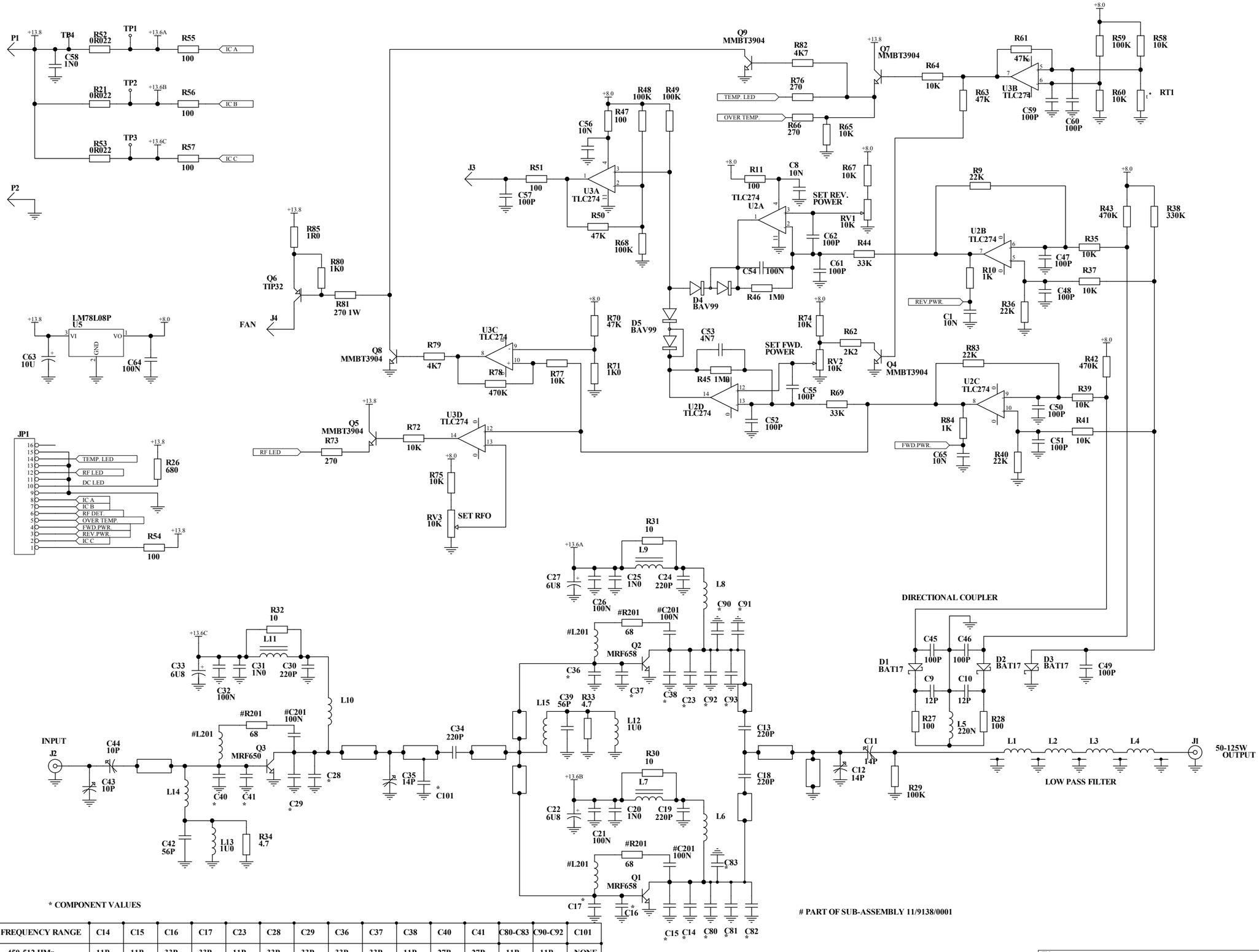
Parts Specific to PA501A (XXX – XXXMHz)

C14	Capacitor Ceramic 22P 2% 500V 100B	46/3102/022P
C23	Capacitor Ceramic 22P 2% 500V 100B	46/3102/022P
C16	Capacitor Ceramic 39P 2% 500V 100B	46/3102/039P
C17	Capacitor Ceramic 39P 2% 500V 100B	46/3102/039P
C28	Capacitor Ceramic 27P 2% 500V 100B	46/3102/027P
C36	Capacitor Ceramic 39P 2% 500V 100B	46/3102/039P
C37	Capacitor Ceramic 39P 2% 500V 100B	46/3102/039P
C29A	Capacitor Ceramic 27P 2% 500V 100B	46/3102/027P
C40	Capacitor Ceramic 39P 2% 500V 100B	46/3102/039P
C41A	Capacitor Ceramic 27P 2% 500V 100B	46/3102/027P
C116	Capacitor, Electrolytic 10U 35V	41/2001/010U

Parts Specific to PA501B (XXX – XXXMHz)

C14	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C23	Capacitor Ceramic 11P 2% 500V 100B	46/3102/011P
C16	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C17	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C28	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C36	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C37	Capacitor Ceramic 33P 2% 500V 100B	46/3102/033P
C40	Capacitor Ceramic 27P 2% 500V 100B	46/3102/027P

(end PA501 for PCB-30/9151/xxxx Partslists)



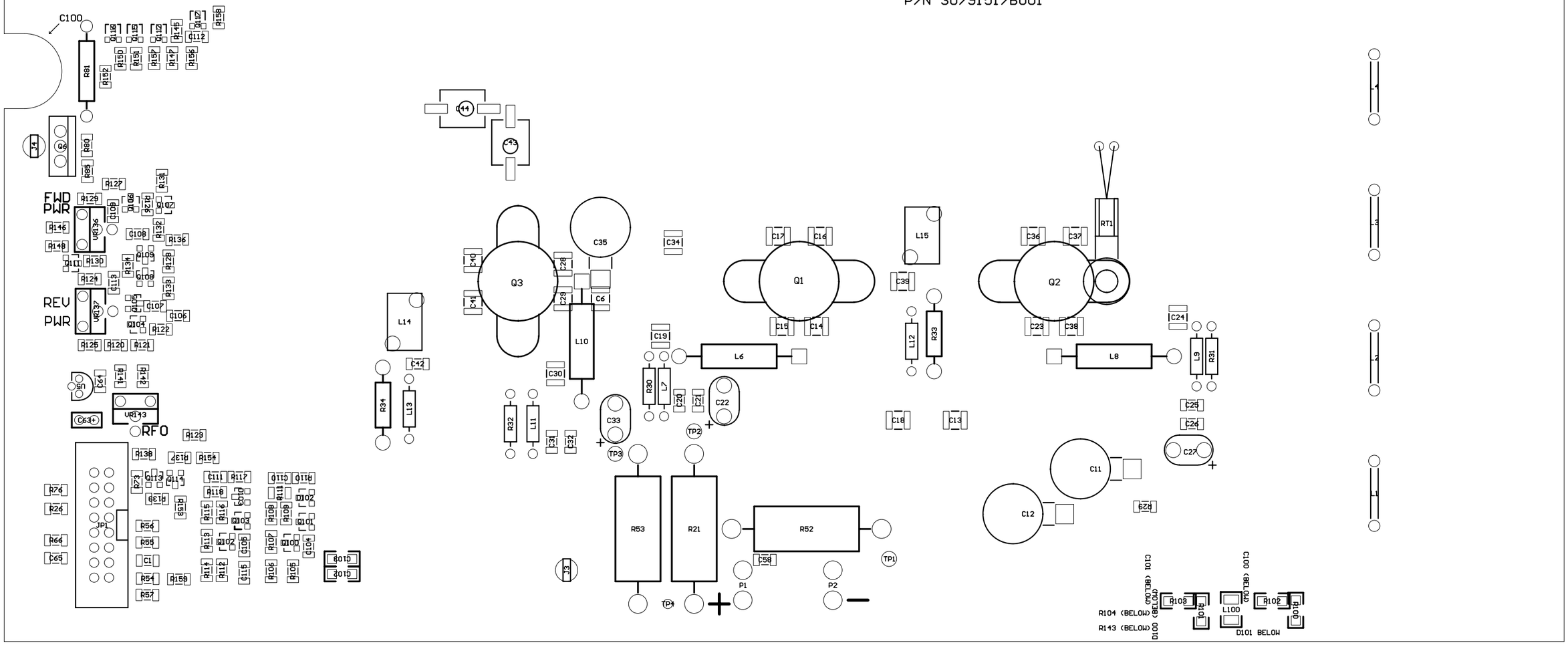
* COMPONENT VALUES

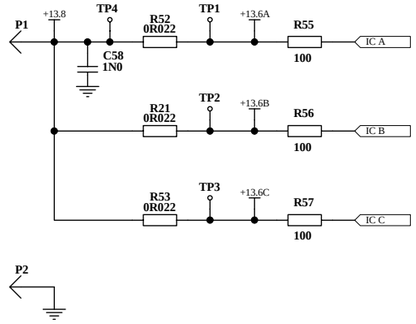
MODEL	FREQUENCY RANGE	C14	C15	C16	C17	C23	C28	C29	C36	C37	C38	C40	C41	C80-C83	C90-C92	C101
PA501B	450-512 HMz	11P	11P	33P	33P	11P	33P	33P	33P	33P	11P	27P	27P	11P	11P	NONE
PA501A	400-450MHz															

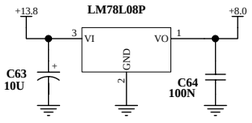
\# PART OF SUB-ASSEMBLY 11/9138/0001

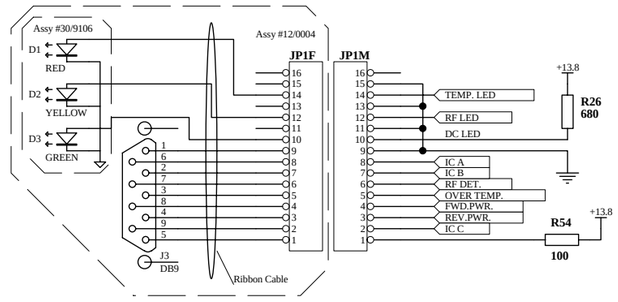
Title	RF TECHNOLOGY PTY. LTD. UNIT 17, 8 LEIGHTON PLACE, HORNSBY, N.S.W. 2077	
Size: Orcad C	Number: 30/9137 (PA501 Mk I)	Revision: 3
Date: 22-Oct-2002	Sheet 1 of 2	
File: D:\Protel Files\Work Files\UHF Manual.ddb	Drawn By: JBS	

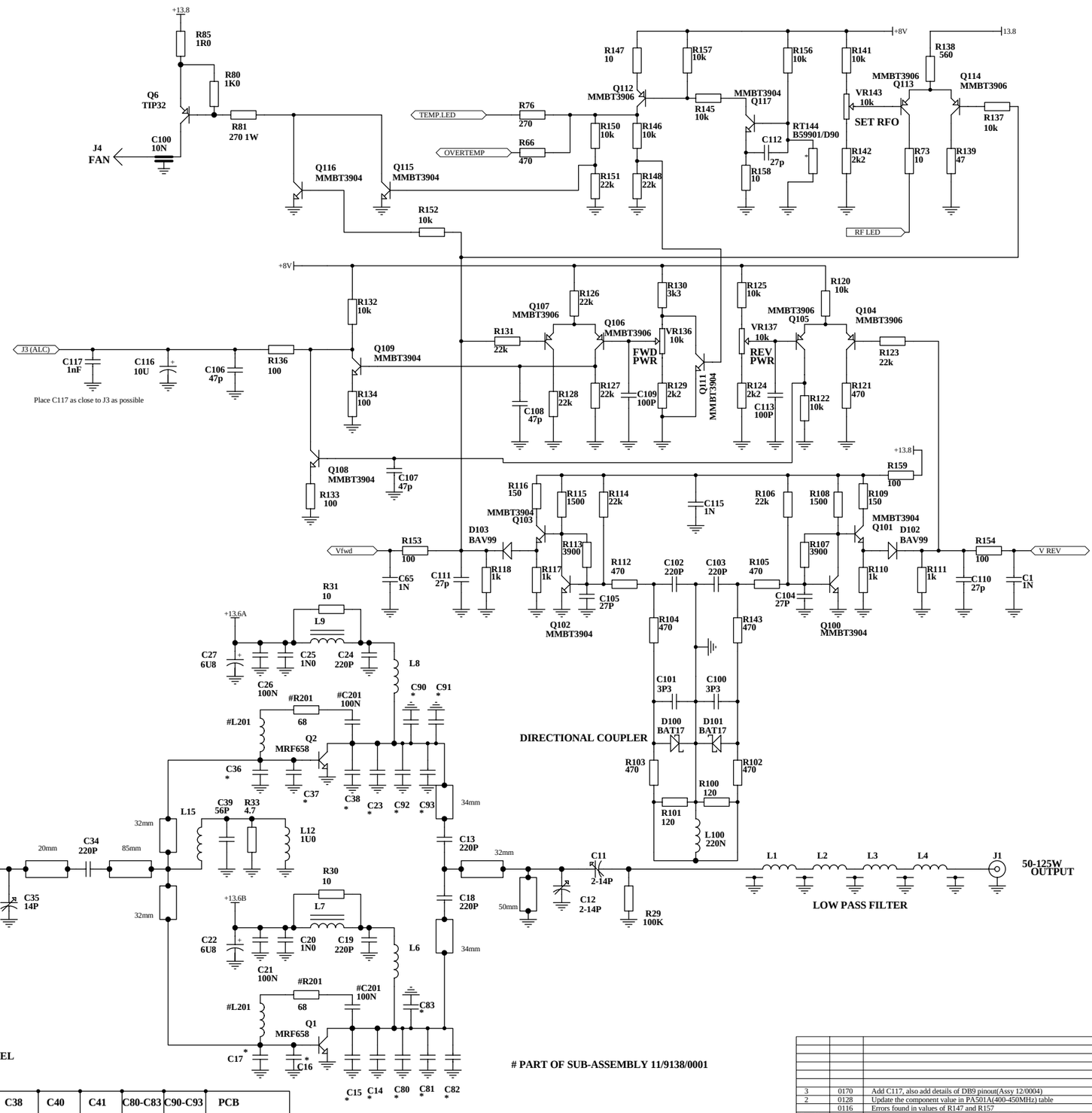
P/N 30/9151/B001











*** COMPONENT VALUES GIVEN IN TABLE BELOW. TL LENGTHS ARE FOR B MODEL**

 # PART OF SUB-ASSEMBLY 11/9138/0001

MODEL	FREQUENCY RANGE	C14	C15	C16	C17	C23	C28	C29	C36	C37	C38	C40	C41	C80-C83	C90-C93	PCB
PA501B	450-512 HMz	11P	11P	33P	33P	11P	33P	33P	33P	33P	11P	27P	27P	11P	11P	30/9151/B001
PA501A	400-450MHz	22P	11P	39P	39P	22P	27P	33//27P	39P	39P	11P	39P	27//27P	11P	11P	30/9151/A001

Rev No.	ECO No.	Description of Change
3	0170	Add C117, also add details of DB9 pinout(Assy 12/0004)
2	0128	Update the component value in PA501A(400-450MHz) table
	0116	Errors found in values of R147 and R157

Title **125W AMPLIFIER, UHF 450-520 MHZ**

Size: A3	Number: 05/9151 R2	Revision: 3	**RF Technology Pty Ltd** Unit 10, 8 Leighton Place Hornsby, NSW 2077 Australia
Print Date: 10-Feb-2005 16:50:24	Sheet 1 of 1		
Rev. Release Date: 18/04/2000	Originator: David Lecomte		

File: C:\Documents and Settings\Guang\Desktop\9151-PA501Mk2.DDB - Documents\9151-PA501Mk2.sch