

MODS FOR CTCSS
TAIL ON T/T



Tait Electronics Ltd.

T356 Transmitter

VHF FM 138-174MHz

(TM-356)

Issue E

Fixed Station Radio Equipment

Service Manual

T356 VHF FM Transmitter

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TECHNICAL INFORMATION

For further information about this Manual or the equipment it describes, contact 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 Tait T356 VHF FM Transmitters.

Additional information relating to the T356/01 version is contained in the T356/01 Supplement to this Manual.

Additional information relating to the T356/52 version is contained in the T356/52 Supplement to this Manual.

T356 VHF FM Transmitter

Ordering Tait Service Manuals

When ordering Tait Service Manuals, quote the Tait Internal Part Number (IPN) and the equipment version required, e.g. IPN TM-356, T356/02 Service Manual.

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Manual Revisions

This Tait Service Manual may incorporate textual revisions and, where necessary, updated Parts Lists and Diagrams.

Those portions **of the text that have been changed** from the previous issue Manual are indicated by a **vertical line in the outer margin** of the page.

CONTENTS

	Page
<u>SECTION 1 GENERAL INFORMATION</u>	
1.1 Introduction	1. 1
1.2 Specifications	1. 2
1.2.1 Introduction	1. 2
1.2.2 General	1. 2
1.2.3 Transmitter RF Section	1. 2
1.2.4 Transmitter Audio Processor	1. 3
1.2.5 Frequency Stability	1. 4
1.3 Versions	1. 4
<u>SECTION 2 CIRCUIT OPERATION</u>	
2.1 RF Section	2. 1
2.1.1 Exciter	2. 1
2.1.2 Transmit Switch & Timer	2. 1
2.1.3 Regulated Supplies	2. 1
2.2 PA Assembly	2. 2
2.3 Audio Processor (B3536)	2. 2
2.3.1 General	2. 2
2.3.2 Microphone Pre-amplifier	2. 2
2.3.3 Audio Switch	2. 2
2.3.4 Audio AGC And Amplifier	2. 2
2.3.5 Pre-emphasis	2. 2
2.3.6 Limiter/Integrator/Low Pass Filter	2. 2
2.3.7 Transmitter Keying	2. 3
<u>SECTION 3 ANCILLARY EQUIPMENT</u> (not used in this Manual)	
<u>SECTION 4 INSTALLATION</u>	
4.1 General	4. 1
4.2 Talk Through Repeater	4. 1
4.3 Line Controlled Base Station	4. 2
4.3.1 4-Wire To 2-Wire Converter (Hybrid)	4. 2
4.4 Audio Processor Flat Response	4. 3
<u>SECTION 5 SERVICING</u>	
5.1 General	5. 1
5.1.1 Notes	5. 1
5.1.2 Technical Instructions	5. 1
5.2 Mechanical	5. 1
5.2.1 Posidriv Recess Head Screws	5. 1

T356 VHF FM Transmitter

5.3	Repair	5.2
5.3.1	Component Checks	5.2
5.3.2	Component Replacement	5.2
5.3.3	To Remove Large Cased Mica Capacitors	5.2
5.3.4	Inter-Board Wiring	5.2
5.4	Setting Up	5.3
5.4.1	Test Equipment Required	5.3
5.4.2	Tuning Hints	5.3
5.4.3	Oscillator Trim Coil Type 617 (L401)	5.4
5.4.4	RF Coils Type 618 (L417, L418)	5.4
5.5	Alignment & Adjustments	5.5
5.5.1	Preliminary Procedure	5.5
5.5.2	Alignment Procedure	5.5
5.5.3	Crystal Oscillator Frequency Trimming	5.6
5.5.3.1	General	5.6
5.5.3.2	Vari-Cap Fine Tuning Option	5.6
5.5.3.3	Frequency Trimming	5.6
5.5.4	B3536 Audio Processor Adjustments	5.7
5.5.4.1	Deviation	5.7
5.5.4.2	Compressor	5.7
5.5.4.3	Line Input Adjustment	5.7
5.5.4.4	Microphone Input Adjustment	5.7
5.5.5	To Set The Tail Timer	5.8
5.6	Fault Finding	5.8
5.6.1	General	5.8
5.6.2	PA Module Special Notes	5.8
5.6.2.1	To Replace The PA Transistors	5.8
5.6.2.2	To Remove The PCB From The Heatsink	5.9
5.6.3	Voltage Chart	5.9

SECTION 6 PARTS LIST

6.1	General	6.1
6.2	B356 T356 Basic Exciter Parts	6.2
6.2.1	Transistors	6.2
6.2.2	Diodes	6.2
6.2.3	Integrated Circuits	6.2
6.2.4	Capacitors	6.2
6.2.5	Resistors	6.3
6.2.6	Coils	6.4
6.2.7	Miscellaneous	6.4
6.3	B356/PA T356 PA Parts	6.5
6.3.1	Transistors	6.5
6.3.2	Diodes	6.5
6.3.3	Capacitors	6.5
6.3.4	Resistors	6.5
6.3.5	Coils	6.6
6.3.6	Miscellaneous	6.6
6.4	C356/01 T356/01 Parts	6.7
6.5	C356/02 T356/02, T356/05 Parts	6.7

T356 VHF FM Transmitter

6.6	C356/52	T356/52 Parts	6. 7
6.7	C356	T356/02 & /05 Additional Parts	6. 8
6.8	B356/MECH	T356 Mechanical Assembly Parts	6. 8
6.9	B356/WIRE	T356 Wire List	6. 8
6.10	B3536	B3536 Audio Processor Basic Parts	6. 9
	6.10.1	Transistors	6. 9
	6.10.2	Diodes	6. 9
	6.10.3	Integrated Circuits	6. 9
	6.10.4	Capacitors	6. 9
	6.10.5	Resistors	6.10
	6.10.6	Miscellaneous	6.11
6.11	C3536/01	B3536/01 Parts	6.11
6.12	C3536/02	B3536/02 Parts	6.11
6.13	C3536/05	B3536/05 Parts	6.11
6.14	C3536/07	B3536/07 Parts	6.12
6.15	B3538	B3538 Parts	6.12
6.16	B3540	B3540 Parts	6.13

ILLUSTRATIONS

Figure 1.	Talk-Through Repeater	4. 1
Figure 2.	Line Controlled Base Station	4. 2
Figure 3.	4-Wire to 2-Wire Converter	4. 3
Figure 4.	Coil Type 617 Pin Connections	5. 4
Figure 5.	Coil Type 618 Pin Connections	5. 4

DIAGRAMS

1.	Test Equipment Set-Up	
2.	Exciter PCB Encoding	
3.	PA PCB Encoding	
4.	B3536 Audio Processor PCB Encoding	
5.	Block Diagram	A2M1180
6.	T356/02, T356/05 Wiring Diagram	A2C298
7.	RF PA Circuit Diagram	A2C257
8.	Exciter Circuit Diagram	A1C256 (Fold-out)
9.	B3536 Audio Processor Circuit Diagram	A1C274 (Fold-out)

SECTION 1 GENERAL INFORMATION

1.1 INTRODUCTION

The T356 is a high performance VHF FM transmitter designed for single channel operation within the 138 to 174MHz frequency range. The circuitry is built onto three printed circuit boards: on the first is mounted the exciter section, on the second the P.A. section, and the third contains the audio processor.

The exciter section consists of a crystal oscillator, two-stage phase modulator, frequency multiplier and RF power output stage. A transmit switch, tail timer and the regulated power supplies are also mounted on this board.

The PA module consists of the PA PCB mounted on a heatsink. The PCB circuitry includes a two-stage, broad-band, class C, RF power amplifier, a harmonic filter and RF power level control circuit.

The audio section consists of a number of audio processing circuits, all having a standard output level, which may be connected in any sequence to suit individual customer requirements.

The boards are mounted in a metal frame together with the sockets, controls etc, and the frame fits inside a robust oxyplast finished metal sleeve for mechanical strength and RF shielding. Labels and handle are fitted to a separate front panel. The audio input circuits cater for a local microphone and a split winding 600 ohm line input whose level may be as low as -20dBm to achieve 60% of maximum deviation. The line sensitivity can be varied by a screwdriver adjustment through the front panel.

Also on the front panel is a 'carrier on' push-button switch intended as a servicing aid to quickly key the transmitter. This switch may, if required, 'enable' the audio signal.

Provision exists in the oscillator circuit for a fine frequency control with a DC voltage, and a monitor output at the crystal frequency is available to facilitate phase-locking the oscillator to an external reference.

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 New Zealand Post Office Specification RTA25.

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

1.2.2 GENERAL

Modulation Type	.. angle telephony
Frequency Range (refer to Section 1.3)	.. 138 to 174MHz
Number Of Channels	.. one
Channel Separation	.. 12.5 or 25kHz (to order)
Supply Voltage:	
Operating Range	.. 10.8 to 16V DC
Standard Test Voltage	.. 13.8V DC
Polarity	.. negative earth only
Supply Current:	
Transmit (25W only)	.. 5.5 amps
Standby	.. 100mA
Antenna Impedance	.. 50 ohms (nominal)
Operating Temperature Range:	
Standard Versions	.. -10°C to +60°C
Low Temperature Versions	.. -30°C to +60°C
Dimensions:	
Height	.. 191mm
Length	.. 310mm
Width	.. 60mm
Weight	.. 2kg

1.2.3 TRANSMITTER RF SECTION

Power Output:	
Maximum	.. 25 watts
Range Of Adjustment	.. 5 to 25 watts
Duty Cycle Ratings:	
Power Up To 10W	.. continuous
Power At 25W	.. 50% (maximum transmission period 15 minutes)

T356 General Information

Spurious Emissions	.. -26dBm
Mismatch Capability	.. stable for VSWR <10:1 at 13.8V supply
Hum And Noise (below 60% max. deviation)	.. 40dB
Modulator Type	.. phase

1.2.4 TRANSMITTER AUDIO PROCESSOR

Inputs Available	.. line or local microphone
Line Input:	
Impedance	.. 600 ohm balanced
Sensitivity for 60% of Limiting Deviation at 1kHz:	
With Compressor	.. -40dBm
Without Compressor	.. -20dBm
Local Microphone Input:	
Impedance	.. 600 ohm unbalanced
Sensitivity for 60% of Limiting Deviation at 1kHz	.. 0.5mV pd
Audio Frequency Characteristics	.. optional flat or pre-emphasised (refer to Circuit Diagram)
Audio Frequency Responses:	
Line Input:	
Flat	.. within +0dB, -3dB of max. system deviation
Pre-emphasised	.. within +1, -3dB of 6dB/octave pre-emphasis (ref. 1kHz)
Mic Input	.. within +1, -3dB of 6dB/octave pre-emphasis (ref. 1kHz)
Bandwidth (refer to Section 1.3)	.. 300 to 3400Hz
CTCSS Input:	
Response	.. within +1dB, -1dB of output at 100Hz
Bandwidth	.. 65Hz to 260Hz
Audio AGC:	
Input Level Range	.. 50dB
Attack Time	.. 20ms
Decay Time	.. 800ms
Deviation Limiting:	
Maximum	.. ± 5 kHz
Range Of Adjustment	.. 0 to maximum values

T356 General Information

1.2.5 FREQUENCY STABILITY

Standard Versions:

Operating Temperature Range .. -10°C to +60°C

Wire-In Crystal:

Type .. TE/11

Stability .. ± 5 ppm

Plug-In Crystal:

Type .. TE/14

Stability .. ± 4 ppm

Low Temperature Versions:

Oven Type .. TA-103

Crystal Type .. TE/25

Stability:

0°C to +60°C .. ± 1 ppm (max.), +0.6ppm (typical)

-30°C to +60°C .. ± 1.5 ppm (max.)

Crystal Frequency (f_x)

.. $f_x = f_t/6$ where f_t is the transmit frequency

1.3 VERSIONS

1. T356/01 Frequency 138-174MHz, **landmobile**
25kHz channel spacing (**± 5 kHz deviation**)
AF bandwidth 300-3400Hz, **pre-emphasis**, CTCSS input
Rated 25 watts intermittent, **10 watts continuous**
B3536/01 audio processor **used with B3538** speech/tone
splitter and B3540 phase **modulator**
2. T356/02 Frequency 138-174MHz, **standard landmobile**
25kHz channel spacing (± 5 kHz deviation)
AF bandwidth 300-3400Hz, pre-emphasis, CTCSS input
Rated 25 watts intermittent, 10 watts continuous
B3536/02 audio processor
3. T356/05 Frequency 138-174MHz, 12.5kHz landmobile
12.5kHz channel spacing (**± 2.5 kHz deviation**)
AF bandwidth 300-3000Hz, pre-emphasis, CTCSS input
Rated 25 watts intermittent, 10 watts continuous
B3536/05 audio processor used
4. T356/52 Frequency 138-174MHz, standard landmobile
25kHz channel spacing (**± 5 kHz deviation**)
AF bandwidth 300-2800Hz, pre-emphasis, CTCSS input
Rated 25 watts intermittent, 10 watts continuous
B3536/07 audio processor
Crystal oven fitted (TA-103)
FCC Type Accepted

SECTION 2 CIRCUIT OPERATION

Refer to the Block and Circuit Diagrams at the rear of this Manual.

2.1 RF SECTION

2.1.1 EXCITER

The RF source is a modified Colpitts crystal controlled oscillator (Q402) and, depending upon a movable link, may be either fixed frequency or fine tuned with a vari-cap diode (D401) which is controlled by a DC voltage. Provision is also made for either switched or unswitched oscillator operation (see Section 5.5.3 for details).

Q401 is a common-base buffer stage whose output is fed via a tuned circuit to a cascaded two-stage phase modulator (Q403, Q404, with their associated components). The two PIN diodes (D402, D403) are used as variable resistors which, in conjunction with the circuit inductances and capacitances, vary the phase shift of the RF signal in sympathy with the current that is a function of the output from the audio processor.

The modulated signal is amplitude limited by Q405, IC401 and Q406, and the third harmonic is selected by the two-stage filter in the output of the tripler (Q406). The signal is then amplified by Q407 and frequency doubled by the push-push doubler (Q408, Q409). The output of the doubler is taken to the exciter output stage which comprises Q410 and a matching network, then to the PA module via a 50 ohm coaxial cable and SMC connector. The output from the exciter is controlled by the 'power adjust' circuit (Q411 & Q412) which compares a rectified sample of the transmitter output with a reference voltage preset by either RV451 (high power) or RV452 (low power), and adjusts the supply to the output stage to maintain a constant output power.

2.1.2 TRANSMIT SWITCH AND TIMER

When the 'Tx enable' line is taken low (approaching 0 volts), the output from IC301a goes low and removes the audio inhibit signal to the audio processor board. IC301d provides the 9 volt switched supply which is on when the Tx enable line is low. When the 'low' is removed, R308 pulls the Tx enable line 'high' and immediately the output from IC301a goes high, thus inhibiting the audio. The 9V switched supply remains on for a time preset by RV312 & C311 to provide a silent tail at the end of each transmission.

2.1.3 REGULATED SUPPLIES

There are two regulated supplies on the exciter board: one is continuous and is applied to the changeover switch (Q305, IC301) and, as an option, to the oscillator. The other supply is switched and is derived from the output of IC301d and fed through Q306, Q307 to lower the output impedance. It is then applied to the modulator, multiplier and exciter output stages via the power control circuits.

Q301 is a current limit sensing device for both supplies and Q302 with D301 provides the voltage reference source.

2.2 PA ASSEMBLY

The output from the exciter (approximately 400mW) is fed through a matching network to the base of the driver (Q501) and, after amplification, via a further network to the final power amplifier (Q502). Both the driver and output transistors are operated in Class C. A harmonic filter follows to suppress any spurious outputs before the signal is taken to the aerial socket. D501 provides a DC voltage proportional to the output power for the power level control circuit. D502 prevents damage to the PA if the supply polarity is accidentally reversed, by blowing the power supply fuse.

2.3 AUDIO PROCESSOR (B3536)

2.3.1 GENERAL

The transmitter audio processor contains circuits for processing the audio inputs to produce a wide variety of modulation characteristics to suit individual customer requirements. The characteristics may be obtained by means of 'wire-in' links.

Each section is designed to have a standard output to allow interconnection of the sections in any order. A brief description of each section follows.

2.3.2 MICROPHONE PRE-AMPLIFIER

Audio signals from the microphone are amplified by Q1 to bring the level to the standard inter-section signal level.

2.3.3 AUDIO SWITCH

The audio switch (IC1) selects either the 'local microphone' or the 'line' as the audio input source. It also provides the inhibit **facility which is used** to obtain a 'silent tail' at the end of each transmission.

2.3.4 AUDIO AUTOMATIC GAIN CONTROL & AMPLIFIER

Transistor Q3, in conjunction with R22, forms a variable potential divider which holds the audio level constant at its collector for a wide range of input amplitudes. The control loop consists of a precision rectifier (D7, D8, IC2b), a comparator (IC2a) which compares the rectified output with a DC level (preset by RV27) and an inverter (Q5) which feeds the amplified error current to the emitter follower (Q4) and the control element (Q3). RV27 sets the reference level and thus a constant output level.

2.3.5 PRE-EMPHASIS

IC3a and its associated components provide a pre-emphasized response from 300 to 3000Hz.

2.3.6 LIMITER/INTEGRATOR/LOW PASS FILTER

A two-stage limiter (IC3b, IC4a) is employed to achieve the desired clean limiting consistent with sufficient gain. RV54 sets the maximum peak deviation.

IC4b and its associated components provide the integrating function to compensate the phase modulators to obtain frequency modulation.

The low pass filter suppresses unwanted modulation products and an emitter follower (Q8) is used to provide a low impedance drive to the modulators on the exciter board.

2.3.7 TRANSMITTER KEYING

The transmitter keying circuit consists of an optional opto-coupler (for isolation between the keying circuits and the transmitter), and a 3 input OR Gate (formed with D1, D2 & D3) such that any one of four inputs will key the transmitter, namely:

1. 'Tx Key' from a receiver or line when the appropriate line is earthed.
2. 'Carrier Switch', a push button for testing purposes, which can also inhibit the audio switch if required.
3. 'Microphone PTT switch', which switches IC1 to select the microphone input and disconnects the line audio.
4. A suitable potential applied to the opto-coupler input.

SECTION 4 INSTALLATION

4.1 GENERAL

Tait Base Station transmitters and receivers may be assembled into a wide variety of base station systems, from a simple 'land mobile base' to a complex 'linking system'.

4.2 TALK THROUGH REPEATER

In this configuration the receiver directly keys the transmitter when the signal is received. The demodulated audio is fed via 600 ohm lines to the transmitter to modulate the carrier. The receiver and transmitter operate simultaneously and must therefore be on different frequencies. The minimum frequency separation depends on the duplexer used.

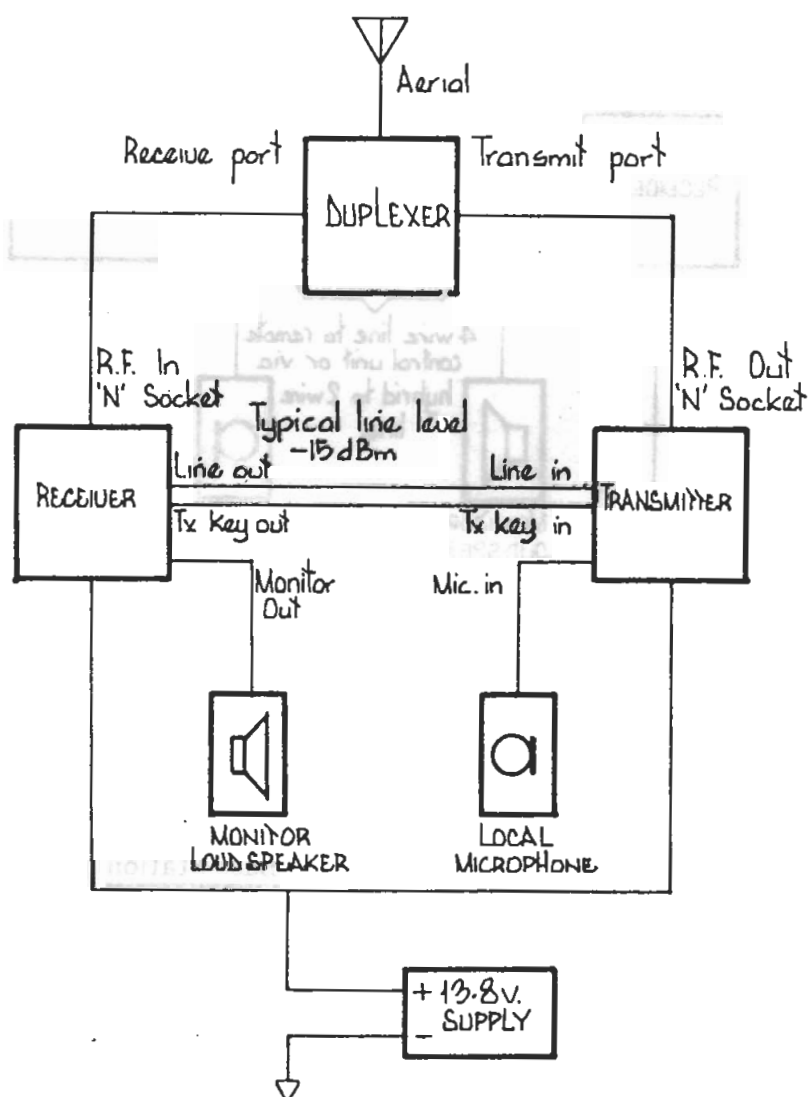


Figure 1 Talk Through Repeater

4.3 LINE CONTROLLED BASE STATION (Without Talk Through)

This installation contains a transmitter and receiver which may or may not be on the same frequency, thus simultaneous transmission and reception is not possible. In this case, the transmitter is keyed from the Remote Control Unit (RCU). When the transmitter is keyed, the coaxial relay is also energised. When the relay is in its rest position, signals from the aerial are passed to the receiver and the demodulated output is fed via 600 ohm lines to the RCU.

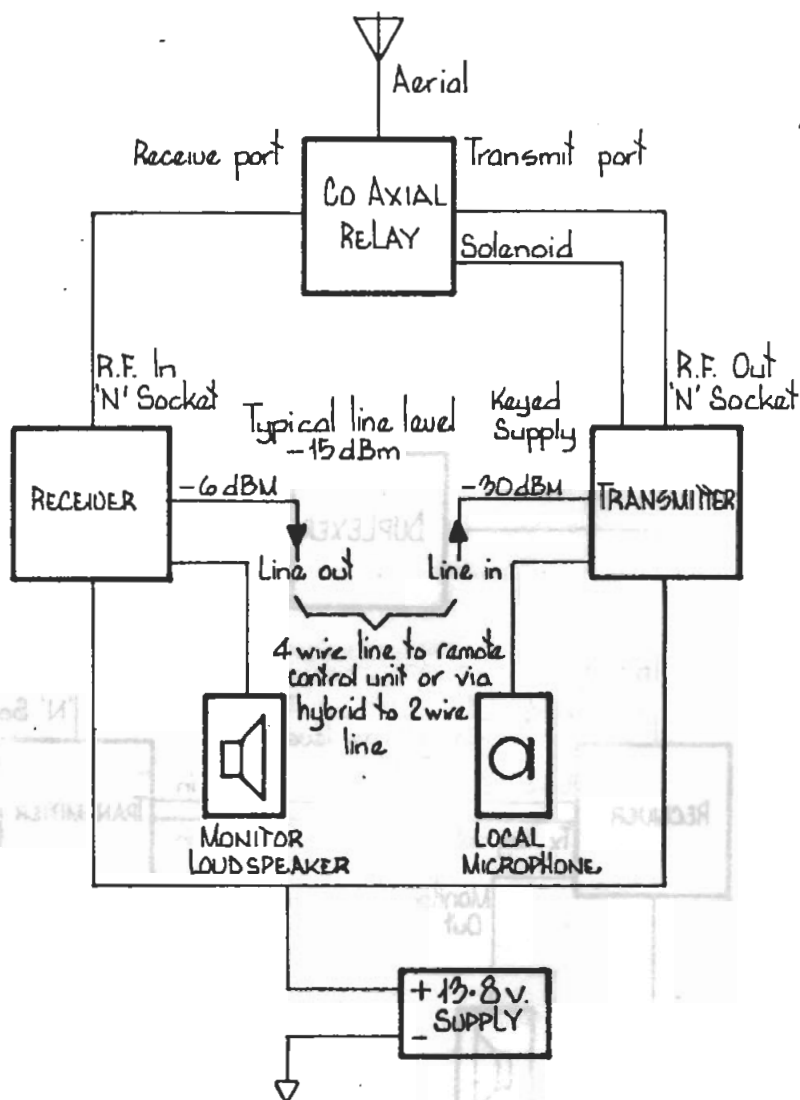


Figure 2 Line Controlled Base Station

4.3.1 4-WIRE TO 2-WIRE CONVERTER (HYBRID)

One way in which a base station may be line controlled by a two-wire line is by providing a 4-wire to 2-wire converter (hybrid). The line transformers may be interconnected to form such a hybrid by the following method.

1. Interconnect the windings of the line transformers as shown in Figure 3.

Note: Although the turns ratios of the transformers are not optimum for correct impedance match, the configuration performs adequately for most applications.

2. RV1, which controls the hybrid balance, may be adjusted for maximum isolation or for a specific talk through level as required. When maximum isolation is required, the slope of the average audio response between the two 4-wire ports may be improved by slight adjustment of RV1, sacrificing 1 or 2dB of total isolation between the 4-wire ports. This adjustment can be carried out audibly by listening to the re-transmitted white noise output of an open receiver with no signal input, and observing the relative response slope while making the adjustment.
3. The hybrid balance may be improved by fitting a capacitor (C1) in series with RV1. This will depend on the line characteristics and whether a capacitor is fitted in the line path. Some experimentation may be necessary to find the value of C1 (usually 1 or 2 μ F).

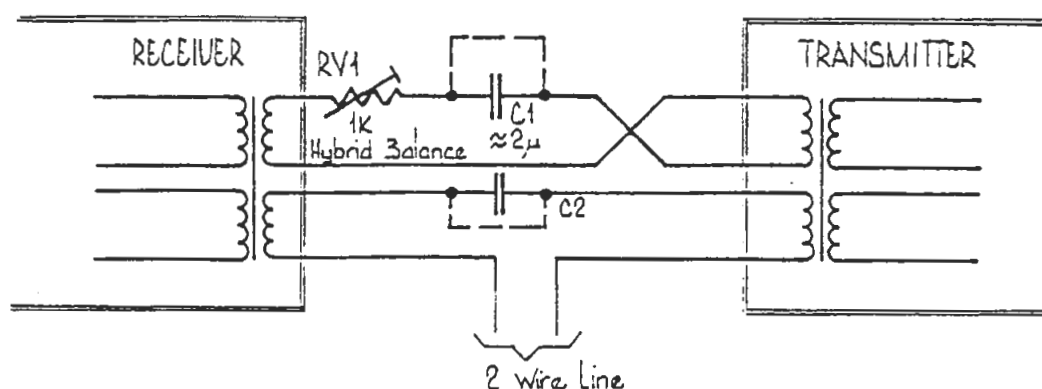


Figure 3 4-Wire to 2-Wire Converter

Note: (a) It is important that the two windings of each transformer are phased as shown.

(b) C2 may be fitted to allow DC signalling on the line.

4.4 AUDIO PROCESSOR FLAT RESPONSE

Refer to the B3536 Circuit Diagram (A1C274) at the rear of this Manual.

The B3536 audio processor links are set during manufacture to customer order. Should a change in processor characteristics become necessary, carry out the circuit changes in accordance with the information given on the B3536 Circuit Diagram.

Note: In some cases, the links shown are incorporated in the copper track (e.g. link k-1). In such cases it is necessary to cut the track at the appropriate point when not required.



2 wire line

4-Wire to 2-Wire Converter

- (a) It is important that the windings of each 1 as shown.
- (b) C2 may be fitted in the 11

AUDIO PROCESSOR PLAT RESERVOIR

to the B3536 Circuit Diagram 12

Wiring links are set
as shown in the
diagram with the

EX. 0077
the B353

IN 876
000000

SECTION 5 SERVICING

5.1 GENERAL

5.1.1 NOTES

If further information is required about the T356 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.

5.1.2 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. Relevant TI's are available from Product Support Group, Tait Electronics Ltd, Christchurch.

5.2 MECHANICAL

5.2.1 POSIDRIV RECESS HEAD SCREWS

Posidriv 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.

Note: Philips cross-head screws are used in some locations which require very small screws. A Philips cross-head driver must be used on these screws.

5.3 REPAIR

5.3.1 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.

5.3.2 COMPONENT REPLACEMENT

Whenever components are removed from, or fitted to the printed circuit track, care must be taken to avoid damage to the track. If it is necessary to remove a component from the track, the following procedure is recommended:

- Remove the solder from the component leads using a solder wick.
- Loosen the individual leads from the printed track.
- Withdraw the component from the top of the PCB.

Do not remove the component from the PCB while the solder is still molten.

Keep all soldering operations, and the heat and solder applied, to a minimum. A thermally controlled, fine tip soldering iron should be used. Ensure that the iron is earthed back to the frame of the set.

5.3.3 TO REMOVE LARGE CASED MICA CAPACITORS

Large cased mica capacitors may be removed by applying a heavy duty soldering iron to the top of the case and lifting gently with a solder resistant spike, or equivalent, once the solder is molten.

5.3.4 INTER-BOARD WIRING

To assist circuit tracing, all plugs and connections are shown on the outer edge of the Circuit Diagrams.

5.4 SETTING UP

5.4.1 TEST EQUIPMENT REQUIRED

1. Oscilloscope good quality, 0-10MHz (e.g. Trio 1566A, Telequipment D61A)
2. VHF FM signal generator capable of providing 138-174MHz at 0dBm to -120dBm frequency modulated to ± 35 kHz deviation at 1kHz (e.g. HP8654)
3. VHF frequency counter (accuracy better than 1ppm)
4. Audio oscillator (e.g. Trio AG 203)
5. Tone box consisting of an audio amplifier of approx. 1.5 watts output driving a speaker. This can be coupled to the T356 local microphone via an adaptor which holds the speaker and microphone close together.
6. Multimeter or DMM (e.g. AVO model 8 or Fluke 8012A)
7. RF diode probe (e.g. Coline M12DM modular RF detector probe)
8. RF Power Attenuator, total attenuation 50dB
(e.g..Weinschel 40-20-33 30dB 150W + Coline 1200 85.20dB 1W)
9. Frequency modulation meter, high resolution usable to 174MHz, with at least 10kHz bandwidth (e.g. Marconi TF2304, HP 8901 or Sayrosa 252)
10. DC power supply capable of delivering 6 amps at 13.8V
11. 15 way D range connector, wired as per T356 Wiring Diagram A2C298
12. TA-036 Adaptor SMC female to BNC male. TA-037 Adaptor SMC male to BNC female
13. Microphone and stereo jack plug for T356 local microphone input
14. Trimming tools (available from Tait Electronics Ltd):

WT 9	Tait IPN	9360110
WT 10		9360111
WT 11		9360112

5.4.2 TUNING HINTS

1. Use of RF Probes:

When using an RF probe, the ground return lead should be kept as short as possible, and connected as close as possible to the point at which the measurement is being made. This is to minimize stray pick-up which may affect the readings.

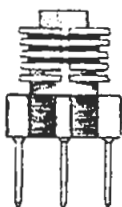
2. Inductor Tuning:

Inductors always have the maximum inductance (hence tune to the lowest frequency) when the slug is centrally placed in the windings. Turning the slug in either direction will always reduce the inductance, but only one direction is correct for a particular type of coil. The incorrect direction will have a smaller tuning range, so it may not tune at the top end of the tuning range and, in addition, the slug will be less secure.

Type A

612 - L404, L407

613 - L409, L410
L412, L413



Type B

617 - L401



Type A Windings close to the top of the former, so at the upper end of the frequency range the slug should be at the PCB end of the former.

Needs a non-conductive tool if tuned from the component side of the PCB.

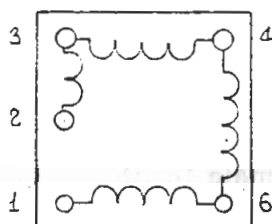
Type B Windings close to the bottom of the former, so at the upper end of the range the slug should be at the top end of the former.

Needs a non-conductive tool if tuned from the underside of the PCB.

5.4.3 OSCILLATOR TRIM COIL TYPE 617 (L401)

The Tait coil type 617 is the crystal trim coil in the T356 transmitter. Pin 1 is the reference terminal and pins 6, 4, 3 & 2 are the taps in order of increasing inductance. The normal connection is to pin 4 and this should trim most crystals to the correct frequency.

In some cases it may be necessary to change the tap to achieve the correct frequency. In this case, disconnect pin 4 and link the track to pin 6 or 3.



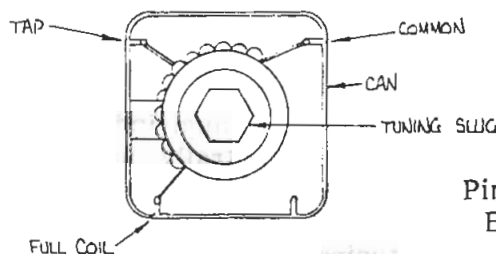
Pin Connections
Bottom View

Figure 4 Coil Type 617

5.4.4 RF COILS TYPE 618 (L417, L418)

RF coils type 618 each have a tap which is connected to the printed circuit during manufacture. For operation in the top half of the frequency range, the tap is connected in circuit and the full coil connection is left open. For operation in the bottom half of the frequency band, the coil tap is cut and the full coil is connected to ground with a short link.

When frequencies near the mid band point are required, check that the coil connections are correct by adjusting the coil slug through its full range. Two peaks should be observed; if only one peak is present, the coil connections should be changed.



Pin Connections
Bottom View

Figure 5 Coil Type 618

5.5 ALIGNMENT AND ADJUSTMENTS

5.5.1 PRELIMINARY PROCEDURE

Check that the oscillator power supply option is correct, and that L617 coil connections are correct for the required frequency range (see Section 5.4.3).

Check for short circuits between:

- Unregulated supply rail and earth.
- Regulated supply rails and earth.

Note: In the event of a short circuit between the unregulated rail and earth on the exciter board, R302 and R303 may go open circuit with no obvious signs of overheating.

Disconnect the coaxial link between the exciter output and the PA.

Set up the test equipment as in Diagram 1 (the wattmeter should be connected to the exciter output via the special connector).

While monitoring the supply current, connect the D range connector to the transmitter. The supply current should not exceed 150mA.

Fit the correct crystal ($F_x = F_t/6$).

Set RV451 & RV452 fully clockwise.

Set the high/low power switch to 'high'.

Note: For frequencies below 150MHz, bring C415a into circuit by bridging pads 'k' & 'l' (these pads are located on the bottom side copper of the modulator section of the exciter PCB).

Earth the key line (pin 13 of the D range connector).

5.5.2 ALIGNMENT PROCEDURE

To carry out the following alignment procedure, the EVM with RF diode probe is connected to the appropriate transistor bases as indicated. The corresponding coil slug is then adjusted for a peak reading on the EVM.

Transistor Base	Coil Slug	Typical EVM Reading
Q403	L404	0.4V
Q406	L407	2.0V
Q407	L409, L410	1.2V
Q408	L412	2.0V
Q409	L413	2.0V
Q410	L417, L418	3.8V

Adjust CV462 & CV464 for maximum power output (between 200 & 500mW).

Retune coils L407, L409, L410, L412, L413, L417, L418, CV462 and CV464 for maximum wattmeter reading.

T356 Servicing

If the exciter power is less than 450mW, connect the emitter of Q410 directly to earth (a solder pad is provided). If the power output is still less than 400mW, either the exciter is faulty or incorrect coil taps are being used (see Section 5.4.4).

Transfer the wattmeter from the exciter output to the PA output terminal.

Connect the exciter to the PA.

Unscrew the four screws holding the PA module to the main chassis.

Adjust CV520 (through the PA shield) for maximum output power (this should be between 28 and 40 watts).

If the output is less than 28 watts, short out R459.

Note: If R459 is already shorted out and the output power is less than 28W, then a fault condition exists.

Secure the PA.

Adjust RV451 (high power) for 25 watts output (maximum).

Set the 'high/low' power switch to 'low'.

Adjust RV452 for the required low power in the range 5 to 25 watts.

5.5.3 CRYSTAL OSCILLATOR FREQUENCY TRIMMING

5.5.3.1 General

The crystal oscillator may be operated from either a switched or continuous supply. If a link is connected between pads 'h' and 'i', the supply will be unswitched. If a switched supply is required, the pads 'h' & 'g' should be linked.

5.5.3.2 Vari-Cap Fine Tuning Option

The vari-cap fine tuning option provides a frequency trimming range of at least $\pm 1\text{kHz}$ for a control range of 0 to 8 volts.

To change the T356 for vari-cap operation:

- Remove the link between pads 'c' & 'd'.
- Fit a link between pads 'e' & 'f'.

5.5.3.3 Frequency Trimming

(a) NON VARI-CAP OPERATION

Adjust the oscillator trim coil slug (L401) for the required carrier frequency measured at the PA output terminal.

(b) VARI-CAP OPERATION

Set the voltage across D401 (vari-cap diode) to +2.5V.

Adjust the oscillator trim coil slug (L401) for the required carrier frequency measured at the PA output terminal.

5.5.4 B3536 AUDIO PROCESSOR ADJUSTMENTS

5.5.4.1 Deviation

The deviation figures given in the following Sections are for $\pm 5\text{kHz}$ deviation (25kHz channel spacing); for $\pm 2.5\text{kHz}$ deviation (12.5kHz channel spacing), use half these figures.

5.5.4.2 Compressor

In current production runs the compressor has been removed from the line input circuit, but retained for use with the microphone.

The B3536 audio processor Circuit Diagram (A1C274) will give the appropriate linking details.

Note: If it is necessary to change the links, check the following component values:

C26 - 3n3
C28 - 10n
C30 - 10n

5.5.4.3 Line Input Adjustment

Remove the T356 sleeve.

Connect the T356 to the rack via an extender panel or TA-086 bench service lead, wired as per Wiring Diagram A2C298.

Set up the test equipment as in Diagram 1.

Set the audio signal generator output to 1kHz at 0dBm into the line.

Set RV64 (line sensitivity control) fully clockwise.

Earth the key line.

Set RV54 (modulation adjust) for a peak reading on the modulation meter of $\pm 5\text{kHz}$ deviation (this sets up the limiter for maximum deviation).

Sweep the audio frequency range and adjust RV54 to ensure that the maximum deviation is kept to $\pm 5\text{kHz}$.

Reduce the audio input to -15dBm.

Turn the line level control on the front panel until the modulation meter reads $\pm 3\text{kHz}$ deviation.

The transmitter line sensitivity has now been set.

5.5.4.4 Microphone Input Adjustment

Plug the microphone jack into the front panel socket.

Turn RV27 (compression adjustment) fully clockwise to remove compression.

Acoustically couple the microphone to a tone box and close the PTT switch.

Set the tone box oscillator to 1kHz.

Increase the audio level until the demodulated waveform shows signs of clipping.

Uncouple the microphone from the tone box.

Speak into the microphone, checking that the modulation peaks do not exceed $\pm 5\text{kHz}$ deviation.

5.5.5 TO SET THE TAIL TIMER

Set RV312 to its minimum position.

Briefly key the transmitter.

Check that the 'tail time' is zero.

Set RV312 to maximum.

Briefly key the transmitter.

Check that the transmitter remains on for approximately 2 seconds after the key is released.

Adjust RV312 for the desired silent tail time.

5.6 FAULT FINDING

5.6.1 GENERAL

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

If a component failure is suspected, in most cases it will require little other than the usual systematic approach with the aid of the information given in this Manual.

A Block Diagram is included with all relevant information, as is a voltage table giving the DC conditions around each transistor, measured with a 20k ohms/volt moving coil meter and the supply rail set at 13.8V.

Refer to Sections 5.3.1 and 5.3.2 before attempting to remove any component.

5.6.2 PA MODULE - SPECIAL NOTES

5.6.2.1 To Replace The PA Transistors

Unsolder the tabs by heating with a soldering iron and lifting up towards the transistor with a thin stainless steel spike or screwdriver. Unscrew the transistor mounting screws and/or stud nuts 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 thermal compound before screwing it securely to the heatsink. Solder the tabs.

CAUTION: Do not solder the tabs before tightening the screws, otherwise the tabs may break.

5.6.2.2 To Remove The PCB From The Heatsink

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

Remove the three PCB retaining screws, unbolt the transistor stud nuts and/or mounting screws and lift the PCB away complete with transistors.

CAUTION: Do not operate the PA with the PCB unattached as the heatsink is used for earthing, and also the transistors will quickly overheat.

5.6.3 VOLTAGE CHART

Test conditions:

Voltmeter:	20k ohms/volt moving coil meter.
Power supply voltage:	13.8V at socket.
Transmitter:	keyed on.
Crystal:	not fitted.

The following chart gives typical figures.



T356 Servicing

Device	Emitter Volts	Base Volts	Collector Volts
Exciter			
Q401	4.5	5.1	7.2
Q402	1.2	1.9	4.5
Q403	1.0	1.7	7.7
Q404	1.0	1.7	7.7
Q405	0.4	1.1	6.7
Q406	1.0	1.6	12.1
Q407	0.8	1.3	12.0
Q408	0.0	0.0	13.0
Q409	0.0	0.0	13.0
Q410	0.0	0.0	13.5
Q411	0.0	0.6	0.9
Q412	13.8	13.2	13.5
Q301	13.8	13.2	0.7
Q302	0.0	0.6	10.0
Q303	9.3	9.9	13.0
Q304	13.6	13.0	9.3
Q305	9.3	8.7	9.3
Q306	9.3	9.9	13.0
Q307	13.5	13.0	9.5
RF Power Amplifier			
Q501	0.0	0.0	13.6
Q502	0.0	0.0	13.6
B3536 Audio Processor			
Q1	0.0	1.5	3.4
Q2	9.4	8.8	0.0
Q3	0.0	0.4	0.0
Q4	0.4	0.8	9.4
Q5	9.3	8.8	0.8
Q6	1.2	0.5	8.4
Q7	9.0	8.4	3.1

SECTION 6 PARTS LIST

6.1 GENERAL

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 parts list printed below is for all versions of the T356. Different versions have different sub-groups. Check the version of your T356 (printed on a label on the back of the set). To find the correct part refer to the sub-groups listed for your version of the T356. The same circuit reference may be listed in more than one sub-group, but it will only be correct in the sub-group listed for your version.

	<u>VERSION</u>	<u>SUB-GROUPS</u>	
1.	<u>T356/01</u>	B356 B356/PA B356/MECH B356/WIRE C356/01 B3536 C3536/01 B3538 B3540	T356 Exciter PCB Assembly Parts T356 PA Parts T356 Mechanical Assembly Parts Wire Kit For Basic T356 Add To B356 For T356/01 B3536 Audio Processor Basic Parts Add To B3536 For B3536/01 B3538 CTCSS Tone/Speech Splitter Parts B3540 Phase Modulator 24.5-29MHz Parts
2.	<u>T356/02</u>	B356 B356/PA B356/MECH B356/WIRE C356 C356/02 B3536 C3536/02	T356 Exciter PCB Assembly Parts T356 PA Parts T356 Mechanical Assembly Parts Wire Kit For Basic T356 Add To T356 For T356/02 & /05 Versions Add To B356 For T356/02 & /05 Versions B3536 Audio Processor Basic Parts Add To B3536 For B3536/02
3.	<u>T356/05</u>	B356 B356/PA B356/MECH B356/WIRE C356 C356/02 B3536 C3536/05	T356 Exciter PCB Assembly Parts T356 PA Parts T356 Mechanical Assembly Parts Wire Kit For Basic T356 Add To T356 For T356/02 & /05 Versions Add To B356 For T356/02 & /05 Versions B3536 Audio Processor Basic Parts Add To B3536 For B3536/05
4.	<u>T356/52</u>	B356 B356/PA B356/MECH B356/WIRE C356/02 C356/52 B3536 C3536/07 B/TA-103 C/TA-103	T356 Exciter PCB Assembly Parts T356 PA Parts T356 Mechanical Assembly Parts Wire Kit For Basic T356 Add To B356 For T356/02 & /05 Versions Add To T356 For T356/52 Version B3536 Audio Processor Basic Parts Add To B3536 For B3536/07 TA-103 Crystal Oven Parts TA-103 Retro-Fit Parts

T356 Parts List

6.2 B356 T356 EXCITER PCB ASSEMBLY PARTS

6.2.1 TRANSISTORS

internal part No.									CHANGE NOTE	check	description	circuit reference	Qty per Set
0	0	0	0	0	0	1	1	1	0		BC548B TRANSISTOR	Q302, Q303, Q306, Q411	4
0	0	0	0	0	0	1	1	3	0		BC557B TRANSISTOR	Q301, Q305	2
0	0	0	0	0	0	1	1	7	0	84/02-052	BD136 TRANSISTOR	Q304, Q307, Q412	3
0	0	0	0	0	0	2	0	1	1	84/04-175	BF424 TRANSISTOR	Q401, Q402, Q403, Q404, Q414	5
0	0	0	0	0	0	2	0	3	5	84/04-175	BF324 TRANSISTOR	Q413	1
0	0	0	0	0	0	2	2	3	0		2N4427 TRANSISTOR	Q410	1
0	0	0	0	0	0	3	1	9	0		MP5H11 TRANSISTOR	Q405, Q406, Q407	3
0	0	0	0	0	0	3	1	9	5		MP53646 TRANSISTOR	Q408, Q409	2

6.2.2 DIODES

0	0	1	0	0	0	1	2	6	8	C/N 2166	MA47600 PDI DIODE	D402, D403	2
											BB204B-VARICAP DIODE	D401	1
0	0	1	0	0	0	1	5	1	7		BZX79/C9V1 ZENER	D301	1

6.2.3 INTEGRATED CIRCUITS

0	0	2	0	0	0	1	2	2	0		LM703LN		
0	0	2	0	0	0	1	4	9	0		CD400111B INT CPT	IC301	1
										ALT.	CD400111B		

6.2.4 CAPACITORS

0	1	1	0	0	5	0	0	0	1		0P5 CAP P100 50V ±0.25P CERAMIC	C452	1
0	1	1	0	0	7	5	0	0	1		0P75 CAP P100 50V ±0.25P CERAMIC	C435, C444	2
0	1	1	0	1	2	2	0	0	1		2P2 CAP NPO 63V	C463, C466	2
0	1	1	0	1	4	7	0	0	1	84/01-516	4P7 CAP NPO 63V TOL D CER AT	C415A	1
0	1	1	0	1	6	8	0	0	1		6P8 CAP NPO 63V	C455	1
0	1	1	0	1	8	2	0	0	1		8P2 CAP NPO 63V	C450	1
0	1	1	0	2	1	8	0	0	1		18P CAP N150 63V 5%	C451	1
0	1	1	0	2	2	2	0	0	1	C/N 2189	22P CAP N150 63V 5%	C436, C415 (SELECT ON TEST)	2
0	1	1	0	2	2	7	0	0	1	C/N 2189	27P CAP N150 63V 5%	C431, C442, C445	3
0	1	1	0	2	3	3	0	0	1		33P CAP N150 63V 5%	C465	1
0	1	1	0	2	3	9	0	0	1	84/07-303	39P CAP NPO 63V 5%	C461	1
0	1	1	0	2	4	7	0	0	1		47P CAP N150 63V 5%	C456	1
0	1	1	0	2	4	7	0	0	6		47P CAP N750 63V 5%	C404A	1
0	1	1	0	2	5	6	0	0	1		56P CAP N150 63V 5%	C408	1
0	1	1	0	2	6	8	0	0	1		68P CAP N150 63V 5%	C428, C432, C443, C446	4
0	1	1	0	3	1	0	0	0	1	84/04-175	100P CAP N150 63V 5%	C497, C429, C437, C447	4

T356 Parts List

0	1	1	0	3	1	5	0	0	1		150P CAP N150 63V 5%	C405, C409	2
0	1	1	0	3	2	2	0	0	1	84/01-546	220P CAP N750 63V 10% CER RT	C419	1
0	1	1	0	3	4	7	0	0	2	84/01-546	470P CAP T/E B 63V 10%	C410,	1
0	1	1	0	3	4	7	0	0	1	84/04-175	470P CAP NIKS 63V 10%	C498	1
0	1	1	0	4	1	0	0	0	1		1n CAP T/E B 63V 10%	C304, C306, C308, C309	
												C310, C311, C313, C314	
												C414, C417, C422, C424	
												C454	13
0	1	1	0	4	4	7	0	0	3	84/04-175	4n7 CAP T/E B 50V 10%	C301, C303, C403	
												C404, C411, C413	
												C420, C423,	
												C427, C430, C433, C438	
												C440, C448, C449, C453	
												C457, C458, C460	
												C4032, C407, C441	22
0	2	0	0	7	3	3	0	0	1		3u3 CAP 50V ELECTRO VERT MTG	C305, C312	2
0	2	0	0	8	1	0	0	0	3	C/N 1521	10u CAP 50V ELECTRO VERT MTG	C307, C315, C412, C418	
												C459, C416, C421	7
0	2	0	0	8	4	7	0	0	2		47u CAP 16V ELECTRO VERT MTG	C434, C439	2
0	2	0	0	9	2	2	0	0	1		220u CAP 16V ELECTRO VERT MTG	C302	1
0	2	8	0	2	1	0	0	0	2		2/10P TRIM CAP (MATSUSHITA EEV-1TY-10P17)	CV462, CV464-	2

6.2.5 RESISTORS

0	3	0	0	1	1	0	0	0	1		1E RESISTOR 10x4mm 5% C/F	R302, R303	2
0	3	0	0	1	3	3	0	0	0		3E3 RESISTOR 7x2.5mm 5% C/F	R459	1
0	3	0	0	2	1	0	0	0	0		10E " " " " "	R446, R449	2
0	3	0	0	2	4	7	0	0	0	84/04-175	47E " " " " "	R405, R411, R414, R421	
												R428, R443	6
0	3	0	0	2	5	6	0	0	0	C/N 2189	56E " " " " "	R461	1
0	3	0	0	3	1	0	0	0	0		100E " " " " "	R306, R408, R416, R417	
												R424, R425, R431, R438	
												R439, R450, R458	11
0	3	0	0	3	1	5	0	0	0	84/04-175	150E " " " " "	R497	1
0	3	0	0	2	3	9	0	0	0	C/N 2189	39E " " " " "	R418	1
0	3	0	0	3	2	7	0	0	0	84/04-175	270E " " " " "	R496	1
0	3	0	0	3	3	3	0	0	0	83/10-994	330E " " " " "	R409, R410, R457	3
0	3	0	0	3	4	7	0	0	0		470E " " " " "	R447, R448, R301, R305	4
0	3	0	0	3	6	8	0	0	0	84/04-175	680E " " " " "	R404, R432, R454, R455	
												R494, R495	6
0	3	0	0	3	6	8	0	0	1		680E " 10x4mm 5% C/F	R460	1
0	3	0	0	4	1	0	0	0	0	83/10-994	1K " 7x2.5mm 5% C/F	R307, R313, R402,	
												R414, R437, R442, R445	
												R456	8
0	3	0	0	4	1	5	0	0	0		1K5 RESISTOR 7x2.5mm 5% C/F	R308	1
0	3	0	0	4	1	8	0	0	0		1K8 " " " " "	R406, R407	2
0	3	0	0	4	2	2	0	0	0		2K2 " " " " "	R443A, R440, R453	3
0	3	0	0	4	2	7	0	0	0	84/04-175	2K7 " " " " "	R492	1
0	3	0	0	4	3	3	0	0	0	84/04-175	3K3 " " " " "	R304, R430, R414A	3
0	3	0	0	4	3	9	0	0	0	84/04-175	3K9 " " " " "	R493	1
0	3	0	0	4	4	7	0	0	0		4K7 " " " " "	R310, R413, R420, R426	
												R441, R423 (SELECT ON TEST)	6
0	3	0	0	4	8	2	0	0	0		8K2	R309	1

T356 Parts List

																					10K	R403, R410, R350/01	1
0	3	0	0	5	1	5	0	0	0												15K	R412, R422, R436	3
0	3	0	0	5	2	2	0	0	0												22K	R415, R429	2
0	3	0	0	5	8	2	0	0	C	B401-546											82K	R419	1
0	3	0	0	6	1	0	0	0	D	R401-546											100K	R427	1
0	3	0	0	6	4	7	0	0	0												470K	R311	1
0	4	2	0	4	2	2	0	0	2												2K RES PRE-SET CERMET 63P FLAT	RV451, RV452	2
																					" " " " "		
0	4	2	0	7	1	0	0	0	8												1M " " " " "	RV312	1

6.2.6 COILS

0	5	0	0	0	0	1	6	1	2			COIL TAIT No 612	L404, L407	2
0	5	0	0	0	0	1	6	1	3			COIL TAIT No 613	L409, L410, L412, L413	4
0	5	0	0	0	0	1	6	1	7			COIL TAIT No 617	L401	1
0	5	0	0	0	0	1	6	1	8			COIL TAIT No 618	L417, L418	2
0	5	2	0	8	1	3	0	1	5			COIL A/W 1.5T/3mm HOR	L414	1
0	5	2	0	8	1	3	0	3	5	84/07-303		COIL A/W 3.5T/3.0mm HOR	L421	1
0	5	2	0	8	1	4	0	6	5			COIL A/W 6.5T/4mm HOR	L422, L423	2
0	5	6	0	0	0	1	0	1	5			INDUCTOR FXD CHOKE No15	L402	1
0	5	6	0	0	0	2	1	0	0			INDUCTOR FXD TAIT TYPE 100 3.3uH	L403, L408, L411, L415 L416, L420	6
0	5	6	0	0	0	2	1	0	1			INDUCTOR FXD TAIT TYPE 101 1.5uH	L405	1
0	5	6	0	0	0	2	1	0	3			INDUCTOR FXD TAIT TYPE 103 (TAPED)	L301	1
0	6	2	0	0	0	1	0	1	1			CAN 14mm ID X 12mm	PERMITS AS PART OF COIL 618	2
0	6	5	0	0	0	1	0	0	4			FERRITE BEAD NS0210 4x2x5 F8	L406, L419	2

6.2.7 MISCELLANEOUS

2	0	0	0	0	0	1	0	0	5		WIRE 0.5mm TINNED COPPER	6 x 20 mm L1M165	120mm
2	0	6	0	0	0	1	0	1	1		CABLE COAX RG316-U		130mm
2	2	0	0	0	0	1	0	5	6		PRINTED CBT BOARD T356 EX		1
2	3	3	0	0	0	1	0	0	5	83/10-444	SWITCH SLIDE MINATURE DPDT	SW 401	1
2	4	0	0	2	1	0	0	4	6		SKT COAX ELBOW 1/8" MC50-2-4C (SUMNER)		1
2	4	0	0	4	0	2	0	2	0		SKT XTAL MTG HC18U PCB MTG McMURDO N3/4E/PC		1
3	0	8	0	0	1	2	0	2	8		HEAT SINK REDPAINT 5F		1
3	4	5	0	0	0	4	0	1	1	87/6-174	SCREW M3 x 10mm PAN/BLZ	MTG Q412	1
3	4	5	0	0	0	5	0	1	2		SCREW M4 x 15mm PLASTIC	FASTENING L301 TORXID	1
3	5	2	0	0	0	1	0	0	8		NUT M3 HEX COLD FORM		1
3	5	2	0	0	0	1	0	1	2		NUT M4 HEX PLASTIC		1

T356 Parts List

3	5	3	0	0	0	1	0	1	3		WASHER M3 SHAKEPROOF		1
3	5	6	0	0	0	1	0	2	6		HARWIN TRACK PIN		22
3	6	2	0	0	0	1	0	0	5		MICA T0-220		1

6.3 B356/PA T356 PA PARTS

6.3.1 TRANSISTORS

0	0	0	0	0	0	2	3	0	5		TRANSISTOR SD1143	Q501	1
0	0	0	0	0	0	3	2	3	5		TRANSISTOR MRF216 (PLANGE MTG)	Q502	1

6.3.2 DIODES

0	0	1	0	0	0	1	1	6	0		STR 2607 DIODE	D502	1
0	0	1	0	0	0	1	3	4	5	83/12-1071	ISS97/2 SCHOTTKY DIODE	D501	1

6.3.3 CAPACITORS

0	1	1	0	0	7	5	0	0	1		0P75 CAP P100 50V ±25P KCM 505JAXR75C	C518	1
0	1	1	0	2	4	7	0	0	1	83/10-994	47P CAP N150 5% 63V	C501	1
0	1	1	0	4	4	7	0	0	3	83/11-1030	4M7 CAP T/C B 10% 50V	C502, C512, C515, C519 C503	5
0	1	2	0	4	1	0	0	0	1	87/2-027	1M CAP CO2 FEEDTHRU (NO LEAD) 5Y22/A1		4
0	1	5	0	4	1	0	0	0	1		1M CAP CER CHIP 200V 10% MUR MDC85	C505, C522	2
0	2	0	0	8	1	0	0	0	3	C/N1521	10µ CAP 50V ELECTRO VERT MTS	C510, C511	2
0	1	2	0	4	1	5	0	0	1	87/2-027	CAP INS FEED THRU LEADLESS		15
0	2	8	0	2	3	0	0	0	3	83/08-857	4/20P TRIM CAP N750 GREEN MUR T2	CV520	1
0	2	9	0	2	2	2	0	0	2		22P CHIP CASE MICH UNELCO 2145-0006	C526	1
0	2	9	0	2	3	6	0	0	2		36P CAP CASE MICH UNELCO 345-0006	C523, C524, C525	3
0	2	9	0	2	4	7	0	0	1		47P CAP CASE MICA UNELCO T102	C521	1
0	2	9	0	2	5	6	0	0	2	83/10-994	56P CAP CASE MICA UNELCO 345-0006	C502A	1
0	2	9	0	2	6	8	0	0	2	83/10-994	68P CAP CASE MICA UNELCO 345-0006	C505A	1
0	2	9	0	3	1	5	0	0	1	88/02-078	150P CAP CASE MICA UNELCO T102	C502,	1
0	2	9	0	3	1	5	0	0	2	88/04-188	150P CAP CASE MICA UNELCO 5mm	C514, C516	2
0	2	9	0	3	1	8	0	0	1		180P CAP CASE MICA UNELCO T102	C517	1
0	2	9	0	3	6	8	0	0	1		680P CAP CASE MICA UNELCO T102	C508, C513	2

6.3.4 RESISTORS

0	3	0	0	2	1	0	0	0	0	C/N 1955	10E RESISTOR 7x2.5mm 5% C/F	R502	1
0	3	0	0	3	1	8	0	0	1	83/02-079 85/02-032	180E RESISTOR 7x2.5mm 5% C/F	R503	1
0	3	0	0	4	4	7	0	0	0		4K7 RESISTOR 7x2.5mm 5% C/F	R507	1

T356 Parts List

0	3	2	3	2	1	0	0	0	0	C/N 1727	10E RESISTOR 10 x 4mm 5% M/F PR37	R504A	1
0	3	2	3	2	4	7	0	0	0	C/N 1727	47E RESISTOR 5% M/F PR37	R504	1
0	3	2	3	3	1	0	0	0	0	85/03-101	100E RESISTOR 5% M/F PR37	R506	1
0	3	2	3	3	1	0	0	1	0	85/03-101	100E RESISTOR 2W BLUE	R501, R505	2

6.3.5 COILS

0	5	2	0	8	1	4	0	5	5	85/10-994	COIL A/W 5.5T/4.0mm HOR	L504	1
0	5	2	0	8	1	3	5	2	5		COIL A/W 2.5T/3.5mm HOR	L501	1
0	5	2	0	8	2	3	0	2	5		COIL A/W 2.5T/3mm VERT	L514	1
0	5	2	0	8	2	3	0	5	5		COIL A/W 5.5T/3mm VERT	L515, L518	2
0	5	2	0	8	2	3	5	5	5		COIL A/W 5.5T/3.5mm VERT	L516, L517	2
0	5	2	0	8	2	4	0	5	5		COIL A/W 5.5T/4mm VERT	L512, L509	2
0	5	6	0	0	0	1	0	1	5		IND FID TRIT CHOKE NO 15	L508	1
0	5	6	0	0	0	2	1	0	1	C/N 1727	IND FID TRIT TYPE 101 1.5x4H	L509A	1
0	5	6	0	0	0	2	1	0	4	85/02-032	IND FID TRIT 104 0.33H	L506	1
0	6	5	0	0	0	1	0	0	4	87/2-027	FERRITE BEAD 4x2x5 NEG ID F8	L503(x2), L505, L511	6
0	6	5	0	0	0	1	0	1	3	87/2-027	BEAD FERRITE 1.4x.4x3.8 SP 70	L512, L520, L521	15

6.3.6 MISCELLANEOUS

2	0	1	0	0	0	3	0	0	2		WIRE 7/0.2 PVC RED	100mm	
2	0	1	0	0	0	3	0	0	4		WIRE 7/0.2 PVC YELLOW	70mm	
2	0	1	0	0	0	5	0	0	2		WIRE 22/0.2 PVC RED 348 AUTO	110mm	
2	0	1	0	0	0	5	0	1	0		WIRE 23/0.2 PVC BLACK 148 AUTO	110mm	
2	0	6	0	0	0	1	0	1	1	C/N 1733	CABLE COAX RG 316-4	170mm	
2	0	9	0	0	0	1	0	2	5	86/02-042	SLOT CAR TRACK 3mm x .35mm x 100FT	L510	15mm
2	2	0	0	0	0	1	0	5	7		PRINTED COT BOARD T356 PA		1
2	4	0	0	0	0	1	0	5	5	87/2-027	PLUG 15WAY D RANGE		1
2	4	0	0	0	1	0	0	4	6		PLUG COAX BULK/HD 24GME50-2-10C (GUHNER)		1
2	4	0	0	2	1	0	0	0	5	83/11-1021	SKT COAX N PNL CPTV S/CLAMP PREF.	1/2 WTG	1
3	0	2	0	0	0	5	1	8	0	87/2-027	BRACKET REED THRU A2M1855		1
3	0	2	0	0	0	3	0	0	2		BRACKET SHORT PA SHIELD A2M258		1
3	0	2	0	0	4	5	0	2	5	87/11-433	BUSH COAX RETAINING A2M1024		1
3	0	8	0	0	1	3	0	4	3	87/10-315	HEAT SINK FINS A2M1377/1		1
3	0	4	0	0	1	3	0	5	1	"	HEAT SINK BODY A2M1555		1
3	1	6	0	0	8	5	0	1	5		GUIDE PIN (LOCATING) A2M775		2
3	1	9	0	0	0	1	0	7	0	C/N 1694	SHIELD PA SHORT A2M1165		1
3	1	9	0	0	3	0	0	4	7	87/10-315	SPACER BAR	P.C.B. MOUNTING	1
3	5	2	0	0	0	1	0	3	5	87/4-098	TRANSISTOR MOUNTING NUT 8-32 UNC	TRANSISTOR 501143	1

T356 Parts List

3	4	9	0	0	0	2	0	0	3	C/N 1716	SCREW 4-40 x 1/4" PAN PZT TAPTITE	"N CON FREQ THRU SKT & SHIELD TO H/S"	7
3	4	9	0	0	0	2	0	0	9	C/N 1716	SCREW 4-40 x 3/8" PAN PZT TAPTITE	"N CON FREQ THRU SKT & SHIELD TO H/S"	10
3	5	2	0	0	0	1	0	4	3		NUT (GUIDE PIN) M3 BZ A4M 793	TRANS & P.C.B TO H/S "H/SINK FINS"	2
3	5	3	0	0	0	1	0	1	2	C/N 1670	WASHER M3 SPRING 1/8" BZ	(UNDER GUIDE PIN NUTS)	2
3	5	6	0	0	0	1	0	0	1	84/11-518	SOLDER TAG 3mm M6132/3.2 SHORT		1
3	5	6	0	0	0	1	0	2	6		HARWIN TRACK PINS		23
4	0	0	0	0	0	2	0	0	3	85/02-032	SLEEVING 1mm SILICON RUBBER		25mm
4	0	0	0	0	0	2	0	0	5	87/1-027	SLEEVING 1.5mm SILICON RUBBER	'D' TYPE PLUG	80mm

6.4 C356/01 T356/01 VERSION PARTS

0	0	1	0	0	0	1	2	5	5		1	BR204B VARIABP DIODE	D401	
0	1	1	0	4	4	7	0	0	3		2	4n7 CAP T/C B 50V	C401, C406	84/11-1038
0	3	0	0	5	1	0	0	0	0		1	10K RESISTOR 7x2.5mm 5% E/W	R403	
0	4	4	0	5	5	0	0	0	3		1	50K PRE-SET 10T PANEL MTG 43PT601	RV401	
2	0	0	0	0	0	1	0	1	1		400mm	COAX CABLE RG316-LL A4M781/16	SAMPLE OUT BMT	
2	4	0	0	2	1	0	0	1	7		1	SKT COAX BNC PANEL JACK 35057-C10H	SAMPLE O/P	
3	0	2	0	0	4	5	0	1	8		1	BUSH COAX RETAINING A4M1024		
2	0	1	0	0	0	3	0	0	8		700mm	WIRE REMIT 7/0.2 PVC GREY		84/02-212
3	1	6	0	0	0	6	2	8	2		1	FRONT PANEL A2A223 A3M1246		
4	1	6	0	0	2	1	1	3	8		1	CHASSIS FRONT PANEL A2M1263		84/05-183
3	1	9	0	0	3	0	0	2	8		1	SPACER BNC A4M1033		
3	4	5	0	0	0	2	0	0	8		4	SCREW M2.5 x 15mm PAN	BNC MTG	02/091
3	5	2	0	0	0	1	0	0	4		4	NUT M2.5 HEX MACHINE		03/091
3	5	3	0	0	0	1	0	0	4		4	WASHER M2.5 SHAKE PROOF		
3	6	0	0	0	0	1	0	4	1		1	SHORTY BUSH 'HEVES'		01/020
3	5	6	0	0	0	1	0	0	3		2	SOLDER TAG 3mm M6249/3.2 LONG	TO SECURE COAX	03-609
3	5	6	0	0	0	2	0	2	3		1	PIN 1.5 PCB MTG		03-609

6.5 C356/02 T356/02 & /05 VERSION PARTS

3	1	6	0	0	0	6	2	5	6		1	FRONT PANEL A4A137 A3M1247		1286
3	1	6	0	0	2	1	1	3	2		1	CHASSIS FRONT PANEL A2M1237		1286

6.6 C356/52 T356/52 VERSION PARTS

3	6	5	0	0	0	1	1	6	6		1	LABEL T356 FCC ID A4A348		
3	6	5	0	0	0	1	2	1	2		1	LABEL CANADA DOC A4A408		85/09-255

T356 Parts List

6.7 C356 T356/02 & /05 ADDITIONAL PARTS

5	3	8	0	0	0	1	0	0	1	1	B/GUIDE
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6.8 B356/MECH T356 MECHANICAL PARTS

0	0	8	0	0	0	1	0	1	5			LED TLG 124A GATEN LESS MTG		1
0	0	8	0	0	0	1	0	1	1			LED TIL 209A RED		1
3	6	2	0	0	0	1	0	3	0			LED MTG GRAMMET		2
0	4	0	0	5	1	0	0	1	2	C/N 1950		POT 10K LOG L/S NOBLE V16		1
2	3	2	0	0	0	1	0	1	0			SWITCH MINATURE 'PUSH ON' 6PST		1
												MIYAMA MS-289 3P		
2	4	0	0	0	0	2	0	0	2			STEREO PLUG		1
1	4	0	0	2	0	2	0	0	4			SKT STEREO PHONE 2 P C/O		1
												HOBIDEN LT 240-1-1		
2	5	2	0	0	0	1	0	1	2			MICROPHONE	(REMOVE THE 12K RESISTOR WHICH IS MOUNTED ON THE PREVIOUS SWITCH CONTACTS).	1
3	0	3	0	0	1	1	1	4	0			CHASSIS SIDE PLATE	A2M1195	2
3	0	6	0	0	0	1	0	1	0			FERRULE	A4M948	2
3	0	8	0	0	0	1	0	0	7			HANDLE PLTD	A4M949	1
												PANEL FRONT - A137 / A4M960		1
												CHASSIS FRONT PANEL - A2M967		1
													du sub assy C356/02	
3	1	9	0	0	2	0	0	4	5			SLEEVE	A2M970	1
3	4	9	0	0	0	2	0	3	3	8/2-072, C/N 1833		SCREW M3X6MM CSK ST B2 TAPTITE	SLEEVE TO SIDE PLATE	8
3	4	5	0	0	0	4	0	2	0			SCREW M3 X 8mm BUTTON SKT BLK	FRONT PANEL	4
3	4	9	0	0	0	2	0	0	2			SCREW 4-40x1/4 CSK PZ1 TAPTITE	CHASSIS P/P TO SIDEPLATE	4
3	4	9	0	0	0	2	0	0	3	C/N 1716		SCREW 4-40x1/4 PAN PZ1 TAPTITE	PCB TO CHASSIS	8
3	4	9	0	0	0	2	0	0	9	C/N 1716		SCREW 4-40x3/8 PAN PZ1 TAPTITE	"CHASSIS TO H/S"	4
3	5	3	0	0	0	1	0	1	0	86/10-294		WASHER H3 FLAT B2 006-75	FOR RD136 XSTR MTG	1
3	5	2	0	0	0	1	0	2	9			NUT M4 NYLOC	HANDLE	2
3	5	3	0	0	0	2	0	4	4			WASHER MIC SOCKET M779		1
3	6	0	0	0	0	1	0	4	0			SNAP PUSH BLACK HEYCO SB-375-4		1
3	5	4	0	0	0	1	0	3	3	88/02-043		PCM INSERT		6
3	6	5	0	0	0	1	0	3	1	C/N K25		LABEL WHITE REMOVABLE		1
3	6	5	0	0	0	1	1	0	3	87/11-407		LABEL 'TEST RESULT INSIDE' A4A267		1
4	0	0	0	0	0	2	0	0	7	86/09-764		2mm SILICON SLEEVING		120mm
3	6	9	0	0	0	1	0	1	4	82/66-232		CABLE TIE NYLON REX CT3P		10
										88/02-072				
4	1	0	0	0	0	1	0	4	2	88/01-025		CARTON, 50mm FLD EQUIP VER 15096		1

6.9 B356/WIRE T356 WIRE KIT

2	0	0	0	0	0	1	0	0	5	W/O-264			'D' SOCKET WIRING	2yins
2	0	1	0	0	0	3	0	0	1			WIRE 7/0.2 PVC BROWN		400mm
2	0	1	0	0	0	3	0	0	2			WIRE 7/0.2 PVC RED		530mm
2	0	1	0	0	0	3	0	0	3			WIRE 7/0.2 PVC ORANGE		850mm
2	0	1	0	0	0	3	0	0	4			WIRE 7/0.2 PVC YELLOW		180mm

T356 Parts List

2	0	1	0	0	0	3	0	0	5		WIRE 7/0.2 PVC GREEN	450mm
2	0	1	0	0	0	3	0	0	6		WIRE 7/0.2 PVC BLUE	550mm
2	0	1	0	0	0	3	0	0	7		WIRE 7/0.2 PVC VIOLET	400mm
2	0	1	0	0	0	3	0	0	8		WIRE 7/0.2 PVC GRAY	450mm
2	0	1	0	0	0	3	0	0	9		WIRE 7/0.2 PVC WHITE	450mm
2	0	1	0	0	0	3	0	1	0		WIRE 7/0.2 PVC BLACK	120mm

6.10 B3536 B3536 AUDIO PROCESSOR BASIC PARTS

6.10.1 TRANSISTORS

0	0	0	0	0	0	1	0	6	6		BC337-40 TRANSISTOR	Q3	1
0	0	0	0	0	0	1	1	1	0		BC548B TRANSISTOR	Q1, Q4, Q6	3
0	0	0	0	0	0	1	1	3	0		BC557B TRANSISTOR	Q2, Q5, Q7, Q8	4

6.10.2 DIODES

0	0	1	0	0	0	1	1	7	0		1N4001 DIODE	D1, D2, D3, D4	4
0	0	1	0	0	0	1	2	0	0	82/08-368	1N4148 DIODE	D5, D6, D7, D8, D9A	5

6.10.3 INTEGRATED CIRCUITS

0	0	2	0	0	0	1	2	4	0		MLM35BP INT CPT	Ic2, Ic3, Ic4	3
0	0	2	0	0	0	1	5	3	0		CD4053 INT CPT	Ic1	1
0	0	2	0	0	0	2	0	5	0		4N25A OPTO COUPLER	Ic5	1

6.10.4 CAPACITORS

0	1	1	0	1	2	2	0	0	1		2P2 CAP NPO 63V	C31	1
0	1	1	0	2	4	7	0	0	1	84/11-531	47P CAP N150 63V 5%	C29, C26A, C10A, C25A, C27A, C28A, C42, C43, C35A	9
0	1	1	0	3	1	0	0	0	1	84/03-139	100P CAP N150 63V 5%	C14, C16, C25, C40, C24	3
0	1	1	0	3	2	2	0	0	1		220P CAP N750 63V 10%	C17A, C18A, C21A	1
0	1	1	0	4	1	0	0	0	1	92/01-021 82/08-368	1n CAP T/E B 10% 63V	C4, C5, C6, C10, C13, C2A	7
0	2	0	0	7	1	0	0	0	2	83/02-576 92/02-051	1μ CAP 50V ELECTRO 5x11mm VERT	C12, C15, C34	3
0	2	0	0	7	4	7	0	0	2		4μ7 CAP 50V ELECTRO 5x11mm VERT	C41	1
0	2	0	0	7	4	7	0	9	0	83/02-576	4μ7 CAP 50V ELECTRO NON BLURISED VERT	C7, C7A, C20	3
0	2	0	0	8	1	0	0	0	3	84/11-531	10μ CAP 50V ELECTRO 5x11mm VERT	C1, C14A, C23, C44	4
0	2	0	0	8	2	2	0	0	1		22μ CAP 16V ELECTRO 5x11mm VERT	C3, C9, C22	3
0	2	0	0	9	1	0	0	0	3		100μ CAP 16V ELECTRO 8x11mm VERT	C17	1
0	2	2	0	4	2	2	0	0	1		222 CAP 50V MYLAR VERT	C2	1

T356 Parts List

0	2	2	0	5	1	0	0	0	1	87/4-097	10N CAP 50V MYLAR VERT	C28, C30	2
0	2	2	0	5	2	2	0	0	1	88/02-874 82/02-061	22m CAP 50V MYLAR VERT	C35	1
0	2	2	0	5	4	7	0	0	1		47m CAP 50V MYLAR VERT	C21, C36 , C37 replaced by C35 in 01-01-11-15	1
0	2	2	0	5	6	8	0	0	2	C/N 2115	68m CAP 50V MYLAR VERT	C32	1
0	2	2	0	6	1	0	0	0	1		100m CAP 50V MYLAR VERT	C18	1
0	2	2	0	6	4	7	0	0	1	83/02-576	470m CAP 100V PETP VERT	C8, C11	2

6.10.5 RESISTORS

0	3	0	0	3	3	3	0	0	0		330E RESISTOR 7x2.5mm 5% C/F	R11	1
0	3	0	0	3	5	6	0	0	0		560E " " " " "	R1, R14	2
0	3	0	0	3	6	8	0	0	0		680E " " " " "	R23, R63	2
0	3	0	0	4	1	0	0	0	0		1K " " " " "	R4, R12A, R36, R62	4
0	3	0	0	4	1	2	0	0	1		1K2 " 10 x 4mm " " "	R9, R10	2
0	3	0	0	4	2	2	0	0	0	82/04-120	2K2 7 x 2.5mm	R2, R21	2
0	3	0	0	4	2	7	0	0	0		2K7 " " " " "	R46, R56	2
0	3	0	0	4	3	3	0	0	0		3K3 " " " " "	R59	1
0	3	0	0	4	3	9	0	0	0		3K9 " " " " "	R5	1
0	3	0	0	4	4	7	0	0	0	87/0-377	4K7 " " " " "	R29, R53A	2
0	3	0	0	4	6	8	0	0	0	82/04-120 87/0 377	6K8 " " " " "	R43	1
0	3	0	0	5	1	0	0	0	0	83/02-576 82/12-818	10K RESISTOR 7x2.5mm 5% C/F	R3, R6, R7, R22, R40, R41, R50 (LINK G-H)	8
0	3	0	0	5	1	2	0	0	0		12K " " " " "	R45	1
0	3	0	0	5	1	5	0	0	0		15K " " " " "	R42	1
0	3	0	0	5	1	8	0	0	0		18K " " " " "	R55	1
0	3	0	0	5	2	2	0	0	0	84/11-531	22K " " " " "	R57A	1
0	3	0	0	5	3	9	0	0	0		39K " " " " "	R39	1
0	3	0	0	5	4	7	0	0	0	82/12-518	47K " " " " "	R21, R16, R33, R48	4
0	3	0	0	5	6	8	0	0	0	84/12-518	68K " " " " "	R31, R35	2
0	3	0	0	5	8	2	0	0	0	82/12-518	82K " " " " "	R26	1
0	3	0	0	6	1	0	0	0	0	82/12-518	100K " " " " "	R13, R15, R18, R19, R20 R20A, R28	7
0	3	0	0	6	1	2	0	0	0		120K " " " " "	R51	1
0	3	0	0	6	1	8	0	0	0		180K " " " " "	R47	1
0	3	0	0	6	2	2	0	0	0		220K RESISTOR 7x2.5mm 5% C/F	R35	1
0	3	0	0	6	3	9	0	0	0		390K " " " " "	R12, R49	2
0	3	0	0	7	1	0	0	0	0		1M " " " " "	R32, R34, R57, R58	4
0	3	0	0	7	2	2	0	3	0		2M2 " " " 10% "	R37, R52, R53	3
0	3	2	0	5	4	7	0	0	0	82/12-513	47K RESISTOR 7x2.5mm 1% M/F	R25, R30	2
0	3	2	0	4	8	2	0	0	0	82/12-513	8K2 RESISTOR 7x2.5mm 1% M/F	R17	1
0	3	2	0	5	1	0	0	0	0	82/12-513	10K RESISTOR 7x2.5mm 1% M/F	R8	1
0	4	2	0	4	5	0	0	0	8	82/12-513	5K RES. PRESET CERMET FLAT 63P	RV54	1
0	4	2	0	5	4	7	0	0	9	82/12-513	50K RES. PRESET CERMET 5A23P	RV27	1

T356 Parts List

6.10.6 MISCELLANEOUS

0	5	3	0	0	0	1	0	1	7		TRANSFORMER TAIT 4030	T1	1
0	5	6	0	0	0	2	2	0	2	82/03-087	IND FLD TYPE 202 68mH SHIELDED	L1	1
2	2	0	0	0	0	1	0	6	0		P.C.B. B3536		1

6.11 C3536/01 ADD TO B3536 FOR B3536/01

0	0	1	0	0	0	1	2	0	0	2	1N4148 DIODE	D11, D12	82/02-412
0	2	0	0	7	2	2	0	0	1	1	2u2 CAP 50V ELECTRO 5x11mm VERT	C23A	
0	2	2	0	4	1	5	0	0	1	1	1n5 CAP 50V MYLAR VERT	C27	
0	2	2	0	4	3	3	0	0	1	1	3n3 CAP 50V MYLAR VERT	C26	87/4-097
0	2	2	0	5	1	5	0	0	1	1	15n CAP 50V MYLAR VERT	C33	
0	2	2	0	5	4	7	0	0	1	2	47n CAP 50V MYLAR VERT	C36, C39	
0	3	0	0	3	5	6	0	0	0	1	560E RESISTOR 7x2.5mm 5% C/F	R44	
0	3	0	0	3	8	2	0	0	0	1	820E " " " "	R60	
0	3	0	0	5	1	0	0	0	0	2	10K " " " "	R56A, R61	
0	3	0	0	5	1	2	0	0	0	1	12K " " " "	R44A	

6.12 C3536/02 ADD TO B3536 FOR B3536/02

0	2	2	0	4	1	5	0	0	1	1	1n5 CAP 50V MYLAR VERT	C27	
0	2	2	0	4	3	3	0	0	1	1	3n3 CAP 50V MYLAR VERT	C26	87/4-097
0	2	2	0	5	1	5	0	0	1	1	15n CAP 50V MYLAR VERT	C33	
0	2	2	0	5	4	7	0	0	1	3	47n CAP 50V MYLAR VERT	C33A, C36, C39	2149
0	3	0	0	3	5	6	0	0	0	1	560E RESISTOR 7x2.5mm 5% C/F	R44	
0	3	0	0	3	8	2	0	0	0	1	820E " " " "	R60	
0	3	0	0	5	1	0	0	0	0	1	10K " " " "	R61	
0	3	0	0	5	1	2	0	0	0	1	12K " " " "	R44A	
0	3	0	0	6	1	5	0	0	0	1	150K " " " "	R56A	2192

6.13 C3536/05 ADD TO B3536 FOR B3536/05

0	2	2	0	4	1	5	0	0	1	1	1n5 CAP 50V MYLAR VERT	C27	
0	2	2	0	4	3	3	0	0	1	1	3n3 CAP 50V MYLAR VERT	C26	87/4-097
0	2	2	0	5	1	5	0	0	1	2	15n CAP 50V MYLAR VERT	C37, C38	
0	2	2	0	5	2	2	0	0	1	1	22n CAP 50V MYLAR VERT	C33	
0	2	2	0	5	4	7	0	0	1	2	47n CAP 50V MYLAR VERT	C36, C39	84/4-427
0	2	2	0	6	1	0	0	0	1	1	100n CAP 50V MYLAR VERT	C33A	84/4-427
0	3	0	0	3	5	6	0	0	0	1	560E RESISTOR 7x2.5mm 5% C/F	R44	

T356 Parts List

0	3	0	0	3	6	8	0	0	0	1	1	680E	"	"	"	"	"	R60		
0	3	0	0	4	8	2	0	0	0	1	1	8K2	"	"	"	"	"	R61		
0	3	0	0	5	1	2	0	0	0	1	1	12K	"	"	"	"	"	R44A		
0	3	0	0	5	6	8	0	0	0	1	1	68K	"	"	"	"	"	R56A		24/4-427

6.14 C3536/07 ADD TO B3536 FOR B3536/07

0	2	2	0	4	1	5	0	0	1	1	1	1m5 CAP 50V MYLAR VERT						C27		
0	2	2	0	4	3	3	0	0	1	1	1	3N3 CAP 50V MYLAR VERT						C26		21/4-017
0	2	2	0	5	1	5	0	0	1	2	2	15m CAP 50V MYLAR VERT						C27, C28		
0	2	2	0	5	2	2	0	0	1	1	1	22m CAP 50V MYLAR VERT						C33		
0	2	2	0	5	4	7	0	0	1	1	1	47m CAP 50V MYLAR VERT						C23A		
0	2	2	0	5	6	8	0	0	2	2	2	68m CAP 50V MYLAR VERT						C26, C29		
0	3	0	0	3	5	6	0	0	0	1	1	560E RESISTOR 7x2.5mm 5% C/F						R44		
0	3	0	0	3	6	8	0	0	0	1	1	680E RESISTOR 7x2.5mm 5% C/F						R60		
0	3	0	0	4	8	2	0	0	0	1	1	8K2 RESISTOR 7x2.5mm 5% C/F						R61		
0	3	0	0	5	1	2	0	0	0	1	1	12K RESISTOR 7x2.5mm 5% C/F						R44A		
0	3	0	0	6	1	5	0	0	0	1	1	150K RESISTOR 7x2.5mm 5% C/F						R56A		

6.15 B3538 B3538 SPLITTER PCB PARTS

0	1	1	0	2	4	7	0	0	1	24/11-532	47P CAP N150 63V 5% CER	C20 - C25	16
0	1	1	0	3	1	0	0	0	1	22/09-392	100P CAP N150 63V 5%	C3A	1
0	0	2	0	0	0	1	4	4	0		MLM324 TNT CCT	IC1, IC2, IC3, IC4	4
0	1	1	0	5	1	0	0	0	2	C/N 1790	10n CAP 63V HIK CER PLT	C11A	1
0	2	0	0	7	2	2	0	0	1		2m2 CAP 50V ELECTRO 5x11 VERT	C19	1
0	2	0	0	8	2	2	0	0	1		22u CAP 16V ELECTRO 5x11 VERT	C1, C2	2
0	2	2	0	6	1	0	0	0	1		100m CAP 50V MYLAR VERT	C3, C12	2
0	2	3	0	4	3	3	0	0	2		3m3 CAP 63V POLYSTYRENE 1%	C4, C5, C6, C7, C8, C9 C10, C12, C13, C14, C15, C16 C17, C18	14
0	3	0	0	4	4	7	0	0	0	C/N 2227	4K7 RESISTOR 7x2.5mm 5%	R2A	1
0	3	0	0	4	8	2	0	0	0		8K2 RESISTOR 7x2.5mm 5% C/F	R2	1
0	3	0	0	5	1	0	0	0	0	" 1794 C/N 1790	10K	R1, R6, R16, R25, R49, R 29A, R49A	7
0	3	0	0	5	1	2	0	0	0	C/N 1790	12K	R26	1
0	3	0	0	6	4	7	0	0	0		470K	R3, R28	2
0	3	2	0	4	1	0	0	0	0		1K RESISTOR 7x2.5mm 1% M/F	R12	1
0	3	2	0	4	1	2	0	0	0		1K2	R40	1
0	3	2	0	4	1	8	0	0	0		1K8	R4, R8, R30	3
0	3	2	0	4	2	2	0	0	0		2K2	R34	1
0	3	2	0	4	8	2	0	0	0		8K2	R41	1

T356 Parts List

0	3	2	0	5	1	0	0	0	C/N 1690	10K	-	-	-	-	R19, R21, R9, R11, R18, R20	10
0	3	2	0	5	1	2	0	0		12K	-	-	-	-	R31, R33, R42, R44	1
0	3	2	0	5	1	5	0	0		15K	-	-	-	-	R45	1
0	3	2	0	5	1	8	0	0		18K	-	-	-	-	R29	1
0	3	2	0	5	2	7	0	0		27K	-	-	-	-	R15, R39, R48	3
0	3	2	0	5	3	3	0	0		33K	-	-	-	-	R32	1
0	3	2	0	5	3	9	0	0		39K	-	-	-	-	R17, R43	2
0	3	2	0	5	6	8	0	0		68K RESISTOR 7x2.5mm 5% M/F	-	-	-	-	R5, R7	2
0	3	2	0	6	1	0	0	0		100K	-	-	-	-	R23	1
0	3	2	0	6	1	2	0	0		120K	-	-	-	-	R14	1
0	3	2	0	6	1	8	0	0		180K	-	-	-	-	R37	1
0	3	2	0	6	2	7	0	0		270K	-	-	-	-	R47	1
0	3	2	0	6	3	3	0	0	C/N 1690	330K	-	-	-	-	R38, R28A	2
0	3	2	0	6	8	2	0	0		820K	-	-	-	-	R24	1
0	3	2	0	7	1	0	0	0	C/N 1690	1M	-	-	-	-	R13, R22, R35, R36	5
0	4	2	0	5	1	0	0	1	0	10K PRE-SET RES. GERMET FLAT 63P	-	-	-	-	RV27	1
2	0	1	0	0	0	1	0	0	5	WIRE 0.6 TINNED COPPER	-	-	-	-	4x20mm LINKS	80
2	2	0	0	0	0	1	0	6	3	PRINTED CBT BOARD B3538	-	-	-	-		1
0	6	5	0	0	0	1	0	0	4	C/N 1690	FERRITE BEAD 4x2x5 /F8	NEOSID	-	-		4
3	4	9	0	0	0	2	0	0	3	C/N 01/015	SCREW A-40 x 1/8 PAN RZ1 TAPITE	-	-	-		4
3	6	5	0	0	0	1	1	3	8	8/02-063	STATIC WARNING LABEL YELLOW	AAA315	-	-		1

6.16 B3540 B3540 PHASE MODULATOR PARTS

0	0	0	0	0	0	2	0	1	1	2	BF494 TRANSISTOR	Q1, Q2		
0	0	1	0	0	0	1	2	6	8	2	MA47600 PIN DIODE	D1, D2		
0	1	1	0	1	4	7	0	0	1	1	4P7 CAP NPO 63V TOL D CER PLT	C4A	83/01-545	
0	1	1	0	2	2	2	0	0	1	1	22P CAP N150 63V 5%	C4		
0	1	1	0	3	2	2	0	0	1	1	220P CAP N750 63V 10% CER PLT	C9	83/01-545	
0	1	1	0	4	1	0	0	0	1	3	1M CAP T/C B 63V 10%	C1, C8, C13		
0	1	1	0	4	4	7	0	0	3	3	477 CAP T/C B 50V 10%	C2, C3, C11	83/11-1038	
0	2	1	0	8	1	0	0	0	1	5	10M CAP 16V ELECTRO AXIAL	C5, C6, C7, C10, C12		
0	3	0	0	2	3	9	0	0	0	1	39E RESISTOR 7x2.5mm 5% C/F	R6		
0	3	0	0	2	4	7	0	0	0	2	47E	R1, R9		
0	3	0	0	3	1	0	0	0	0	4	100E	R4, R5, R12, R13		

T356 Parts List

0	3	0	0	4	4	7	0	0	0	4	4K7 RESISTOR 7x2.5mm 5% 5/F	R3, R8, R11, R14		
0	3	0	0	5	1	5	0	0	0	2	15K	R2, R10		
0	3	0	0	5	8	2	0	0	0	1	82K	R7,	83/01-545	
0	3	0	0	6	1	0	0	0	0	1	100K	R15	83/01-545	
0	5	6	0	0	0	2	1	0	1	1	FMD IND TYPE 10L 1.5uH HORIZ.	L2		
0	6	5	0	0	0	1	0	0	4	1	FERRITE BEAD FB 4x2x5	L1		
2	0	0	0	0	0	1	0	0	5	0.07g	WIRE 1/0.5 TINNED COPPER	1x40mm 4		
2	0	1	0	0	0	3	0	0	1	50mm	WIRE 7/0.2 PVC BROWN	1x50mm AUDIO I/P ①		
2	0	1	0	0	0	3	0	0	3	60mm	WIRE 7/0.2 PVC ORANGE	1x60mm RF I/P ③		
2	0	1	0	0	0	3	0	0	5	60mm	WIRE 7/0.2 PVC GREEN	1x60mm OUTPUT ⑤		
2	0	1	0	0	0	3	0	0	8	50mm	WIRE 7/0.2 PVC GREY	1x50mm +8V REG ②		
2	0	1	0	0	0	3	0	1	0	60mm	WIRE 7/0.2 PVC BLACK	1x60mm GROUND ④		
2	2	5	0	0	0	1	0	8	6	1	PRINTED COT BOARD B2540	COT DRG A4C339		
3	4	9	0	0	0	2	0	0	3	2	SCREW 4-40x1/4 PAN BZ1 TAPTITE	PCB MTG		
3	5	6	0	0	0	1	0	2	6	12	HAWK TRACK PINS			

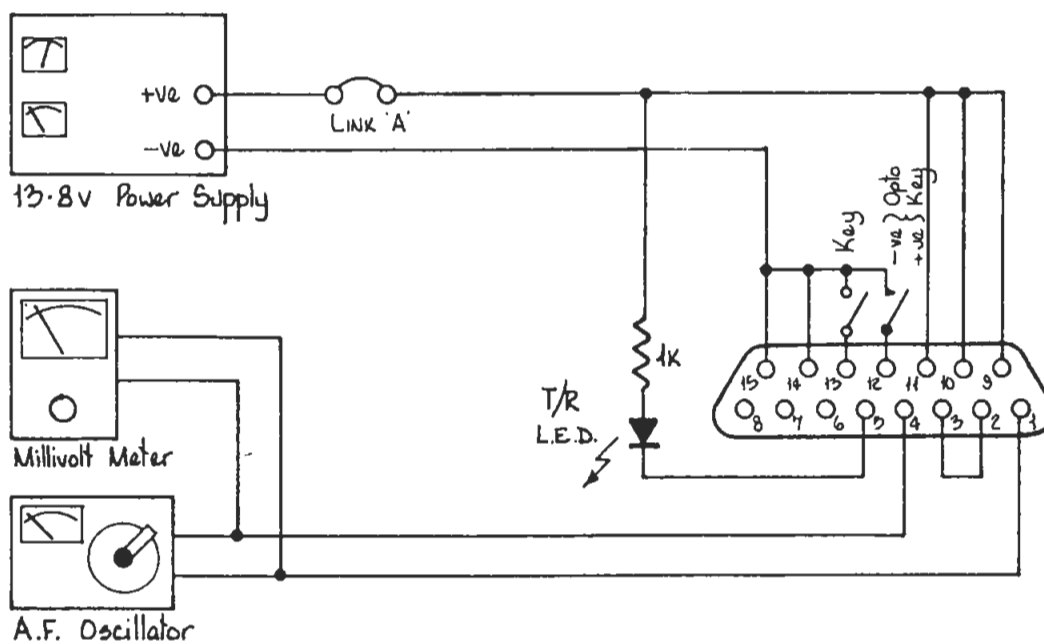
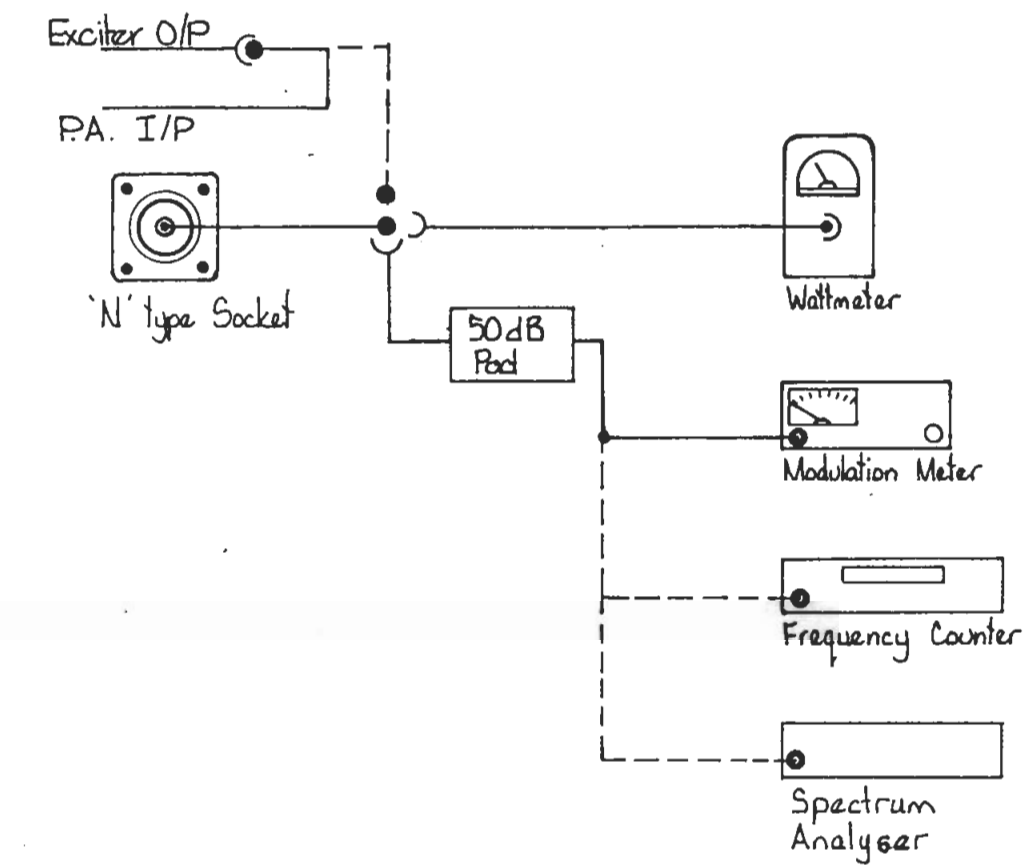


Diagram 1 Test Equipment Set-Up

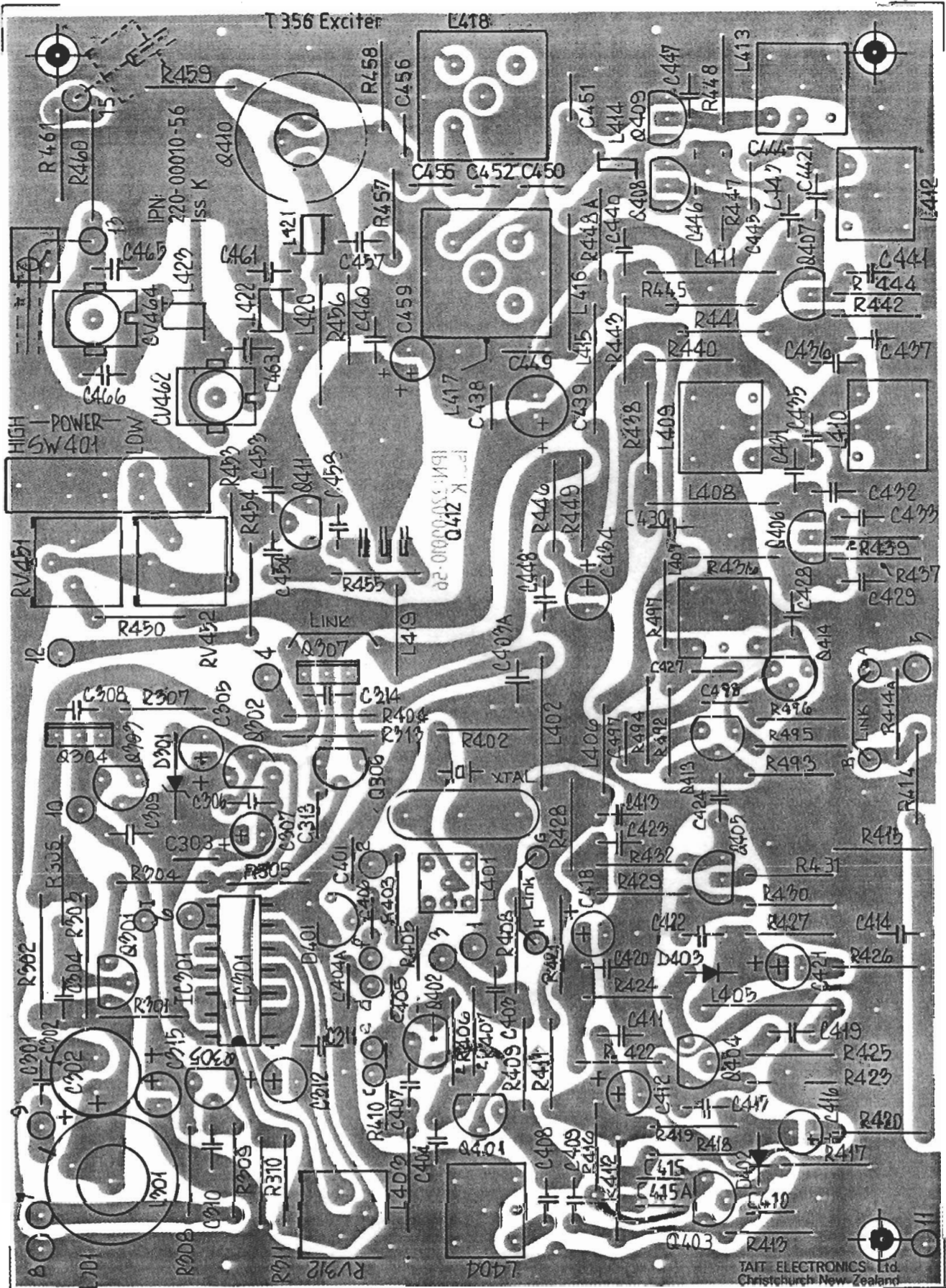
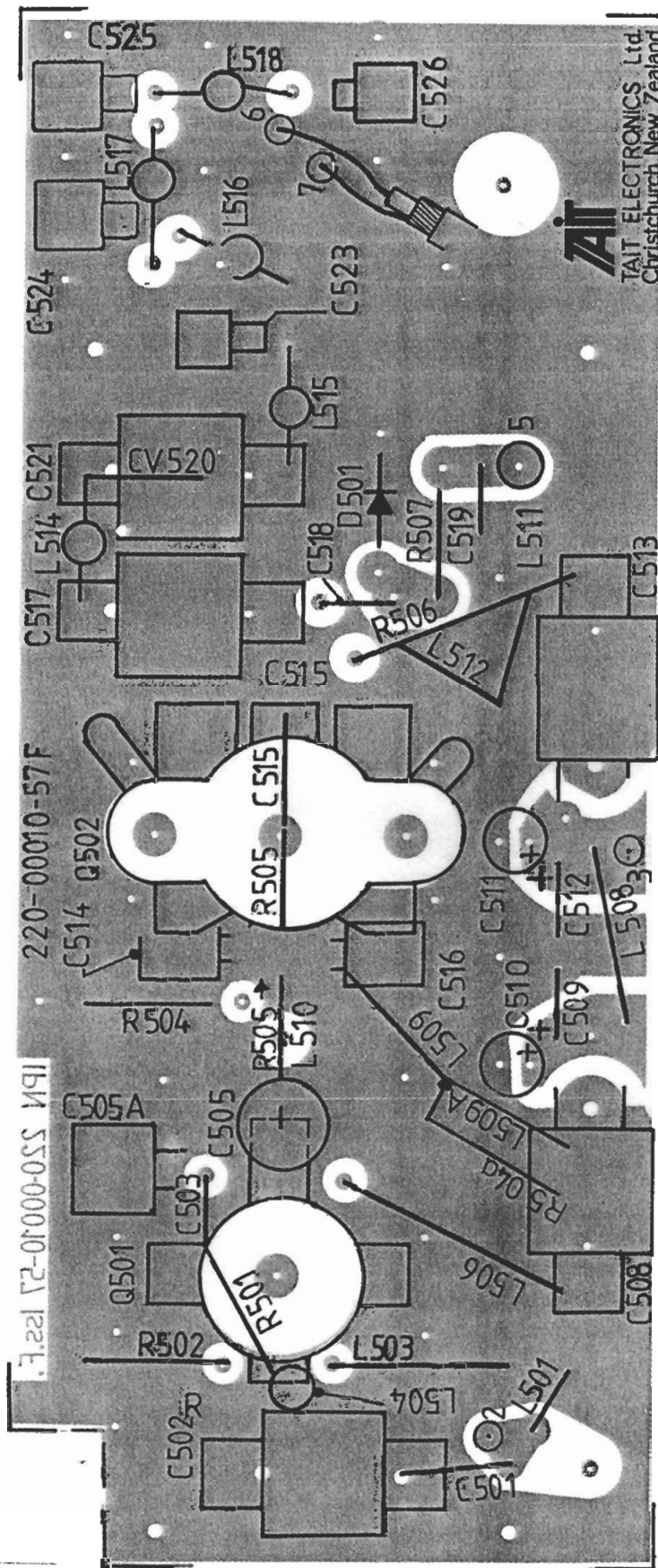


Diagram 2 Exciter PCB Encoding



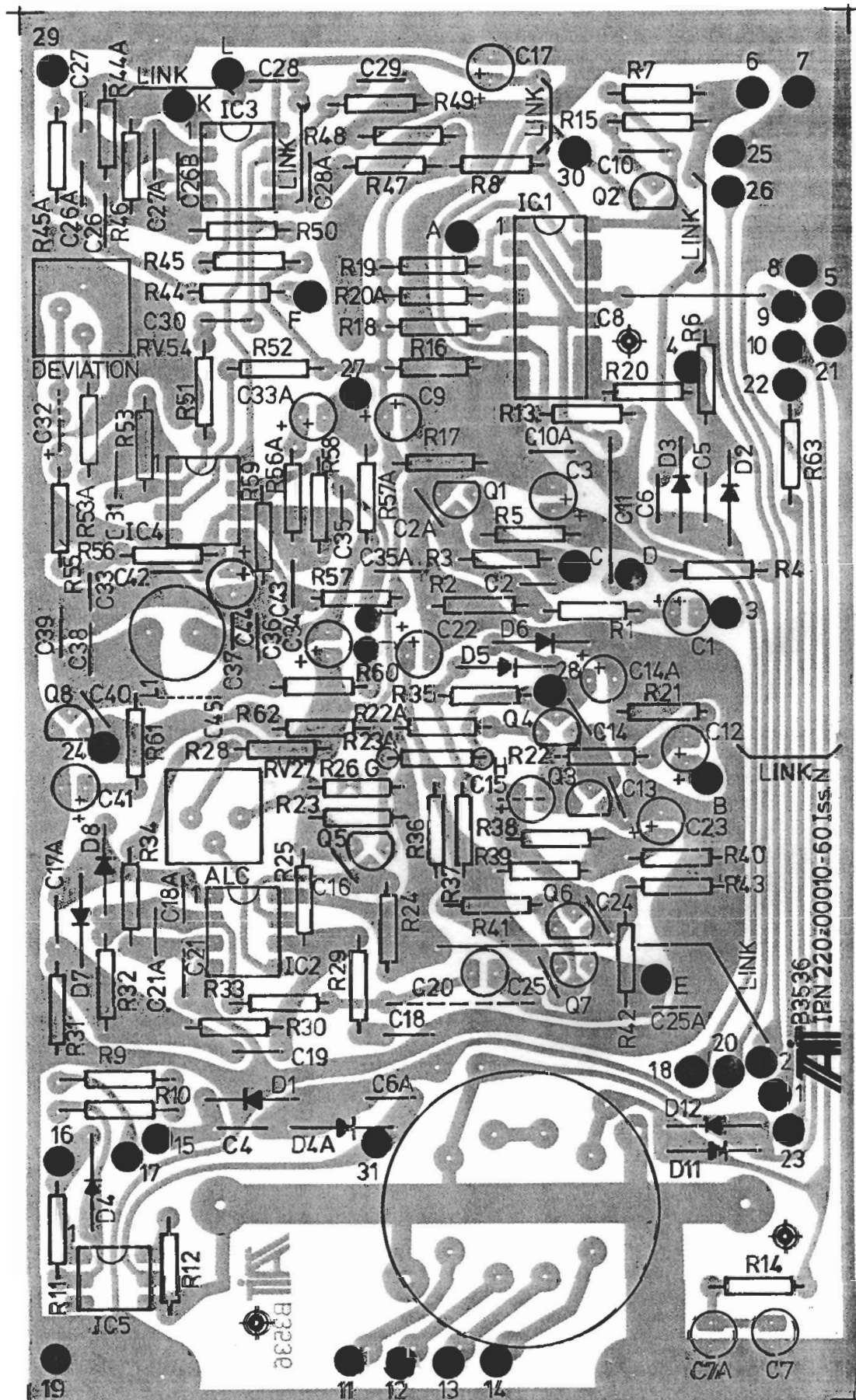
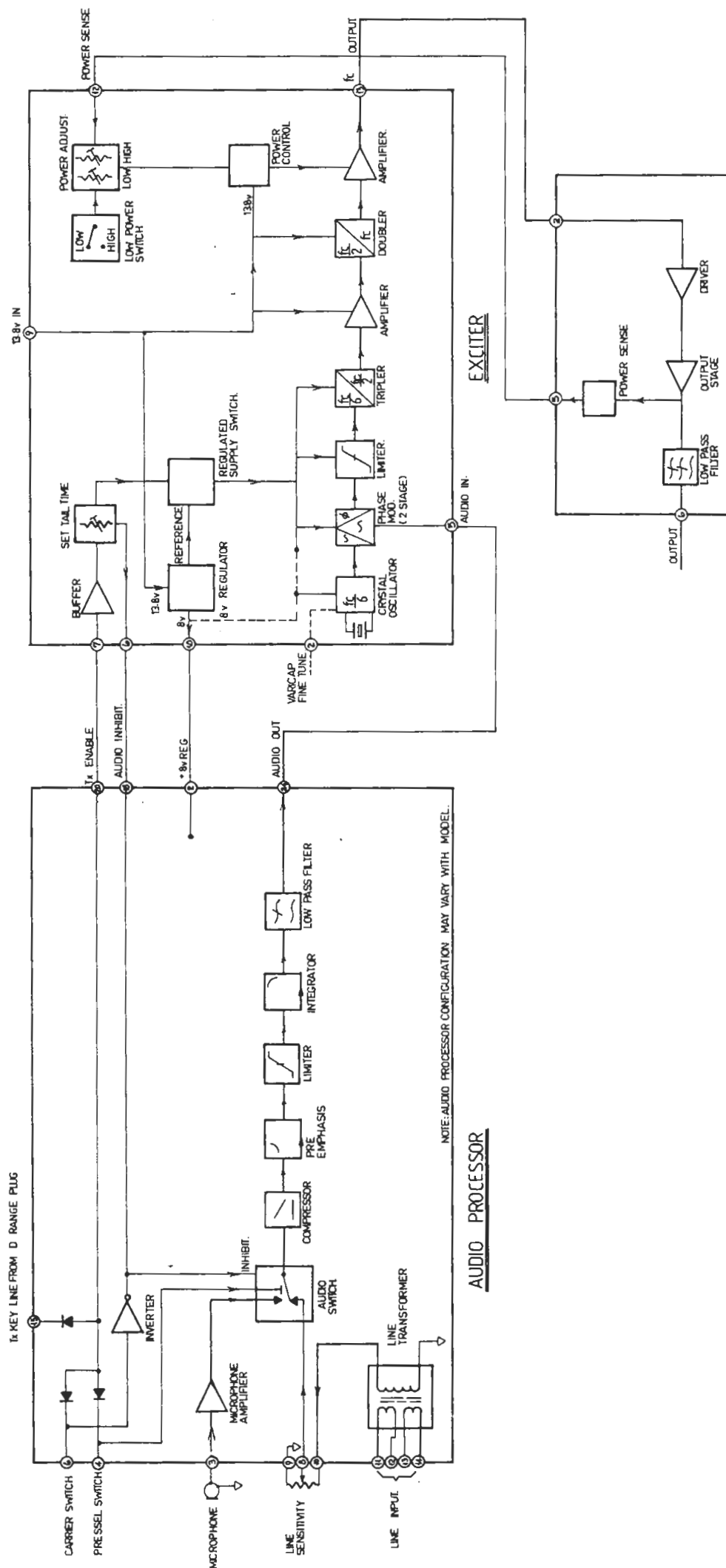


Diagram 4 B3536 Audio Processor PCB Encoding



POWER AMPLIFIER

SCALE:
MATERIAL:
FINISH:
GEN. LIMITS:

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PARTY WITHOUT THE WRITTEN CONSENT OF
T-356-111-111-111-111

ISSUE	AMENDMENTS	DRN	CHKD	APVD	DATE
1	ORIGINAL				2/2/61

T356	BLOCK	DIAGRAM			TAIT ELECTRONICS LTD	
DRAWING NUMBER			A2		ISSUE	
			M		1180	

	TAIT ELECTRONICS LTD	ISSUE	
		A2	M1180

	TAIT ELECTRONICS LTD	ISSUE	
		A2	M1180

	TAIT ELECTRONICS LTD	ISSUE	
		A2	M1180

	TAIT ELECTRONICS LTD	ISSUE	
		A2	M1180

	TAIT ELECTRONICS LTD	ISSUE	
		A2	M1180

	TAIT ELECTRONICS LTD									
	ISSUE									
DRAWING NUMBER	A2 M1180									

	TAIT ELECTRONICS LTD									
	ISSUE									
DRAWING NUMBER	A2 M1180									

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DRAWING NUMBER	A2 M1180									

	TAIT ELECTRONICS LTD									
	ISSUE									
DRAWING NUMBER	A2 M1180									

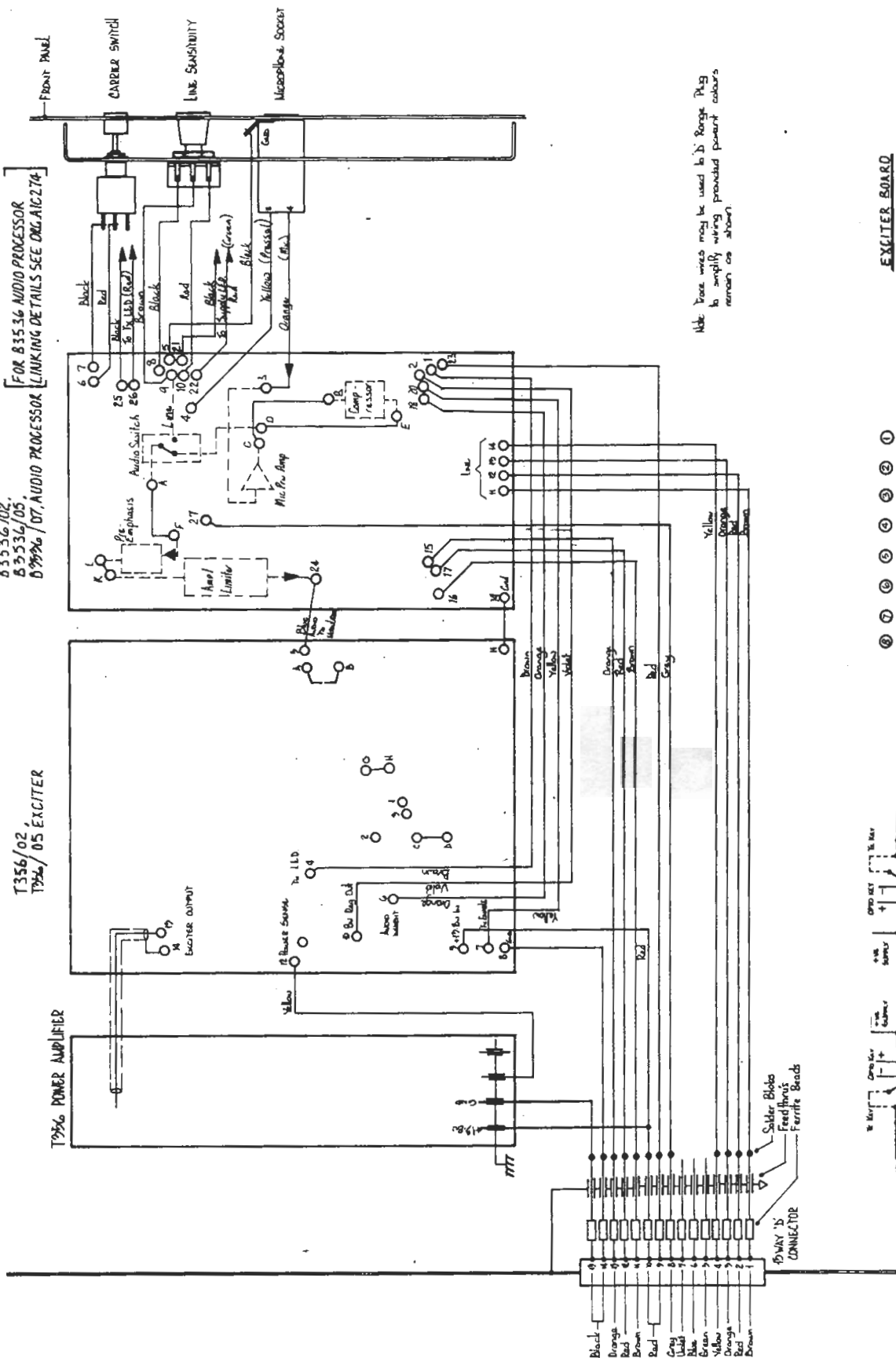
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	ISSUE									
DRAWING NUMBER	A2 M1180									

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	ISSUE									
DRAWING NUMBER	A2 M1180									

85536/02.
85536/05.
85536/07, AUDIO PROCESSOR [LINKING DETAILS SEE DRG AIC274]

T356/02.
T356/05 EXCITER

T356 POWER AMPLIFIER

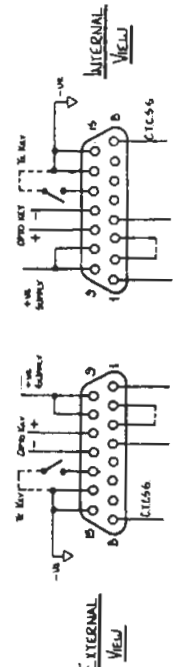


EXCITER BOARD

T356/02 Link A-B Connected
T356/05 Link A-B Not Connected
T356/52 Link A-B Connected

- ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲ ⑳ ㉑ ㉒ ㉓ ㉔ ㉕ ㉖ ㉗ ㉘ ㉙ ㉚ ㉛ ㉜ ㉝ ㉞ ㉟ ㊱ ㊲ ㊳ ㊴ ㊵ ㊶ ㊷ ㊸ ㊹ ㊺ ㊻ ㊼ ㊽ ㊾ ㊿

FIELD INPUT MODELS
(same view)



'D' RANGE CONNECTOR DETAILS

DEM	CHNO	APID	DATE	ISSUE	AMENDMENTS
85536/02	85536/05	85536/07	85536/08	85536/09	85536/10

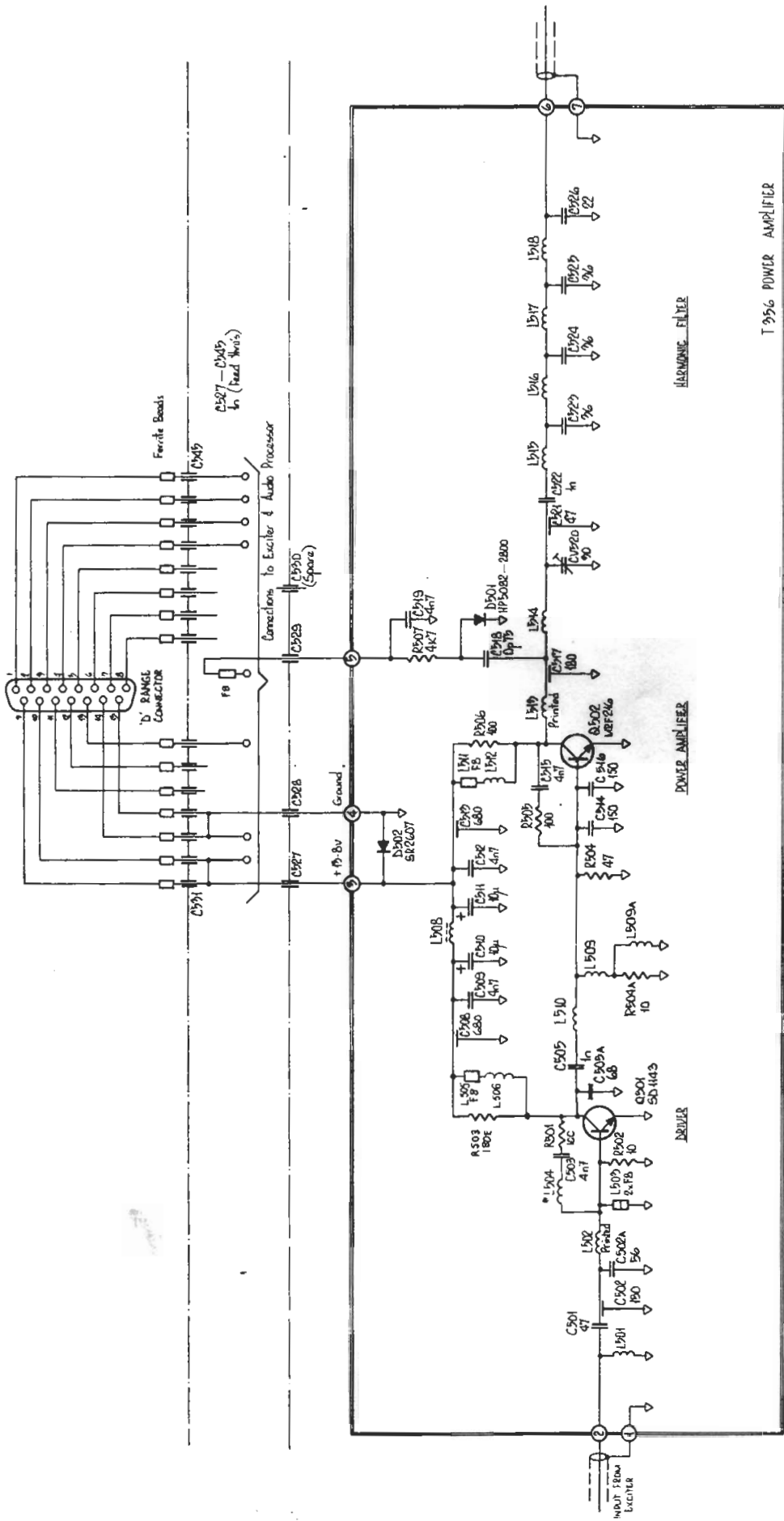
ISSUE	AMENDMENTS
1	85536/02-471

SCALE:
MATERIAL:
FINISH:
GAGE LIMITS:

WIRING DIAGRAM - T356/02, T356/05 & T356/52

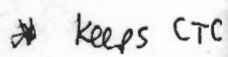
IPN
TAIT ELECTRONICS LTD
DRAWING NUMBER
A2 C298
ISSUE
A2 C298

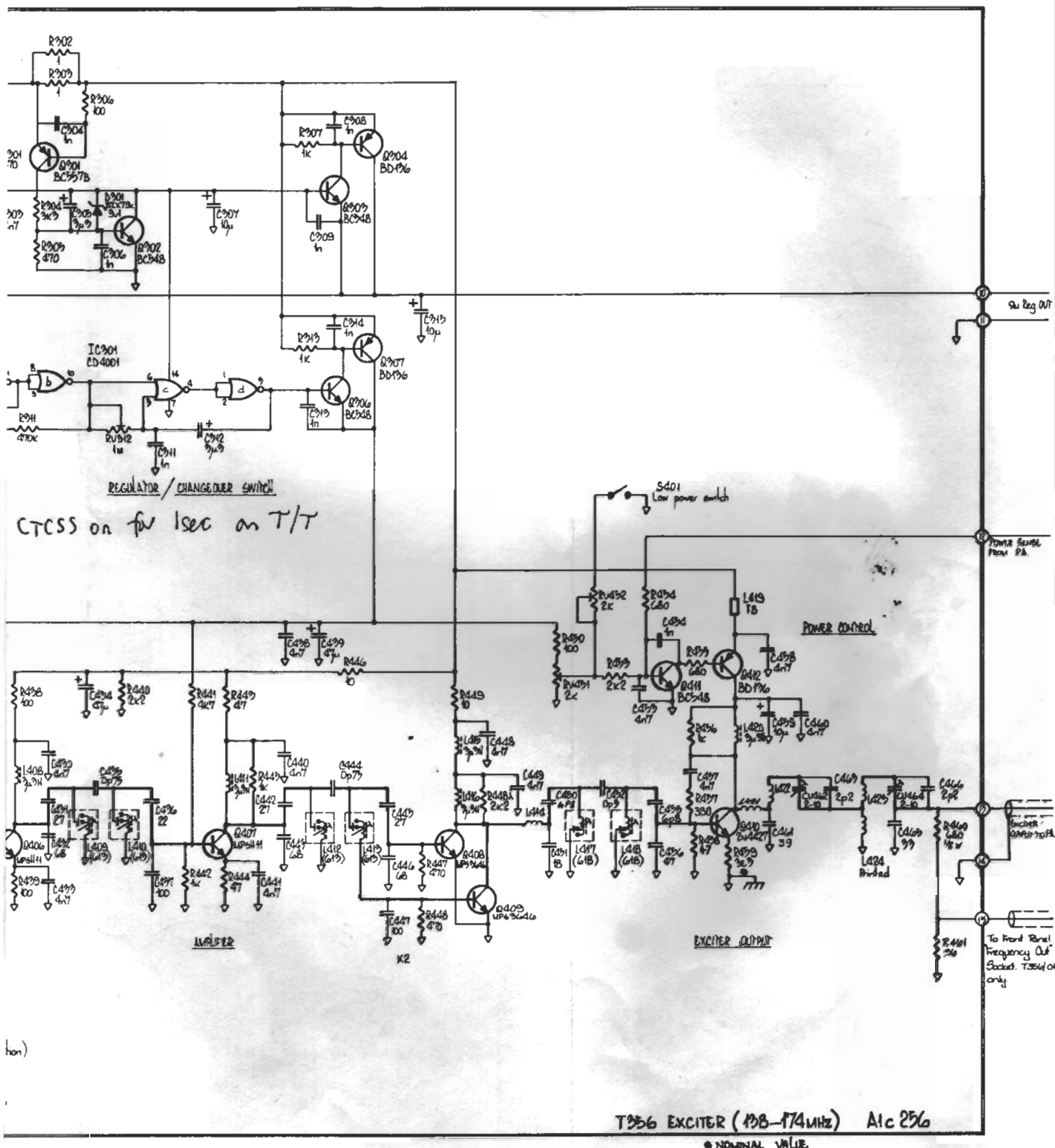
USED ON
T356/02
T356/05
T356/52



S.I.T. 150A used to increase driver gain only
if output power is less than 30 Watts
when the input power is -400 mW

USED ON		T356	
THIRD ANGLE PROJECTION		IPN	
W/O		A2	
DRAWING NUMBER		C257	
ISSUE		A2	
TAIT ELECTRONICS Ltd.		Christchurch New Zealand	
CIRCUIT DIAGRAM — T356 POWER AMPLIFIER		(138-474 Wks)	
DRN	CHG	APV	DATE
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
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14	14	14	14
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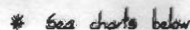


USED ON
T356/02
T356/05

ISSUE	AMENDMENTS	DRN.	CHKD.	APVD.	DATE
1	Rev A	1	1	1	1/1/01
2	Rev B	2	2	2	2/1/01
3	Rev C	3	3	3	3/1/01
4	Rev D	4	4	4	4/1/01
5	Rev E	5	5	5	5/1/01

CIRCUIT DIAGRAM—T356 EXCITER
(138-174MHz)

IPN 22100001036	TAIT ELECTRONICS LTD	ISSUE
DRAWING NUMBER A1 C256		



for T⁹%/04 see drg A/c 319

IPN 22000001060

 TAIT ELECTRONICS LTD	
DRAWING NUMBER A1 C 274	ISSUE 1

18 JUL 67 JMW