TAIT ELECTRONICS LTD

Address: 558 Wairakei Road,
Christchurch,
New Zealand.

Postal Address: PO Box 1645,
Christchurch,
New Zealand.

Telegrams & Cables: 'Taitronics'

Telex: 4926

Telephone: 583 399

Fax: (64) (03) 583 603 or 583 636

T375 Receiver

VHF FM 138-225MHz

(TM-375)

Issue A

TECHNICAL INFORMATION

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

UPDATING EQUIPMENT & SERVICE MANUALS

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

SCOPE OF MANUAL

This Manual covers General, Technical and Servicing Information on the Tait T375 VHF FM Receiver.

Ordering Service Manuals

When ordering the T375 Service Manual quote the Tait IPN and the version required, e.g. IPN TM-375, Version T375/02, T375/05 etc.

Date Of Issue

IPN TM-375 T375 Service Manual
Provisional Issue published October 1987
Issue A published July 1988

CONTENTS

ILLUSTRATIONS

DIAGRAMS

SECTION 1 GENERAL INFORMATION

1.1 INTRODUCTION

The T375 is a high performance FM Base Station Receiver designed for single or four channel operation in the 138 to 225MHz frequency range. The receiver has two basic versions which cover either 138-174MHz or 174-225MHz.

The RF section of the receiver is a dual conversion superhet with intermediate frequencies of 21.4MHz and 455kHz. The IF line-up includes two 21.4MHz crystal filters which determine the band-pass characteristics. Amplitude limiting, detection and an audio pre-amplifier are contained in a single integrated circuit.

The IF section also drives carrier and noise level detectors for signal strength indication and gating of audio outputs.

The audio section delivers up to +10dBm to a 600 ohm balanced output and 1 watt to a local monitor speaker. Provision is also made to monitor the 600 ohm balanced output.

Front panel controls include gate sensitivity, line level, monitor volume, local oscillator frequency monitor and mute disable switch. This switch disables the mute (squelch) signal to the monitor amplifier as an aid to servicing. A local oscillator frequency trim adjustment is also provided when the standard reference crystal is fitted.

The components are mounted on two printed circuit boards which are secured in a metal frame. The frame fits into a robust metal sleeve which gives mechanical and environmental protection.

The T375 may be housed together with up to six similar modules in a Tait rack shelf which in turn may be mounted in a standard 484mm (19 inch) rack frame or a lockable cabinet to provide an attractive and convenient installation.

1.2 SPECIFICATIONS

1.2.1 INTRODUCTION

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

Where applicable, the test methods used to obtain the following performance figures are those described in the 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

Type	.. dual conversion superheterodyne
Frequency Range	.. 138 to 225MHz
Frequency Increments	.. 5kHz or 6.25kHz
Number of Channels	.. one (four channel option available)
Switching Range	.. 2.5MHz
Supply Voltage:	
Operating Range	.. 10.8 to 16 volts DC
Standard Test Voltage	.. 13.8 volts DC
Polarity	.. negative earth only
Supply Current:	
Gate Off, Monitor On	.. 220mA
Gate On, Monitor On, full audio	.. 600mA
Antenna Impedance	.. 50 ohms (nominal)
Operating Temperature Range (refer to Section 1.2.5)	.. -30°C to +60°C
Dimensions:	
Height	.. 191mm
Length	.. 300mm
Width	.. 60mm
Weight:	
With Sleeve	.. 1.2kg
With Sleeve & Guide	.. 1.6kg

1.2.3 RF & IF SECTIONS

12dB Sinad Sensitivity	.. -118dBm
IF Amplifiers:	
Frequencies	.. 21.4MHz and 455kHz
Bandwidth:	
Narrow Band	.. 7.5kHz
Wide Band	.. 15kHz

Signal+Noise To Noise Ratio:	
RF Level -107dBm	.. 20dB
RF Level -47dBm	.. 45dB
Selectivity (Adjacent Channel):	
Narrow Band	.. 80dB
Wide Band	.. 85dB
Spurious Response Attenuation	.. 85dB
Intermodulation Response Attenuation	.. 75dB
Gating Sensitivity:	
Threshold	.. -121dBm (0.2µV pd)/6dB Sinad
Hard Setting	.. -110dBm (0.7µV pd)/22dB Sinad
Oscillator Fine Frequency Trim Range	.. ±500Hz

1.2.4 AUDIO OUTPUTS

Outputs Available	.. line and monitor
Load Impedances:	
Line Terminals	.. 600 ohms
Monitor Speaker	.. 3 ohms
Output Power:	
Line Terminals	.. +10dBm
Monitor Speaker	.. 1W maximum
Distortion (line terminals)	.. 3%
Audio Frequency Characteristics:	
Types Available	.. flat or de-emphasised
Flat Response: 67 to 3400Hz	.. within +1, -2dB of output level at 1kHz
De-emphasised Response:	
67 to 300Hz	.. within +1, -2dB of output level at 100Hz
300 to 3400Hz	.. within +1, -3dB of a 6dB/octave de-emphasis characteristic (ref. 1kHz)

1.2.5 FREQUENCY REFERENCE

Oscillator Frequency:	
5kHz Reference Frequency	.. 10.24MHz
6.25kHz Reference Frequency	.. 12.8MHz
Crystal Type	.. TE/26
Standard Versions:	
Temperature Range	.. -10°C to +60°C
Stability	.. ±4ppm

Low Temperature Version:

Temperature Range	.. -30°c to +60°C
Stability	.. ±2.5ppm
Crystal Frequency	.. 12.8MHz
TCXO Type	.. TCO-909A

1.3 VERSIONS

The following versions of the T375 receiver are covered by this Manual:

T375/02
FM Receiver 138-174MHz
Frequency increment 6.25kHz minimum
IF bandwidth 15kHz
Front panel frequency trim
B3535/02 audio processor

T375/05
FM Receiver 138-174MHz
Frequency increment 6.25kHz minimum
IF bandwidth 7.5kHz
Front panel frequency trim
B3535/02 audio processor

T375/15
FM Receiver 174-225MHz
Frequency increment 6.25kHz minimum
IF bandwidth 7.5kHz
Front panel frequency trim
B3535/02 audio processor

T375/22
FM Receiver 138-174MHz
Frequency increment 6.25kHz minimum
IF bandwidth 15kHz
4 channels available
Front panel frequency trim
B3535/02 audio processor

T375/25
FM Receiver 138-174MHz
Frequency increment 6.25kHz minimum
IF bandwidth 7.5kHz
4 channels available
Front panel frequency trim
B3535/02 audio processor

T375/42
FM Receiver 174-225MHz
Frequency increment 6.25kHz minimum
IF bandwidth 7.5kHz
4 channels available
Front panel frequency trim
B3535/02 audio processor

T375/51

FM Receiver 138-174MHz
Frequency increment 5kHz minimum
IF bandwidth 15kHz
Front panel frequency trim
B3535/02 audio processor

T375/55

FM Receiver 138-174MHz
Frequency increment 5kHz minimum
IF bandwidth 15kHz
4 channels available
Front panel frequency trim
B3535/02 audio processor

SECTION 2 CIRCUIT OPERATION

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

2.1 FREQUENCY SYNTHESIZER

The T375 employs the dual modulus system of frequency synthesis. The voltage controlled oscillator (VCO, Q22 and buffer Q23) runs at the actual local oscillator operating frequency; ie, there are no multiplier stages. The loop control voltage on varicap D16 determines the VCO frequency over its switching range.

A crystal provides a stable reference frequency of 12.8MHz (10.24MHz) which is divided down to 6.25kHz (5kHz) and fed to one input of a phase comparator within IC3. Fine tuning trim consists of a varicap diode and a front panel multiturn preset control. A second varicap (D19), together with an NTC resistor (R89), temperature compensates the oscillator. For applications which require better frequency stability over the temperature range, a temperature compensated crystal oscillator (TCO-909) may be fitted, however this cannot be adjusted from the front panel.

The VCO frequency is divided by the 40/41 prescaler, IC4, and then further divided within IC3 to provide the other input to the phase comparator. The division ratio in IC3, and hence the channel frequency, is determined either by the onboard DIP switches for single channel applications, or by a diode matrix board for multi-channel applications.

The phase comparator output (pins 7 & 8 of IC3) is fed to the VCO tuning varicap via an active loop filter (IC2a). The loop bandwidth is opened up, using pin diode switching, when the lock detect line on IC3 indicates an out of lock condition.

2.2 RF & IF SECTIONS

The signal enters the receiver via the N-type female connector mounted on the rear chassis panel, and feeds down via a 50 ohm coaxial cable to the PCB.

It passes through a two-section, capacatively-coupled band-pass filter to the base of the common-emitter RF amplifier (Q8) mounted on the underside of the board. From the collector, the signal is further filtered by a 3-section, capacitively-coupled band-pass filter before being presented to the sources of the balanced mixer transistors (Q11 & Q12).

The output from the synthesizer is phase split and presented to the bases of the mixer transistors (Q11 & Q12). The IF signal appears in anti-phase at the drains of the mixer transistors and is combined in the tuned circuit before being presented to the first IF crystal filter (XF1) which provides the required high selectivity. The filter passes only the 21.4MHz component of the mixer output to the input of the first IF amplifier (Q14 & Q15). Further IF filtering then takes place in a two pole crystal filter (XF2) before the 21.4MHz signal is mixed with the output of a 20.945MHz crystal oscillator (X2 & IC1a) to give the second IF signal at 455kHz. This signal is then fed into a limiting amplifier before demodulation, using a frequency discriminator (IC1). The audio output is then fed to the audio processor PCB.

The squelch operates at frequencies outside the audio bandwidth. The audio signal is band-pass filtered (IC1c), amplified, rectified and then smoothed. The resultant DC level is compared with a preset DC level, adjustable from the front panel, and the mute control line fed to the audio PCB.

Hysteresis is introduced on the comparator (IC5a) to prevent the mute opening and closing in rapid succession. The attack and decay time constants of the squelch are controlled by the components on the output of IC5a.

A signal strength indicator is provided to meet the requirments of a trunking system. The 455kHz IF signal is buffered (Q28), amplified (Q29), rectified (D24) and smoothed. Feedback is provided to achieve a linear characteristic between received signal strength (dBm) and output voltage. The resultant signal is fed through a temperature compensated amplifier (IC5d) and output to the rear D range connector.

2.3 9 VOLT REGULATOR

A 5V line is generated directly (Q1) from the 13.8V (nominal) supply. A 9V supply is generated using a DC differential amplifier configuration (Q2 - Q5). The DC gain is determined by the ratio of R4 and R5.

2.4 AUDIO PROCESSOR (B3535)

The mute output from the RF/IF section is fed to a buffer inverter (Q1) whose collector current flows through the 'gate' LED on the front panel to the bases of Q2 and Q5.

Q1A would provide a receiver 'disable' function by clamping the base of Q1 to its emitter. An 'enable' delay may be provided by RV1a, R1b, R2b and C1b when the receiver is to be used in a semi-duplex, two frequency linking system to prevent interaction. This block of circuitry is unused in the standard T375.

When the base of Q2 is driven, its collector clamps the bases of both gating transistors (Q3 and Q4) to their emitters, thus allowing audio to pass to the line and monitor outputs. Q4 maybe held in the unmuted condition by closing the front panel 'Monitor Mute' toggle switch (S1) as a servicing aid.

Applying drive to the base of Q5 also causes its collector to clamp to the 0V line, providing an open-collector output which may be used to key a transmitter. If a relay is fitted, the pull-in coil is also driven by Q5 (Q5 may be a medium or high power device depending upon its application).

The audio signal is applied to the op. amps (IC1a and IC1b) which, depending upon the associated components, provide either a CTCSS-compensated function or a totally 'flat' function, both having unity gain at 1kHz. A bridged T network (C7, C8, C9, R13 & R15) connected in a feedback loop gives a broad resonance at about 280Hz. When combined with the de-emphasis network (R19, C10), the circuit complies with the requirements for a flat response at CTCSS frequencies, but retains the de-emphasized response at audio frequencies.

When a totally flat response is required (e.g. in linking systems), the de-emphasis components are effectively eliminated by the changes set out in Section 4.5.

The signal is presented to a low pass filter (R21, C12 to C15, L1 & R22) which limits the upper audio response, then passes to the individual line and monitor level controls (RV39 & RV40). The signal is taken from the sliders of the potentiometers past the muting transistors (Q3 & Q4) to IC2 which contains two power amplifier sections. One section provides an output to drive a speaker, the other provides the line output via transformer T1. The output impedance is set at 600 ohms by two feedback loops around the line amplifier - one proportional to the output current, the other proportional to the output voltage.

A monitor output is also available from the 'hot' end of the line transformer primary, via R41, which may be taken to a monitor module.

SECTION 4 INSTALLATION

4.1 GENERAL

Tait Fixed Equipment transmitters and receivers may be assembled into a wide variety of fixed equipment systems, from a simple 'land mobile base' to a complex 'linking system' operating in the 'hot standby mode'.

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.

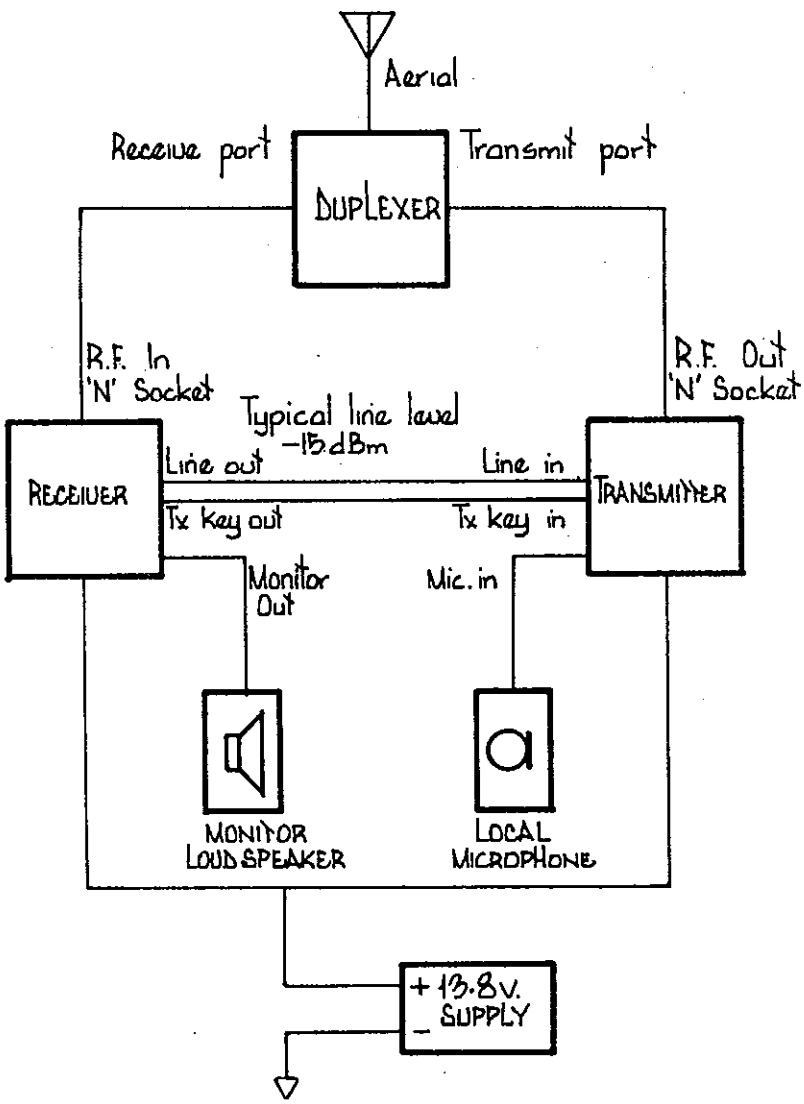


Figure 1 Talk Through Repeater

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.

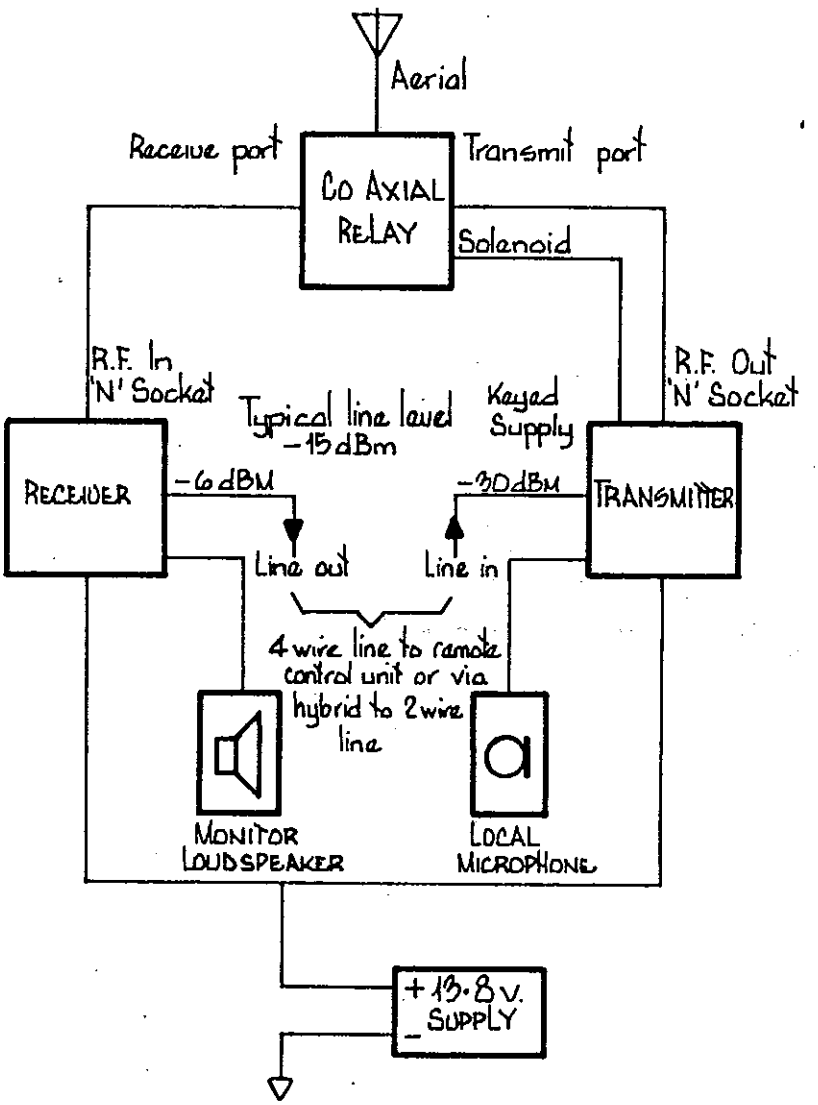


Figure 2 Line Controlled Base Station

4.4 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 retransmitted 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 2µF).

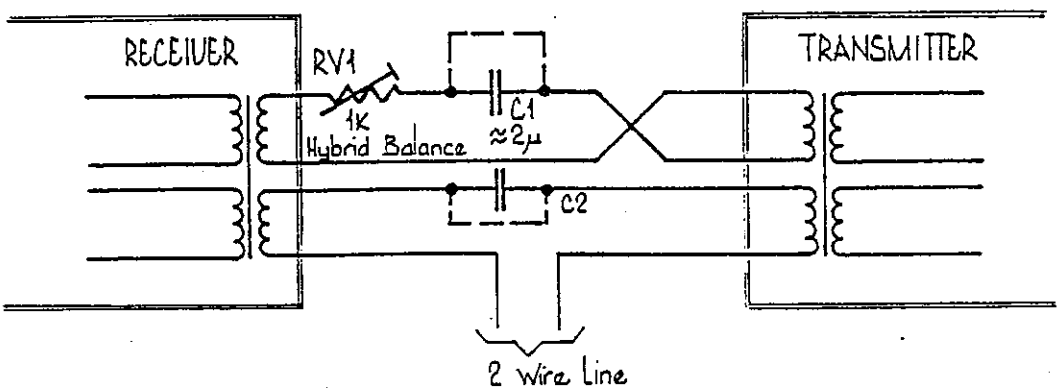


Figure 3 4-Wire to 2-Wire Converter

Note 1: It is important that the two windings of each transformer are phased as shown.

Note 2: C2 may be fitted to allow DC signalling on the line.

4.5 AUDIO PROCESSOR FLAT RESPONSE

Refer to Circuit Diagram A2C 279.

The B3535 audio processor links are set to give a CTCSS de-emphasis response. If a flat response is required (e.g. in linking systems), the following circuit changes should be carried out:

(a) Fit an insulated wire link across C8 on the underside of the PCB.

(b) Remove the link which connects the junction of 'C11, R20' and the junction of 'C10, R19 to IC1b pin 8'.

(c) Fit an insulated wire link between the junction of 'C11, R20' and point 'B' which is connected to pin 14 of IC1a.

Note: No components are removed, so the de-emphasis can be restored by removing the links (a) and (c) and refitting the link (b) as given above.

SECTION 5 SERVICING

5.1 GENERAL

5.1.1 NOTES

If further information is required about the T375 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 susceptible to damage from static charges. 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), etc.

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.

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 IC is suspect, the most reliable check is to measure the DC operating voltages. Due to the catastrophic nature of most IC failures, the pin voltages will usually be markedly different from the recommended values in the presence of a fault. The recommended values can be obtained from either the Circuit Diagram or the component data catalogue.

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 or solder sucker.
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 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 generator capable of providing 138-225MHz at 0dBm to -127dBm frequency modulated to ±25kHz deviation at 1kHz. (e.g. HP8654)
3. VHF frequency counter (accuracy better than 1ppm)
4. Sinad meter (e.g. Helper Instruments Sinadder)
5. Audio oscillator
6. Multimeter or DMM (e.g. AVO model 8 or Fluke 8012A)
7. AC millivoltmeter (e.g. Trio VT106)
8. DC millivoltmeter (e.g. Trio VT120, Tech.Inst. TE65)
9. RF diode probe (e.g. Greenpar GE 88202)
10. External speaker 3 ohm voice coil
11. DC power supply capable of delivering 1 amp at 13.8V
12. 'N' to 'BNC' adaptors (2)

13. Trimming tools (available from Tait Electronics Ltd)

WT 9	Tait IPN 9360110
WT 10	9360111
WT 11	9360112

14. Bench service lead — TA-086 Tait Electronics Ltd.

15. Audio band-pass (300-3000Hz) or high-pass (300Hz) filter required for signal to noise ratio measurements only.

5.4.2 TUNING HINTS

1. 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 readings.

2. When tuning coils on the Receiver PCB, all adjustments must be made from the top (component side) of the PCB. A non-metallic tuning tool should be used.

5.4.3 FREQUENCY RANGE SELECTION

5.4.3.1 General

The T375 will cover the frequency ranges 138-174MHz or 174-225MHz according to the version specified (refer to Section 1.3). Each of these frequency bands is further divided into two by a simple arrangement of solder bridge links.

The 138-174MHz version is band-split at 156MHz and the 174-225MHz version is band-split at 200MHz. When manufactured the T375 is initially set for high band operation.

5.4.3.2 To Set To Low Band Operation (138-156MHz or 174-200MHz)

Under each of the five front-end coils (L4, L5, L7, L8 & L9) are two octagonal pads, A and B. Link pad A to ground and isolate pad B from ground by the addition or removal of a solder bridge link.

Under L13 connect link A and open circuit link B by the addition or removal of a solder bridge (refer to Figure 4).

Bring C96 into the VCO circuit by short circuiting link 6 with a solder bridge. This link is positioned under the rear VCO cover and uses the terminal pads of C95 and C96.

Ensure that the connection between link 4 and link 5 is open circuit.

5.4.3.3 To Restore To High Band Operation (156-174MHz or 200-225MHz)

Under each of the five front-end coils (L4, L5, L7, L8 & L9) are two octagonal pads, A and B. Link pad B to ground and isolate pad A from ground by the addition or removal of a solder bridge link.

Under L13 connect link B and open circuit link A by the addition or removal of a solder bridge (refer to Figure 4).

Isolate C96 from the VCO circuit by setting link D open circuit by removing the solder bridge. This link is positioned under the rear VCO cover and uses the terminal pads of C95 and C96.

When operating in the 200-225MHz band, connect link 4 and link 5 with a solder bridge.

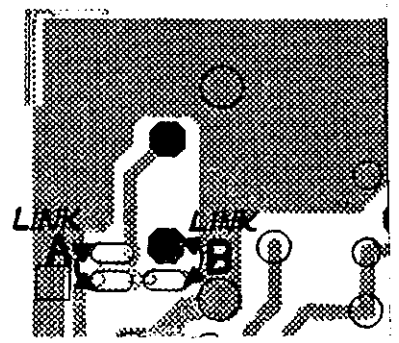


Figure 4 Link Arrangement Under L13

5.5 RECEIVER ADJUSTMENTS

5.5.1 PRELIMINARY CHECKS

Check that the correct components are fitted for operation in the required frequency band.

Check for short circuits between the positive rail and earth ('D' range pins 9 and 15), and between the +9V regulated rail and earth.

Set up the test equipment as shown in Diagram 1.

Connect the bench test plug to the receiver while monitoring the supply current. This should be between 100 and 200mA.

Set the gating sensitivity control (RV38) fully anticlockwise (this should open the gate).

Set the line level control (RV39) and monitor level control (RV40) at levels suitable for driving a Sinadder, speaker, etc.

5.5.2 CHANNEL PROGRAMMING

5.5.2.1 Reference Frequency Selection

For 12.5kHz or 25kHz channel spacing, use a 6.25kHz reference (12.8MHz crystal).

For 30kHz channel spacing, use a 5kHz reference (10.24MHz crystal).

5.5.2.2 Programming

For single channel applications, the synthesizer may be programmed using the two 8-bit switches positioned centrally on the receiver PCB.

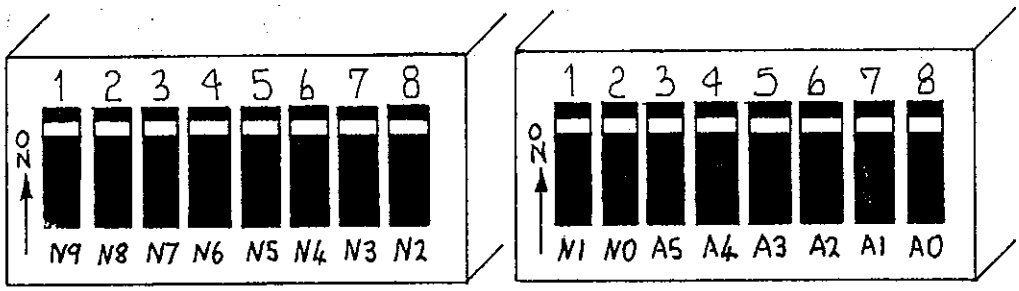


Figure 5 8-Bit Switches

16 bits (numbered A0-N9) are required to programme a frequency, which will be a multiple of the reference frequency. Note that a particular bit will add its frequency increment to the programmed frequency only when its corresponding switch is in the off position.

Table 1 shows the frequency increments represented by each of the 16 bits, A0-N9. Note the discontinuity between A5 and N0.

Table 1

5.0kHz	6.25kHz	Bit No.
102.4MHz	128.0MHz	N9
51.2	64.0	N8
25.6	32.0	N7
12.8	16.0	N6
6.4	8.0	N5
3.2	4.0	N4
1.6	2.0	N3
0.8	1.0	N2
0.4	0.5	N1
0.2	0.25	N0
0.16	0.2	A5
0.08	0.1	A4
0.04	0.05	A3
0.02	0.025	A2
0.01	0.0125	A1
0.005	0.00625	A0

The following example shows a simple method of calculating the correct programme code.

Example: Rx frequency = 154.0MHz.

VCO frequency = 154.0 - 21.4 = 132.6MHz.

VCO frequency:	132.6	
Subtract	128.0	switch 'off' N9
	4.6	
Subtract	4.0	switch 'off' N4
	0.6	
Subtract	0.5	switch 'off' N1
	0.1	
Subtract	0.1	switch 'off' A4
	0.0	

In each case subtract the largest value from Table 1 which yields a positive result. Continue the process until zero is reached.

To check: The sum of the extracted values should equal the required VCO frequency.

N9 + N4 + N1 + A4 = VCO

128 + 4 + 0.5 + 0.1 = 132.6

The DIP switches would therefore be arranged as shown in Figure 6.

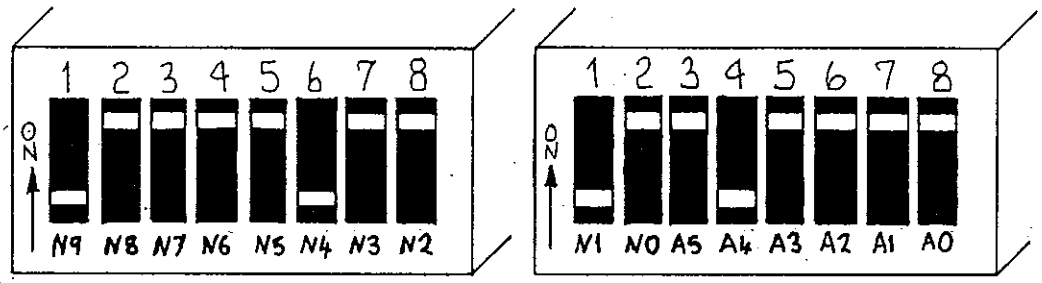


Figure 6 DIP Switch Positions

5.5.3 MULTI-CHANNEL PROGRAMMING

5.5.3.1 General

A plug-in diode matrix board can be used to programme the receiver for up to 4 channels. Channel selection is achieved by pulling low one of four lines via a second 'D' range connector (refer to the Wiring Diagram for pin-out details).

Note: Only one line may be pulled low at any one time, and the PCB mounted DIP switches must all be in the off position.

5.5.3.2 TA-500/M2 PCB

Note: The supplied diode programming PCB will have several low value chip resistors fitted as standard for production testing. These must be removed (from both channels) before any programming is attempted.

The programming of each of the four channels is accomplished by soldering between the required pads on each row of surface mount diodes (see Figure 7).

A connected pad pulls IC1 input low and deletes the frequency increment.

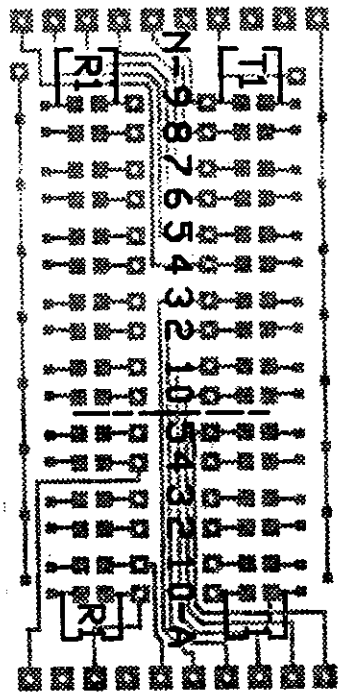
An unconnected pad allows IC1 input to go high and adds the frequency increment.

Figure 7

Table 2 shows the frequency increments represented by each of the 16 bits, A0-N9. Note the discontinuity between A5 and N0.

Table 2

5.0kHz	6.25kHz	Bit No.
102.4MHz	128.0MHz	N9
51.2	64.0	N8
25.6	32.0	N7
12.8	16.0	N6
6.4	8.0	N5
3.2	4.0	N4
1.6	2.0	N3
0.8	1.0	N2
0.4	0.5	N1
0.2	0.25	N0
0.16	0.2	A5
0.08	0.1	A4
0.04	0.05	A3
0.02	0.025	A2
0.01	0.0125	A1
0.005	0.00625	A0



The four programmable channels on the diode matrix board correspond to channels 1-4 in the T375 as follows:

TA-500/M2	T375
T1	Channel 1
T2	Channel 2
R1	Channel 3
R2	Channel 4

When a pad is solder bridged, its corresponding N or A value is subtracted from the maximum frequency count.

When a pad is left open, the corresponding value is incremented from zero.

The following example shows a simple method of calculating the correct diode programme.

Example: Rx frequency = 154.0MHz.

VCO frequency = 154.0 - 21.4 = 132.6MHz.

VCO frequency:	132.6	
Subtract	128.0	pad N9 unconnected
	4.6	
Subtract	4.0	pad N4 unconnected
	0.6	
Subtract	0.5	pad N1 unconnected
	0.1	
Subtract	0.1	pad A4 unconnected
	0.0	

In each case subtract the largest value from Table 2 which yields a positive result. Continue the process until zero is reached.

To check: The sum of the extracted values should equal the required VCO frequency.

N9 + N4 + N1 + A4 = VCO

128 + 4 + 0.5 + 0.1 = 132.6

Note: All these N values have pads left open. The remainder, i.e. N8, N7, N1, A5, A4, A2, A1 & A0, are all solder shorted.

5.5.4 VCO ALIGNMENT

Ensure that the synthesizer is correctly programmed.

Monitor the loop voltage (centre pin of P3) with a high impedance volt meter (0-15V range).

5.5.4.1 Single Channel Operation

Adjust CV98 for 5V at P3.

Check the frequency using a frequency counter connected to the front panel BNC socket.

5.5.4.2 Multi-Channel Operation

Adjust CV98 so that, when switching between channels, the loop voltages are symmetrically placed about 5 volts, but within the limits of 2 and 8 volts. The channel frequencies should not span more than 2.5MHz.

Check each frequency using a frequency counter connected to the front panel BNC socket.

5.5.4.3 Reference Frequency Adjustment (standard option only)

Any error in the reference frequency will be seen as a frequency error in the VCO frequency.

Adjust the front panel mounted 'Freq Trim' pot for the correct VCO frequency (±100Hz), monitoring the frequency on the front panel BNC socket.

Note: CV108 provides coarse frequency adjustment to compensate for variances in crystal characteristics and is set as follows:

Set the voltage on the wiper of the crystal trim pot. to approximately 5 volts and adjust CV108 to the nominal frequency.

Fine trim as above.

5.5.5 BALANCED MIXER ALIGNMENT

This adjustment can be made without any receive signal input and should be carried out before any IF or RF alignment is made.

Ensure that L13 has the correct taps for the frequency used (refer to Section 5.4.3).

Connect a DC voltmeter across R18.

Adjust L13 for maximum DC voltage across R18.

A maximum voltage corresponds to maximum power transfer from the local oscillator into the mixer. This DC voltage should increase about 0.5V for optimum injection. A typical adjustment would vary this voltage from approximately 2 to 2.5V or from 3 to 3.5V.

5.5.6 RF ALIGNMENT

Note 1: The following RF alignment procedure assumes that the IF alignment is correct and should not be touched unless there is clear evidence of malfunction. If IF alignment is required see Section 5.5.7.

Note 2: In this and following Sections, measurements and settings are given which differ for wide band and narrow band sets. In these cases the figures for wide band sets are given first followed by the figures for narrow band sets in brackets.

Set up the test equipment as in Diagram 1.

Set the mute disable switch on the front panel to off.

For multi-channel operation, select a frequency mid-way between the highest and lowest channel frequencies.

Set the RF signal generator to give an accurate 'on channel' signal modulated to ±3kHz (±1.5kHz) deviation at 1kHz and the output level to give a 12dB Sinad.

Check that coils L4, L5, L7, L8 and L9 have the correct tap settings for the frequency used (refer to Section 5.4.3).

Tune L4, L5, L7, L8 and L9 for best Sinad while progressively reducing the signal generator output level to keep the Sinad reading less than 12dB to ensure that limiting does not occur.

Retune L4, L5, L7, L8 and L9 for best Sinad while progressively reducing the signal generator output as before.

The signal generator output level should not be greater than -118dBm for a 12dB Sinad.

5.5.7 IF ALIGNMENT

5.5.7.1 General

Note: The IF sections have been correctly aligned during manufacture and should not require readjustment unless repairs have been carried out, or there is clear evidence of misalignment or malfunction.

In this Section two methods of IF alignment are described. Section 5.5.7.2 describes Sinad alignment and Section 5.5.7.3 Sweep alignment. The Sinad method is recommended for field alignments. The 'sweep' method requires the use of an oscilloscope and a signal generator with DC FM facilities.

5.5.7.2 Sinad Alignment

Ensure that the VCO and RF sections are correctly aligned as in Sections 5.5.4, 5.5.5 and 5.5.6.

Connect a Sinad meter to the audio output terminals.

Set the RF signal generator to give an accurate 'on channel' signal modulated to ±3kHz (±1.5kHz) deviation at an output level to give a 12dB Sinad.

Tune L14, L15, L19, L20 and L21 for best Sinad, reducing the signal generator output level to maintain a Sinad of about 12dB.

Repeat the previous step.

To further improve response, measure the 'Receiver Signal Strength Indicator' (RSSI) output voltage ('D' range pin 5) with a DC voltmeter.

Adjust L19 for maximum voltage and L20 for minimum voltage at this point.

The signal generator output level should not be greater than -118dBm for a 12dB Sinad.

5.5.7.3 Sweep Alignment

Ensure that the VCO and RF sections are correctly aligned as in Sections 5.5.4, 5.5.5 and 5.5.6.

Set the RF signal generator to give an on channel signal level of approximately -105dBm.

Externally modulate the signal generator with between 3 and 5Hz and set it to give approximately ±30kHz deviation.

Connect the oscilloscope 'Y' amp. to the RSSI output (pin 5 of the D range).

Connect the source of the modulating signal to the oscilloscope 'X' amp. (both X and Y amps. should preferably be DC coupled).

Set the oscilloscope to the 'X-Y' display.

Tune L14, L15 and L19 for maximum oscilloscope waveform amplitude.

Tune L20 for a minimum oscilloscope waveform amplitude.

Retune L19 and L15 alternately for minimum ripple consistent with maximum oscilloscope waveform amplitude.

Repeat the tuning of L14, L15, L19 and L20 to obtain a symmetrical response with minimum ripple.

Disconnect the external modulation and the oscilloscope.

Set the signal generator modulation to ±3kHz (±1.5kHz) deviation at 1kHz.

Connect a Sinad meter across the speaker terminals and set the signal generator output level to give a 12dB Sinad.

Tune L21 for best Sinad.

The signal generator output level should not be greater than -118dBm for a 12dB Sinad.

5.5.8 CARRIER LEVEL DETECTOR ADJUSTMENT

Connect a DC voltmeter (10V range) to the RSSI output.

Set the signal generator to -100dBm and switch the modulation off.

Adjust R113 for a signal strength voltage of 2.2V.

Vary the signal generator output level in 5dB steps from -115dBm to -95dBm and check that the RSSI voltage increases at a rate of approximately 0.5V/5dB.

5.6 FAULT FINDING

5.6.1 GENERAL

During servicing it may be necessary to measure specific performance parameters as a means of verifying the presence of a fault condition. The following performance tests provide a means of checking these parameters.

5.6.2 SYNTHESIZER FAULT FINDING

5.6.2.1 To Check The VCO Control Range

Plug a frequency counter onto the VCO front panel socket.

Short the middle pin on P3 alternately to each of the outer pins of P3.

The frequency shift should be more than 5MHz.

5.6.2.2 If The VCO Gives No Output

Remove the VCO box and check for shorts inside.

Check the drain, gate and source voltages (as per the Circuit Diagram) of the VCO and buffer amplifier transistors, Q22 and Q23.

5.6.2.3 If The Synthesizer Does Not Lock Up

Check the VCO control range following the instructions in Section 5.6.2.1.

If the control range is less than 5MHz, check the circuit for faults between P3 and the varicap. The voltage on the varicap must be the same as the loop voltage (P3).

Tune the VCO until its programmed frequency is within the switching range.

If the loop voltage is still either less than 0.6V or more than 7.5V, check pin 7 and pin 8 of the synthesizer (IC3):

(Under normal operating conditions the loop voltage is between 1.75 and 6.5V and both pin 7 and pin 8 are high, except for very narrow pulses [100ns] at the same rate as the reference frequency.)

(a) If pin 7 pulses low and the loop voltage is low, or if pin 8 pulses low and the loop voltage is high, check the circuitry between IC3 and P3.

(b) If both stay high and the loop voltage is high, check the crystal oscillator.

Measure the VCO frequency.

Measure the prescaler output frequency (pin 3).

Check that $f_{prescaler} = f_{VCO}/40$.

Note: The prescaler should not be loaded with 50 ohms - a 1M ohm input counter must be used.

Check that the input voltage of the synthesizer (pin 1) is more than 500mV pp.

Once locked, the lock detect output (IC3, pin 28) should be high (9V).

5.6.2.4 To Check The VCO Output Frequency Stability

If the synthesizer locks up but does not reach a stable VCO output frequency, or if the VCO output frequency is a few channels off frequency, check:

(a) that the input power to the prescaler from the VCO is not too low;

(Check the VCO output power and the circuitry between the VCO and the prescaler.)

(b) that the modulus control pulse (pin 1 of the prescaler) is more than 4.0V.

5.6.2.5 Microphonics

If the set shows a high level of microphonics:

(a) Check that all components inside the VCO box are flush mounted to the PCB, paying special attention to the trimmer capacitor and the inductor. (Resoldering may be attempted, but a solvent cleaner must never be used inside the VCO box.)

(b) Remove any excess solder where the VCO box touches the PCB.

(c) Ensure that all screws are securely tightened.

5.6.3 RF SENSITIVITY

Connect a Sinad meter across the speaker terminals.

Connect an 'on channel' RF signal generator to the aerial input terminal.

Set the signal generator accurately on receive frequency.

Set the signal generator deviation to ±3kHz (±1.5kHz) at 1kHz.

Turn the mute monitor off.

Set the signal generator output level to -127dBm.

Increase the signal generator output level until a Sinad of 12dB is reached.

The signal generator output should not be greater than -118dBm (0.28μV pd) and should be typically -120dBm.

5.6.4 GATING

5.6.4.1 To Check The Gate Operation

Connect an on channel RF signal generator modulated to ±3kHz (±1.5kHz) with a 1kHz tone to the receiver input, and a Sinad meter across the speaker terminals.

For several input signal strengths between -123dBm and -105dBm turn the gating sensitivity control on the front panel in a clockwise direction until the audio is muted; turn anticlockwise until the audio just unmutes.

Decrease the RF level in 0.5dB steps until the audio is muted.

Increase the RF level until the audio is just unmuted, noting the increase in RF level and the Sinad level at which the audio unmutes.

The increase in RF level required to unmute the audio is the mute hysteresis.

The mute should operate for Sinads between 6 and 20dB. The hysteresis, which will vary with gate setting, should be between 1.5 and 8dB.

5.6.4.2 To Check The Squelch Ratio

Set the signal generator output level to -107dBm (1μV), modulated to ±3kHz (±1.5kHz) deviation at 1kHz.

Replace the Sinad meter with an AC voltmeter across the speaker terminals.

Turn the squelch control fully anticlockwise.

Adjust the volume control to give a reading of 3 volts on the mV/meter.

Reduce the signal generator output level to -127dBm.

The fall in output is the 'squelch ratio' is should be at least 70dB.

5.6.5 RECEIVED SIGNAL STRENGTH (RSSI) OPERATION

Connect the RF signal generator, modulated to ±3kHz (±1.5kHz) with a 1kHz tone, to the receiver input.

Connect the DC voltmeter (set to the 10V range) to pin 5 of the D range connector.

Vary the input signal level over the range -95dBm to -115dBm, recording the output voltage.

Note that the signal strength output voltage should be approximately 2.2V for -95dBm, varying by approximately +0.5V for each 5dB increase in signal level.

5.6.6 LINE AMPLIFIER OUTPUT LEVEL

Set up the test equipment as in Diagram 1(a).

Apply an RF input signal at a level of -50dBm, modulated to ±3kHz (±1.5kHz) with a 1kHz tone.

Set the receiver line level control to give an indicated output of 0dBm.

While monitoring the waveform on the oscilloscope, increase the line level output to ensure that at least +10dBm is available before clipping occurs.

Set the line level control to give an output of 0dBm.

5.6.7 MONITOR AMPLIFIER OUTPUT LEVEL

Set up the test equipment as in Diagram 1(b), including a 3 ohm speaker (capable of handling 1 watt) connected between pins 8 and 15 of the 'D' range connector.

Connect the audio EVM in parallel with the speaker and apply an RF input signal at a level of -60dBm, modulated to ±3kHz (±1.5kHz) with a 1kHz tone.

Check that at least 1.73 volts RMS is available into the speaker before clipping occurs.

5.6.8 SIGNAL+NOISE TO NOISE RATIO

Set up the test equipment as in the line amplifier test Diagram 1(a).

Set the RF signal generator output to -50dBm, modulated to ±5kHz (±2.5kHz) with a 1kHz tone. Adjust the line level to 0dBm.

Switch the modulation off.

Check that the residual noise is less than -45dBm at the line output.

Note: It may be necessary to increase the meter sensitivity to get a satisfactory reading.

SECTION 6 PARTS LIST

6.1 GENERAL

The 10 digit numbers (000-00000-00) in this parts list are 'Internal Parts Numbers' (IPN's).

Your spare parts orders can be handled more efficiently if you quote equipment type, circuit reference, IPN and give a brief description of the part.

The parts list printed below is for all versions of the T375. Different versions have different sub-groups. Check the model of your equipment (printed on a label on the back of the equipment). To find the correct part refer to the sub-groups listed for your equipment. 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.

This section contains a list of the various T375 versions and their sub-groups.

	VERSION	SUB-GROUPS	
1.	T375/02:	B375	T375 Common Parts
		B375/AI	T375 Common Auto-Insert Parts
		B375/M	T375 Mechanical Parts
		B375/W	T375 Wire List
		C375/XO	T375 Standard Crystal Oscillator Parts
		C375/X6	Add To C375/XO For 6.25kHz Increments
		C375/02	Add To B375 For 138-174MHz
		C375/B	T375 15kHz IF Bandwidth Parts
		C375/M	Add To B375/M For Single D Plug Fitting
		B3535	B3535 Audio Processor Basic Parts
		C3535/02	B3535 3.4kHz Filter Parts
2.	T375/05:	B375	T375 Common Parts
		B375/AI	T375 Common Auto-Insert Parts
		B375/M	T375 Mechanical Parts
		B375/W	T375 Wire List
		C375/XO	T375 Standard Crystal Oscillator Parts
		C375/X6	Add To C375/XO For 6.25kHz Increments
		C375/02	Add To B375 For 138-174MHz
		C375/C	T375 7.5kHz IF Bandwidth Parts
		C375/M	Add To B375/M For Single D Plug Fitting
		B3535	B3535 Audio Processor Basic Parts
		C3535/02	B3535 3.4kHz Filter Parts
3.	T375/15:	B375	T375 Common Parts
		B375/AI	T375 Common Auto-Insert Parts
		B375/M	T375 Mechanical Parts
		B375/W	T375 Wire List
		C375/XO	T375 Standard Crystal Oscillator Parts
		C375/X6	Add To C375/XO For 6.25kHz Increments
		C375/12	Add To B375 For 174-225MHz
		C375/C	T375 7.5kHz IF Bandwidth Parts
		C375/M	Add To B375/M For Single D Plug Fitting
		B3535	B3535 Audio Processor Basic Parts
		C3535/02	B3535 3.4kHz Filter Parts

4. T375/22:	B375	T375 Common Parts
	B375/AI	T375 Common Auto-Insert Parts
	B375/M	T375 Mechanical Parts
	B375/W	T375 Wire List
	C375/XO	T375 Standard Crystal Oscillator Parts
	C375/X6	Add To C375/XO For 6.25kHz Increments
	C375/02	Add To B375 For 138-174MHz
	C375/B	T375 15kHz IF Bandwidth Parts
	C375/M2	Add To B375/M For Double D Plug Fitting
	B/TA-500/M2	SMD Diode Memory PCB Parts
	B3535	B3535 Audio Processor Basic Parts
	C3535/02	B3535 3.4kHz Filter Parts
5. T375/25:	B375	T375 Common Parts
	B375/AI	T375 Common Auto-Insert Parts
	B375/M	T375 Mechanical Parts
	B375/W	T375 Wire List
	C375/XO	T375 Standard Crystal Oscillator Parts
	C375/X6	Add To C375/XO For 6.25kHz Increments
	C375/02	Add To B375 For 138-174MHz
	C375/C	T375 7.5kHz IF Bandwidth Parts
	C375/M2	Add To B375/M For Double D Plug Fitting
	B/TA-500/M2	SMD Diode Memory PCB Parts
	B3535	B3535 Audio Processor Basic Parts
	C3535/02	B3535 3.4kHz Filter Parts
6. T375/42:	B375	T375 Common Parts
	B375/AI	T375 Common Auto-Insert Parts
	B375/M	T375 Mechanical Parts
	B375/W	T375 Wire List
	C375/XO	T375 Standard Crystal Oscillator Parts
	C375/X6	Add To C375/XO For 6.25kHz Increments
	C375/12	Add To B375 For 174-225MHz
	C375/C	T375 7.5kHz IF Bandwidth Parts
	C375/M2	Add To B375/M For Double D Plug Fitting
	B/TA-500/M2	SMD Diode Memory PCB Parts
	B3535	B3535 Audio Processor Basic Parts
	C3535/02	B3535 3.4kHz Filter Parts
7. T375/55:	B375	T375 Common Parts
	B375/AI	T375 Common Auto-Insert Parts
	B375/M	T375 Mechanical Parts
	B375/W	T375 Wire List
	C375/XO	T375 Standard Crystal Oscillator Parts
	C375/X5	Add To C375/XO For 5kHz Increments
	C375/02	Add To B375 For 138-174MHz
	C375/B	T375 15kHz IF Bandwidth Parts
	C375/M2	Add To B375/M For Double D Plug Fitting
	C375/55	Add to T375 For /55 Version
	B/TA-500/M2	SMD Diode Memory PCB Parts
	B3535	B3535 Audio Processor Basic Parts
	C3535/02	B3535 3.4kHz Filter Parts

6.2 B375 T375 PCB COMMON PARTS

6.2.1 TRANSISTORS

INTERNAL PART NO.	QTY/SET	DESCRIPTION	REFERENCE		CH/N
0005002011	2	BF494 " AT	Q14, Q30		
0000011700	1	BD136 "	Q5		
0000002035	1	BF324 "	Q15		
0000022555	1	2N5484 "	Q28		
0000031755	1	3SK87K "	Q23		
0000031866	1	MPSH02 "	Q29		
0000032155	1	BFR91 "	Q8		
0000033100	3	J310 TRANSISTOR	Q11, Q12, Q22		

6.2.2 DIODES

0010001026	4	BA482 DIODE	D10, D11, D13, D14		
0010001160	1	SR2607 "	D1		
0010012001	0.001	1 THRU 1N4148 DIODES	D24 (VERT)		
0010012053	1	BB405 VARICAP "	D16		
0010015111	1	BZX79/C5V1 ZENER "	D12		

6.2.3 INTEGRATED CIRCUITS

0020001240	1	MLM358 INT CCT	IC2		
0020001440	1	MLM324 INT CCT	IC5		
0020001458	1	78L05 INT CCT	Q1		
0020001470	1	3357 INT CCT	IC1		
0020001750	1	MC12016 INT CCT	IC4		93/3-134
0020001760	1	145152 INT CCT	IC3		

6.2.4 CAPACITORS

0115110001	1	1P0 CAP P100 50/63J CERAMIC	C42A		88/01-033
0115112001	1	1P2 CAP P100 ±0.25P 50/63V CER	C105		
0115127001	2	2P7 CAP NP0 ±0.5P 50/63V CER	C42, C99		
0115139001	1	3P9 CAP NP0 ±0.5P 50/63V CER	C20		
0115312001	2	120P CAP N150 5% 50/63 CER	C43, C45		
0115410001	1	1n CAP T/C B 10% 63V CER	C7		
0200710002	1	1µ CAP 50V ELECTRO 5Y11mm	C61		89/12-473

0200722001	1	2M2 CAP 50V ELECTRO 5x11mm	C119	
0200747002	1	4µ7 CAP 50V ELECTRO 5x11mm	C75	
0200810003	4	10µ CAP 50V ELECTRO 5x11mm	C4, C81, C89, C90	
0200847002	1	47µ CAP 16V ELECTRO 6x11mm	C1	
0200910003	1	100µ CAP 16V ELECTRO 8x11mm	C73	
0200947002	1	470µ CAP 16V ELECTRO 10x20mm	C5	
0225415001	1	1n5 CAP 10% 50V MYLAR	C117	
0225447001	4	4n7 CAP 10% 50V MYLAR	C77, C84, C94, C128	
0225515102	2	15n CAP 10% 63V MYLAR POTTED	C70, C118	
0225610001	3	100n CAP 10% 50V MYLAR	C60, C80, C85	
0250710001	1	1µ CAP 35V TANT BEAD	C120	
0250610001	1	10µ CAP 16V TANT BEAD	C3	

6.2.5 RESISTORS

0305247002	1	47E RESISTOR 5% FILM 4x1.6mm	R80	87/4-140
0305312021	1	120E RESISTOR 5% FILM 4x1.6mm BI	R65	
0305347021	2	470E " " " "	R19, R20	
0305356021	1	560E " " " "	R53	
0305382021	1	820E " " " "	R11	
0305418021	1	1K8 " " " "	R69	
0305510021	1	10K RESISTOR 5% FILM 4x1.6mm	R64 (0.4" LEAD SPACE)	
0305515021	2	15K " " " "	R5, R118	
0305539021	1	39K " " " "	R93	87/2-473
0305522021	1	22K " " " "	R61 (0.4" LEAD SPACE)	
0305533021	3	33K " " " "	R100, R114, R122	
0305556021	1	56K " " " "	R126	
0305568021	1	68K " " " "	R117	
0305647021	1	470K " " " "	R95	87/2-473
0420547009	1	50K PRESET RES. FLAT CERMET	RV113	
0450447001	1	4K7 NTC RES. 5mm DISC	TR128	

6.2.6 COILS

0500016292	2	COIL TAIT No 629	L14, L15	
0500016313	3	COIL TAIT No 631	L19, L20, L21	
0500016333	1	COIL TAIT No 633	L27	
0500016426	6	COIL TAIT No 642	L4, L5, L7, L8, L9, L13	

6.2.7 MISCELLANEOUS

0620001011	6	CAN 14mm² x 19mm	FOR L42 COILS
0560002101	5	1μ5H FXD IND	L6, L12, L24, L25, L26
0560002102	2	100μH FXD IND	L1, L28
0560002202	1	68mH FXD IND. SHIELDED	L31
2200001121	1	PRINTED CCT BOARD	
2300001019	2	SWITCH X 8 SPST DIP	
2400002057	1	HEADER 10WAY 1 ROW	
2400002059	1	HEADER 3WAY 1 ROW	
2400402057	1	SKT 10WAY 1 ROW, PCB MTG. TOP ENTRY	
2740001002	1	CRYSTAL 20.945 MHZ TE15	

6.3 B375/AI T375 PCB COMMON AUTO-INSERT PARTS

6.3.1 TRANSISTORS

0005001110	6	BC547B TRANSISTOR AI	Q2, Q3, Q19, Q21, Q25, Q26
0005001130	1	BC557B "	Q4

6.3.2 DIODES

0015001201	0.003	1 THRU 1N4148 DIODES AI	D6, D9, D22	87/11-409

6.3.3 CAPACITORS

0111514700 1	1	4P7 CAP NPO ±0.5P 50/63V CER AI	C101	
0111521000 1	2	10P CAP NPO 5% 50/63V CER AI	C59, C63	
0111522700 1	1	27P CAP N150 5% 50/63V CER AI	C57	
0111523900 1	1	39P CAP N150 5% 50/63V CER AI	C58	
0111531000 1	1	100P CAP N150 5% 50/63V CER AI	C74	
0111541000 1	4	1n CAP T/C B 10% 63V CER AI	C92, C100, C103, C129	87/10-388
0111544700 1 3	0.016	1 THRU 4n7 CAP T/C B, 10% 50V CER DISC AI	C2, C6, C19, C38, C44, C49, C50, C52, C53, C56, C65, C71, C78, C91, C104, C107	
0225510010	6	10n CAP 10% 63V MYLAR BITTED	C66, C79, C82, C123, C125, C127	
0225522010	3	22n CAP 10% 63V MYLAR BITTED	C76, C83, C93	
0225547010	6	47n CAP 10% 63V MYLAR BITTED	C62, C64, C72, C102, C124, C126	

6.3.4 RESISTORS

0305247020	5	47E RESISTOR 5% FILM 4x1·6mm AI	R22, R28, R30, R77, R83
0305310020	3	100E " " "	R12, R21, R70
0305322020	2	220E " " "	R75, R116
0305333020	1	330E " " "	R18
0305410020	5	1K " " "	R1, R51, R79, R115, R119
0305415020	1	1K5 " " "	R112
0305422020	4	2K2 " " "	R38, R52, , R97, R110
0305439020	2	3K9 " " "	R24, R27
0305447020	5	4K7 " " "	R10, R46, R73, R120, R133
0305456020	2	5K6 " " "	R29, R47
0305468020	3	6K8 " " "	R3, R26, R54
0305482020	1	8K2 " " "	R49
0305510020	7	10K RESISTOR 5% FILM 4x1·6mm AI	R9, R56, , R96, R101, R104 R106, R127
0305512020	1	12K " " "	R4
0305522020	7	22K " " "	R37, R39, R57, R59, R65, R76, R105
0305539020	2	39K " " "	R25, R129
0305547020	8	47K " " "	R2, R41, R48, R50, R58, R63, R74, R99
0305582020	1	82K " " "	R102
0305610020	7	100K " " "	R60, R62, R71, R72, R98, R123, R124,
0305615020	1	150K " " "	R121
0305622020	4	220K " " "	R125, R130, R131, R132
0305710020	2	1M " " "	R45, R103

6.4 B375/M T375 MECHANICAL PARTS

0080001011	1	LED 3mm RED
0080001015	1	LED 3mm GREEN
0120415001	15	1n5 CAP CERAMIC FEED THRU
0400510006	1	10K LOG POT LESS ELU. V16	MONITOR VOLUME
0400510012	1	10K LOG POT, L/S, SLOT SHAFT V6.	LINE LEVEL
0400510015	1	10K LIN POT L/S SLOT SHAFT V16	GATE
0445005003	1	50K PRE-SET RES. 10T PNL MTG.	XTAL TRIM
0650001013	15	FERRITE BEAD 1·9x0·3x3·8mm STACKPOLE 7D.	
2300001003	1	TOGGLE SWITCH SPST	

T375 Parts List

2	4	0	0	0	0	1	0	5	5	1	PLUG, 15WAY D RANGE, WIRE WRAP ANS.		
2	4	0	0	2	1	0	0	0	5	1	SKT, COAXIAL, 'N' TYPE		
2	4	0	0	2	1	0	0	1	7	1	SKT, COAXIAL, BNC PNL JACK	freq out.	
3	0	2	0	0	0	5	1	8	6	1	BRACKET, FEEDTHRU MTG A2M1855		
3	0	2	0	0	4	5	0	2	5	1	BUSH, COAX RETAINING A4M2143		
3	0	3	0	0	1	1	1	4	0	2	CHASSIS SIDE PLATE A2M1196		
3	0	3	0	0	2	3	0	9	1	1	COVER, 'D' RANGE HOLE A4M1230	brass formed to C375/M	
3	0	6	0	0	0	1	0	1	0	2	FERRULE, (HANDLE) A4M948		
3	0	8	0	0	0	1	0	0	7	1	HANDLE A4M949		
3	1	1	0	0	0	1	0	1	5	1	KNOB 15mm (SBTO K34)	VOL	
3	1	6	0	0	0	6	3	3	4	1	FRONT PANEL A2A456 A3M1196		
3	1	6	0	0	2	1	0	9	1	1	PANEL, CHASSIS REAR A2M951		
3	1	6	0	0	2	1	1	7	(1)	1	PANEL, CHASSIS FRONT A2M1995		
3	1	6	0	0	8	5	0	1	5	2	LOCATING PIN, D RANGE PLUG A4M975		
3	1	9	0	0	0	1	1	4	9	1	SHIELD, VCO BOX ALLOY NO.5 A1M2229		88/5-247
3	1	9	0	0	0	1	1	0	9	1	SHIELD, VCO LID A2M1655		
3	1	9	0	0	0	1	1	3	4	1	SHIELD, SOLDER SIDE A2M2037		
3	1	9	0	0	0	1	1	3	5	1	SHIELD, COMPONENT SIDE A2M2038		
3	1	9	0	0	2	0	0	4	5	1	SLEEVE, STD BASE STATION A2M970		
3	1	9	0	0	3	0	0	2	8	1	SPACER, BNC MTG A4M1033		
3	4	5	0	0	0	1	0	0	2	12	SCREW M2×6mm PAN POZI ST BZ	RF SHIELDS.	
3	4	5	0	0	0	1	0	0	6	4	SCREW M2 ×16mm CH HD ST BZ	BNC MTG	
3	4	5	0	0	0	4	0	0	6	5	SCREW M3×8mm PAN POZI ST BZ	'N' TYPE SKT, Q5 MTG. (BD136)	
3	4	5	0	0	0	4	0	0	9	8	SCREW M3×6mm CSK POZI ST BZ	SLEEVE	
3	4	5	0	0	0	4	0	1	0	4	SCREW M3×6mm PAN POZI ST BZ	SIDE PLATES/CHASSIS REAR	
3	4	5	0	0	0	4	0	2	0	4	SCREW M3×8mm MUSH SKT HD BLACK	FRONT PANEL	
3	4	9	0	0	0	2	0	0	2	4	SCREW 4-40×¼ CSK POZI TAPTITE	SIDE PLATES/CHASSIS FRONT	
3	4	9	0	0	0	2	0	0	3	~~8~~ 12	SCREW 4-40×¼ PAN POZI TAPTITE	PCB/CHASSIS.	
3	4	9	0	0	0	2	0	3	1	4	SCREW M3×10mm PAN POZI TAPTITE	VCO LID	
3	5	2	0	0	0	1	0	0	1	16	NUT M2 HEX	RF SHIELDS	
3	5	2	0	0	0	1	0	0	4	4	NUT M2.5 HEX	BNC MTG	
3	5	2	0	0	0	1	0	0	8	5	NUT M3 HEX	'N' TYPE SKT, Q5 (BD136) MTG	
3	5	2	0	0	0	1	0	2	9	2	NUT M4 NYLOC	HANDLE	
3	5	2	0	0	0	1	0	4	3	2	NUT M3, LOCATING PIN A4M793		
3	5	3	0	0	0	1	0	0	6	12	WASHER M2.5 SPRING ZINC PLATED	RF SHIELDS	87/7-211
3	5	3	0	0	0	1	0	0	2	4	WASHER M2 SHAKEPROOF	BNC MTG	88/7-334
3	5	3	0	0	0	1	0	1	0	1	WASHER M3 FLAT	Q5 MTG	
3	5	3	0	0	0	1	0	1	2	3	WASHER M3 SPRING	LOCATING PIN 2, Q5 1	

3 5 3 0 0 0 1 0 1 3	4	WASHER, M3 SHAKEPROOF	'N' TYPE SKT				
3 5 4 0 0 0 1 0 3 3	16	M3 PEM FASTENERS.	ISSUE TO MANUFACTURER OF METALWORK				
3 5 6 0 0 0 1 0 0 3	3	SOLDER TAG, M3 LONG.	SECURES COAX UNDER PCB.				87/11-440
3 6 0 0 0 0 1 0 4 0	2	SNAP BUSH, BLACK. HEYCO SB-375-4					
3 6 0 0 0 0 1 0 4 1	1	SHORTY BUSH, BLACK. HEYCO B187-125					
3 6 2 0 0 0 1 0 0 6	1	MICA INSULATOR TO-126	95 (BD136)				
3 6 2 0 0 0 1 0 3 0	2	GROMMET, 3mm LED MTG					
3 6 5 0 0 0 1 0 3 1	1	LABEL, WHITE REMOVEABLE					
3 6 5 0 0 0 1 1 0 3	1	LABEL, TEST REPORT INSIDE' A4A267					87/11-407
3 6 5 0 0 0 1 1 4 1	1	LABEL, STATIC WARNING A4A320	FASTEN TO RF SHIELD				
3 6 9 0 0 0 1 0 1 2	1	FURNITURE FOOT, BLACK R/C 359	FITTED IN V.C.O COIL (CUT BOTTOM END OFF)				88/4-204
3 6 9 0 0 0 1 0 1 4	10	CABLE TIE, NYLON 100×2.6mm					
4 0 0 0 0 0 1 0 7 0	20mm	SLEEVING, 7mm PVC	2 × 10mm, CABLE HARNESS				
4 0 0 0 0 0 2 0 0 1	320mm	SILICON SLEEVING 0.7mm.					
4 1 0 0 0 0 1 0 4 2	1	CARTON, 60mm FxD EQUIP UEB15096					88/1-025
5 3 8 0 0 0 1 0 0 1	1	GUIDE, FxD EQUIP, SINGLE 'D' SKT.	transferred to C375/M.				
0 3 0 0 4 1 8 0 1 0	1	1K8 RESISTOR 5% FILM 7×2.5mm	R42 ON B3535 PROCESSOR				
0 3 0 0 4 3 9 0 1 0	1	3K9 " " " "	R1 ON B3535 PROCESSOR				

6.5 B375/WIRE T375 WIRE LIST

2 0 0 0 0 0 1 0 0 5	0.5g/m	WIRE 0.5mm TINNED COPPER	3×30mm, 2×35mm, 3×40mm, 1×60mm				
2 0 1 0 0 0 3 0 0 1	440mm	WIRE 7/0.2 PVC BROWN	2×220mm				
2 0 1 0 0 0 3 0 0 2	640mm	WIRE 7/0.2 PVC RED	1×60mm, 70mm, 90mm, 200mm, 220mm				
2 0 1 0 0 0 3 0 0 3	450mm	WIRE 7/0.2 PVC ORANGE	1×20mm, 210mm, 220mm				
2 0 1 0 0 0 3 0 0 4	500mm	WIRE 7/0.2 PVC YELLOW	1×220mm, 280mm.				
2 0 1 0 0 0 3 0 0 5	110mm	WIRE 7/0.2 PVC GREEN	1×110mm				
2 0 1 0 0 0 3 0 0 6	200mm	WIRE 7/0.2 PVC BLUE	1×200mm,				87/7-205
2 0 1 0 0 0 3 0 0 7	200mm	WIRE 7/0.2 PVC VIOLET	1×200mm				87/7-205
2 0 1 0 0 0 3 0 0 8	580mm	WIRE 7/0.2 PVC GREY	1×80mm, 200mm, 300mm				87/7-205
2 0 1 0 0 0 3 0 0 9	280mm	WIRE 7/0.2 PVC WHITE	, 280mm				87/7-205
2 0 1 0 0 0 3 0 1 0	435mm	WIRE 7/0.2 PVC BLACK	1×35mm, 2×40mm, 1×60mm, 260mm				
2 0 6 0 0 0 1 0 1 1	420mm	COAX CABLE RG316U	1×60mm, 360mm				87/10-358
4 0 0 0 0 0 2 0 0 1	250mm	0.7mm SILICON SLEEVING.					

6.6 C375/XO T375 STANDARD CRYSTAL OSCILLATOR PARTS

0 0 1 0 0 0 1 2 5 7	1	BB212 VARICAP DIODE	D19				
0 0 1 0 0 0 1 2 6 3	1	BB409 VARICAP DIODE	D18				
0 1 1 5 2 1 8 0 0 1	1	18P CAP N150 5% 50/63V CER	C112				
0 1 1 5 2 2 2 0 0 1	1	22P CAP N150 5% 50/63V CER	C109				88/3-148

0	1	1	5	2	5	6	0	0	1	1	56P CAP N150 5% 50/63V CER	C110		
0	1	1	5	4	4	7	0	1	3	0.001	4n7 CAP T/C B 10% 50V DISC CER	C111		
0	2	8	0	1	7	0	0	0	2	1	2/7P CAP TRIM NPO TOP ADJUST	C108		88/3-148
0	3	0	5	4	1	0	0	2	0	1	1K RESISTOR 5% FILM 4x1.6mm	R84		
0	3	0	5	5	1	0	0	2	0	2	10K " " " "	R85, R87		
0	3	0	5	5	1	5	0	2	0	1	15K " " " "	R86 (0.2" PITCH)		
0	3	0	5	5	4	7	0	2	0	1	47K " " " "	R88 (0.4" PITCH)		87/10-359
0	4	5	0	4	4	7	0	0	1	1	4K7 NTC RES. 6mm DISC	R89		

6.7 C375/X5 ADD TO C375/XO FOR 5kHz INCREMENTS

2	7	4	0	0	0	1	0	0	8	1	CRYSTAL 10.24MHz TE9			

6.8 C375/X6 ADD TO C375/XO FOR 6.25kHz INCREMENTS

2	7	4	0	0	0	1	0	0	7	1	CRYSTAL 12.8MHz TE9.			

6.9 C375/02 T375 138-174MHz PARTS

0	1	1	5	1	2	2	0	0	1	3	2P2 CAP NPO ±0.5P 50/63V CER	C14, C25, C30		
0	1	1	5	1	3	3	0	0	1	1	3P3 " " " "	C96		
0	1	1	5	1	4	7	0	0	1	4	4P7 " " " "	C10, C17, C21, C33		
0	1	1	5	1	5	6	0	0	1	1	5P6 " " " "	C9.		87/12-484
0	1	1	5	1	6	8	0	0	1	1	6P8 " " " "	C95		
0	1	1	5	2	1	0	0	0	1	6	10P CAP NPO 5% 50/63V CER	C23, C26, C27, C28, C29, C31		
0	1	1	5	2	1	2	0	0	1	2	12P " " " "	C12, C15		
0	1	1	5	2	1	5	0	0	1	3	15P " " " "	C13, C16, C22		
0	1	1	5	2	2	2	0	0	1	3	22P CAP N150 5% 50/63V CER	C18, C24, C32		
0	1	1	5	2	2	7	0	0	1	1	27P " " " "	C41		
0	1	1	5	2	3	3	0	0	1	2	33P " " " "	C34, C39		
0	1	1	5	2	3	9	0	0	1	1	39P " " " "	C40		
0	1	5	2	2	2	2	0	0	1	1	22P CAP NPO 0805 CHIP	CC11		87/12-484
0	2	8	0	2	J	5	0	0	1	1	2/15P TRIM CAP PHILIPS 2 TAG.	C98		
0	3	0	5	3	2	2	0	2	0	1	220E RESISTOR 5% FILM 4x1.6mm	R14		
0	3	0	5	3	4	7	0	2	0	1	470E " " " "	R13		

6.10 C375/12 T375 174-225MHz PARTS

0	1	1	0	0	7	5	0	0	1	2	0P75 CAP P100 ±0.25P 50V CER	C25, C30		
0	1	1	5	1	2	2	0	0	1	1	2P2 CAP NPO ±0.5P 50/63V CER	C96		
0	1	1	5	1	2	7	0	0	1	1	2P7 CAP " " " "	C95		

0 1 1 5 1 3 3 0 0 1	1	3P3	C14		
0 1 1 5 1 3 9 0 0 1	6	3P9	C10, C12, C15, C17, C21, C33		
0 1 1 5 1 4 7 0 0 1	2	4P7	C23, C31		
0 1 1 5 1 5 6 0 0 1	5	5P6	C26, C27, C28, C29, C9		88/1-031
0 1 1 5 1 6 8 0 0 1	4	6P8	C13, C16, C24, C32		
0 1 1 5 2 1 2 0 0 1	1	12P CAP NPO 5% 50/63V CER	C41		
0 1 1 5 2 1 5 0 0 1	1	15P	C39		
0 1 1 5 2 1 8 0 0 1	2	18P CAP N150 5% 50/63V CER	C18, C40		88/1-031
0 1 1 5 2 2 2 0 0 1	1	22P	C22		
0 1 1 5 2 3 9 0 0 1	1	39P CAP N150 5% 50/63V CER	C34		
0 1 5 2 2 1 8 0 0 1	1	18P CAP NPO 50V 0805 CHIP	CC11		88/1-031 87/12-484
0 2 8 0 2 1 0 0 0 7	1	2/10P TRIM CAP. 6x8mm PH05002	C98		83/5-240

6.11 C375/B T375 15kHz IF BANDWIDTH PARTS

0 1 1 5 2 1 5 0 0 1	1	15P CAP NPO ±0.5P 50/63V CER	C55		87/11-607
0 1 1 5 2 5 6 0 0 1	1	56P CAP N150 5% 50/63V CER	C48		
0 1 1 5 3 1 5 0 0 1	1	150P CAP N150 5% 50/63V CER	C47		
0 3 0 5 3 8 2 0 2 0	1	820E RESISTOR 5% FILM 4x1.6mm	R23		87/11-607
0 3 0 5 4 1 0 0 2 0	1	1K	R32		
0 3 0 5 4 1 8 0 2 0	1	1K8	R31		
0 3 0 5 4 3 9 0 2 0	1	3K9	R36		
0 3 0 5 4 5 6 0 2 0	1	5K6	LOCATION C51 (R34)		87/11-607
0 3 0 5 5 2 2 0 2 0	1	22K	R40		87/12-673 87/9-346
0 3 0 5 5 6 8 0 2 0	1	68K	R94		
0 5 6 0 0 0 2 1 0 0	1	3u3 FXD IND	L18		
2 7 6 0 0 0 1 0 4 0	1	CRYSTAL FILTER 8P 15KHz (21F15D)	XF1		
2 7 6 0 0 0 1 0 4 7	1	CRYSTAL FILTER 2P 15KHz (21N15A)	XF2		

6.12 C375/C T375 7.5kHz IF BANDWIDTH PARTS

0 1 1 5 1 3 3 0 0 1	1	3P3 CAP P100 ±0.5P 50/63V CER	C51, C55		87/11-607
0 1 1 5 1 2 7 0 0 1	1	2P7 CAP NPO ± 0.5P 50/63V CER	C46		
0 1 1 5 2 5 6 0 0 1	1	56P CAP N150 5% 50/63V CER	C48		
0 1 1 5 3 1 0 0 0 1	1	100P CAP N150 5% 50/63V CER	C47		
0 3 0 5 3 4 7 0 2 0	1	470E RESISTOR 5% FILM 4x1.6mm	R23		87/11-607
0 3 0 5 3 8 2 0 2 0	1	820E RESISTOR 5% FILM 4x1.6mm	R31		
0 3 0 5 3 1 5 0 2 0	1	150E	R32		87/11-607
0 3 0 5 4 1 5 0 2 0	1	1K5	R36		

0305422020	1	2K2 " " " "	R33	
0305547020	1	47K " " " "	R40	87/9-342
0305622020	1	220K " " " "	R94	
2760001041	1	CRYSTAL FILTER 6P 7.5KHz. (21F7.5D)	XF1	
2760001046	1	CRYSTAL FILTER 2P 7.5KHz (21N7.5A)	XF2	

6.13 C375/M T375 SINGLE 'D' PLUG FITTING PARTS

3030023091	1	COVER, 'D' RANGE HOLE A4M1230		
3490002003	2	SCREW 4-40x¼ PAN POZI TAPTITE	HOLE COVER.	
5380001001	1	GUIDE, FXD EQUIP, SINGLE 'D' SKT		

6.14 C375/M2 T375 DOUBLE 'D' PLUG FITTING PARTS

0121041500 1	15	1n5 CAP, CERAMIC FEEDTHRU LEADLESS		
0650001013	15	FERRITE BEAD 1.9x0.9x3.8mm 7D		
2010003005	180mm	WIRE 7/0.2mm PVC GREEN		87/10-358
2010003006	180mm	WIRE 7/0.2mm PVC BLUE		"
2010003007	180mm	WIRE 7/0.2mm PVC VIOLET		"
2010003008	180mm	WIRE 7/0.2mm PVC GREY		"
2400001055	1	PLUG, 15WAY 'D' RANGE W/W PINS.		
3020005186	1	FEED THRU BRACKET A2M1855		
3160085015	2	LOCATING PIN A4M775		
3450004009	2	SCREW M3x6mm PAN POZI ST BZ	BRKT MTG	
3520001008	2	NUT M3 HEX	BRKT MTG	
3520010743	2	NUT, LOCATING PIN A4M793		
3530001012	2	WASHER M3 SPRING	LOCATING PINS	
3530001013	2	WASHER M3 SHAKEPROOF	BRKT MTG.	
3690010114	3	CABLE TIE, NYLON. 100x2.5mm.		
4000002003	40mm	1mm SILICON SLEEVING.		
5380010008	1	GUIDE WITH TWO 'D' RANGE SKTS.		

6.15 C375/55 T375/55 VERSION PARTS

3655001325	1	LABEL T375/55 FCC ID A4A5544		
3650010002	1	LABEL BLANK METAL POLY 12.7x25	LABEL NO.247 AHA585 AUST DOC	88/5-232

6.16 B/TA-500/M2 SMD DIODE MEMORY PCB PARTS

001100070	32	BAV70 DIODE		
0361000000	9	ZERO OHM RESISTOR 0505 CHIP		88/4-198
2250001171	1	PCB TA-500/M2 (6 PCBS PER ARRAY)	STENCIL REQUIRED FOR PRODUCTION ISSUE A.	
2400020570	1	HEADER, 10WAY 1 ROW PCB MTG.		
2400402057	1	SKT 10 WAY, 1 ROW PCB MTG. TOP ENTRY		

6.17 B3535 B3535 AUDIO PROCESSOR BASIC PARTS

6.17.1 TRANSISTORS

0000001066		BC337-40 TRANSISTOR	Q3, Q4, Q5	3
0000001110		BC548B "	Q2	1
0000001130	82/09-371	BC557B "	Q1, Q1A	2

6.17.2 DIODES

0010001170		1N4001 DIODE	D1, D2, D3, D4, D5	5
0010012000	82/09-371	1N4148 DIODE	D1A	1

6.17.3 INTEGRATED CIRCUITS

0020001410		LM377 INT CCT	Ic2.	1
0020001440		MLM324P INT CCT	Ic1	1

6.17.4 CAPACITORS

0110315001		150P CAP N150 63V 5%	C4	1
0110410001		1n CAP T/C B 63V 10%	C1, C3	2
0110447013	83/11-1038	4n7 CAP T/C B 10%	C16, C18, C30	3
0200710002	83/11-1070 84/01-089	1µ CAP 50V ELECTRO 5 x 11mm VERT	C2, C17, C20, C27	4
0200810003		10µ CAP 50V ELECTRO 5x11mm VERT	C5, C11, C24	3
0200910003		100µ CAP 16V ELECTRO 8x11mm VERT	C6, C21, C22	3
0200922001		220µ CAP 16V ELECTRO 10x12.5mm VERT	C26, C28	2
0220447001		4n7 CAP 50V MYLAR VERT	C9	1
0220510001		10n CAP 50V MYLAR VERT	C12, C19	2
0220547001		47n CAP 50V MYLAR VERT	C7 C8, C10,	
0220610001		100n CAP 50V MYLAR VERT	C23, C25, C29	3
0220647001		470n CAP 100V PETP VERT	C1A	1

6.17.5 RESISTORS

0	3	0	0	1	2	2	0	0	0		2E2 RESISTOR 7x2·5mm 5% C/F	R34	1
0	3	0	0	1	3	3	0	0	0		3E3 " " " "	R35A	1
0	3	0	0	2	3	9	0	0	0		39E " " " "	R35	1
0	3	0	0	3	3	3	0	0	0		330E " " " "	R7	1
0	3	0	0	3	6	8	0	0	0		680E " " " "	R33A	1
0	3	0	0	3	9	1	0	0	0		910E " " " "	R32	1
0	3	0	0	4	1	0	0	0	0	82/09-371 C/N 3094	1K " " " "	R2A R2, R20, R23, R25	
												R36, R37, R41	8
0	3	0	0	4	2	2	0	0	0	C/N 3094 82/03-080	2K2 " " " "	R1	1
											When used with T335 and T355 R1 becomes 1K	1K part of TA-053/1 noisegate kit. Refer B375/M.	
0	3	0	0	4	3	9	0	0	0		When used with T375 R1 becomes 3K9 — 3K9 " " " "	R17	1
0	3	0	0	4	4	7	0	0	0		4K7 " " " "	R27	1
0	3	0	0	4	5	6	0	0	0		5K6 " " " "	R16	1
0	3	0	0	4	6	8	0	0	0	82/09-371	6K8 " " " "	R3, R6, R10, R3A	4
0	3	0	0	4	8	2	0	0	0		8K2 " " " "	R5	1
0	3	0	0	5	1	0	0	0	0		10K RESISTOR 7x2·5mm 5% C/F	R4, R13, R15	3
0	3	0	0	5	1	2	0	0	0	82/03-080	12K " " " "	R14, R18, R19	3
											When used with T335 and T355, R14 becomes 560K	part of TA-053/1 noise gate kit.	
0	3	0	0	5	3	9	0	0	0		39K " " " "	R30	1
0	3	0	0	5	4	7	0	0	0		47K " " " "	R24, R26	2
0	3	0	0	6	1	0	0	0	0		100K " " " "	R33	1
0	3	0	0	6	1	8	0	0	0		180K " " " "	R9, R11, R12	3
0	3	0	0	6	4	7	0	0	0		470K " " " "	R8, R28, R29, R31	4

6.17.6 MISCELLANEOUS

4	0	0	0	0	0	2	0	0	1	82/09-371	SILICON SLEEVING 0·7		50mm
0	5	3	0	0	0	1	0	1	7		TRANSFORMER T4030	T1	1
2	0	0	0	0	0	1	0	0	5	82/09-371	TINNED COPPER WIRE 0·5		60mm
2	2	0	0	0	0	1	0	5	9		PCB T3535 RX AUDIO PROCESSOR		1
2	3	7	0	0	0	1	0	2	2	82/12-1068	RELAY DIL DPDT 12V FLAT PCB MT		1
3	0	8	0	0	1	3	0	2	4		HEATSINK FOR LM377 A4M 1131		1

6.18 C3535/02 B3535 3.4kHz FILTER PARTS

0	2	2	0	4	3	3	0	0	1		3n3 CAP 50V MYLAR VERT	C15	1
0	2	2	0	5	4	7	0	0	1		47n CAP 50V MYLAR VERT	C13, C14	2
0	3	0	0	3	8	2	0	0	0		820E RESISTOR 7x2·5mm 5% C/F	R21	1
0	5	6	0	0	0	2	2	0	2	82/03-087	FXD IND 68mH TYPE 202 SHIELDED	L1	1
0	3	0	0	4	2	2	0	0	0	C/N 1704	2K2 RESISTOR 7x 2·5mm 5% C/F	R 22	1

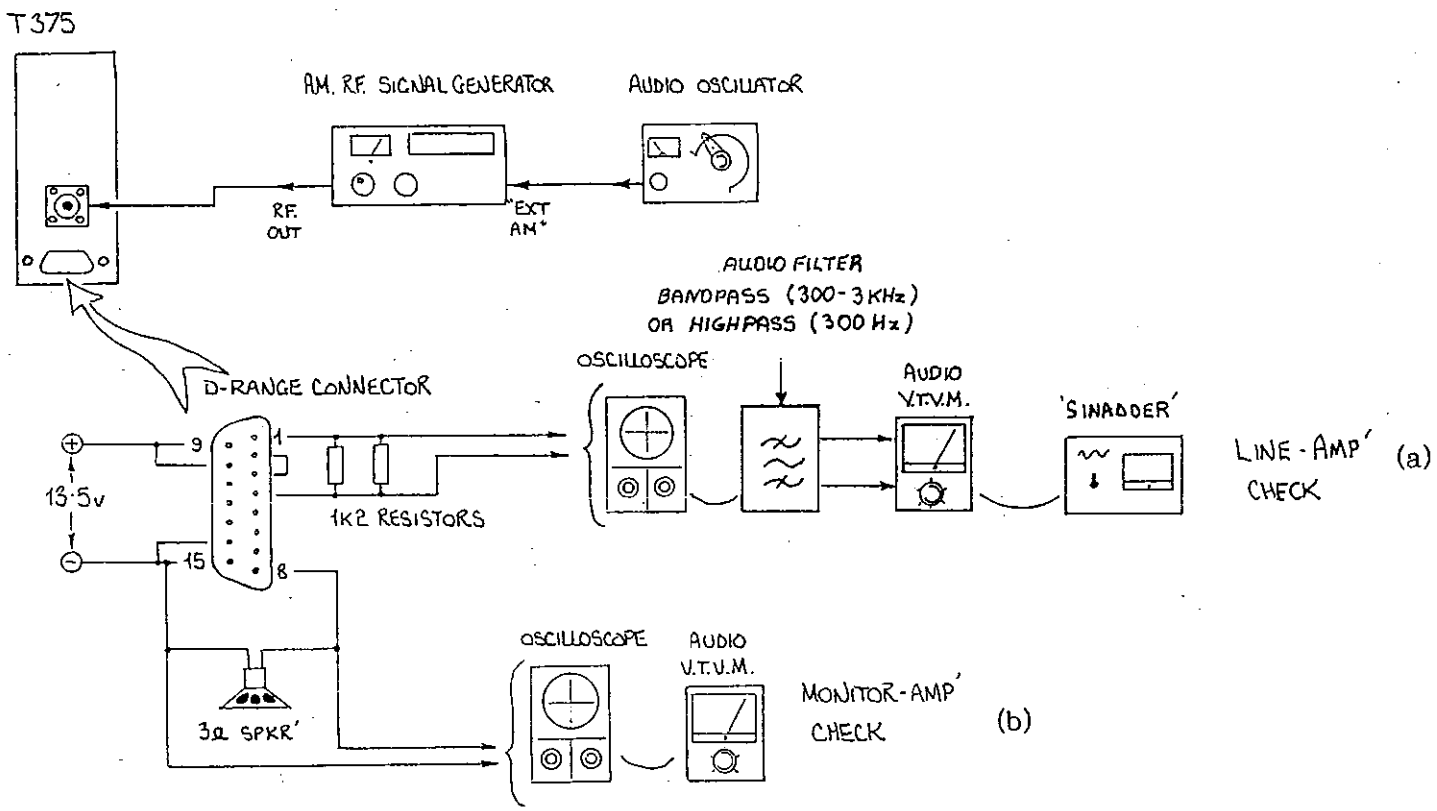


Diagram 1 T375 Test Equipment Set-Up

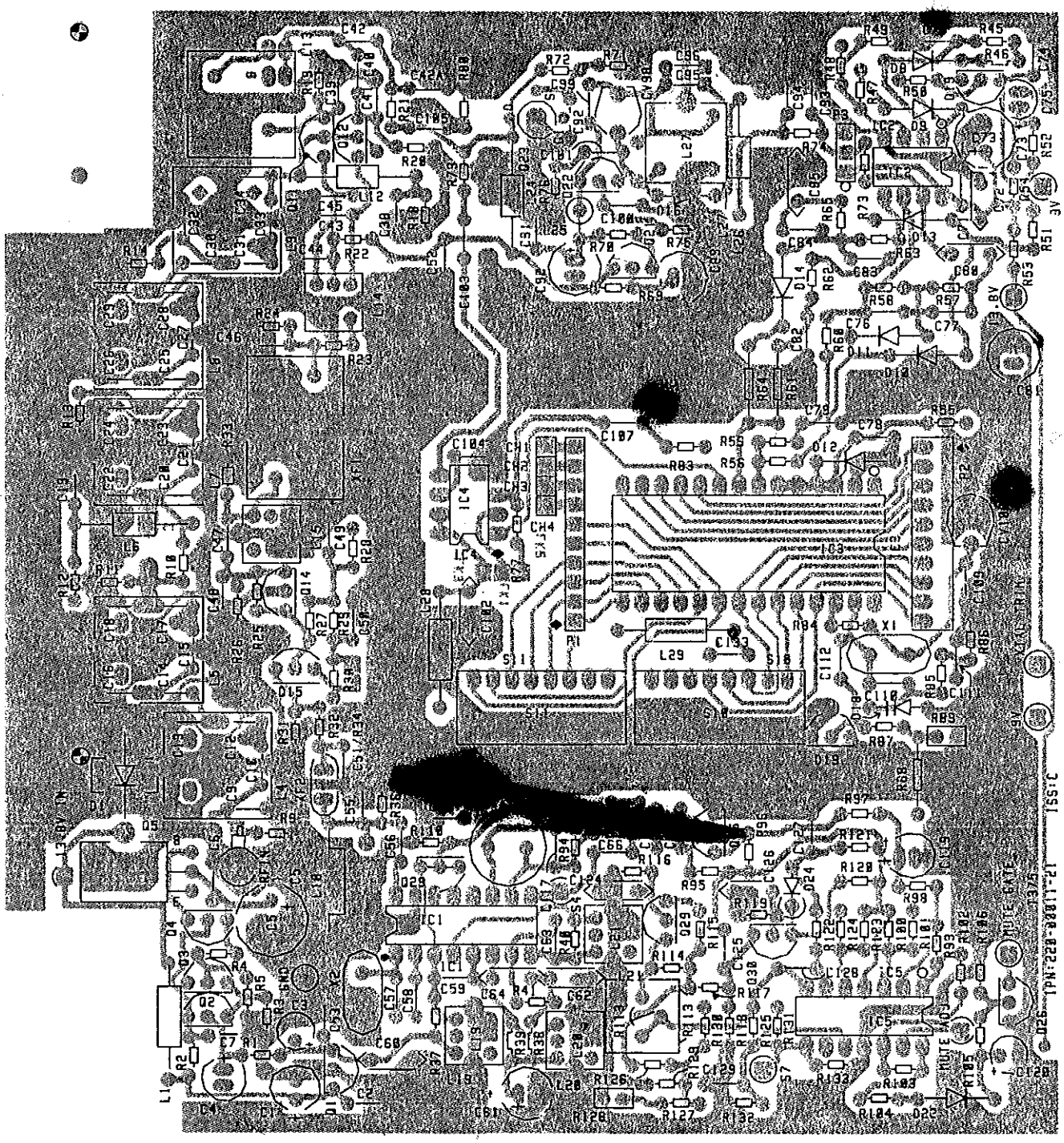


Diagram 2 T375 PCB Encoding

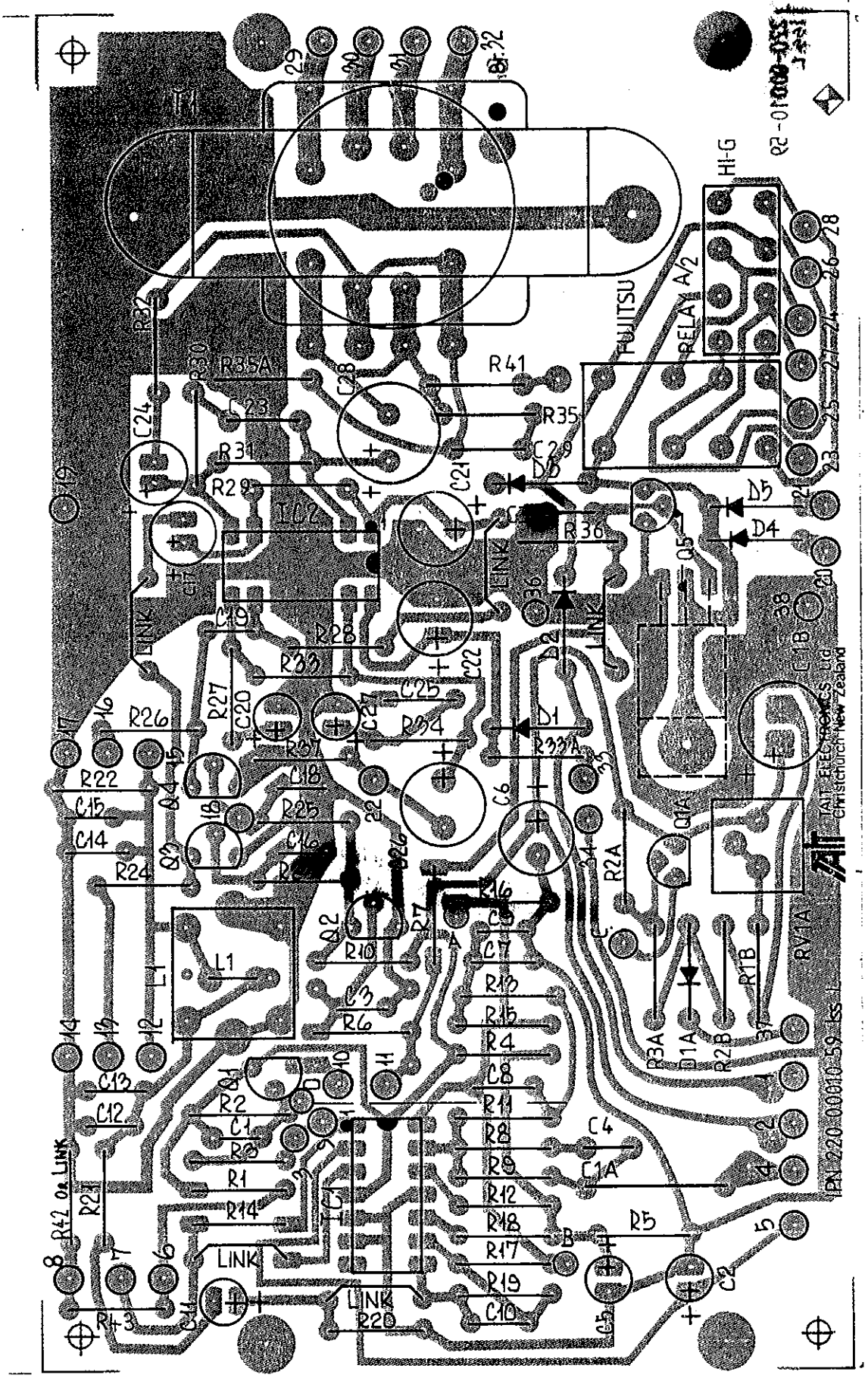
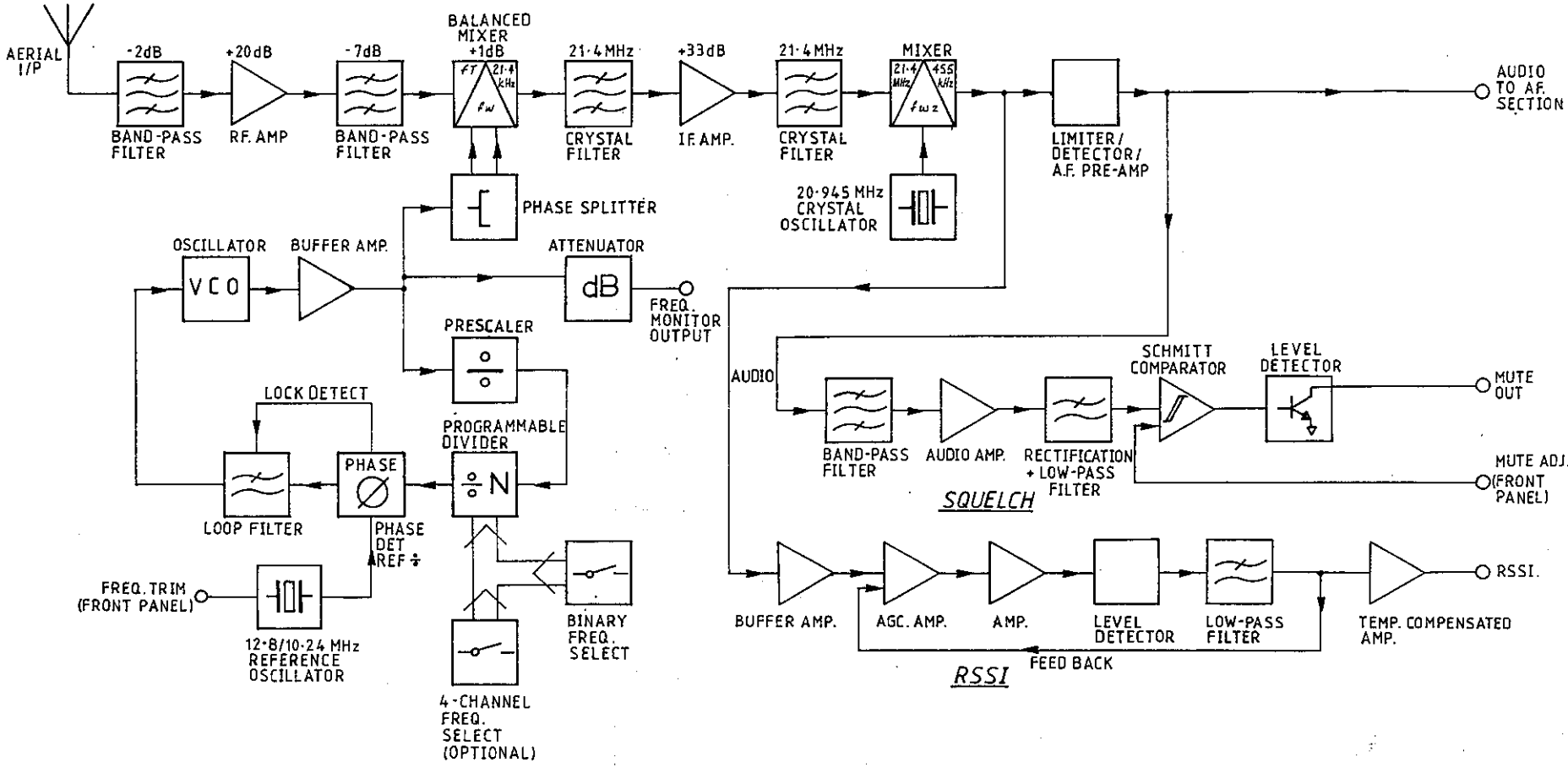


Diagram 3 B3535 Audio Processor PCB Encoding



SCALE: x Full Size
MATERIAL :
FINISH :
GEN LIMITS :

THIRD ANGLE PROJECTION

ARTWORK	IPN	USED ON
		T375

ISSUE	AMENDMENTS	DRN	CHKD	APVD	DATE	ISSUE	AMENDMENTS	DRN	CHKD	APVD	DATE
A	ORIGINAL										

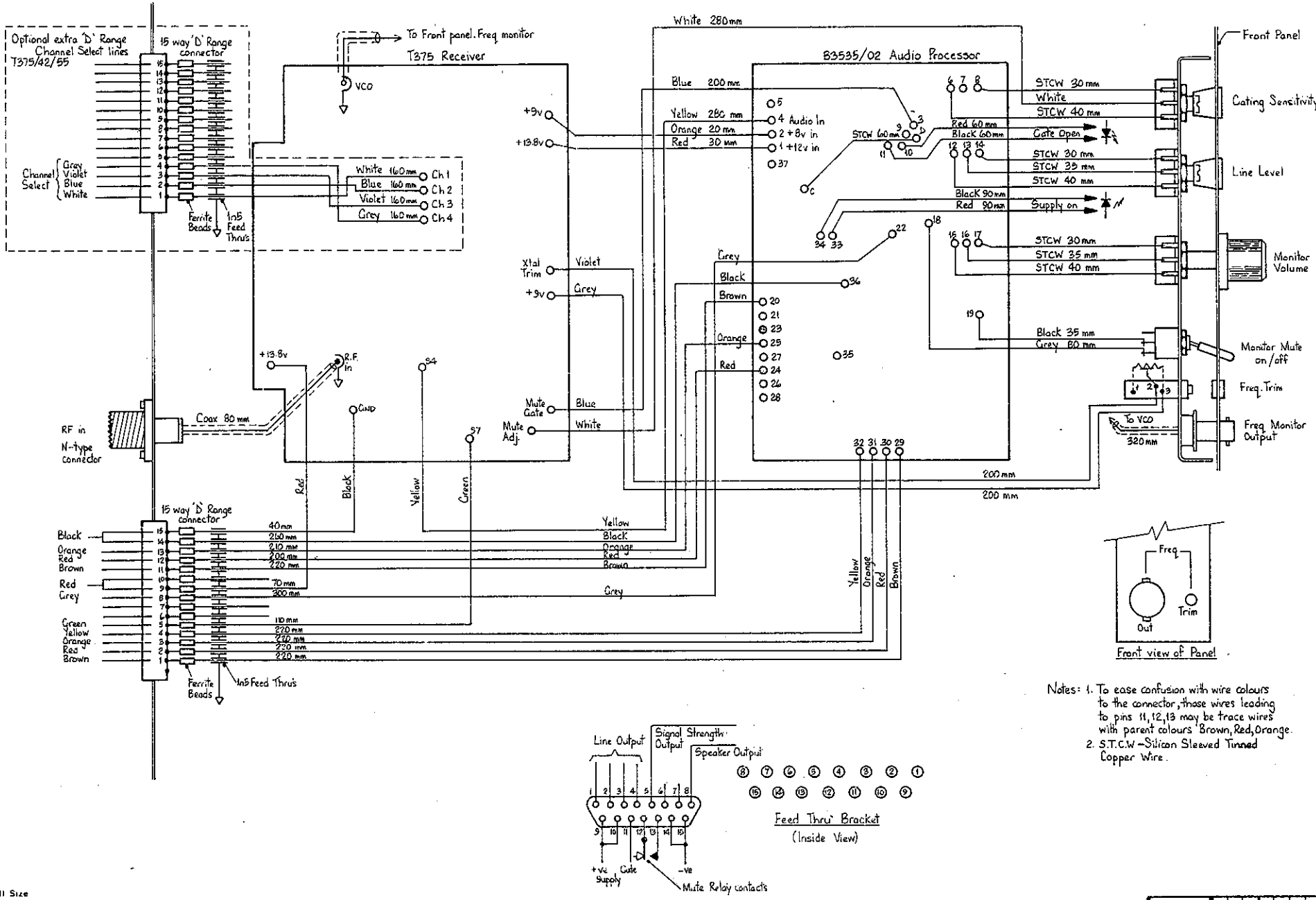
T375 RECEIVER RF-IF SECTION BLOCK DIAGRAM

TAIT ELECTRONICS Ltd.
Christchurch New Zealand

DRAWING NUMBER A2 C606

ISSUE A

dimensions in m.m. DO NOT SCALE OFF DRG.



Notes: 1. To ease confusion with wire colours to the connector, those wires leading to pins 11, 12, 13 may be trace wires with parent colours 'Brown, Red, Orange.
2. S.T.C.W – Silicon Sleeved Tinned Copper Wire.

'D' Range External Rear View

Feed Thru' Bracket (Inside View)

T375

SCALE: x Full Size
MATERIAL :
FINISH :
GEN LIMITS :

THIRD ANGLE PROJECTION

ARTWORK	IPN	USED ON

ISSUE	AMENDMENTS	DRN	CHKD	APVD	DATE	ISSUE	AMENDMENTS	DRN	CHKD	APVD	DATE
A	ORIGINAL										

WIRING DIAGRAM – T375

TAIT ELECTRONICS Ltd.
Christchurch New Zealand

DRAWING NUMBER A2C605

ISSUE A

All dimensions in m.m. DO NOT SCALE OFF DRG.