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T835 Receiver

VHF FM 136-174MHz

(M835-00)

Issue A

TECHNICAL INFORMATION

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

UPDATING EQUIPMENT AND 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 contains general, technical and servicing information on the T835 receiver.

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

Date Of Issue

IPN M835-00 T835 Service Manual (All Versions)

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Refer to page 10.2 for index.

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SECTION 1 GENERAL INFORMATION

1.1 INTRODUCTION

The T835 is a high performance FM base station receiver designed for single or multichannel operation in the 136 to 174MHz frequency range.

The receiver is a dual conversion superhet with a synthesised local oscillator. The first IF is 21.4MHz, allowing exceptionally high spurious signal rejection to be achieved in the receiver front end. The second IF section (455kHz) combines amplitude limiting, detection and RSSI within a single integrated circuit. It also drives a noise level detector for gating the audio output. RSSI is also used to drive a carrier mute for audio output gating.

The audio section delivers up to +10dBm to a 600 ohm balanced output, and 1W to a local monitor speaker. A flat or de-emphasised audio response is link selectable.

The synthesiser frequency is programmed via an EPROM which is attached to a separate plug-in memory board. A DIP switch on the memory PCB allows fast single channel selection from a multichannel programmed EPROM, but for true multichannel capability the EPROM must be addressed separately via an additional D-range plug at the rear of the set.

All components except those on the VCO and memory boards are mounted on a single PCB. This is secured to a die-cast chassis which is divided into compartments to individually shield each section of circuitry. Access to both sides of the main PCB is obtained by removing each of the two chassis lids. There is provision within the chassis to mount small option PCB's.

The front panel controls include gate sensitivity, line level, monitor volume and a mute disable switch. This switch disables the mute (squelch) signal to the monitor amplifier as an aid to servicing.

1.2 SPECIFICATIONS

1.2.1 INTRODUCTION

The performance figures given are minimum figures, unless otherwise indicated, for equipment tuned with the maximum switching band and operating at standard room temperature (+22°C to +28°C).

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

Details of test methods and the conditions which apply for Type Approval testing in all countries can be obtained from Tait Electronics Ltd.

1.2.2 GENERAL

Frequency Range	.. 136-174MHz
Type	.. dual conversion superheterodyne
Frequency Increment	.. 5 or 6.25kHz
Switching Range	.. 3MHz
Number Of Channels:	
Standard	.. 1
Optional	.. 8
Internally Selectable	.. 128
Supply Voltage:	
Operating Voltage	.. 10.8 to 16V DC
Standard Test Voltage	.. 13.8V DC
Polarity	.. negative earth only
Polarity Protection	.. crowbar diode
Supply Current:	
Standby	.. 350mA
Full Audio	.. 750mA
Input Impedance	.. 50 ohms
Operating Temperature Range	.. -30°C to +60°C
Frequency Stability:	
Standard Version	.. ±2.5ppm, -30°C to +60°C
Very High Stability Option	.. ±1ppm, 0°C to +60°C
Signal Strength Indicator	.. -125dBm to -70dBm, 2 to 7V at 11dB/V
Dimensions:	
Height	.. 191mm
Width	.. 60mm
Length	.. 310mm
Weight	.. 2kg

1.2.3 RF SECTION

IF Amplifiers:	
Frequencies	.. 21.4MHz and 455kHz
Bandwidths-	
Narrow Band (NB)	.. 7.5kHz
Wide Band (WB)	.. 15kHz
Sensitivity:	
Single Channel	.. -117dBm
Bandspread (12dB Sinad)	.. -115dBm
Signal+Noise To Noise Ratio:	
RF Level -107dBm	.. 30dB
RF Level -83dBm (NB)	.. 50dB (CEPT)
RF Level -57dBm (WB)	.. 55dB (EIA)
Selectivity:	
Narrow Band (±12.5kHz)	.. 90dB (typical) [CEPT]
Wide Band (±25kHz)	.. 95dB (EIA)
Offset Selectivity (Canada only)	.. 20dB
Spurious Response Attenuation	.. 100dB
Intermodulation Response Attenuation:	
Narrow Band	.. 80dB (typical) [CEPT]
Wide Band	.. 85dB (EIA)
Blocking	.. 100dB
Co-channel Rejection	.. 6dB
Amplitude Characteristic	.. 3dB
Spurious Emissions:	
Conducted	.. -90dBm to 4GHz
Radiated	.. -57dBm to 1GHz -47dBm to 4GHz

1.2.4 AUDIO SECTION

Outputs Available	.. line and monitor
Frequency Response	.. flat or de-emphasised (link selectable)
Flat Response:	
Bandwidth	.. 67 to 3400Hz
Response	.. within +1, -2dB of output level at 1kHz
De-emphasised Response:	
CTCSS Band-	
Bandwidth	.. 67 to 260Hz
Response	.. within +1, -2dB of output level at 100Hz
Speech Band-	
Bandwidth	.. 300 to 3400Hz
Response	.. within +1, -3dB of a 6dB/octave de-emphasis characteristic (ref. 1kHz)

Line Output:

Power	.. adjustable to +10dBm
Load Impedance	.. 600 ohms
Distortion	.. 2%

Monitor Output:

Power	.. 1W
Speaker Impedance	.. 3.5 ohms
Distortion	.. 3%

Mute Operation (Gate)

Systems Available	.. noise mute and carrier mute

Noise Mute:

Operating Range	.. 6-20dB sinad
Hysteresis	.. 1.5 to 6dB
Threshold	.. adjustable to -105dBm
Opening Time	.. 20ms
Closing Time	.. 50ms

Carrier Mute (Optional):

Operating Range	.. -115 to -80dBm
Hysteresis	.. 2 to 10dB
Opening Time	.. 5ms
Closing Time	.. 50ms

1.3 VERSIONS

Description	Version			
	10	15	20	25
136-156MHz	+	+		
148-174MHz			+	+
15kHz IF Bandwidth	+		+	
7.5kHz IF Bandwidth		+		+
2.5ppm TCXO	+	+	+	+

SECTION 2 CIRCUIT OPERATION

2.1 INTRODUCTION

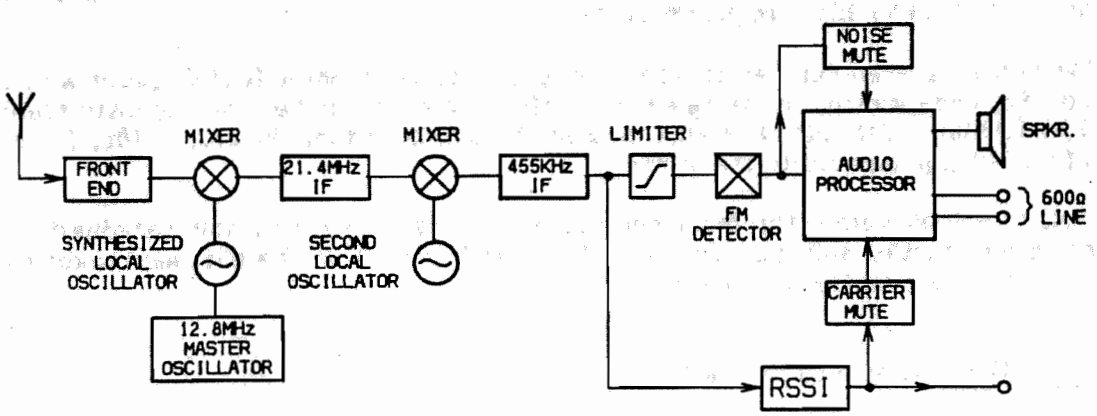


Figure 1 High Level Block Diagram

The T835 receiver consists of a number of distinct stages: the front end, mixer, synthesised local oscillator, IF, audio processor, mute (squelch), regulator circuits and received signal strength indicator (RSSI). These stages are clearly identifiable in Figure 1. Refer to the Circuit Diagrams at the rear of the Manual for further detail.

2.2 RECEIVER FRONT END

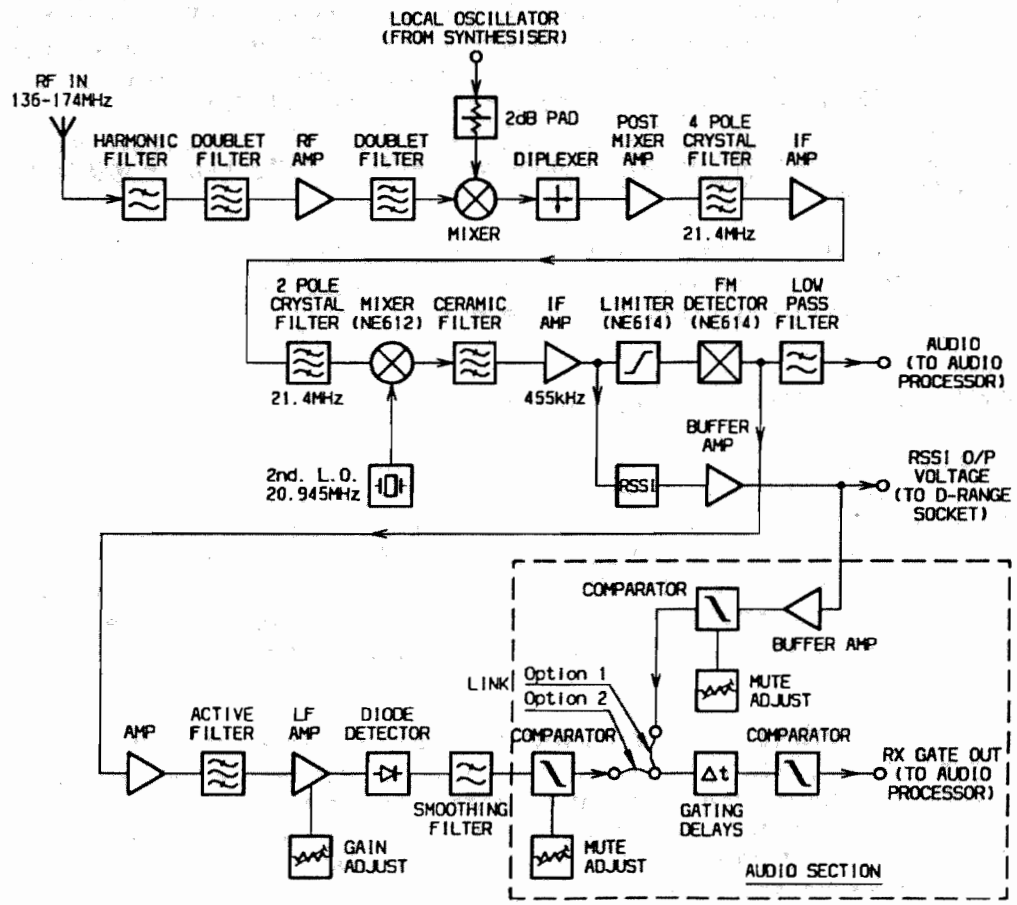


Figure 2 Front End, IF and Mute Block Diagram

The incoming signal from the N-type antenna socket is fed through a 7-pole, low pass filter with a cut frequency of approximately 200MHz. This low loss filter (typically less than 0.5dB over 136-174MHz) provides excellent immunity to interference from high frequency signals.

The signal is then further filtered, using a notched doublet (L304, L305) which provides exceptional image rejection, before being amplified by approximately 12dB (Q302). The signal is then passed through a further doublet (L309, L310) before being presented to the mixer.

Each sub-block within the front end has been designed with 50 ohm terminations for ease of testing and fault finding. The overall gain from the antenna socket to the mixer input varies from 0-2dB.

2.3 MIXER (Refer to Figure 2.)

IC301 is a high level mixer requiring a local oscillator (LO) drive level of +17dBm (nominal). The voltage controlled oscillator (VCO) generates a level of +22dBm (typical) and this is fed to the mixer via a 2dB attenuator pad. A diplexer terminates the IF port of the mixer in a good 50 ohms, thus preventing unnecessary intermodulation distortion.

2.4 IF CIRCUITRY (Refer to Figure 2.)

Losses in the mixer are made up for in a tuned, common gate, post mixer amplifier (Q303). Several stages of amplification and filtering are employed in the IF circuitry. The first crystal filter is a 4-pole device (&XF301) which is matched into 50 ohms on both its input and output ports. This stage is followed by a 2-stage amplifier which is designed as a 50 ohm block, after which the signal is mixed down to 455kHz with the second local oscillator (20.945MHz).

The 455kHz signal is filtered using a 6-pole ceramic filter (&XF303) before being limited and detected.

The second IF mixer, limiter, detector and RSSI is in a 16-pin IC (IC303). Quadrature detection is employed, using L319, and the recovered audio on pin 7 of IC303 is typically 0.3V p-p for 60% system deviation.

2.5 NOISE MUTE (SQUELCH) (Refer to Figure 2.)

The noise mute operates on the detected noise outside the audio bandwidth. An operational amplifier in IC304 is used as an active band pass filter centred on 70kHz to filter out audio components. The noise spectrum is then further amplified in a variable gain, two stage amplifier (Q306 & Q307) with additional filtering. The noise is then rectified (D301) and filtered to produce a DC voltage proportional to the noise amplitude. The lowest average DC voltage corresponds to a high RF signal strength and the highest DC voltage corresponds to no signal at the RF input.

The rectified noise voltage is compared with a threshold voltage set up on RV100, the front panel mute potentiometer. Hysteresis is introduced by the feedback resistor (R106) to prevent the received message from being chopped when the average noise voltage is close to the threshold. R111 and R110 determine the mute opening and closing times. The mute control signal at pin 7 of IC100 is used to disable the speaker and line audio outputs. The speaker output can be separately enabled for test purposes by operating the front panel mute disable switch, SW100.

The mute control line is available on pad 101 (Rx gate out) for control of external circuitry. A high (9V) on pad 101 indicates that the audio is disabled and a low (0V) indicates that a signal above the mute threshold level is being received.

The audio can also be disabled using the "Rx-disable" inputs, pads 100 and 113, having connected the "Rx-disable" link between pins 1 & 2 of PL100. An adjustable time delay (RV101) is provided on these lines. In order to disable the audio, either pad must be pulled to 0V.

The red front panel LED (D102) indicates the status of the mute circuit. When a signal above the mute threshold is received, the LED is illuminated. A relay with undedicated contacts is provided (RL100) for transmitter keying or other functions and this can be operated from the mute line by linking PL102.

2.6 CARRIER MUTE (Refer to Figure 2.)

A high level carrier mute facility is also available. The RSSI (refer to Section 2.10) provides a DC voltage proportional to the signal strength. This voltage is compared with a preset level, set up on RV104, and may be linked into the mute timing circuit using PL104. PL104 selects either the noise mute or the carrier mute. From this point both mute circuits operate in the same manner, using common circuitry.

2.7 AUDIO PROCESSOR

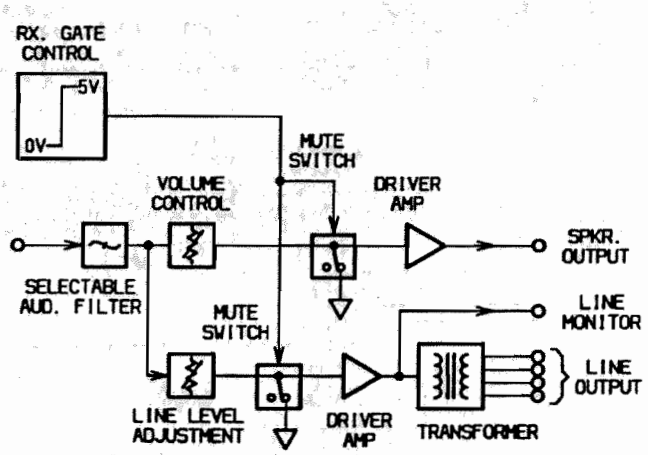


Figure 3 Audio Processor Block Diagram

The recovered audio on pin 7 of IC303 is processed in a third order elliptic active filter to give the required response. Linking (PL101 & PL103) is available to give either a flat or de-emphasised audio response, with de-emphasis giving a 6dB/octave roll off. The output of IC101 is split to provide separate paths for the speaker and line outputs.

The speaker volume is set using the front panel volume knob (RV103) and the line level is set using the recessed potentiometer (RV102). The signals are passed to audio drive amplifiers IC102 and IC103. Under muted conditions the inputs of these amplifiers are shunted to ground via transistors Q105 and Q106 respectively.

The audio output of IC102 has a DC component which is removed by C122, and this then drives a speaker directly. The output of IC103 is fed into a line transformer to provide a balanced 2-wire or 4-wire, 600 ohm output.

2.8 POWER SUPPLY AND REGULATOR

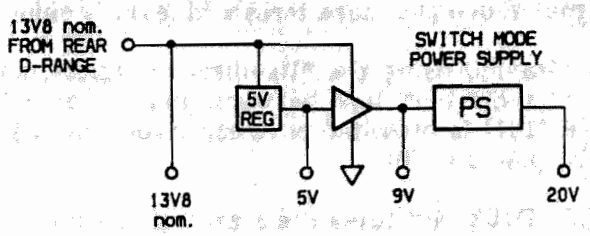


Figure 4 Power Supply and Regulator Block Diagram

The T835 is designed to operate off a 10.8-16V DC supply (13.8V nominal). A 5.3V regulator (IC202) runs directly off the 13.8V rail, driving much of the synthesiser circuitry. This is used as the reference for a DC amplifier (IC201, Q200 & Q201) which provides a medium current capability 9V supply. A switchmode power supply, based on Q202 and Q203, runs off the 9V supply and provides a low current capability +20V supply. This is used to drive the synthesiser loop filter (IC4), giving a VCO control voltage of up to 20V. The 13.8V supply drives both output audio amplifiers without additional regulation.

2.9 SYNTHESISED LOCAL OSCILLATOR

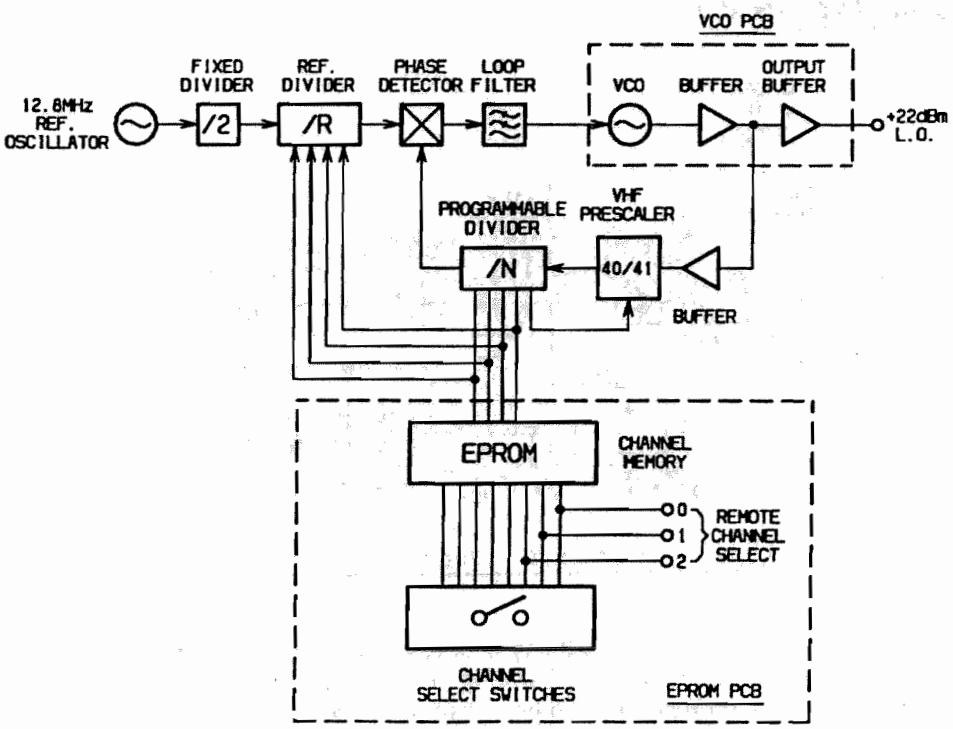


Figure 5 Synthesiser Block Diagram

The synthesiser employs a phase-locked loop (PLL) to lock a VCO to a given reference frequency.

A master oscillator at 12.8MHz (&IC2) is buffered, divided by two and then divided down to 6.25kHz or 5kHz within the synthesiser IC (IC3). A buffered output of the VCO is fed to a programmable divider, comprising a VHF prescaler (IC1) and a divider internal to IC3. These two signals are applied to the phase detectors within IC3.

A digital phase detector (PDB) provides rapid coarse tuning of the VCO until the phase error is within the range of the high gain sample and hold detector (PDA). The phase detector outputs are passed through an active loop filter (IC4a) which produces a DC voltage between 0 and 20V to tune the VCO. This VCO control line is further filtered to attenuate noise and spurs. As the control line voltage increases, the VCO frequency also increases.

The division ratio of the programmable divider is stored within EPROM memory (IC1). Up to 128 frequencies can be stored within the memory and are addressable using the internal DIP switches. Three of the address lines are also available for external frequency control via an extra D-range connector at the rear of the chassis. A change of state of any of these three lines (CH SEL 0-2) commences a programming cycle during which the frequency data in the EPROM is down-loaded to a divider within IC3. 32 bits of data are loaded in eight 4-bit words.

The VCO transistor (Q1) operates in a common source configuration, with an LC tank circuit coupled between its gate and drain to provide the feedback necessary for oscillation. The VCO control voltage from the loop filter (IC4) is applied to the varicaps (D1-D4) to facilitate tuning within a 3MHz band of frequencies. A trimcap (VC1) is used for coarse tuning of the VCO. The output from the oscillator circuit drives a cascode amplifier stage (Q2, Q3) which supplies +10dBm (typically) to a further stage of amplication, Q5. This is the final amplifier on the VCO PCB, and delivers +22dBm (typically) to the receiver mixer input pad.

A low level "sniff" is taken from the input to Q5 and used to drive the divider buffer for the VHF prescaler (IC1). The prescaler divide ratio is 40/41.

The VCO operates at the actual frequency required by the first mixer, i.e. there are no multiplier stages.

The VCO frequency spans from either 157-177MHz or 169-196MHz according to version. The VCO is tuned to 21.4MHz above the desired receive frequency to produce a 21.4MHz IF signal on the output of the mixer.

2.10 RECEIVED SIGNAL STRENGTH INDICATOR (RSSI)

The RSSI provides a DC voltage proportional to the signal level at the receiver input and is an on-chip function of IC303. Buffering and temperature compensation are provided by IC304 and the voltage is available at the rear D-range connector.

The RSSI also provides the capability for high level signal strength muting, which may be selected on PL104 (refer to Section 4.4). The mute threshold may be set between -125dBm and -70dBm at RV104.

SECTION 3 INTRODUCTION TO SERVICING

3.1 GENERAL

3.1.1 NOTES

If further information is required about the T835 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.

3.1.2 TECHNICAL INSTRUCTIONS (TI's)

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

3.2 MECHANICAL

3.2.1 POZIDRIV RECESS HEAD SCREWS

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

3.3 COMPONENT REPLACEMENT

3.3.1 LEADED COMPONENTS

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

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

3.3.1.1 Desoldering Iron Method

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

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

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

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

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

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

3.3.1.2 Component Cutting Method

Cut the leads on the component side of the PCB.

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

Fill the hole with solder and then clear with solderwick.

3.3.2 SURFACE MOUNT DEVICES

CAUTION: Surface mount devices (SMD's) require special storage, handling, removal and replacement techniques.

This equipment should be serviced only by an approved Tait Dealer or Service Centre equipped with the necessary facilities.

Repairs attempted with incorrect equipment or by untrained personel may result in permanent damage. If in doubt, contact Tait Electronics Ltd or your nearest Tait Branch or Subsidiary.

SECTION 4 INITIAL TUNING & ADJUSTMENT

4.1 INTRODUCTION

The full tuning and adjustment procedure is as follows:

- channel programming
- channel selection
- selecting required audio links
- synthesiser alignment
- receiver front end and IF alignment
- noise mute adjustment
- setting line output level
- setting monitor output level
- setting up the RSSI
- carrier level mute adjustment.

These operations are described more fully in the following Sections.

4.2 CHANNEL PROGRAMMING

Up to 128 channel frequencies can be stored in the EPROM memory (IC1). Each channel can be addressed using the bank of 8 switches (SW1). The most significant bit of this switch is set according to the type of EPROM fitted:

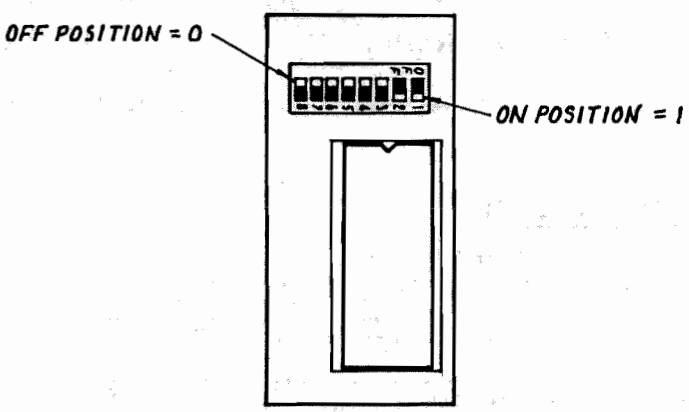
ON = 27C16
OFF = 27C64

Up to 8 channels may be addressed externally when the optional extra rear D-range connector is fitted.

Programming is accomplished by using an IBM* PC, a PROM programmer and the PGM800 software package. For a full description of the programming procedure, refer to the T800 Programming Handbook.

*IBM is a registered trademark of International Business Machines.

4.3 DIP SWITCH CODES FOR CHANNEL ADDRESSES



27C64 shown

Figure 6 Channel DIP Switch Setting

The PGM800 software used to programme the EPROM will present the user with a DIP switch code for each channel address; e.g. channel 124 will be assigned a switch code of 0000011, in which case the switches should be set as shown in Figure 6.

Note 1: For remote multichannel applications using the T800-07 multichannel memory PCB, the DIP switch is not used and should have the first 3 least significant bits (1-3) in the off position. The next 4 bits (4-7) should be on, while the most significant bit (8) is selected according to the EPROM used (refer to Section 4.2). This will allow the existing CHSEL lines to be used to select up to 8 channels.

It is possible to address blocks of 8 channels throughout the 128 channel EPROM capacity by switching bits 4 to 7 on the DIP switch.

Note 2: Alternatively, all 128 channels may be remotely addressed on the T800-07, but bits 1-7 of the DIP switch should be in the off position.

In this case it will be necessary to drill a hole to route the 7 channel select lines from the synthesiser compartment to the D-range connector.

4.4 AUDIO PROCESSOR LINKS

The links available for various circuit block options are listed by function as follows:

Plug PL100	1-2	Rx disable link
	2-3	not connected
Plug PL101	1-2	flat response
	2-3	de-emphasised response
Plug PL102	1-2	relay link
	2-3	not connected
Plug PL103	1-2	de-emphasised response
	2-3	flat response
Plug PL104	1-2	noise mute
	2-3	carrier mute
Plug PL105*	1-2	bypass high pass filter
	2-3 or 3-4	300Hz high pass filter in circuit
	4-5	audio input via audio 2 or 3
Plug PL106	1-2	audio input via audio 2 pad
	2-3	audio input via audio 3 pad

*Refer to Section 9.4.4 for further details.

The required options should be selected before alignment of the receiver is attempted.

4.5 TEST EQUIPMENT SET-UP

Set up the test equipment as shown below:

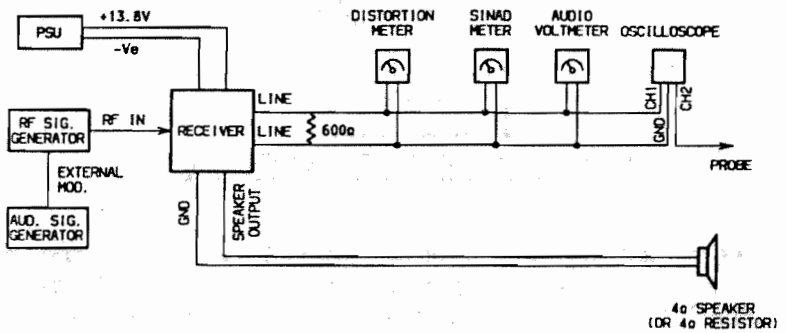


Figure 7 Test Equipment Set-Up

4.6 SYNTHESISER ALIGNMENT

1. Ensure that the EPROM (IC1) has been programmed with the required frequencies using PGM800 software.

2. Single Channel:

   Select a channel on the EPROM PCB DIP switch.

   Multichannel:

   Select the middle channel via the EPROM PCB DIP switch.

   If there is no channel near the middle of the required switching range, it may be necessary to programme an additional channel specifically for alignment purposes.

3. Connect a high impedance voltmeter to PL4-1 or the junction of L1 & R1 in the VCO (this measures the synthesiser loop voltage).

4. Single Channel:

   Tune VCO trimmer VC1 for a synthesiser loop voltage of 9V.

   Multichannel:

   Tune VCO trimmer VC1 for a synthesiser loop voltage of 9V on the middle channel.

   All channels should lie within the upper and lower limits of 13V and 5V respectively.

   Do not attempt to programme channels with a greater frequency separation than the specified switching range of 3MHz.

5. The TCXO (&IC2) output frequency should be trimmed when the IF is tuned - refer to Section 4.7.

4.7 ALIGNMENT OF RECEIVER FRONT END AND IF

Note 1: In this and following Sections deviation settings are given first for wide band sets, followed by settings in brackets for narrow band sets [ ].

Note 2: Frequency Range

- 136-156MHz: With the power supply switched off, solder bridge links 1-6 and link B in the front end.
- 148-174MHz: Solder bridge link A and ensure links 1-6 and link B are not connected.

Align the synthesiser as instructed in Section 4.6. For multichannel operation the receiver should be aligned on a frequency in the middle of the required band.

Inject a strong on-channel RF signal with 3kHz deviation [1.5kHz] at 1kHz into the antenna socket and adjust L304, L305, L309 & L310 to give best sinad.

Continually decrease the RF level to maintain 12dB sinad.

Roughly tune IF coils L315/L316/L317, VC301 and quad coil L319 for best sinad.

While maintaining a low level unmodulated RF input to the receiver, loosely couple into the first IF an additional high level signal at 21.4MHz - a beat note will be heard.

Trim the synthesiser TCXO (&IC2) for zero beat.

Readjust the front end doublets (L304, L305, L309 & L310) to give best sinad.

Change the RF signal level to -75dBm and modulate with 3kHz deviation [1.5kHz] at 1kHz.

Connect an oscilloscope probe to the RSSI test point (pad 115 or 125) and connect plugs PL101 and PL103 to give a flat audio response (refer to Section 4.4).

Readjust IF coils L315/L316/L317, VC301 and quad coil L319 to give a maximum amplitude response on the oscilloscope with minimal amplitude modulation.

Further adjust these coils, along with L319, for minimum audio distortion, ensuring that the 455kHz level (on the oscilloscope) does not fall significantly.

Check that the distortion reading is less than 2%.

Reconnect plugs PL101 and PL103 to give a de-emphasised audio response (if required) and reduce the RF level until 12dB sinad is reached. The receiver sensitivity should be better than -117dBm, assuming that the audio levels are not being overdriven (refer to Section 4.9).

4.8 NOISE MUTE ADJUSTMENT

Connect pins 1 & 2 of PL104 to enable the noise mute.

Align the receiver as instructed in Sections 4.6 and 4.7.

Set the RF level to -105dBm with 3kHz deviation [1.5kHz] at 1kHz.

Set RV100 (gate sensitivity) fully anticlockwise.

Adjust RV301 to close the mute (if necessary turn off the RF signal and then turn it on again).

Rotate RV301 anticlockwise until the mute just opens.

Once the mute has been set up as described above, RV100 (gate sensitivity) on the front panel may be adjusted for the required opening sinad.

4.9 AUDIO PROCESSOR

4.9.1 LINE AMPLIFIER OUTPUT

Apply an on-channel signal from the RF generator at a level of -70dBm with 3kHz deviation [1.5kHz] at 1kHz.

Adjust the front panel line level pot. (RV102) to give an output of +10dBm on the 600 ohm line.

Check for any clipping or distortion on the oscilloscope.

Set the line level to the required output level.

4.9.2 MONITOR AMPLIFIER OUTPUT (SPEAKER OUTPUT)

Adjust the front panel monitor volume control (RV103) to give an output of 2V rms into a 3.5 ohm resistive load.

Check for any clipping or distortion on the oscilloscope.

Switch to a 3.5 ohm speaker load and adjust RV103 to the required level.

4.10 RSSI

Align the receiver as instructed in Sections 4.6 and 4.7.

Apply an on-channel signal from the RF generator at a level of -100dBm with 3kHz deviation [1.5kHz] at 1kHz.

Adjust RV303 to give 4.5V RSSI output on pin 5 on the rear D-range connector when measured with a high impedance DMM.

4.11 CARRIER LEVEL MUTE

Connect pins 2 and 3 of PL104 to enable the carrier mute and disable the noise mute.

Apply an on-channel signal from the RF generator at the required mute opening level with 3kHz deviation [1.5kHz] at 1kHz.

Adjust the carrier mute pot. (RV104) to close the mute (if necessary, momentarily turn off the RF), then slowly adjust it until the mute just opens. The mute should now open at this preset level.

SECTION 5 FUNCTIONAL TESTS

The following test procedures will confirm that the T835 has been tuned and adjusted correctly and is fully operational.

Note: In this and following Sections deviation settings are given first for wide band sets, followed by settings in brackets for narrow band sets [ ].

5.1 CURRENT CONSUMPTION

Connect the T835 to a 13.8V power supply.

Rotate the front panel mute pot. anticlockwise until the mute LED is extinguished.

Turn the front panel "Monitor Mute" switch to the on position.

Check that the current in the 13.8V power cable is less than 350mA.

Rotate the mute pot. clockwise until the mute LED is lit.

Rotate the line level adjuster and the volume control to give maximum outputs.

Check that the current is less than 800mA.

5.2 SENSITIVITY

Apply an on-channel signal from the RF generator with 3kHz deviation [1.5kHz] at 1kHz.

Adjust the RF level to give 12dB audio sinad.

Check that the sensitivity is better than -117dBm.

5.3 SWITCHING BAND (MULTICHANNEL ONLY)

Apply an on-channel signal from the RF generator at various frequencies within the 3MHz front end bandwidth, corresponding to pre-programmed channels.

Measure the sensitivity at each frequency as described in Section 5.2.

Ensure that the sensitivity is better than -115dBm across the whole band.

5.4 AUDIO DISTORTION

The level of distortion measured at the line output gives a good indication of the accuracy of the IF alignment.

Apply an accurate on-channel signal from the RF generator at a level of -70dBm with 3kHz deviation [1.5kHz] at 1kHz.

Adjust the front panel line level control (RV102) to give +10dBm into 600 ohms.

Check that the distortion is approximately 1% THD.

Note: For a de-emphasised response, the distortion should always be better than 2%.

Adjust the front panel monitor volume control (RV103) to give 2V rms into a 4 ohm resistive load.

Check that the distortion at the monitor output is better than 2% THD.

5.5 ULTIMATE SIGNAL TO NOISE RATIO

Apply a signal from the RF generator at a level of -57dBm with 3kHz deviation [1.5kHz] at 1kHz.

Select de-emphasis on the links provided in the audio processor (refer to Section 4.4), and link pins 2 & 3 of PL105 to include the 300Hz filter.

Adjust RV102 (line level) to provide +10dBm output.

Switch off the modulation, checking that the residual noise is lower than -45dBm [-39dBm] at the line output (this corresponds to S/N of 55dB [49dB] and is in accordance with EIA measurement conditions).

Note: The measurement can be made without the 300Hz high pass filter but will give a result which is 10dB worse.

5.6 DE-EMPHASISED AUDIO FREQUENCY RESPONSE

Set RV102 (line level) to provide 0dBm output at 1kHz modulating frequency.

Sweep the modulating frequency, checking that the response closely follows that shown in Figure 8 - the limits should not be exceeded.

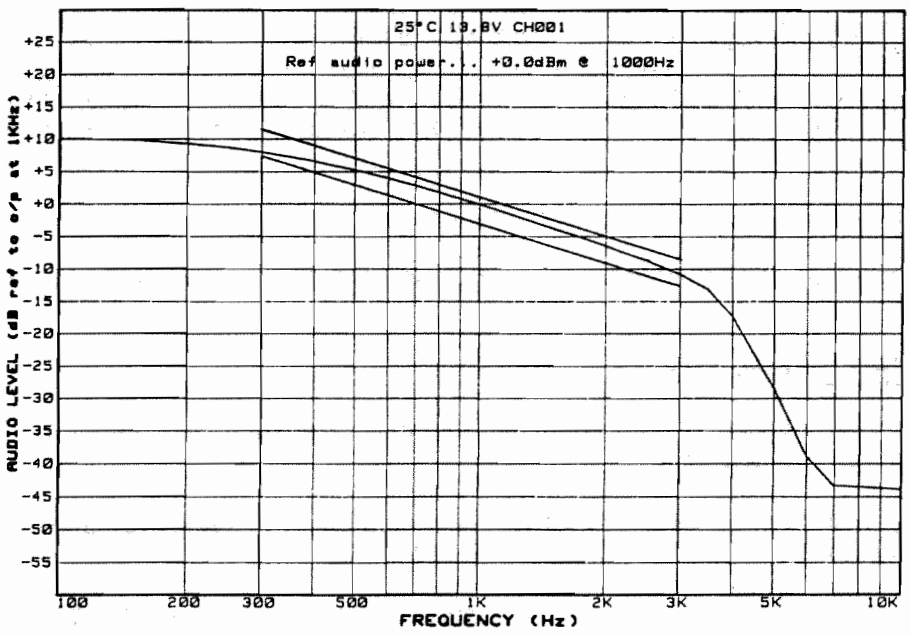


Figure 8 De-emphasised Audio Frequency Response

5.7 NOISE MUTE (IF LINKED IN)

Rotate the front panel mute pot. (RV100) fully anticlockwise.

Apply an on-channel signal from the RF generator at a level of -110dBm with 3kHz deviation [1.5kHz] at 1kHz.

Increase the RF level in 1dB steps, checking that the mute opens for an RF input level of approximately -105dBm.

Turn the RF off and check that the mute closes.

Rotate the mute pot. clockwise and check that the mute opens.

Reset the mute pot. to give the required opening sinad.

5.8 RSSI

Apply an on-channel signal from the RF generator at a level of -100dBm with 3kHz deviation [1.5kHz] at 1kHz.

Using a high impedance DMM, check that the RSSI output voltage on pin 5 of the rear D-range connector is 4.5V (nominal).

Vary the RF level in 5dB steps and check that the RSSI output voltage changes at a rate of approximately 0.5V/5dB over the range of -115dBm to -70dBm (refer to Figure 9 for RSSI voltage vs signal strength).

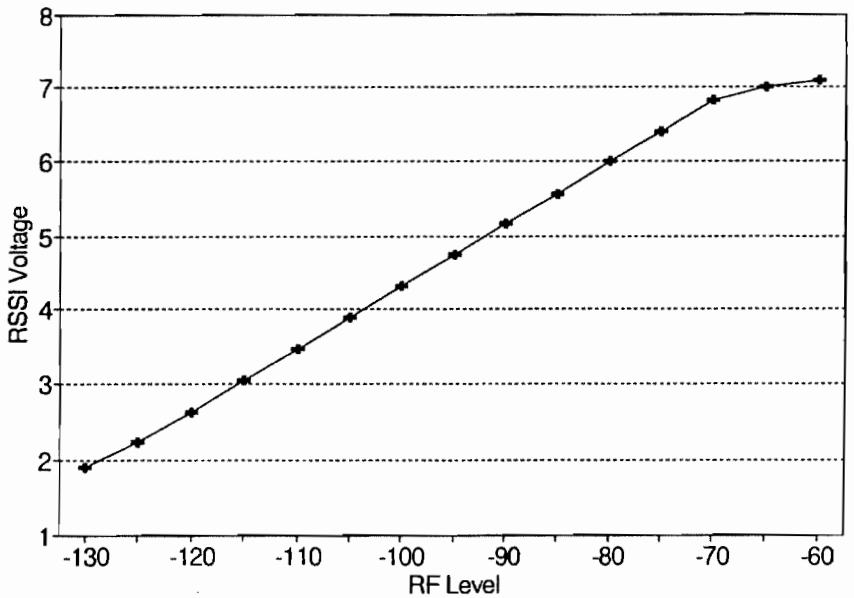


Figure 9 RSSI Voltage vs Signal Strength (dBm)

5.9 CARRIER LEVEL MUTE (CARRIER MUTE LINKED IN)

Apply an on-channel signal from the RF generator at a level of -120dBm with 3kHz deviation [1.5kHz] at 1kHz.

Increase the RF level in 2dB steps and check that the mute opens at an RF level which corresponds with the preset level on RV104 (i.e. between -115dBm and -70dBm).

SECTION 6 FAULT FINDING

6.1 VISUAL CHECKS

Remove the covers from the T835 and inspect the PCB for damaged or broken components, paying particular attention to the surface mounted devices (SMD's).

Check for defective solder joints. If repair or replacement is considered necessary, refer to Sections 3.3.1 and 3.3.2.

6.2 COMPONENT CHECKS

If a transistor is suspected of faulty operation, an indication of its performance can be assessed by measuring the forward and reverse resistance of the junctions. First make sure that the transistor is not shunted by some circuit resistance (unless the device is completely unsoldered). A 20k ohm/V or better multimeter should be used for taking the measurements, using only the medium or low resistance ranges.

The collector current drawn by multi-junction transistors is a further guide to their performance.

If an 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.

6.3 DC CHECKS

6.3.1 POWER RAILS

Refer to Diagram 5 for test point locations, and to the regulator fault finding chart (Section 6.5) for fault diagnosis.

Check the 9V (TP2) and 13.8V (TP1) power supply test points in the audio compartment with a DMM.

Check the 20V (TP3) regulator output at the test point in the regulator compartment.

Check the 5V (TP4) regulator output at the test point in the regulator compartment and on pin 4 of IC303.

6.3.2 VCO LOCKING

Using a DMM, monitor the VCO control voltage at PL4-1 or the junction of L1 & R1 (located adjacent to the electrolytic capacitor on the VCO PCB).

If the synthesiser is locked and the VCO aligned, the voltage at this point should be between 5 and 13V.

If the VCO is not locked, refer to the synthesiser fault finding chart (Section 6.6).

6.3.3 MUTE OPERATION

The front panel LED will show the status of the mute circuitry. It will be lit when a signal is received above the threshold level. It should always be possible to open the mute gate by rotating the mute potentiometer fully clockwise, or by enabling the monitor with the front panel switch.

If the mute fails to operate correctly, refer to the mute fault finding charts (Sections 6.7 & 6.8).

6.4 RF CHECKS

6.4.1 VCO FREQUENCY

Check that the VCO is phase locked (refer to Section 6.3.2).

Connect a frequency counter (level +19dBm) to the VCO input to the mixer (IC301).

Monitor the local oscillator frequency and check that it is 21.4MHz above the required receive frequency.

Refer to the synthesiser fault finding chart (Section 6.6) for further information.

6.4.2 RF SENSITIVITY

Ensure that the VCO is on the correct frequency and the receiver correctly aligned.

Check that the sensitivity into the front end is -117dBm (typical).

If the sensitivity is poor, the fault can be traced by measuring the sensitivity into successive circuit blocks. Test breaks are provided at all 50 ohm test points.

Check that the sensitivity at each test point is within 2dB of the levels shown on the Circuit Diagram.

Poor sensitivity indicates a fault in one of the circuit blocks following the test point.

Note: Poor sensitivity into the mixer can be caused by lack of drive level from the VCO (the drive level should be >+17dBm).

Refer to the receiver fault finding charts (Section 6.9) for further information.

6.4.3 OSCILLATOR STABILITY

6.4.3.1 TCXO

While maintaining a low level unmodulated RF input to the receiver, loosely couple into the first IF an additional high level signal at 21.4MHz - a constant low frequency beat note should be heard.

Tap the TCXO with a finger and replace it if the beat note permanently changes.

6.4.3.2 Second IF

While maintaining a low level unmodulated RF input to the receiver, loosely couple into the second IF an additional high level signal at 455kHz - a constant low frequency beat note should be heard.

Adjust the frequency of the 455kHz signal for zero beat.

If the second IF is more than 300Hz off frequency, check IC302, X301, C361 and C362 and replace if necessary.

6.4.4 DEMODULATOR OUTPUT

Apply an on-channel RF signal modulated by 1kHz with 3kHz [1.5kHz] deviation at an amplitude of -65dBm.

Connect an oscilloscope probe (DC coupled) to IC303 pin 7 (audio output).

Check that an audio signal of approximately 380mV peak to peak is present.

Optimum tuning of the quad coil (L319) for minimum audio distortion (with a "flat" audio response) should coincide with maximum audio amplitude and a DC level of approximately 1.3V.

6.4.5 IF DISTORTION

If after careful IF alignment (Section 4.7) the audio distortion is still high, the IF should be swept to investigate the bandpass response.

Apply an on channel RF signal modulated at 10Hz with 12kHz [6kHz] deviation at an amplitude of -80dBm.

Connect the modulating 10Hz audio signal to the "X" input of an oscilloscope and observe the 455kHz IF input to IC303 pin 16 via a suitable RF probe on the "Y" input.

Note: The X input should be DC coupled.

Check that the swept response has a rounded top and no sharp non-linearities (refer to Figure 10).

Increase the RF level to -50dBm; the trace will now show the shape of the 455kHz ceramic filter (XF303).

Check that the response has no sharp non-linearities.

If sharp non-linearities do occur, replace the filter and sweep to confirm a satisfactory solution (refer to Figure 11).

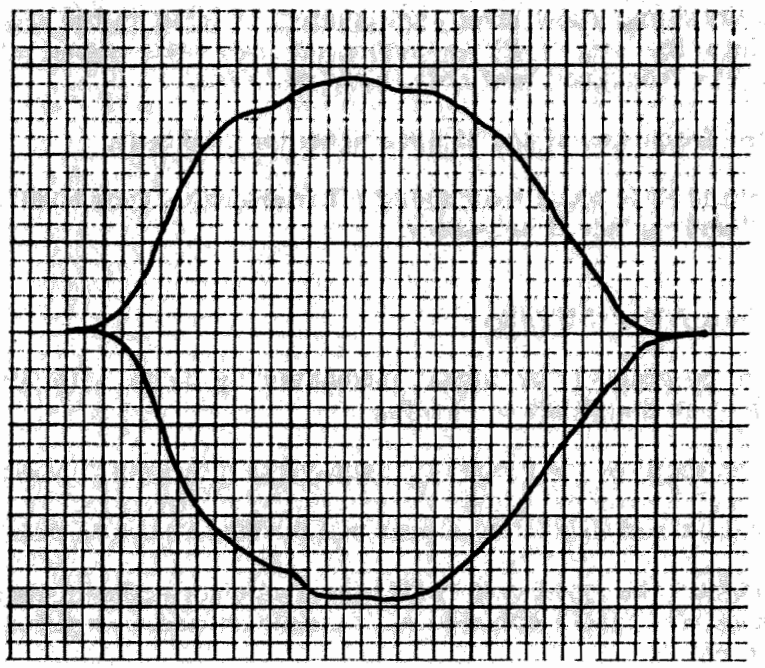


Figure 10 IF Swept Response

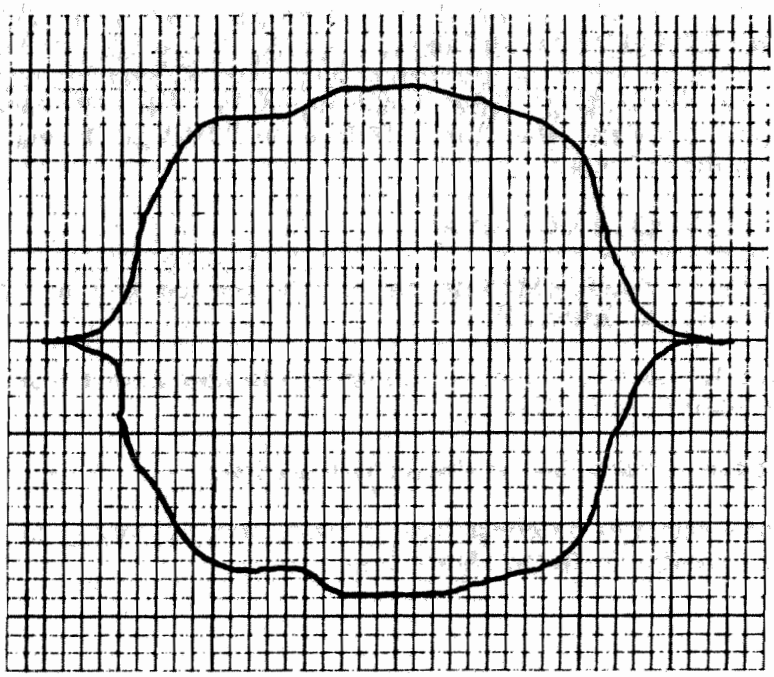
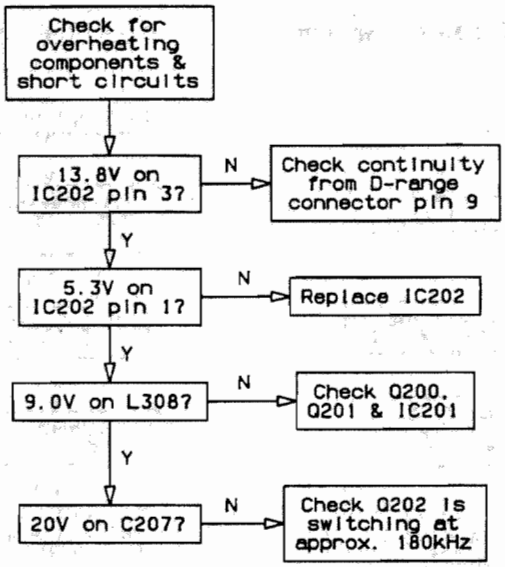


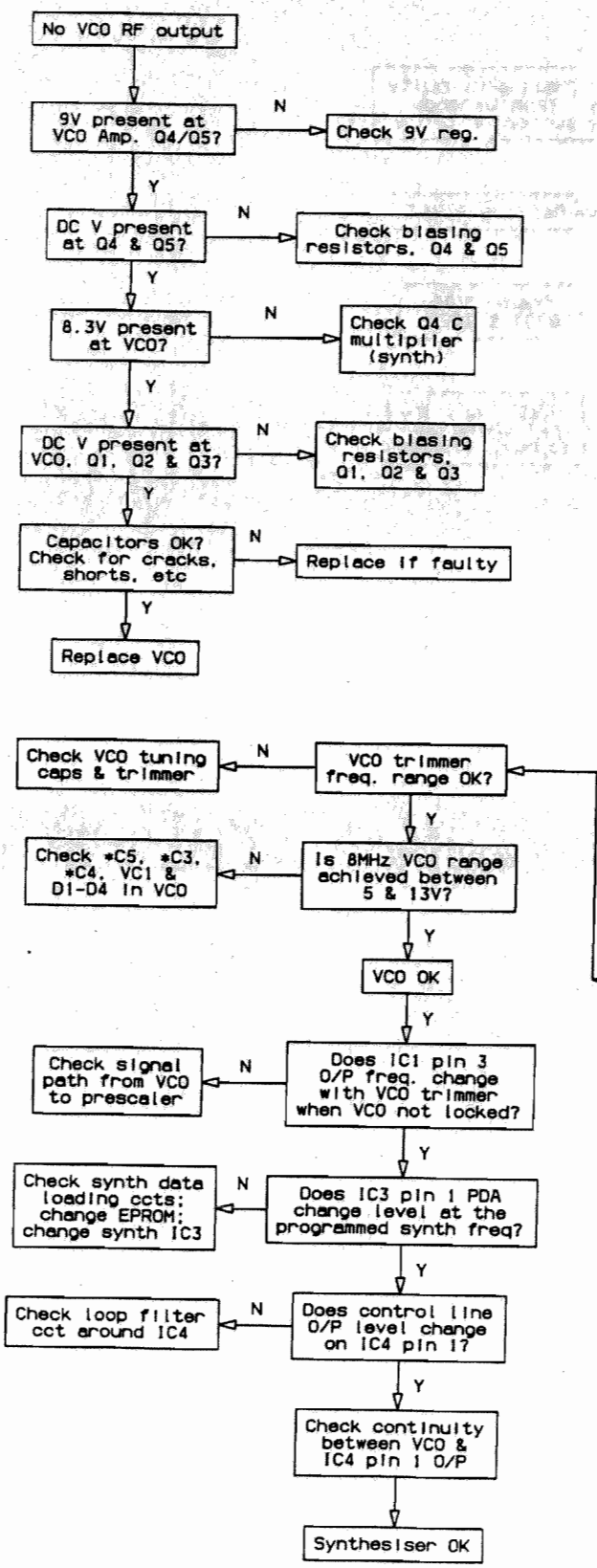
Figure 11 Ceramic Filter Swept Response

6.5 REGULATOR FAULT FINDING CHART



6.6 SYNTHESISER FAULT FINDING CHARTS

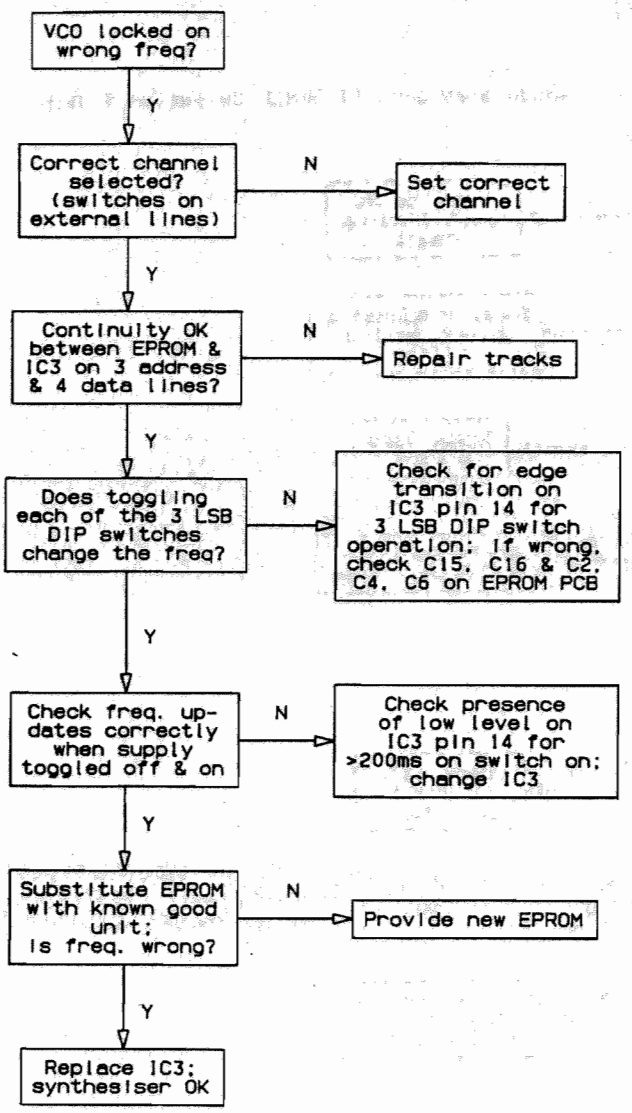
A Refer to VCO Circuit Diagram



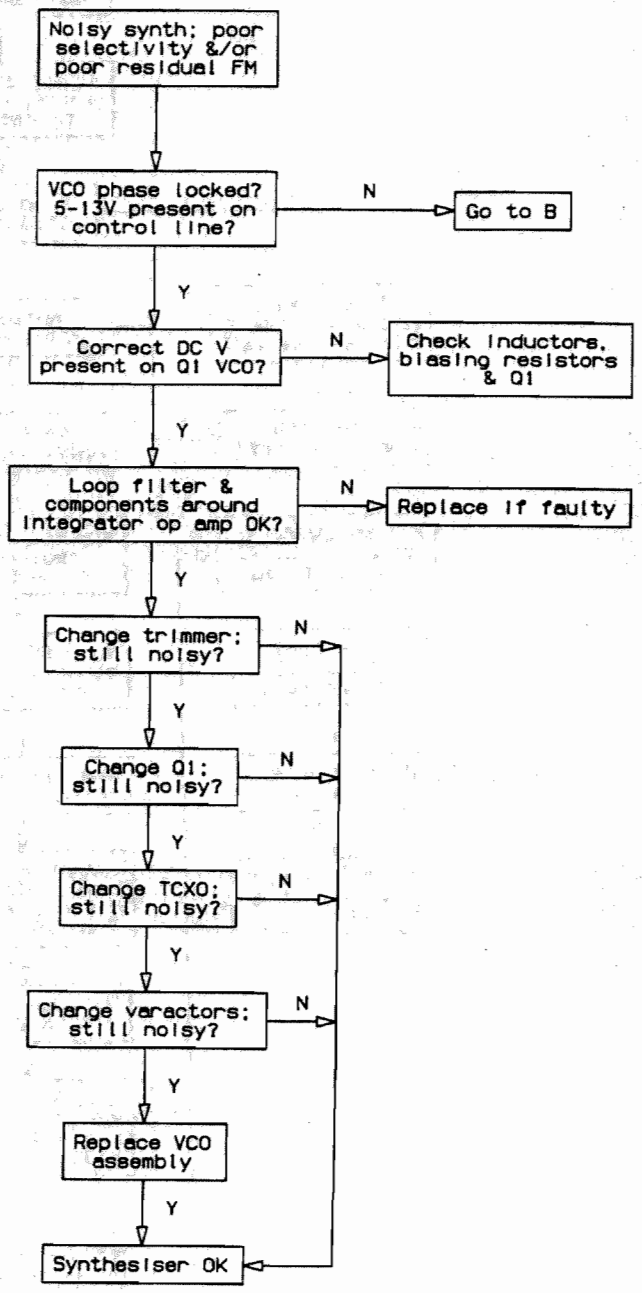
B Refer to synthesiser Circuit Diagram

Continued on next page.

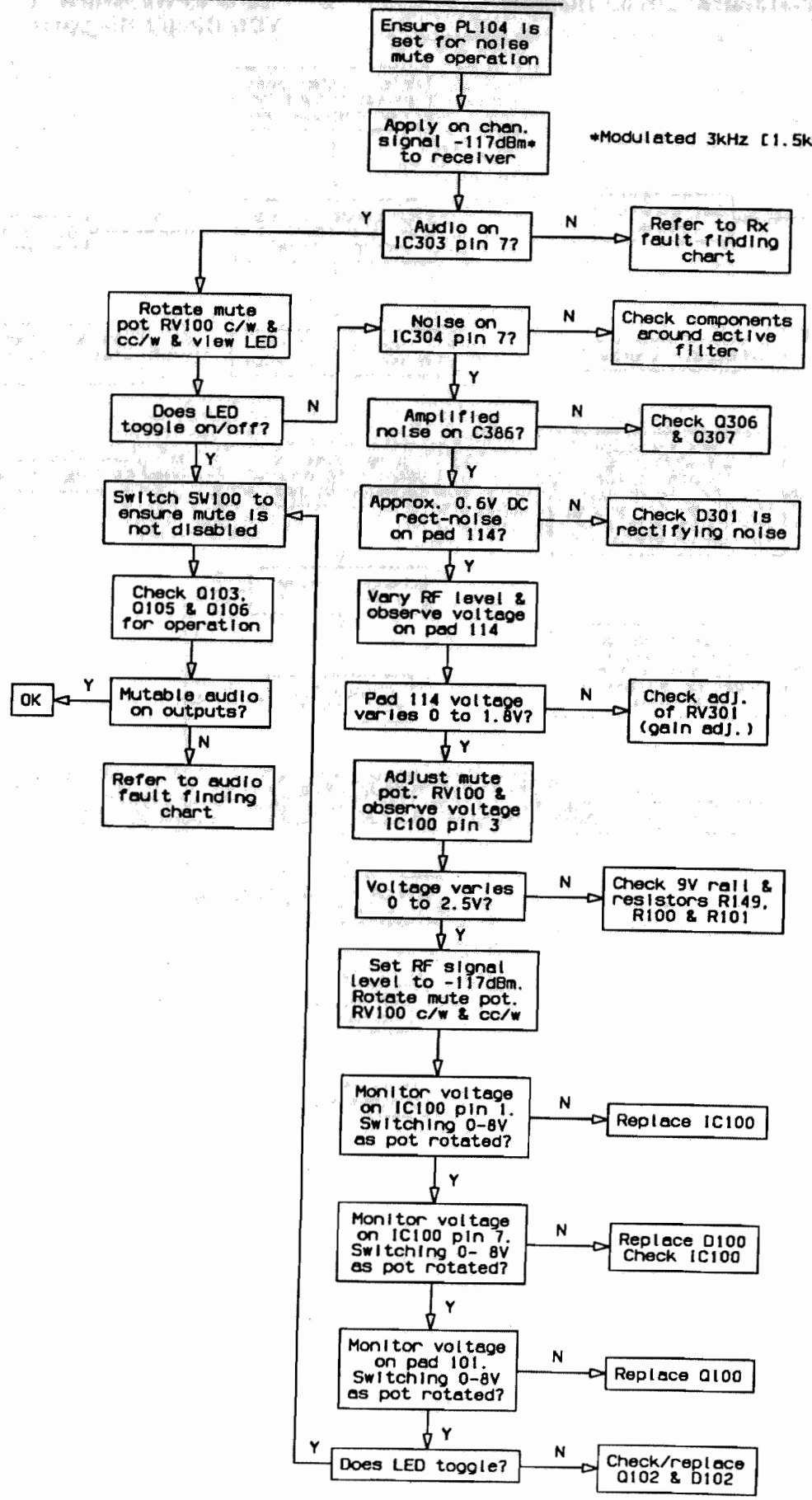
C Refer to synthesiser Circuit Diagram



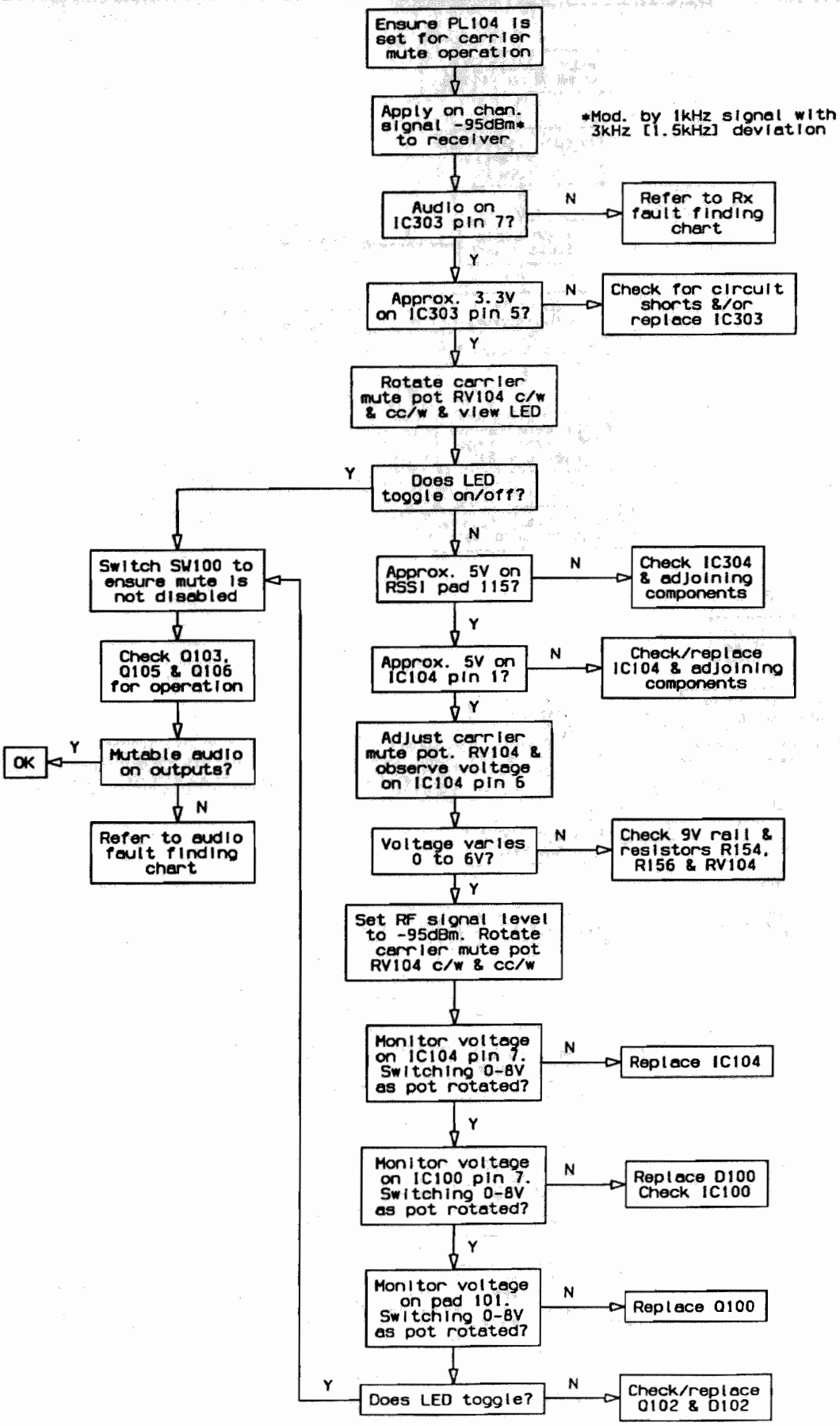
D Refer to synthesiser & VCO Circuit Diagrams



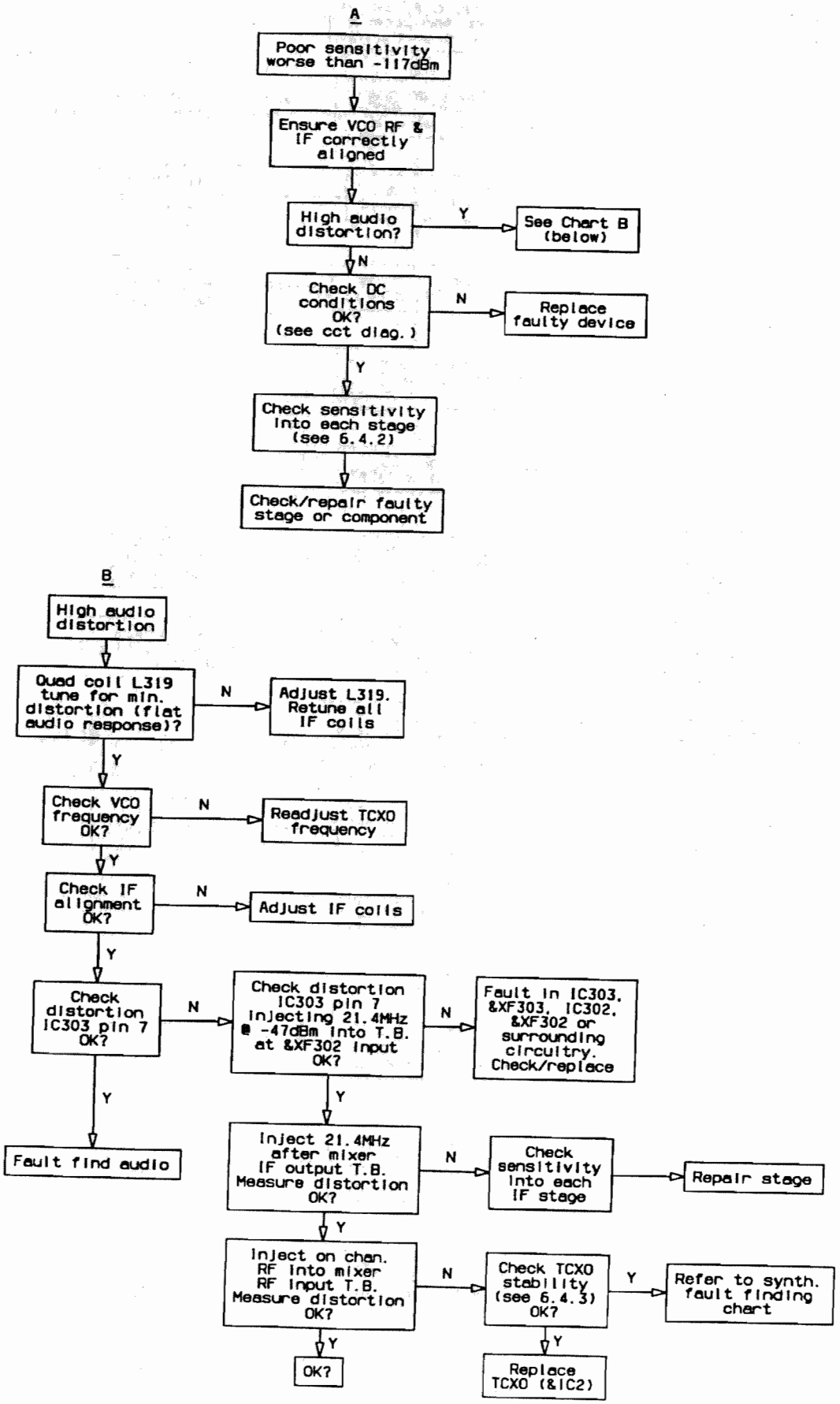
6.7 NOISE MUTE FAULT FINDING CHART



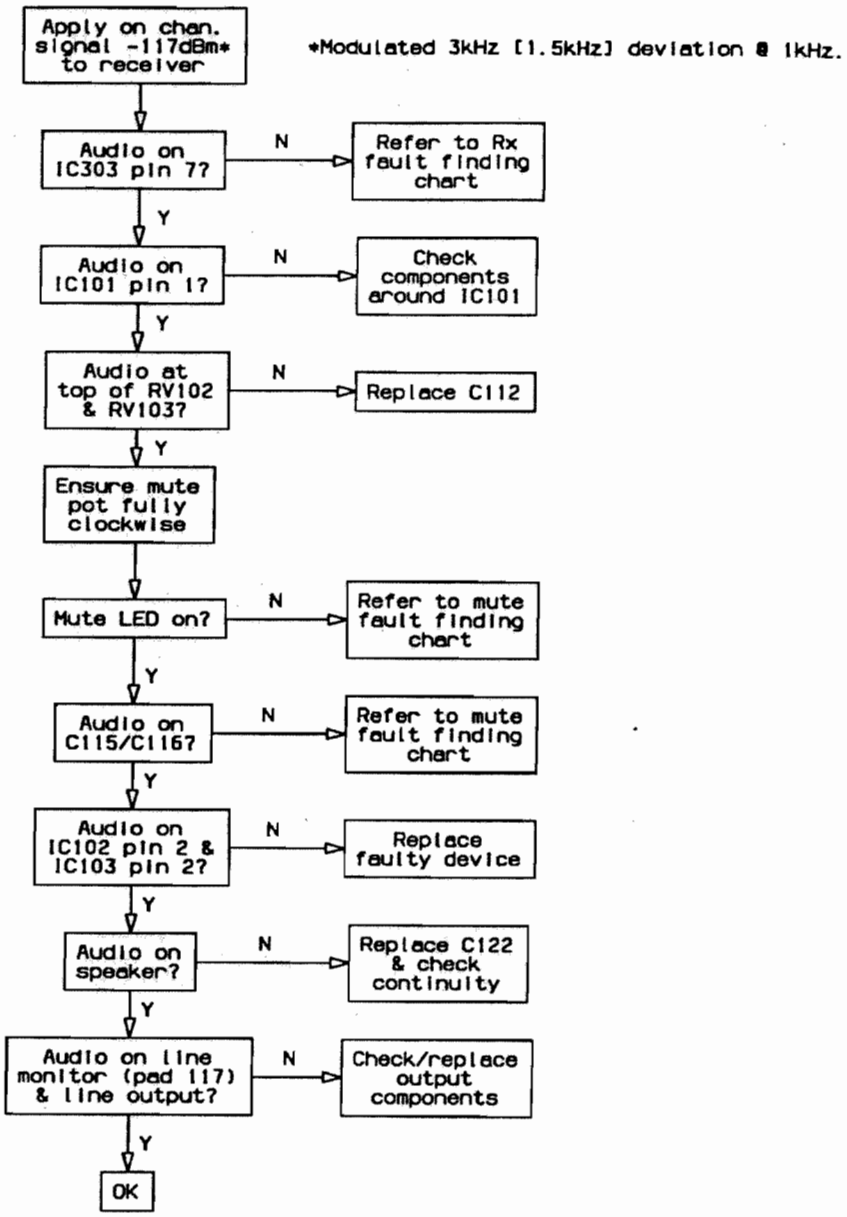
6.8 CARRIER MUTE FAULT FINDING CHART

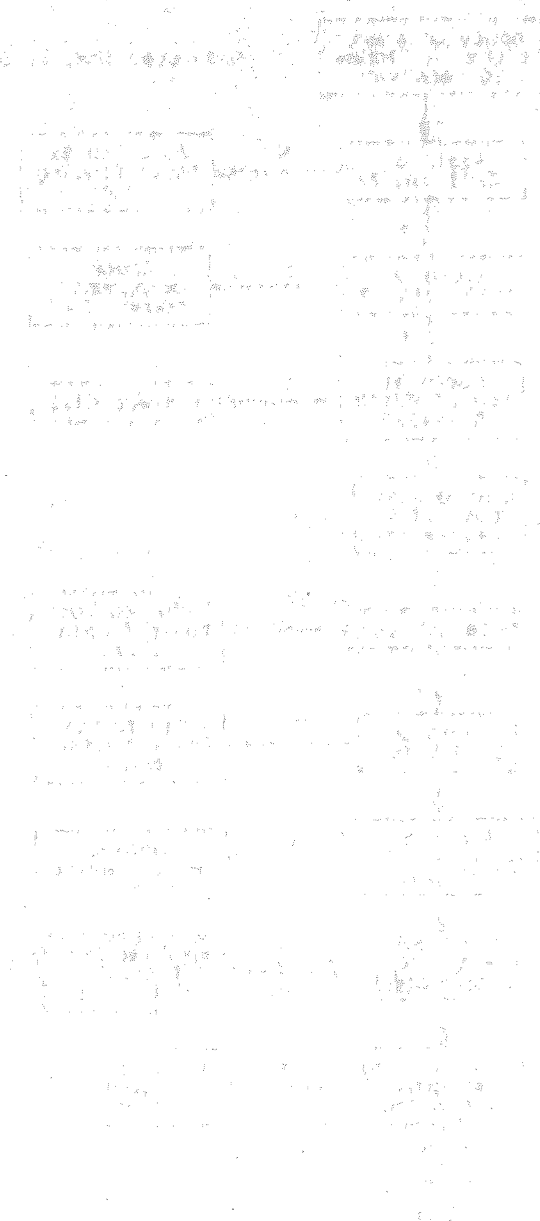


6.9 RECEIVER FAULT FINDING CHARTS



6.10 AUDIO FAULT FINDING CHART





SECTION 7 INSTALLATION

7.1 RACK MOUNTING

The T835 base station receiver is designed for use in a standard 483mm rack frame using a Tait T800 Series guide which locates and mates the rear D-range connectors (refer to Figures 12 & 13).

A T800 Series guide is supplied with each T835 receiver. The guide is located in the rack frame with four screws, two at the rear and two at the front. The T835 is secured into the guide with two front panel mounting screws.

The RF input is via the rear N-type connector, while all DC, audio and control connections are via the D-range connector. An additional rear D-range connector (T800-03) is fitted when remote multichannel operation or additional control of low frequency lines is required.

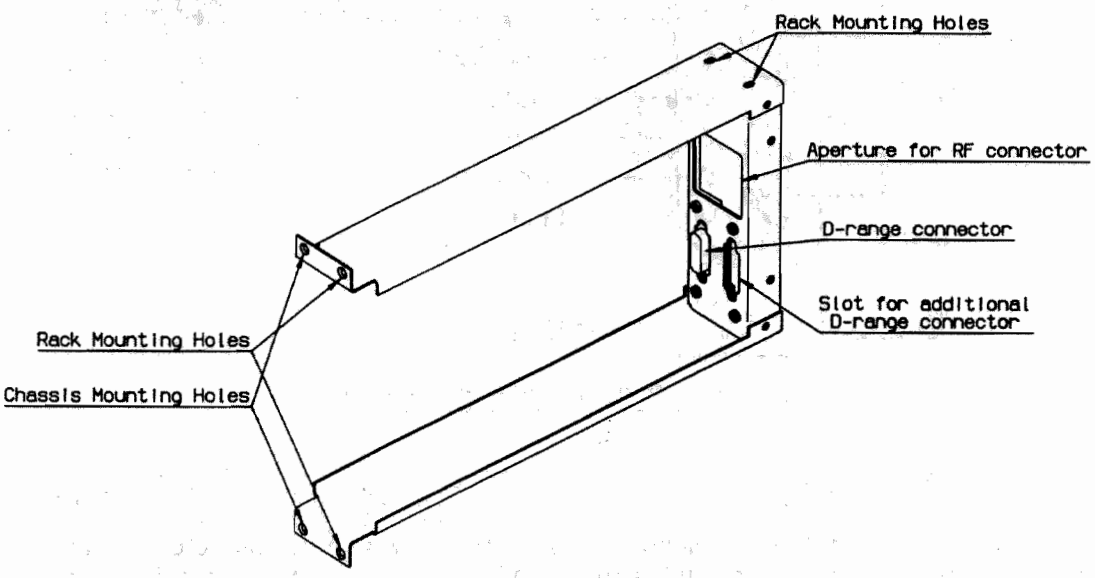


Figure 12 T800 Series Guide

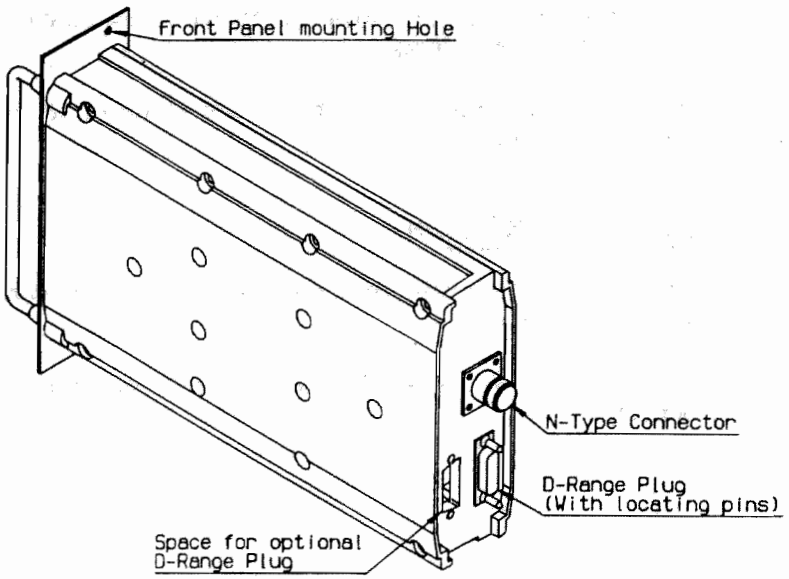


Figure 13 T835 Chassis Connectors

7.2 RACK WIRING

Wire the D-range connector as shown in Figure 14. Ensure that the cables are not subjected to any stresses due to tight bends or incorrect lengths.

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

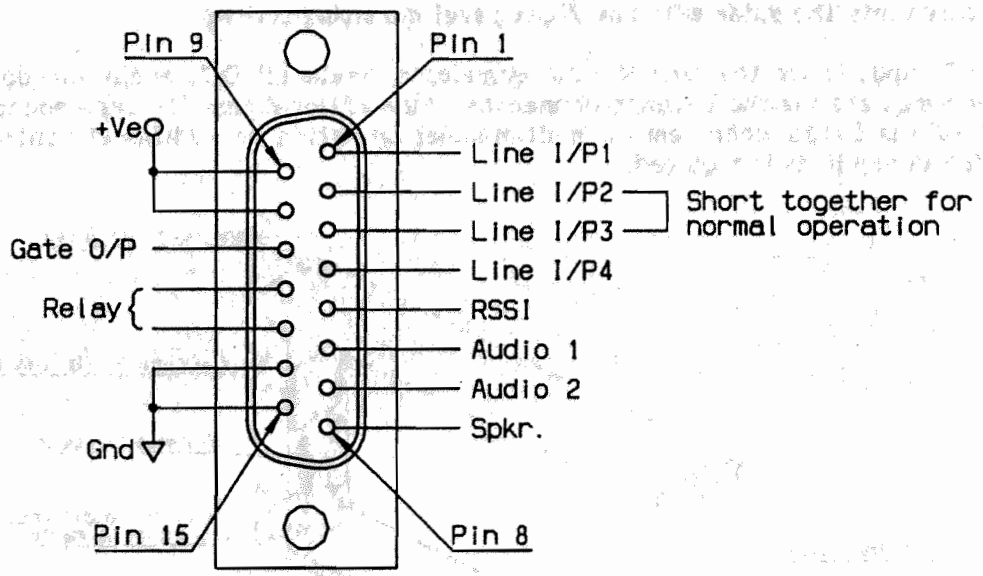


Figure 14 D-Range Wiring - Rear View

7.3 POWER SUPPLY

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

The system should be protected by the use of appropriately rated fuses in the power supply. Where several receivers are powered by the same supply, each unit should be individually protected with a fuse.

Note: **It is particularly important when the prime power source is a battery that fuses be fitted in all supply lines.**

7.4 REVERSE POLARITY PROTECTION

A shunt diode is fitted to each T835 receiver for protection against connection to a power supply of incorrect polarity.

Note: A fuse must be fitted in the power supply line for the diode to provide effective protection.

SECTION 8 SYSTEM CONFIGURATIONS

8.1 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 hot standby mode.

8.2 LINK SELECTABLE FEATURES

The T835 comes with a number of link selectable features which give added system flexibility.

8.2.1 FLAT OR DE-EMPHASISED RESPONSE

The links of PL101 and PL103 may be set to give either a flat or de-emphasised audio frequency response (refer to Section 4.4 for further details).

8.2.2 MUTE RELAY CONTROL

A relay with undedicated contacts (RL100) is available in the audio processor circuit block for various switching applications. A link (PL102) is available for control of the relay from the mute circuit (refer to Section 4.4). This makes the relay suitable for controlling the keying of a transmitter in repeater applications.

8.2.3 MUTE SELECTION

Link PL104 may be set to operate with noise mute or carrier mute (refer to Section 4.4).

8.2.4 RECEIVER DISABLE

The receiver audio can be disabled by pulling the "Rx disable" line low. When the circuit is pulled from low to high, the receiver audio cannot be re-enabled until the disable timer completes its operation. This time is variable from 15ms to 200ms by adjusting RV101 in the audio processor section.

If required, the operation of this circuit can be disabled by changing the link of PL100 from 1-2 to 2-3.

Typical applications of the receiver disable are as an extra mute for signalling purposes, or when the T835 is configured as a line controlled base station (refer to Section 8.4)

8.2.5 CTCSS CONFIGURATION

Links PL105 & PL106 select various CTCSS options (refer to Section 9.4.4).

8.2.6 300Hz HIGH PASS FILTER

Link PL105 also allows the insertion of this filter to improve hum and noise performance.

8.3 TALK THROUGH REPEATER

Refer to Figure 15.

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.

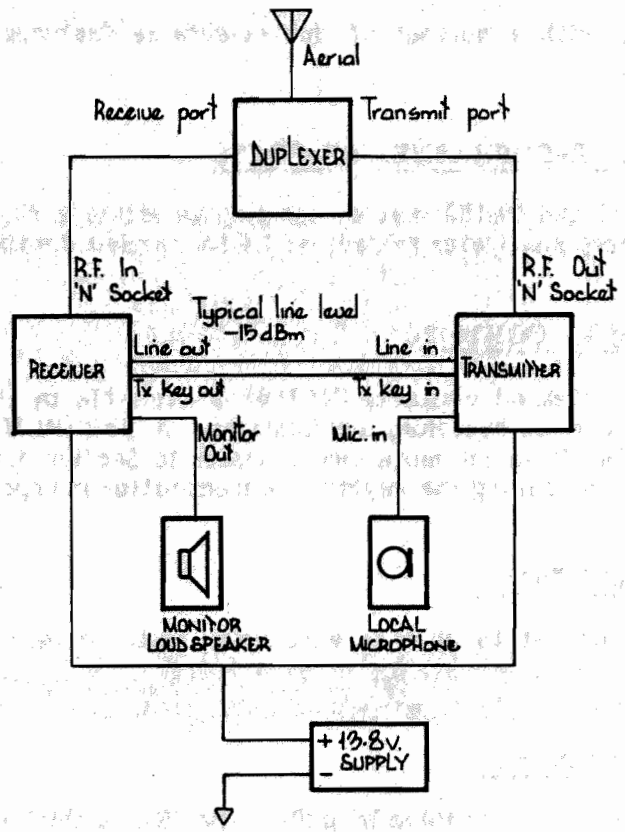


Figure 15 Talk Through Repeater

8.4 LINE CONTROLLED BASE STATION (WITHOUT TALK THROUGH)

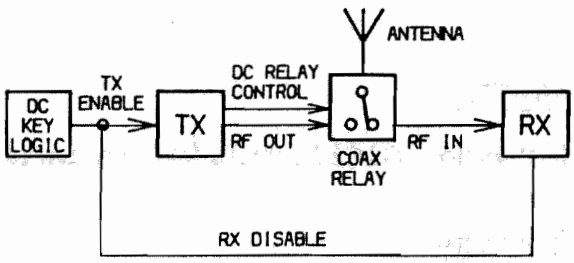


Figure 16 Basic Configuration

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. 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.

The receiver is disabled when the transmitter is energised to prevent the receiver mute opening from RF due to lack of isolation in the relay, direct radiation or the noise skirt of the dual frequency link.

Since the base station may be controlled via a 2-wire line and a 4-wire to 2-wire hybrid, there is a possibility of system oscillation if the receiver is not disabled during transmit. This occurs when the transmit energy enters the receiver and produces an audio response which can pass from the receive to the transmit audio part of the hybrid (impedance imbalance, etc).

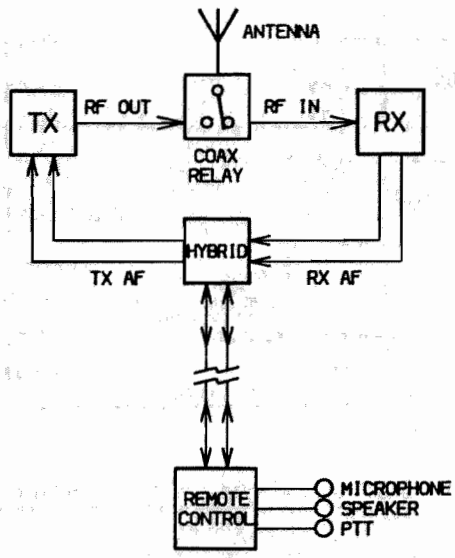


Figure 17 Remote Line Controlled Base Station

If the transmitter has a tail timer fitted, the receiver disable timer must be set so that $^{t}Rx/Dis > {}^{t}Tx/Tail$.

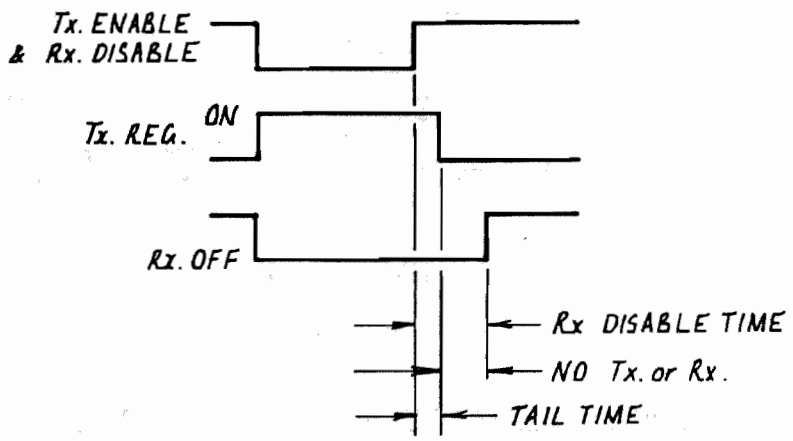


Figure 18 Receiver Disable Time vs Tail Time

8.5 DC LINE KEYING

Where the transmitter and receiver are separated by only a short distance and DC isolation is not required, DC loop keying may be employed.

A small DC current (usually less than 10mA) can be fed via the balanced 2-wire line to provide remote control of various functions.

In a duplex system the receiver mute is used to key a transmitter, provided there is a common earth between the two units (refer to Figure 19).

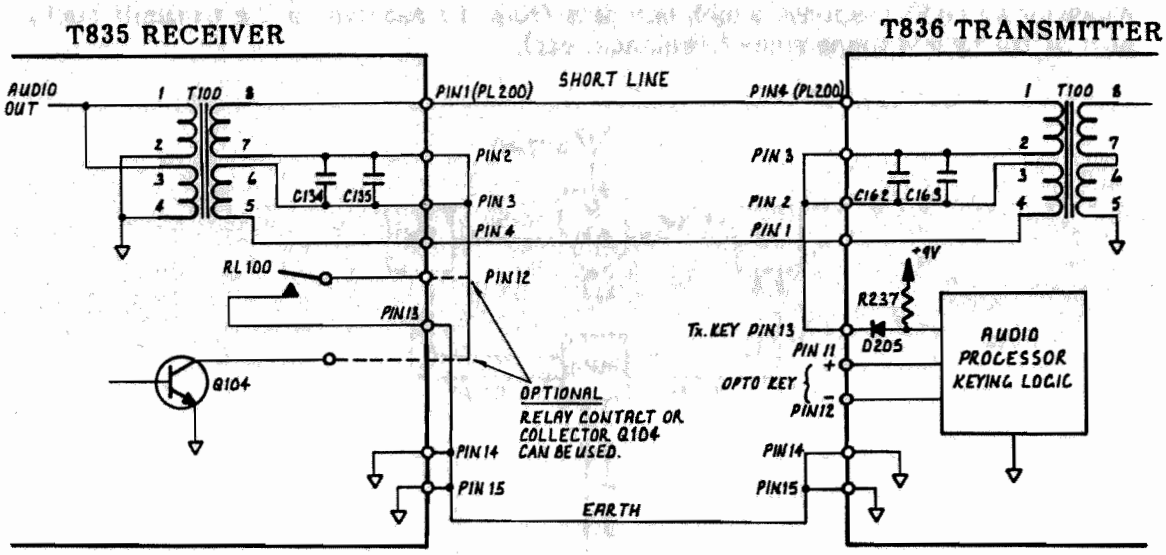


Figure 19 DC Loop Keying With Common Earth

Where the receiver and transmitter (or remote control) are distant, DC loop keying is provided by an isolated supply, driver and detector because an earth cannot be relied on (refer to Figures 20, 21 & 22).

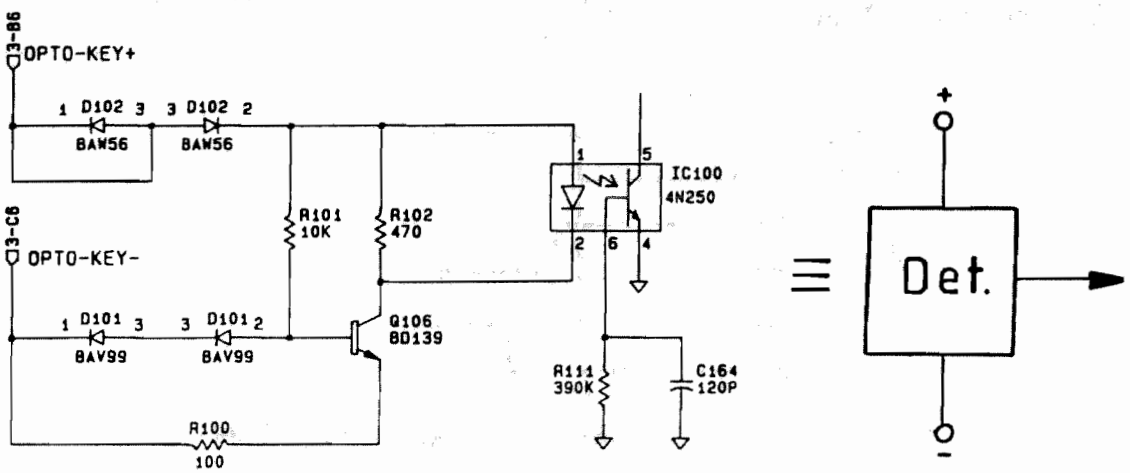


Figure 20 Isolated Constant Current Loop Current Detector
(Opto-key input on T836 & T837)

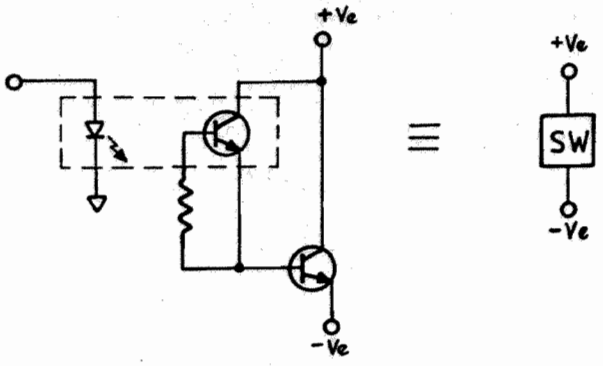


Figure 21 Isolated Loop Current Switch

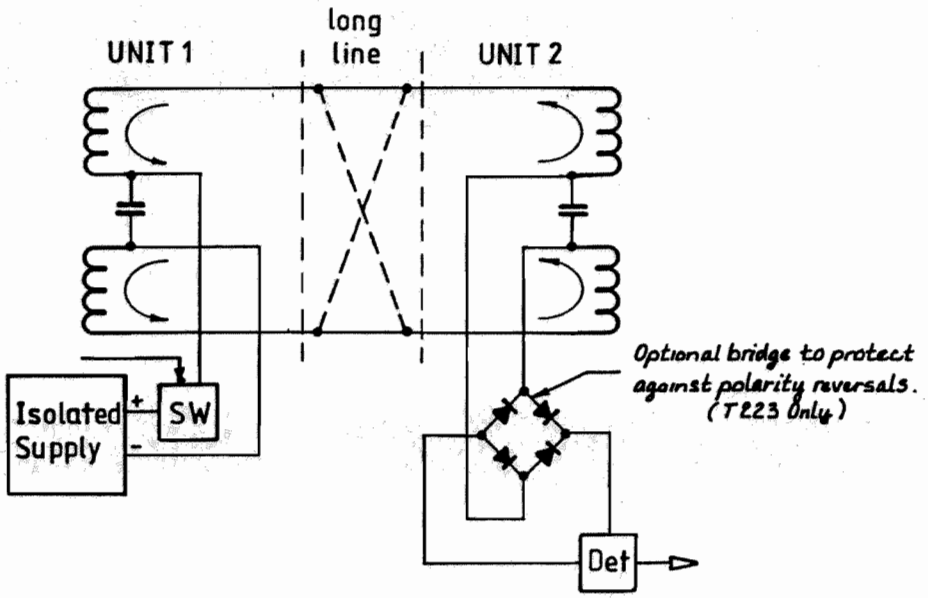


Figure 22 Typical System

SECTION 9 STANDARD OPTIONS

9.1 GENERAL

The T835 is available with a range of standard options to suit many requirements. For further details on these or more specialised options, please contact your nearest Tait dealer or agent.

9.2 TCXO

A very high stability TCXO is available to suit specific requirements. The stability of this and the standard TCXO is set out below:

±1ppm	0°C to +60°C
±2.5ppm	-30°C to +60°C (standard)

They are pin compatible devices and may be fitted in location &IC2 in the synthesiser compartment.

Refer to Section 1.3 for details of specific versions.

9.3 MULTICHANNEL

9.3.1 REMOTE

For multichannel operation it is necessary to fit an additional D-range connector (T800-03) to the rear of the chassis and replace the standard plug-in EPROM PCB with the T800-07 multichannel memory PCB. Three channel select lines (CH SEL 0, 1 & 2) are brought into the D-range connector compartment and should be connected to pins 11, 12 and 13 of the extra D-range, providing 8 channel control. The fourth wire is earth and should be soldered onto the main PCB.

For remote operation it is necessary to disable these three lines internally by switching the 3 least significant address DIP switches (SW1:1-3) to the off position. Channel selection is achieved by pulling one or more of the channel select lines low.

If more channels are required (up to 128 are available), a hole must be drilled in the end wall of the synthesiser compartment to route the extra channel select wires.

9.3.2 INTERNAL SELECTION

The EPROM can be loaded with up to 128 channel frequencies, each of which is addressable via the 8 bit DIP switch (SW1). Thus, one of 128 channel operation is possible.

9.4 CTCSS

9.4.1 SINGLE CHANNEL - SINGLE TONE

For single tone use, the T800-02 unit should be used. This is a retrofit PCB which is mounted on the specially provided lugs in the audio processor compartment of the receiver (refer to Figure 23).

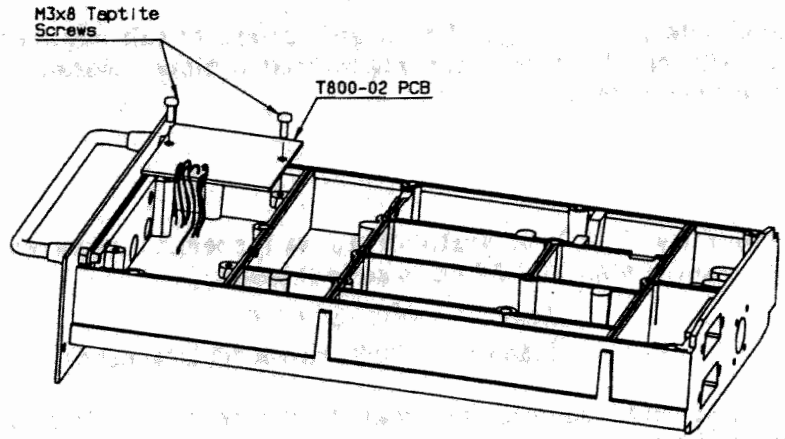


Figure 23 T800-02 Mounting Details

Access to all necessary audio and power supply points is provided by accessory pads in the audio processor. Refer to Figure 24 for installation and wiring details.

(INTERNAL WIRING)

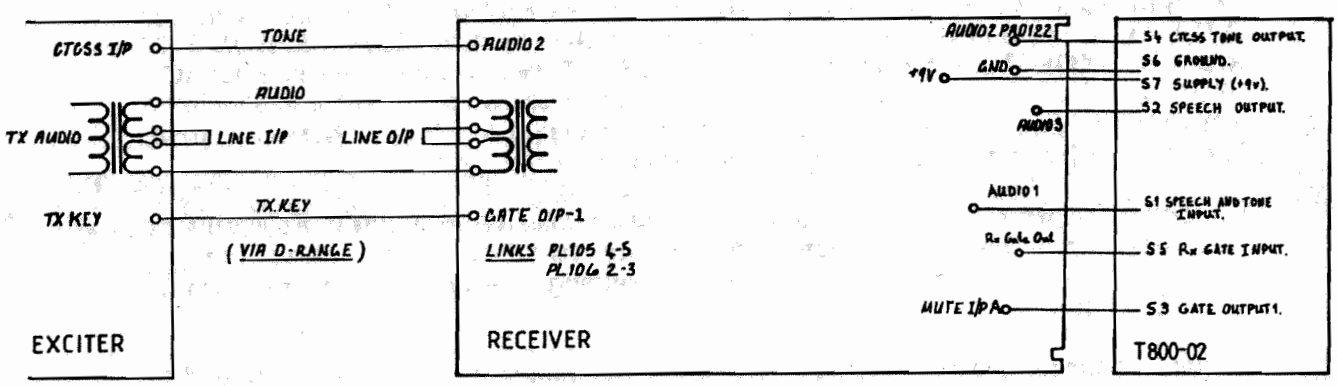


Figure 24 CTCSS Wiring Detail

Outputs are available on the receiver to key the transmitter, when used in a repeater situation, and to pass the CTCSS tone to the exciter. Connections to the exciter are given in Section 8.

If required, the CTCSS processing can be carried out in the exciter (refer to M837-00). In this case the CTCSS tone is passed along the 600 ohm line and decoded in the exciter.

9.4.2 MULTICHANNEL - SEPARATE TONES

In applications where each RF channel has a separate CTCSS tone, it is necessary to take the CTCSS tone select lines to the additional rear D-range connector. From the D-range, up to eight RF channels and any of the CTCSS tones can be selected by grounding the necessary pins.

9.4.3 SINGLE CHANNEL - MULTI-TONE

Where more than one tone is used on the same channel, some form of external encoding/decoding such as the T310-05 or T310-10 must be used. The system should be connected as shown in Figure 25.

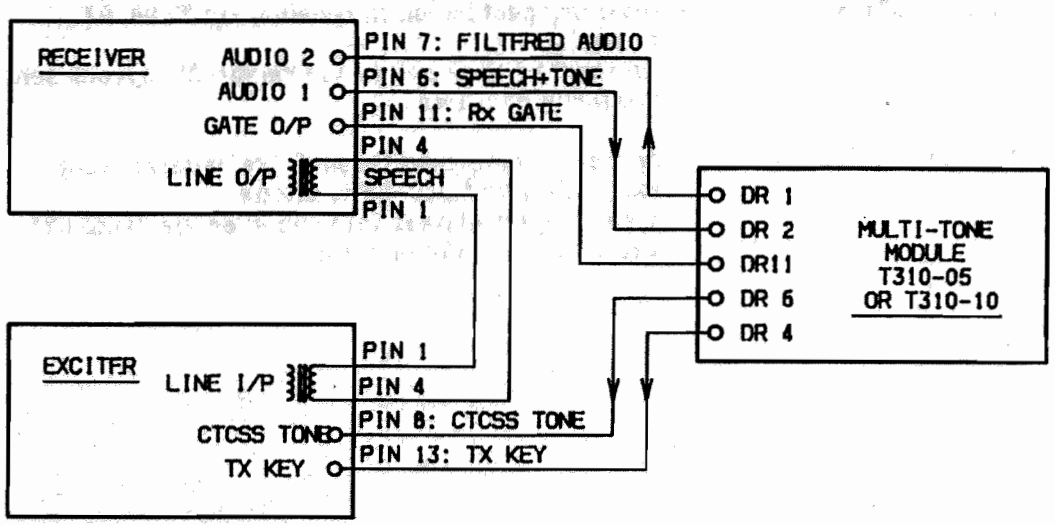


Figure 25 Multi-Tone Control with T310-05 or T310-10

An alternative configuration is to send speech plus tone along the 600 ohm line and carry out the detection on the exciter audio. However, this would require the 300Hz high pass filter formed by Q109 to be linked out, thus degrading the residual hum and noise performance by 10dB.

Refer to the exciter Service Manual (M837-00) for further details.

9.4.4 AUDIO PROCESSOR LINKING DETAILS FOR CTCSS

The audio processor links must be appropriately connected for the CTCSS option used, as shown in the table below.

CTCSS Option	PL105	PL106
standard, no CTCSS	2-3	2-3
CTCSS tone + speech to line output	1-2	2-3
internal CTCSS	4-5	2-3
external CTCSS	4-5	1-2

The conditions stated in the above table are defined as follows:

* standard, no CTCSS
  - no CTCSS or other sub-audio signalling used
  - audio bandwidth 300Hz to 3kHz
  - hum & noise -55dB

T835 Standard Options

* CTCSS tone + speech to line output	- tone and speech transmitted down 600 ohm line - audio bandwidth 10Hz to 3kHz - hum & noise -45dB - decoding performed in exciter/transmitter
* internal CTCSS	- decoding performed in receiver by T800-02 or similar - re-encoded tone output via "audio 2", speech sent down 600 ohm line
* external CTCSS	- decoding performed through the receiver (but externally) by T310-05 or similar - speech injected back into receiver via "audio 2" and sent down 600 ohm line

SECTION 10 PARTS LIST

INTRODUCTION

The 10 digit numbers (000-00000-00) in this Parts List are "internal part numbers" (IPN's). Your spare parts orders can be handled more efficiently if you quote: equipment type, circuit reference and IPN, along with a brief description of the part.

The components listed in this Parts List are divided into two main types: those with a circuit reference (e.g. C2, D106, R121, etc) and those without (miscellaneous and mechanical).

Those with a circuit reference are grouped firstly by PCB, then by component type in numerical order. Each component entry comprises four columns: the circuit reference, variant number (if applicable), IPN and description. A number in the variant column indicates that this particular component is fitted only to that variant.

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

INDEX

T835 MAIN BOARD PARTS LIST

REF	VAR	IPN	DESCRIPTION
C1		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C2		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C4		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C5		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C6		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C7		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C8		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C9		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C13		020-08100-07	CAPACITOR ELECTRO RADIAL 10UF 50V 5X11MM 5MM L/S
C14		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C15		015-22560-01	CAPACITOR CERAMIC 0805 CHIP 56P 5% NPO 50V
C16		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C17		015-23470-08	CAPACITOR CERAMIC 0805 CHIP 470P 10% X7R 50V
C19		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C20		025-08100-02	CAPACITOR TANT BEAD 10M 10% 16V
C21		015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
C22		015-25150-08	CAPACITOR CERAMIC 0805 CHIP 15N 10% X7R 50V
C23		022-06330-03	CAPACITOR METAL POLYESTER 330N 10% 50V 5MM L/S
C24		020-08100-07	CAPACITOR ELECTRO RADIAL 10UF 50V 5X11MM 5MM L/S
C25		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C26		025-08100-02	CAPACITOR TANT BEAD 10M 10% 16V
C27		025-08100-02	CAPACITOR TANT BEAD 10M 10% 16V
C28		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C30		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C31		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C32		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C33		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C34		015-21820-01	CAPACITOR CERAMIC 0805 CHIP 8P2 +/-0.25P NPO 50V
C35		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C36		025-08100-02	CAPACITOR TANT BEAD 10M 10% 16V
C37		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C39		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C40		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C100		020-07100-52	CAPACITOR ELECTRO RADIAL 1M 50V 5X11MM 5MM L/S
C101		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C102		020-08470-08	CAPACITOR ELECTRO RADIAL 47M 16V 6X11MM 5MM L/S
C103		015-05470-08	CAPACITOR CERAMIC 1206 CHIP 47N 10% X7R 50V
C104		015-21220-01	CAPACITOR CERAMIC 0805 CHIP 2P2 +/-0.25P NPO 50V
C105		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C106		015-22470-01	CAPACITOR CERAMIC 0805 CHIP 47P 5% NPO 50V
C107		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C108		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C110		020-09100-06	CAPACITOR ELECTRO RADIAL 100M 16V 8X11MM 5MM L/S
C111		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C112		020-08100-07	CAPACITOR ELECTRO RADIAL 10UF 50V 5X11MM 5MM L/S
C113		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C114		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C115		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C116		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C117		020-09100-06	CAPACITOR ELECTRO RADIAL 100M 16V 8X11MM 5MM L/S
C118		020-09100-06	CAPACITOR ELECTRO RADIAL 100M 16V 8X11MM 5MM L/S
C119		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C120		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C121		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C122		020-09470-05	CAPACITOR ELECTRO RADIAL 470M 16V 10X12.5MM
C123		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C124		020-09100-06	CAPACITOR ELECTRO RADIAL 100M 16V 8X11MM 5MM L/S
C125		020-09220-01	CAPACITOR ELECTRO RADIAL 220M 16V 10X12.5MM
C126		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C127		020-09220-01	CAPACITOR ELECTRO RADIAL 220M 16V 10X12.5MM
C128		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C129		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
&C130	10	015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
&C130	15	015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
&C130	20	015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
&C130	25	015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C131		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C132		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C133		015-05470-08	CAPACITOR CERAMIC 1206 CHIP 47N 10% X7R 50V
C134		020-07470-91	CAPACITOR ELECTRO RADIAL 4M7 63V 6X11MM BI-POLAR
C135		020-07470-91	CAPACITOR ELECTRO RADIAL 4M7 63V 6X11MM BI-POLAR
C136		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C137		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C138		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C140		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C141		020-08100-07	CAPACITOR ELECTRO RADIAL 10UF 50V 5X11MM 5MM L/S
C142		015-05470-08	CAPACITOR CERAMIC 1206 CHIP 47N 10% X7R 50V
C200		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C201		020-08100-07	CAPACITOR ELECTRO RADIAL 10UF 50V 5X11MM 5MM L/S
C202		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C203		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C204		020-09470-07	CAP 470M 16V 20% ELEC VRT 8*20 3.5MM L/S LO-ESR
C205		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C207		020-08100-07	CAPACITOR ELECTRO RADIAL 10UF 50V 5X11MM 5MM L/S
C210		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C211		025-08100-02	CAPACITOR TANT BEAD 10M 10% 16V
C212		025-07330-01	CAPACITOR TANT BEAD 3M3 35V
C213		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C214		020-07100-52	CAPACITOR ELECTRO RADIAL 1M 50V 5X11MM 5MM L/S
C215		020-08100-07	CAPACITOR ELECTRO RADIAL 10UF 50V 5X11MM 5MM L/S
C216		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C217		015-23120-01	CAPACITOR CERAMIC 0805 CHIP 120P 5% NPO 50V
C218		015-23120-01	CAPACITOR CERAMIC 0805 CHIP 120P 5% NPO 50V
C219		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C220		015-23120-01	CAPACITOR CERAMIC 0805 CHIP 120P 5% NPO 50V
C222		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C301		015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
C302		015-22330-01	CAPACITOR CERAMIC 0805 CHIP 33P 5% NPO 50V
C303		015-22330-01	CAPACITOR CERAMIC 0805 CHIP 33P 5% NPO 50V
C304		015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
C305		015-22390-01	CAPACITOR CERAMIC 0805 CHIP 39P 5% NPO 50V
C306		015-21560-01	CAPACITOR CERAMIC 0805 CHIP 5P6 +/-0.25P NPO 50V
C307		015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
C308		015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
C309		015-22390-01	CAPACITOR CERAMIC 0805 CHIP 39P 5% NPO 50V
C310		015-22330-01	CAPACITOR CERAMIC 0805 CHIP 33P 5% NPO 50V
C311		015-22120-01	CAPACITOR CERAMIC 0805 CHIP 12P 5% NPO 50V
C312		015-21560-01	CAPACITOR CERAMIC 0805 CHIP 5P6 +/-0.25P NPO 50V
C313		015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
C314		015-22390-01	CAPACITOR CERAMIC 0805 CHIP 39P 5% NPO 50V
C315		015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
C316		015-22390-01	CAPACITOR CERAMIC 0805 CHIP 39P 5% NPO 50V
C317		015-22220-01	CAPACITOR CERAMIC 0805 CHIP 22P 5% NPO 50V
C318		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C319		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C320		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C321		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C322		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C324		015-22470-01	CAPACITOR CERAMIC 0805 CHIP 47P 5% NPO 50V
C325		015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
C326		015-21680-01	CAPACITOR CERAMIC 0805 CHIP 6P8 +/-0.25P NPO 50V
C327		015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
C328		015-22470-01	CAPACITOR CERAMIC 0805 CHIP 47P 5% NPO 50V
C329		015-22100-01	CAPACITOR CERAMIC 0805 CHIP 10P +/-0.5P NPO 50V
C330		015-22390-01	CAPACITOR CERAMIC 0805 CHIP 39P 5% NPO 50V
C331		015-22470-01	CAPACITOR CERAMIC 0805 CHIP 47P 5% NPO 50V
C332		015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
C333		015-21680-01	CAPACITOR CERAMIC 0805 CHIP 6P8 +/-0.25P NPO 50V
C335		015-22470-01	CAPACITOR CERAMIC 0805 CHIP 47P 5% NPO 50V
C336		015-23180-01	CAPACITOR CERAMIC 0805 CHIP 180P 5% NPO 50V
C337		015-23180-01	CAPACITOR CERAMIC 0805 CHIP 180P 5% NPO 50V
C338		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C339		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C340		020-08100-07	CAPACITOR ELECTRO RADIAL 10UF 50V 5X11MM 5MM L/S
C341		015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C342		015-22330-01	CAPACITOR CERAMIC 0805 CHIP 33P 5% NPO 50V
C343		015-22390-01	CAPACITOR CERAMIC 0805 CHIP 39P 5% NPO 50V
&C344	10	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
&C344	15	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
&C344	20	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
&C344	25	015-22390-01	CAPACITOR CERAMIC 0805 CHIP 39P 5% NPO 50V
&C345	10	015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
&C345	15	015-22820-01	CAPACITOR CERAMIC 0805 CHIP 82P 5% NPO 50V
&C345	20	015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
&C345	25	015-22820-01	CAPACITOR CERAMIC 0805 CHIP 82P 5% NPO 50V
&C346	10	015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
&C346	15	015-22820-01	CAPACITOR CERAMIC 0805 CHIP 82P 5% NPO 50V
&C346	20	015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
&C346	25	015-22820-01	CAPACITOR CERAMIC 0805 CHIP 82P 5% NPO 50V
&C347	10	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
&C347	15	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
&C347	20	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
&C347	25	015-22390-01	CAPACITOR CERAMIC 0805 CHIP 39P 5% NPO 50V
C348		015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
C349		020-08100-07	CAPACITOR ELECTRO RADIAL 10UF 50V 5X11MM 5MM L/S
C350		015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
C351		015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
C352		015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
&C353	10	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
&C353	15	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
&C353	20	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
&C353	25	015-22390-01	CAPACITOR CERAMIC 0805 CHIP 39P 5% NPO 50V
&C354	10	015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
&C354	15	015-22820-01	CAPACITOR CERAMIC 0805 CHIP 82P 5% NPO 50V
&C354	20	015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
&C354	25	015-22820-01	CAPACITOR CERAMIC 0805 CHIP 82P 5% NPO 50V
&C355	10	015-20050-01	CAPACITOR CERAMIC 0805 CHIP 0P5 +/-0.5P NPO 50V
&C355	15	015-21180-01	CAPACITOR CERAMIC 0805 CHIP 1P8 +/-0.25 NPO 50V
&C355	20	015-20050-01	CAPACITOR CERAMIC 0805 CHIP 0P5 +/-0.5P NPO 50V
&C355	25	015-21180-01	CAPACITOR CERAMIC 0805 CHIP 1P8 +/-0.25 NPO 50V
C357		015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
C358		025-08100-02	CAPACITOR TANT BEAD 10M 10% 16V
C359		015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
C360		015-24470-08	CAPACITOR CERAMIC 0805 CHIP 4N7 10% X7R 50V
C361		015-22330-01	CAPACITOR CERAMIC 0805 CHIP 33P 5% NPO 50V
C362		015-22330-01	CAPACITOR CERAMIC 0805 CHIP 33P 5% NPO 50V
C363		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C365		015-05470-08	CAPACITOR CERAMIC 1206 CHIP 47N 10% X7R 50V
C366		015-23150-01	CAPACITOR CERAMIC 0805 CHIP 150P 5% NPO 50V
C367		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C368		015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C369		015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
C370		015-05470-08	CAPACITOR CERAMIC 1206 CHIP 47N 10% X7R 50V
C371		015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
C372		015-23100-01	CAPACITOR CERAMIC 0805 CHIP 100P 5% NPO 50V
C373		025-08100-02	CAPACITOR TANT BEAD 10M 10% 16V
C374		025-08100-02	CAPACITOR TANT BEAD 10M 10% 16V
C375		025-08100-02	CAPACITOR TANT BEAD 10M 10% 16V
C376		015-23100-01	CAPACITOR CERAMIC 0805 CHIP 100P 5% NPO 50V
C377		015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V

T835 MAIN BOARD PARTS LIST

REF	VAR	IPN	DESCRIPTION
C378		015-23100-01	CAPACITOR CERAMIC 0805 CHIP 100P 5% NPO 50V
C379		015-23100-01	CAPACITOR CERAMIC 0805 CHIP 100P 5% NPO 50V
C380		015-25100-08	CAPACITOR CERAMIC 0805 CHIP 10N 10% X7R 50V
C382		015-05470-08	CAPACITOR CERAMIC 1206 CHIP 47N 10% X7R 50V
C383		015-05470-08	CAPACITOR CERAMIC 1206 CHIP 47N 10% X7R 50V
C384		015-23120-01	CAPACITOR CERAMIC 0805 CHIP 120P 5% NPO 50V
C385		015-23120-01	CAPACITOR CERAMIC 0805 CHIP 120P 5% NPO 50V
C386		015-05470-08	CAPACITOR CERAMIC 1206 CHIP 47N 10% X7R 50V
C387		015-05470-08	CAPACITOR CERAMIC 1206 CHIP 47N 10% X7R 50V
&C500	10	015-20050-01	CAPACITOR CERAMIC 0805 CHIP 0P5 +/-0.5P NPO 50V
&C500	15	015-22100-01	CAPACITOR CERAMIC 0805 CHIP 10P +/-0.5P NPO 50V
&C500	20	015-20050-01	CAPACITOR CERAMIC 0805 CHIP 0P5 +/-0.5P NPO 50V
&C500	25	015-22100-01	CAPACITOR CERAMIC 0805 CHIP 10P +/-0.5P NPO 50V
D1		001-10000-70	DIODE SMD BAV70 DUAL SWITCH SOT-23 COMMON CATHODE
D2		001-10000-70	DIODE SMD BAV70 DUAL SWITCH SOT-23 COMMON CATHODE
D100		001-10000-99	DIODE SMD BAV99 DUAL SWITCH SOT-23 SINGLE IN LINE
D101		001-10000-56	DIODE SMD BAW56 DUAL SWITCH SOT-23 COMMON ANODE
D102		362-00010-33	GROMMET LED MTG 3MM LO CURRENT LEDS
D103		001-10000-70	DIODE SMD BAV70 DUAL SWITCH SOT-23 COMMON CATHODE
D104		001-10000-70	DIODE SMD BAV70 DUAL SWITCH SOT-23 COMMON CATHODE
D105		362-00010-33	GROMMET LED MTG 3MM LO CURRENT LEDS
D106		001-00011-70	DIODE 1N4001 1A/50V
D107		001-00011-70	DIODE 1N4001 1A/50V
D108		001-00011-70	DIODE 1N4001 1A/50V
D200		001-10000-99	DIODE SMD BAV99 DUAL SWITCH SOT-23 SINGLE IN LINE
D201		001-00011-60	DIODE SR2607 6A/30V
D203		001-10000-70	DIODE SMD BAV70 DUAL SWITCH SOT-23 COMMON CATHODE
D301		001-10000-56	DIODE SMD BAW56 DUAL SWITCH SOT-23 COMMON ANODE
IC1		002-00017-51	INTEGRATED CCT SP8793 DUAL MOD PRESCALER 40/41(S)
IC2	10	539-00010-41	TCXO 12.8MHZ +-2.5PPM -30 TO +70C NDK NSA0175A
IC2	15	539-00010-43	TCXO 12.8MHZ +/- 2PPM -10 TO +60C NDK TIC3002A
IC2	20	539-00010-41	TCXO 12.8MHZ +-2.5PPM -30 TO +70C NDK NSA0175A
IC2	25	539-00010-43	TCXO 12.8MHZ +/- 2PPM -10 TO +60C NDK TIC3002A
IC3		002-00017-63	INTEGRATED CCT NJ8820DP FREQ SYNTHESIZER (S)
IC4		002-00012-47	INTEGRATED CCT MC33078 DUAL OP AMP LO NOISE (S)
IC5		002-74000-04	INTEGRATED CCT 74HCU04 UNBUFFERED HEX INVERTER (S)
IC6		002-74000-74	INTEGRATED CCT 74HC74 DUAL D F/F (S)
IC100		002-00012-40	INTEGRATED CCT 358P DUAL OP AMP (S)
IC101		002-00012-40	INTEGRATED CCT 358P DUAL OP AMP (S)
IC102		002-00014-05	INTEGRATED CIRCUIT TDA7231 1.6W AF PWR (S)
IC103		002-00014-05	INTEGRATED CIRCUIT TDA7231 1.6W AF PWR (S)
IC104		002-00012-40	INTEGRATED CCT 358P DUAL OP AMP (S)
IC201		002-00012-40	INTEGRATED CCT 358P DUAL OP AMP (S)
IC202		002-00014-62	INTEGRATED CCT 317L 100MA REG 3 TERMINAL TO-92
IC301		002-00022-01	MIXER DOUBLE BALANCED TAK-1WH MIXER 2-750MHZ
IC302		002-00011-91	IC NEG12N DBM & OSCILLATOR
IC303		002-00014-74	IC NE614N LOW POWER FM IF 8-PIN
IC304		002-00012-25	INTEGRATED CCT TL084 QUAD OP AMP JFET I/P (S)
LED_1		008-00013-32	LED 3MM RED LOW CURRENT LESS MOUNTING (S)
LED_2		008-00013-35	LED 3MM GREEN LOW CURRENT LESS MOUNTING (S)
L1		052-08160-25	COIL A/W 2.5T/6.0MM HOR 0.8MM WIRE
L100		056-00021-02	INDUCTOR FIXED 100UH AXIAL
L301		052-08140-35	COIL A/W 3.5T/4.0MM HOR 0.8MM WIRE
L302		052-08140-35	COIL A/W 3.5T/4.0MM HOR 0.8MM WIRE
L303		052-08140-35	COIL A/W 3.5T/4.0MM HOR 0.8MM WIRE
L304		050-00016-59	COIL TAIT 659 RF 3.5T C/W SLUG & CAN
L305		050-00016-59	COIL TAIT 659 RF 3.5T C/W SLUG & CAN
L306		052-08135-65	COIL A/W 6.5T/3.5MM HOR 0.8MM WIRE
L307		056-00021-04	INDUCTOR FIXED 330NH AXIAL
L308		056-00021-04	INDUCTOR FIXED 330NH AXIAL
L309		050-00016-59	COIL TAIT 659 RF 3.5T C/W SLUG & CAN
L310		050-00016-59	COIL TAIT 659 RF 3.5T C/W SLUG & CAN
L311		056-00021-04	INDUCTOR FIXED 330NH AXIAL
L312		056-00021-04	INDUCTOR FIXED 330NH AXIAL
L313		056-00021-07	INDUCTOR FIXED 33UH AXIAL
L314		056-00021-09	INDUCTOR FIXED 820NH AXIAL 4X9MM
L315		050-00016-58	COIL TAIT 658 2MH IF 7.5*7.5 12.5 HIGH
L316		050-00016-58	COIL TAIT 658 2MH IF 7.5*7.5 12.5 HIGH
L317		050-00016-58	COIL TAIT 658 2MH IF 7.5*7.5 12.5 HIGH
L319		050-00016-55	COIL TAIT NO 655 455KHZ QUAD COIL 7MM CAN
PL5		240-00020-57	HEADER 10 WAY 1 ROW PCB MTG
PL03		240-00020-59	HEADER 3 WAY 1 ROW PCB MTG
PL100		240-00020-59	HEADER 3 WAY 1 ROW PCB MTG
PL101		240-00020-59	HEADER 3 WAY 1 ROW PCB MTG
PL102		240-00020-59	HEADER 3 WAY 1 ROW PCB MTG
PL104		240-00020-59	HEADER 3 WAY 1 ROW PCB MTG
PL105		240-00020-58	HEADER 5 WAY 1 ROW PCB MTG
PL106		240-00020-59	HEADER 3 WAY 1 ROW PCB MTG
Q1		000-10057-10	TRANSISTOR SMD MMBR571 NPN SOT-23 UHF LO POWER
Q3		000-10008-48	TRANSISTOR SMD BCW60/BC848 NPN SOT-23 AF SMALL SIG
Q100		000-10008-48	TRANSISTOR SMD BCW60/BC848 NPN SOT-23 AF SMALL SIG
Q101		000-10008-57	TRANSISTOR SMD BCW70/BC857 PNP SOT-23 AF SMALL SIG
Q102		000-10008-57	TRANSISTOR SMD BCW70/BC857 PNP SOT-23 AF SMALL SIG
Q103		000-10008-57	TRANSISTOR SMD BCW70/BC857 PNP SOT-23 AF SMALL SIG
Q104		000-10008-17	TRANSISTOR SMD BCX19/BC817 NPN SOT-23 AF LO POWER
Q105		000-10008-48	TRANSISTOR SMD BCW60/BC848 NPN SOT-23 AF SMALL SIG
Q106		000-10008-48	TRANSISTOR SMD BCW60/BC848 NPN SOT-23 AF SMALL SIG
Q107		000-10008-48	TRANSISTOR SMD BCW60/BC848 NPN SOT-23 AF SMALL SIG
Q108		000-10008-48	TRANSISTOR SMD BCW60/BC848 NPN SOT-23 AF SMALL SIG
Q109		000-10008-48	TRANSISTOR SMD BCW60/BC848 NPN SOT-23 AF SMALL SIG
Q200		000-00011-30	TRANSISTOR BC557B PNP TO-92 AF SMALL SIG
Q201		000-00012-15	TRANSISTOR BD234 PNP TO-126 AF POWER
Q202		000-10008-17	TRANSISTOR SMD BCX19/BC817 NPN SOT-23 AF LO POWER
Q203		000-10008-57	TRANSISTOR SMD BCW70/BC857 PNP SOT-23 AF SMALL SIG
Q301		000-10008-57	TRANSISTOR SMD BCW70/BC857 PNP SOT-23 AF SMALL SIG
Q302		000-10095-10	TRANSISTOR SMD MMBR951 NPN UHF SOT-23
Q303		000-00020-18	TRANSISTOR BF247A JFET TO-92 VHF SMALL SIG (S)
Q304		000-10095-10	TRANSISTOR SMD MMBR951 NPN UHF SOT-23
Q305		000-10095-10	TRANSISTOR SMD MMBR951 NPN UHF SOT-23
Q306		000-10008-48	TRANSISTOR SMD BCW60/BC848 NPN SOT-23 AF SMALL SIG
Q307		000-10008-48	TRANSISTOR SMD BCW60/BC848 NPN SOT-23 AF SMALL SIG
RL100		237-00010-22	RELAY 12V DPDT 14PIN DIL PCB MTG FUJITSU 244 PRE
R1		036-12100-00	RESISTOR M/F 0805 CHIP 10E 5%
R2		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R4		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R5		036-14330-00	RESISTOR M/F 0805 CHIP 3K3 5%
R6		036-12680-00	RESISTOR M/F 0805 CHIP 68E 5%
R7		036-13220-00	RESISTOR M/F 0805 CHIP 220E 5%
R8		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R10		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R12		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R13		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R14		036-12100-00	RESISTOR M/F 0805 CHIP 10E 5%
R15		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R16		036-12220-00	RESISTOR M/F 0805 CHIP 22E 5%
R20		036-12220-00	RESISTOR M/F 0805 CHIP 22E 5%
R21		036-15220-00	RESISTOR M/F 0805 CHIP 22K 5%
R22		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R23		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R24		036-13220-00	RESISTOR M/F 0805 CHIP 220E 5%
R25		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R26		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R27		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R28		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R29		036-16100-00	RESISTOR M/F 0805 CHIP 100K 5%
R30		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R31		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R32		036-16470-00	RESISTOR M/F 0805 CHIP 470K 5%
R33		036-16470-00	RESISTOR M/F 0805 CHIP 470K 5%
R34		036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
R35		036-12220-00	RESISTOR M/F 0805 CHIP 22E 5%
R36		036-13680-00	RESISTOR M/F 0805 CHIP 680E 5%
R37		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R38		036-15150-00	RESISTOR M/F 0805 CHIP 15K 5%
R39		036-16100-00	RESISTOR M/F 0805 CHIP 100K 5%
R40		036-12220-00	RESISTOR M/F 0805 CHIP 22E 5%
R41		036-12100-00	RESISTOR M/F 0805 CHIP 10E 5%
R42		036-12100-00	RESISTOR M/F 0805 CHIP 10E 5%
R43		036-13100-00	RESISTOR M/F 0805 CHIP 100E 5%
R45		036-12220-00	RESISTOR M/F 0805 CHIP 22E 5%
R100		036-15270-00	RESISTOR M/F 0805 CHIP 27K 5%
RV100		040-05100-21	POTENTIOMER 10K LIN VERT PCB MTG 15MM SLOT SHAFT
R101		036-13100-00	RESISTOR M/F 0805 CHIP 100E 5%
RV101		042-05100-06	RESISTOR PRESET 10K CARBON 6MM FLAT
R102		036-14220-00	RESISTOR M/F 0805 CHIP 2K2 5%
RV102		040-05100-21	POTENTIOMER 10K LIN VERT PCB MTG 15MM SLOT SHAFT
R103		036-15220-00	RESISTOR M/F 0805 CHIP 22K 5%
RV103		040-05100-22	POTENTIOMETER 10K LOG DUAL PCB MTG 6MM OD SHAFT
R104		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
RV104		042-05100-06	RESISTOR PRESET 10K CARBON 6MM FLAT
R105		036-16220-00	RESISTOR M/F 0805 CHIP 220K 5%
R106		036-16330-00	RESISTOR M/F 0805 CHIP 330K 5%
&R107	10	036-15220-00	RESISTOR M/F 0805 CHIP 22K 5%
&R107	15	036-15180-00	RESISTOR M/F 0805 CHIP 18K 5%
&R107	20	036-15220-00	RESISTOR M/F 0805 CHIP 22K 5%
&R107	25	036-15180-00	RESISTOR M/F 0805 CHIP 18K 5%
R108		036-14820-00	RESISTOR M/F 0805 CHIP 8K2 5%
R109		036-15150-00	RESISTOR M/F 0805 CHIP 15K 5%
R110		036-16100-00	RESISTOR M/F 0805 CHIP 100K 5%
R111		036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
R112		036-15390-00	RESISTOR M/F 0805 CHIP 39K 5%
R113		036-16100-00	RESISTOR M/F 0805 CHIP 100K 5%
R114		036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
R115		036-14270-00	RESISTOR M/F 0805 CHIP 2K7 5%
R116		036-13100-00	RESISTOR M/F 0805 CHIP 100E 5%
R117		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R119		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R120		036-14390-00	RESISTOR M/F 0805 CHIP 3K9 5%
R121		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
&R122	10	036-14820-00	RESISTOR M/F 0805 CHIP 8K2 5%
&R122	15	036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
&R122	20	036-14820-00	RESISTOR M/F 0805 CHIP 8K2 5%
&R122	25	036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
R123		036-14680-00	RESISTOR M/F 0805 CHIP 6K8 5%
R124		036-14680-00	RESISTOR M/F 0805 CHIP 6K8 5%
R125		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R126		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R127		036-16100-00	RESISTOR M/F 0805 CHIP 100K 5%
R128		036-13560-00	RESISTOR M/F 0805 CHIP 560E 5%
R129		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R130		036-14220-00	RESISTOR M/F 0805 CHIP 2K2 5%

T835 MAIN BOARD PARTS LIST

REF	VAR	IPN	DESCRIPTION
R131		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R132		036-14680-00	RESISTOR M/F 0805 CHIP 6K8 5%
R133		036-14120-00	RESISTOR M/F 0805 CHIP 1K2 5%
R134		036-15390-00	RESISTOR M/F 0805 CHIP 39K 5%
R135		036-14820-00	RESISTOR M/F 0805 CHIP 8K2 5%
R136		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R137		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R138		036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
R139		036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
R140		036-14820-00	RESISTOR M/F 0805 CHIP 8K2 5%
R141		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R142		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R143		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R144		036-11470-00	RESISTOR M/F 0805 CHIP 4E7 10%
R145		036-11470-00	RESISTOR M/F 0805 CHIP 4E7 10%
R146		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R147		036-13150-00	RESISTOR M/F 0805 CHIP 150E 5%
R148		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R149		036-13100-00	RESISTOR M/F 0805 CHIP 100E 5%
R150		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R151		036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
&R152	10	036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
&R152	15	036-14330-00	RESISTOR M/F 0805 CHIP 3K3 5%
&R152	20	036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
&R152	25	036-14330-00	RESISTOR M/F 0805 CHIP 3K3 5%
R153		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R154		036-13100-00	RESISTOR M/F 0805 CHIP 100E 5%
R155		036-15150-00	RESISTOR M/F 0805 CHIP 15K 5%
R156		036-14560-00	RESISTOR M/F 0805 CHIP 5K6 5%
R157		036-16220-00	RESISTOR M/F 0805 CHIP 220K 5%
R158		036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
R159		036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
R160		036-14680-00	RESISTOR M/F 0805 CHIP 6K8 5%
R161		036-16100-00	RESISTOR M/F 0805 CHIP 100K 5%
R162		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R163		036-15150-00	RESISTOR M/F 0805 CHIP 15K 5%
R164		036-14390-00	RESISTOR M/F 0805 CHIP 3K9 5%
R165		036-13470-00	RESISTOR M/F 0805 CHIP 470E 5%
R200		036-12330-00	RESISTOR M/F 0805 CHIP 33E 5%
R201		036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
R203		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R204		032-33270-00	RESISTOR M/F POWER 270E 5% 1W 12X4.5MM
R205		032-31100-00	RESISTOR M/F POWER 1E0 5% 1W 12X4.5MM
R206		036-14680-00	RESISTOR M/F 0805 CHIP 6K8 5%
R207		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R208		032-31100-00	RESISTOR M/F POWER 1E0 5% 1W 12X4.5MM
R209		036-13100-00	RESISTOR M/F 0805 CHIP 100E 5%
R210		036-12330-00	RESISTOR M/F 0805 CHIP 33E 5%
R212		036-12100-00	RESISTOR M/F 0805 CHIP 10E 5%
R213		036-15150-00	RESISTOR M/F 0805 CHIP 15K 5%
R214		036-16100-00	RESISTOR M/F 0805 CHIP 100K 5%
R215		036-15560-00	RESISTOR M/F 0805 CHIP 56K 5%
R216		036-14150-00	RESISTOR M/F 0805 CHIP 1K5 5%
R217		036-13470-00	RESISTOR M/F 0805 CHIP 470E 5%
R301		036-14390-00	RESISTOR M/F 0805 CHIP 3K9 5%
RV301		042-04220-06	RESISTOR PRESET 2K2 CARBON 6MM FLAT
R302		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R303		036-14220-00	RESISTOR M/F 0805 CHIP 2K2 5%
RV303		042-05470-06	RESISTOR PRESET 47K CARBON 6MM FLAT
R304		036-13470-00	RESISTOR M/F 0805 CHIP 470E 5%
R305		036-12100-00	RESISTOR M/F 0805 CHIP 10E 5%
R306		036-13180-00	RESISTOR M/F 0805 CHIP 180E 5%
R307		036-12330-00	RESISTOR M/F 0805 CHIP 33E 5%
R308		036-13470-00	RESISTOR M/F 0805 CHIP 470E 5%
R309		036-12120-00	RESISTOR M/F 0805 CHIP 12E 5%
R310		036-13470-00	RESISTOR M/F 0805 CHIP 470E 5%
R311		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R312		036-10000-00	RESISTOR M/F 0805 CHIP ZERO OHM
R314		036-13470-00	RESISTOR M/F 0805 CHIP 470E 5%
R315		036-12120-00	RESISTOR M/F 0805 CHIP 12E 5%
R316		036-13470-00	RESISTOR M/F 0805 CHIP 470E 5%
R317		036-12470-00	RESISTOR M/F 0805 CHIP 47E 5%
R318		036-13100-00	RESISTOR M/F 0805 CHIP 100E 5%
R319		036-12100-00	RESISTOR M/F 0805 CHIP 10E 5%
R320		036-13680-00	RESISTOR M/F 0805 CHIP 680E 5%
R321		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R322		036-14330-00	RESISTOR M/F 0805 CHIP 3K3 5%
R323		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R324		036-11470-00	RESISTOR M/F 0805 CHIP 4E7 10%
R325		036-13100-00	RESISTOR M/F 0805 CHIP 100E 5%
R326		036-12560-00	RESISTOR M/F 0805 CHIP 56E 5%
R327		036-12390-00	RESISTOR M/F 0805 CHIP 39E 5%
R328		036-13470-00	RESISTOR M/F 0805 CHIP 470E 5%
&R329	10	036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
&R329	15	036-14330-00	RESISTOR M/F 0805 CHIP 3K3 5%
&R329	20	036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
&R329	25	036-14330-00	RESISTOR M/F 0805 CHIP 3K3 5%
R330		036-13680-00	RESISTOR M/F 0805 CHIP 680E 5%
R331		036-14120-00	RESISTOR M/F 0805 CHIP 1K2 5%
R333		036-15820-00	RESISTOR M/F 0805 CHIP 82K 5%
R334		045-03500-01	RESISTOR NTC 500E 5MM DISC UNCOATED
R335		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R338		036-16100-00	RESISTOR M/F 0805 CHIP 100K 5%
R339		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%

REF	VAR	IPN	DESCRIPTION
R340		036-15220-00	RESISTOR M/F 0805 CHIP 22K 5%
R341		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R342		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
&R343	10	036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
&R343	15	036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
&R343	20	036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
&R343	25	036-14470-00	RESISTOR M/F 0805 CHIP 4K7 5%
R345		045-03500-01	RESISTOR NTC 500E 5MM DISC UNCOATED
R346		036-13220-00	RESISTOR M/F 0805 CHIP 220E 5%
R347		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R348		036-14150-00	RESISTOR M/F 0805 CHIP 1K5 5%
R349		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R350		036-16330-00	RESISTOR M/F 0805 CHIP 330K 5%
R351		036-12100-00	RESISTOR M/F 0805 CHIP 10E 5%
R352		036-14330-00	RESISTOR M/F 0805 CHIP 3K3 5%
R353		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R354		036-15150-00	RESISTOR M/F 0805 CHIP 15K 5%
R355		036-14330-00	RESISTOR M/F 0805 CHIP 3K3 5%
R356		036-16100-00	RESISTOR M/F 0805 CHIP 100K 5%
R357		036-15220-00	RESISTOR M/F 0805 CHIP 22K 5%
R358		036-13100-00	RESISTOR M/F 0805 CHIP 100E 5%
R359		036-14270-00	RESISTOR M/F 0805 CHIP 2K7 5%
R360		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R361		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R362		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R363		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R364		036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R365		036-12120-00	RESISTOR M/F 0805 CHIP 12E 5%
R366		036-12680-00	RESISTOR M/F 0805 CHIP 68E 5%
R367		045-06100-01	RESISTOR NTC 100K 20% 5MM DISC
R368		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R369		036-15470-00	RESISTOR M/F 0805 CHIP 47K 5%
R370		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R371		036-10000-00	RESISTOR M/F 0805 CHIP ZERO OHM
R372		036-17100-00	RESISTOR M/F 0805 CHIP 1M 5%
R373		036-12560-00	RESISTOR M/F 0805 CHIP 56E 5%
SK1		240-04020-57	SOCKET 10 WAY 1ROW PCB MTG TOP ENTRY
SW100		230-00010-30	SWITCH TOGGLE SPDT RT ANGLE PCB MT PARALLEL ACTION
SM1-22	25	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
T100		053-00010-17	TRANSFORMER T4030 LINE MATCH POT CORE
T200		050-00016-50	COIL TAIT NO 650 455KHZ 5.6MM CAN
VC301		028-02100-06	CAPACITOR TRIMMER 3/10P NPO TOP ADJ BLUE MUR TZ
X301		274-00010-02	CRYSTAL 20.945MHZ SPEC TE/15
&XF301	10	276-00010-43	FILTER XTAL ONE PAIR 21.4MHZ 15KHZ 2*POLE 21N15B
&XF301	15	276-00010-44	FILTER XTAL ONE PAIR 21.4MHZ 7.5KHZ B/W 4 POLE 21N
&XF301	20	276-00010-43	FILTER XTAL ONE PAIR 21.4MHZ 15KHZ 2*POLE 21N15B
&XF301	25	276-00010-44	FILTER XTAL ONE PAIR 21.4MHZ 7.5KHZ B/W 4 POLE 21N
&XF302	10	276-00010-47	FILTER CRYSTAL 21.4MHZ 15KHZ B/W 2POLE 21N15A
&XF302	15	276-00010-46	FILTER CRYSTAL 21.4MHZ 7.5KHZ B/W 2POLE 21N7.5A
&XF302	20	276-00010-47	FILTER CRYSTAL 21.4MHZ 15KHZ B/W 2POLE 21N15A
&XF302	25	276-00010-46	FILTER CRYSTAL 21.4MHZ 7.5KHZ B/W 2POLE 21N7.5A
&XF303	10	276-00010-14	FILTER CERAMIC 455KHZ 15KHZ B/W CFW455E
&XF303	15	276-00010-13	FILTER CERAMIC 455KHZ 9KHZ B/W CFW455G
&XF303	20	276-00010-14	FILTER CERAMIC 455KHZ 15KHZ B/W CFW455E
&XF303	25	276-00010-13	FILTER CERAMIC 455KHZ 9KHZ B/W CFW455G

T835 D-RANGE PARTS

REF	IPN	DESCRIPTION
C1	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C2	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C3	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C5	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C6	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C7	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C8	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C9	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C10	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C11	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C12	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C13	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C14	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD
C15	012-04150-01	CAPACITOR CERAMIC FEEDTHRU 1N5 LESS LEAD

T835 PARTS LIST MISCELLANEOUS & MECHANICAL

IPN	DESCRIPTION
### VARIANT T835-10 15 RECEIVER FM 136-156MHZ 15KHZ IFBW TCXO 2.5PPM	
055-01004-00	COIL TOROID 103NH 22P 9T T830 TX
### VARIANT T835-15 15 RECEIVER FM 136-156MHZ 7.5KHZ IFBW TCXO 2PPM	
055-01004-00	COIL TOROID 103NH 22P 9T T830 TX
### VARIANT T835-20 15 RECEIVER FM 148-174MHZ 15KHZ IFBW TCXO 2.5PP	
015-22180-01	CAPACITOR CERAMIC 0805 CHIP 18P 5% NPO 50V
055-01003-00	COIL TOROID 91NH 22P 8T T830 RX
### VARIANT T835-25 15 RECEIVER FM 148-174MHZ 7.5KHZ IFBW TCXO 2PPM	
015-22180-01	CAPACITOR CERAMIC 0805 CHIP 18P 5% NPO 50V
055-01003-00	COIL TOROID 91NH 22P 8T T830 RX
### COMMON PARTS	
015-22120-01	CAPACITOR CERAMIC 0805 CHIP 12P 5% NPO 50V
015-22220-01	CAPACITOR CERAMIC 0805 CHIP 22P 5% NPO 50V
062-00010-13	CAN 10MM SQ X 11MM SANWA 613 A4M1017 Fit over coil T200
065-00010-13	BEAD FERRITE 7D 1.9*0.9*3.8MM STACK POLE
201-00030-02	WIRE REMIT 7/0.2MM PVC RED 2x20mm LED.
201-00030-10	WIRE REMIT 7/0.2MM PVC BLACK 2x25mm LED.
220-01186-02	PRINTED CIRCUIT BOARD T835 RX 136-174 MHZ
230-00010-31	COVER LEVER FOR TOGGLE SW 230-00010-30
240-00010-55	PLUG 15 WAY D RANGE WIRE WRAP PINS PNL MTG
240-02010-54	SOCKET 15WAY D RANGE PANEL MTG DAF15S
240-02100-06	SOCKET COAXIAL N TYPE PANEL MTG OPEN TERMINATION
240-04020-62	SOCKET 2 WAY RECEPTACLE SHORTING LINK
240-04020-65	SOCKET JACK PIN 1.3MM PCB MTG 64 WAY SIL STRAP [SJ-2 3 4-1 to 4-5 5-1 to 5-5.]
303-11168-00	CHASSIS HEATSINK PAINTED CMPLT A1M2364 800 SERIE
303-23118-00	COVER A3M2247 D RANGE HOLE T855/7
303-50074-00	CLIP A4M2246 SPRING TRANSISTOR CLAMP T857
306-01010-00	FERRULE A4M948 HANDLE FXD EQUIP
308-01007-00	HANDLE A4M949 FXD EQUIP
311-01015-00	KNOB SATO K34 AG 15MM & SKIRT 6MM SHAFT FXD EQUI
312-01052-00	LID TOP PAINTED COMPLETE A1M2364 800 SERIES
312-01053-00	LID BOTTOM PAINTED COMPLETE A1M2364 800 SERIES
316-06406-01	PANEL FRONT COMPLETE T835 A3M2208/1 A3M2208/4
316-85015-00	PIN A4M775 LOCATING D RANGE
316-85099-00	PLATE FLOAT A3M2248 DUAL D RANGE SOCKET BOX
316-85100-00	PLATE FRONT A3M2249 DUAL D RANGE SOCKET BOX
318-01014-00	RAIL A2M2214 FOR 800 SERIES FXD EQUIP
319-01152-00	SHIELD A#M2250 FEEDTHRU MTG T857
345-00040-08	SCREW M3*12MM PAN POZI ST BZ 'D' range hole cover
345-00040-09	SCREW M3*6MM CSK POZI ST BZ rail mounting
345-00040-10	SCREW M3*6MM PAN POZI ST BZ Rail x4 Float Plate x4.
345-00040-20	SCREW M3*8MM BUTTON SKT HD BLACK ZINC PHOS front panel

IPN	DESCRIPTION
349-00020-32	SCREW TAPTITE M3X8MM PAN POZI BZ PCB mounting x8 'N' connector x4.
349-00020-43	SCREW TAPTITE M4X12MM PAN POZI BZ top cover
349-00020-45	SCREW TAPTITE M4X20MM PAN POZI BZ bottom cover
352-00010-08	NUT M3 COLD FORM HEX ST BZ 'D' plug x2 cover x2 vco x2.
352-00010-29	HANDLE NUT M4 NYLOC HEX
353-00010-12	WASHER M3 SPRING BZ 'D' plug
353-00010-13	WASHER M3 SHAKEPROOF INT BZ 'D' hole cover x2 vco x2.
360-00010-40	BUSH SNAP BLACK HEYCO SB-375-4 front panel
362-00010-23	GASKET SILICONE INSULATING TO-220 CLIP MOUNTED
365-00100-03	LABEL BLANK 10.8X30MM S/A METALISED POLYESTER
365-00100-20	LABEL WHITE S/A 28X11MM QUIKSTIK RW718/4
400-00020-05	SLEEVING 1.5MM SILICONE RUBBER
410-00010-42	PACKAGING CARTON 60MM FXD EQUIP MODULE UEB 15096

T830 VCO PARTS LIST

REFERENCED PARTS

REF	VAR	IPN	DESCRIPTION
CV1		028-02400-02	CAP TRIM 5/40P CER 5MM KV40001
C2		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 6 10%
*C3	10	015-22180-01	CAPACITOR CERAMIC 0805 CHIP 18P 5% NPO 50V
*C3	15	015-22180-01	CAPACITOR CERAMIC 0805 CHIP 18P 5% NPO 50V
*C3	20	015-22180-01	CAPACITOR CERAMIC 0805 CHIP 18P 5% NPO 50V
*C3	25	015-22180-01	CAPACITOR CERAMIC 0805 CHIP 18P 5% NPO 50V
*C4	10	015-22180-01	CAPACITOR CERAMIC 0805 CHIP 18P 5% NPO 50V
*C4	15	015-22180-01	CAPACITOR CERAMIC 0805 CHIP 18P 5% NPO 50V
*C4	20	015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
*C4	25	015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
*C5		015-22220-01	CAPACITOR CERAMIC 0805 CHIP 22P 5% NPO 50V
*C6	10	015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
*C6	15	015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
*C6	20	015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
*C6	25	015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
*C7	10	015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
*C7	15	015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
*C7	20	015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
*C7	25	015-22150-01	CAPACITOR CERAMIC 0805 CHIP 15P 5% NPO 50V
C8		015-23120-01	CAPACITOR CERAMIC 0805 CHIP 120P 5% NPO 50V
C9		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C10		015-21220-01	CAPACITOR CERAMIC 0805 CHIP 2P2 /-0.25P NPO 50V
C11		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C12		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C13		025-08100-02	CAPACITOR TANT BEAD 10M 10% 16V
C14		015-23680-08	CAPACITOR CERAMIC 0805 CHI P 680P10% X7R 50V
C15		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P 10% X7R 50V
C16		015-22560-01	CAPACITOR CERAMIC 0805 CHIP 56P 5 % NPO 50V
C17		015-22560-01	CAPACITOR CERAMIC 0805 CHIP 56P % NPO 50V
C18		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P V
C19		015-05470-08	CAPACITOR CERAMIC 1206 CHIP 47N
C20		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P V
C21		015-23680-08	CAPACITOR CERAMIC 0805 CHIP 680P V
C22		015-23680-08	CAPACITOR CERAMIC 0805 CHI P 680PV
C23		015-21820-01	CAPACITOR CERAMIC 0805 CHIP 8P2 50V
C24		015-21680-01	CAPACITOR CERAMIC 0805 CHIP 6P8 50V
*C26	10	015-22560-01	CAPACITOR CERAMIC 0805 CHIP 56P 5% NPO 50V
*C26	15	015-22560-01	CAPACITOR CERAMIC 0805 CHIP 56P 5% NPO 50V
*C26	20	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
*C26	25	015-22270-01	CAPACITOR CERAMIC 0805 CHIP 27P 5% NPO 50V
D1		001-00012-63	DIODE VARICAP BB809
D2		001-00012-63	DIODE VARICAP BB809
D3		001-00012-63	DIODE VARICAP BB809
D4		001-00012-63	DIODE VARICAP BB809
L1		056-00021-56	INDUCTOR FIXED 3.3UH AXIAL 10X4
L2		056-00021-60	INDUCTOR FIXED 330NH 6.6X2.7MM GNETI
*L3		055-01004-00	COIL TOROID 103NH 22P 9T T830 TX
L4		056-00021-52	INDUCTOR FIXED 820NH 10% NON MTIC
L5		056-00021-56	INDUCTOR FIXED 3.3UH AXIAL 10X4OLIC
L6		052-08135-35	COIL A/W 3.5T/3.5MM HOR 0.8MM
L7		056-00021-56	INDUCTOR FIXED 3.3UH AXIAL 10X4OLIC
L8		052-08130-45	COIL A/W 4.5T/3.0MM HOR 0.8MM
PL-1		240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN
PL-2		240-00025-36	PLUG 32WAY 1ROW PC MTG HARWIN
*R5		036-13390-00	RESISTOR M/F 0805 CHIP 390E 5%
Q1		000-10003-10	TRANSISTOR SMD MMBFJ310 JFET SO UHF
Q2		000-10057-10	TRANSISTOR SMD MMBR571 NPN SOT-OWER
Q3		000-10057-10	TRANSISTOR SMD MMBR571 NPN SOT-OWER
Q4		000-10008-57	TRANSISTOR SMD BCW70/BC857 PNP ALL SIG
Q5		000-00032-47	TRANSISTOR MRF559 NPN XPACK UHF
R1		036-12220-00	RESISTOR M/F 0805 CHIP 22E 5%
R3		036-11470-00	RESISTOR M/F 0805 CHIP 4E7 10%
R6		036-12560-00	RESISTOR M/F 0805 CHIP 56E 5%
R7		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R8		036-12560-00	RESISTOR M/F 0805 CHIP 56E 5%
R9		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R10		036-12100-00	RESISTOR M/F 0805 CHIP 10E 5%
R11		036-14270-00	RESISTOR M/F 0805 CHIP 2K7 5%
R12		036-13180-00	RESISTOR M/F 0805 CHIP 180E 5%
R13		036-12220-00	RESISTOR M/F 0805 CHIP 22E 5%
R14		036-12560-00	RESISTOR M/F 0805 CHIP 56 E 5%
R15		036-12220-00	RESISTOR M/F 0805 CHIP 22E 5%
R16		036-13270-00	RESISTOR M/F 0805 CHIP 270E 5%
R17		036-13270-00	RESISTOR M/F 0805 CHIP 270E 5%
R18		036-12180-00	RESISTOR M/F 0805 CHIP 18E 5%
R19		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R20		036-14680-00	RESISTOR M/F 0805 CHIP 6K8 5%
R21		036-14100-00	RESISTOR M/F 0805 CHIP 1K 5%
R22		036-14220-00	RESISTOR M/F 0805 CHIP 2K2 5%
R23		036-12180-00	RESISTOR M/F 0805 CHIP 18 E 5%
R24		036-12220-00	RESISTOR M/F 0805 CHIP 22E 5%
R25		036-13220-00	RESISTOR M/F 0805 CHIP 220E 5%

MISCELLANEOUS & MECHANICAL

IPN	DESCRIPTION
220-01176-01	PRINTED CIRCUIT BOARD T830 VCO

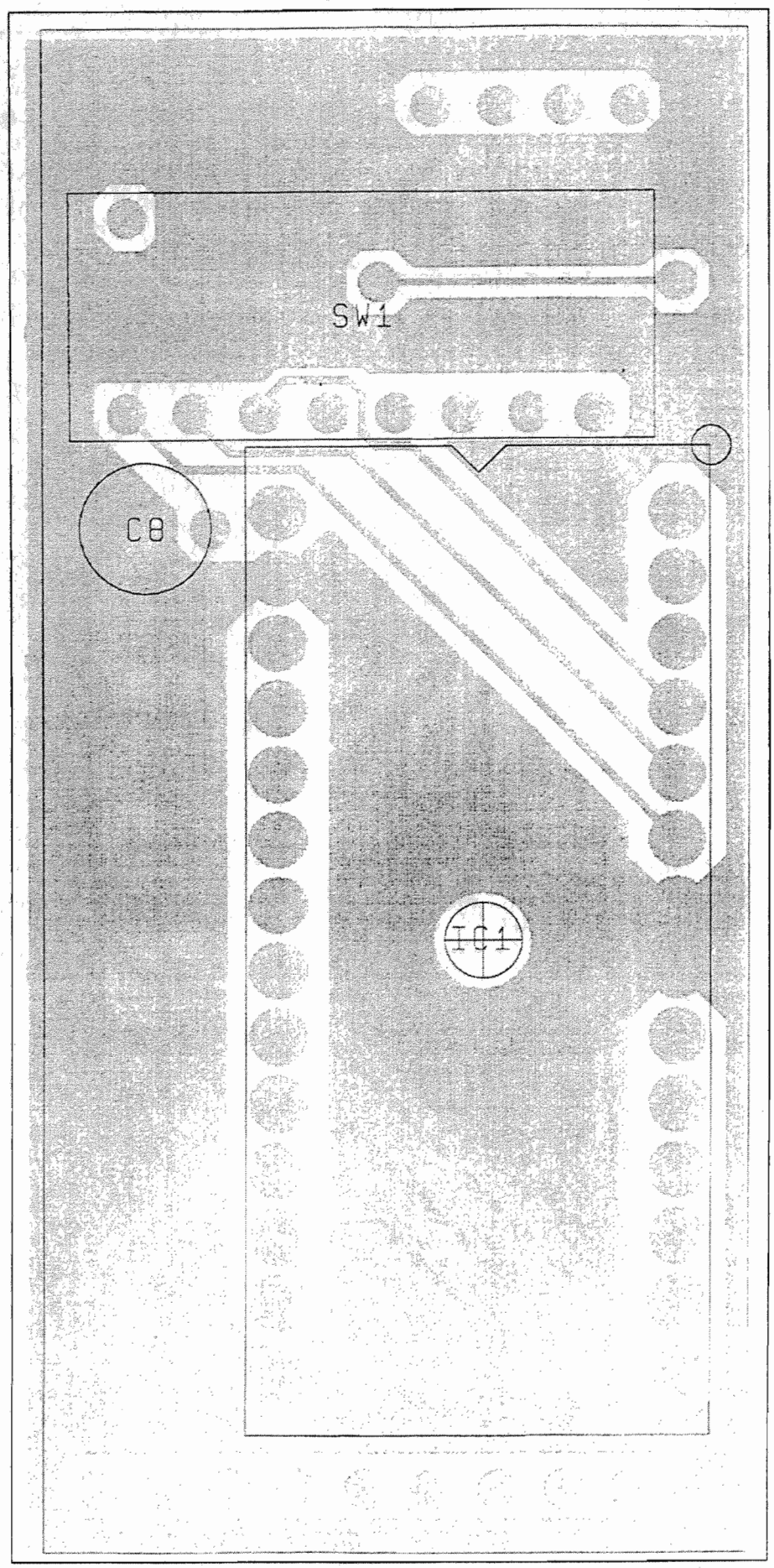
T800 EPROM PARTS LIST

REFERENCED PARTS

REF	IPN	DESCRIPTION
C1	015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C2	015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C3	015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C4	015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C5	015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C6	015-24100-08	CAPACITOR CERAMIC 0805 CHIP 1N 10% X7R 50V
C7	015-06100-08	CAPACITOR CERAMIC 1206 CHIP 100N 10% X7R 50V
C8	025-08100-02	CAPACITOR TANT BEAD 10M 10% 16V
D1	001-10000-70	DIODE SMD BAV70 DUAL SWITCH SOT-23 COMMON CATHODE
D2	001-10000-70	DIODE SMD BAV70 DUAL SWITCH SOT-23 COMMON CATHODE
D3	001-10000-70	DIODE SMD BAV70 DUAL SWITCH SOT-23 COMMON CATHODE
IC1	002-00018-04	INTEGRATED CCT 27C64 CMOS 8K*8 UV EPROM (S)
PL1	240-00020-57	HEADER 10 WAY 1 ROW PCB MTG
R	036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R1	036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R2	036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R3	036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R4	036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R5	036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R6	036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R7	036-15100-00	RESISTOR M/F 0805 CHIP 10K 5%
R9	036-12220-00	RESISTOR M/F 0805 CHIP 22E 5%
SW1	230-00010-19	SWITCH*8 SPST DIP PACKAGE
SK1	240-04020-57	SOCKET 10 WAY 1ROW PCB MTG TOP ENTRY

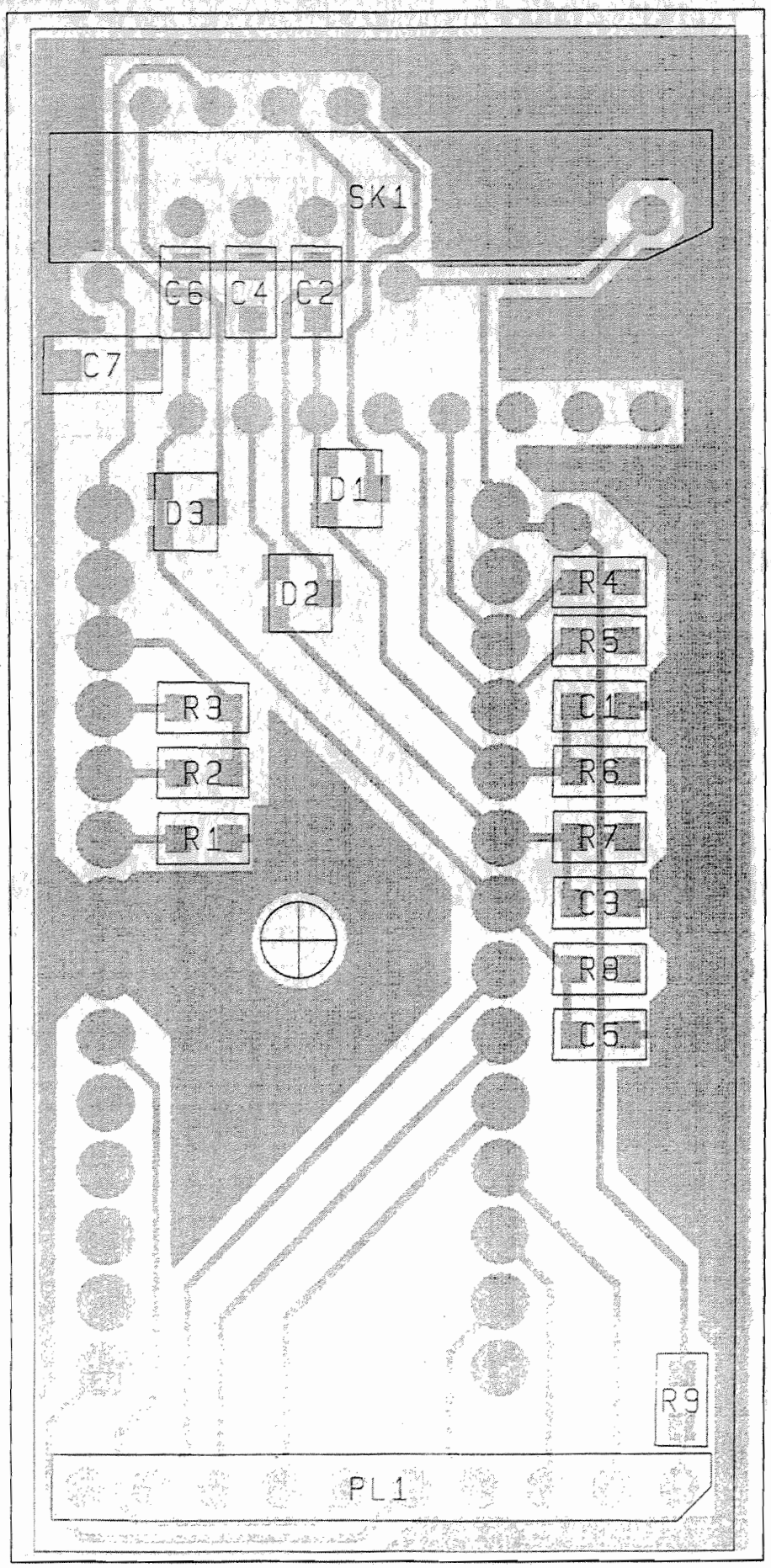
MISCELLANEOUS & MECHANICAL

IPN	DESCRIPTION
220-01144-00	PRINTED CIRCUIT BOARD T855/856/857 MEMORY
240-04020-35	SOCKET,28 PIN DIL INTEGRATED CCT,LOW PROFILE



220-00011-44B

DIAGRAM 1 - EPROM PCB LAYOUT - TOP SIDE



220-0001-44B

DIAGRAM 2 - EPROM PCB LAYOUT - BOTTOM SIDE

IPN: 220-01176-01 ISSUE: 1B

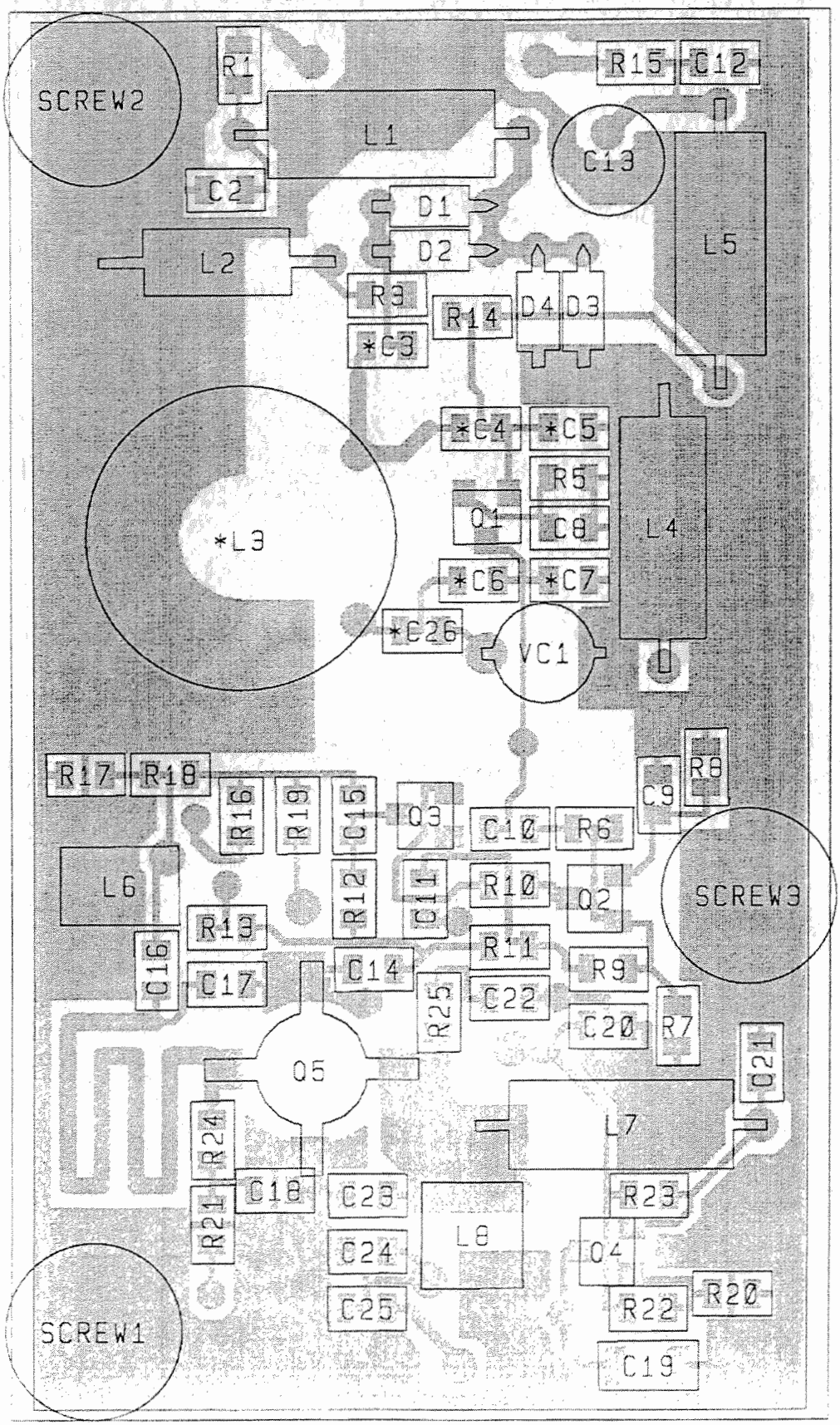


DIAGRAM 3 - VCO PCB LAYOUT - TOP SIDE

IPN: 220-01176-01 ISSUE: 1B

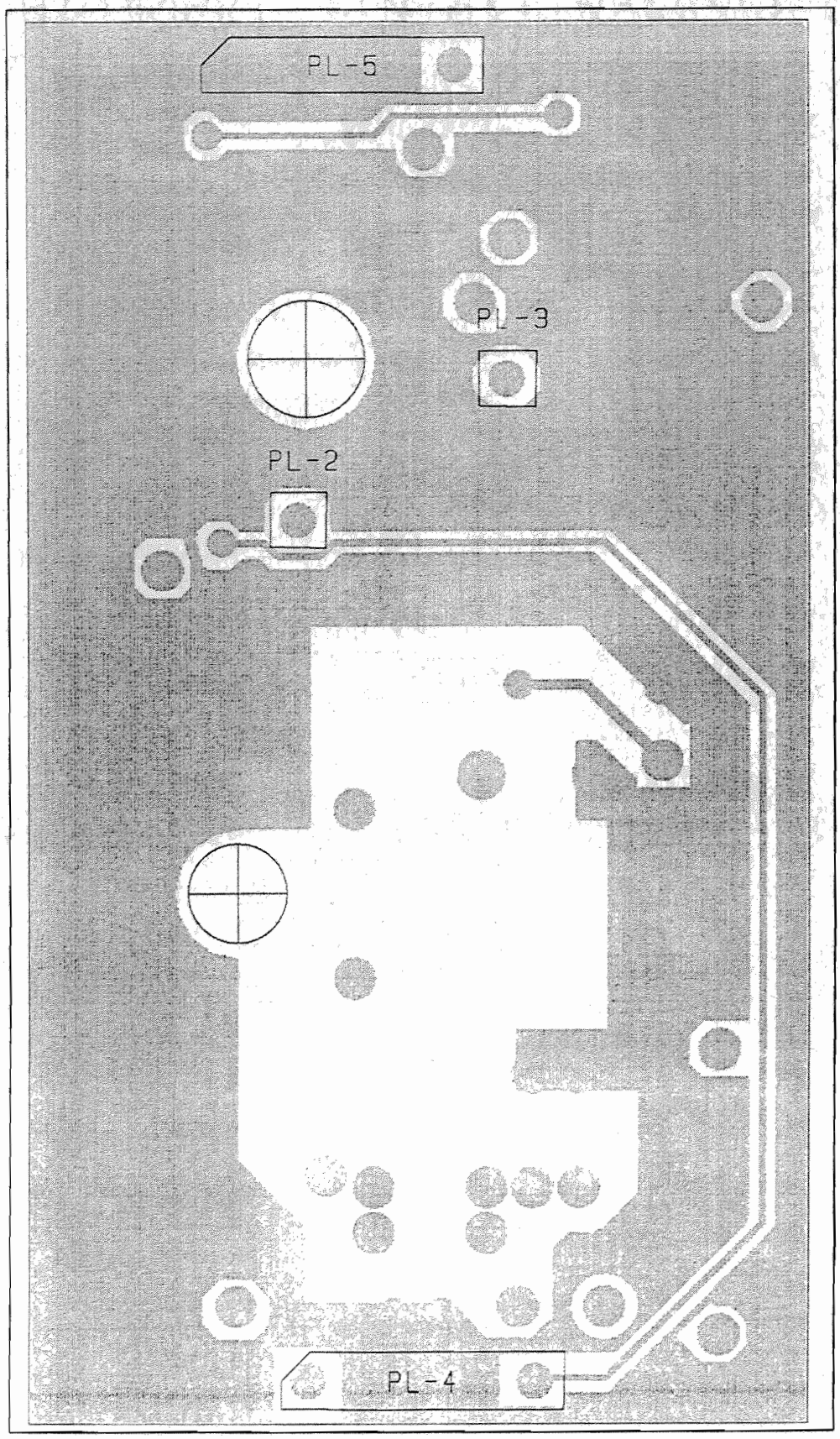


DIAGRAM 4 - VCO PCB LAYOUT - BOTTOM SIDE

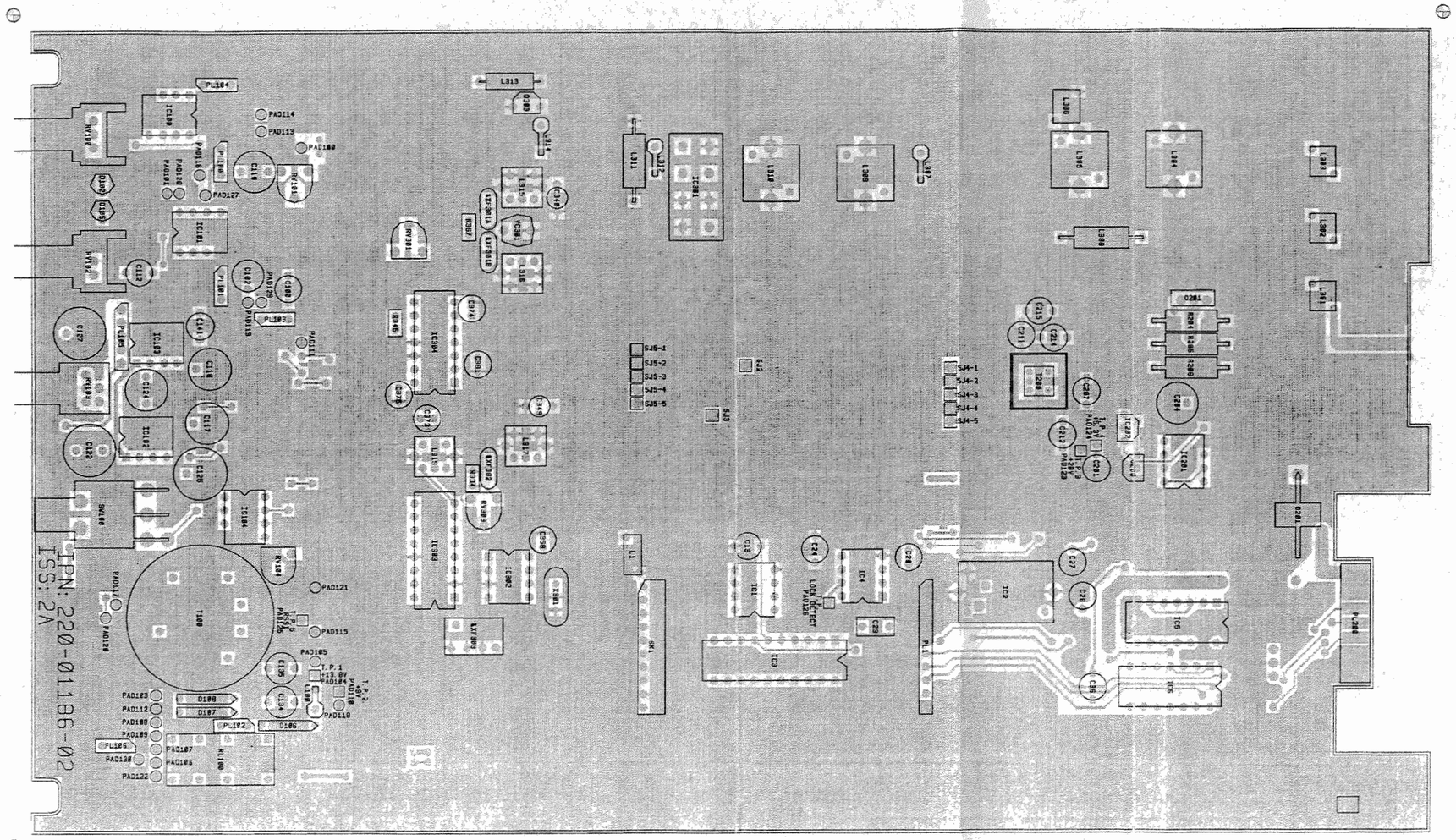


DIAGRAM 5 T835 PCB LAYOUT - TOP SIDE

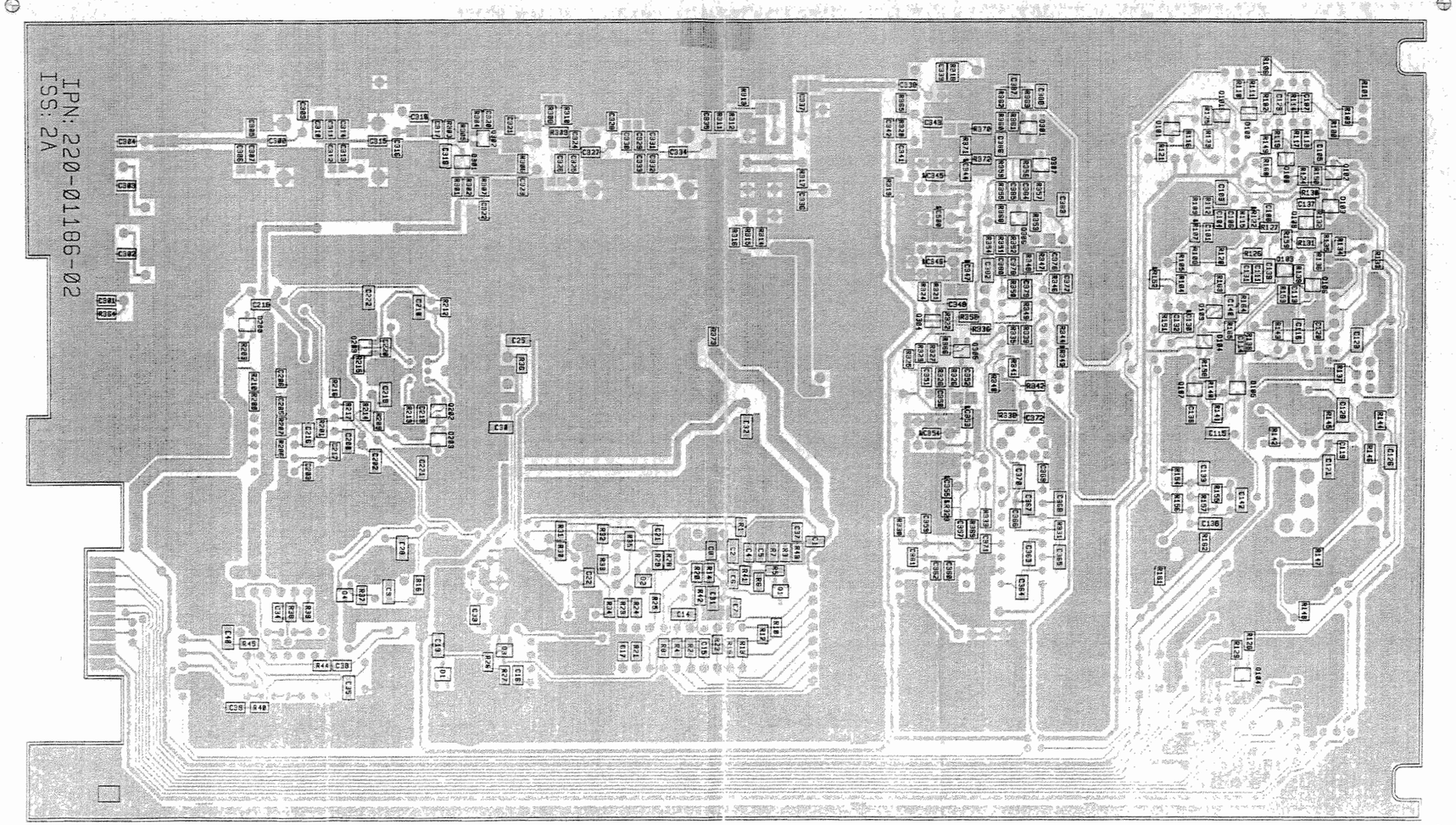
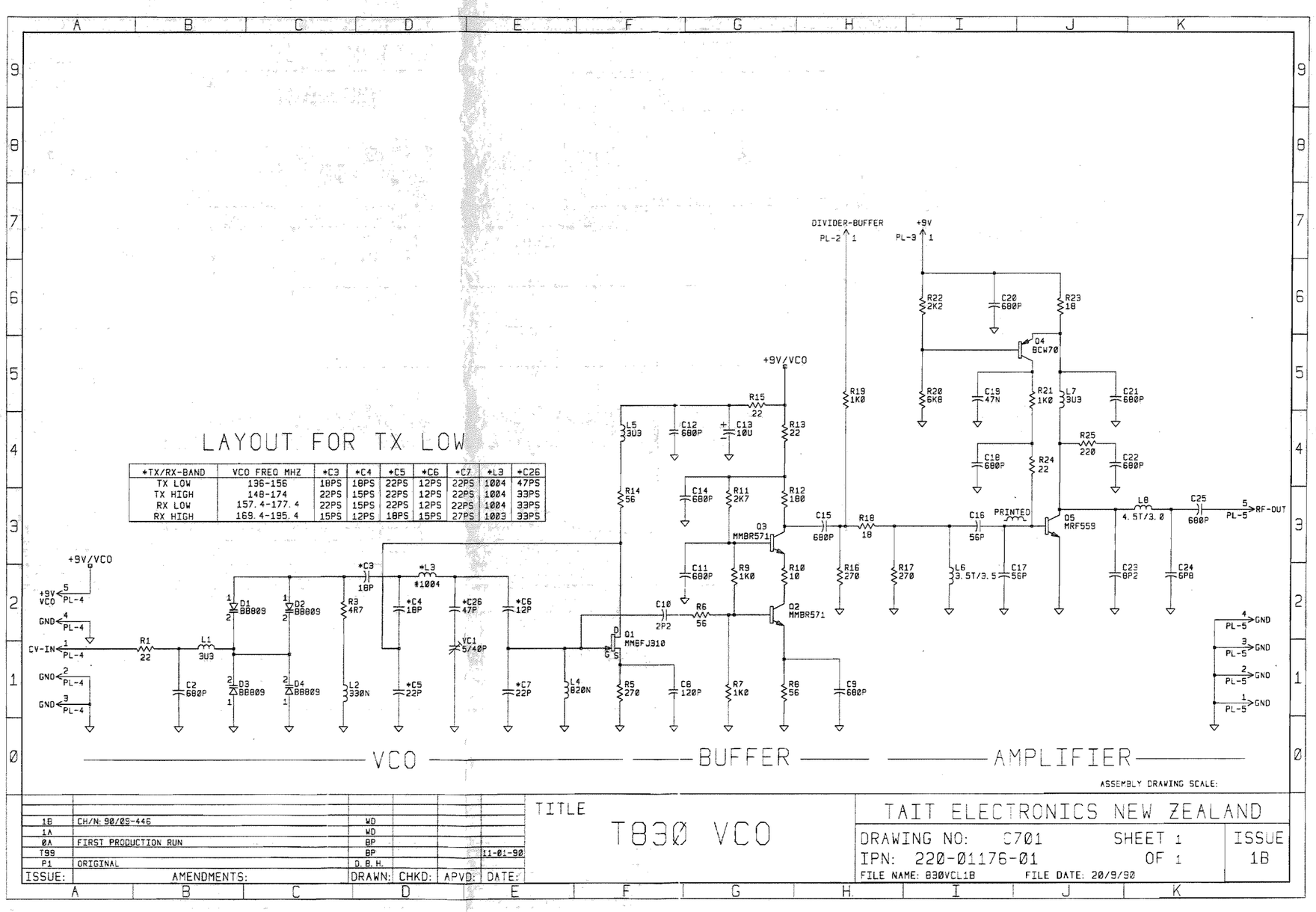


DIAGRAM 6 T835 PCB LAYOUT - BOTTOM SIDE



LAYOUT FOR TX LOW

*TX/RX-BAND	VCO FREQ MHZ	*C3	*C4	*C5	*C6	*C7	*L3	*C26
TX LOW	136-156	18PS	18PS	22PS	12PS	22PS	1004	47PS
TX HIGH	148-174	22PS	15PS	22PS	12PS	22PS	1004	33PS
RX LOW	157.4-177.4	22PS	15PS	22PS	12PS	22PS	1004	33PS
RX HIGH	169.4-195.4	15PS	12PS	18PS	15PS	27PS	1003	33PS

ASSEMBLY DRAWING SCALE:

ISSUE:	AMENDMENTS:	DRAWN:	CHKD:	APVD:	DATE:
1B	CH/N: 90/05-446	WD			
1A		WD			
0A	FIRST PRODUCTION RUN	BP			
T99		BP			11-01-90
P1	ORIGINAL	D.B.H.			

TITLE

T830 VCO

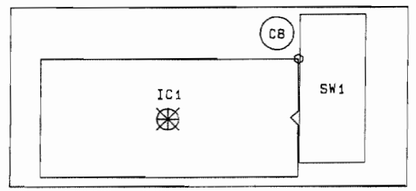
TAIT ELECTRONICS NEW ZEALAND

DRAWING NO: C701 SHEET 1 OF 1 ISSUE 1B

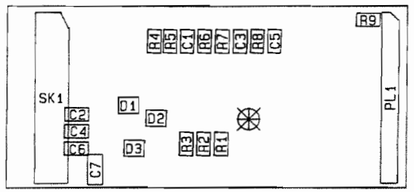
IPN: 220-01176-01

FILE NAME: 830VCL1B FILE DATE: 20/9/90

TOP SIDE



BOTTOM SIDE



CONNECTORS

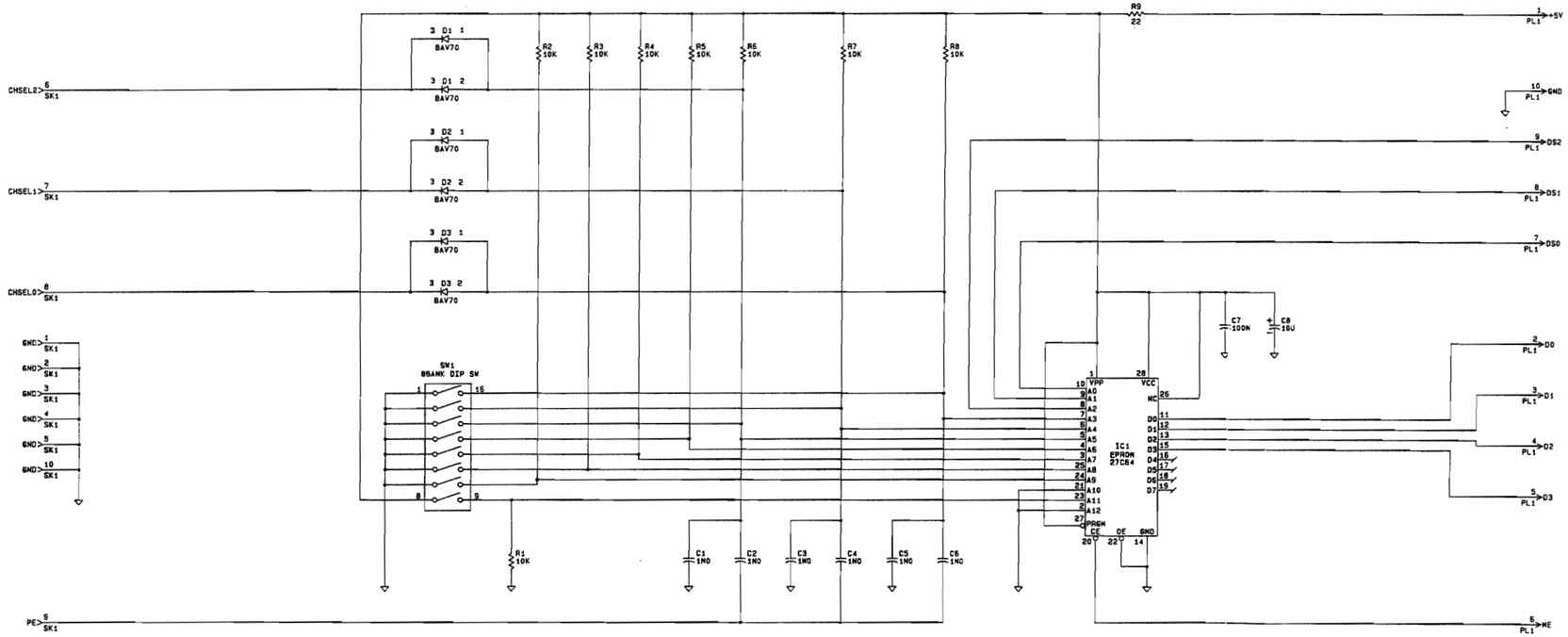


Diagram 1 EPROM Circuit Diagram

ISSUE:	AMENDMENTS:	DRAWN:	CHKD:	APVD:	DATE:
B	CH. NO. 89/05 257	B.P			2/6/89
A		RH			
PROT:		RH			

TITLE

T855/T857
EPROM

TAIT ELECTRONICS NEW ZEALAND

DRAWING NO: C656	SHEET 1	ISSUE
IPN: 220-00011-44	OF 1	B
FILE NAME: 855EPLB	FILE DATE: 02/06/89	

&BW	&C344	&C345	&C346	&C347	&C353	&C354	&C355	&R328	&R343	&XF301A	&XF301B	&XF302	&XF303	&C508
WB	27PS	10NS	10NS	27PS	27PS	10NS	0P5S	1MG05	10KS	21N15B	21N15B	21N15A	CFW455E	8PSS
NB	39PS	82PS	82PS	39PS	39PS	82PS	1P6S	3K3S	4K7S	21N7.5B	21N7.5B	21N7.5A	CFW455D	10PS

FREQUENCY	135-155	155-175
LINK1	IN	OUT
LINK2	IN	OUT
LINK3	IN	OUT
LINK4	IN	OUT
LINK5	IN	OUT
LINK6	IN	OUT
LINK A	OUT	IN
LINK B	IN	OUT

T.B. = TEST BREAK

SENSITIVITY

RSSI LEVEL

NOISE MUTE GAIN

ISSUE:	AMENDMENTS:	DRAWN:	CHKD:	APVD:	DATE:
2A	C#/N 98-11-569	WMD			
1A	C#/N 98-09-411	WMD			
A		WMD			
TBB		WMD			
P1		WMD			

TITLE

T835 RECEIVER

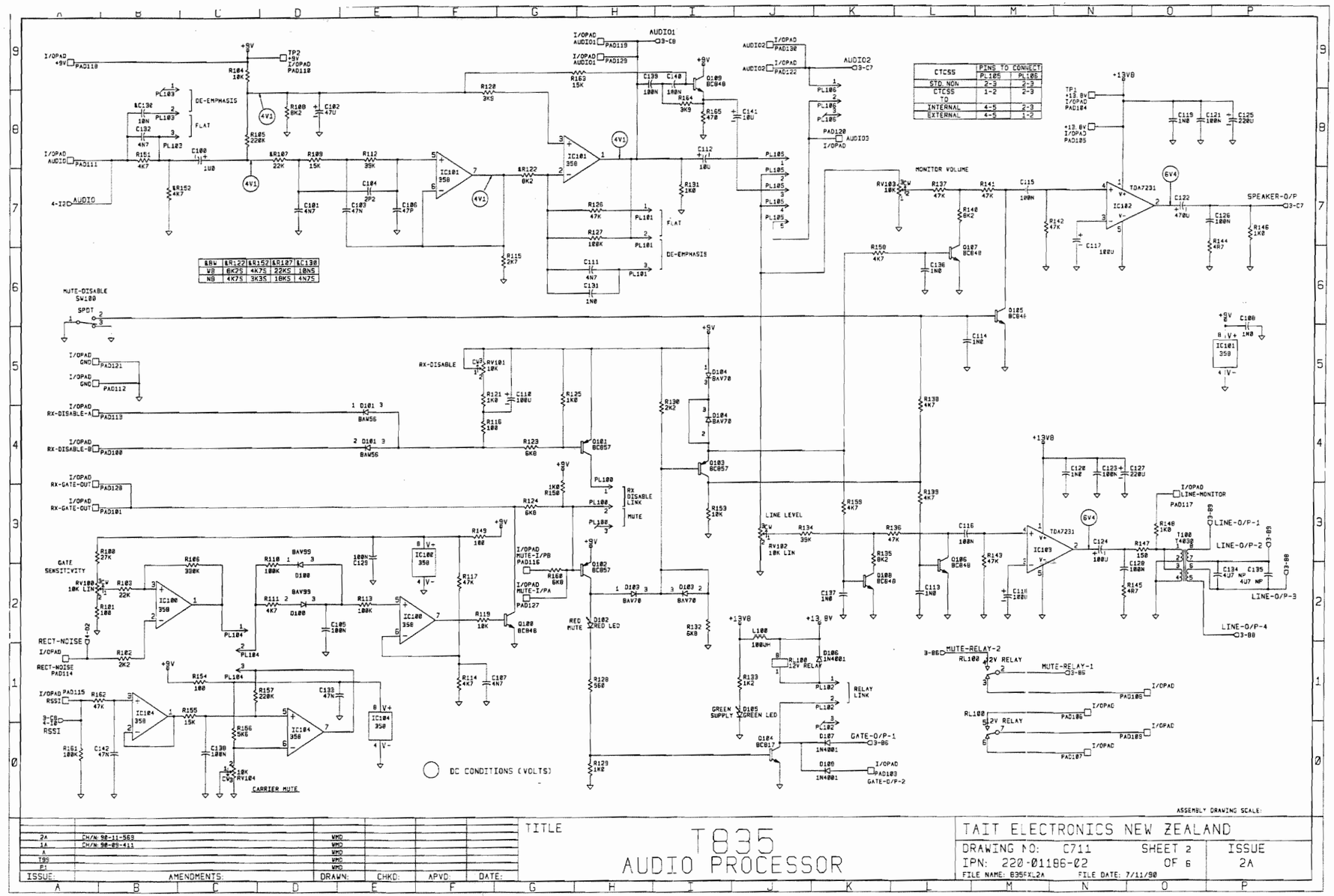
ASSEMBLY DRAWING SCALE:

TAIT ELECTRONICS NEW ZEALAND

DRAWING NO: C711 SHEET 4 OF 6 ISSUE 2A

IPN: 220-01186-02

FILE NAME: B35RXL2A FILE DATE: 7/11/98



CTCSS	PINS TO CONNECT	
	PL105	PL106
STD NON CTCSS	2-3	2-3
	1-2	2-3
INTERNAL	4-5	2-3
EXTERNAL	4-5	1-2

&BW	&R127	&R152	&R107	&C138
WB	6K25	4K75	22K5	18N5
NB	4K75	3K35	10K5	4N75

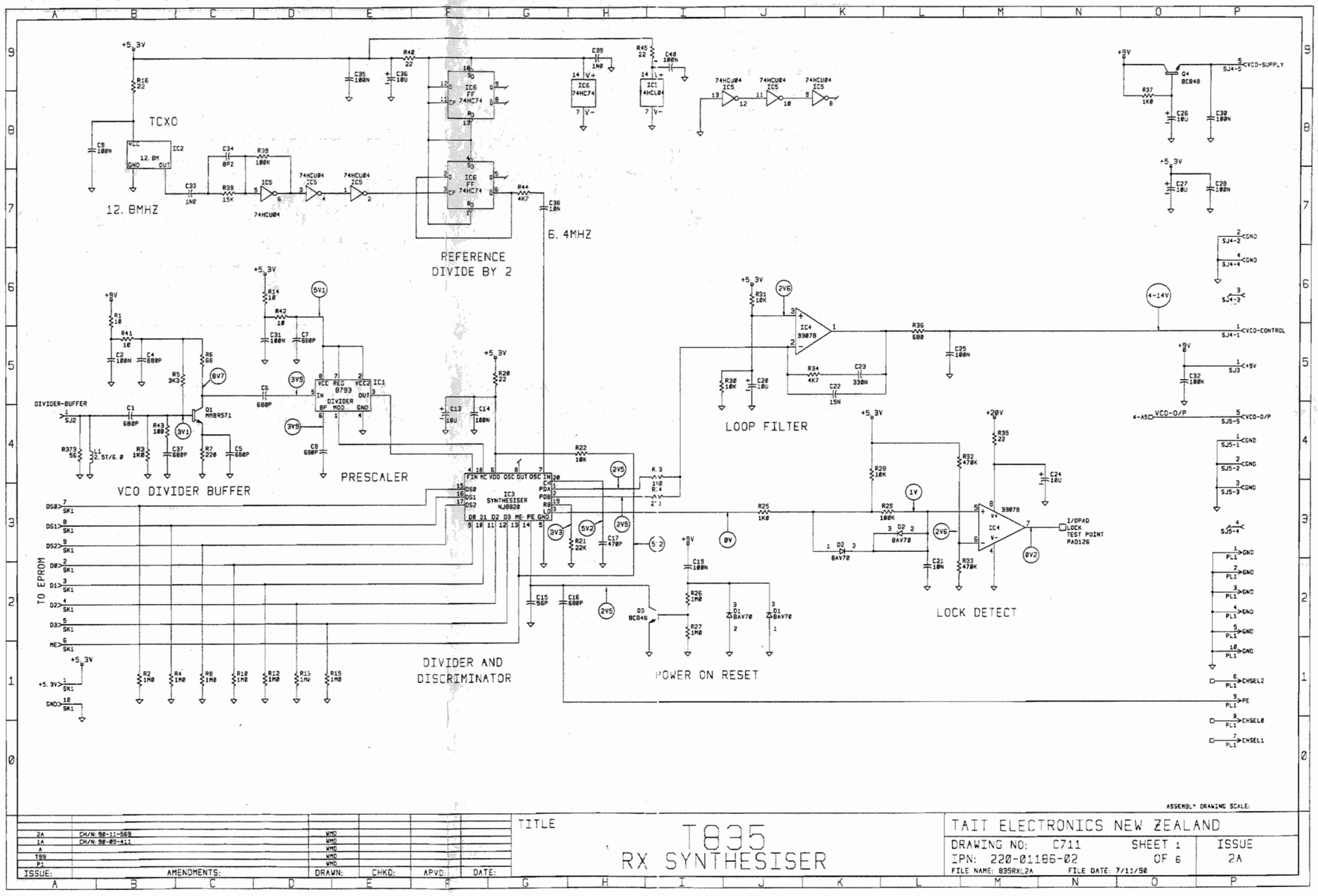
ISSUE:	AMENDMENTS:	DRAWN:	CHKD:	APVD:	DATE:
2A	CH/N: 92-11-563	WMD			
1A	CH/N: 92-05-411	WMD			
A		WMD			
195		WMD			
P1		WMD			

TITLE

T835 AUDIO PROCESSOR

TAIT ELECTRONICS NEW ZEALAND

DRAWING NO: C711	SHEET 2 OF 6	ISSUE 2A
IPN: 220-01186-02		
FILE NAME: 835FKL2A	FILE DATE: 7/11/90	



ISSUE:	AMENDMENTS:	DRAWN:	CHKD:	APVD:	DATE:
2A	CH/N: 98-11-569	WMD			
1A	CH/N: 98-05-411	WMD			
A		WMD			
199		WMD			
P1		WMD			

ASSEMBLY DRAWING SCALE:

TITLE

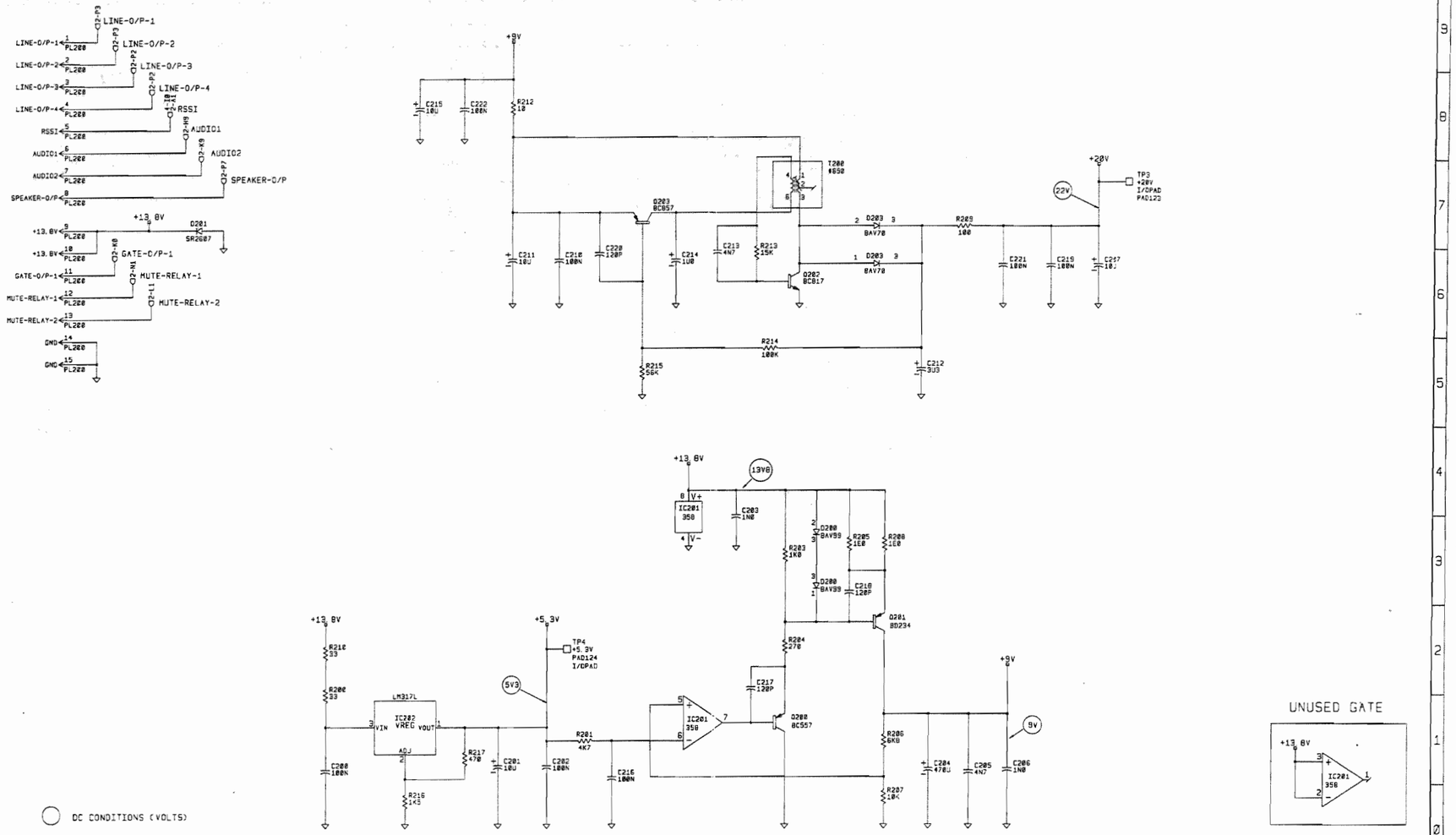
T835
RX SYNTHESISER

TAIT ELECTRONICS NEW ZEALAND

DRAWING NO: C711 SHEET 1 OF 6 ISSUE 2A

IPN: 220-01186-02

FILE NAME: B35RXL2A FILE DATE: 7/11/98


LINE-O/P-1
LINE-O/P-2
LINE-O/P-3
LINE-O/P-4
RSSI
AUDIO1
AUDIO2
SPEAKER-O/P
+13.8V
GATE-O/P-1
MUTE-RELAY-1
MUTE-RELAY-2
GND
+8V
+20V
+13.8V
+5.3V
+9V
LM317L
DC CONDITIONS (VOLTS)
UNUSED GATE
ASSEMBLY DRAWING SCALE:
TITLE
T835
REGULATOR
TAIT ELECTRONICS NEW ZEALAND
DRAWING NO: C711
SHEET 3
OF 5
IPN: 220-01186-02
ISSUE
2A
FILE NAME: 835RXL2A
FILE DATE: 7/11/90
ISSUE:
AMENDMENTS:
DRAWN:
CHKD:
APVD:
DATE:
2A CH/N 92-11-569
1A CH/N 92-05-411
A
T85
P1
WMD