

5 T856/857 Fault Finding

The following test procedures and fault finding flow charts may be used to help locate a hardware problem, however they are by no means a complete fault finding procedure. If the fault still exists after having progressed through them in a logical manner, contact your nearest authorised Tait Dealer or Service Centre. Further assistance may be obtained from the Customer Support Group, Radio Infrastructure Division, Tait Electronics Ltd, Christchurch, New Zealand.

Refer to Section 6 where the parts lists, grid reference index and diagrams will provide detailed information on identifying and locating components and test points on the main PCB. The parts lists and diagrams for the memory and VCO PCBs are in Part E.

The following topics are covered in this section.

Section	Title	Page
5.1	Visual Checks	5.3
5.2	Component Checks	5.3
5.3	DC Checks	5.4
5.3.1	Power Rails	5.4
5.3.2	VCO Locking	5.4
5.4	RF Checks	5.5
5.4.1	T856 Drive Power	5.5
5.4.2	T856 PA Output Power	5.5
5.4.3	T857 Output Power	5.5
5.4.4	Audio And Modulation	5.6
5.5	Fault Finding Charts	5.7
5.5.1	Regulator	5.7
5.5.2	Synthesiser	5.8
5.5.3	T856 Drive Amplifier	5.10
5.5.4	T856 PA & Power Control	5.11
5.5.5	T857 Exciter Drive Amplifier	5.12
5.5.6	Audio Processor	5.13

5.1 Visual Checks

Remove the covers from the T856/857 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 Section 3 of Part A.

5.2 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 desoldered). A 20k ohm/V or better multimeter should be used for taking the measurements, using only the medium or low resistance ranges.

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

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

5.3 DC Checks

5.3.1 Power Rails

Refer to the test points and options diagrams (Section 6) for test point locations, and to the regulator fault finding chart (Section 5.5.1) for fault diagnosis.

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

Check the 5V (TP4) and 20V (TP3) rails at their respective test points in the synthesiser compartment.

Check that Tx reg. (TP5) comes up to 8.8V when the exciter is keyed.

Check for short circuits.

5.3.2 VCO Locking

Key the exciter.

Using a DMM, monitor the VCO control voltage on the long lead of L1 (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 3 and 16V.

If the VCO is not locked, refer to the synthesiser fault finding chart (Section 5.5.2).

Note: When changing frequencies, only the three least significant bits of the EPROM address (e.g. DIP switch) will initiate a synthesiser programme cycle. Changing a high order bit will therefore not result in a change of frequency unless a low order bit is also changed last.

5.4 RF Checks

In-circuit RF levels may be measured with an RF probe on which the earth lead has been shortened to a minimum (i.e. 13mm). Refer to the circuit diagrams for typical levels.

5.4.1 T856 Drive Power

Refer to the drive amplifier fault finding chart (Section 5.5.3).

Ensure that the VCO locks (refer to Section 5.3.2).

Connect the drive output to a power meter and key the transmitter.

Check that the output power is between 700 and 1300mW.

Note: The lock detector (synthesiser, IC5 pin 3) will not allow the RF signal to reach the PA if the synthesiser is out of lock.

5.4.2 T856 PA Output Power

Refer to the PA & power control fault finding chart (Section 5.5.4).

Reconnect the drive output to the PA input.

Connect the PA to a power meter and key the transmitter.

Check that the output power is >30W with power control RV356 adjusted fully clockwise.

5.4.3 T857 Output Power

Refer to the exciter drive amplifier fault finding chart (Section 5.5.5).

Ensure that the VCO locks (refer to Section 5.3.2).

Connect the exciter output to a power meter and key the exciter.

Check that the output power is between 700 and 1300mW.

Note: The lock detector (synthesiser, IC5 pin 3) will not allow the RF signal to reach the drive amplifier if the synthesiser is out of lock. This is achieved by the use of a diode switch formed by D302, D303 and D304.

5.4.4 Audio And Modulation

Refer to the audio processor fault finding chart (Section 5.5.6).

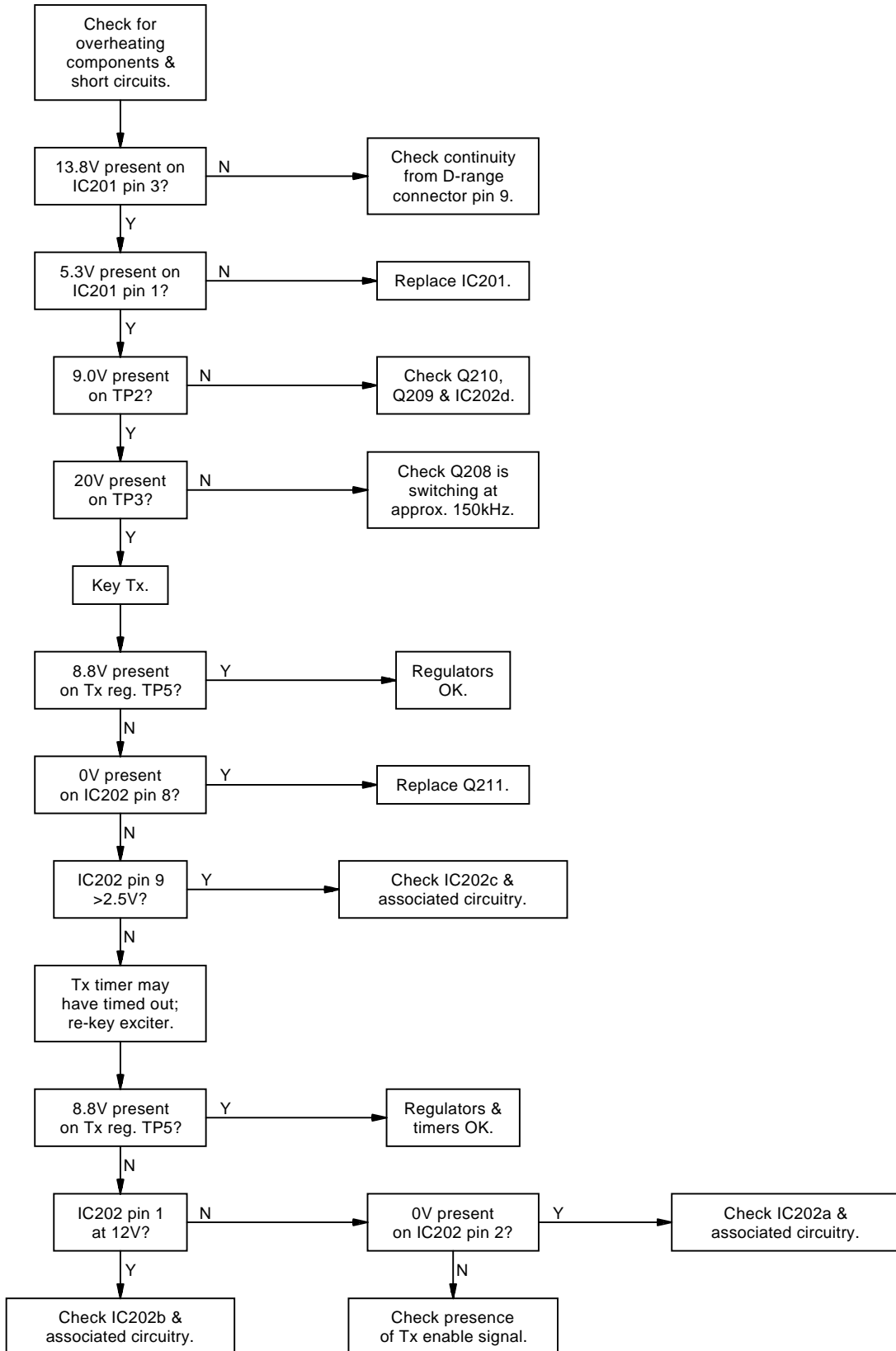
Set up the audio processor as described in Section 3.8.

Check that the demodulated RF output has the frequency response referred to in Section 4.6 with at least 5kHz [2.5kHz] (10kHz) deviation available at 1kHz modulating frequency.

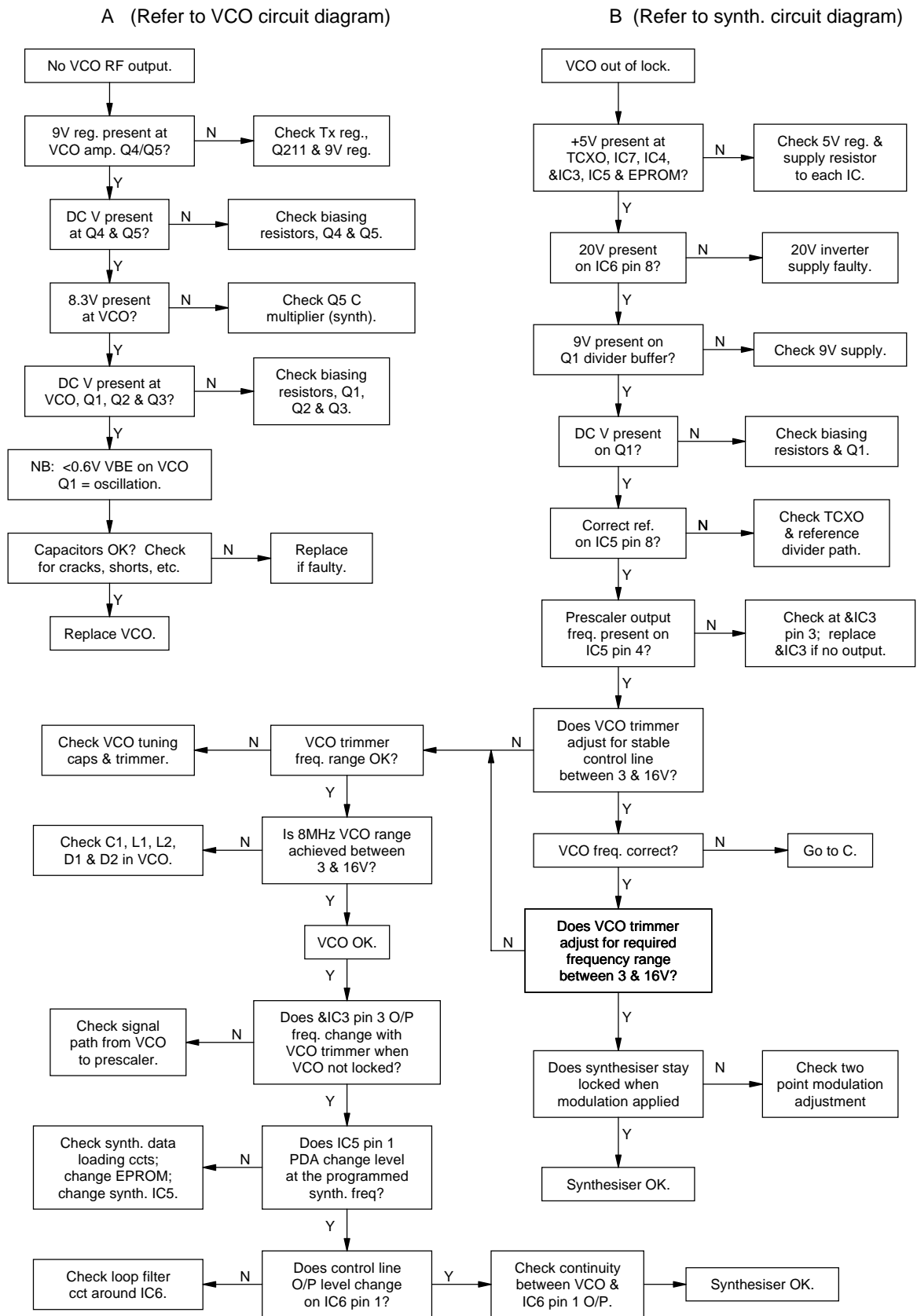
If the above result is not achieved, either the two modulators are incorrectly adjusted or a fault condition exists.

5.5 Fault Finding Charts

5.5.1 Regulator

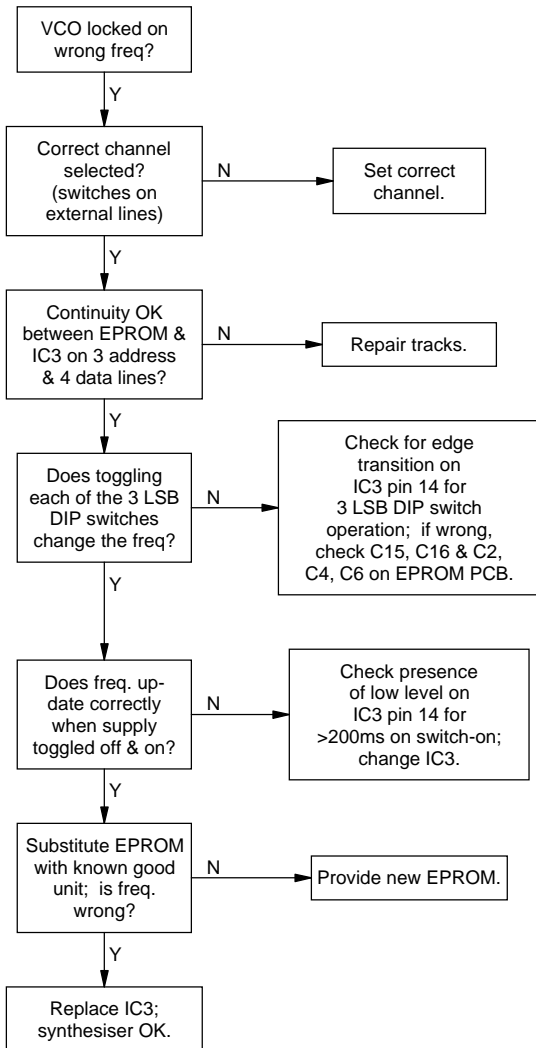


5.5.2 Synthesiser

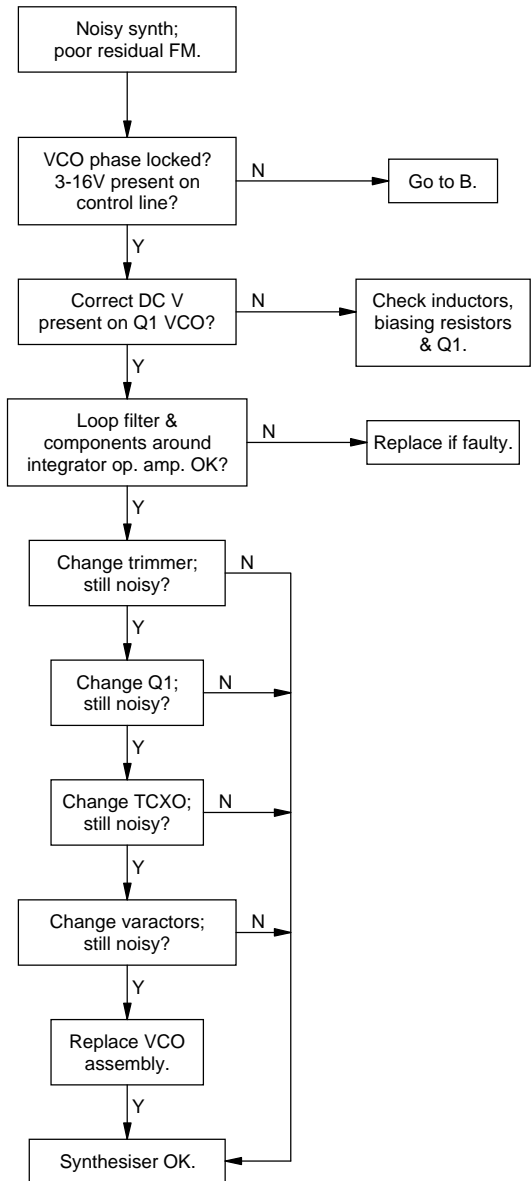


Continued on next page.

C (Refer to synth. circuit diagram)

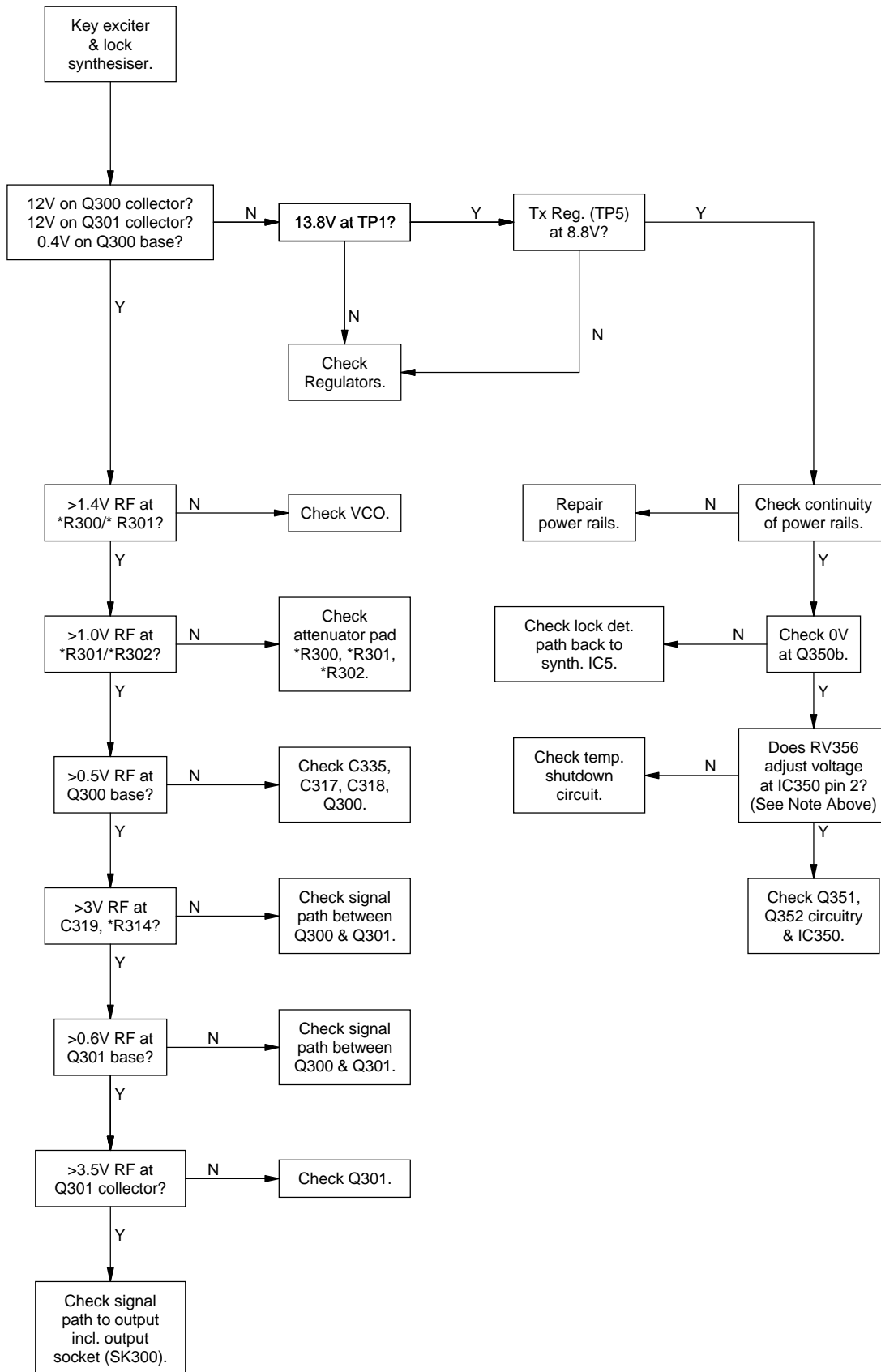


D (Refer to synth. & VCO circuit diagrams)

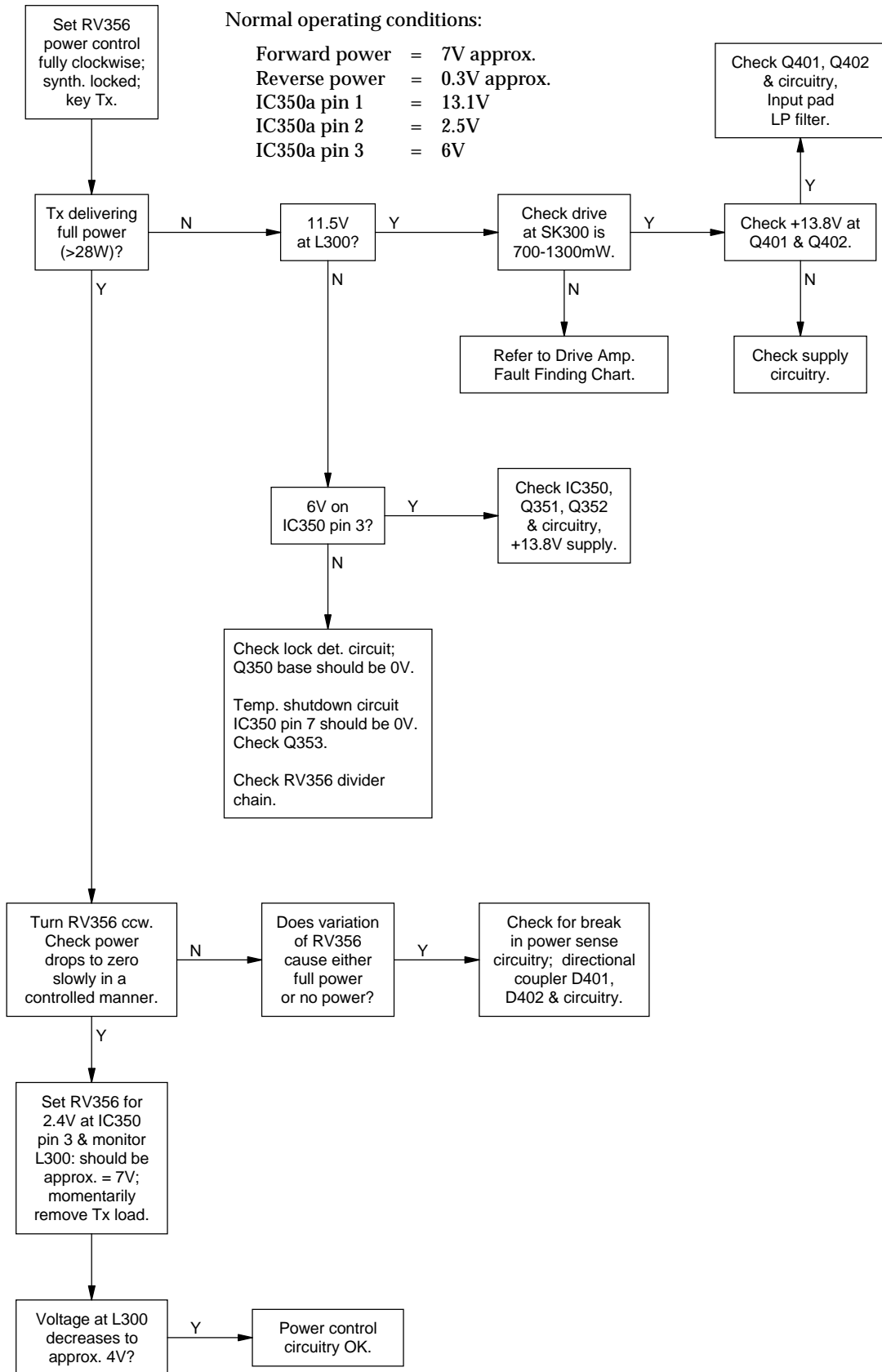


5.5.3 T856 Drive Amplifier

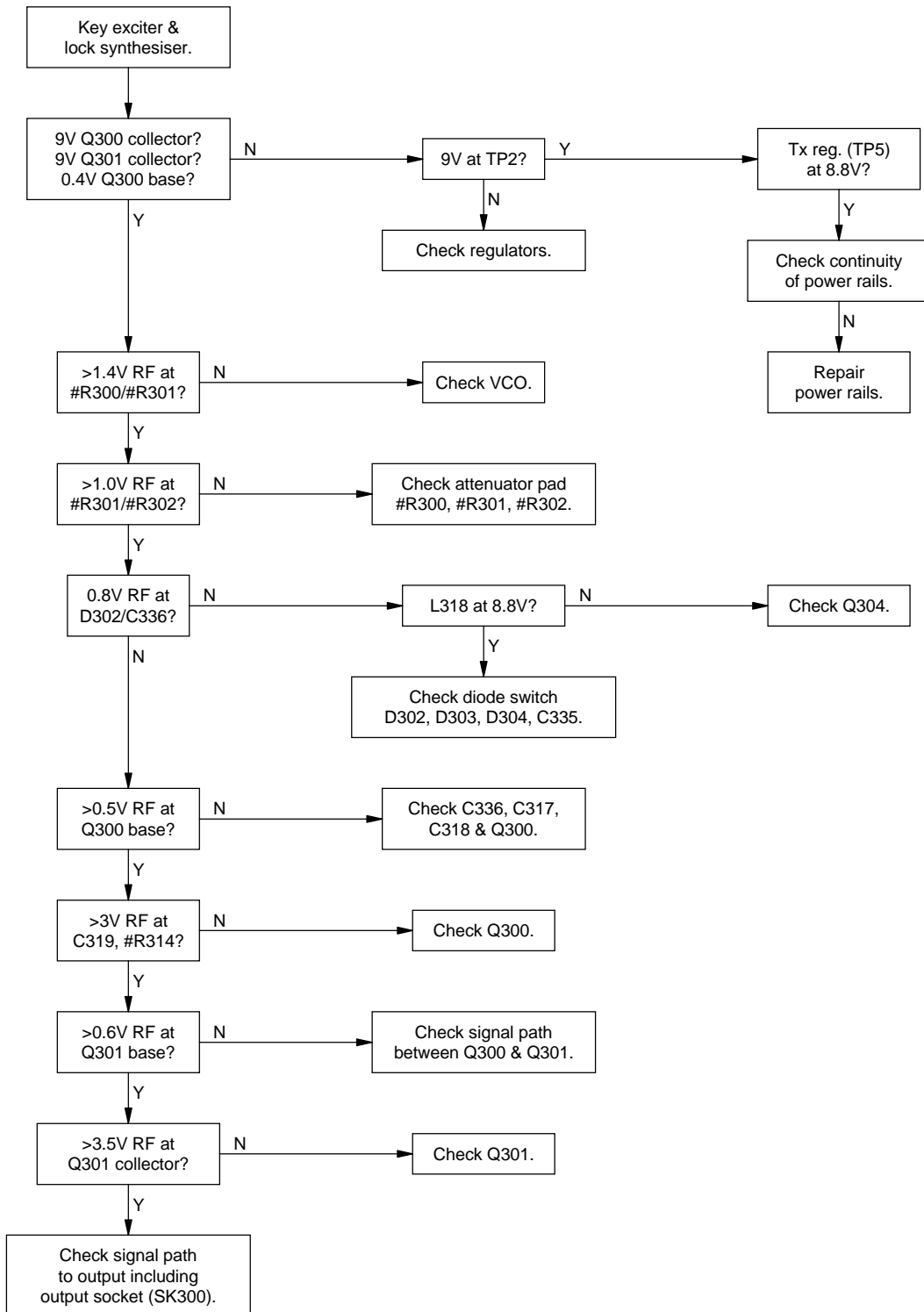
Note: On early issue PCBs RV356 acts on pin 3 of IC350.



5.5.4 T826 PA & Power Control



5.5.5 T827 Exciter Drive Amplifier



5.5.6 Audio Processor

