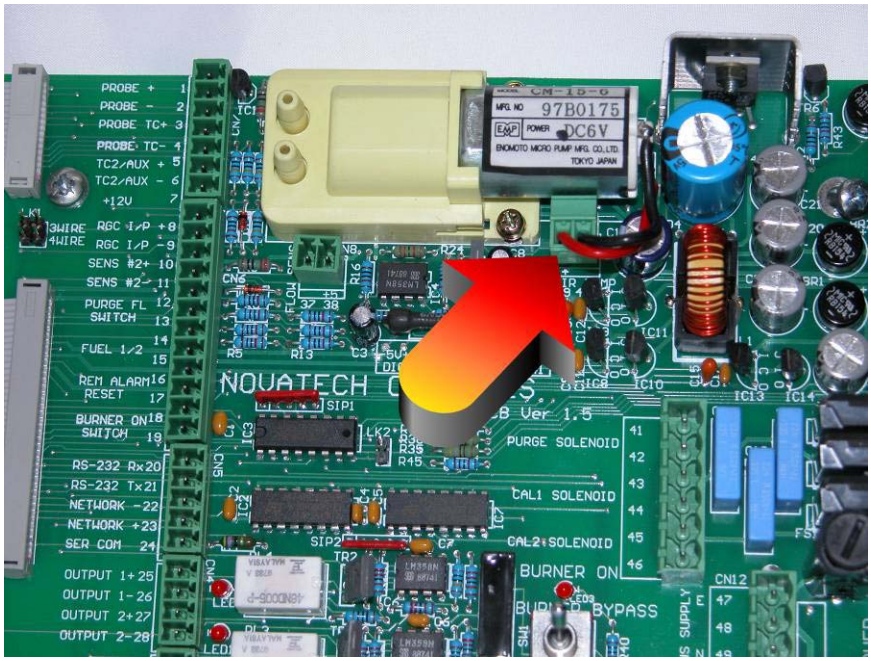
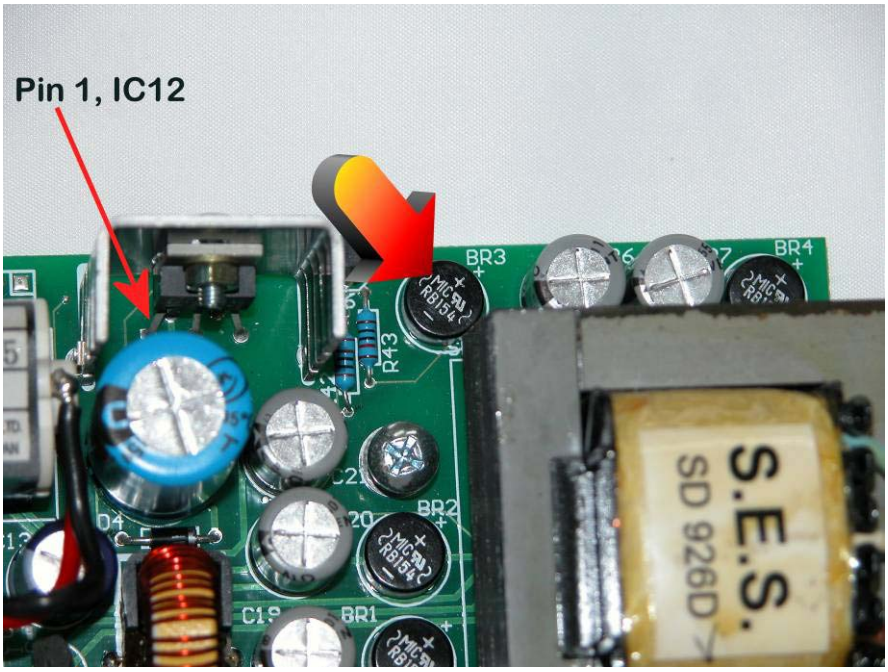
163x +5V Rail

The +5V rail in a 1630 series analyser can cause the microprocessor to “reset” if the rail drops to 4.93V. This note lists the known common causes and cures for a poor quality 5V rail.

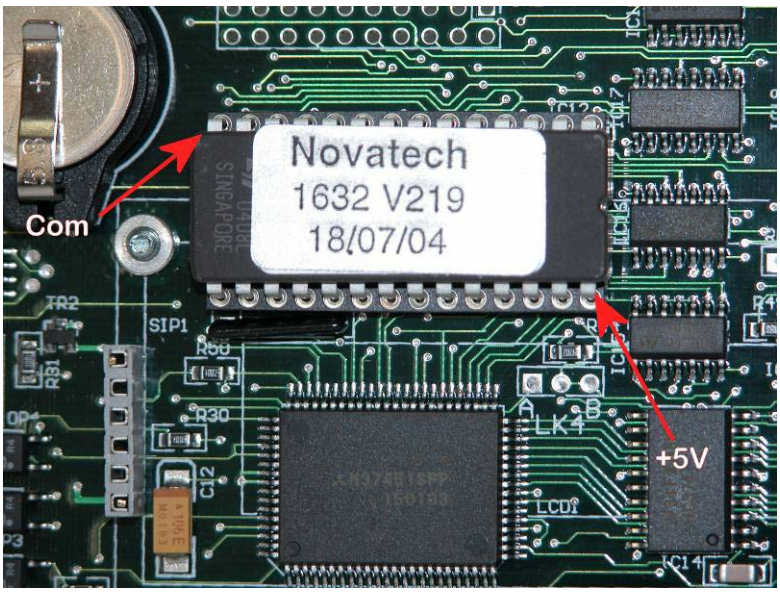
1) The CM-15 reference air pump is worn and is drawing a higher than normal current from the 5V rail. This normally results in the analyser constantly resetting it self when the pump is turned on at the end of the start-up sequence. If this stops when the pump cable is unplugged then the pump requires replacement.



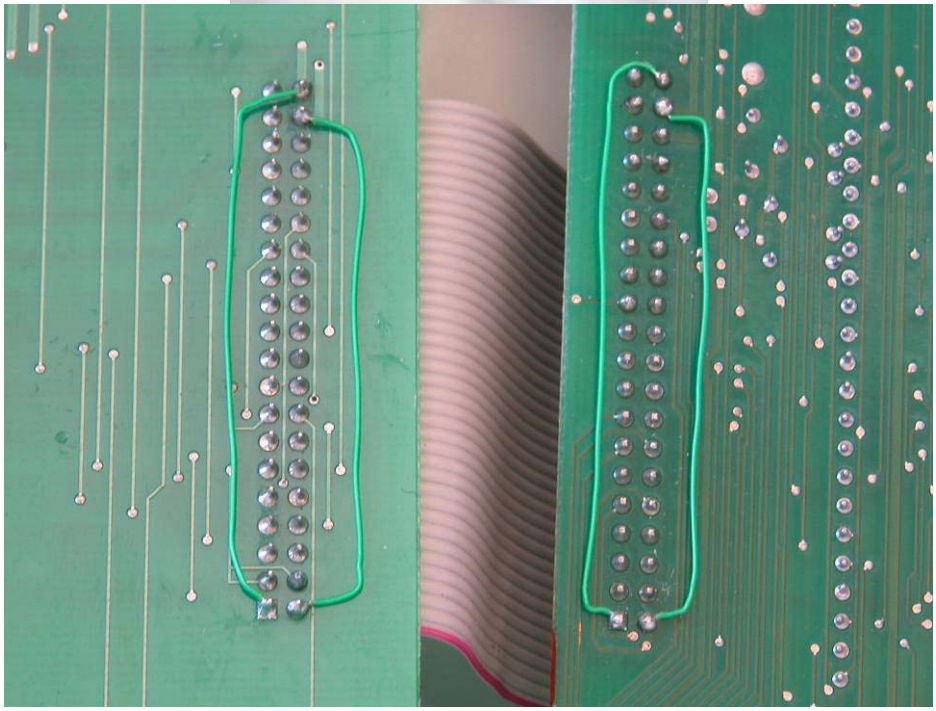
2) The bridge rectifier, BR3, has an open circuit diode reducing the available power from the 5V rail. This can be confirmed measuring the pre-regulated DC voltage on pin 1 of IC12, this should be between 14 & 18VDC, or by using a CRO. Replace BR3 and make sure the component is installed so there is at least 3mm between the component and the circuit board. This helps the component to dissipate heat.



3) On analysers with version 1.6 or earlier 1630-2 boards, the 40-way ribbon cable is worn or damaged. Measure the 5V rail on the 1630-2 PSU board and then on the 1630-1 board. If the value measured on the 1630-1 board is less than the value measured on the 1630-2 then the ribbon cable is causing excessive voltage drop.



There are spare conductors in the ribbon cable that can be utilised for the 5V rail and the common of the power supply. Solder two jumpers to each of the headers as shown below.



4) The DC-to-DC converter, PS1, that powers the output 4-20mA channel 2, can be damaged if a power supply is connected in an attempt to loop power the output circuit. The isolated 4-20mA outputs are active outputs on the 1630 series of analysers. When the DC-to-DC converter is damaged due to loop powering it will overload the +5V rail causing the component to rise in temperature.

   Replace the DC-to-DC converter, PS1, with an HPR-104 (5V to +/-12V).