

The (Aztec) trickle problem and its solution.

The +5V.TRKL supply voltage for the power-on circuit, as fed to pin 10 of the (Macintosh IIcx/IIci) power supply connector, is in the Aztec power supply generated on the top PCB (95402 A) with a circuit that (a.o.) consists of C34 (33 nF), Q5 and Q6 (transistors) and D15. This circuit forms a sawtooth oscillator (sawtooth voltage on C34), the output of which is fed to the transformer T4, in order to galvanically separate the trickle supply from the mains (the sawtooth generator is on the primary side !).

The function of D15 is to compensate a voltage (junction) gap, but this compensation is critical, unfortunately. Therefore, the oscillator can end up in a stable, non oscillating state (minimum voltage over C34) and consequently no AC voltage on the secondary side of T4.

Simply superimposing a trickle voltage (5 V, > 5 mA) on pin 10 of the power supply connector (or the ADB connector) does not work, because signals from the sawtooth oscillator are used in other places of the supply as well.

The solution to the problem is to replace D15 by two silicon (signal) diodes, connected in series, thus doubling the voltage gap to 1.2 Volts. In that case, there is no stable non-oscillating state possible. In order to end up with (approximately) the original frequency (roughly 17 KHz), it might be considered to change C34 to 39 nF, but the value is by no means critical.

The change, though simple and very cheap, requires some experience with electronics and at least a soldering iron. Please note that the primary DC voltages are high (hundreds of Volts) and remain present some time after the supply has been disconnected.

Disconnect the computer, open it and remove the power supply (directions can be found on the internet). Remove the fan (latches on the bottom side). You may choose not to disconnect the fan, since the lock of the power connector (on the lower PCB) is hard to reach.

Open the power supply by removing its top cover (two screws) and remove the top insulation sheet. Remove the two screws with which the top PCB is fastened, pull it (a little) towards the rear and lift it. Unplug the mains connector from the top PCB (lock is on the down side !) and rotate the PCB far enough to see D15. Unsolder D15 (entirely) and connect it in series with another (similar) diode. Remount the duo and reverse the above steps (put everything together again).

The startup of the IIcx/IIci after this modification is always certain, but the startup delay depends on temperature. The colder the machine, the longer the delay.

You have gained the US\$ 15 of a new supply (if available !)