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Macintosh II, IIx & IIfx: Power Up Questions And Answers

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TOPIC ---

This article covers several questions about powering up a Macintosh II,
Macintosh IIx, and Macintosh IIfx.

DISCUSSION --

Question: Is there a way to power up the Macintosh when AC power is supplied,
instead of toggling the keyboard button or the power button on the back of the
Macintosh II?

Answer: There is a way to power up the Macintosh without pressing a button.
However, this requires modifying the power supply or using a power supply other
than the one supplied.

Circuitry in the Macintosh II, IIx and IIfx power supply senses a level
transition from the logic board, which is initiated by pressing either the
button on the back of the machine or the Power On key on the ADB keyboard. The
power supply must sense the transition to being the power-up cycle. If this
transition does not occur, the power-up sequence does not start. Therefore, if
the power supply is modified to provide (or another power supply is used that
provides) a steady voltage to the power fail signal line of the power supply,
the power-up sequence does not start.

Question: How does the power button on the back of the Macintosh work? Does it
short pins 2 and 4 on the ADB port, or does it do something else?

Answer: Pin 2 of the ADB port is the power on (PwrOn) signal line; pin 4 is
ground (Gnd). When the reset key is pressed, pin 4 (Gnd) is connected to pin 2
(PwrOn) through a 1N914 diode. This supplies Gnd to the input of a CMOS chip on
the logic board, which turns on a transistor and applies approximately +6VDC to
the power fail warning (PFW) signal line. This level shift on the PFW signal

line initiates the power-up sequence in the power supply. Once the power supply is powered up, +5VDC is applied through a diode to the same line, which keeps the power supply powered up.

Question: Can the power button on the back of the Macintosh be replaced with a power-sensing switch?

Answer: When replacing the switch on the back of the Macintosh:

- Ensure that all connections are correct (the switch is a double-pole, double-throw type).

- Ensure that the new switch performs the same functions as the original switch (that is, it switches ground in to the shut-down circuit to shut off the system, and it switches power in to the circuit to turn on the system).

Question: Can the logic in the power supply be bypassed so that it does not sense anything from the motherboard?

Answer: It may be possible to bypass the power fail logic in the power supply; however, it is probably easier to replace the power supply with one having the same functions, but that handles power fail differently. A power fail-type circuit is necessary because there is a thermal sensor on the Macintosh II logic board that shuts down the system if high temperature is detected. This same circuit also shuts off the power supply in response to the Shut Down menu command.

Another possible solution is to create a circuit that plugs into the ADB port, which generates pulses between 3.0VDC and 6.8VDC for >1.5 seconds on pins 2 and 4. This would trigger the power fail circuit in the present power supply to power it up.

The logic in the power supply also generates a PFW signal to the system when there is an AC input voltage failure. If AC power is removed, the power fail circuit pulls PFW low at least 2 ms before the DC power fails.

For further information on operational restrictions, see the "Designing Cards and Drivers for the Macintosh II and Macintosh SE" manual (Addison-Wesley, ISBN 0-201-19256-X), chapter 6, page 4.

All of these factors should be taken into consideration beforeremoving the existing power supply.

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