

EXPANDER MOTHERBOARD THEORY OF OPERATION

The Expander Motherboard serves two functions:

1. It busses power from the power supply to the fans and backplane.
2. It provides a minimum load of 15W to the +5V power supply to insure proper regulation.
3. It drives the front panel LED.

I. POWER BUSSING

1. Starting with Rev. C motherboards, the sense wires for the +5V supply are tied into the +5V and ground planes near the ribbon cables to allow the power supply to compensate for drops across the motherboard.
2. Power for the expander backplane is routed through the 20 pin power connector (J3) on the motherboard.
3. The JC and JD cables between the backplane and expander have 22 logic ground wires allocated to minimize any logic ground differential between the boxes.
4. DGND is connected directly to logic ground at the DIO connector. It is the responsibility of the I/O card designer to design the card such that large current glitches are not placed on this ground.
5. The small fan is an 18V fan that we run at 17V. The large fan is a 12V fan that we run at 11V. The two series diodes CR2 and CR3 drop the 12V supply from typically 12.4V - 2*(0.7V) to 11V. Diodes were used instead of a resistor to provide a more "current insensitive" supply to the fan.

II. LOAD RESISTORS

1. Load resistors were added across the +5V supply to provide a minimum load to the +5V supply. Without this minimum load, the +/-12V supplies were not guaranteed to be in regulation. The resistors are placed in front of the small fan for cooling and to be hidden from the customer.



III. LED POWER SENSE

1. A 15V zener diode was added to the motherboard to provide a power supply sense for the front panel LED circuit. +12V and -12V can only come up if the +5V supply is up. The circuit is designed such that if either of the +12V or -12V supplies are at 0V, there will be inadequate current to turn the front panel LED on. This circuit provides sort of a poor man's power supply up detector.