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ADB Devices: Power Requirements Cause Intermittent Failure 2/97

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TOPIC -----

I have been having problems with my PowerBook 5300 ADB devices. I have a mouse, keyboard, and an AppleVision 1710AV display connected. Is there a limit to how much power ADB devices should use? I have replaced my PowerBook logic board and I'm not sure if connecting too many ADB devices is causing the problem.

DISCUSSION -----

There should be no way that the ADB +5V line on the PowerBook 5300 can be "blown out" by connecting too many ADB devices. There is a protection circuitry that shuts the ADB +5vdc lines off when the load is exceeded. The protection circuitry is reset when the ADB load is removed.

When too many ADB devices are connected and the current load is too high, to protect the PowerBook the ADB power turns off. The connected ADB devices will stop working when this protection circuitry activates and shuts the ADB power off. When this happens, the ADB devices need to be physically disconnected to reactivate the +5vdc ADB line in the PowerBook. Once the devices have been disconnected and after a few minutes, the protection circuitry on the PowerBook 5300 is reset and the ADB +5 volt line reactivated.

If you connect enough devices to exceed the 200ma ADB specification for the PowerBook 5300, you may think there is a problem with the computer. This may seem like the case when the ADB current draw activates the protection circuitry, and the power is turned off since the external devices stop working.

The PowerBook 5300 ADB supply current and keyboard/mouse current requirements are shown in the charts below. The ADB current of other Apple models is available in technical specifications section of the Tech Info Library. You can locate your specific model by searching for specsht and the Macintosh model you own.

Device	ADB current
PowerBook 5300	Can supply 200mA maximum to connected ADB devices.
Apple Desktop Bus Mouse II	80mA

Apple Design Keyboard (M2980)	under 200mA
Apple Extended Keyboard (M3501)	85mA
Apple Keyboard II (M0487)	100mA

The AppleVision 1710 Display draws different amounts of ADB current based on its power or operating status. An AppleVision 1710 Display powers on when the following conditions exist: the AC switch is on, the display is plugged in, and there are active video signals on the video connector. Even when the display is plugged in and the power switch is on, as long as there is no video signal the display is not powered on.

These are typical ADB values for the AppleVision 1710 and AppleVision 1710AV Displays; variation from unit to unit may be 10%.

Display Device	ADB current AC power off	ADB current AC power on
AppleVision 1710	50mA	0mA
AppleVision 1710AV	100mA	1mA

A keyboard and mouse can reliably be attached to a PowerBook 5300 depending on which keyboard is attached. When also attaching an AppleVision 1710 or AppleVision 1710AV display, it is recommended that you only use the Keyboard II or Extended Keyboard. Under circumstances where the total current for the ADB devices exceeds the 200mA specification for the PowerBook 5300, the ADB +5vdc power may shut off. This disables the ADB devices, such as the mouse and keyboard, but it does not permanently harm the PowerBook 5300.

If you have a question about whether devices will work if they are all connected, you can connect them as an experiment to see if they will work. If the devices do not work because the power requirements are greater than the PowerBook 5300 specification, the ADB devices should be disconnected. Only the configuration that has a total load less than 200ma should be used, but the PowerBook 5300 ADB will not get "blown out" by testing a particular configuration.

When the PowerBook has been activated, taken out of sleep, or powered up, the AppleVision 1710 and AppleVision 1710AV Display will be activated by the video signal from the PowerBook and the display will power up. Once the display image is active, the ADB current draw from the AppleVision Display will drop close to zero. When the display is powered up, the only current draw on the ADB line is

that of the other devices attached to the ADB line, such as a mouse or keyboard.

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