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Apple Desktop Bus (ADB): Specifications (12/94)

Revised: 12/8/94
Security: Everyone

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Article Created: 23 October 1986
Article Reviewed/Updated: 08 December 1994

TOPIC -----

This article provides specifications and information about the Apple Desktop Bus, which was introduced with the Apple IIGS and has been used in Macintosh computers since the introduction of the Macintosh SE and Macintosh II.

DISCUSSION -----

The Apple Desktop Bus (ADB) is a standard for input devices connecting to the Apple IIGS and later Macintosh computers that follow the Apple Desktop Bus protocol. Because the Apple Desktop Bus is run by an intelligent microcontroller, a number of different types of input devices may be connected to the ADB simultaneously: the computer's keyboard, mouse, tablet, light pen, second keyboard, or joystick.

Each device has a unique bus address, so that the ADB microcontroller may direct its commands to a particular piece of equipment. The ADB specification supports up to a maximum of 16 unique devices, however it is suggested that only 3 devices be connected to each ADB bus in order to prevent signal degradation problems from appearing. On the Apple IIGS, the control function is performed by the M50740 Keyboard Microcontroller. It uses a superset of the 6502 instruction set, and contains 96 bytes of RAM and 3K bytes of ROM. The Macintosh may use one of several different implementations which are documented in the Guide to the Macintosh Family Hardware manual published by Addison Wesley.

When the microcontroller requests input from a device, it sends a signal to the input device to "talk". If no return input information action (key pressed, mouse movement, button clicked, etc.) has occurred, the microcontroller keeps waiting for the device to respond until a time-out occurs.

The host may also instruct a device to "listen" to data being sent on the bus from the host. All devices on the Apple Desktop Bus must include the intelligence to respond to both talk and listen commands.

The Apple Desktop Bus uses a 4-pin mini-DIN jack and a 4-wire cable, with serial interface signals. When appropriate, the input device will have two ADB jacks, so that devices may be daisy-chained from the host. The Apple Desktop Bus Mouse does not have a second connector, so it must be at the end of the chain.

SPECIFICATIONS:

- throughput: approximately 154 bytes per second
- cable length: maximum 5 meters
- cable capacitance: maximum 100 picofarads per meter

ADB devices may use the +5 volt power supplied by the bus, but must not draw more than 500 mA total for all devices.

The Apple Standard Keyboard draws a maximum of 100 mA, and the Apple Extended Keyboard draws a maximum of 85 mA.

All devices are connected in parallel, using the signal, power, and ground wires. Due to connector resistance and signal degradation, daisy-chaining more than three devices is not recommended.

Article Change History:

08 Dec 1994 - Revised discussion.

21 Jun 1994 - Updated to combine information from two similar articles.

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Tech Info Library Article Number:902