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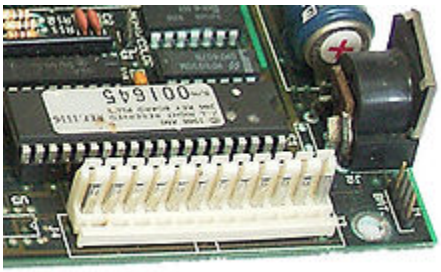
Keyboard controller (computing)

In computing, a **keyboard controller** is a device that interfaces a keyboard to a computer. Its main function is to inform the computer when a key is pressed or released. When data from the keyboard arrives, the controller raises an interrupt (a *keyboard interrupt*) to allow the CPU to handle the input.



Keyboard controller and AT-Keyboard jack on an AT-Mainboard

If a keyboard is a separate peripheral system unit (such as in most modern desktop computers), the keyboard controller is not directly attached to the keys, but receives scancodes from a microcontroller embedded in the keyboard via some kind of serial interface. In this case, the controller usually also controls the keyboard's LEDs by sending data back to keyboard through the wire.

The IBM PC AT used an Intel 8042 chip to interface to the keyboard. This computer also controlled access to the A20 line in order to implement a workaround for a chip bug in the Intel 80286.[1] The keyboard controller was also used to initiate a software CPU reset in order to allow the CPU to transition from protected mode to real mode[1] because the 286 did not allow the CPU to go from protected mode to real mode unless the CPU is reset. This was a problem because the BIOS and the operating system services could only be called by programs in real mode. These behaviors have been used by plenty of software that expects this behavior, and therefore keyboard controllers have continued controlling the A20 line and performing software CPU resets even when the need for a reset via the keyboard controller was obviated by the Intel 80386's ability to switch to real mode from protected mode without a CPU reset. The keyboard controller also handles PS/2 mouse input if a PS/2 mouse port is present. Today the keyboard controller is either a unit inside a Super I/O device or is missing, having its keyboard and mouse functions handled by a USB controller and its role in controlling the A20 line handled by the chipset.

See also

- Keyboard buffer
- AT keyboard
- KVM extender
- Embedded controller: The Intel 8042 and other keyboard controllers used in computers based on the IBM PC/AT design can be considered embedded controllers.

References

1. http://www.win.tue.nl/~aeb/linux/kbd/A20.html

External links

- keyboard controller - Computer Dictionary (http://www.yourdictionary.com/computer/keyboard-controller)
- KBD43W13 Keyboard and PS/2 Mouse Controller (http://www.datasheetcatalog.org/datasheet/StandardMicrosystems/mXsstsv.pdf)
