

# Supporting I/O Devices - Chapter #10

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## Key Terms

**3-D RAM** — Special video RAM designed to improve 3-D graphics simulation.

**active matrix** — A type of video display that amplifies the signal at every intersection in the grid of electrodes, which enhances the pixel quality over that of a dual-scan passive matrix display.

**bandwidth** — In relation to analog communication, the range of frequencies that a communications channel or cable can carry. In general use, the term refers to the volume of data that can travel on a bus or over a cable stated in bits per second (bps), kilobits per second (Kbps), or megabits per second (Mbps). Also called data throughput or line speed.

**bus mouse** — A mouse that plugs into a bus adapter card and has a round, 9-pin mini-DIN connector.

**chip creep** — A condition in which chips loosen because of thermal changes.

**DCE (Data Communications Equipment)** — The hardware, usually a dial-up modem, that provides the connection between a data terminal and a communications line. *See also* DTE.

**dot pitch** — The distance between the dots that the electronic beam hits on a monitor screen.

**DTE (Data Terminal Equipment)** — Both the computer and a remote terminal or other computer to which it is attached. *See also* DCE.

**dual-scan passive matrix** — A type of video display that is less expensive than an active-matrix display and does not provide as high-quality an image. With dual-scan display, two columns of electrodes are activated at the same time.

**ECP (Extended Capabilities Port)** — A bidirectional parallel port mode that uses a DMA channel to speed up data flow.

**EPP (Enhanced Parallel Port)** — A parallel port that allows data to flow in both directions (bidirectional port) and is faster than original parallel ports on PCs that allowed communication only in one direction.

**FireWire** — *See* IEEE 1394.

**flat panel monitor** — A desktop monitor that uses an LCD panel

**graphics accelerator** — A type of video card that has an on-board processor that can substantially increase speed and boost graphical and video performance.

**Graphics DDR (G-DDR)** — type of video memory

**Graphics DDR2 (G-DDR2)** — type of video memory

**Graphics DDR3 (G-DDR3)** — type of video memory

**hot-pluggable** — *See* hot-swappable.

**hot-swappable** — A device that can be plugged into a computer while it is turned on and the computer will sense the device and configure it without rebooting, or the device can be removed without an OS error. Also called hot-pluggable.

**hub** — A network device or box that provides a central location to connect cables.

**i.Link** — *See* IEEE 1394.

**I/O controller card** — An older card that can contain serial, parallel, and game ports and floppy drive and IDE connectors.

**IEEE 1284** — A standard for parallel ports and cables developed by the Institute for Electrical and Electronics Engineers and supported by many hardware manufacturers.

**IEEE 1394** — Standards for an expansion bus that can also be configured to work as a local bus. It is expected to replace the SCSI bus, providing an easy method to install and configure fast I/O devices. Also called FireWire and i.Link.

**IEEE 1394.3** — A standard, developed by the 1394 Trade Association, that is designed for peer-to-peer data transmission and allows imaging devices to send images and photos directly to printers without involving a computer.

**infrared transceiver** — A wireless transceiver that uses infrared technology to support some wireless devices such as keyboards, mice, and printers. A motherboard might have an embedded infrared transceiver, or the transceiver might plug into a USB or serial port. The technology is defined by the Infrared Data Association (IrDA). Also called an *IrDA transceiver* or *infrared port*.

**Interlaced** — A type of display in which the electronic beam of a monitor draws every other line with each pass, which lessens the overall effect of a lower refresh rate.

**IrDA transceiver** — *See* infrared transceiver.

**isochronous data transfer** — A method used by IEEE 1394 to transfer data continuously without breaks.

**modem eliminator** — *See* null modem cable.

**motherboard mouse** — *See* PS/2-compatible mouse.

**MultiBank DRAM (MDRAM)** – type of video memory

**multiscan monitor** — A monitor that can work within a range of frequencies and thus can work with different standards and video cards. It offers a variety of refresh rates.

**noninterlaced** — A type of display in which the electronic beam of a monitor draws every line on the screen with each pass.

**null modem cable** — A cable that allows two data terminal equipment (DTE) devices to communicate in which the transmit and receive wires are cross-connected and no modems are necessary.

**PCI (Peripheral Component Interconnect) bus** — A bus common on Pentium computers that runs at speeds of up to 33 MHz or 66 MHz, with a 32-bit-wide or 64-bit-wide data path. PCI-X, released in September 1999, enables PCI to run at 133 MHz. For some chip sets, it serves as the middle layer between the memory bus and expansion buses.

**pixel** — A small spot on a fine horizontal scan line. Pixels are illuminated to create an image on the monitor.

**PS/2-compatible mouse** — A mouse that plugs into a round mouse PS/2 port on the motherboard. Sometimes called a motherboard mouse.

**refresh rate** — As applied to monitors, the number of times in one second an electronic beam can fill the screen with lines from top to bottom. Also called vertical scan rate.

**resolution** — The number of pixels on a monitor screen that are addressable by software (example: 1024 × 768 pixels).

**serial mouse** — A mouse that uses a serial port and has a female 9-pin DB-9 connector.

**SGRAM (synchronous graphics RAM)** — Memory designed especially for video card processing that can synchronize itself with the CPU bus clock.

**touch screen** — An input device that uses a monitor or LCD panel as a backdrop for user options. Touch screens can be embedded in a monitor or LCD panel or installed as an add-on device.

**UART (universal asynchronous receiver/transmitter) chip** — A chip that controls serial ports. It sets protocol and converts parallel data bits received from the system bus into serial bits.

**USB host controller** — Manages the USB bus. If the motherboard contains on-board USB ports, the USB host controller is part of the chipset. The USB uses only a single set of resources for all devices on the bus.

**VRAM (video RAM)** — RAM on video cards that holds the data that is being passed from the computer to the monitor and can be accessed by two devices simultaneously. Higher resolutions often require more video memory.

**WRAM (window RAM)** — Dual-ported video RAM that is faster and less expensive than VRAM. It has its own internal bus on the chip, with a data path that is 256 bits wide.

## Review Questions

1. Identify three things that may cause monitor flicker.

1. Poor cable connections
2. Electrical noise
3. Large speakers

2. What is the value of installing additional video RAM?

The ability to handle a larger volume of data that is generated by increased resolution and color.

3. Describe what to do if you've just spilled soda pop on your keyboard.

Replace it!

4. Explain how to check that chips on a video card are properly seated in their sockets.

Remove the card from the expansion slot and then use a screwdriver to press down firmly on each corner of each socketed chip on the card.

5. When troubleshooting problems with a monitor in Windows 2000, why would you enter Safe Mode?

This allows the OS to select a generic display driver and low resolution.

6. Describe how to boot Windows 98 into Safe Mode.

Press F5 during the boot.

7. Why would an external modem cost more than an internal modem?

With any external device a case must be built around the device where an internal device does not need a case surrounding it so therefore it would be cheaper.

8. Name three possible ways a scanner might interface with a motherboard.

By using a serial port, parallel port, or a USB port.

9. By definition, what system resources does COM1 use? COM2? COM3? COM4?

- COM1 – IRQ 4
- COM2 – IRQ 3
- COM3 – IRQ 4
- COM4 – IRQ 3

10. To what does RS-232 refer?

The standard interface that originally called for 25 pins, but because microcomputers only use 9 of those pins, manufacturers often installed a modified 9-pin port. A serial port conforms to the standard interface (Reference Standard 232 Revision c)

11. How many pins are on a typical serial port?

9

12. Why is AGP technology described as being more like a port than a bus?

Because AGP can share system memory with the CPU to do its calculations, and therefore does not always have to first copy data from system memory to video memory on the graphics card.

13. What is a null modem cable, and what is it often used for?

A cable that allows two data terminal equipment (DTE) devices to communicate in which the transmit and receive wires are cross-connected and no modems are necessary. It is often used to connect two computers for data transfer between them.

14. What is the name of the technology within the chip set that controls the speed of serial ports?

CMOS

15. Why might you choose to use ECP mode for your parallel port rather than EPP mode?

ECP uses a DMA channel

16. When might you need to disable ECP mode for a parallel port?

When you are having problems using the port.

17. How would you disable a serial port on a motherboard?

You disable it in the CMOS settings.

18. What Windows OSs support USB? Include the OS version numbers where that information is important.

Include the OS version number where that information is important. Windows 98/ME/2000/NT/XP

19. What is the maximum speed of Original USB? Of Hi-Speed USB?

High speed is 480- Mbps

20. What is the maximum length of a USB Hi-Speed cable?

16.4 feet

21. What are two other names for FireWire? What is the highest data throughput approved for FireWire?

IEEE 1394 and I.link and the highest data speed allowed is 3.2 Gbps

22. List the steps in Windows 98/Me to display the list of I/O addresses currently in use.

Start/Settings/ControlPanel/System/DeviceManager/Computer/Properties/View Resources

23. When installing a device, why would you prefer to use a PCI expansion slot rather than an ISA expansion slot?

An ISA slot is outdated and also it does not manage the system resources as does the PCI.

24. If PCI is attempting to use an IRQ that is used by a legacy ISA device, how can you force PCI to not use the IRQ?

By setting up the IRQ settings to show that the IRQ it is trying to use is already in use therefore preventing conflicts. All of this can be done through the Device Manager.

25. What criteria effect how much video RAM is needed for a video card to hold one frame buffer?

The screen resolution, number of colors, and enhancements to color information

26. Give three examples of monitor screen sizes. How are monitor screen sizes measured?

1. 14 inches
2. 15 inches
3. 17 inches

Monitor sizes are measured on the diagonal.

27. Which provides better quality, an interlaced monitor or a noninterlaced monitor? Why?

An interlaced monitor because they generally have slightly less flicker.

28. What type of monitor can offer a variety of refresh rates?

## Multiscan monitors

**29. What makes a device an ergonomic device?**

It is designed for safe and comfortable interaction between human beings and machines

**30. How many pins are there on a DIN connector and a PS/2 connector for a keyboard?**

DIN connector – 5 pins

PS/2 connector – 6 pins

**31. What three colors are used to build all colors on a color monitor screen?**

Red, Green, and Blue

**32. Which gives better image quality, a .25-mm dot pitch monitor or a .28-mm dot pitch monitor? Why?**

A .25-mm dot pitch monitor because the smaller the pitch is, the sharper the image is.

**33. If a mouse begins to be difficult to operate, what simple thing can you do to help?**

Clean the rollers with a cotton swab dipped in a very small amount of liquid soap.