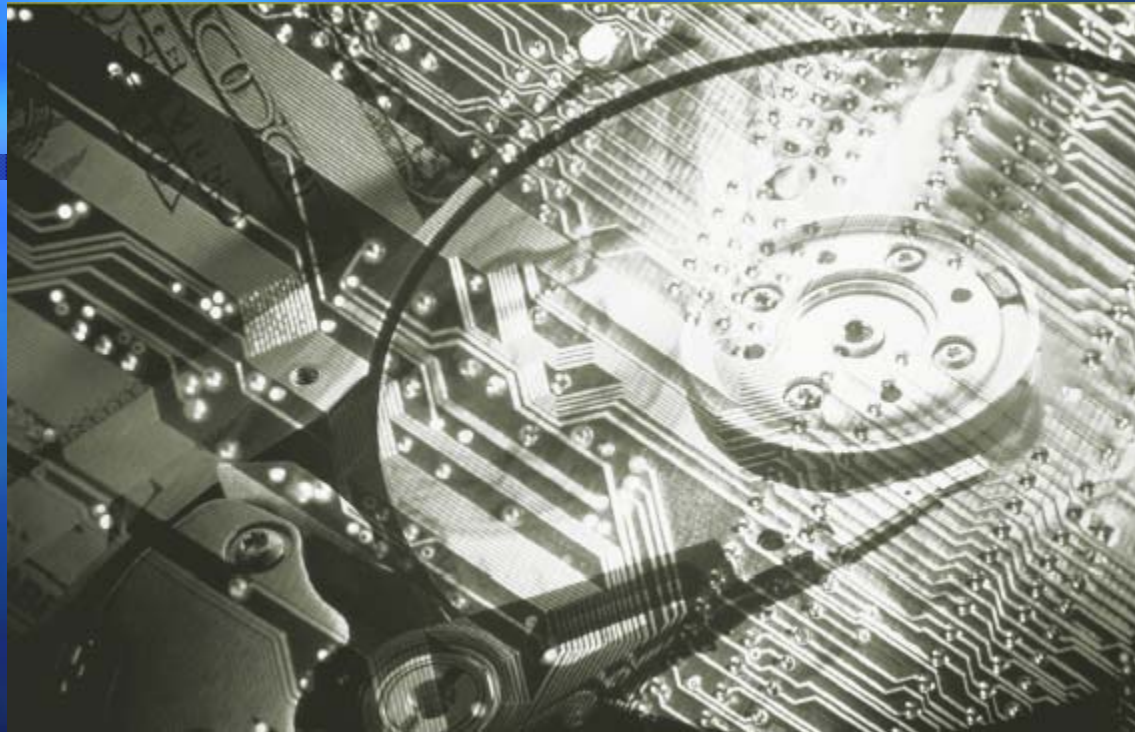


Hardware Basics

Basic Computing Concepts



Types of Computers

It's more than just a PC

Types of Computers

- PC

- Desktop
- Laptop
- Palmtop
- Workstation

Types of Computers

- Server
- Mainframe
- Minicomputer
- Supercomputer
- Wearable
- Gaming

The PC Basics

- PCs were first known as microcomputers because they were a complete computer but built on a smaller scale than the huge systems in use by most businesses.



The PC : Desktop

- A PC that is not designed for portability.
- Will be set up in a permanent location.
- Most desktops offer more power, storage and versatility for less cost than their portable brethren.



The PC: Laptop

- Also called notebooks
- Portable computers that integrate the display, keyboard, a pointing device or trackball, processor, memory and hard drive all in a battery-operated package slightly larger than an average hardcover book.



The PC: Palmtop

- Known as Personal Digital Assistants
- Tightly integrated computers that often use flash memory instead of a hard drive for storage.
- Usually do not have keyboards



The Workstation

- A desktop computer that has a more powerful processor, additional memory and enhanced capabilities for performing a special group of task, such as 3D Graphics or game development.



The Server

- A computer that has been optimized to provide services to other computers over a network. Servers usually have powerful processors, lots of memory and large hard drives.



The Mainframe

- Huge computers that could fill an entire room or even a whole floor!
- The term mainframe has fallen out of use in favor of enterprise server.
- IBM AS/400 is a current example



The Minicomputer

- Another term rarely used anymore
- fall in between microcomputers and mainframes.
- Minicomputers are normally referred to as mid-range servers now.



Supercomputer

- \$100K-\$1,000K and up
- Most are comprised of multiple high performance computers working in parallel.
- The best known are built by Cray Supercomputers.



Wearable

- The latest trend in computing
- Essentially, common computer applications are integrated into watches, cell phones, visors and even clothing!



Gaming Computers

- These are the computers designed for gaming purposes
- Usually no keyboard or other input device other than a joystick
- They can connect to others



How Computers Work

The background of the slide is a deep blue and purple gradient with a subtle, swirling pattern. On the left side, there is a vertical strip with a fine grid pattern. Below the title, a horizontal bar with a similar grid pattern extends across the width of the text.

How the PC Works

- Computer functions thru four stages:
 - **Input** provides the computer with data
 - Keyboard and mouse
 - **Processing** is when the computer processes or manipulates your data
 - **Output** is seeing the result of processing your data
 - Monitor and printer

How the PC Works (cont)

- **Storage** is how you keep your data for later use
 - Floppy diskette, CD-ROM disk, hard drive
- Hardware and software interact together to accomplish the four stages above



Recognizing the Major Components of a PC

CPU

- Central Processing Unit (CPU)
 - Also called a microprocessor
 - Performs calculations
 - Modern CPUs generate a lot of heat
 - Uses a cooling fan and/or heat sink



CPU

■ Makes

- Intel
- AMD

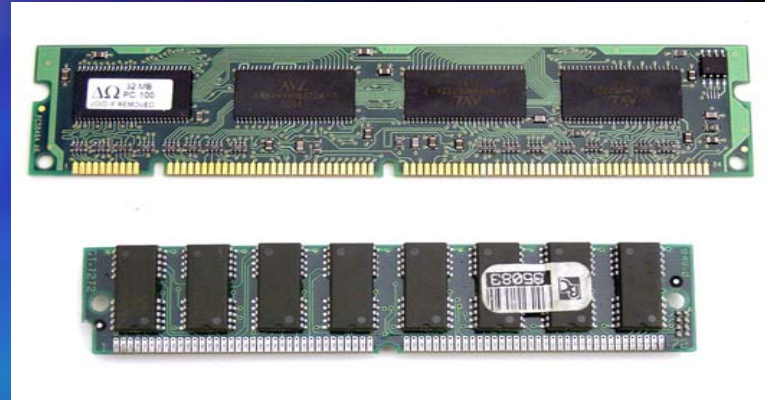
■ Models

- Celeron
- Athlon
- Duron
- Pentium

CPU

- **Clock speed** is used to measure the performance
 - Measured in megahertz (MHz)
- CPUs come in different packages
 - Pin Grid Array (PGA)
 - Most common today
 - Single Edge Cartridge (SEC)
 - Older package

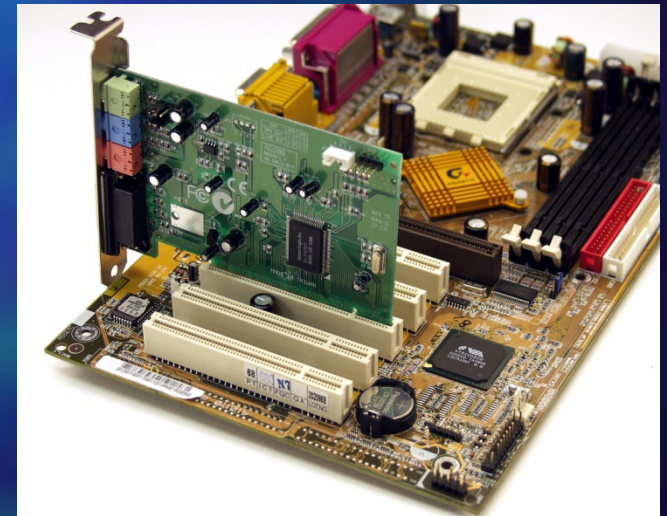
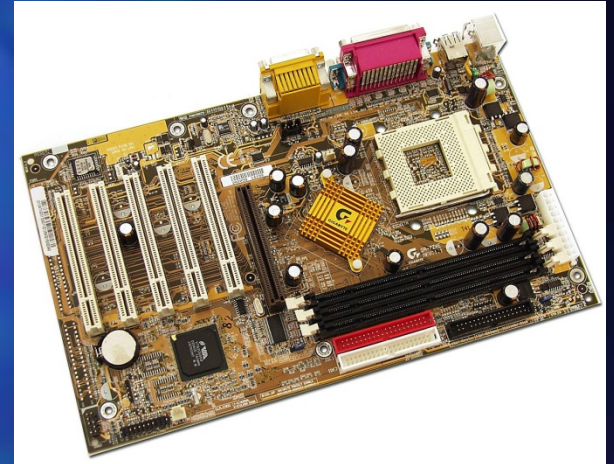
RAM



- **Random Access Memory (RAM)**
 - Stores programs and data your PC is currently working on
 - Measured in megabytes (MB)
 - Each piece or module of RAM is called a stick
 - Packages include
 - Dual Inline Memory Module (DIMM)
 - Single Inline Memory Module (SIMM)

Motherboard

- The **motherboard** is a thin, flat piece of circuit board
 - Everything connects directly or indirectly to the motherboard
 - Contains sockets for the CPU, RAM, power connectors, connectors for external devices like mice, printers, and keyboards
 - Expansion slots allow the addition of new components



Case

- The **case** houses all of the internal components of your PC
 - Includes slots or holes to enable external devices to connect



Power Supply

- The **power supply** provides electrical power to make the PC operate
 - Uses power from the wall outlet
 - Provides special connectors to the motherboard and other devices
 - Uses a fan to keep itself and the PC cool inside



Floppy Drive

- The **floppy drive** uses floppy diskettes to store data
 - Connects to the computer via a ribbon cable
 - Connects to the floppy controller on the motherboard
 - Uses a connector from the power supply



Hard Drive

- **Hard Drives** store programs and data not currently in use by the CPU
 - Capacity measured in megabytes (MB) or gigabytes (GB)
 - A typical PC has one hard drive but may contain up to four hard drives
 - Common types include
 - Enhanced Integrated Drive Electronics (EIDE)
 - Small Computer System Interface (SCSI)
 - Connects to PC via a ribbon cable
 - Uses a power cable from the power supply



CD-ROM Drive

- **CD-ROM** drives enable access to CD-ROM discs
 - EIDE and SCSI versions
 - PCs may come with recordable CD-ROM drives that use CD-R discs
 - Newer PCs use CD-RW drives that allow rewriting to the disc – called burning
 - Today PCs come with digital video discs (DVDs) that store huge amounts of information





Common PC Devices

Sound Cards

■ Sound cards

- take digital information and turns it into sound
- Take sound from a microphone and turns it into digital data
- Use mini-audio jacks for speakers and microphones
- Use a 15-pin DB socket for a joystick or musical instrument



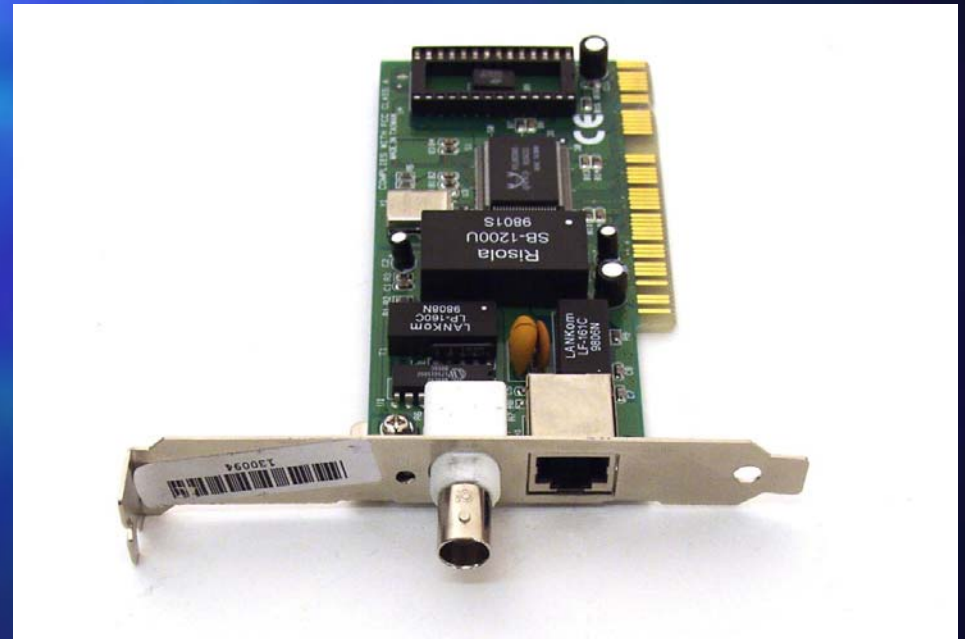
Video Cards

- **Video cards** connect to monitors
 - Use a 15-pin female DB connector or the newer digital video interface (DVI) connector



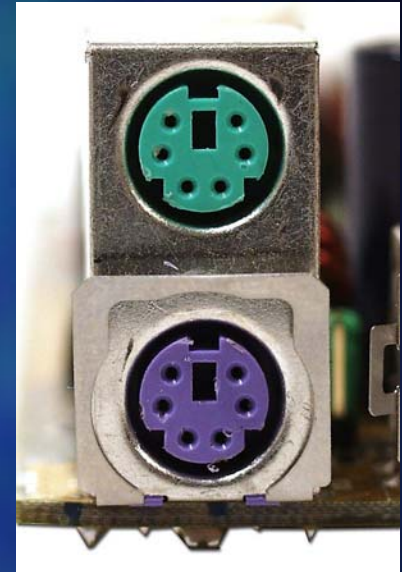
Network Cards

- PCs connect to other PCs to share information or devices using a **network interface card (NIC)**
 - Connectors include RJ-45, BNC, DB



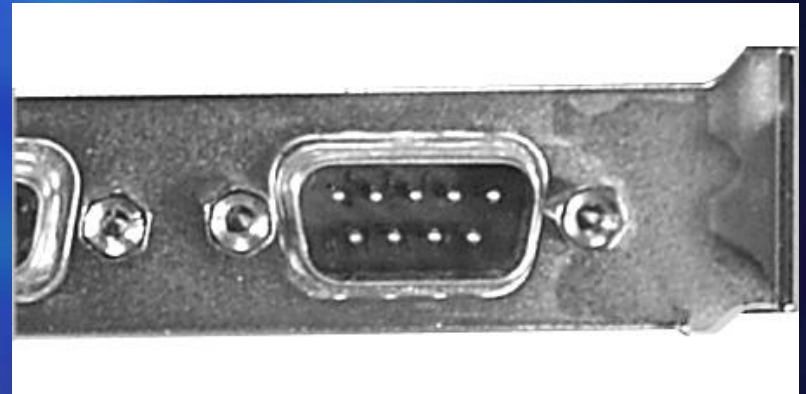
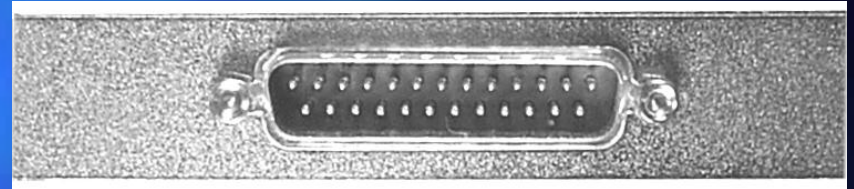
Keyboard

- **Keyboards** come in many sizes and shapes
 - Use a keyboard port on the motherboard
 - DIN connector is obsolete
 - Mini-DIN is most common today
 - USB connectors are sometimes used today
 - Use the same kind of connector as a mouse but most PCs clearly mark the connectors



Serial Ports

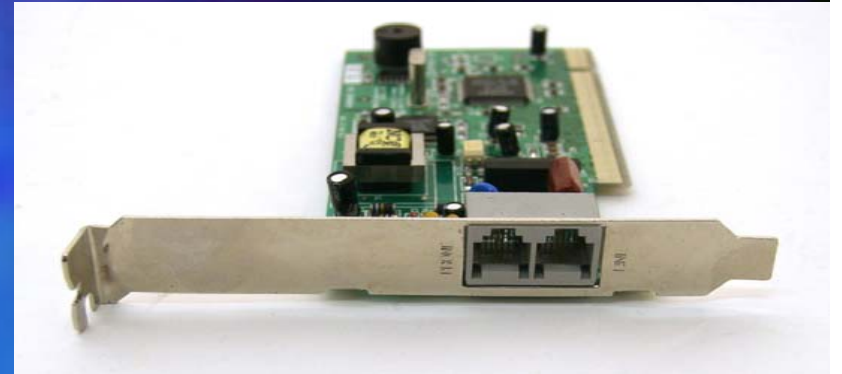
- **Serial ports** are used to add external devices to a PC
 - Takes a stream of serial data from the CPU and outputs it in a serial format
 - 9-pin or 25-pin serial ports



Mouse

- A **mouse** allows you to select graphical items on a screen
 - Early computers did not need a mouse
 - Mice used to connect to the PC thru a 9-pin or 25-pin serial port
 - Now mice connect thru a mini-DIN (or PS/2) port which is also serial
 - Today mice may use a USB port
 - Trackballs may be used instead of mice

Modem



- **Modems** work with your telephone to translate analog telephone signals into digital serial data or vice versa
 - Internal modems are expansion cards
 - External modems connect to a serial port
 - Uses two RJ-11 sockets
 - One to the telephone jack on the wall
 - One to a telephone if you wish

Printer

- **Printers** output data from the PC onto paper
 - Used a 25-pin parallel port for years
 - Today printers almost exclusively use a USB port



Joystick

- **Joysticks** are used almost exclusively to play games on the computer – not used any more. Most joysticks are USB
 - Originally designed as an input device to be used much like a mouse is

