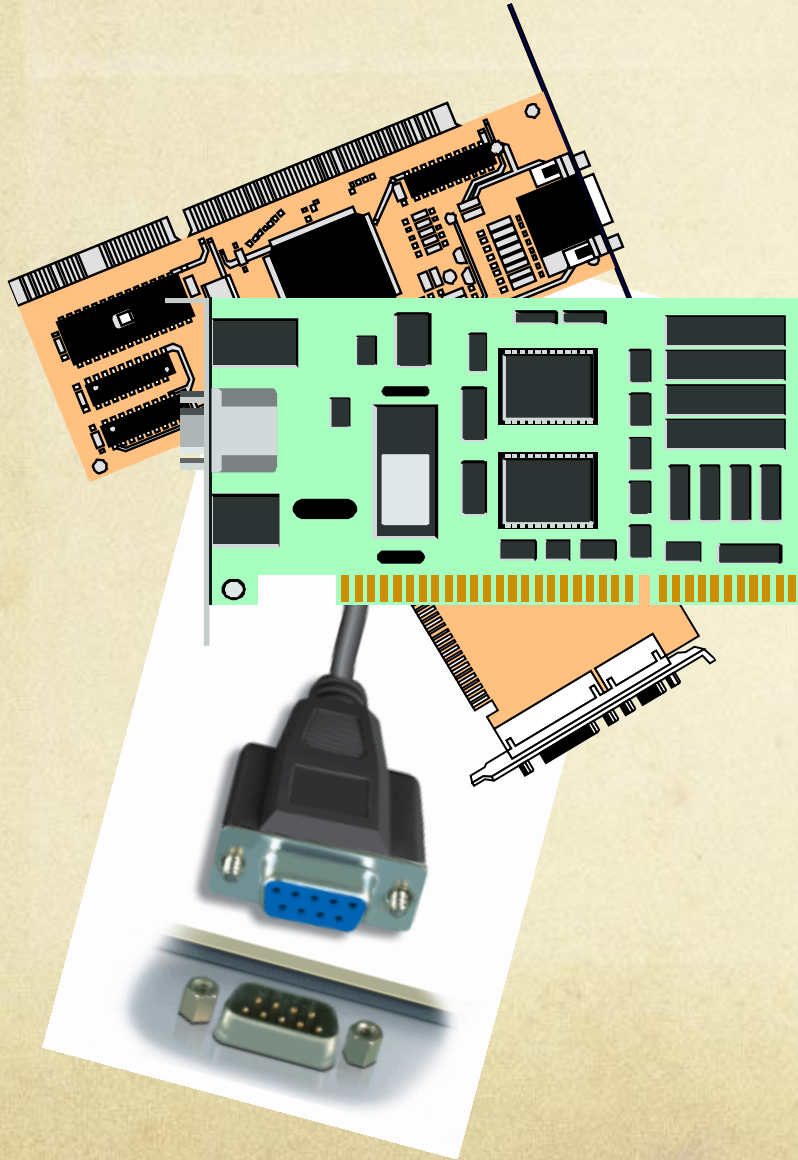


We will learn about:



Expansion Slots

Adapter Cards

Ports

Buses

Bays

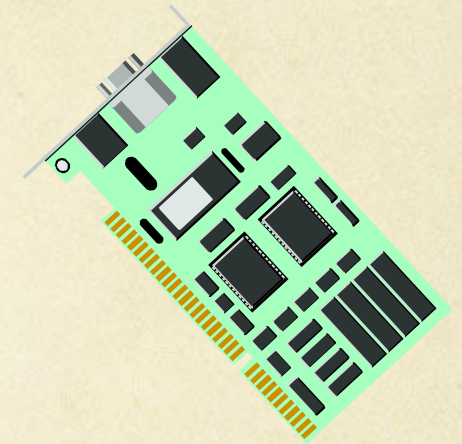
Power Supplies



Expansion (interface or adapter) card - The circuit board used to add devices or capabilities to a computer.

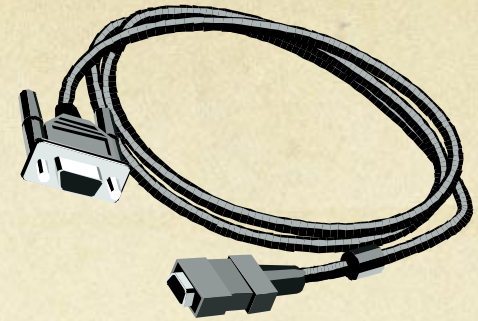
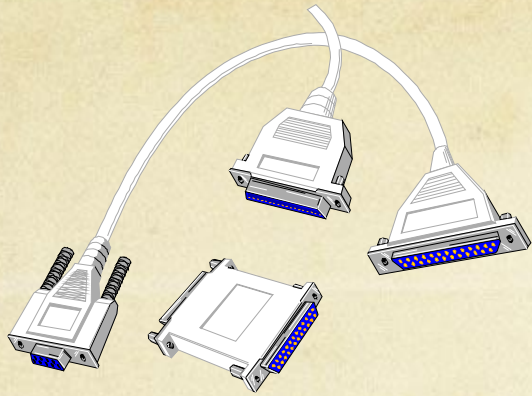
Types of Adapter cards include:

- Video (or graphics) card - converts output to video signal
- Video Capture - used with a video camera (camcorder)
- Sound - speakers, microphone
- Modem - allows communications through phone lines
- Network - allows communications to a network
- PC/TV - connect to a TV
- TV tuner (HDTV tuner) - view TV on the monitor
- FireWire / USB 2.0 - connect devices
- MIDI - connect musical instruments



Plug and Play - computer automatically configures the adapter card when it is installed.

Ports and Connectors



Ports, used to add keyboard, monitor, printer, etc., are places to attach external devices using connectors.

A **connector** joins a cable to a device. Male connectors have exposed pins, female connectors have matching holes.

Different devices have different pin layouts.

CONNECTOR TYPES

Connector Type	Picture	Connector Type	Picture
Audio In		Monitor	
Cable TV		Mouse	
Center Surround Sound/Subwoofer		Network	
Composite video In		Printer	
Digital Video Interface (DVI)		Rear Surround Sound	
eSATA port		Serial	
FireWire		Side Surround Sound	
FM reception		S/PDIF	
HDMI port		Speaker	
Headphones		S-video	
Keyboard		Telephone line In	
Microphone		USB	

Port Types

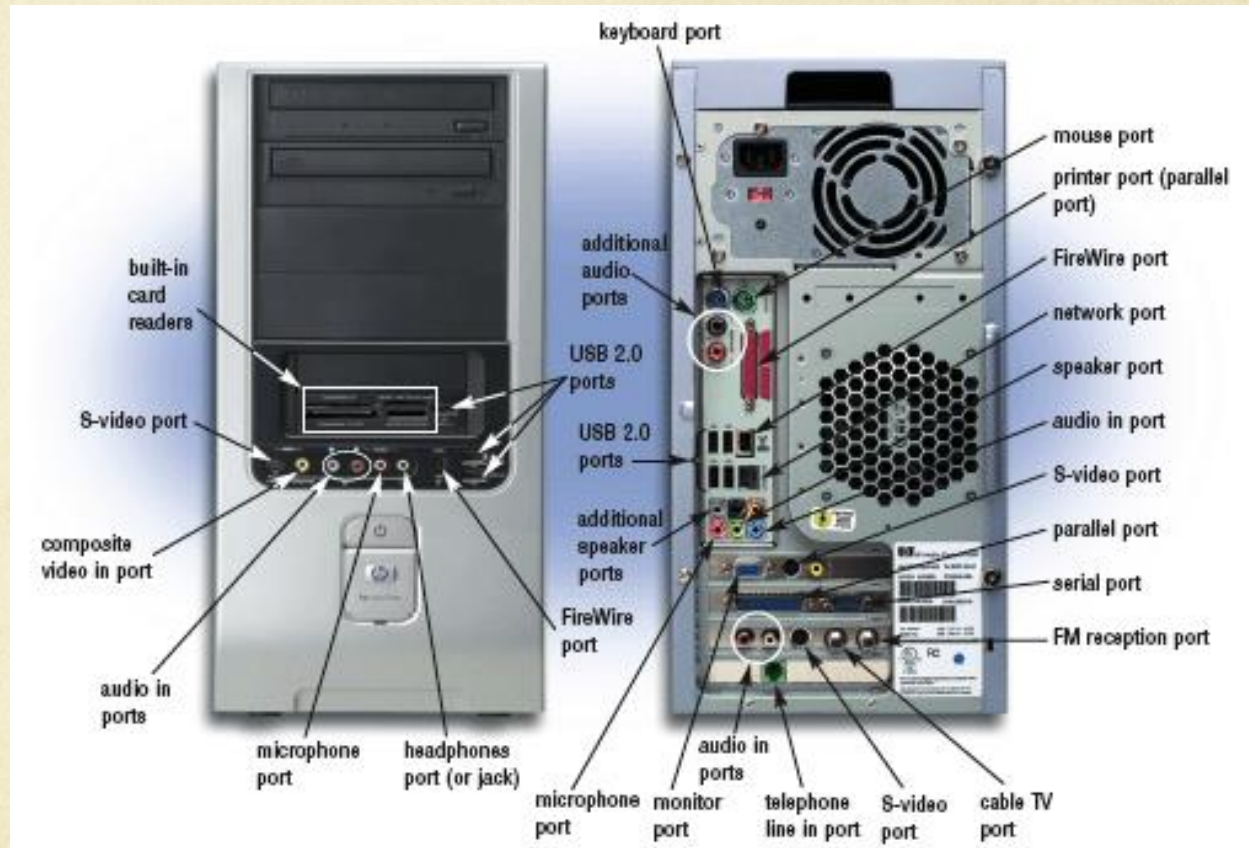


Exhibit 2-8 Typical ports and connectors for desktop computers

POWER CONNECTOR

Connects the computer to a power outlet.

VGA MONITOR PORT

Connects a VGA monitor.

USB PORTS

Connect a keyboard, mouse, scanner, flash memory drive, printer, digital camera, or other USB devices.

HDMI PORT

Connects a high-definition monitor.



FIREWIRE PORT

Connects FireWire devices.

NETWORK PORT

Connects the computer to a network.

AUDIO PORTS

Connect speakers, headphones, and a microphone.

EMPTY SLOTS

Ports located on new expansion cards added to the computer will be accessible here.

CONNECTORS



Monitor (VGA)



USB



Monitor (HDMI)



FireWire



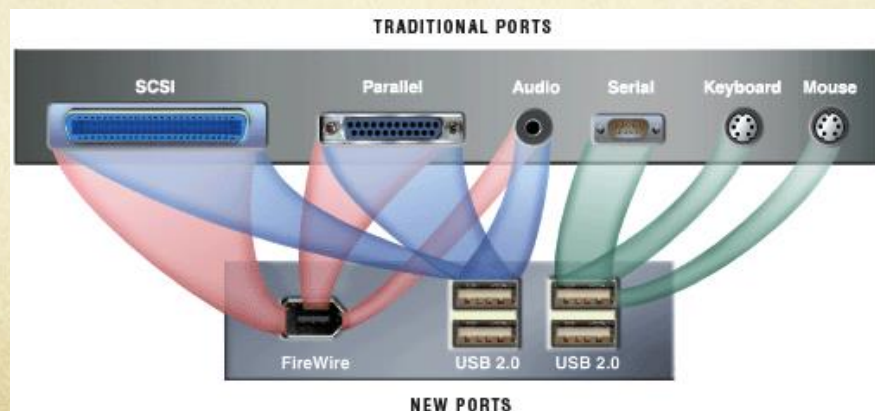
Network (RJ-45)

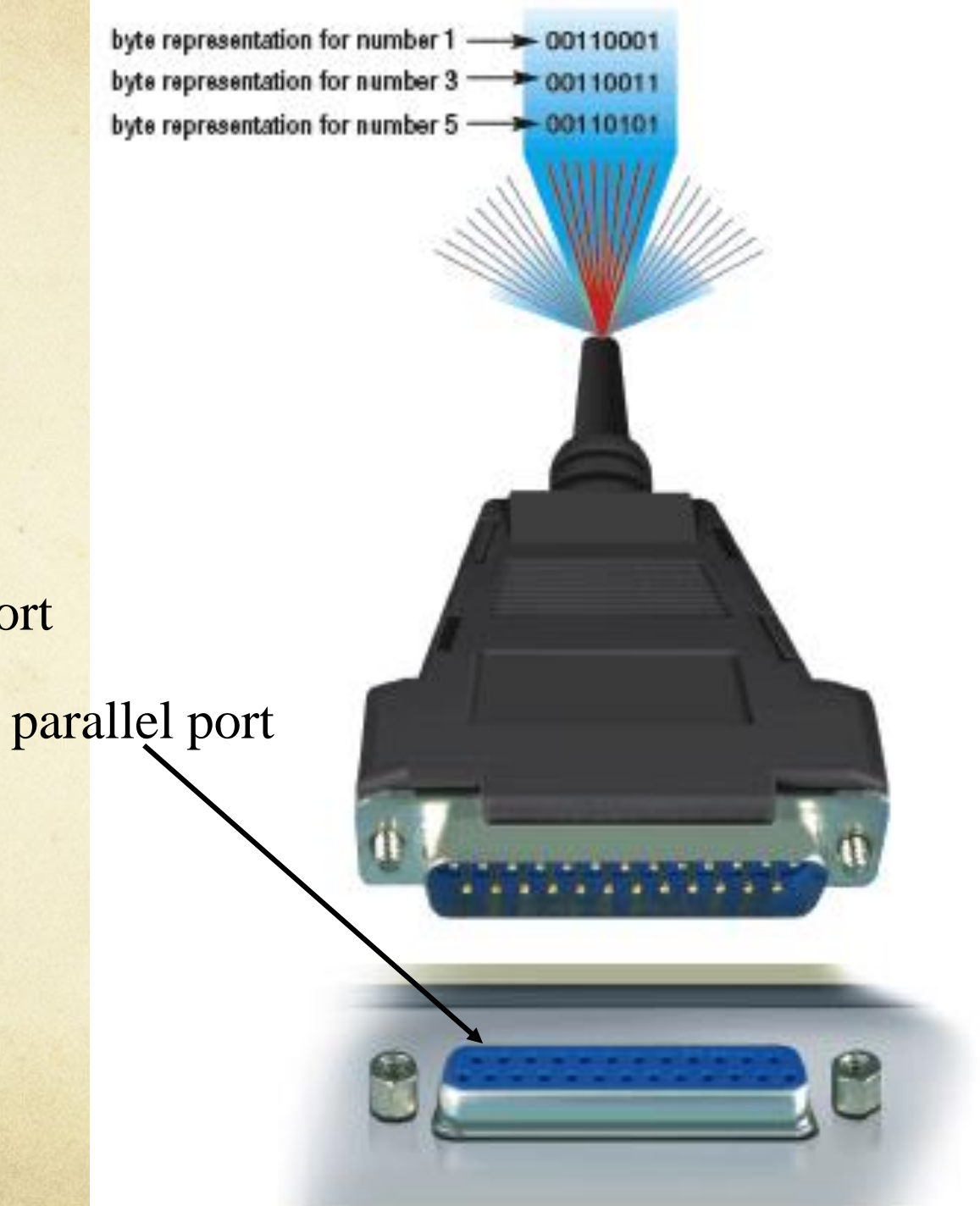
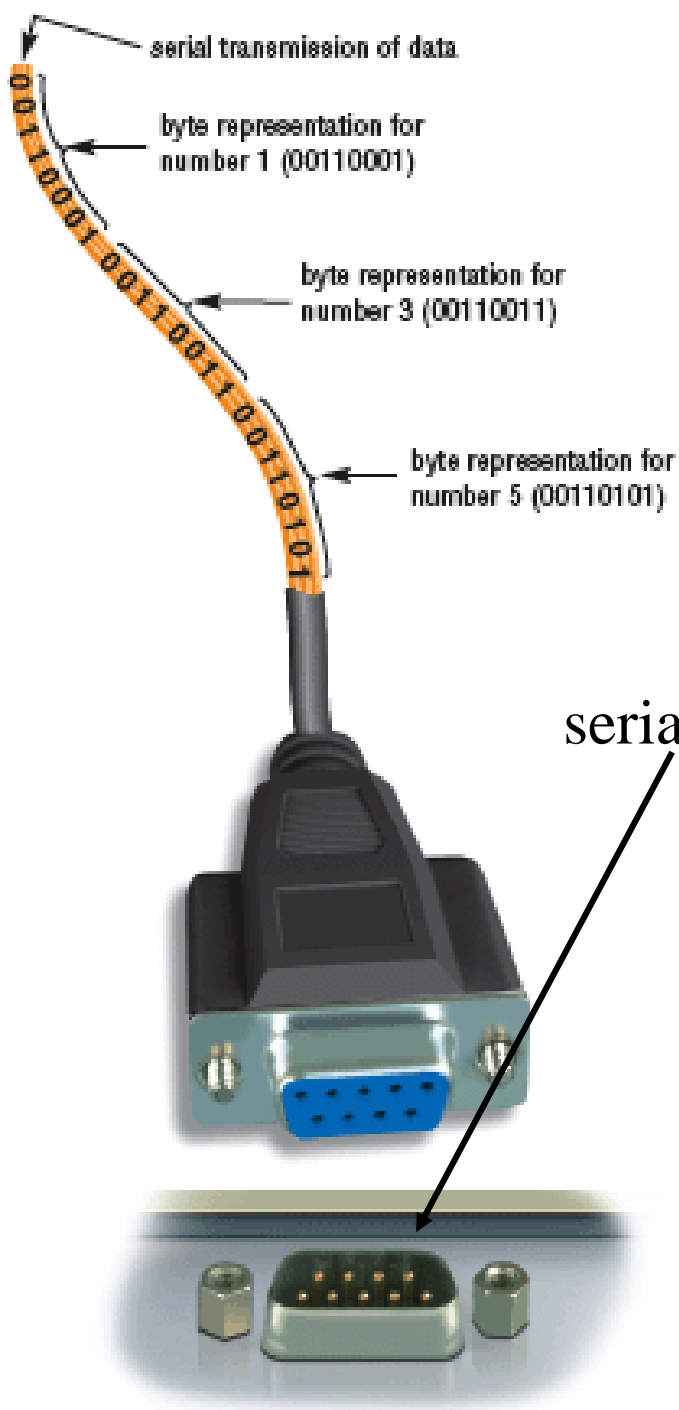


Audio (3.5 mm)

Types of Ports

- **Serial Port** – transmits only one bit of data at a time, traditionally used to connect things that don't require a fast transmission time like a keyboard, mouse, or modem.
- **Parallel port** - transmits more than one bit of data at a time, generally faster than serial ports.





Special Purpose Ports

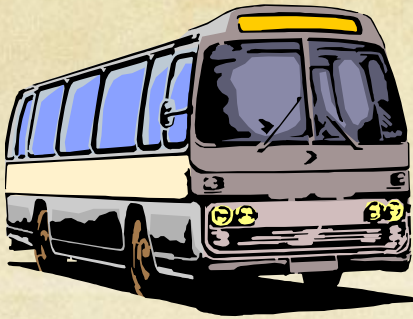
- USB (Universal Serial Bus) – allows up to 127 different devices to connect via one single port.
(USB 1.0 – 12 Mbps, USB 2.0 – 480 Mbps, USB 3.0 – 4.8 Gbps)
- 1394 or FireWire (like USB port) – also connects multiple devices.
(320 Mbps – 3.2 Gbps).
- SCSI (small computer system interface) – high speed parallel port for disk drives and printers.
- MIDI (musical instrument digital interface)
- IrDA (InfraRed Data Association) – used for wireless connections.
- Bluetooth – also used for wireless, uses radio waves.

PC cards, Flash Memory Cards and USB drives

add memory, communications, storage, modem or other devices to a laptop or other mobile device (like digital cameras).



Unlike cards that plug into a motherboard, PC cards can be changed while the device is running – called **hot swapping (plugging)**



Buses

Buses are the electrical pathway (trace) along which bits are transferred.

Used to transfer bits from:

- storage devices to memory
- input devices to memory
- memory to the CPU
- CPU to memory
- memory to output devices
- memory to storage devices

address bus – transfers information about where data is stored in memory

data bus – transfers actual data

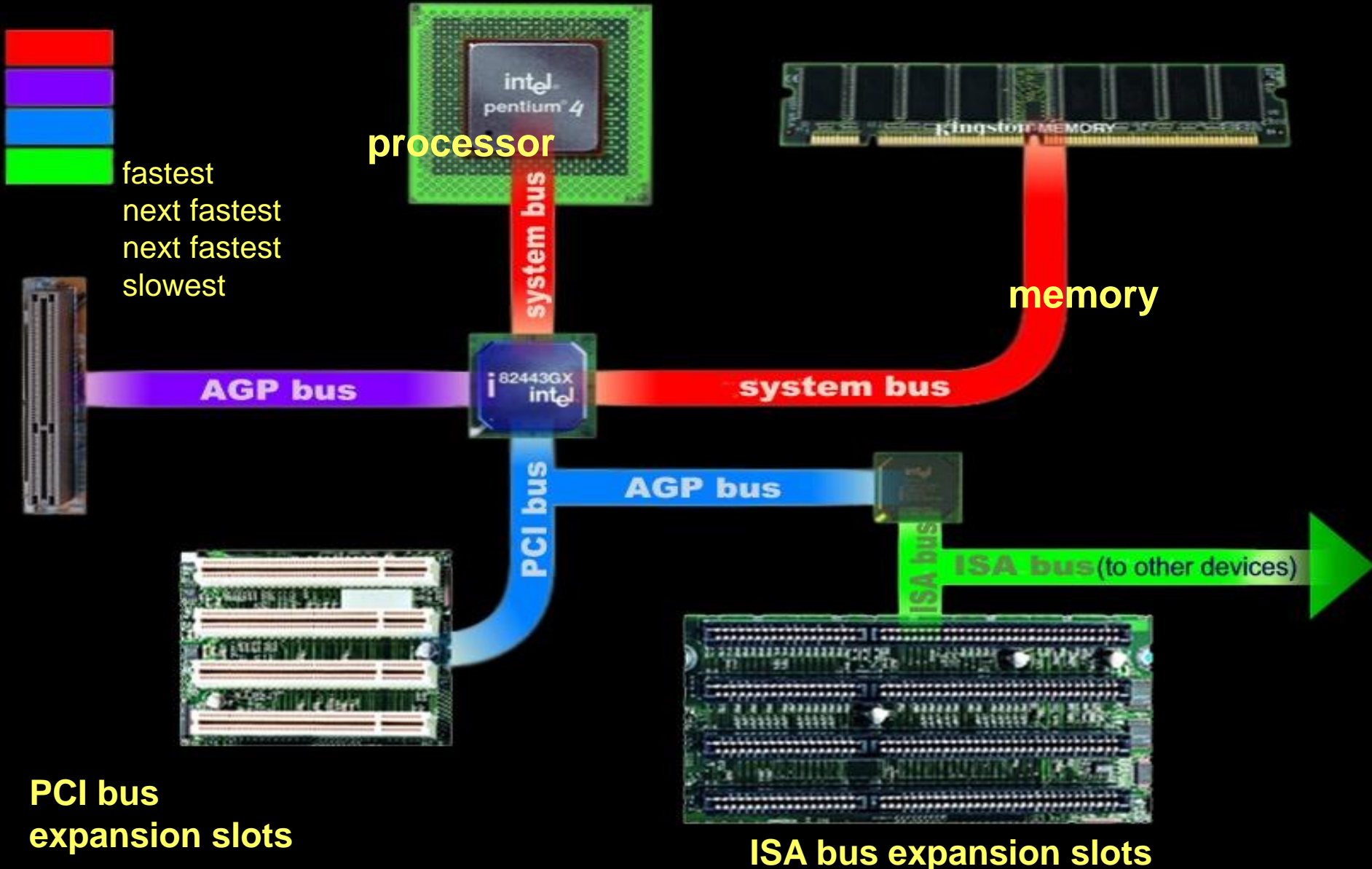
Two types of buses are:

- System bus – part of the motherboard that connects CPU to main memory (generally what is meant by bus)
- Expansion bus – allows CPU to communicate with peripheral devices.

Bus Speed

- A bus is measured by its size or bus width. The bus width determines the number of bits that can be transferred at one time. The larger the number of bits handled by the bus, the faster the computer transfers data. (For example a 64-bit number has to be transferred in two steps on a 32-bit bus). The wider the bus, the fewer number of transfers must be made.
- Every bus has a clock speed (like the CPU). The faster the clock, the faster the data can be transferred.

Expansion bus



Bays

Open area inside the system unit for installing additional equipment

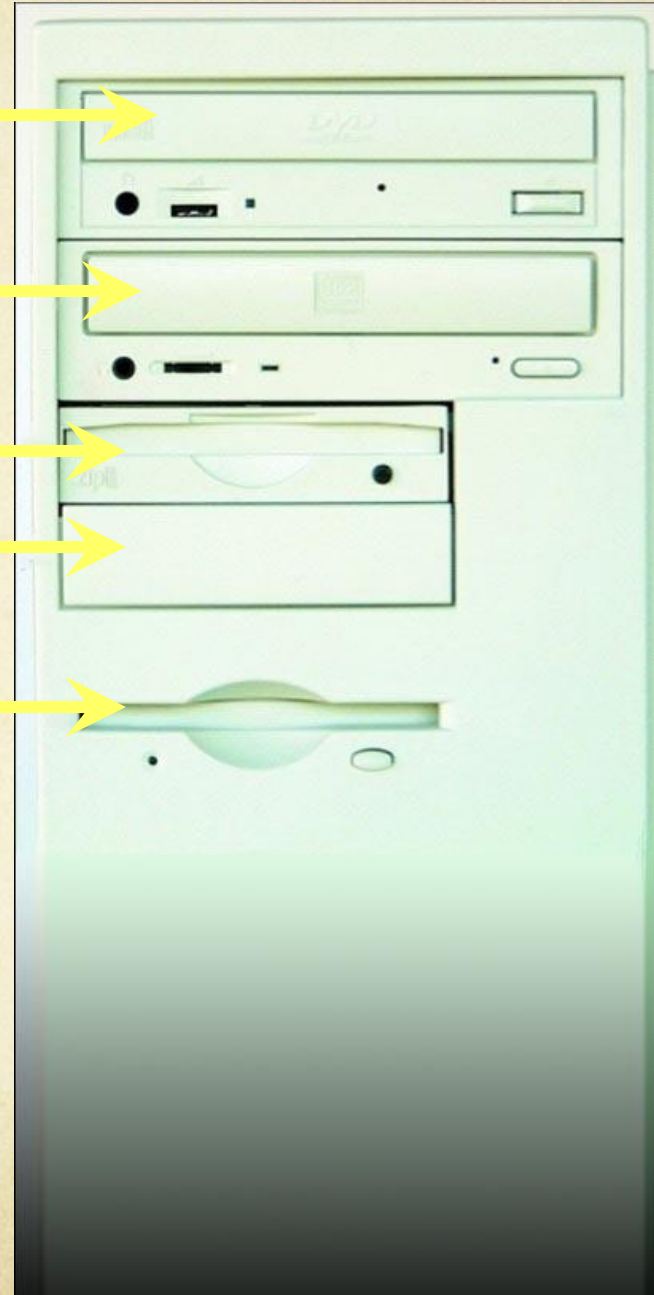
DVD-ROM drive

CD-RW drive

Zip drive

empty drive bay

floppy disk drive



Power Supply



- Standard wall outlets supply AC current ranging from 115 to 120 volts.
- Computers use DC current ranging from 5 to 12 volts.
- The power supply converts the AC power to DC power.
- Supplies power to the motherboard, hard disk, CD/DVD, floppy drive, etc.

Be Sure you can:

- Explain the purpose of expansion slots and expansion cards
- List the different types of expansion cards
- Define hot swapping
- Define plug and play
- Explain the purpose of a port and connector
- Explain the difference between a serial port and parallel port
- Explain what a USB port is used for
- List the special purpose ports
- Explain the purpose of a bus
- Explain how bus width affects speed
- Explain what a bay is used for
- Explain the purpose of the power supply

Homework/Labs

- Read pages 55 – 74 on Input & Output devices
- Take Quiz #6 on Ports and Buses

