Inside the Box
The Modern PC

Lou Naclerio

The Mahopac Public Library

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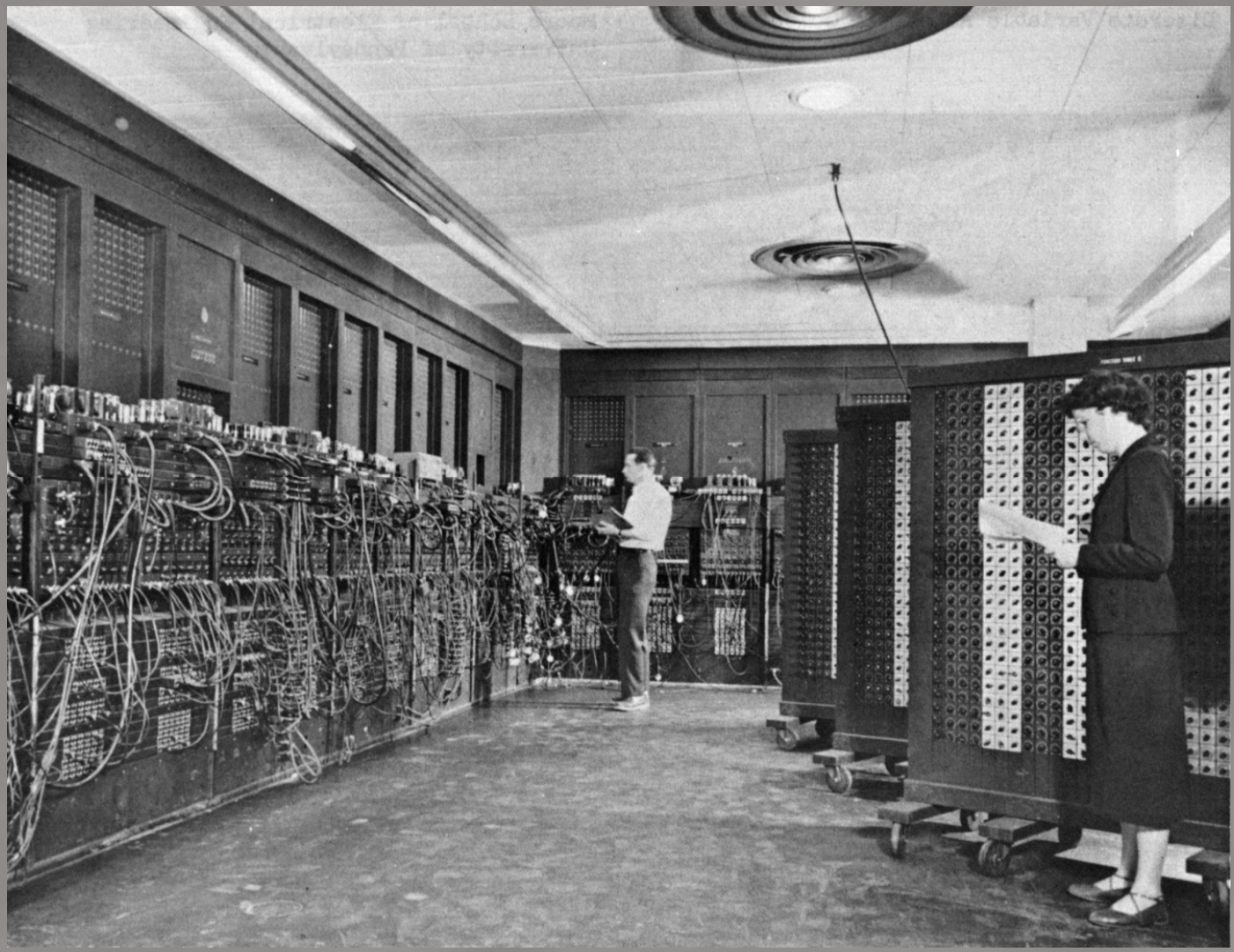
The First Computer – 1946 - The ENIAC (Electronical Numerical Integrator and Computer)



- ✓ 17,468 vacuum tubes
- ✓ 70,000 resistors
- ✓ 10,000 capacitors
- ✓ 1800 square feet and weighed 30 tons
- ✓ consumed 160 kilowatts of electrical power

IBM 1401 - 1959

- ✓ The all-transistorized 1401 was introduced in 1959.
- ✓ Shown in the background (from left) are the IBM 1402 Card-Read Punch, 1401 Processing Unit, 1403 Printer and 729 Magnetic Tape Units.

The IBM PC - 1981

- ✓ 64 kilobytes of RAM
- ✓ 4.77 MhZ 8088 processor
- ✓ 160K 5.25" single sided floppy drive
- ✓ Retailed for $2,880

Today - USmart's 4.8-inch MC-1

- ✓ USmart's 4.8-inch MC-1 is about the size of a man's wallet
- ✓ 1.6GHz Intel Atom Z530 CPU
- ✓ 1GB of RAM
- ✓ 4GB of on-board storage

Dell Studio XPS 8100 Desktop

- ✓ Intel® Core™ i5 and Core™ i7
- ✓ Windows® 7 Professional 64-Bit
- ✓ New! THX® TruStudio PC™ to enhance music and movies, making them sound livelier, clearer, smoother providing a better listening experience.
- ✓ High-performance graphics with ATI HD up to 1 GB GDDR5

What are they talking about?

Bits

Bytes

MegaBytes

GigaBytes

TerraBytes

Data is represented in Bits and Bytes

- 1 Byte has 8 bits
- bits can be Off(0) or On(1) - $0_8 0_7 0_6 1_5 0_4 0_3 0_2 1_1$
- 1 Byte = 1 Character (0-9, A-Z, a-z, !@#$%^&*(),etc.)
- 1 Byte can represent 256 Characters
- The word "HOUSE" is represented in the computer in 5 Bytes, containing 40 bits

1 **B**yte = 8 **b**its
1 **K**ilo**B**yte = 1000 Bytes = 1000 Characters
1 **M**ega**B**yte = 1000 KiloBytes = 1,000,000 Characters
1 **G**iga**B**yte = 1000 MegaBytes = 1,000,000,000 Characters
1 **T**era**B**yte = 1000 GigaBytes = 1,000,000,000,000 Characters

A typical page of text = 2000 Characters or 2 **K**ilo**B**ytes or **2000 Bytes**

A Computer has Temporary Storage and Permanent Storage

Temporary Storage

Memory Chips

Memory Cards

Permanent Storage

Hard Disk Drive
HDD

Floppy Disks

CDs
DVDs

Memory Cards

Flash Drives

How Temporary and Permanent Storage Work together

The Hard Disk Drive stores

- Programs (like Microsoft Word)
- Data (like MyResume.doc)

When you start a program, part of the program (Word) is stored in Memory

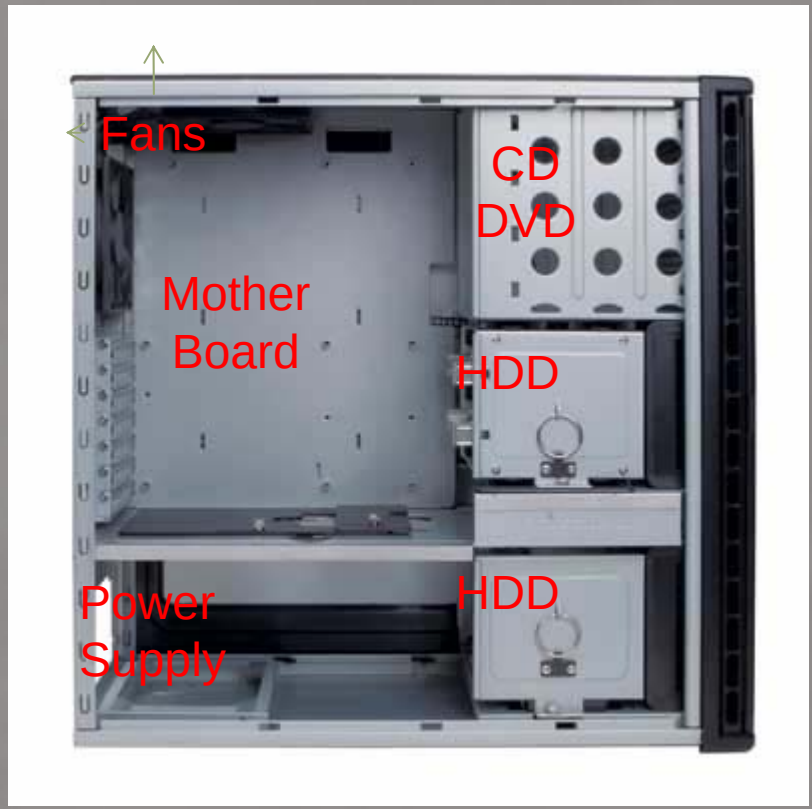
When you open MyResume.doc it is also stored in Memory

How Temporary and Permanent Storage Work together

After you edit and SAVE your new My Resume.doc, it is saved to the Hard Disk

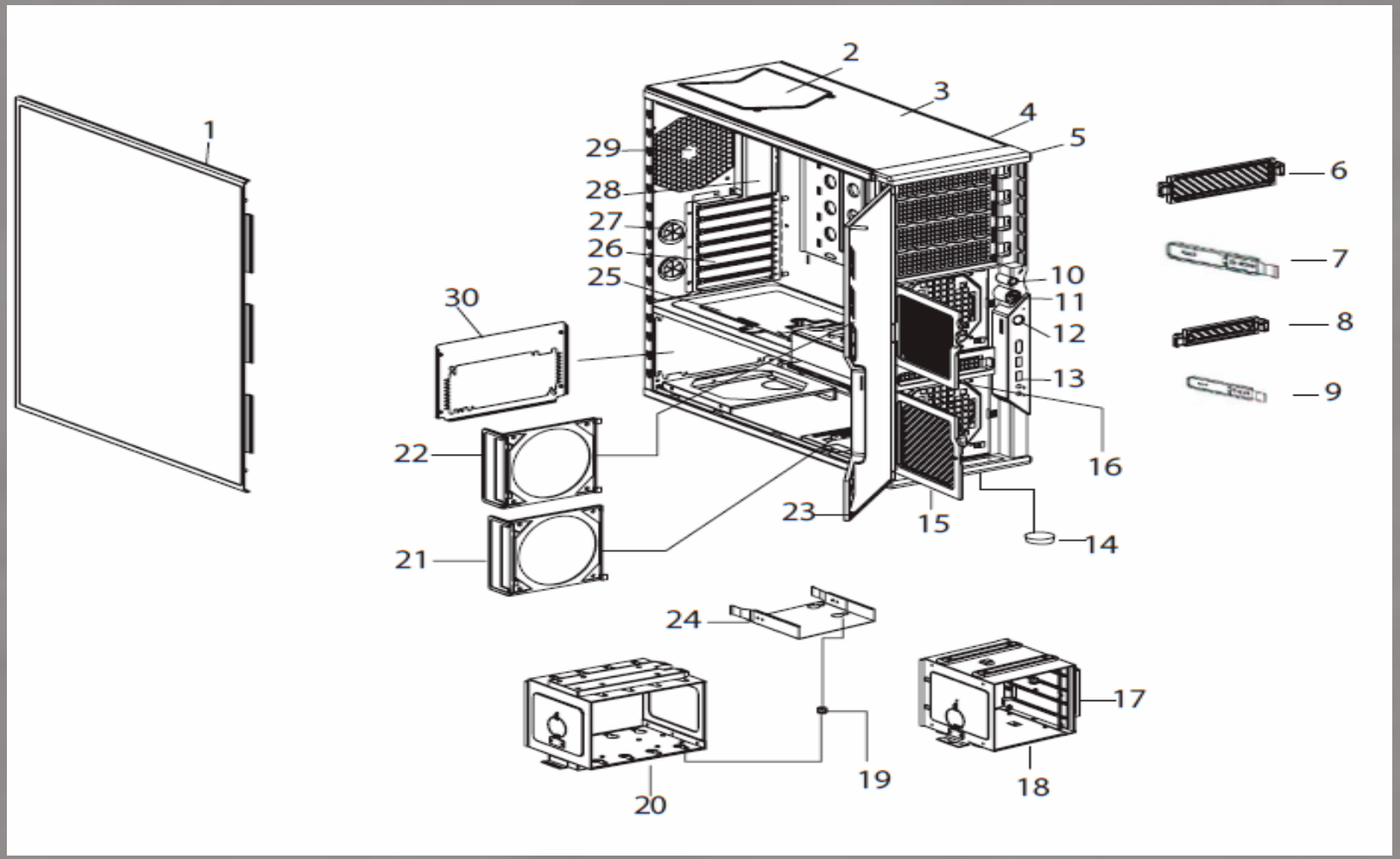
When you CLOSE the program (Word), Memory is marked as reusable or cleared, and ready for your next program to be loaded.

The Box or The Computer Case



Antec P183
Advanced Super Mid Tower

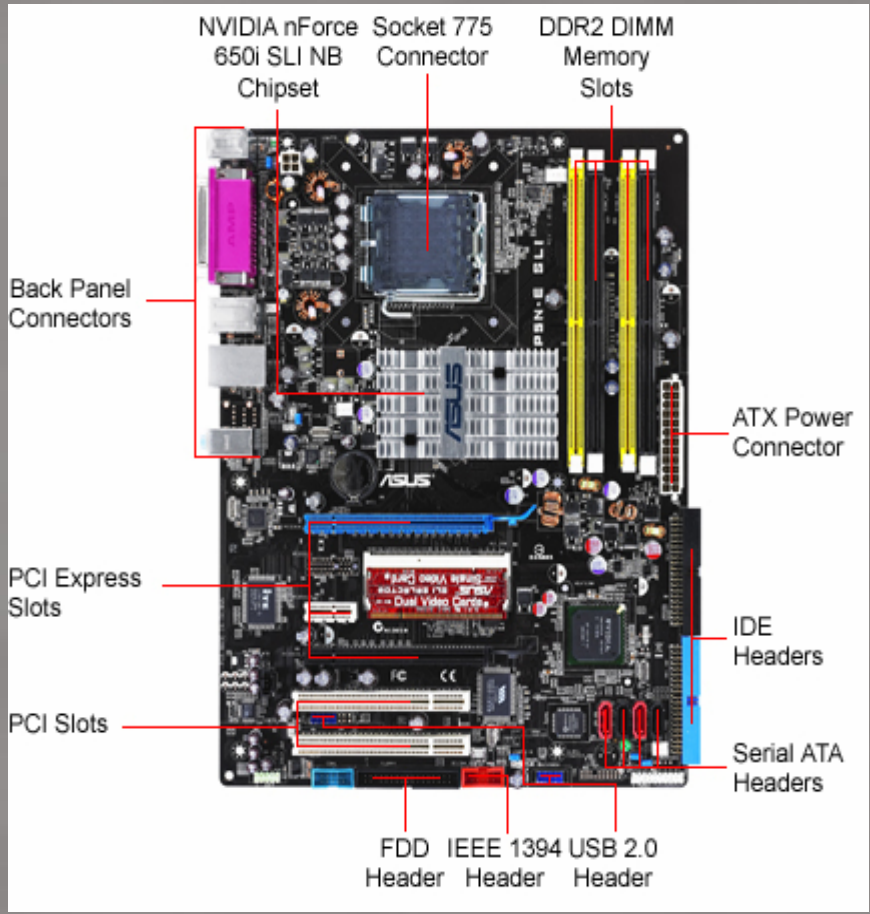
P183 Expanded



The primary purpose of the case is to house all your components, provide power, and keep everything cool.

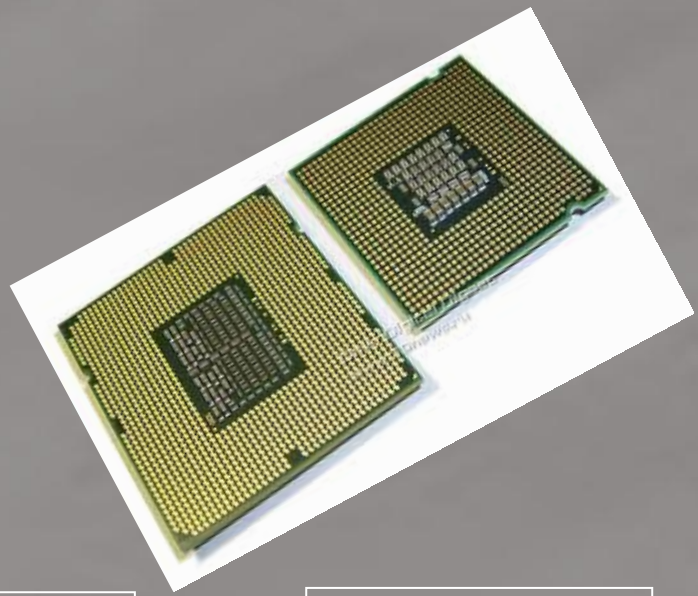
Cases come in all shapes and sizes

The Mother Board



Everything gets connected here!!!

CPU (Central Processing Unit), The Brains



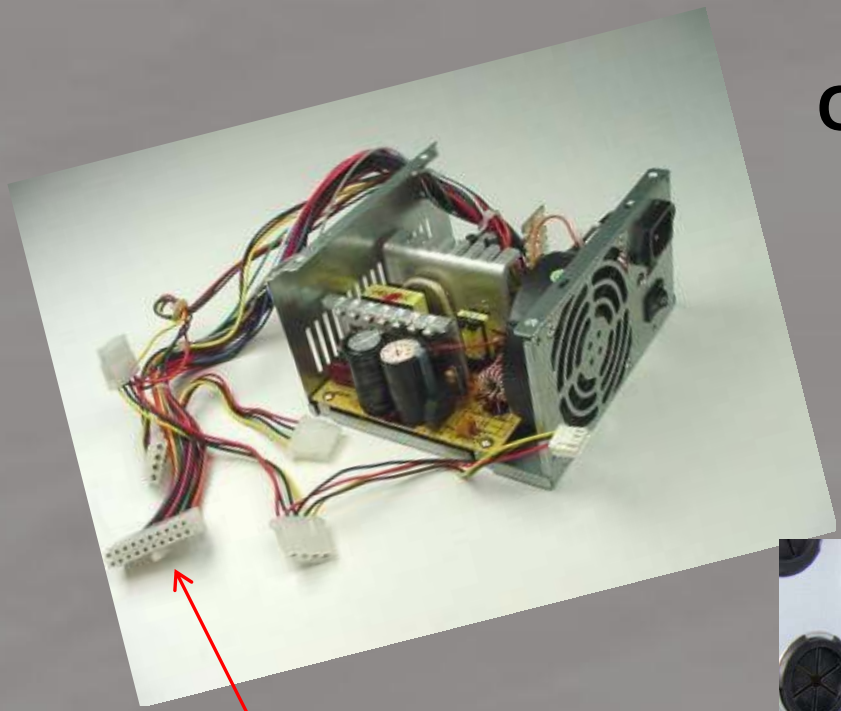
Air Cooling

Water Cooling

Heat Sink

A CPU gets very hot, and different methods are used to keep it cool.

PSU (Power Supply Unit)



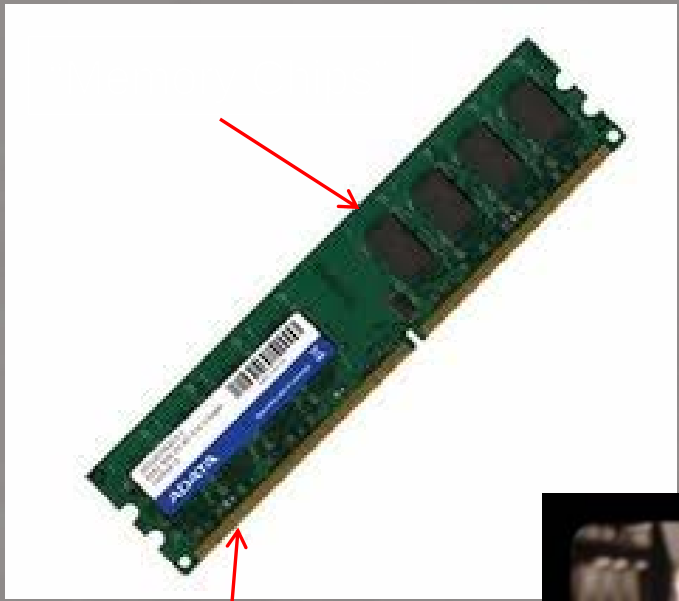
Motherboard Connectors

Clean Power
+/- 5 Volts

Surge Protection

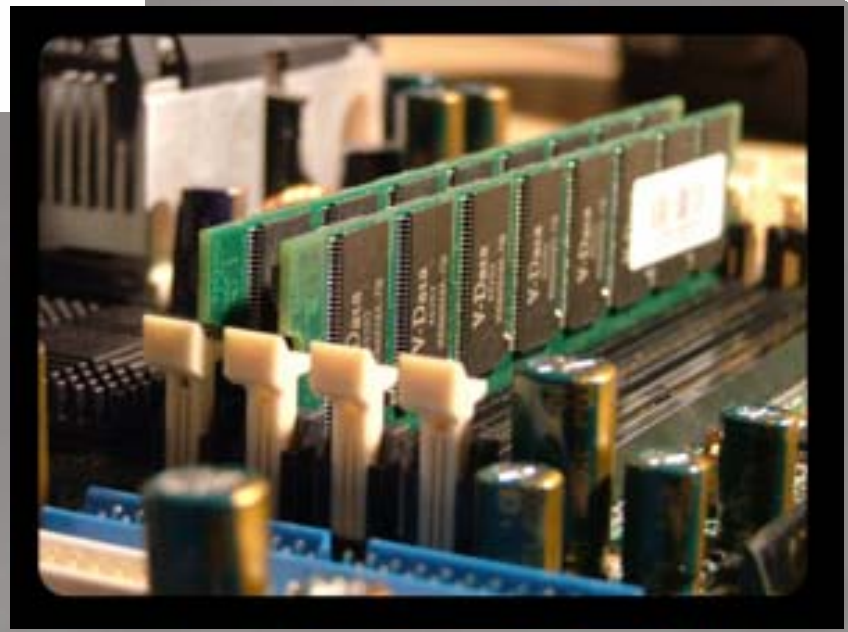
Memory Cards

RAM – Random Access Memory

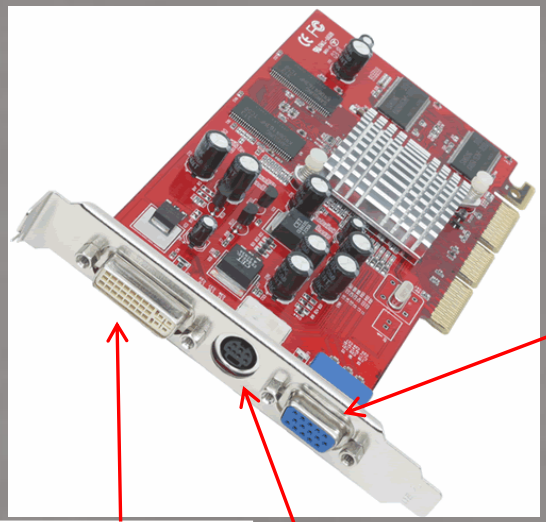


Memory Card

With Cooling Covers



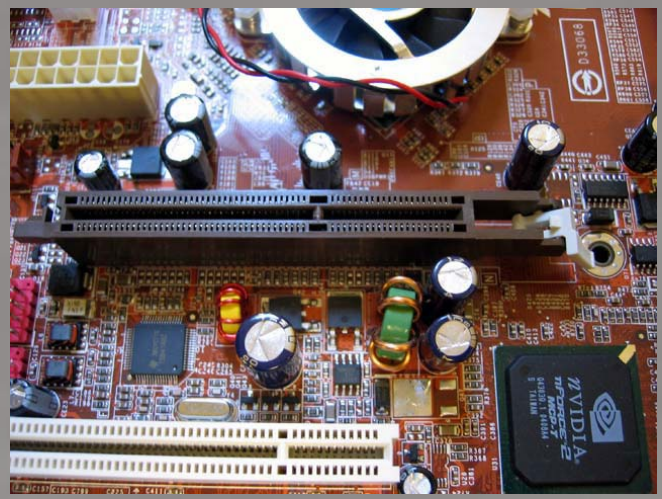
Video Cards – Controls your display



VGA Connector

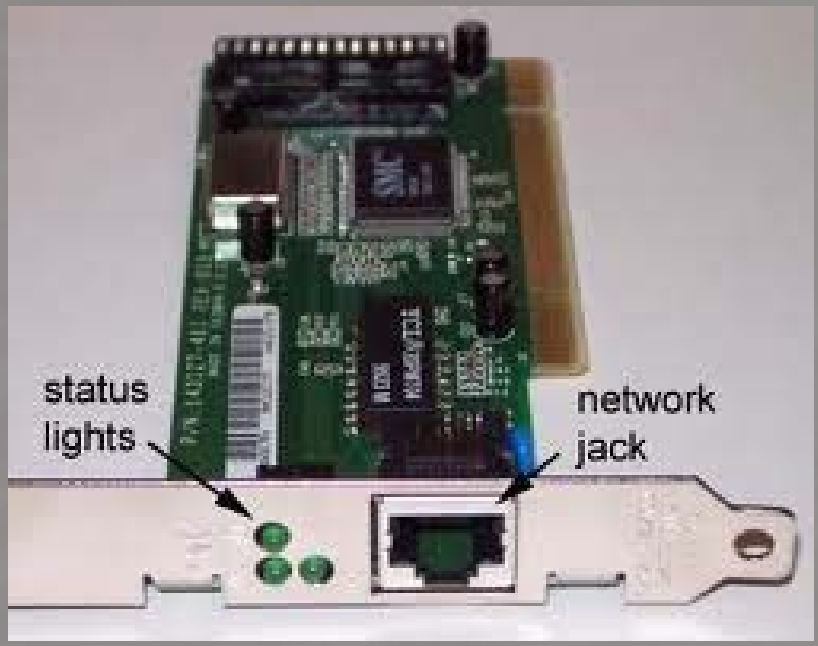
DVI Connector

TV Connector



Network Cards

Communicating with other computers and the Internet



Wired Ethernet

Wired/Wireless
Router

Wireless Ethernet Card

HDD (Hard Disk Drive)

(My first 5 megabyte drive cost $1,900 in 1983. Today, 1 TeraByte cost about $100)

Magnetic Platters

Read/Write Head

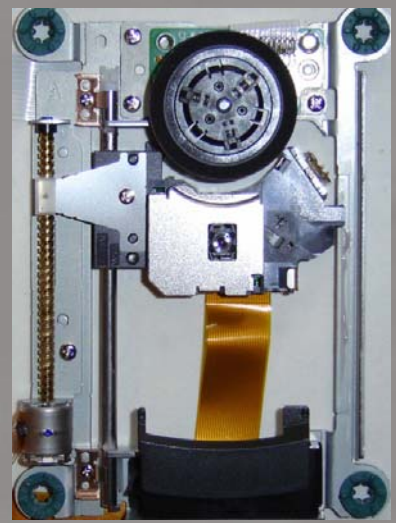
Platters Spin at:
5400RPM
7200RPM
10000RPM

Floppy Disk Drives and CD-ROM

CD/DVD Read/Write Drive

3.5in Rigid

5.25in Floppy

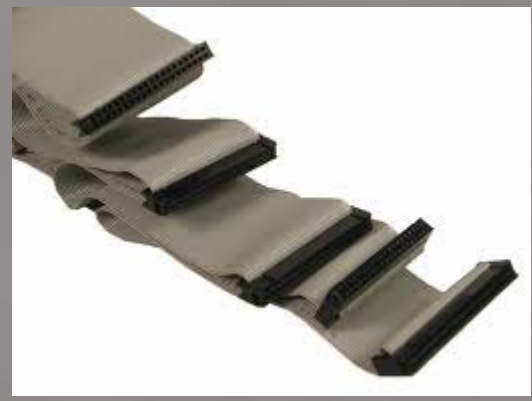


CD's, DVD's

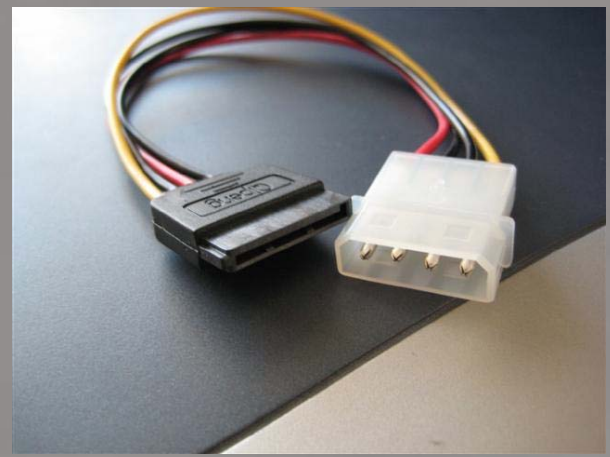
Cables To Connect Everything

SATA Cables

Audio Cable



IDE Cables



Power Cable Adapter

Putting It All Together

All-in-one Printer

Scanner

Mobile Phone

Speakers

IPOD

Webcam

What makes it all work together?

The Operating System

Microsoft Windows

Windows (3.0, 2000, XP, Vista, 7)

1. Tells all the computer components how to work together
2. It is "software" vs "hardware"
3. It provides a Graphical User Interface (GUI) for YOU to interact with the computer
4. It provides other software, like Microsoft Word, with the "tools" needed to use all the components of the computer

Windows will be covered in detail in another PCC program. Please check our PCC Events Calendar for dates and times.