**TECHNICAL COMPUTER CONCEPTS**

TCC: 2:03 pm 01/21/2023

Types of Personal Computers (MicroComputer)

> Smallest computer created

- Desktop:

: most common type of personal computer

: made/design for table/desk

: system you see around in schools, home, and offices

: as of today, desktop computer are more powerful in this generation

- Workstation

> Specialized Personal Computer

> Single user; more powerful, and more features than Standard PC4

> High resolution monitors and graphics

Mostly used by:

: Scientist

: Engineer

: Animators

- Notebook Computer(Laptop)

> More popular but less power than desktop computer

> Smaller size

> Operated by both alternating current and direct current battery

GPU:

Graphics Processing Unit

- Tablet

> Newest development in portable

> Full featured pc

> less performance

- Handheld/Mobile Device

> [PDA] Personal Digital Assistance

> Fits in your hand

> Mostly used by negotiators/corporators/companies

- Smartphone

> most used personal computer

> portable

Network

> connection between devices

Identifying the key parts of computer

Note:

Group Presentation \*Reporting\*

- 8 members

-

TCC W3 1:28 pm 01/28/2023

Identifying Key Parts of Computer:

> Motherboard:

- Backbone that ties the computer's components together at one spot and allows them to talk to each other

- main hub

: Standard-ATX (Advance Technology eXtended)

- pre-built computer system

: Micro-ATX

: Mini-ITX (Information Technology Extended)

: Nano-ITX

: Pico-ITX

- Smart phones (Handheld computer)

> Parts of Motherboard:

: PCi Express

- for Graphic Card/Video CArd

: Peripheral Component Interconnect

- external soundcard, landcard

; replacement for specific internal parts

: Earphone, Headphone, Audio Port

-

: Display Port:

- VGA, DVI, HDMI

IDE Connector/Cable (outdated) (Integrated Drive Electronics)

SATA Connector/Cable (Serial Advanced Technology Attachment)

: CMOS (Complementary Metal-Oxide SemiConductor)

- battery

: RAM Slot

- limited compatibility

CPU (Central Processing Unit)

- brain of computer system

- a computer hardware that carries out a computer's instructions and controls all the arithmetical, logical, and input/output operations of a computer system

- most important part of computer

- also known as micro processor/ central processor

Location:

- placed in the CPU socket center around the VRM section of the motherboard connected with the other hardware elements inside the computer cabinet

- situated under the Heat Sink to regulate temperature

VRM:

- Voltage Regulator Module

Intel 4004:

- world's first microprocessor invented by intel company

- March, 1971 (November 15)

- 4th generation

Function:

- store and process by performing all the mathematical and logical calculations with the input data to provide the output data to the users, thereby working on the computer

Input Device:

- keyboard

- mouse

- microphone

- scanner

- camera

- sensor

Data Storage: Processes and stores Cache for Future Use

- HDD

- SDD

- Memory Cards

- Pen Drives

- Optical Disks

Output Device:

- monitor

- printer

- speaker

- headphone

- screen projector

- plotter

Cycle:

1. Fetching

- receives basic instructions or series of binary numbers from RAM to CPU

2. Decoding

- data is loaded to CPU and performs logical and arithmetic operations

3. Executing

- decoded instructions will be execute, computer has to carry out the instruction during execution step

- loading and performing data from memory

Importance:

- Accountable for processing data

Brain:

- Manages functions throughout the whole system

Components:

- ALU (Arithmetic Logic Unit)

- CU (Control Unit)

- Registers

- Cache

- Busses

- Clock

Types:

- classified to cores

; single-core

; dual-core

; quad-core

; Hexa-core

; Octa-core

; Deca-core

- classified to architecture

Main Functions:

- Fetching

- Decoding

- Execution

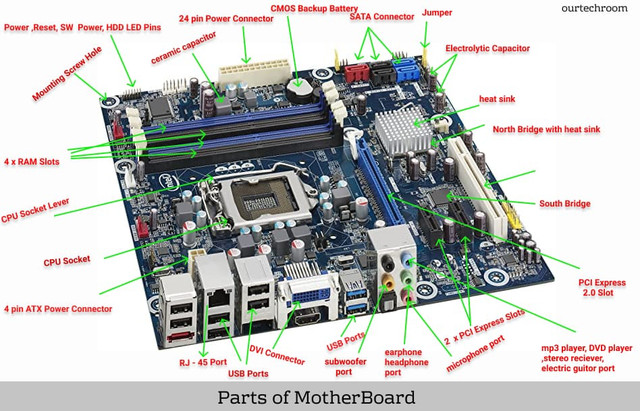
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Motherboard

-the backbone that ties computer’s components together at one spot and allows them to talk to each other.

Types:

* Standard-ATX
* Micro-ATX
* Mini-ITX(information technology extended)
* Nano-ITX
* Pico-ITX



What is CPU?

* CPU or Central Processing Unit that carries out a computer’s instructions and controlls all the arithmetical ligical and input/output operations of a computer system.

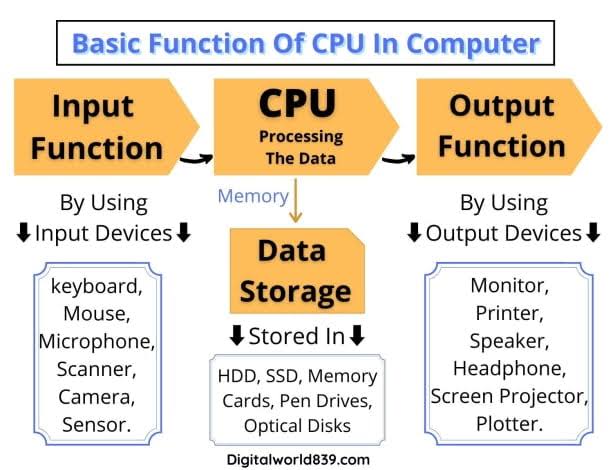
1st microprocessor of intel: Intel 4004

Where CPU is located in the computer?

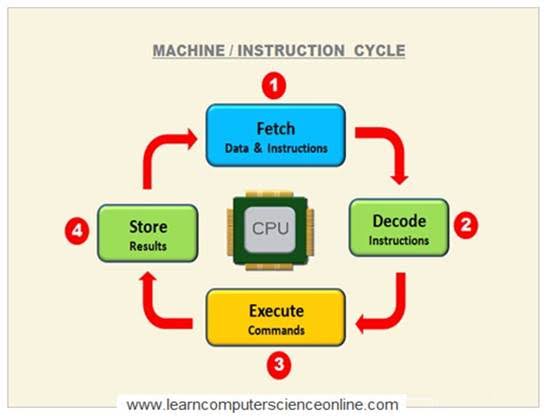
* This CPU is placed on the CPU around socket center around the VRM(Voltage Regulation Module) section of the motherboard connected with other hardware elements inside the **computer cabinet**.

What is the function of CPU in computer?

* The main function of CPU in the computer is to store and process by performing all the mathematical and logical calculations with the input data to provide the output data to the users, thereby working on the computer.



How CPU (Central Processing Unit) works?

1. Fetching
2. Decoding
3. Executing

FAQ’s

* Why CPU is important?
* Why is rhe CPU called the brain of the computer?
* What are the components of CPU?

-ALU ,CU , Register, cache,buses, clock

* Types of CPU?

-Single-core, dual-core, quad-core, hexa-core and deca-core.

* What are the 3 main functions of CPU?
* Are CPU and processor the same
* Why CPU is situated under the heat sink?

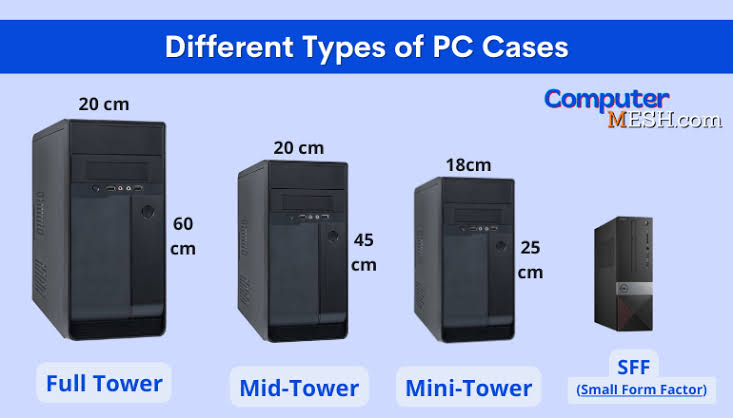
*COMPUTER CASES/TOWERS*

**CONTINUATION:** Identifying key parts of a Personal Computer



What is PC Case?

* The computer cases are a visible part of our computers called PC towers and Computer towers. Its function is to serve as a protective structure for the rest of the internal components where they will be assembled.

**4 Different types of Computer Cases**

**FULL TOWER**

-Full Tower is used to accommodate an **E- ATX**(Extended-Advance Technology eXtended) **or CEB(**Compact Electronics Bay Specification) **motherboard**

* **E-ATX** = 13” instead of 9.6”
* **CEB** = 12” x 10.5”
* Full tower size 55-75cm tall and 22-32cm width

**MID TOWER**

-the most popular and widely used computer case that allows you to use many drives and almost all types of motherboards with acceptable overall dimensions in it.

* Mid tower size 35-55cm tall and 15-25cm width

**MINI TOWER**

-designed to take up as little physical space and without Installing decent-sized graphics cards

* Mini tower size 30-45cm tall and 15-25cm in width

**SFF (SMALL FORM FACTOR)**

-These types of cases were considered very niche, but in recent years they have gained popularity due to the miniaturization of powerful components that can fit in them.

**Power on Self Test**

***What is POST (Power on Self Test) in computers?***

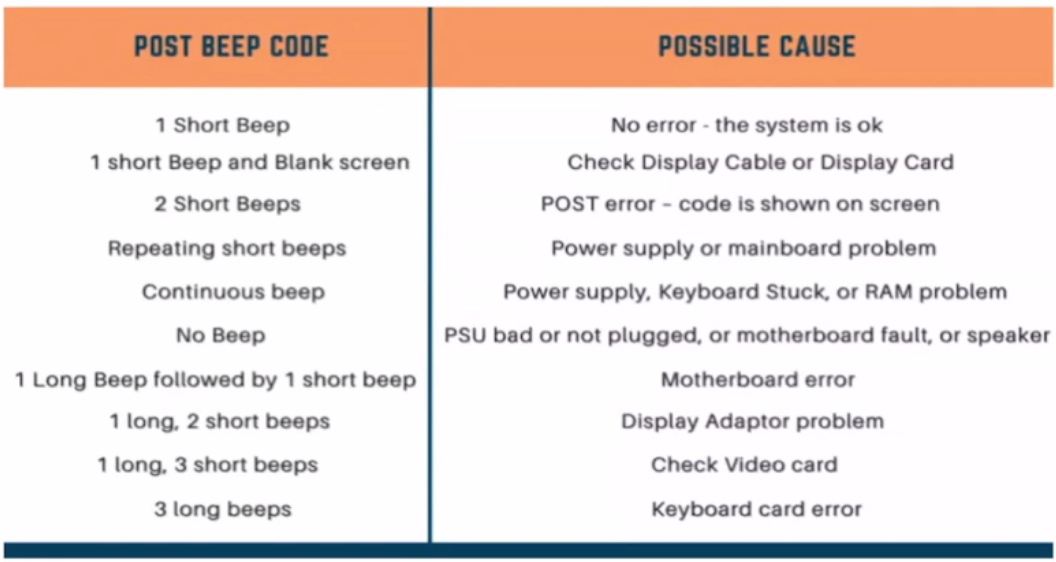
The Power On Self Test, or POST, is a diagnostic procedure that a computer performs when it boots up and is stored in the ROM BIOS on the motherboard.

Using POST to recognize failures

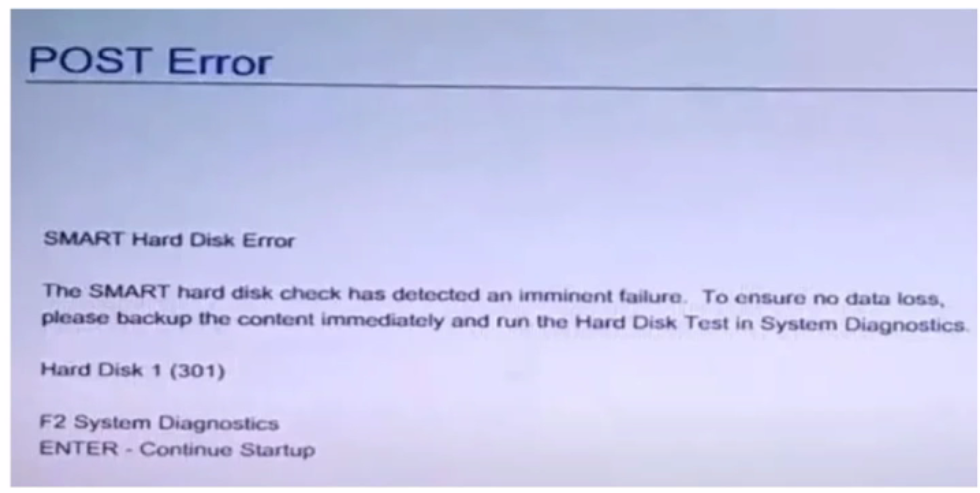
* + Beeps sound
  + Messages displayed on the monitor screen
  + Hexadecimal error codes issued on the / O port

**Tests of *Power on Self Test***

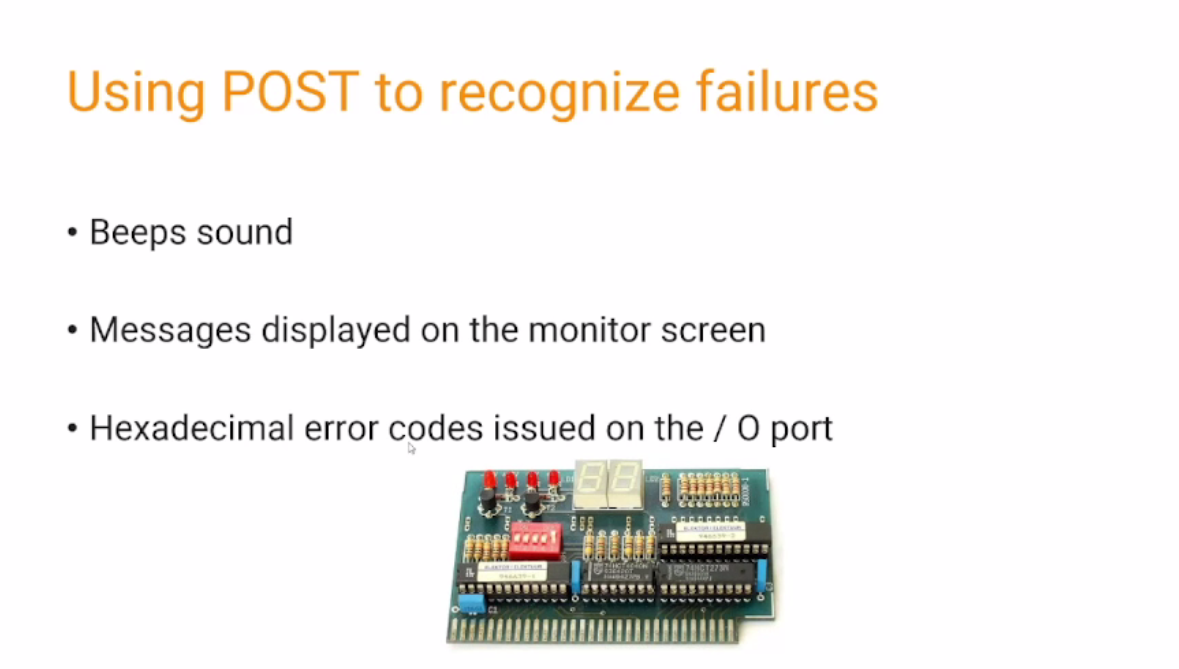
* CPU register test,
* ROM checksum test,
* System timer and beeper port test,
* Checking the DMA controller,
* Reviewing the lower region of RAM for projecting resident programs in the BIOS,
* Launch of local programs,
* Checking the standard graphics adapter (VGA),
* Testing RAM,
* Checking the main input devices,
* CMOS check,
* Checking the main LPT / COM ports,
* Checking hard disk drives (HDD), and SSDs,
* Self-testing of BIOS functional subsystems,
* Transferring control to the bootloader.



|  |  |
| --- | --- |
| POST BEEP CODE | POSSIBLE CAUSE |
| 1 Short Beep | **No error - the system is ok** |
| 1 Short Beep and Blank screen | **Check Display Cable or Display Card** |
| 2 Short Beeps | **POST error - code is shown on screen** |
| Repeating short beeps | **Power supply or mainboard problem** |
| Continuous beep | **Power supply. Keyboard Stuck. or RAM problem** |
| No Beep | **PSU bad or not plugged. or motherboard fault. or speaker** |
| 1 Long Beep followed by 1 short beep | **Motherboard error** |
| 1 long 2 short beeps | **Display Adaptor problem** |
| 1 long. 3 short beeps | **Check Video card** |
| 3 long beeps | **Keyboard card error** |



|  |  |
| --- | --- |
| Error Code | Possible Cause |
| 301 | Indicates the hard drive is failing |
| 201 or 203 | Memory module failure detected |
| 1101 | Malfunction in your system operation or failed installation of software, or **system crashing** |
| 601 | Battery error or dead |
| 161 | Irregular entries in the Windows registry or in configured system |



Expansion slot

3 basis post card made

* **ISA slot** > x86 architecture
* **PCI slot** > x86 architecture (power CPUs)
* **AGP slot** > x86 architecture

Standard steps to resolve errors if you are getting some sort of error in the post code you can try suggestions and look at if they solved the issue

* Restart
* Unplug any drives or USB devices.
* Disconnect external devices.
* Reconnect the power supply cables.
* Identify the beep code using the component or device manual.
* Check the fans turned off or on.
* Disconnect all expansion cards.
* Power off and on the computer.
* Check if the BIOS chip is loose.
* Update BIOS.
* Change motherboard, GPU, RAM, PSU, storage disks as a proxy to see whether the POST continues to proceed further.