

# Block Diagram of Computer System and its Various Components

**Block Diagram of Computer System:** The Computer system consists of mainly three types that are central processing unit (CPU), Input Devices, and Output Devices.

The Central processing unit (CPU) again consists of ALU (Arithmetic Logic Unit) and Control Unit.

The set of instructions is presented to the computer in the form of raw data which is entered through input devices such as a keyboard or mouse.

Later this set of instructions is processed with the help of the *CPU [Central Processing Unit]*, and the computer system produces an output with the help of output devices like printers and monitors.

A large amount of data is stored in computer memory with the help of primary and secondary storage devices temporarily and permanently.

**These are called storage devices.**

The CPU is the heart | Brain of a computer because, without the necessary action taken by the CPU, the user cannot get the desired output.

The **Central Processing Unit [CPU]** is responsible for processing and handling all the Instructions which is given to the computer system.

Below Block Diagram of Computer and Its Components are mentioned for better understanding.

The Basic components & parts of computer system are mentioned

- Input Devices
- Output Devices
- CPU (Central Processing Unit)
- Storage Unit
- ALU(Arithmetic Logic Unit)
- Control Unit

## Input Devices of Computer System

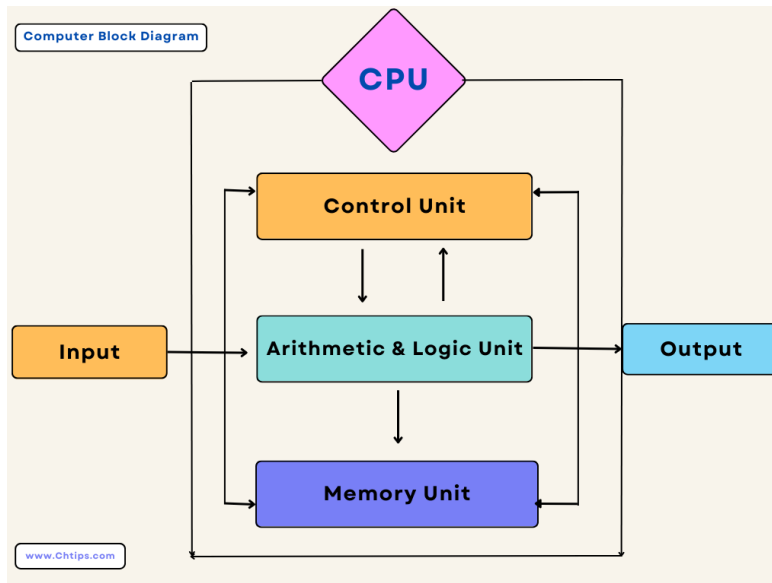
The set of instructions or information is provided to the computer system or PC with the help of input devices such as *(a keyboard, mouse, scanners, etc. )*.

The Instruction or data presented to the computer system is converted into binary form then it is supplied to a computer system for further processing.

The Input Unit perform transferring the data from outside the world into the system and later this data is processed and the system produces instructions through output units such as **printers, monitors, etc.**

The Input devices enter the data from outside the world into the primary storage devices.

The input devices are a means of communication with the outside world and our computer system.



Input Devices accept or receive data or instructions from outside the world such as input devices like keyboard and mouse

- It converts the data or instruction or information into a machine-readable form for further processing & handling.
- Later it supplies the decipherable information to the PC for additional handling
- They act like a connection between outside the world and our own computer system
- **Keyboards and mouse** are prime examples of input devices.
- When the procedure is finished we get or receive desired results using output devices such as **printers and monitors**.

## Output Devices of Computer Systems

Output devices of computers produce or generate results with the help of devices or gadgets such as a printer, monitors, etc.

Primarily these instructions or data provided to a computer system is in binary code

so to produce or generate the desired output the system has to convert this data into human-readable form, to do so it has to first present the data or instruction to a computer system for further processing or handling.

With the help and assistance of output devices, the system is linked or connected with the outside world.

**For Example**, The data or instruction such as Graphics, images, or text is inserted into the computer system with the help of input devices as the data received from the input devices is in binary code, therefore,

The data has to be primarily converted into human-readable form after processing the user gets the required or desired data or set of information.

**The prime examples of Output devices are Printer, Monitor, Projectors etc.**

- The output devices receive all the data or instructions in binary code.
- The output devices convert the binary codes into human-readable or intelligible forms for better understanding and better functionality.

- They produce the changed or converted result to the user .which is effectively comprehensible by humans for proper and accurate understanding.
- They act as a connection or link between the outside world and the computer system or our own PC framework.
- **Printers, monitors,** and projectors are prime examples of output devices.

## Central Processing Unit (CPU) of Computer System

The Central Processing Unit is also called the brain or heart of a computer.

The CPU is nothing but an electronic hardware device that carries or performs all the operations such as arithmetic and logic operations.

Below we have discussed briefly arithmetic and logical operation.

The CPU in another term is also called as "PROCESSOR".

## Central Processing Unit

Every instruction given through the **input devices** such as keyboard or mouse is carried further for processing and we users get our desired results through are output devices such as printers and monitors

The CPU is also responsible for controlling all the operations of the other units of the computer system.

When we talk or discuss CPU we tend to speak about its speed as speed these days matters most due to a high number of large software which requires a fast processor for execution.

The different component of CPU is Arithmetic logical unit And Control Unit.

## Top 5 Processor Brands

- **Intel**
- AMD
- Cyrix.
- Fujitsu
- Hitachi

## Control Unit

The Control Unit or CU Controls or coordinates all activities performed in a computer system.

It receives information or instruction or directions from the main **memory of computer.**

It tells the logic unit, memory as well as input and output devices how to handle the program or instruction in proper order.

When the control unit receives any set of information or instruction it converts them to control signals then these signals are sent to the central processor for further processing finally, it understands which operation to execute, exactly or precisely, and in which order.

## Arithmetic and Logic Unit

- Arithmetic Unit (AU)

- Logic Unit (LU)

There are some processors now that have more than a single **AU [Arithmetic Unit]**.

ALU performs arithmetic and logical operation. When a set of instructions or programs is conveyed.

The control unit generally characterized which sort of operation to execute.

The arithmetic operation comprises (**Addition, subtraction, division, and** multiplication) and the logical unit carries out the operation such (as AND, OR, Equal, less than, and greater than), and later the control is changed to ALU, and the result is generated.

ALU is later stored or put away in transitory memory.

## Storage Unit of Computer

The information or set of guidelines can be stored in the PC storage unit when information or direction is exhibited to the PC system utilizing Input devices.

To begin the procedure on information, Instructions given by input devices the information must be put away in memory, and later when the preparation is done the outcome produced is likewise put away in the computer system for additional handling

This type of work and action is done by the storage unit. In another word, we can also describe the storage unit as the unit which gives space to store data or instruction of processed data, processed result.

- It stores information or instruction
- It stores Results
- It stores the consequences of prepared data

**Storage Devices::** The term storage is defined as the devices which store data given by the input devices or output devices after processing, the data is stored in a computer system.

i.e. Primary storage or secondary storage depends entirely on the size of the data.

There are mainly two types of storage Unit

- Primary Storage
- Secondary Storage

**Primary Storage::** They are also called Main memory or in other words **RAM (Random Access Memory)**.

The Data or set of instructions is stored in primary storage before processing and later the data is transferred to ALU where further processing is done.

The **primary Storage** cannot store a huge amount of data, and the data stored in this memory is temporary (The data is lost when there is a power failure),

it is also called temporary memory, they are very expensive.

The other example of **primary Storage is the L1 Cache of the Processor**

## RAM (RANDOM ACCESS MEMORY)

The RAM is called "Random Access Memory".

It is a type of **volatile memory** that is not capable of storing data or information when there is no power supply.

This **type of memory** is very fast, less expensive, and light in weight.

## Random Access Memory

This type of computer memory is able to transfer data and instructions from the central processing unit [CPU] much speedier than secondary storage devices like **Hard disks**.

The RAM is placed inside the computer system to be precise they are installed on a computer motherboard.

Computer RAM is the primary reason for the speed of the modern-day personal computer.

It is used for storing all active programs or instructions with the goal that it can be additionally exchanged for CPU for the additional process.

The technology used in RAM is based on semiconductor integrated circuits. Ram is divided into two more categories

- Static Ram
- Dynamic Ram

**Static RAM::** The static Ram stores binary information in clocked sequential circuits. It is comprised of flip-flops and stores a touch of voltages.

It is a volatile or unstable memory if the power from the data or instructions is destroyed. This kind of memory does not require refreshing.

**Dynamic RAM::** Dynamic RAM stores binary information in the form of electric charges that are connected to capacitors that are inside the chip.

This type of Ram Consumes less power and is capable of storing or holding more data and information compared to static RAM.

ROM (READ-ONLY MEMORY)

ROM Stands for "**READ ONLY MEMORY**" they are a non-volatile type of memory that can store data or instruction permanently. They can be used as permanent storage.

End users cannot manipulate, delete, edit, or update instructions inside ROM.

The data can be changed or updated by the programmer who has the necessary programming skills and knowledge to do so.

**ROM is of different Types**

- PROM
- EPROM
- EEPROM

## PROM

PROM stands for "**Programmable Read-Only Memory**" it is also a type of non-volatile memory .which once programmed or customized then the set of instructions stored cannot be deleted or updated or refreshed.

Computer Programmers write and compose programs or codes in this chip in such a way to obtain the desired result, special equipment is used to write programs inside the chip.

## EPROM

EPROM stands for “***Erasable Programmable Read-Only Memory***” as the name suggests the programs which had been written and composed by computer programmers can be deleted or updated according to the necessities.

One simply needs to uncover this chip to High Ultraviolet light for over 20 minutes to delete the information. Once exposed they can be reused after reprogrammed

They should not be overexposed to avoid damage.

You cannot delete, or erase a single content from them if you try to do it the whole data or information inside the chip gets deleted or erased.

This type of memory is broadly used as they are cheap and reliable.

## EEPROM

EEPROMS stands for “***Electrically Erasable Programmable Read-Only Memory***” to erase or delete the information or data inside them one should take the memory outside the PCB (Printed Circuit Board).

As the time required for erasing the information is significantly speedier the EPROMs.

**Secondary Storage::** Secondary storage is also called a permanent storage unit as when the data stored in this memory is stored permanently users can recall the data whenever they need it.

The data remains in this memory even when there is a power failure or shutdown, they are much cheaper than primary memory.

The Example of Secondary Storage is Hard disk and Zip drives.

## Computer Hard Disk

Computer Hard Disks are also called hard drives, HDDs (Hard Disk drives), and **Fixed Disks**.

They are used as a **secondary storage device**, they are a non-volatile memory (Data is not lost when power is off)

They are the cheapest and faster device that is used for data storage.

Modern Hard disk comes in huge data storage capacity such as 160 GB,250 GB, 500 GB,1 TB, and 2 TB.

## Computer Hard Disk

They have a rotation speed of 7200 rpm, 9200 rpm (Revolution Per Minute), and 15000 rpm, and the access speed of hard drives are approx. 1000 kb per second.

Computer Hard disk was first introduced in 1956 by IBM. They are the most crucial part of the computer system where all the important data can be stored almost permanently.

Hard drives are made up of rigid materials, it has a disk-shaped platter made up of aluminium or glass and is coated with a thin layer of magnetic material the platters are hard and cannot be bent, therefore, are called **fixed disk**.

The sizes of disk platters vary from 1 to 14 inches in diameter.

HDD records data by magnetizing ferromagnetic material directionally to represent either 0 or 1 in a binary form.

## Pen Drives | Zip Drives | Thumb Drives

Pen drives are used extensively in the world they have replaced **CDs** and **Floppy Disk** due to their massive records storing capability and quicker information transferring speed.

Pen drives and USB flash drives are linked to USB (Universal Serial Bus) Port which is accessible on pc motherboards they are used except for any extra electricity they acquire the energy from the USB port itself and subsequently are taking part in a dominant function in the PC world.

### *Pen Drive*

Pen drives, USB Flash drives, and thumb drives come in large storage capabilities from 2 GB to 128 GB.

The USB Memory Stick comes with one-of-a-kind built-in facets embedded in itself such as a built-in camera, built-in audio, and video enjoying applications.

These pen drives allow users to copy records from one laptop to other with ease with no data loss.

The USB Memory Stick and USB flash drives are Plug and play units i.e. they do not require any extra drives or software programs and hardware or utility to run effortlessly.

Modern Pen drives come in **3.0 and 4.0** speeds which are much faster compared to previous drives.

### Digital Versatile Disk [DVD]

DVD stands for Digital Video Disk or Digital Versatile Disk.

DVD or optical disk is widely used for storing digital content material for each Personal computer system and some digital products.

DVDs can store almost 7 times more data than CDs. Physically both CD and DVD are of the same diameter and thickness which is 5.25”.

### *Digital Versatile Disk*

DVD comes in 4.7 GB on a single layer and nowadays it comes in 8 GB on a double-layer disk.

- The Optical Disk is cheaper, light in weight, easy to handle, and easy to store data.
- In an Optical Disk data can be almost permanently stored.
- The optical disk has a very high storage density therefore you can store a huge amount of data.
- As there is no read/write head there is no risk of the head crashing against the disk surface.
- The optical is usually circular in shape therefore the data is stored in proper order.
- The DVD is smaller in size, therefore, needs to require less space. Useful Video On: Block Diagram of Computer

## 4 Functions of Computer

- Input
- Output
- Processing
- Storage

### Functional Unit of Computer Block Diagram?

- Input Unit
- Output Unit.
- Central Processing Unit.

- Memory Unit Arithmetic & logical Unit.
- Control Unit.

## Basic 6 Components of Computer System

The basic components of computer are mentioned below.

- Input Devices
- Output Devices
- Central Processing Unit [CPU]
- Control Unit [CU]
- Arithmetic Logic Unit [ALU]
- Storage Unit

### *Components of Computer*

## Cache Memory of Computer System

Cache memory resides between primary memory and CPU [Central Processing Unit].

They are extremely expensive therefore the manufacturer uses it in low numbers.

1. They are fast and reliable.
2. They are likewise called high-speed semiconductors.
3. They are primarily responsible for accelerating the CPU.
4. They store the data which is frequently used by the **“COMPUTER PROCESSOR”**.
5. This program or information is transferred and exchanged from disk to cache memory with the assistance of the operating system so that Processor can access them.
6. They are considerably much faster than main memory the data exchanging time is less as compared to main memory.
7. This is one of the fastest computer memory used in computer systems.
8. The powerful computer uses more cache memory to speed up the process of information transferring and exchanging.

## What are the Basic Blocks of a Computer?

Memory Unit. Control Unit. Arithmetic and Logical Unit.

## Registers & Their Types

A CPU [**central processing unit**] contains various registers to store information temporarily during the execution of a program.

The number of registers varies from processor to processor .some processor contains more registers some processors contains fewer registers.

### *Resistors and Their Types*

Registers are classified as follows

- General Purpose Registers
- Accumulator
- Special Purpose Registers
- Status Register or Flag Register



- Instruction Register
- Index Register
- Memory Address Register (MAR)
- Memory Buffer Register (MBR) or Data Register (DR)

### General Purpose Registers

These registers store data and intermediate results during the execution of a program they are accessible to users through instructions if the users are working in assembly language.

The accumulator is the most important general-purpose register having multiple functions.

It is most efficient in data movement arithmetic and logical operations its functions depend on the design of the processor whether the processor is an accumulator-based processor or a general-purpose registers-based processor.

They have some special features that the other general-purpose registers do not have.

In an accumulator-based processor design, the accumulator holds one of the operands of arithmetic and logical operations.

After the execution of arithmetic and logical instructions, the result is placed in the accumulator all data transfers between CPU and device /port are performed through the accumulator

### Special purpose registers

A CPU contains a number of special-purpose registers for different purposes these are:

- Program counter
- Stack pointer
- Status register
- Instruction register
- Index register

### Memory address registers memory buffer register

All CPUs do not contain all of these special registers a powerful processor contains the majority of them.

A brief description of these registers is mentioned below.

**The program counter (PC)** The program counter keeps the track of the address of the instruction/data which is to be executed next.

So it holds the address of the memory location which contains the next instruction to be fetched from memory.

**Stack pointer::** The stack is a sequence of a memory location defined by the users. It is used to save/store the contents of a register if it is required during the execution of the program.

**Stack register or flag register:** a flag register contains a number of flags either to indicate certain conditions arising after arithmetic and logical operations or to control certain operations.

**Instruction registers:** it holds an instruction until the data is decoded.

Some computers have two instruction registers and so they can fetch and save the next instruction while the execution of the previous instruction is going on.

**Index registers:** index registers are used for addressing. one or more registers are designated as index registers.

**Memory address registers (MAR):** it holds the address of the instructions /data to be fetched from the memory.

The CPU transfers the address of the next instruction from the program counter (PC) to the memory address register.

**Memory Buffer Register (MBR) or Data Register (DR):** It holds or saves the instructions code or data received from or sends to the memory. It is connected to the data bus the data which are written into the memory

Are stored in the registers until the write operation is completed.

## Block Diagram of Computer Network

Computer networks connect computers and devices to share critical data and information within the network.

Different types of computer networks are listed below.

1. LAN {Local Area Network}.
2. WAN {Wide Area Network}.
3. PAN {Personal Area Network}.
4. MAN {Metropolitan Area Network}.
5. VPN {VIRTUAL PRIVATE NETWORK}.

## Block Diagram of Computer Network

In a computer network, data and resources are shared limitedly or extensively.

A block diagram of a computer network can be expressed simply as the graphical representation of the component of the computer system and different types of networks with their topologies.

The computer, devices, or nodes communicate within the network. A computer network is a group of computers that are connected.

Computer networks can be done with wired or wireless networks.

**LAN {Local Area Network}.**

**LAN stands for Local Area Network.**

In a Lan network, two or more devices, computers, or nodes are connected for data and information sharing.

Printers, internet, applications, and other resources are shared in LAN networks.

**WAN {Wide Area Network}.**

**WAN stands for Wide Area Network.**

WAN networks usually cover a large area that provides internet services within countries and continents.

WAN networks have a range between substantial geographical regions.

PAN {Personal Area Network}.

Full-Form of PAN in Computer is Personal Area Network.

PAN computer networks are primarily used and utilized for connecting devices like smartphones, computers, laptops, etc., that can be handled by the network individually.

PAN networks are instrumental in data and information sharing, with ease in communications.

A PAN network can be established with the help and assistance of WI-Fi, LAN, and Bluetooth.

MAN {Metropolitan Area Network}.

**The full form of MAN is Metropolitan Area Network.**

MAN is a more extensive network than the local Area Network but smaller than WAN Wide Area Network.

A Metropolitan Area Network links or connects to the LANs and through the internet to the MAN with the network.

MAN provides high-capacity data which customer needs, and it can provide a lower cost and excellent efficiency than obtaining local service from the telephone company.

VPN {VIRTUAL PRIVATE NETWORK}.

**VPN stands for Virtual Private Network.**

VPN is a network technology used for network security for public and private networks.

VPNs usually hide the user's location, identity, and IP address for an additional layer of security.

They are also used and utilized for data and information security.

## **10 Main Parts of Computer System**

- 1** Central Processing Unit | Processor | CPU.
- 2** Motherboard.
- 3** RAM [Random Access Memory].
- 4** Hard Disk Drives | SSD [Solid State Drives].
- 5** Switching Mode Power Supply [SMPS].
- 6** DVD RW.
- 7** Cabinet | Case.
- 8** Monitor.
- 9** Keyboard
- 10** Mouse.

## **Frequently Asked Questions [FAQs] on Block Diagram of Computer**

### **How Many Units is a Computer Block Diagram**

Three units are input, output and CPU.

### **What are the 4 Main Components of a Computer**

input devices, processing devices, output devices, and storage devices.

**Who is the Father of Computer**

**Charles Benjamin Babbage.**

**What is the First Modern Computer**

**[ENIAC] Electronic Numerical Integrator and Computer.**

**Which is the World's First Supercomputer?**

**CDC 6600.**

**Most Important Part of a Computer Block Diagram?**

The Central Processing Unit [CPU] or Processor or Microprocessor.

*For More Information Please Visit*

*<https://www.chtips.com/computer-fundamentals/block-diagram-of-computer-system/>*