

5-1 INPUT DEVICES

Input unit consists of external devices that is, components outside the computers CPU. It provides or fetches information and instructions to the computer. These include keyboard, mouse (mechanical/ opto- mechanical/ optical), light pen, joystick, scanner, microphones (voice recognition modules), Optical Character Reader (OCR), Magnetic Ink Character Reader Recognition (MICR), bar code reader, badge reader, digitizer, touch screen and optical mark reader (OMR).

- A. **Light pen:** This is a stylus with a light sensitive tip that is used to draw directly on a computers video screen or to select information on the screen by pressing a clip in the light pen or by pressing the light pen against the surface of the screen. The pen contains light sensors that identify which portion of the screen it is passed over. It is mostly used with Laptop.
- B. **Mouse:** This is a pointing device designed to be gripped by one hand. It has a detection device (usually a ball) on the bottom that enables the user to control the motion of an on-screen pointer, or cursor, by moving the mouse on a flat surface. As the device moves across the surface, the cursor moves across the screen. To select items or choose commands on the screen, the user presses a button on the mouse.
- C. **Joystick** is a pointing device composed of a lever that moves in multiple directions to navigate a cursor or other graphical object on a computer screen.
- D. **Keyboard:** Keyboard is typewriter-like device that allows the user to type in text, numeric and execute commands with the aid of the functional keys on the keyboard.
- E. **Optical Scanner:** This is light-sensing equipment that converts images such as a picture or text into electronic signals that can be manipulated by a computer. For example, a photograph can be scanned into a computer and then included in a text document created on that computer. The two most common scanner types are the flatbed scanner, which is similar to an office photocopier, and the handheld scanner, which is passed manually across the image to be processed.
- F. **Microphone:** This is a device for converting sound into signals that can then be stored, manipulated, and played back by the computer. A voice recognition module is a device that converts spoken words into information that the computer can recognize and process.

G. **Modem:** It stands for modulator-demodulator, is a device that connects a computer to a telephone line or cable television network and allows information to be transmitted to or received from another computer. Each computer that sends or receives information must be connected to a modem.

5-2 OUTPUT DEVICES

Output devices consists of hardware that transfer information from the computers CPU to the computer user. This includes the **monitor, Printer, plotters, or speaker.**

- 1- **Video Graphic Adapter:** This is a device that converts information generated by the computer into visual information called **Monitor**. It looks similar to a television set. Information from the CPU is displayed on the screen of the monitor.
- 2- **Printers:** Information and graphics processed or produced with the aid of computer are printed out as hardcopy with the aid of printer. There are different types of printers; Dot-matrix printers, Laser printers, Inkjet, etc.
- 3- **Plotters:** Computer output to microfilm or fiche (COM) which process information on rolls of film (drum plotter) or slide of film (flatbed plotter).

5-3 STORAGE DEVICES

Storage devices provide permanent storage of information and programs for retrieval by the computer.

The two main types of storage devices are **disk drives and memory**. There are several types of disk drives: **hard disk drive, floppy disk, magneto-optical, and compact disk.**

1- Hard disk drives:

Store information in magnetic particles embedded in a disk. Usually, a permanent part of the computer, hard disk drives can store large amounts of information and retrieve that information very quickly. The disks are of different sizes such as **1G, 10G, 40G**, etc.

2-Floppy disk drives:

Also store information in magnetic particles embedded in removable disks. Floppy disks store less information than a hard disk drive and retrieve the information at a much slower rate. It is of a 2 types **5 1/4** floppy disk and **3 1/2** floppy disk.

3-Magneto-optical disc drives:

Store information on removable discs that are sensitive to both laser light and magnetic fields. They can typically store as much information as hard disks, but they have slightly slower retrieval speeds.

4- Compact Disc Drives:

Store information on pits burned into the surface of a disc of reflective material such as CD-ROM. CD-ROMs can store about as much information as a hard drive but have a slower rate of information retrieval.

5- Digital Video Disc (DVD):

This is similar and works like a CD-ROM but can store more than 15 times as much information.

6-Flash drives:

Work as floppy disks but more sensitive as a hard disk that must be ejected logical before final removal from the computer system. It has more memory than floppy disks.

7-Memory Cards:

Work as flash drive but with an additional device called the card reader. This is very effective and more durable than the flash drives.

Note:

Some devices serve more than one purpose. For example, **floppy disks** may also be used as **input devices** if they contain information to be used and processed by the computer user. In addition, they can be used as **output devices** if the user wants to store the results of computations on them.

5-4 SYSTEM MEMORY

Memory refers to the computer chips that store information for quick retrieval by the CPU. They are basically divided into two **ROM** and **RAM**.

5-4-1 Random Access Memory (RAM):

Is used to store information and instructions that operate the computer's programs. Typically, programs are transferred from storage on a disk drive to RAM. RAM is also known as volatile memory because the information within the computer chips is lost when power to the computer is turned off or the computer hanged.

5-4-2 Read-Only Memory (ROM)

Contains critical information and software that must be permanently available for computer operation, such as the operating system that directs the computer's actions from start up to shut down. ROM is called non-volatile memory because the memory chips do not lose their information when power to the computer is turned off.

5-5 HARDWARE CONNECTIONS

To function, hardware requires physical connections that allow components to communicate and interact. A bus provides a common interconnected system composed of a group of wires or circuitry that coordinates and moves information between the internal parts of a computer. A bus is characterized by two features: how much information it can manipulate at one time, called the bus width, and how quickly it can transfer these data.

1-A serial connection:

Is a wire or set of wires used to transfer information from the CPU to an external device such as a mouse, keyboard, modem, scanner, and some types of printers. This type of connection transfers only one piece of data at a time, and is therefore slow. The advantage of using a serial connection is that it provides effective connections over long distances.

2-A parallel connection:

Uses multiple sets of wires to transfer blocks of information simultaneously. Most scanners and printers use this type of connection. A parallel connection is much faster than a serial connection, but it is limited to distances of less than 3 m (10 ft) between the CPU and the external device.

5-6 COMPUTER SOFTWARE

Software is the set of instruction that tells the computer what to do and when to do it. The computer uses this instruction to manipulate data, and enhance the proper functioning of the hardware components. It is designed to exploit and provide the potential capabilities of the hardware to the user. It converts data into information and allows users to use the computer in different ways.

These programs are usually stored and transferred via the computer's hardware to and from the CPU. Software also governs how the hardware is utilized; for example, how information is retrieved from a storage device. The interaction between the input and output devices is controlled by software called the Basic Input Output System (BIOS) Software. Software as a whole can be divided into a number of categories based on the types of work done by programs. The two primary software categories are system software, and application software.