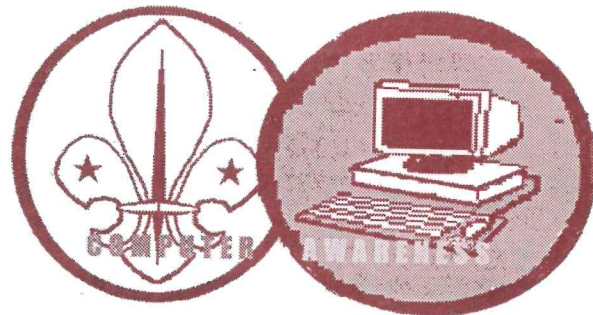


# COMPUTER AWARENESS

PROFICIENCY



BADGE

A BOSCOUTS PUBLICATION



## COMPUTER AWARENESS

1. Have knowledge of Brief History of Computer and its latest development.
2. Be acclimatized with computer components and peripherals.
3. The best use of computers in Scout/Guide activities.
4. Knowledge of the commonly used packages.
5. Perform the following
  - Booting and shutting down of a computer
  - Use Pen drive/DVD drive and hard disc in the computer

### 1. HAVE KNOWLEDGE OF BRIEF HISTORY OF COMPUTER AND ITS LATEST DEVELOPMENT.

| Computer History Year/Enter | Computer History Inventors/Inventions               | Computer History Description of Event                            |
|-----------------------------|-----------------------------------------------------|------------------------------------------------------------------|
| 1936                        | Konrad Zuse - <b>Z1 Computer</b>                    | First freely programmable computer.                              |
| 1942                        | John Atanasoff & Clifford Berry <b>ABC Computer</b> | Who was first in the computing biz is not always as easy as ABC. |

|         |                                                                                            |                                                                                                   |
|---------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 1944    | Howard Aiken & Grace Hopper<br><b>Harvard Mark I Computer</b>                              | The Harvard Mark 1 computer.                                                                      |
| 1946    | John Presper Eckert & John W. Mauchly<br><b>ENIAC 1 Computer</b>                           | 20, 000 vacuum tubes later...                                                                     |
| 1948    | Frederic Williams & Tom Kilburn<br><b>Manchester Baby Computer &amp; The Williams Tube</b> | Baby and the Williams Tube turn on the memories.                                                  |
| 1947/48 | John Bardeen, Walter Brattain & William Shockley<br><b>The Transistor</b>                  | No, a transistor is not a computer, but this invention greatly affected the history of computers. |
| 1951    | John Presper Eckert & John W. Mauchly<br><b>UNIVAC Computer</b>                            | First commercial computer & able to pick presidential winners                                     |
| 1953    | International Business Machines<br><b>IBM 701 EDPM Computer</b>                            | IBM enters into 'The History of Computers'.                                                       |

|                       |                                                                                            |                                                                                                       |
|-----------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 1954                  | John Backus & IBM<br><b>FORTRAN Computer Programming Language</b>                          | The first successful high level programming language.                                                 |
| 1955<br>(In Use 1959) | Stanford Research Institute, Bank of America, and General Electric<br><b>ERMA and MICR</b> | The first bank industry computer - also MICR (magnetic ink character recognition) for reading checks. |
| 1958                  | Jack Kilby & Robert Noyce<br><b>The Integrated Circuit</b>                                 | Otherwise known as 'The Chip'                                                                         |
| 1962                  | Steve Russell & MIT<br><b>Spacewar Computer Game</b>                                       | The first computer game invented.                                                                     |
| 1964                  | Douglas Engelbart<br><b>Computer Mouse &amp; Windows</b>                                   | Nicknamed the mouse because the tail came out the end.                                                |
| 1969                  | <b>ARPAnet</b>                                                                             | The original Internet.                                                                                |

|         |                                                                    |                                               |
|---------|--------------------------------------------------------------------|-----------------------------------------------|
| 1970    | <b>Intel 1103 Computer Memory</b>                                  | The world's first available dynamic RAM chip. |
| 1971    | Faggin, Hoff & Mazor<br><b>Intel 4004 Computer Microprocessor</b>  | The first microprocessor.                     |
| 1971    | Alan Shugart & IBM<br><b>The "Floppy" Disk</b>                     | Nicknamed the "Floppy" for its flexibility.   |
| 1973    | Robert Metcalfe & Xerox<br><b>The Ethernet Computer Networking</b> | Networking.                                   |
| 1974/75 | <b>Scelbi &amp; Mark-8 Altair &amp; IBM 5100 Computers</b>         | The first consumer computers.                 |
| 1976/77 | <b>Apple I, II &amp; TRS-80 &amp; Commodore Pet Computers</b>      | More first consumer computers.                |

|      |                                                                      |                                                                     |
|------|----------------------------------------------------------------------|---------------------------------------------------------------------|
| 1978 | Dan Bricklin & Bob Frankston<br><b>VisiCalc Spreadsheet Software</b> | Any product that pays for itself in two weeks is a surefire winner. |
| 1979 | Seymour Rubenstein & Rob Barnaby<br><b>WordStar Software</b>         | Word Processors.                                                    |
| 1981 | IBM<br><b>The IBM PC - Home Computer</b>                             | From this "Acorn" grows a personal computer revolution              |
| 1981 | Microsoft<br><b>MS-DOS Computer Operating System</b>                 | From "Quick And Dirty" comes the operating system of the century.   |
| 1983 | <b>Apple Lisa Computer</b>                                           | The first home computer with a GUI, graphical user interface.       |
| 1984 | <b>Apple Macintosh Computer</b>                                      | The more affordable home computer with a GUI.                       |
| 1985 | <b>Microsoft Windows</b>                                             | Microsoft begins the friendly war with Apple.                       |

## EARLY HISTORY

The earliest known as tool for use in computation was the **abacus**, developed in period 2700–2300 BCE in Sumer. The Sumerians' abacus consisted of a table of successive columns which delimited the successive orders of magnitude of their sexagesimal number system. Its original style of usage was by lines drawn in sand with pebbles. Abaci of a more modern design are still used as calculation tools today.

The **Antikythera** mechanism is believed to be the earliest known mechanical analog computer. It was designed to calculate astronomical positions. It was discovered in 1901 in the Antikythera wreck off the Greek island of Antikythera, between Kythera and Crete, and has been dated to c. 100 BCE. Technological artifacts of similar complexity did not reappear until the 14<sup>th</sup> century, when mechanical astronomical clocks appeared in Europe.

Mechanical analog computing devices appeared a thousand years later in the medieval Islamic world. Examples of devices from this period include the **equatorium** by Arzachel, the mechanical geared astrolabe by Abū Rayhān al-Bīrūnī, and the **torquetum** by Jabir ibn Aflah. Muslim engineers built a number of automata, including some musical automata that could be 'programmed' to play different musical patterns. These devices were developed by the Banū Mūsā brothers and Al-Jazari Muslim mathematicians also made important advances in cryptography, such as the development of cryptanalysis and frequency analysis by Alkindus.

When John Napier discovered logarithms for computational purposes in the early 17<sup>th</sup> century, there followed a period of considerable progress by inventors and scientists in making calculating tools. In 1623 **Wilhelm Schickard** designed a calculating machine, but abandoned the project, when the prototype he had started building was destroyed by a fire in 1624. Around 1640, Blaise Pascal, a leading French mathematician, constructed the first mechanical adding device based on a design described by Greek mathematician Hero of Alexandria. Then in 1672 **Gottfried Wilhelm Leibnitz** invented the **Stepped Reckoner** which he completed in 1694.

In 1801 French engineer **Joseph -Marie Jacquard** built a loom controlled by punched cards. In 1888 the American **Herman Hollerith** invented a punched card using tabulating machine. Hollerith's company becomes the International Business Machine (IBM)

In 1837 **Charles Babbage** first described his Analytical Engine which is accepted as the first design for a modern computer. The analytical engine had expandable memory, an arithmetic unit, and logic processing capabilities able to interpret a programming language with loops and conditional branching. Although never built, the design has been studied extensively and is understood to be logically complete by Alan Turing, the developer of modern computer logic system. The analytical engine would have had a memory capacity of less than 1 kilobyte of memory and a clock speed of less than 10 Hertz.

Considerable advancement in mathematics and electronics theory was required before the first modern computers could be designed

**First generation: 1937 – 1946** - In 1937 the first electronic digital computer was built by Dr. John V. Atanasoff and Clifford Berry. It was called the Atanasoff-Berry Computer (ABC). In 1943 an electronic computer name the Colossus was built for the military. Other developments continued until in 1946 the first general-purpose digital computer, the Electronic Numerical Integrator and Computer (ENIAC) was built. It is said that this computer weighed 30 tons, and had 18, 000 vacuum tubes which was used for processing. When this computer was turned on for the first time lights dimmed in sections of Philadelphia. Computers of this generation could only perform single task, and they had no operating system.

**In 1947 John Bardeen, Walter H.Brattain an William B. Shockley invent the transistor which completely revolutionised computing.**

**Second generation: 1947 – 1962** - This generation of computers used transistors instead of vacuum tubes which were more reliable. In 1949 the Manchester Mark I was the first stored programme computer, with random access memory and a magnetic drum storage, In 1951 the first computer (Ferranti Mark I) for commercial use was introduced to the public; the Universal Automatic Computer (UNIVAC 1). In 1952, American scientist Grac Murray Hopper invents the symbolic operatic code that controls the Machine code of individual computers. This ultimately leads to Computer programming packages that do standardised tasks as word processing, accounting etc. In 1953 the International

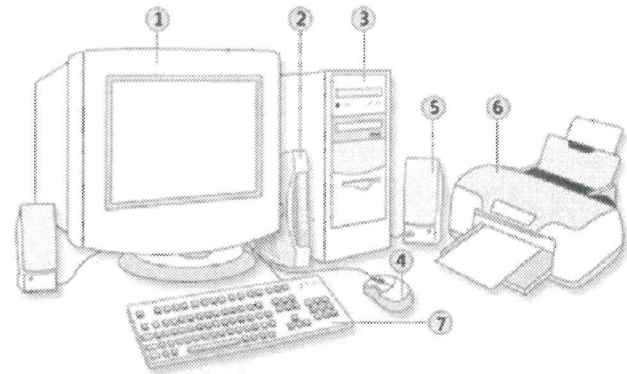


Business Machine (IBM) **650** and **700** series computers made their mark in the computer world. During this generation of computers over 100 computer programming languages were developed, computers had memory and operating systems. Storage media such as tape and disk were in use also were printers for output.

In 1958 The first **INTEGRATED CIRCUIT** was created with many transistors on a **Silicon Chip** This will miniaturize computer circuits and make room for personal computer (PC)

**Third generation: 1963 - present** - The invention of integrated circuit brought us the third generation of computers. With this invention computers became smaller, more powerful more reliable and they are able to run many different programs at the same time. In 1980 **Microsoft Disk Operating System (MS-Dos)** was born and in 1981 **IBM introduced the personal computer (PC)** for home and office use. Three years later Apple gave us the Macintosh computer with its icon driven interface and the 90s gave us **Windows operating system**.

As a result of the various improvements to the development of the computer we have seen the computer being used in all areas of life. It is a very useful tool that will continue to experience new development as time passes.



- |           |               |           |            |
|-----------|---------------|-----------|------------|
| ① Monitor | ③ System unit | ⑤ Speaker | ⑦ Keyboard |
| ② Modem   | ④ Mouse       | ⑥ Printer |            |

## COMPUTER COMPONENTS

There are internal and external components which makeup the device we call a computer.

The main **internal components** are: **motherboard with Central processor (CPU)** – with links to all main components, **memory software (RAM)**, **Internal memory or BIOS**, video/graphics card (GPU), **hard disk** (holds main permanent store of programmes and data) **drive and optical drive** (CD/DVD- removable disk data)

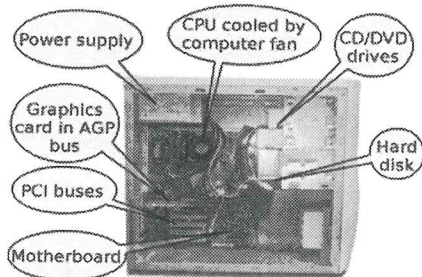
storage), **POWER BOARD** with **SMPS** (switch mode power supply), **Expansion slots** with Internet card and other cards for special functions, Heat sink and Fan.

## INTERNAL COMPUTER HARDWARE

### Introduction

Computer Hardware is the physical part of a computer, as distinguished from the computer software that executes or runs on the hardware. The hardware of a computer is infrequently changed, while software and data are modified frequently. The term soft refers to readily created, modified, or erased. These are unlike the physical components within the computer which are hard.

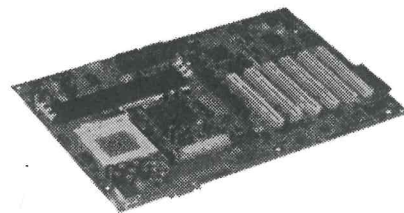
When you think of the term computer hardware you probably think of the guts inside your personal computer at home or the one in your classroom. However, computer hardware does not specifically refer to personal computers. Instead, it is all types of computer systems. Computer hardware is in embedded systems



in automobiles, microwave ovens, CD players, DVD players, and many more devices. In 2003, only 0.2% of all microprocessors sold were for personal computers. How many other things in your house or your classroom use computer hardware?

### Motherboard

The motherboard is the body or mainframe of the computer, through which all other components interface. It is the central circuit board



making up a complex electronic system. A motherboard provides the electrical connections by which the other components of the system communicate. The mother board includes many components such as: central processing unit (CPU), random access memory (RAM), firmware, and internal and external buses.

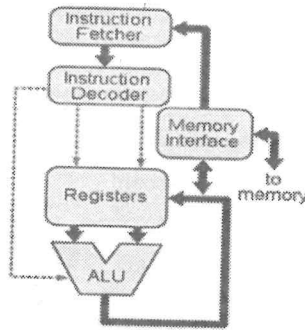
## MOTHERBOARD

### Central Processing Unit

The Central Processing Unit (CPU; sometimes just called processor) is a machine that can execute computer programs. It is sometimes referred to as the brain of the computer.

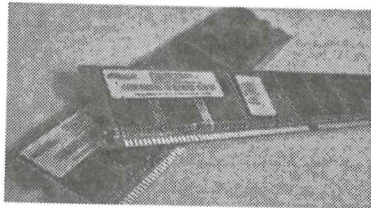
## CPU Diagram

There are four steps that nearly all CPUs use in their operation: fetch, decode, execute, and writeback. The first step, fetch, involves retrieving an instruction from program memory. In the decode step, the instruction is broken up into parts that have significance to other portions of the CPU. During the execute step various portions of the CPU, such as the arithmetic logic unit (ALU) and the floating point unit (FPU) are connected so they can perform the desired operation. The final step, writeback, simply writes back the results of the execute step to some form of memory.



## RANDOM ACCESS MEMORY

Random access memory (RAM) is fast-access memory that is cleared when the computer is power-down. RAM attaches directly to the motherboard, and is used to store programs that are



RAM

currently running. RAM is a set of integrated circuits that allow the stored data to be accessed in any order (why it is called random). There are many different types of RAM. Distinctions between these different types include: writable vs. read-only, static vs. dynamic, volatile vs. non-volatile, etc.

## Firmware

Firmware is loaded from the Read only memory (ROM) run from the Basic Input-Output System (BIOS). It is a computer program that is embedded in a hardware device, for example a microcontroller. As its name suggests, firmware is somewhere between hardware and software. Like software, it is a computer program which is executed by a microprocessor or a microcontroller. But it is also tightly linked to a piece of hardware, and has little meaning outside of it. Most devices attached to modern systems are special-purpose computers in their own right, running their own software. Some of these devices store that software ("firmware") in a ROM within the device itself.

## Power Supply

The power supply as its name might suggest is the device that supplies power to all the components in the computer. Its case holds a transformer, voltage control, and (usually) a cooling fan. The power supply converts about 100-120 volts of AC power to low-voltage DC power for the internal components to use. The most common computer power supplies are built to conform with the ATX form factor. This enables different power supplies to be interchangeable with different components inside the computer.



ATX power supplies also are designed to turn on and off using a signal from the motherboard, and provide support for modern functions such as standby mode.

### Removable Media Devices

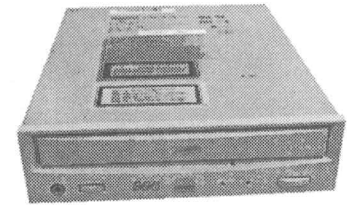
If your putting something in your computer and taking it out is most likely a form of removable media. There are many different removable media devices. The most popular are probably CD and DVD drives which almost every computer these days has at least one of. There are some new disc drives such as Blu-ray which can hold a much larger amount of information then normal CDs or DVDs. One type of removable media which is becoming less popular is floppy disk.

### CD

CDs are the most common type of removable media. They are inexpensive but also have short life-span. There are a few different kinds of CDs. CD-ROM which stands for Compact Disc read-only memory are popularly used to distribute computer software although any type of data can be stored on them. CD-R is another variation which can only be written to once but can be read many times. CD-RW (rewritable) can be written to more than once as well as read more than once. Some other types of CDs which are not as popular include Super Audio CD (SACD), Video Compact Discs (VCD), Super Video Compact Discs (SVCD), Photo CD, Picture CD, CD-i, and Enhanced CD.

### CD-ROM Drive

There are two types of devices in a computer that use CDs: CD-ROM drive and a CD writer. The CD-ROM drive used for reading a CD. The CD writer drive can read and write a CD. CD writers are much more



popular are new computers than a CD-ROM drive. Both kinds of CD drives are called optical disc drives because the use a laser light or electromagnetic waves to read or write data to or from a CD.

### DVD

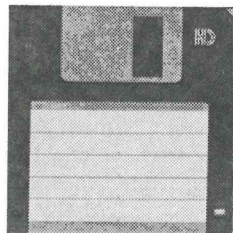
DVDs (digital versatile discs) are another popular optical disc storage media format. The main uses for DVDs are video and data storage. Most DVDs are of the same dimensions as compact discs. Just like CDs there are many different variations. DVD-ROM has data which can only be read and not written. DVD-R and DVD+R can be written once and then function as a DVD-ROM. DVD-RAM, DVD-RW, or DVD+RW hold data that can be erased and re-written multiple times. DVD-Video and DVD-Audio discs respectively refer to properly formatted and structured video and audio content. The devices that use DVDs are very similar to the devices that use CDs. There is a DVD-ROM drive as well as a DVD writer that work the same way as a CD-ROM drive and CD writer. There is also a DVD-RAM drive that reads and writes to the DVD-RAM variation of DVD.

## Blu-ray

Blu-ray is a newer optical disc storage media format. Its main uses are high-definition video and data storage. The disc has the same dimensions as a CD or DVD. The term "Blu-ray" comes from the blue laser used to read and write to the disc. The Blu-ray discs can store much more data than CDs or DVDs. A dual layer Blu-ray disc can store up to 50GB, almost six times the capacity of a dual layer DVD (WOW!). Blu-ray discs have similar devices used to read them and write to them as CDs have. A BD-ROM drive can only read a Blu-ray disc and a BD writer can read and write a Blu-ray disc.

## Floppy Disk

A floppy disk is a type of data storage that is composed of a disk of thin, flexible ("floppy") magnetic storage medium encased in a square or rectangular plastic shell. Floppy disks are read and written by a floppy disk drive. Floppy disks are a dying and being replaced by the optical and flash drives. Many new computers do not come with floppy drives anymore but there are a lot of older ones with floppy drives lying around. While floppy disks are very cheap the amount of storage on them compared to the amount of storage for the price of flash drives makes floppy disks unreasonable to use.



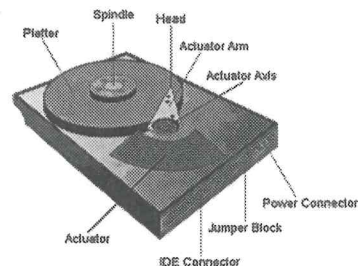
Floppy Disk

## Internal Storage

Internal storage is hardware that keeps data inside the computer for later use and remains persistent even when the computer has no power. There are a few different types of internal storage. Hard disks are the most popular type of internal storage. Solid-state drives have grown in popularity slowly. A disk array controller is popular when you need more storage than a single hard disk can hold.

## Hard Disk Drive

A hard disk drive (HDD) is a non-volatile storage device which stores digitally encoded data on rapidly rotating platters with magnetic surfaces. Just about every new computer comes with a hard disk these days unless it comes with a new solid-state drive. Typical desktop hard disk drives store between 120 and 400GB, rotate at 7,200 rpm, and have a media transfer rate of 1 Gbit/s or higher. Hard disk drives are accessed over one of a number of bus types, including parallel ATA (also called IDE), Serial ATA (SATA), SCSI, Serial Attached SCSI, and Fibre Channel.



Hard Drive

### **Solid-State Drive**

A solid-state drive (SSD) is a data storage device that uses solid-state memory to store persistent data. An SSD emulates a hard disk drive, thus easily replacing it in any application. SSDs have begun to appear in laptops because they can be smaller than HDDs. SSDs are currently more expensive per unit of capacity than HDDs which is why they have not caught on so quickly.

### **Disk Array Controller**

A disk array controller is a device which manage the physical disk drives and presents them to the computer as logical units. It almost always implements hardware RAID. RAID (Redundant Array of Independent Drives) is a technology that employs the simultaneous use of two or more hard disk drives to achieve greater levels of performance, reliability, and/or larger data volume sizes. A disk array controller also provides additional disk cache

The **external components**, the case, mouse (track/Touch pad), keyboard and monitor (vdu), speakers, Printer, Scanner, Microphone, Headphone, External Storage, webcam. Connectors like USB, Fire wire. **Audio Video cables and Jacks.**

### **USE OF COMPUTERS IN SCOUT GUIDE ACTIVITY**

1. To keep track of individual scout/Guide progress in Scouting/ Guiding advancement.
2. To keep in touch with Scouts and Scouters in the District, State and at the National Head quarters
3. To gather information on National and International Scout Guide activities especially 'Scouting for Peace' activity
4. To share in the BLOGGING activities of other Scouts and Guides
5. To Learn relevant skills from experts
6. To access Scouting. Guiding literatures, especially legacy and archival materials
7. For social networking with other scouts/Guides through Facebook, Instagram, Linkdin etc
8. To upload the videos of your Scouting/ guiding activities on the Internet
9. To publish easily a newsletter of the Scout troop
10. To keep in touch with other like minded organisations

## **COMMONLY USED COMPUTER PACKAGES**

1. Operating software like MS-DOS, Windows, LINUX
2. Word Processing software like the WORD
3. Data Processing software like EXCEL
4. Computer security Software like NORTON Anti Virus
5. Personal Information management software like MICROSOFT OUTLOOK
6. Presentation Software like POWER POINT