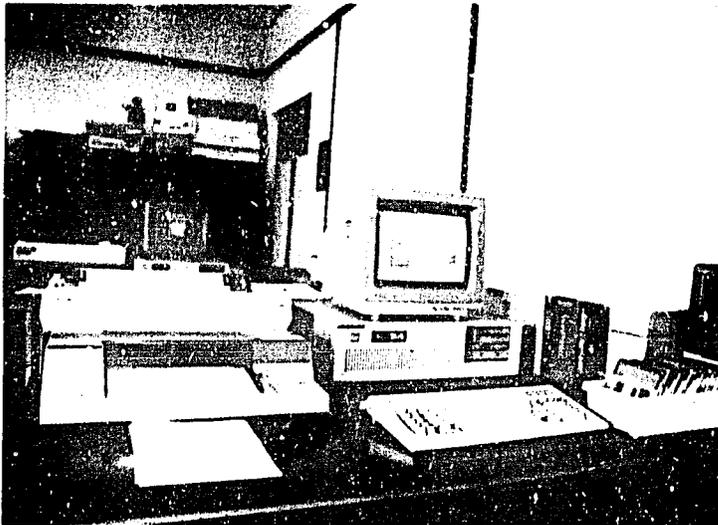


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**BEGINNER'S GUIDE
TO
COMPUTER & DISK OPERATING SYSTEM**



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**PAKISTAN FOREST INSTITUTE
PESHAWAR
1990**

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By

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FOREWORD

Today, people speak of computer literacy. What does it really mean? How can we, as educators, as trainers or human resource professionals, gain the understanding we need to use this new technology and share it as well with others? There exists voluminous information and instructions on computer operations but only simple guidelines are required for a beginner. This manual has been designed to serve that purpose.

In the near future the personal computer, like a calculator or a telephone, will be an essential tool in every office. It is, therefore, important to have a practical approach to acquainting people with this tool. As all of us feel, we have to develop our country. This can be achieved by adopting the newer and better technology and in this respect, computer technology is at the heading edge of management, business and science.

The manual consists of three chapters; chapter I comprises basic information about the personal computer, chapter II is concerned with the basic concepts of the disk operating system (DOS), and chapter III contains elementary DOS commands which are essential to proper use of the equipment. A glossary of essential terms has been added to help the reader understand the manual.

This manual is not meant to replace existing computer manuals, it is meant only as an aid to the beginning computer student regardless of age. Hopefully, the manual will help in the transition from normal english to the jargon of the computer world.

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1. COMPUTER AND COMPUTER SYSTEM

1.1 Introduction

The computer can be defined as an electronic device capable of receiving and storing data, performing prescribed numeric or logical operations on that data, and reporting the results of those operations.

1.1.1 Personal Computer

A personal computer (PC) usually refers to a computer which is small enough to fit on the desk; it usually accommodates one user at a time, is affordable in price and has a considerable amount of computing power or capability. A personal computer is also called a microcomputer.

1.1.2 Mainframe Computer

A mainframe computer is a large computer, which is usually centrally located and is generally designed to accommodate many users at a time.

1.2 Hardware

The term hardware is used to describe the physical components of the computer system. The monitor (screen), keyboard, printer etc are examples of the hardware components.

1.3 Computer system

Computer system can be divided into the following five components:

- a. Arithmetic logic unit
- b. Control unit
- c. Memory unit
- d. Input unit
- e. Output unit

1.3.1 Arithmetic Logic Unit, Control Unit

The arithmetic logic unit (ALU) performs the addition, subtraction, multiplication, comparison and logic operation. On the other hand the control unit (CU) regulates the operation of the whole machine. It interprets the given instructions and controls the flow of information to the computer's other devices (video screen, printer, disk drives, etc.) according to the instructions.

The arithmetic logic unit and Control unit can be considered the computer brain. The ALU and CU can be combined into a single integrated circuit called a central processing unit.

1.3.1.1 Central Processing Unit

The central processing unit (CPU) is most important piece of hardware. The CPU is the heart of the computer. It can not only perform calculations, comparison and manipulation of data but it also controls all system operations including all external equipment, such as printers, disk drives, and display screen. It is designed to monitor either on or off electrical signals.

A CPU is a fairly small piece of equipment, measuring about one inch square inside the system unit on the personal computers just to the left side of the input/output port. CPU is also called microprocessor.

1.3.2 Memory Unit

The memory unit is the remembering part of the machine, which stores programs, data, calculations and results. A personal computer contains two types of memories:

- i. Permanent memory
- ii. Temporary memory

The permanent memory is called read-only-memory (ROM). The ROM chips are permanently programmed or written into the computer instructions as they are manufactured. ROM can be read from but cannot be written to (altered) by action of the computer. ROM usually contains utility software encoded in it that will be needed frequently and permanently by the computer, such as a bootstrap routine (one that allows it to read in an operating system files from a diskette). Sometimes a programming language translator such as a BASIC interpreter is also included in ROM.

Information can be read from or fed into the temporary memory, called random-access-memory (RAM), at any time. The RAM is sometimes also called main memory. The RAM only exists in the computer when the power is on. When power is turned off, the program and data fed in the RAM are lost.

For storing the RAM permanently, external memory can be attached to the personal computer. The external memory can be floppy disk drives, hard disk drives, and tape drives.

Information is represented inside the computer by bits. A bit by itself is not very interesting. It is either On or Off. A group of 8 bits is called a **byte**. A byte can be used to represent the English character set which are the lower case and upper case digits, the numerals, the punctuation marks and the special symbols and characters.

The CPU by itself can only store a few bytes or information. To perform anything useful, the CPU needs a "scratch pad". This "scratch pad" is the Random Access Memory (RAM) of the computer. A modern microcomputer typically contains sufficient RAM to hold about 256K to 640K characters and 1 K byte is equal to 1024 (2^{10}) bytes, or roughly 1,000 bytes.

1.3.3 Input, Output Units

Communication with the computer can be made by input and output units. The interfaces of personal computers are called peripheral. Therefore, peripheral is any device connected to the basic personal computer.

An input unit permits commands, programs, and data to enter into the computer. Keyboards, joysticks, game paddles, graphics tablets, light pens, microphones and analog-to-digital converters (ADCs) are the examples of input devices.

The computer communicates with us through output unit. Monochrome and colour display, printers, plotters, speakers, and digital-to-analog converters (DACs) are examples of output devices.

There are some devices which are used for both input and output. These include the mass storage devices (floppy disk drives, hard disk and hard card devices, and tape storage systems), modulator Demodulators (MODEMs) can also be used as input and output devices, which enable computer to transmit communications over long distances.

1.3.3.1 Internal and External Storage

Personal computers require internal storage which is referred to as internal memory. RAM & ROM are the two primary types of the internal memory chips. Internal memory is used to hold the instructions of a program plus part or all of the required data needed by the personal computer to execute the program.

External storage devices are peripheral units which store small or large amounts of information external to the main RAM memory. The main objective of these storage devices is to store the RAM permanently. For this purpose magnetic tape cassettes and flexible or rigid magnetic disk can be used.

A personal computer can have diskette drives or fixed disk drives with diskette drives. The computer system may be one of the following:

- a. One disk drive system
- b. Two disk drives system
- c. One disk drive and fixed disk(s)
- d. Two disk drives and fixed disk(s)

The IBM PC may have the following types of diskette drives and diskettes:

- a. Single-sided (160 KB / 180 KB)
- b. Double-sided (320 KB / 360 KB)
- c. Double-sided (720 KB)
- d. High-capacity (1.2 MB)

Where K stand for Kilo, M for Mega and B for Byte.

1.4 Software

Software is a sequence of related instructions, called a program, that is stored within the RAM, telling the PC how to perform a specific task. A software package is an interrelated group of programs that accomplishes a set of related tasks, and is normally sold, bought and used as a unit. Software packages are of two types:

- a. Operating software
- b. Application software

Operating system (OS) software is very specific to each brand and model of computer, and is normally supplied by the computer manufacturer with every machine sold. An operating system (Sometimes also known as the monitor, supervisor, or master control program) is a special software package that controls the running of other programs and the manipulation of files. It allocates the computer's hardware resources to various system functions, such as creating, copying, executing, and deleting files. A disk operating system (DOS) is a group of utility programs, such as those for editing, sorting, debugging, and loading other files.

Many users eventually find the OS software supplied with their computer much too limited and difficult to use. Therefore, alternative OS packages with more attractive features are usually purchased for a particular make and model of computer.

2. DISK OPERATING SYSTEM

2.1 Introduction

As far as software is concerned, the basic software for starting the IBM PC is Disk Operating System (DOS). DOS controls the movement of information on the computer. In simple words, DOS controls the way in which the computer uses programmes and applications.

Before explaining the different commands of the DOS, it will be appropriate to define the following terms:

- a. File
- b. Directory
- c. Pathname
- d. Tracks, Bytes, and Sectors

2.1.1 File

The information or data fed in the computer is usually saved permanently in the external memory. This information or data is then grouped together and stored in what is called a file. To save the file, a name is required which is called a filename. A filename consists of two parts.

- i. Filename proper: It is sometimes called the first name of a file.
- ii. Filename extension: It is sometimes called the last name of the file.

There are certain rules for naming the file, which are as follows:

- a. The proper and extension parts of the filename must be separated by a full stop (.). For example FOREST.DAT would be a filename with a first name of FOREST and a extension name of DAT.
- b. The first name of the file cannot exceed eight characters in length. A character is any letter A through Z, any number 0 through 9, or following punctuations:

\$ & # @ ! % ' ^ () - _

No blank spaces are allowed in filename. e.g. FOR EST.DAT

- c. The filename extension is optional and does not have to be used.
- d. If a filename extension is used it can only be three (3) characters long.
- e. Filename extensions are often used to group certain files together. For example in a group of files containing data by adding a .DAT filename extension to the end of first name.

e.g. PUNJAB.DAT SINDH.DAT BLOCHTAN.DAT NWFP.DAT

These files may contain any data on Punjab, Sindh, Balochistan and NWFP. DAT may help to group these files.

- f. A filename extension may be letters numbers, or the following punctuations in any order:

\$ & = @ ! % ' ^ () -

No blank spaces are allowed in filename extension.

2.1.2 Directory

A directory is a way to group the files on a diskette. The files in one directory are completely separate from the files in another directory. When a directory is created, it partitions the diskette in separate areas. Files can then be stored in these partitioned areas. More than one directory can be created on the hard disks or floppy diskettes.

Directories are usually used to partition the fixed disk or hard disk, although floppy diskettes may also have directories. All the floppy diskettes and hard disks that are formatted have at least one directory called the root directory.

2.1.3 Pathnames

A diskette can have many directories, therefore a way is needed to tell the computer in which directory it is required to work. For this purpose DOS uses a pathname. Usually a back slash \ is used before the path.

2.1.4 Tracks, Sectors, Bytes, and Bits

Information is written on diskettes along concentric circles called tracks. The read/write head of the diskette drive moves back and forth from one track to another as the diskette spins. As the read/write head moves, it finds the data to read or locates a place on the diskette to write data.

The terms, sector and byte are also used to describe diskettes. Tracks are divided into sections called sectors. Space on a diskette is measured in bytes. One byte hold one character. One Byte contains eight (8) bits.

The number of tracks, sectors and bytes on a diskette depends on the type of the diskette. The number of tracks, sectors and bytes for the diskettes mentioned earlier are given below:

A single-sided diskette contains 40 tracks, 8/9 sectors per track, and holds up to 160K/180K bytes of information.

A 320/360 KB double sided diskette contains 40 tracks 8/9 sectors per track and holds up to 320K/360K bytes of information.

A 720 KB diskette is a double-sided diskette that contains 80 tracks per side, 9 sectors per track, and holds up to 720 KB of information.

A high-capacity diskette is a double-sided diskette that contains 80 tracks per side, 15 sectors per track, and holds up to 1.2 MB of information.

2.2 Use of DOS Diskette

A disk operating system (DOS) diskette is needed to start the personal computer. DOS refers to diskette drives and fixed disk drives by the letters A - Z.

If the personal computer has only one diskette drive then DOS assigns letter A to the drive. If the PC has one diskette drive and a fixed drive then DOS assigns letter A to the diskette drive and letter C to a fixed disk drive. If the computer has only two diskette drives without a hard disk drive then DOS assigns the letter A to the first diskette drive and letter B to the second diskette drive. If the PC has two diskette drives and one or more fixed disk drives, DOS assigns letters A, B, C, D, to the first diskette drive, second diskette drive, first fixed drive, second fixed drive, respectively.

The first time that the user starts DOS, he must select the keyboard layout and the country whose date and time format he wants to use. The "Select Procedure", to be discussed later, not only allows the user to make these two selections, but also make a backup of the DOS diskette.

2.3 File Specification

To locate a file in DOS, three things are required:

- a. The drive letter
- b. The first filename
- c. The extension filename.

For example A:FILENAME.EXT

The drive letter i.e. A and colon : are called the drive specification, A: is the file specification which tells DOS where the file is located. It is always required to type a colon : after the drive letter.

The filename with extension name immediately follows the drive specification with no space.

2.4 Starting DOS the first time

When starting DOS on the computer for the first time, follow the "Select Procedure" to tell the DOS information about the type and format of keyboard, and date & time of the country which is to be used. The country code tells DOS the date and time format. It also tells DOS the currency symbol, and the decimal separator for the country which is selected. If the country code for the U.S.A. is chosen then the format of date, time, currency symbol and decimal separator is as follows:

- a. The date format is HH/MM/YY
(month/day/year)
- b. The time format is HH:MM:SS
(hours:minutes:seconds)
- c. The currency symbol is \$ (dollar)
- d. The decimal separator is . (period)

The country and keyboard codes for the "Select Procedure" are given below:

<u>Country</u>	<u>Country Code</u>	<u>Keyboard</u>
Australia	061	(**)
Belgium	032	(**)
Canadian-French	002	(**)
Denmark	045	(**)
Finland	358	(**)
France	033	FR
Germany	049	GR
Italy	039	IT
Israel	972	(**)
Middle East	785	(**)
Netherlands	031	(**)
Norway	047	(**)
Portugal	351	(**)
Spain	034	SP
Sweden	046	(**)
Switzerland	041	(**)
United Kingdom	044	UK
United States	001	US

3. DISK OPERATING SYSTEM COMMANDS

DOS is necessary to start or boot the computer. DOS is a complicated system that only the most experienced computer programmer can fully understand and utilize. The objective of this chapter is to cover the general concept of DOS and to provide sufficient instructions about some DOS commands in order to handle numerous situations which are faced while learning to use an IBM PC. The objectives of some basic DOS commands are:

- Formatting and partition of the hard disk
- Replacing the previous DOS version
- Format a brand new diskette so that it can be used.
- Copy a diskette from another diskette.
- Copy a file.
- Find out what files are on the diskette.
- Change a file's name.
- Remove a file from a diskette.
- Disk reporting

3.1 Starting of the Computer

Before starting the computer, check all the cables to make sure that they are connected properly. Next, turn on the electric current, the stabilizer, un-interrupted power supply (UPS) system, all the peripheral devices connected to the computer system, and the computer system, in that order.

If computer system is without the fixed disk (hard disk) then the DOS diskette is required in the first diskette drive every time the computer is turned on. With a fixed disk drive the DOS diskette is required to be installed only once. After the computer has the DOS commands, it can be started. The starting of the computer is called "BOOTING". If the computer is already on and it is desired to reboot the computer. It can be done simply by pressing the Ctrl, Alt and Del keys at the same time.

3.2 How to insert Diskette

When it is necessary to insert a diskette in the diskette drives. Use the following procedures:

- i. Remove the diskette from the paper envelope.
- ii. Open the diskette drive door.
- iii. Gently slide the diskette into the drive with label side up and toward the user.
- iv. Make sure the diskette is all the way in, and close the door of the drive.

3.3 Installation of the DOS

There are different ways of installing the DOS diskette on the floppy diskette or fixed disk.

3.3.1 Installation of DOS on Fixed Disk

The Select Procedure can be used for the first time to install DOS on the computer system. This procedure is different on different type of IBM computers e.g. the computer systems with one or two diskette drives, computers with one or more fixed disk drives. The Select Procedure for the computer system which has no fixed disk drive can be used only for making a backup of the DOS diskette.

If the Select Procedure is required for the computer system having a fixed disk drive(s) then DOS partitions will have to be installed.

Three steps are required to prepare the fixed disk (FDISK):

- a Using the FDISK command to create a DOS partition.
- b Using the SELECT command to load the keyboard and country code for the system. This procedure will format the fixed disk and copy all the DOS files from the DOS diskette to the fixed disk. The details of FORMAT command will be explained later. By formatting the disk, all the information on the disk will be lost. So it is recommended that the Select Procedure be used only once. However, if it is required to replace the old DOS with the new DOS version, then the SYS procedure should be followed. SYS will be explained later in this chapter.

- c There are two diskettes in a DOS package, one is labeled DOS, and the other is the Supplemental DOS diskette. By using the COPY command the files of Supplemental DOS diskette can be transferred to the hard disk.

If the partition of the fixed disk already exists then leave the procedure of FDISK.

3.3.2 Using FDISK to create a DOS Partition

The fixed disk can be partitioned into one or more portions. Partitions can be made by the FDISK command. To start the FDISK procedure follow the steps below:

Insert your DOS diskette in drive "A", and boot the computer. After entering the date and time the computer will show the prompt as:

```
A>
      (which is called DOS prompt)
```

After the DOS prompt type FDISK, i.e. A>FDISK and press Enter (Return) key. The program's main menu appears with 4 or 5 choices (depending the number of fixed disks in your computer).

```
IBM Personal Computer fixed disk
set up program version 3.20 (c)
copy right IBM Corp. 1983, 1986.
```

FDISK Options

Choose one of the following:

1. Create DOS Partition.
2. Change active partition.
3. Delete DOS partition.
4. Display partition data.
5. Select next fixed Disk Drive.

```
Enter Choice: [1]
Press Esc-Key to return to DOS
```

Select choice 1, create DOS partition, by pressing enter key. Note the message:

Create DOS Partition

Partition	Status	Type	Start	End	Size
1	A	DOS	0	613	614

```
Total disk space is 614 cylinders.
DOS partition already exists.
Press Esc to return to FDISK Options
```

If the above message appears on the screen it means, the partition exists. There is no need to partition the fixed disk, leave the FDISK procedure by pressing the Esc key, the computer will again show the DOS prompt A. Now follow the SELECT procedure.

If the following message appears:

```

Create DOS partition

Current Fixed Disk Drive: 1

Do you want to use the entire

fixed disk for DOS [Y/N]..? (Y)

```

Then continue, answer Y by pressing enter key, the computer will show the following message:

```

System will now restart

Insert DOS diskette in drive A:
Press any key when ready.....

```

With the DOS diskette is in drive A, press any key to continue. The computer will ask about the current date and time. After entering the date and time the computer will again show the A> DOS prompt.

3.3.3 Select Procedure for Fixed Disk Drive System

Warning: During select procedure, the fixed disk is formatted. Do not use SELECT if you have information on your disk, that is to be saved, otherwise all of it will be lost.

Insert the DOS diskette in drive A and start the computer. If the computer is already on, insert the DOS disk in drive A and press Ctrl, Alt and Del keys all together (boot). After entering the date and time the computer will show the DOS prompt A>. Then enter the SELECT command after the A> prompt. The format of the SELECT command is as follows:

```

SELECT C: xxx yy          (where xxx is the country code and
                          yy is the keyboard code).

```

For example, the country for USA code is 001 and keyboard code is US. In this case the select command will be:

A>SELECT C: 001 US

Entering the above command the computer will show this message.

```
SELECT is used to install DOS the first
time. SELECT erases everything on the
specified target and then installs DOS.
Do you want to continue (Y/N)? Y
```

If there is information on the fixed disk, do not continue. Type N to end the SELECT procedure. If it is desired to continue then press Enter key to continue. If the Keyboard routine is not on the DOS diskette, there will be another message:

```
is KEYByy.COM on another
diskette (Y/N)?
```

In place of yy the keyboard code will appear which was entered in SELECT procedure. Type Y. (It will require the diskette with the keyboard routine later.)

Before the formatting procedure begins, the following message appears:

```
WARNING, ALL DATA ON NON-REMOVABLE DISK
DRIVE C: WILL BE LOST!
Proceed with Format (Y/N)?
```

To proceed with formatting, type Y and press Enter key.

If the computer does not give the above messages then the computer will indicate the formatting process.

```
Format complete
```

```
System Transferred
```

```
Volume label (11 characters, ENTER for none)?
```

If a label is desired then enter the fixed disk label otherwise press enter for none.

If DOS is already installed on the hard disk and it is desired to replace the older version of DOS with new one, then the procedure is as follows:

Insert the DOS system diskette in drive A and boot the system. After entering the date and time, computer shall show the DOS prompt A. At the DOS prompt enter the command:

```
SYS C:
```

This transfers the new DOS system files from the diskette to the fixed disk. After replacing existing DOS files on the fixed disk, enter the following command:

```
REPLACE A:\*.* C:\ /S/R
```

For replacing the existing DOS supplemental programs, change to the directory where the DOS files are required to be stored. Remove the DOS diskette from drive A and insert the Supplemental Programs DOS diskette in drive A and type the following and press enter key.

```
REPLACE A:\*.* C:\ /S /R
and
REPLACE A:\*.* C:\[path] /A
```

Path should be replaced with the directory name containing the DOS software.

3.4 Some DOS Commands

There are three parts of the DOS command.

- i. The first part is the command name. It identifies the set of instructions that is required.
- ii. The second part of a DOS command is the parameters. Parameters indicate what is required of the command to work on. It may be desired to work on an entire diskette or just a single file on the diskette.
- iii. The third part of a DOS is called the switch. Switches tell the computer how the command is to work.

The following command will illustrate all three parts.

```
DIR A:/W
```

- i. DIR is the name of a command that display the contents of a diskette on the computer monitor.
- ii. A: is the parameter, on which the computer is to work. In this example the computer is asked to work on the diskette in drive A.

- iii. /W is the switch. The / symbol is used to separate the switch from the parameter. W is the abbreviation of the word Wide. If /W is not used then the computer would have displayed the contents of the diskette in drive A down the monitor. By using /W the computer is being told to display the names of the files on the diskette in drive A across the screen.

3.4.1 Wild Card and its use in DOS

DOS makes good use of wild cards. Wild Card is an American expression, which means that a card will match with anything. DOS uses wild cards as a way of specifying a filename so several files will match the specifications.

The first wild card is the * symbol. When this symbol is used as a parameter in a DOS command it will provide a match to any filename. For example:

- *.* would be a match for any and all filenames.
- FOREST.* would match a file with a first name of FOREST regardless of the filename extension.
- *.DAT would be a match for all files with a filename extension of DAT, regardless of the first name.

The second type of wild card is the ? symbol. It is used to match characters within the filename. For example:

- FORE???? this would match any filename that begin with FORE regardless of the last four characters.
- FORESTRY.EX? would be a match for all files those begin with the characters FORESTRY.EX regardless of the last character.

In the material covered so far, it has been explained that DOS can be installed in the fixed disk. After installing the DOS on the hard disk then the computer can be booted from the hard disk without inserting the DOS diskette in drive A. So if the computer is booted from the hard disk, after entering date and time it will show the DOS prompt as:

C>

If the computer is booted from drive A then after entering date and time, the computer will show the DOS prompt as given below:

A>

At any DOS prompt, DOS commands can work. The only condition is that the specified DOS prompt must contain the external DOS command which is required to proceed.

Some elementary DOS commands are as follows:

3.4.2 Time and Date Commands

DOS keeps track of the date and time of the day. When the computer is started, DOS reads the date and time from a clock/calendar that is located inside the computer.

To see the today's date enter the date after the DOS prompt (by entering the command means, first type the command and then press enter key). The computer will show the current date which can be changed easily as explained on the monitor screen. On the same line command TIME can be entered into the computer after the DOS prompt, which will show current time and that can also be changed easily by following the message given on the screen.

3.4.3 Diskette Information Commands

DOS uses commands to tell something about the diskettes which is being used. These commands let the computer user know what files are on the diskette, the condition of the diskette, and the name or label of the diskette.

a. List of files

The first command is DIR which is called the directory listing command. DOS keeps track of files through the use of directories. DIR displays these directories on the computer monitor for the user to see.

For use of the directory listing type command DIR after the DOS prompt and press enter key.

DIR will list all the files on a disk. This list will include the filename, filename extension, the size of the file in characters or bytes, and the date and time the file was created or last changed.

Parameter can also be used as:

DIR A:

By using the parameter, the computer will show the directory of the files on the diskette in drive A.

DIR

The above command appears to have no parameter but actually it has. If no parameter is mentioned then the parameter becomes the current disk drive denoted by the letter before the > symbol in the DOS prompt, which is called the "DEFAULT" DOS prompt.

Wild cards can be used in DOS command as:

DIR A:*.SYS

In this command wild card and SYS filename extension are used. The computer will show all the files on A drive with filename extension SYS.

Switches

There are two switches which can be used with DIR, namely /P and /W. The switches, /P, tells the computer to display the list of files on a full screen at one time. The letter P is an abbreviation of the word Pause. After the computer displays one full screen, it will pause. Pressing any key will make the computer continue listing files. The switch, /W, causes the listings of files to be displayed in five columns across the width of the monitor. When using /W, the size of the files, date and time the files were created or changed are not displayed. Following are some examples of DIR command using switches:

DIR /P lists all the files on the current drive. /P causes the computer to pause after the monitor fills up.

DIR /W lists all the files on the current drive. /W lists the files in five columns across the width of the monitor.

Switches can also be combined with parameters in order to control DOS commands.

DIR A:/P lists all the files on the diskette in drive A. /P causes the computer to pause after the monitor screen is filled.

DIR A:/W lists all the files on the diskette in drive B. /W lists the files in five columns across the width of the monitor screen.

b. Diskette Reporting

The next disk information command is CHKDSK. This command gives a report on a diskette. CHKDSK performs two functions:

- i. Checks the diskette to see how much storage space is available, how much of the space is being used, and if there is any discrepancy in space usage. CHKDSK then reports the total storage space, the space in use, and if there are any hidden files.

Space is reported in terms of bytes which is the amount of storage space required by one character.

Hidden files are special files those are not listed by the DIR command.

- ii. Repairs any logical damage in the use of space. Sometimes storage space may become lost, CHKDSK can recover it. It also reports and repairs other kinds of mix-ups in the storage space.

CHKDSK tells the user if there is something wrong with the diskette and in certain cases CHKDSK can do some repairs on the diskette. Some examples of CHKDSK are given below:

CHKDSK the parameter is the current drive (default drive) and this command gives a report on the disk in the current drive.

CHKDSK A: the parameter is the A drive. A report on the diskette in the A drive will be displayed on the computer monitor.

CHKDSK A:/F the parameter is the A drive. In this command a switch has been used. It has been discussed earlier that if some damage is found CHKDSK will attempt to repair it. However no repairs will take place unless the /F switch is used.

c. Diskette Identification

Diskettes can have identifying label stored on them called Volume ID labels. These labels are sometimes useful in describing the information stored on the diskette. The VOL

command is used to make DOS display the label for computer operator to see. You may or may not wish to label the diskette. Here are some ways to use the VOL command:

VOL reports the Volume ID label of the diskette in the default drive.

VOL A: reports the Volume ID label of the diskette in drive A.

If it is required to change the Volume ID label, or add a label to an unlabeled diskette, or remove an existing volume ID label then LABEL command is used. Examples of the LABEL command are given as under:

LABEL A:

If A: is missing in this command then computer will take the current drive or default drive.

DOS will respond the following message:

Volume in drive A has no label

or

Volume in drive A is xxxxxxxxxxxx
(where xxxxxxxxxxxx may be any label)

Volume label (11 characters, Enter for none)?

If it is desired to add or change the label, type the new label (maximum 11 characters) and press enter key. If it is desired to delete the label then press enter key without typing anything. DOS would then respond with a new message:

Delete current volume label (Y/N)?

Press Y to delete the label otherwise press N to leave the label as such.

3.5 Internal and External DOS Commands

DOS has two types of commands which are as follows:

- i) Internal commands
- ii) External commands

By inserting the diskette in the correct diskette drive of the computer, the list of the files can be seen. It will be observed that there are many files with the extension names .EXE and .COM which can be loaded or executed on the computer. If anyone of these

commands are desired then it is not necessary to write the extension name. As the enter key is pressed, the command takes the action according to the instructions.

There are some DOS commands which can never be seen on the DOS diskette e.g. ERASE, DIR, TYPE, COPY, RENAME etc. These commands are loaded for the first time as the computer is started, and are stored in the RAM. These commands are called Internal commands. On the other hand, External commands are those commands which must be loaded from the disks every time they are to be executed. e.g. FORMAT, DISKCOPY, CHKDSK, SELECT etc.

3.6 Diskette Preparation Commands

DOS relies heavily on the use of diskettes; however each diskette must be prepared for use by the computer. A new diskette just taken from the box is useless to the computer. The diskette must be prepared so the computer can use it to store and retrieve information. This process is called "Formatting".

3.6.1 FORMAT

The command most important in preparing a diskette is the FORMAT command. FORMAT is used to prepare a disk for use. It is the equivalent of drawing guidelines on a blank sheet of paper to make it possible to write evenly. Once a diskette has been formatted then there is no need to format it again. If a user formats the diskette again then existing information on the diskette will be erased.

FORMAT performs two important tasks:

- i) Creates the electronic guidelines that make it possible to work with the diskette.
- ii) Checks for any defects or bad spots on the diskette. If bad spots are found, FORMAT marks the spots to prevent information from being stored there.

Four steps are needed to use the FORMAT command:

- a) DOS FORMAT.COM command is required to run the format procedure because it is an external command.
- b) Type FORMAT after the DOS prompt
- c) Specify which drive contains the diskette to be formatted. The drive specification is the parameter.
- d) The last step is to press the enter key.

It is assumed that the computer system has a hard disk and a high density diskette drive A. When the computer is booted from the hard disk and after entering the date and time, the user is on DOS prompt i.e. C> and all the DOS commands are stored on the hard disk through the Select Procedure. All the DOS commands can be utilized from the hard disk.

FORMAT command can format different types of diskettes. FORMAT procedure will be explained only for two types of diskettes i.e. Double Sided High Density (DS HD) and Double Sided Double Density (DS DD) diskettes. For formatting the diskette in high density drive A, enter the FORMAT command after the DOS prompt C:.. Formatting of the diskette in high density drive A will be as follows:

FORMAT A: (for DS HD diskette)

FORMAT A:/4 (for DS DD diskette)

After pressing the enter key computer will show the following message:

Insert new diskette for drive A:

and strike ENTER when ready

At this time insert the required diskette to be formatted in the drive A: and press the enter key. After completing the process of formatting, the computer will give the message:

Format complete

Format another (Y/N)?

If it is required to format another diskette then enter Y otherwise enter N for not.

There are a number of switches that can be used with the FORMAT command but only /S and /V will be discussed.

S is the abbreviation for the word System. System refers to a portion of DOS that contains some basic commands. /S makes DOS copy a portion of itself onto the diskette being formatted. V is the abbreviation for the word Volume. Volume refers to the volume ID label that can be stored on a diskette. /V allows the user to give the diskette a label. A label can consist of eleven (11) characters.

The following are two examples of using /S & /V:

FORMAT A:/S this formats the diskette in the A drive and then copies a portion of DOS on the diskette. In this way full DOS commands can be installed on the target drive with the help of COPY command. In this example the target drive is A:

FORMAT A:/V this formats the diskette in A drive and allows the computer user to give the diskette a volume ID label.

WARNING: FORMAT is one of the most dangerous of all DOS commands because it erases or destroys all the information stored on a diskette. Never type FORMAT without specifying the drive (A or B) on which the diskette to be formatted is located.

3.6.2 DISKCOPY

The second diskette preparation command is DISKCOPY. It reads all the formatting and data from one diskette (called the source diskette) and copies it on another diskette (called the target diskette). DISKCOPY has some major disadvantages:

- a) if either of the diskettes, used for copying from or for copying into, has bad areas, DISKCOPY will not work.
- b) some of the IBM AT personal computers have two different types of floppy disk drive. The top drive is referred to as a high density drive (drive A) and the bottom drive is called a double density drive (drive B). The high density drive formats a diskette so that it can store about 1.2 million characters of information. The double density drive formats a diskette so that it can store only 360 thousand characters of information. Because DISKCOPY copies the formatting from one diskette to another, user can not use it to copy the contents of a diskette in the A drive to a diskette in the B drive due to the difference in formats (e.g. incompatibility). To overcome this problem user will have to perform a one drive operation.
- c) if only some portion of the diskette is required to be copied, then the DISKCOPY command will not work.
- d) the information on the target diskette is lost.

An advantage of using DISKCOPY is that if the diskette one is copying on to, is unformatted, DISKCOPY will format it. This can save time because formatting and copying are done in one operation.

Some examples of the DISKCOPY commands are as follows for the DOS prompt C>.

```
C>DISKCOPY A: A:
```

```
C>DISKCOPY B: B:
```

The above examples are for the computer systems having one disk drive or two different drives.

```
C>DISKCOPY A: B:
```

The above command is for the computer systems having two similar disk drives. In this case A drive is the source drive and B is the target drive.

After completing the process of DISKCOPY the computer will ask about using the diskcopy again. Then the computer will act according to the command given by the computer user.

3.6.3 MKDIR, RMDIR and CHDIR

These commands are used for making, removing and changing the directories on the target drive. MKDIR or MD is used for making the directory, RMDIR or RD is used for removing and CHDIR or CD is used for changing the directory on the target diskette. These commands are entered after the DOS prompt. The format of these commands is as follows:

```
MD A:DIRNAME
```

```
MKDIR A:DIRNAME
```

This command will make a new directory "DIRNAME" on the target diskette in drive A.

If the current directory is the root directory and it is desire to go into the sub-directory "DIRNAME", then follow this procedure:

```
CD \DIRNAME
```

```
CHDIR \DIRNAME
```

Normally it is desired to leave or change the sub-directory. For changing the directory or sub-directory, CD or CHDIR command is used as:

```
CD \
```

```
CHDIR \
```

By entering the above command, the computer will bring the user back into the root directory. If it is desired to see the current directory or current drive of the computer, enter the following command after the DOS prompt:

CD

The computer will show the current directory including drive.

Usually it is desired to work with different disk drive of the computer i.e. A, B, C etc. The method for skipping from one drive to another is very simple. Type the letter of the desired disk drive with colon : and press enter key. The computer will change to the desired drive. From any DOS prompt i.e C> enter the command:

A:

By entering the above command computer will bring the user in drive A.

C:

By entering the above command computer will again bring the user in drive C.

RD A:DIRNAME

RMDIR A:DIRNAME This command will remove the DIRNAME directory for the target diskette in drive A. It will work only when DIRNAME directory is empty. It means there will be no files including hidden files in the specified directory.

Any name can be used for a directory as long as all the rules for naming files are followed. By calling the directory with the help of DIR command, the computer will put the following mark against the directories:

<DIR>

This is for differentiating the files from the directories.

3.7 Commands for Copying, Removing, Viewing, & Renaming Files

The following command are used to change files around by copying, erasing, viewing or renaming them:

- i. COPY
- ii. DEL or ERASE
- iii. RENAME
- iv. TYPE

3.7.1 COPY

The first command is the COPY command. It is used to make copies of files on the same diskette or to copy files from one diskette to another. If it is desired to copy all the files on a diskette then this is the recommended command to use instead of the DISKCOPY command. To use the COPY command, the target diskette must already be formatted. Because it does not format the diskette, the COPY use two parameters, the source (what is desired to copy) and the target (where it is desired to copy into). Some examples of copy command which can be entered after the DOS prompt:

COPY A:PUNJAB.DAT B: The two parameters for this command are A:PUNJAB.DAT (the source) and B: (the target). The file called PUNJAB.DAT located on the diskette in drive A will be copied to the diskette in drive B and will have the same name as on the source diskette.

COPY A:*. * B: This command uses a wild card to copy all the files from the source drive A to the target drive B. The *. * will match all the filenames on the A drive and copy these files on the drive B. The filenames on the drive B will be identical to the filename on the drive A. This is the recommended command for copying the contents of an entire diskette to another diskette. On the same line, wild card ? can be used in the COPY command.

COPY A:PUNJAB.DAT B:PUNJAB1.DAT

This command copies the file PUNJAB.DAT on the diskette in drive A to a file named PUNJAB1.DAT on the diskette in drive B. In this case the filename has been changed because it has mentioned a new target filename.

COPY A:PUNJAB.DAT A:PUNJAB1.DAT

This command is very similar to the command above, except that the source and the target drive are same. This would copy the PUNJAB.DAT on the diskette in drive A to a new filename PUNJAB1.DAT on the same diskette. By this method two identical files can be created on the same diskette by different names.

This copy command has one major drawback which is, if the target diskette already has files of the same names as those of the source diskette then the existing files will be replaced by the new source diskette files.

3.7.2 ERASE or DEL

Sometimes it is desired to get rid of the file(s) those are no longer needed. For this purpose there are two commands that can be used to get rid of unwanted file(s), DEL (delete) and ERASE. DEL and ERASE are easy to use but they must be used with care. If a file is erased it may be lost completely. Some special programmes may be able to un-erase files. However, it is better to be careful and not delete the file. To use DEL or ERASE, type the command after the DOS prompt, next specify a disk drive and the complete filename that is to be erased. The final step is to press the enter key. Format of the ERASE and DEL commands is the same. It is up to the user, either command, the ERASE or the DEL can be used. Below are some examples:

```
ERASE A:FILENAME.EXT
DEL A:FILENAME.EXT
```

either one of these commands will erase or delete the file FILENAME.EXT in drive A. The parameter for this file is the drive A where the diskette is located and the filename, A:FILENAME.EXT.

In the ERASE and DEL command wild card * and ? can be used. Some examples are as follows:

ERASE B:*. *
DEL B:*. *

these commands will erase all the files on the diskette in the B drive. DOS will not erase the files immediately. DOS will ask.

Are you sure (Y/N)

If the user really wants to erase the entire diskette then he should enter Y otherwise N for not deleting the files.

DEL A:*.DAT
ERASE A:*.DAT

all the files with a file name extension of DAT would be deleted from the diskette in drive A. In this example DOS will not ask the user to be sure. DOS will only ask this when all the files of the diskette are to be deleted.

DEL A:*.?AT
ERASE A:*.?AT

All the files with AT last two characters of the extension name will be deleted from the diskette in drive A.

3.7.3 RENAME or REN

The REN an abbreviation of the word rename. This command is used to change the filename. In this command two parameters are required.

- a) The disk drive which contains the files alongwith the name of the file.
- b) The new name of the file.

The new filename must be one that is not being used or else the command will not work. DOS will display an error message if the new filename already exists. Listed below are ways to use the RENAME or REN command:

REN A:NAME.OLD NAME.NEW
RENAME A:NAME.OLD NAME.NEW

This command renames the files called NAME.OLD on the diskette in drive A gives it the new filename of NAME.NEW.

```

RENAME A:*.USA *.PAK
REN A:*.USA *.PAK

```

All the files with a filename extension of USA on the diskette in drive A are renamed so they have a filename extension of PAK. The first name of the files remains unchanged.

3.7.4 TYPE

TYPE is an easy way to get a quick look at the contents of some files. Not all files are readable when displayed by this command. The reason is that these files are coded in machine language, the language which the computer uses to operate. In general, files created by a word processing package may be readable when displayed by the TYPE command.

The TYPE command simply writes a copy of a file onto the display screen of the computer. To use this command it is necessary to specify one parameter, the file and its location (drive A, B, C, etc). Below is an example:

```
TYPE C:AUTOEXEC.BAT
```

The parameter in this example is C:AUTOEXEC.BAT. The C: specifies the disk drive on which the diskette containing the file is located. AUTOEXEC.BAT is the file which is required to displayed on the screen.

3.8 Some Other Useful Commands

There are two other commands which are very useful and easy to use. These are VER and CLS.

3.8.1 VER

The VER displays the exact version of DOS that the computer is using. DOS, like a text book, is continually being updated and improved upon. Some DOS commands will only work on the latest version of DOS. It is very useful to know what version of DOS is being used. To do so, type VER after the DOS prompt and press the enter key. DOS will then display the version number.

3.8.2 CLS

The command CLS is the abbreviation of CLear Screen. This command is used to clear the display screen of the computer. This is very useful when the screen becomes full of DOS commands or messages from the computer.

To use it type CLS after the DOS prompt and press enter key.

3.9 Key Commands

The key commands are those commands which are given to the computer by pressing a combination of keys. These commands can be used to stop the computer, to print information, or to make the computer-pause and wait.

3.9.1 BREAK

DOS provides a way to stop the computer from continuing with a command. To do this two keys are used at the same time, the Ctrl key and either the Break key or the C key. The result of using these keys is the Break command. To issue the Break command hold down the Ctrl key and press either the Break key or C key. Once the computer receives the message to break then it displays the DOS prompt and is ready to accept another command.

3.9.2 ECHO

Another useful feature of DOS is the Echo command. The Echo command is given by holding down the Ctrl key and by pressing the PrtSc key. PrtSc is an abbreviation for the words Print Screen. The Echo command causes whatever is displayed on the computer monitor to be printed on the paper by the printer. Each time information is displayed on the monitor it is also sent to the printer. First hold down the Ctrl key and press the PrtSc key, it will turn the Echo command on. When next time Ctrl key is held down and pressed the PrtSc key is it turns the Echo command off. Remember to turn off Echo at the end of operation.

3.9.3 SCREEN COPY

A command similar to the Echo command is the Screen Copy command. Screen Copy differs from the Echo command in that only what is seen on the screen at that time is printed. Further; there is no need to shut it off as in the case of Echo command. To use the Screen copy command, hold down the shift key and press the PrtSc key. The printer will immediately start to print whatever is on the Screen. When the printing is completed, Screen Copy turns itself off.

3.9.4 PAUSE

The last command that is sent through the keyboard is the Pause command. Pause temporarily prevents the computer from displaying information on the screen. This prevents the screen from the scrolling away information. For the computer to continue scrolling, any key may be pressed. The Pause command can be sent to the computer by holding down the Ctrl key and pressing the S key. By pressing any key causes the computer to continue displaying information on the screen.

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GLOSSARY

- Application Programme (or) Software:** Programme or software prepared to play a specific task, such as mathematical analysis, home finance, games, graphics, or word processing.
- Arithmetic Processing Unit (APU):** A chip that adds, subtracts, multiplies, and divides without the use of external software.
- BASIC:** Beginners All-purpose Symbolic Instruction Code. It is high-level programming language widely adopted for the use with personal computers.
- Bit:** The smallest unit of computer data, represented by 1 or 0 (On or Off electric impulse)
- Boot:** To ready a computer for use by loading the disk operating system into the computer's temporary memory or random access memory.
- Break:** A command that informs the computer to terminate what is performing and wait for further instructions. A break may be part of a programme, or may be activated through the use of a break or escape key.
- Break Key:** Most computers have a break key that permits the user to stop the computer.
- Byte:** A character of 8 bits represents one byte, which can be thought of as a letter, number, symbol, or space.
- Central Processing Unit:** The chip that guides the flow of information within the computer and does the actual computing. Also used to describe the physical part of the computer that houses the CPU chip.
- Character:** Any single letter, number, or symbol.
- Chip:** An integrated circuit made by etching a myriad of transistors and other electronic components onto a wafer of silicon a fraction of an inch on each side.
- Command:** An order to the computer to perform a particular job.
- Copy:** To duplicate a file or programme to hold the original and work on the duplicate.
- Diskette:** Sometimes called a floppy disk or floppy, these are plastic magnetic records used to save information. Diskettes come in varying sizes.

- Disk Operating System (DOS):** The programme directs the computer how to deliver information to and from a disk.
- Double Sided:** A combination of disk and disk drive that uses both sides of a diskette for recording information.
- File:** A group of units or characters, which develop a record when grouped together.
- Floppy Disk:** Diskette is also called floppy disk.
- Hard Disk or Fixed Disk:** A rigid disk used to record information. Hard disk can save more information than a diskette and can write and read information more rapidly.
- Hardware:** The physical parts of the computer system.
- Input:** To set information into a computer using a keyboard, disk drive, or telephone connection via a modem.
- Input/Output (I/O):** A common term that describes the equipment used to get information into and out of a computer.
- Instruction:** Programming term for a direction given the computer.
- Integrated Circuit:** A large number of interrelated circuits in a single, very small package. Integrated circuits are often referred to as chips.
- Load:** To place a programme into a computer's main memory.
- Memory:** One of the central components of a CPU. It is the area where information and programmes are saved and processed.
- Microprocessor:** A chip containing all the elements required to operate calculations, and which serves as the basis for a CPU.
- Operating System:** A programme that supervises the overall operations of a computer.
- Peripheral:** Attachment parts of a computer system that are not considered essential to its operation, including printer and external storage devices.
- Printer:** An output device that exhibits a printed copy of the information produced by a computer.
- Programme:** Any set of instructions that directs a computer what to perform.

Prompt: A character or message from the computer requiring the user to answer.

Random Access Memory: It is the primary memory stored within a computer's hardware, and is measured in kilobytes. RAM is temporary; turning off the computer erases it.

Read Only Memory: It is a permanent part of the computer's internal memory. Computer programme cannot change it. It needs no interaction from the user to act.

Sector: A small storage area on a disk, usually 256 bytes.

Software: Alternate name of the programme.

Track: Tracks on a computer disk are organized in concentric circles around the disk much like the grooves of phonograph record.

Write: To store information onto a disk or other storage medium.