

GWYNNE LARSEN  
VERLENE LEEBURG



D O S

# First Look at... DOS

Gwynne Larsen and Verlene Leeburg



**Mitchell McGRAW-HILL**

New York St. Louis San Francisco Auckland Bogotá Caracas  
Lisbon London Madrid Mexico Milan Montreal New Delhi Paris  
San Juan Singapore Sydney Tokyo Toronto Watsonville

This book is printed on acid-free paper.

Mitchell **McGRAW-HILL**  
Watsonville, CA 95076

First Look at DOS

Copyright © 1992 by **McGRAW-HILL, Inc.** All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of the publisher.

6 7 8 9 0 DOH DOH 9 0 9 8 7 6 5 4

ISBN 0-07-036585-7

The sponsoring editor was Roger Howell.

The editorial assistant was Laurie Boudreau.

The production assistant was Leslie Austin.

The production manager was Christi Payne Fryday, Bookman Productions.

The interior designer was Renee Deprey.

The cover designer was Janet Bollow.

Cover photo by W. Warren/**Westlight**.

The compositor was Rick Gordon, Bookman Productions.

The printer and binder was R. R. Donnelley & Sons.

Library of Congress Card Catalog No. 91-066889

MS-DOS is a registered trademark of Microsoft Corporation.

# Preface

*First Look at DOS* is a step-by-step, hands-on tutorial covering basic concepts of DOS. You can use this book as a self-paced guide, in a lecture class that addresses either a single operating system or a combination of systems, such as DOS, Windows, NetWare, and the like, or as a supplemental text in a variety of classes.

*First Look at DOS* will quickly get you “up to speed” with the program’s most useful features. Complete with a comprehensive command summary at the end of the book, reference is quick and easy.

## ..... **ORGANIZATION**

Each lesson contains the following features:

- A list of objectives followed by an overview of the lesson
- A hands-on tutorial that guides you through specific functions and commands
- Caution and Note sections that appear throughout the lesson, alerting you to common program pitfalls
- A summary of commands that includes the page number where each command was first introduced
- A self-test that reinforces learning

## ..... **DATA DISKETTE**

A data diskette that contains files and subdirectories is available for instructors through your local McGraw-Hill representative. The data diskette saves students the time it takes to create the files and subdirectories required for the tutorial. Since the diskette also contains empty subdirectories, instructors should reproduce the diskette by using either the DISKCOPY or XCOPY

commands. For example, if the data diskette is in drive A and you wish to copy it to drive B, at the command line type `XCOPY A: B: /S/E`. We have instructed students to perform the majority of the exercises from drive A, so that each student's directory structure will be consistent. To keep this consistency, we recommend you do not load this data diskette on your local area network.

As you work through *First Look at DOS*, you will create files that are referenced in later lessons. For this reason we suggest that you use your own data diskette for file storage and retrieval. In addition, you can use either pull-down menu commands or function key commands, which appear for every lesson.

.....

## FIRST LOOK AT... SERIES

This book is part of the First Look at... series, which consists of titles designed to cover the most popular commercial software packages.

The purpose of each book in this series is to provide an inexpensive, quick, and complete learning tool that you can use for ready reference after you've completed the tutorial. At the end of each book, a comprehensive summary of commands, arranged alphabetically, makes reference easy. It is assumed that you have access to the complete software package and all its features.

In a minimum number of pages, each book covers the most commonly used features of the particular program—enough to equip students with fundamental proficiency in a short time.

.....

## ACKNOWLEDGMENTS

We wish to acknowledge the assistance of our reviewers: O. D. Perry, Fort Lewis College, and Jim Davies, DeAnza Community College.

We would like especially to thank our families for being so supportive and patient throughout this project.

Gwynne Larsen  
Metropolitan State College of Denver  
Denver, Colorado

Verlene Leeburg  
Leeburg and Associates  
Boulder, Colorado

# Contents

Preface   vii

## ..... **LESSON 1**

### **Microcomputer Systems**

**1**

Objectives	1
Microcomputers for Business and Home Use	1
Input Devices	3
Processing	5
Output Devices	11
Data Processing	13
Microcomputer Software	13
Summary of Commands	14
Self-Test	14

## ..... **LESSON 2**

### **The Disk Operating System — DOS**

**16**

Objectives	16
Services DOS Performs	16
Components of DOS	17
DOS Versions	18
DOS File Extensions	19
The Importance of Knowing DOS	19
Summary of Commands	20
Self-Test	20

## ..... **LESSON 3**

### **Getting Started**

**22**

Objectives	22
Powering Up the Computer and Loading DOS (Cold Boot)	22
Entering the Date and Time	25
The DOS Prompt	26
Entering Information at the DOS Prompt	27
Giving DOS a Command	28

Restarting DOS (Warm Boot) 28  
Turning Off the Computer 29  
Summary of Commands 30  
Self-Test 30

.....  
**LESSON 4**

**Using DOS Commands 31**

Objectives 31  
Giving DOS a Command 31  
Internal and External DOS Commands 34  
DIR (Internal) 35  
Changing the Current Drive 39  
Pausing a DOS Command 40  
Canceling a DOS Command 40  
CLS (Internal) 41  
VER (Internal) 42  
Summary of Commands 42  
Self-Test 42

.....  
**LESSON 5**

**Files and Filenames 44**

Objectives 44  
Files and Filenames 44  
Managing Your Files 48  
TYPE (Internal) 49  
PRINT (External) 50  
COPY (Internal) 51  
COMP (External) 53  
RENAME (Internal) 53  
ERASE (Internal) 54  
ATTRIB (External) 55  
Summary of Commands 57  
Self-Test 58

.....  
**LESSON 6**

**Managing Your Diskettes 59**

Objectives 59  
How DOS Keeps Track of Files 59

FORMAT (External)	60
LABEL (Internal)	62
VOL (Internal)	63
CHKDSK (External)	64
DISKCOPY (External)	65
DISKCOMP (External)	67
Summary of Commands	68
Self-Test	69

## ..... **LESSON 7**

### **Hard Disk Management**

**70**

Objectives	70
Root Directory and Subdirectories	70
Directory Tree Structure	72
Directory Capacity	73
The Current Directory	74
Directory Movement	74
Copying a File from One Directory to Another	79
PROMPT (Internal)	81
Creating a Subdirectory	82
Removing a Subdirectory	84
Displaying a Disk's Directory Structure	85
PATH (Internal)	87
Summary of Commands	88
Self-Test	89

## ..... **LESSON 8**

### **BACKUP and RESTORE**

**90**

Objectives	90
BACKUP (External)	90
Restoring Files	96
Summary of Commands	100
Self-Test	100

## ..... **LESSON 9**

### **Using DOS as a Text Editor**

**101**

Objectives	101
DOS Editing Keys	101



Edlin	106
Summary of Commands	115
Self-Test	115

.....

## **LESSON 10      Creating Batch Files      117**

Objectives	117
What Is a Batch File?	117
Creating a Batch File	117
Batch File Commands	118
Batch File Execution	119
Replaceable Parameters	121
AUTOEXEC.BAT Batch File	122
Summary of Commands	125
Self-Test	126

## **Self-Test Answers      127**

## **DOS Command Summary      129**

## **Index      131**

# Microcomputer Systems

## OBJECTIVES

At the end of this lesson, you will be able to:

- Describe a microcomputer.
- Identify some of the uses of a microcomputer.
- Explain what input devices are.
- Describe how a microcomputer processes data.
- Understand the type of memory in a microcomputer.
- Describe the types of disk drives.
- Tell what the diskette capacities are.
- Explain what the correct way to handle diskettes.
- Describe a monitor.
- Differentiate among printers.
- Understand the uses of ports and expansion slots.
- Explain what a modem is.
- Understand how microcomputers accept data.
- Tell the difference between application software and system software.

. . . . .

## MICROCOMPUTERS FOR BUSINESS AND HOME USE

Microcomputers (sometimes called personal computers or PCs) are becoming extremely important in today's society. Before long, most businesses will have a microcomputer on every employee's desk. Business uses of microcomputers include preparing letters and reports with word processing, utilizing spreadsheet packages to prepare budgets and income/expense statements, making graphs and charts for presentations, and creating databases consisting of clients, customers, inventory parts, and employees.

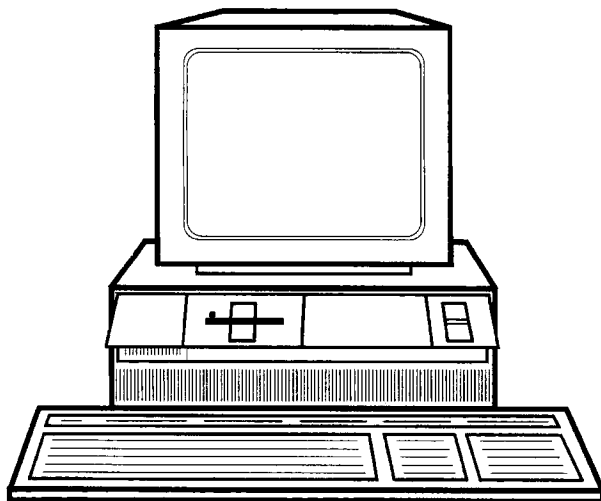
More and more families are acquiring microcomputers for home use, as well. Their children use them for homework projects, and the adults use them to prepare family budgets and income tax information. They can access

external databases (such as those on Prodigy and CompuServe) to obtain entertainment information or stock market information, to order clothes and other items, to send electronic mail messages, and to collect information from on-line databases such as encyclopedias.

On August 12, 1981, International Business Machines (IBM) introduced the Personal Computer; today, many other manufacturers produce computers that function in the same way and therefore are compatible with software packages designed to run on IBM PCs. The “PC clones” have intensified competition in the PC market. PCs (IBM or compatible) can be configured in numerous ways with various components and attachments, but a basic computer system must consist of the following components: hardware (system unit, keyboard, and monitor) and software (disk operating system—DOS). This combination represents the minimum amount of equipment needed to create a functional computer. Other components, such as a printing device (printer or plotter), a mouse, or a modem, may be attached to the basic system unit. Figure 1-1 shows a PS/2 microcomputer by IBM.

A computer system electronically processes data or produces information to solve a business problem or to meet a specific need. The three basic elements of a computer system are input, processing, and output. Data is input (entered) into the computer via various input devices (a keyboard, a scanner, or a mouse). Once the data has been entered, the processing is done in the central processing unit (CPU). Processing consists of the execution of a set of instructions given to the computer. After the data has been converted into meaningful information, the information is output to a device such as a monitor (computer screen), a printer, or a plotter (to plot graphs). The term for the physical, touchable part of the system is **hardware**; the term for the written programs that provide internal instructions for the computer is **software**.

**Figure1-1**



# ..... INPUT DEVICES

## Keyboard

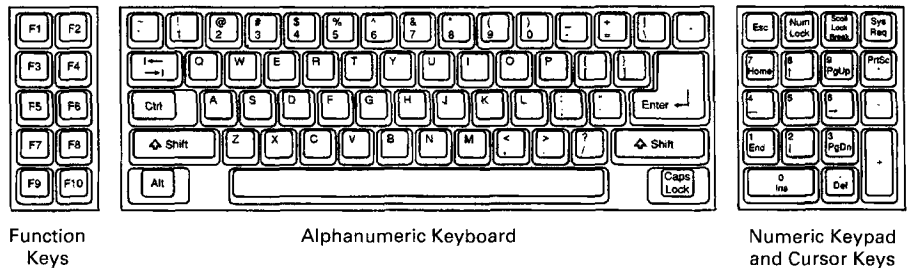
The keyboard allows you to communicate with the computer. As keys are pressed on the keyboard, the corresponding characters appear on the monitor. Two types of keyboards are currently available for the IBM PC: the PC/XT keyboard and the AT-PS/2 keyboard. The main difference between the two keyboards is that the PC/XT has 10 function keys positioned on the left-hand side of the keyboard, whereas the AT-PS/2 has a row of 12 function keys along the top. For the most part, both keyboards function the same way a typewriter does. The PC/XT keyboard is illustrated in Figure 1-2, and the PS/2 keyboard is shown in Figure 1-3.

## Special-Purpose Keys

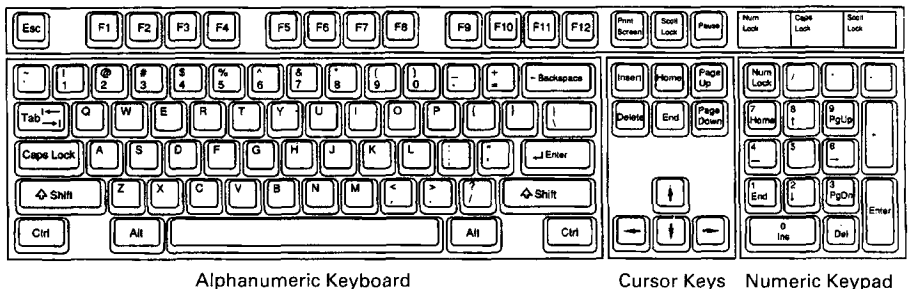
In addition to containing alphabetic and numeric keys, the keyboard has several other keys that serve specific purposes or functions—for example the Enter key, the function keys, and the numeric keypad.

**Enter Key** To communicate with the computer through DOS, you must enter (type in) commands and information on the keyboard. This involves typing in the text and then pressing **Enter** to execute the command. The **Enter**

**Figure1-2**



**Figure1-3**



key is often referred to as the **Return** key. When it is pressed, DOS responds by processing the information or executing the command given. The **Enter** key is essentially your “yes” key. The information entered must follow the precise format given in the DOS Documentation Manual. Any misspellings or incorrect syntax in the use of commands is not acceptable and will cause an error message to appear.

**Function Keys** The PC/XT keyboard has 10 function keys located on the far left-hand side of the main keyboard. They are labeled **F1** through **F10**. The AT-PS/2-style keyboard has 12 function keys located along the top of the keyboard. They are labeled **F1** through **F12**. The function keys have special meanings, depending on the function involved and the software the computer is running.

**Numeric Keypad** When the **Num Lock** light is illuminated, the numeric keypad (located on the far right-hand side of the keyboard) can be used as a 10-key calculator pad for entering numbers. If **Num Lock** is not illuminated, the keypad can be used to move the cursor with the arrow keys.

**Print Screen** **Prt Sc** is used to print the information that is currently displayed on the monitor. On the PC/XT keyboard, however, you must press **Shift-Prt Sc**.

**Control Print Screen** Pressing the **Ctrl-Prt Sc** combination instructs DOS to begin printing every line displayed on the monitor. A printed copy of your computer work session is then produced on the printer. This key combination works as a toggle: press once to turn it on; press again to turn it off.

**Shift** The **Shift** key is labeled with an open arrow or the word *Shift*. The two **Shift** keys operate in a fashion similar to the **Shift** keys on a typewriter. To enter an uppercase character, hold down **Shift** and press the character to be capitalized.

**Backspace** If you type in an error while entering a command or other information, press **Backspace** (the key with the arrow pointing to the left) to back up one space and delete the character in that space. Once the error has been deleted, continue typing the command or information.

**Insert** **Ins** inserts a character and moves the next character forward as long as you continue to type.

**Delete** **Del** deletes the character above the cursor. It is a repeating key, so you should be careful not to hold it down too long.

**Escape** **Esc** cancels a typed line. A backslash (\) is then displayed at the end of the line, and the cursor is positioned at the beginning of the next line.

However, pressing **[Esc]** will not terminate a line if **[Enter]** has already been pressed. (In some software packages, **[Esc]** cancels the command just entered.)

**Caps Lock** Press **[Caps Lock]** to type all characters in uppercase. Press the key again to return to lowercase. Even with **[Caps Lock]** on, however, you must still use **[Shift]** to enter the characters above numbers.

**Control Break** Pressing **[Ctrl]-[Break]** simultaneously cancels whatever function the system is performing. Use this key combination whenever you want to discontinue the function being executed. This function can also be entered as **[Ctrl]-[C]**.

**Control Number Lock** Pressing **[Ctrl]-[Num Lock]** halts whatever the system is doing until another key is pressed. This function is normally used to freeze the display when the information is scrolling too fast or is off the screen. **[Ctrl]-[S]** can also be used for this purpose.

## Mouse

Another input device gaining in popularity is the **mouse**—a hand-held device that is moved around on the desktop, controlling the cursor on the screen. A mouse is virtually essential for use with desktop publishing packages. Most software packages written today support a mouse.

## Scanner

A **scanner** takes a picture of text, photographs, and drawings; digitizes it (transfers it into machine-readable form); and stores it in the computer. A scanner is a very fast and accurate way to input to the computer. When text is to be scanned and later edited, a software program must be used. A scanned document takes about 1 megabyte of storage per page scanned.

## ..... PROCESSING

The system unit of the microcomputer is made up of several components, including the central processing unit (CPU), the main memory, and disk drives.

## Central Processing Unit (CPU)

The CPU is a microprocessor that performs several functions:

- It coordinates all the activities of the computer—retrieving the files from disk drives, interpreting data and commands entered from an input device, and sending information to output devices such as printers and plotters.
- It performs all the arithmetic calculations and logical operations in an area called the arithmetic/logic unit.

The CPU is sometimes referred to as the “brain” of the computer. It operates by executing a program, which is a list of instructions telling the computer exactly what to do. The **microprocessor** is a small silicon chip that resides on a large circuit board called the **motherboard**, which also contains other integrated circuits or chips.

The first microprocessors in IBM and compatible microcomputers were the Intel 8086 and 8088. These chips had a 4.77-MHz internal clock speed (explained later) and an 8-bit word length (meaning that 8 bits could be processed at a time). In 1984, the Intel 80286 chip was used in IBM’s AT computer, which had a speed ranging from 8 to 12 MHz and a 16-bit word length. The Intel 80386 chip was introduced in 1987; it had a speed ranging from 16 to 33 MHz and a 32-bit word length. Released in 1991, IBM’s 486 computer contains an 80486 microprocessor ranging from 25 to 50 MHz and a 32-bit word length. The 80586 is now on the drawing board. Obviously, microcomputers continue to get faster and more powerful.

**Internal Clock Speed** The internal clock speed of the computer indicates how fast the computer can process information; this value is measured in megahertz (MHz), or millions of cycles per second. The earlier microcomputers operated at 4 to 10 MHz, while newer ones are now up to 35 to 50 MHz.

## Memory

The computer requires a certain amount of temporary space to store information and instructions that will be retrieved by the CPU for processing. This area of the computer is called the memory. Before a program can be executed, the program instructions and any data to be processed must first be placed in memory. The CPU retrieves both the program instructions and the data to be processed from the memory as needed.

Memory is made up of bytes. A byte is essentially the equivalent of one character. For example, if your computer has 64,000 bytes (or 64 kilobytes—64K), it can store approximately 64,000 characters in memory.

Three terms are associated with memory: **random access memory (RAM)**, **cache memory**, and **read-only memory (ROM)**. RAM is used to store and

retrieve any type of data. However, this memory is only temporary. When the computer is turned off, any information or data residing in RAM is lost. Cache memory is a form of random access memory that can be called up more quickly than RAM. The computer stores the data it has used most recently in cache memory; thus it is more readily available. ROM is not available for use. It consists of instructions programmed into the computer at the time of manufacture and contains information the computer requires when it is first turned on. Unlike RAM data, the contents of ROM are not lost when the computer is turned off.

## Disk Drives

The disk drive is the device that writes and reads data, and the diskette is the medium that stores or holds the information. A disk drive can read and write information to or from a diskette. The mechanism inside the disk drive that reads information from and writes information onto the diskette is called a read/write head, and functions in much the same way as does the play/record head on a cassette tape recorder.

Two types of disk drives are available inside the computer: a hard disk drive (also referred to as a *fixed disk drive*) and a floppy disk drive. Disk drives are designated in DOS by a letter followed by a colon.

**Hard Disk Drive** A hard disk drive is a high-speed, large-capacity disk drive. A hard disk can hold substantially more information than can a diskette in a floppy disk drive. For example, a floppy disk drive supports mini/microfloppy diskettes that can store between 360,000 and 1.44 million bytes of information. In contrast, a 20-megabyte (20M) hard disk can hold 20 million bytes of information. A hard disk is vacuum-sealed to limit the possibility of damage to the storage media. Consequently, the risk of losing data is considerably less on a hard disk drive than on a floppy disk drive. A hard disk drive is designated in DOS as drive C.

**Floppy Disk Drive** When a system is configured with either one or two floppy disk drives, the first disk drive is designated as drive A and the second as drive B.

**CDROM Drives** CDROM (compact disk read-only memory) drives are just beginning to be used in business. Data on CDROM disks is permanently written and can only be read—not written over. Disks are purchased with information such as databases, encyclopedias, fonts, and clip-art pictures already on the disk. The compact disk stores data optically; lasers burn information onto the disk as bubbles, and these are later read by another laser. One CDROM can hold a gigabyte (one billion bytes) of information, and they are excellent for backing up information and for archival (or storage) purposes.



## Diskettes

Diskettes (also called *disks*) are the magnetic medium on which programs and data are stored. The diskette must be inserted into the floppy disk drive in order for the computer to be able to access or retrieve information from it. Two types of diskettes are available: minifloppy and microfloppy.

**Minifloppy Diskettes** The 5¼-inch minifloppy diskette is surrounded by a stiff jacket to protect the diskette (see Figure 1-4).

Data is accessed through the read/write opening. The index hole is used to align the diskette when it is placed into the disk drive. This type of diskette comes in two capacities: a double-sided diskette that holds 360K of information, or a high-density diskette that accommodates up to 1.2M of data.

**Microfloppy Diskettes** The 3½-inch microfloppy diskette functions in a way similar to the 5¼-inch minifloppy diskette. The microfloppy is smaller and provides more protection for the magnetic medium, yet it stores more information (see Figure 1-5).

The 3½-inch diskette comes in both double-density and high-density formats. The double-density diskette accommodates up to 720K of data, and the high-density diskette can store 1.44M. The letters HD in the upper right-hand corner of the plastic case distinguish the high-density diskette from the double-density diskette. In addition, the high-density disk contains a square

**Figure 1-4**

