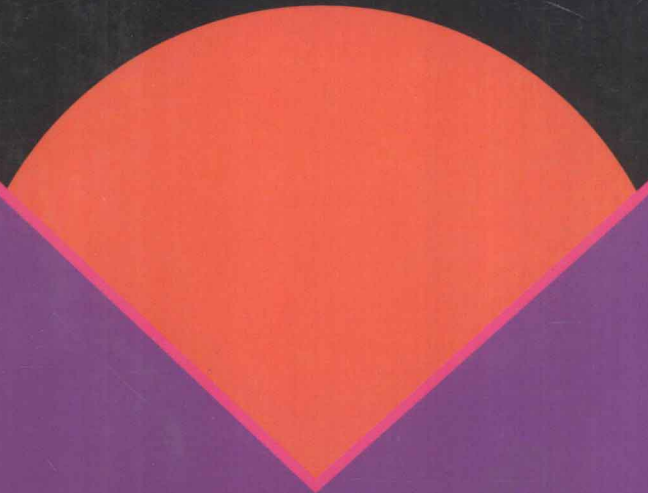


DOS 5.0



Ruth Schmitz

Using DOS 5.0

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Preface

USING DOS 5.0 provides the same realistic learning approach and comprehensive coverage presented in the author's previous book, *Practical DOS!* It combines DOS 5.0 concepts and commands in an easy to understand and easy-to-learn format.

This text assumes no prerequisites. It is designed to be used as a stand-alone textbook in an operating system course using DOS 5.0, as a supplement to an introductory computer text, or as a reference for anyone who wants to master DOS 5.0.

DISTINGUISHING FEATURES

As you review *Using DOS 5.0*, you will note the following features and benefits:

- **Comprehensive, hands-on coverage of DOS 5.0** and its major features: DOS Shell, DOS Text Editor, Help, and Batch programs.
- **Chapter Objectives** at the beginning of each chapter focus on major commands and concepts the reader will master by the end of the lesson.
- **Commands and concepts** are introduced, illustrated, and explained in order to maximize and reinforce student comprehension.
- **More than 50 Hands-On Activities** allow the reader to put commands into action.
- **Thorough end-of-chapter review material** includes: **Key Points**, which summarize the chapter's main concepts; **Review Questions** and **Hands-On Problems** test the reader's understanding of DOS before taking the **Hands-On Chapter Tests**, which are included in the Instructor's Manual.
- **The basic features of Windows 3.0 and 3.1** are covered in Chapters 14 and 15, including re-sizing, minimizing and maximizing windows as well as a description of Notepad and File Manager.
- **Both mouse and keystroke approach** are covered while working with the DOS Shell.
- **A complete reference guide** for DOS 5.0, DOS Shell, and Windows Command Summaries at the end of the text refer the reader back to the page where a specific command was first introduced.

INSTRUCTOR SUPPORT

The accompanying Instructor's Manual includes "Lesson Insights," answers to problems in the text, suggested discussion questions and answers, and additional

testing material. The text is packaged with either a 3¹/₂" or 5¹/₄" Student Data Disk, which the student uses to work through the Hands-On Activities. In addition to the Student Data Disk, the student will need three blank diskettes.

COMMANDS NEW TO DOS 5.0 INCLUDED IN THIS TEXT _____

The following alphabetical list of commands new to DOS 5.0 are incorporated into the text:

DEVICEHIGH
DOS=HIGH,UMB
DOSKEY
DOSKEY Macros
EMM386.EXE
FASTOPEN.EXE
HELP
HIMEM.SYS
INSTALL
LOADHIGH
MEM
MIRROR
UNDELETE
UNFORMAT
SMARTDRV
SYS

ACKNOWLEDGMENTS _____

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Ruth Schmitz

Contents

Preface iii

CHAPTER 1

Welcome to DOS 5.0 1

Objectives 1

DOS in Action 2

SECTION 1.1 Explore DOS 5.0's World 2

Hardware Components of a
Microcomputer 3

Hands-On Activity 1.1 9

SECTION 1.2 Boot the Computer 12

Hands-On Activity 1.2 13

SECTION 1.3 Special Keyboard Keys and Common Error Messages 14

Hands-On Activity 1.3 16

Key Points 17

Review Questions 18

CHAPTER 2

Introduction to DOS 5.0

Commands 20

Objectives 20

DOS in Action 21

DOS Commands 21

SECTION 2.1 DATE, TIME, VER, and SCL Commands 21

DATE 21

TIME 22

VER 22

CLS 22

Command Self-Review 2.1 23

Hands-On Activity 2.1 24

SECTION 2.2 File Names and the DIR (Directory) Command 25

File Name Specifications 25

DIR 26

Command Self-Review 2.2 28

Hands-On Activity 2.2 29

SECTION 2.3 More DIR Commands 30

Target Drive 30

Wild-Card Characters 30

Command Self-Review 2.3 31

Hands-On Activity 2.3 31

SECTION 2.4 FORMAT Command 32

Command Self-Review 2.4 35

Hands-On Activity 2.4 36

Key Points 38

Review Questions 38

Hands-On Problem 39

CHAPTER 3

DOS 5.0 Command Aids 41

Objectives 41

DOS in Action 42

DOS Commands 42

SECTION 3.1 PATH and PROMPT

Commands 42

PATH 42

PROMPT 43

Command Self-Review 3.1 44

Hands-On Activity 3.1 45

SECTION 3.2 HELP Command 46

HELP 46

Command Self-Review 3.2 47

Hands-On Activity 3.2 48

SECTION 3.3 DOS Editing Keys 49

Hands-On Activity 3.3 52

SECTION 3.4 DOSKEY Command 51

DOSKEY 51

DOSKEY Macros 52

Hands-On Activity 3.4 53

Key Points 55

Review Questions 56

Hands-On Problem 57

CHAPTER 4

Multidirectory Structure 59

Objectives 59

DOS in Action 60

DOS Commands 60

SECTION 4.1 Directory Structure	60
Multilevel Directories	60
TREE	61
Hands-On Activity 4.1	62
SECTION 4.2 CD Command	63
CD (Current Directory)	63
CD (Change Directory)	63
Command Self-Review 4.2	65
Hands-On Activity 4.2	66
SECTION 4.3 MD Command	69
MD (Make a Directory) Command	69
Command Self-Review 4.3	70
Hands-On Activity 4.3	71
SECTION 4.4 RD Command	72
RD (Remove Directory)	72
Command Self-Review 4.4	74
Hands-On Activity 4.4	75
Key Points	76
Review Questions	77
Hands-On Problem	78

CHAPTER 5 File Management 80

Objectives	80
DOS in Action	81
DOS Commands	81
SECTION 5.1 COPY Command	81
COPY	81
Command Self-Review 5.1	82
Hands-On Activity 5.1	83
SECTION 5.2 More COPY	
Commands	86
Copy Keyboard File	86
Copy Multiple Files	87
Command Self-Review 5.2	87
Hands-On Activity 5.2	88
SECTION 5.3 DEL Command	90
DEL	90
Command Self-Review 5.3	91
Hands-On Activity 5.3	91
SECTION 5.4 MIRROR, UNFORMAT, and UNDELETE Commands	93
UNDELETE	94
MIRROR	94
UNFORMAT	95
Command Self-Review 5.4	97
Hands-On Activity 5.4	97
Key Points	99
Review Questions	100
Hands-On Problem	102

CHAPTER 6 More File Management Commands 104

Objectives	104
DOS in Action	105
DOS Commands	105
SECTION 6.1 TYPE and REN	
Commands	105
TYPE	105
REN (Rename)	106
Command Self-Review 6.1	107
Hands-On Activity 6.1	109
SECTION 6.2 COMP and FC	
Commands	109
COMP	110
FC (File Compare)	112
Command Self-Review 6.2	112
Hands-On Activity 6.2	113
SECTION 6.3 Redirect, Pipe, and Filter I/O Commands	114
Ports	114
Redirect I/O	115
Pipe I/O	117
Filter I/O	117
Command Self-Review 6.3	120
Hands-On Activity 6.3	120
SECTION 6.4 MODE and PRINT	
Commands	122
MODE	122
PRINT	123
Command Self-Review 6.4	125
Hands-On Activity 6.4	125
Key Points	126
Review Questions	128
Hands-On Problem	129

CHAPTER 7 Disk Management 131

Objectives	131
DOS in Action	132
DOS Commands	132
SECTION 7.1 DISKCOPY and DISKCOMP	
Commands	132
DISKCOPY	133
DISKCOMP	135
Command Self-Review 7.1	137
Hands-On Activity 7.1	137

SECTION 7.2 XCOPY Command	138
XCOPY	138
Command Self-Review 7.2	141
Hands-On Activity 7.2	142
SECTION 7.3 CHKDSK Command	143
CHKDSK	143
Command Self-Review 7.3	147
Hands-On Activity 7.3	147
SECTION 7.4 VOL and LABEL	
Commands	148
LABEL	148
VOL	150
Command Self-Review 7.4	150
Hands-On Activity 7.4	150
Key Points	151
Review Questions	153
Hands-On Problem	154

CHAPTER 8

Hard Disk Management 156

Objectives	156
DOS in Action	157
DOS Commands	157
SECTION 8.1 BACKUP and RESTORE	
Commands	157
BACKUP	158
RESTORE	160
Command Self-Review 8.1	162
Hands-On Activity 8.1	163
SECTION 8.2 ATTRIB and SYS	
Commands	164
ATTRIB	164
SYS	166
Command Self-Review 8.2	166
Hands-On Activity 8.2	167
SECTION 8.3 REPLACE Command	169
REPLACE	169
Command Self-Review 8.3	169
Hands-On Activity 8.3	170
Key Points	171
Review Questions	172
Hands-On Problem	174

CHAPTER 9

Welcome to the DOS 5.0 Shell 176

Objectives	176
DOS in Action	177
SECTION 9.1 DOS Shell Basics	177
Identify Parts of the DOS Shell	177
Terminology	178
Hands-On Activity 9.1	179

SECTION 9.2 Menus, Dialog Boxes, and Help	182
Drop-Down Menus	182
Dimmed Commands	183
Dialog Boxes	183
Help	184
Hands-On Activity 9.2	184
SECTION 9.3 DOS Shell Directory Tree	186
Hands-On Activity 9.3	187
SECTION 9.4 File List	189
Hands-On Activity 9.4	191
Key Points	193
Review Questions	194
Hands-On Problem	195

CHAPTER 10

Commands from the DOS 5.0 Shell 197

Objectives	197
SECTION 10.1 Format	198
Hands-On Activity 10.1	198
SECTION 10.2 Make and Remove Directories	199
Make a Directory	199
Remove a Directory	200
Hands-On Activity 10.2	201
SECTION 10.3 Copy Files	203
Copy	203
Select Multiple Files	204
Hands-On Activity 10.3	205
SECTION 10.4 Move, Delete, and Undelete	207
MOVE	207
DELETE and UNDELETE	207
Hands-On Activity 10.4	207
SECTION 10.5 TYPE, REN, VOL, ATTRIB, and RUN	209
TYPE	209
REN	210
VOL	210
ATTRIB	211
RUN	212
Hands-On Activity 10.5	215
SECTION 10.6 DISKCOPY, BACKUP, and RESTORE	214
DISKCOPY	214
BACKUP and RESTORE	215
Hands-On Activity 10.6	216
Key Points	217
Review Questions	218
Hands-On Problem	219

CHAPTER 11**DOS Text Editors 221****Objectives 221****DOS in Action 222****SECTION 11.1 Basic EDLIN****Commands 222**

EDLIN Prompt and File Message 222

L (LIST) 224

I (INSERT) 224

D (DELETE) 225

EDIT 226

E (END) 227

Q (QUIT) 227

Command Self-Review 11.1 229

Hands-On Activity 11.1 229

SECTION 11.2 EDIT Command 231

Hands-On Activity 11.2 233

SECTION 11.3 Copy, Move, and Delete**Text in EDIT 236**

Select Text 236

Delete Text 236

Copy Text 236

Move Text 237

Hands-On Activity 11.3 237

Key Points 239**Review Questions 240****Hands-On Problem 241****CHAPTER 12****Batch Programs 244****Objectives 244****DOS in Action 245****SECTION 12.1 AUTOEXEC.BAT 245**

ECHO OFF 245

PATH 246

Create an AUTOEXEC.BAT File 247

Command Self-Review 12.1 248

Hands-On Activity 12.1 249

SECTION 12.2 Batch Files 251

Batch Commands 251

REM (Remark) and PAUSE 252

ECHO 253

Command Self-Review 12.2 254

Hands-On Activity 12.2 255

SECTION 12.3 Advanced Batch**Commands 257**

Parameters 257

SHIFT, :LABEL, GOTO, and IF EXIST

Batch Commands 258

Command Self-Review 12.3 259

Hands-On Activity 12.3 260

Key Points 262**Review Questions 263****Hands-On Problem 264****CHAPTER 13****Customize Your System 266****Objectives 266****DOS in Action 267****DOS Commands 267****SECTION 13.1 CONFIG.SYS 267**

MEM (Memory) 267

Break 268

Buffers 269

Files 269

Lastdrive 270

Device 270

CONFIG.SYS File Example 271

Command Self-Review 13.1 272

Hands-On Activity 13.1 272

SECTION 13.2 Optimize Memory 274

Types of Memory 274

Operating Mode 275

Optimize Memory 276

Placing DOS in High Memory 276

DOS = HIGH 277

Loadhigh 277

Devicehigh 278

Command Self-Review 13.2 279

Hands-On Activity 13.2 280

**SECTION 13.3 Disguise Drives
and Directories 282**

Assign 282

Subst (Substitute) 283

Join 284

Command Self-Review 13.3 285

Hands-On Activity 13.3 286

**SECTION 13.4 Customize the
DOS Shell 287**

Associate Files 287

Program Groups 287

Program Items 288

Active Task List 289

Hands-On Activity 13.4 289

Key Points 293**Review Questions 294****Hands-On Problem 296****CHAPTER 14****Introduction to Windows
and Notepad 298****Objectives 298****SECTION 14.1 Getting Started with
Windows 299**

Identify Parts of a Window 299

Terminology 300

Major Program Group Windows 300

Load Windows Program	301
Select and Cancel a Menu Choice	303
Minimize, Maximize, and Restore a Window	304
Open and Close a Program Manager Group Window	306
Resize and Move a Window and Icon	307
Open, Close, and Switch Active Windows	309
Customize the Mouse	310
Exit Windows	311
Hands-On Activity 14.1	313
SECTION 14.2 Notepad	313
Enter Text/Word Wrap/Cursor Movement/Tab	314
Save a File	315
Clear Notepad	318
Retrieve a File	318
Edit a File	318
Hands-On Activity 14.2	321
Key Points	322
Review Questions	323

CHAPTER 15

Windows File Manager 325

Objectives	325
SECTION 15.1 Windows 3.0	
File Manager	326
Access File Manager	326
Directory Tree	326
Directory Window	327
Multiple Directory Windows	329
Hands-On Activity 15.1	331
SECTION 15.2 Windows 3.1	
File Manager	331
Accessing File Manager	332
Directory Tree	332
Content List	334
Multiple Directory Trees and Content Lists	334
Hands-On Activity 15.2	336

SECTION 15.3 Working with File Manager	336
Format a Disk	336
Label a Disk	338
Create and Remove a Directory	339
Copy Files	339
Delete Files	340
Multiple Files	341
Hands-On Activity 15.3	342
Key Points	343
Review Questions	344

APPENDIX A

Student Data Disk Directory Structure and Files 346

APPENDIX B

Command Self-Review Answers 348

APPENDIX C

Answers to Review Questions 354

APPENDIX D

DOS 5.0 Command Summary 361

APPENDIX E

Advanced DOS 5.0 Commands 364

APPENDIX F

Windows Commands 370

Index 372

Welcome to DOS 5.0

Objectives After completing this chapter, you should be able to:

- Define DOS and recognize some DOS tasks
- Understand why computers need an operating system
- Identify the parts of a computer
- Understand the disk drive letter designations
- Understand the purpose of write protecting a disk
- Understand how the computer keyboard differs from a typewriter keyboard
- Cold boot and warm boot the computer
- Understand and correct booting error messages
- Identify the current drive
- Temporarily interrupt and cancel the execution of a command
- Print the screen and have the printer mirror the screen
- Understand and correct several common error messages

DOS in Action

"Jim, your report on employee safety in the workplace is well done," said Jack Wilson, president of Wilson Manufacturing. "However, I think the report needs to emphasize our safety record more. We have had only three minor work-related accidents in the plant during the last 18 months."

"The plant's safety record is mentioned on page 17," Jim responded. "I can easily add a couple more paragraphs about it there, or do you think the safety record should be mentioned earlier in the report?"

"Well," replied Jack, "I believe I'd leave it where it is in the report and add a couple of paragraphs as well as a graph showing our safety record in comparison to the national safety record of similar types of plants. In fact, adding graphs to emphasize the pertinent data in several of the tables in the report will enhance the report's readability."

"I'll get right on it this morning," answered Jim. "Since all the data is already on the computer, it won't take long to make the additions. The report will be on your desk by 5:00 P.M. today ready for you to take to the conference."

Using computers is no longer reserved just for big firms as it was in the 1950s, 1960s, and 1970s. The cost of the microcomputer has made it possible for small firms and individuals to tap the power of computers.

An increasingly popular use of the microcomputer is desktop publishing. Desktop publishing is done with a program that allows you to create, edit, save, and print text and graphics. Windows is another popular program that makes it easy to integrate graphics into textual material.

So where does DOS fit in? You need DOS just to turn on the microcomputer to use Windows or your desktop publishing program. To prepare a disk to save your work (such as the Wilson Manufacturing report), you need DOS to format a disk (make it ready to accept data). To see what files are saved on a disk, you can use DOS to do a directory (listing of files). To make a copy of a file (duplicate a file in case the original is destroyed), use DOS for the copy operation. Because microcomputers are found in offices of big and small businesses, classrooms, dorm rooms, and homes, understanding how to use DOS is a necessity.

Welcome to the world of DOS 5.0! Like anything new, learning DOS can be exciting, challenging, and frustrating. Learning DOS can reduce your frustration in using the computer and increase your excitement as you meet the challenge and learn how to put the power of DOS 5.0 to work for you.

SECTION 1.1

Explore DOS 5.0's World

What is DOS? The initials *DOS* stand for *disk operating system*. Every computer must have an operating system, and DOS is a type of operating system used on IBM and IBM-compatible microcomputers. The operating system is actually made up of many small programs, or files, that are each designed to do a different task in controlling, coordinating, and managing all the components of a computer.

A computer without an operating system is like a car without a driver. Before driving a car, you turn the key, and the car starts. Shift to reverse, and the car backs up. As the driver, you control the car. Your actions as the driver determine whether the car lights are off or on, whether the car idles in neutral or backs up in reverse. A driver is essential to the operation of a car, and an operating system is just as essential to the operation of a computer. Without an operating system, a computer is a useless piece of equipment. The computer needs DOS to interpret and execute actions such as loading the desktop publishing program to be used, retrieving or saving a file, and printing a document.

Two common operating systems for IBM and IBM-compatible microcomputers are PC DOS and MS DOS, respectively. PC DOS was written for IBM by Microsoft,

and MS DOS is Microsoft's close look-alike version. Since the development of DOS 1.0 (the first DOS version) in 1981, there have been several improvements made to the DOS programs. Each new version of DOS has expanded and enhanced the capabilities of the DOS programs to meet the technological advances made in microcomputers.

DOS versions are referred to by numbers such as 1.0, 2.1, 2.11, 3.2, 3.3, 4.01, and 5.0. Major changes to DOS are noted in the whole numbers, such as the 3 in 3.2 or the 5 in version 5.0. Minor changes are indicated by the numbers following the decimal points. Although higher-number DOS versions have more capability, and in most instances more DOS commands, later DOS versions such as DOS 5.0 are compatible with (will run the commands of) earlier DOS versions.

DOS 5.0, released in mid-1991, has several major enhancements and improvements that have been eagerly awaited by microcomputer users. Although DOS 5.0 has been widely accepted by microcomputer users, there are still several million users of earlier DOS versions. For this reason, commands and features that are available in DOS 5.0 but not in prior DOS versions will be noted.

DOS controls and coordinates all parts of a computer. Before you sit down and use the computer, a brief explanation of computer equipment (hardware) is necessary so you can understand and follow the instructions as you start your adventure exploring the world of DOS 5.0.

Hardware Components of a Microcomputer

Every microcomputer system has four major hardware components: the central processing unit (CPU, processor, or system unit), keyboard, one or more disk drives, and monitor (screen or display). (See Figure 1.1.) Disks are important in a computer system because they are the media used to store data. Although it is not an integral part of a microcomputer, most people think of a printer as a necessary hardware component of a computer system. The mouse is also rapidly becoming a hardware device found on many microcomputer systems. One of DOS's tasks is to coordinate all actions performed by the hardware.

Disk Drives

Disk drives read and write on magnetic disks. Disk drives on IBM and IBM-compatible microcomputers are referred to by letter (A:, B:, C:, etc.). Drive A: and drive B: refer to the disk drives for floppy or removable diskettes. Drive C: refers to the drive for the hard (nonremovable) disk. Each drive has a small light that goes on to show when the computer is reading or writing data to the disk in that drive.

Most computers have at least two drives. The arrangement of the drives varies with the brand of computer. If the computer has two drives for removable diskettes side by side, the left drive is drive A: and the right drive is drive B:. If the drives for removable diskettes are stacked, the top drive is drive A: and the bottom drive is drive B:.

If a computer has only one drive for removable diskettes, the single drive can usually be called either the A: or B: drive. Usually it is referred to as the A: drive while the hard disk drive is still called drive C:. A computer can have more than one hard disk drive or the hard disk can initially be divided to be recognized as several drives. In this case, the drives are still referred to by letter—C:, D:, E:, and so on.

There are two sizes of microcomputer disk drives for removable diskettes. The 3.5-inch drive can read/write only on a 3.5-inch diskette, and the 5.25-inch drive can read/write only on a 5.25-inch diskette. The drives for removable diskettes are also available in different densities: double- or low-density, high-density, and extra-high-density. *Density* refers to how closely together data is stored on a diskette. A high-density diskette drive can read and write to either a high-density or

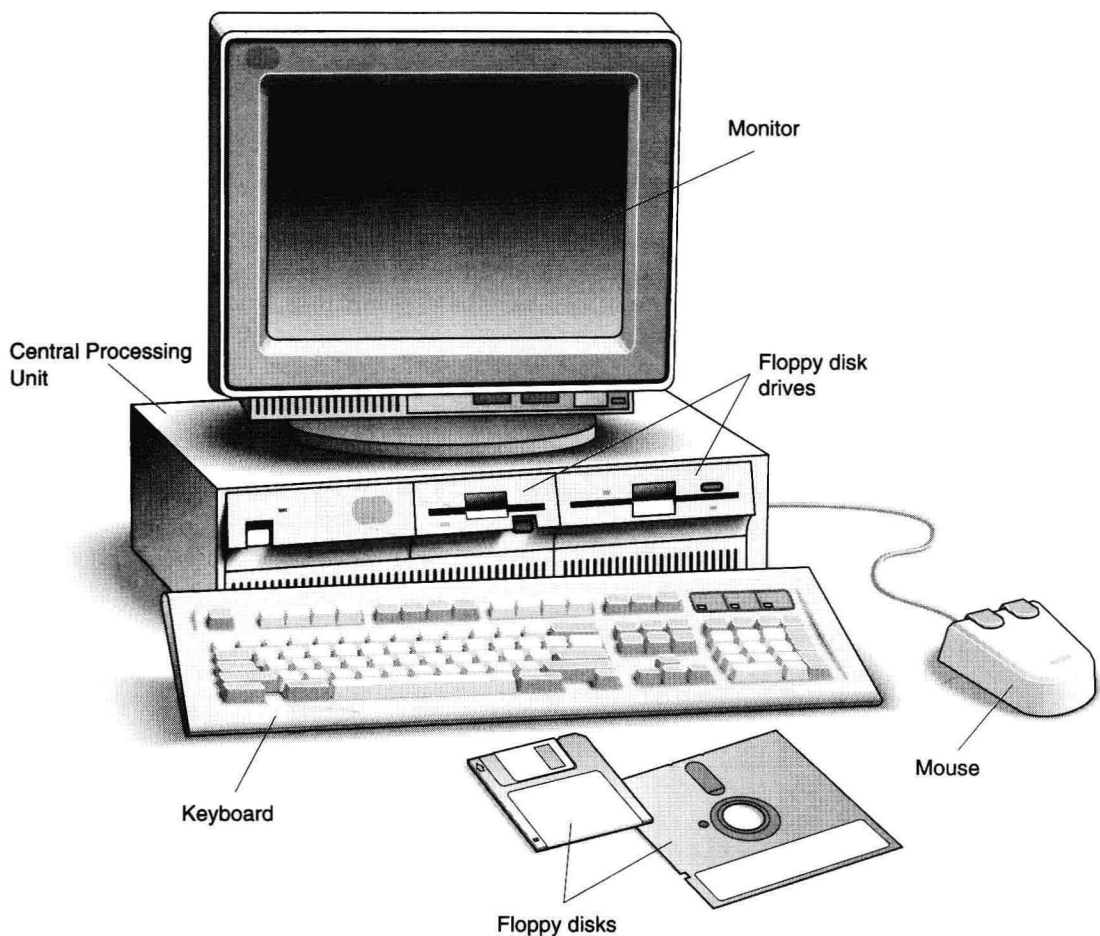


FIGURE 1.1
Microcomputer
Hardware
Components

double-density formatted diskette. However, a double-density diskette drive can only read/write to a double-density formatted diskette.

The microcomputer industry has made rapid technological advancements since the first microcomputer was introduced in the early 1980s. The early microcomputer disk drives could read/write on only one side of a removable diskette. The drives were called single-sided, double-density (SS/DD) drives. Soon the disk drives were improved to be able to read/write on both sides of a removable diskette (double-sided, double-density [DS/DD] drives). Now technological advances have made possible high-density drives that increase the amount of data that can be stored on each side of a removable diskette. These drives are called double-sided, high-density (DS/HD) drives. See Table 1.1 for descriptions and capacities of commonly used disk drives.

A common way to describe a disk drive is by its capacity in terms of the number of *bytes* of data that the disk drive can read/write to a removable diskette. A byte represents one character (letter, number, space, or special symbol). The letters *KB* are used to represent 1000 bytes (actually 1024, rounded to 1000 when referring to floppy disk capacity), and the letters *MB* represent one million bytes of data. A 360KB (kilobyte) drive has the capacity of reading/writing 362,496 bytes or characters to a diskette, and a 1.44MB (megabyte) drive has the capacity of reading/writing 1,457,664 bytes or characters to a diskette.

Table 1.1
Disk Drive
Configurations

Size (inches)	Description	Capacity (bytes)
5.25	Double-sided, double-density*	360KB†
3.5	Double-sided, double-density	720KB
5.25	Double-sided, high-density	1.2MB‡
3.5	Double-sided, high-density	1.44MB
3.5	Double-sided, extra-high-density	2.88MB

* Double-density is also called low-density.

† KB: kilobyte (kilo = 1000).

‡ MB: megabyte (mega = 1 million).

Diskettes

Diskettes for the microcomputer are either 5.25 inches or 3.5 inches. The 5.25-inch floppy diskette is contained in a thin plastic case to protect the magnetized surface of the flexible disk. The 3.5-inch flexible disk is enclosed in hard plastic to protect the magnetized disk surface. Because the disks themselves are flexible, the term *floppy disk* is used to refer to either the 5.25-inch or 3.5-inch diskette.

Diskette Write Protection. The purpose of *write-protecting* a floppy disk is to protect the contents of a diskette from being accidentally written over or erased. This safety feature is only for floppy disks; the nonremovable hard disk cannot be write-protected.

The notch near the top on the upper right side of the 5.25-inch diskette is the write-protect notch (Figure 1.2a). If the notch is covered by a small, nontransparent adhesive tab, the diskette is *write protected*. The data stored on a write-protected diskette can be read by DOS, but DOS cannot write data on the diskette, nor can the data be erased. If the 5.25-inch diskette does not have a notch, it is already write-protected.

The 3.5-inch diskette can also be write protected. On the bottom right of the back side of the diskette is a write-protect window (Figure 1.2b). When the window is open, the diskette is write protected, and data cannot be written or erased on the diskette. When the plastic slide is moved so the window is closed, data can be written and erased on the diskette. Some 3.5-inch diskettes do not have a write-protect window; these diskettes are already write protected.

A double-density and a high-density 3.5-inch diskette are almost identical in appearance. The only difference in appearance is the added square cutout opposite the write-protect switch on the back side of the 3.5-inch high-density diskette. The double-density 3.5-inch diskette does not have such a cutout. A double-density and a high-density 5.25-inch diskette appear to be identical. The manufacturer's label on the front top-left corner of the 5.25-inch diskette should identify whether the diskette is high-density or double-density.

Diskette Handling. The surface of the flexible disk, which is coated with iron oxide for magnetization, requires care. Table 1.2 lists Dos and Don'ts of floppy disk handling.

Diskette Labels. When you buy a floppy disk, the diskette should come with a self-adhesive paper label. The label is used to identify the contents of the diskette.

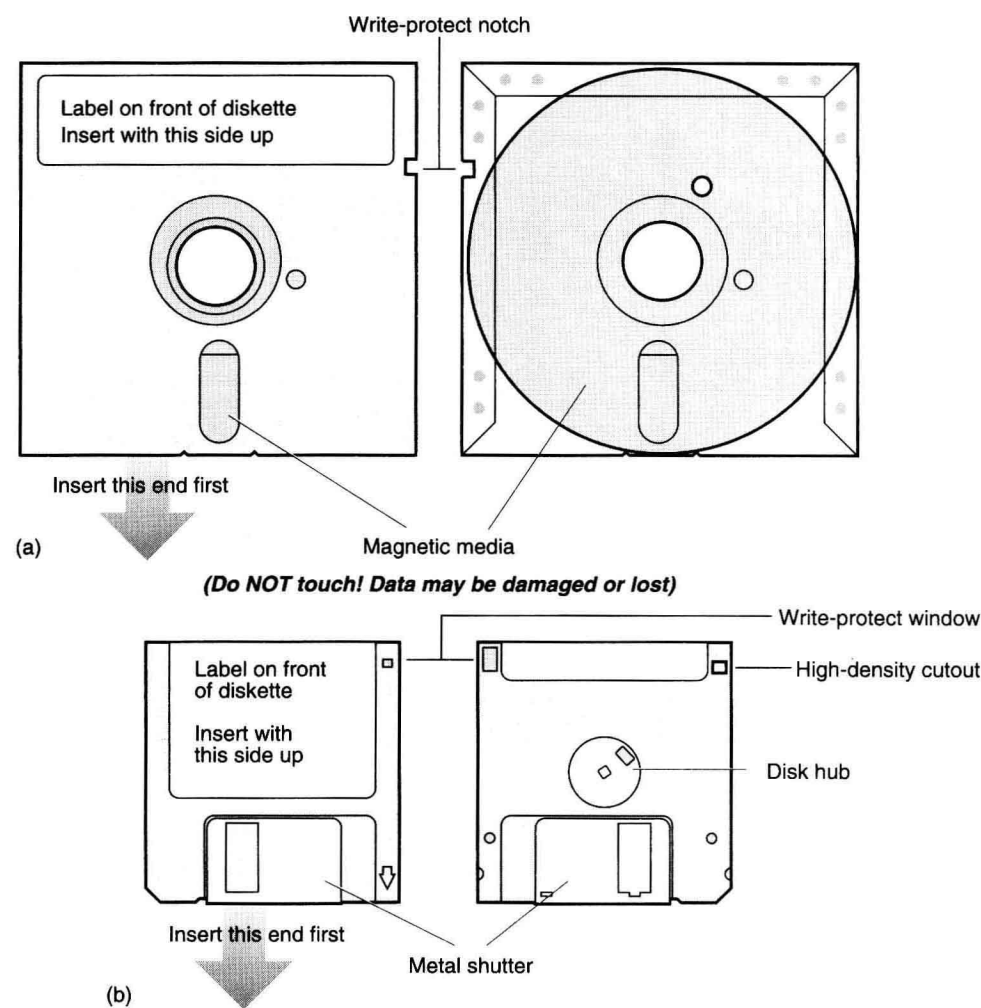


FIGURE 1.2
(a) 5.25-inch diskette;
(b) 3.5-inch diskette

Table 1.2
DISKETTE
HANDLING

Do	Don't
Handle carefully	Force into the disk drive
Keep flat	Touch the unprotected surface
Use a felt-tip pen to write on a label already affixed to the disk	Fold, bend
Keep at normal temperature	Write on a disk label affixed to a disk with a pen or pencil
Keep in jacket when not in use	Leave in direct sunlight or extreme cold
Keep away from magnets	Use paper clips
	Lay on a printer, stereo, TV, monitor, or system unit
	Keep by a telephone

Use only a felt-tip pen to write on a label once you put the label on the diskette. The 5.25-inch floppy disk should also come with a small adhesive tab for write protection and a paper jacket.

Hard Disk

Besides removable floppy disks, many computers also have a *hard disk*. The hard disk is made up of several rigid disks coated with iron oxide. Because the hard disk is not removable, it is often referred to as a *fixed disk*. The capacity of the hard, or fixed, disk is expressed in terms of megabytes 20MB, 40MB, 80MB, and so on. A 20MB hard disk can hold over 20 million bytes of data (actually 21,309,440 total bytes of disk space). This is the equivalent of over fourteen 3.5-inch 1.44MB diskettes.

Monitor

The monitor displays the commands entered on the keyboard. The monitor, also called the display or computer screen, also displays the output of some DOS commands as they are executed. Together the monitor and keyboard are called a *console*.

Central Processing Unit (CPU)

The CPU is the heart of a computer system. One of the main components of the processor is *memory*. Some memory is reserved for special functions; however, most memory is available as a temporary working space (*RAM*, or *random access memory*) for programs, data, and commands. When the computer is turned off, the contents of the RAM are erased. Most microcomputers have at least 640KB (640,000 bytes) of memory; many systems have 1MB or more of memory. One of the major advancements found in DOS 5.0 is its capability for optimizing the use of memory (presented in Section 13.2).

Printer

Though a printer is not an integral part of a computer, most users think of it as a part of a computer system. There are many types of printers available, from inexpensive dot matrix printers to expensive laser printers. Because of their cost, most school computer labs use dot matrix printers. The printed characters of these are made up of several closely spaced dots—thus the name *dot matrix*.

Most printers have buttons used to advance an entire sheet of paper (*form feed*) or to advance the paper just one line at a time (*line feed*). Because the placement of these buttons varies so widely based on the brand and model of printer, your instructor will explain how the particular printers in your school computer laboratory operate to advance paper one line or an entire sheet at a time.

Mouse

A *mouse* is a hand-held device used to move the cursor on the monitor. A mouse can be used only with programs specifically designed for it. Today most software is designed to accept commands by pointing and clicking with the mouse or by highlighting the command from the keyboard.

Keyboard

The computer keyboard is much like that of a typewriter (Figure 1.3). The alphabetic portion is identical. The **Shift** key is used to type a letter in uppercase and the **Caps Lock** key puts all letters (and *only* letters) in uppercase. On computer