SOUTH-WESTERN

DOS 6

Versions 6.0–6.2

QUICK COURSE

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SOUTH-WESTERN

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Introduction

Welcome to the high-tech, updated world of DOS 6. If you have been using an IBM PC or compatible computer, you have been using some version of DOS. DOS stands for *disk operating system*. Any time you turn on a computer and boot up an application, such as a word processor, spreadsheet, or database management program, you are using DOS. Even if you are playing games on the PC, you are using DOS. DOS is the system that enables your computer to carry out instructions from the programs you load and to process information you type on the keyboard. DOS is constantly being upgraded with new features, and the application programs that rely on DOS are also upgraded to take advantage of improvements.

If you are a computer beginner and find all those pieces of hardware facing you on the table a little intimidating, don't despair. All you need to feel more comfortable with them is a basic understanding of how those pieces of hardware interact to process information.

Computers are electronically wondrous objects, but they can't think or do anything by themselves. All they can do is carry out the instructions they are given, and they do so with lots and lots of little electrical impulses. The problem is that those electrical impulses can't be understood by 99.9% of human beings. They aren't part of the English language, or any other language for that matter. That's where DOS comes in.

DOS is not really a single thing. It is a group of small files assembled in a program that tells your computer what to do, how to do it, and when to do it. Each one of these files is made up of a set of instructions that can perform a particular task. Sometimes the task gets taken care of automatically, and sometimes the set of instructions sits in the background waiting for you to tell it what to do.

DOS is a translator that takes the program instructions and the instructions from the keyboard and translates them into the electrical bit language the computer can understand and carry out. DOS is also a traffic director that makes certain all the parts of your computer system work together and get the task accomplished at the right time and in the right place.

An in-depth study of DOS could take at least a semester and possibly longer. If you are a small-business or home user, however, you may use frequently only about a dozen DOS commands.

Understanding and becoming familiar with the DOS basics will allow you to handle your work more efficiently and productively. You'll feel more comfortable with your computer system, too. As you gain confidence, you can delve into the reference books and manuals to explore the bells and whistles of DOS's more complex functions.

The versions of DOS through 3.3 carried out their tasks from instructions given at the familiar system prompt. Versions 4 and 5 began to introduce the use of the mouse and a menu system called a *shell*. Version 6, introduced in the spring of 1993, made a quantum leap in refinement and features. The mouse interface and the Shell environment have been improved and other features have been added, such as virus protection, file compression, undelete, help, and backup, as well as a host of technical features having to do with memory.

For the diehard who hates shells, be assured that all the features and commands in DOS can be carried out from the system prompt. You don't have to use a shell. For the person who wants to start simply, it may be easier to first gain an overview of DOS by doing some of the exercises in *DOS 6: Quick Course* and then seeing how those same commands are handled within the Shell system of DOS 6.

This book, *DOS 6: Quick Course*, will concentrate on all the basic features needed to operate a computer efficiently, using both the Shell feature of DOS 6 and the mouse. The use of a mouse is not absolutely required, but it is certainly quicker and more fun. At first, instruction for use of the keyboard will be given, followed by instructions for the mouse.

WHAT'S NEW IN DOS 6

- *MS DoubleSpace:* This is a built-in feature that increases disk space on both the hard disk and floppies by compressing files. This can be installed when and if it is needed.
- *The /c switch:* This new switch for the DIR command goes with DoubleSpace and gives information about the ratios on compressed drives.
- *MS Backup:* This program makes it easier to back up the data. Backup is offered for both MS-DOS and Windows. There is also a variety of backup options from which to choose.
- *MS Anti-Virus:* DOS 6 includes anti-virus for both DOS files and Windows files. Once installed, Anti-Virus can be used regularly to check and clean your disks.

- *MS Undelete:* This program was introduced in version 5 and enhanced in version 6 and 6.2 to give three levels of protection in case a file is accidentally deleted. Undelete is provided for both DOS and Windows.
- *Technical features:* A great many technical improvements have been included to enhance memory capabilities: memory optimization, device drivers for using extended memory, device drivers for loading programs into specific areas of memory, and a MEM command to provide information about memory usage. The system can now have multiple configurations. The new technical features are best left to the one who installed DOS 6, to a friendly computer guru, or to some future date when you feel the necessity of exploring and using these features with the aid of a 4-pound reference book from the local bookstore.

ABOUT THIS BOOK

This text-workbook is intended first as a training guide for the most commonly used DOS features and second as a quick reference guide whenever needed. Hopefully, it may answer a few questions you may have wondered about and never asked.

A hands-on approach is used to accompany the explanations. Additional exercises are provided at the end of each lesson. A vocabulary list of words that will be encountered is given at the beginning of each lesson. Look for these words as you work through the lesson. At the end of the lesson, you will be reminded of the words and asked to define them in a glossary provided in the appendix. When you have finished the book, you will have a completed glossary for your personal reference.

For purposes of instruction, this book will assume that DOS 6 is installed on a hard disk in drive C:. If installed elsewhere, substitute that drive designator for the C: designator.

SYSTEM REQUIREMENTS

1. A personal computer with an 8088 or higher processor.
2. If you are installing the upgrade version of DOS 6, an MS-DOS operating system of 2.11 or later.
3. 512K of memory.
4. 5.25- or 3.5-inch disk drive.
5. A hard disk is not required but is highly recommended.
6. A mouse is optional but also recommended.

Don't be timid or hesitant about experimenting with the various commands and Shell menus. You are not going to break anything. You will probably learn more from solving your own mistakes than from just following the exercises. If you ever feel hopelessly boggled, get temporarily lost in the menus, or just can't do what you want to do, use the File menu and Exit. Turn off the computer, relax, go for a walk, take a break, and then start over again. You'll be amazed at how quickly clicking through the menus will become automatic.

LESSON 1

Getting Started

LEARNING OBJECTIVES

In this lesson you will:

- Describe computer hardware
- Distinguish between ROM and RAM
- Determine the configuration of a computer
- Describe a mouse
- Analyze the structure for file management
- Boot up the computer

VOCABULARY

Watch for the following words and phrases in this lesson:

Booting up	File	Megabyte (MB)
Byte	Floppy disk	Mouse
Configuration	Function keys	Output device
CPU	Hard disk	RAM
Ctrl key	Hardware	ROM
Default	Input device	Root directory
Directory	Kilobyte (K)	Subdirectory

OVERVIEW

If you are new to computers, you need a quick tour through the parts of your computer system. This lesson will review the hardware components of a computer system; discuss the basic operation of a system, including ROM, RAM, and disk storage; and introduce the concept of the tree structure used for file management. If you are an experienced computer user and feel comfortable with the various parts of your hardware, you may want to quickly browse the beginning part of this lesson and then jump to the section *Tree Structure for File Management*.

HARDWARE

When you sit down to work, the computer system is spread out before you. It will probably consist of at least four pieces: the keyboard resembling a typewriter keyboard, a display screen similar to a mini-TV, a box with a switch and one or two slots, and a printer. All of these pieces that you can touch and feel and move around when necessary are called **hardware**. By themselves, they just sit there waiting. When a computer operator types instructions on the keyboard or when the computer receives programmed instructions from an application, the computer can perform a vast variety of business or personal tasks in a faster and easier manner.

KEYBOARD

The keyboard is called an **input device** because it is used to enter instructions and data *into* the computer system to carry out a task.

The main part of the keyboard is similar to a typewriter keyboard with all the letters, numbers, and symbols in the same places. The Shift keys, Caps lock, Backspace, and Tab keys you will recognize immediately from the typewriter. In addition, the keyboard has some special-purpose keys that you should locate and become familiar with.

Figure 1.1 shows the most common computer keyboard. As you read through the brief description of the special-purpose keys, locate each one on your keyboard. If your keyboard does not match exactly, do not worry. It will still contain the special-purpose keys.

On the right side of the keyboard will be two small banks of keys. The right-hand set will have numbers plus arrows on the 2, 4, 6, and 8 keys and the notations Home, End, PgUp, PgDn, Insert, and Del on the other number keys. There will also be an array of math operators for adding, subtracting, etc., and a Num Lock key. When Num Lock is turned on, this number keypad works like a calculator and enters numbers. When Num Lock is off, the arrow keys move the cursor around the screen. The other keys will take you to

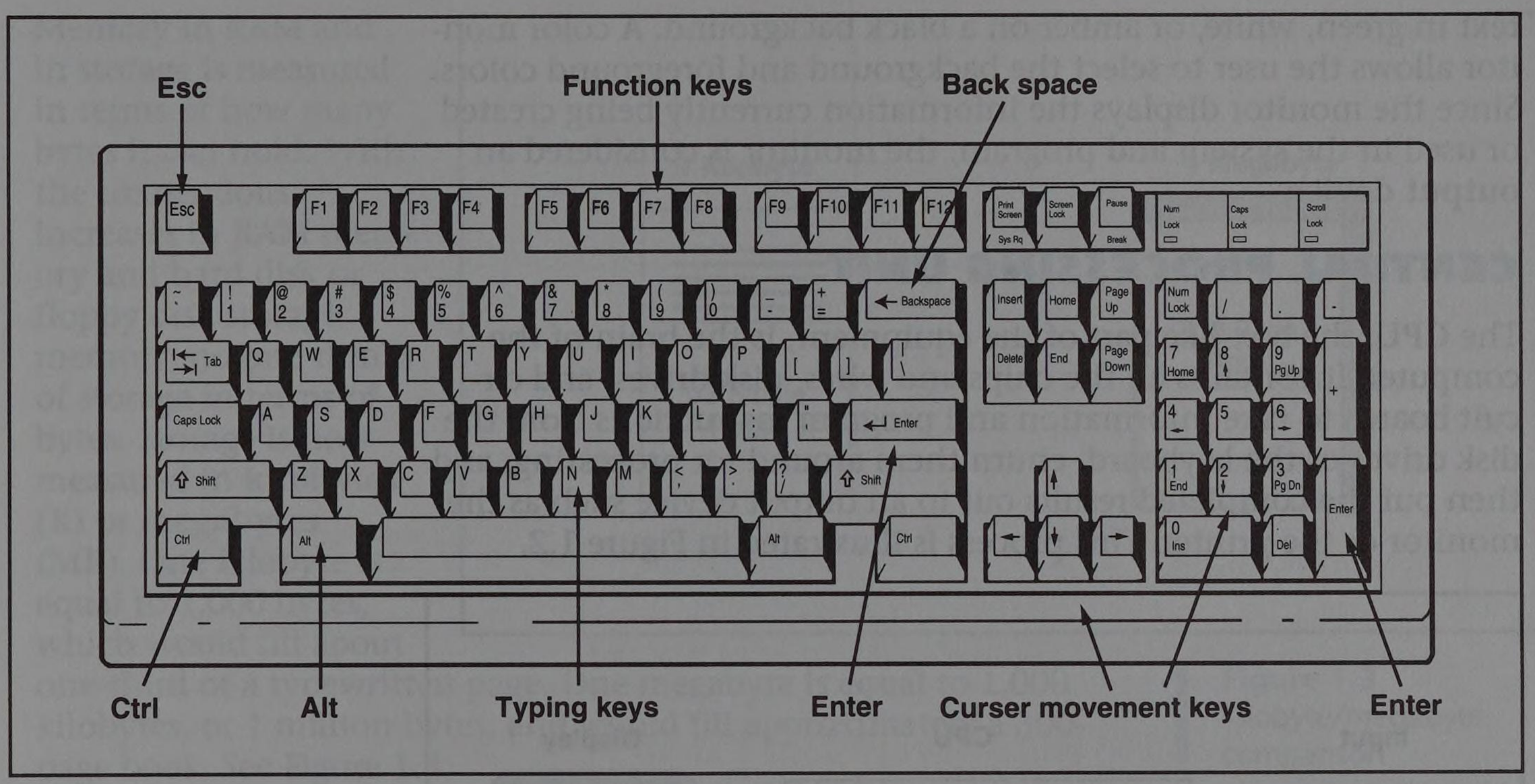


Figure 1.1
Extended keyboard

the beginning and end of a file or allow you to move up or down one page at a time.

There is usually a separate small bank of keys between the standard keyboard and the number pad. The lower part will contain keys with the same arrows and notations but no numbers. This is the cursor pad. The keys on this pad will always move the cursor on the screen. The keys directly above this small cursor pad will perform the Home, End, etc. tasks described above.

Across the top of the keyboard you will find 10 or 12 **function keys**. They will be marked F1, F2, etc. The uses of these function keys vary from one application program to another. DOS has its own uses for function keys.

The most commonly used special key is the **control key (Ctrl)**. When this key is held down, it tells the computer that the keys that follow are not typed text but have some special purpose. The *alternate key (Alt)* functions in much the same manner. The use of these two keys, like the function keys, will vary with the application program being used.

Two other keys are worth mentioning. The *escape key (Esc)*, at the upper left of the keyboard, allows you to exit from the current screen in many applications. The *backslash key* (\) is used to denote directories or subdirectories.

N O T E

NOTE: The cursor is a small line or box that appears on the screen and indicates where information will be entered.

MONITOR

The *monitor* is the TV-like screen that shows you what is going on in the program with which you are working. It is also called a *screen*, or *CRT* (*cathode ray tube*). A monochrome monitor displays

text in green, white, or amber on a black background. A color monitor allows the user to select the background and foreground colors. Since the monitor displays the information currently being created or used in the system and program, the monitor is considered an **output device**.

CENTRAL PROCESSING UNIT

The CPU, the box-like part of the equipment, is the brain of the computer. It contains all the chips and wires, disk drives, and circuit boards to take information and program instructions from the disk drives or the keyboard, churn them around for processing, and then put the completed results out to an output device such as the monitor or the printer. This process is illustrated in Figure 1.2.

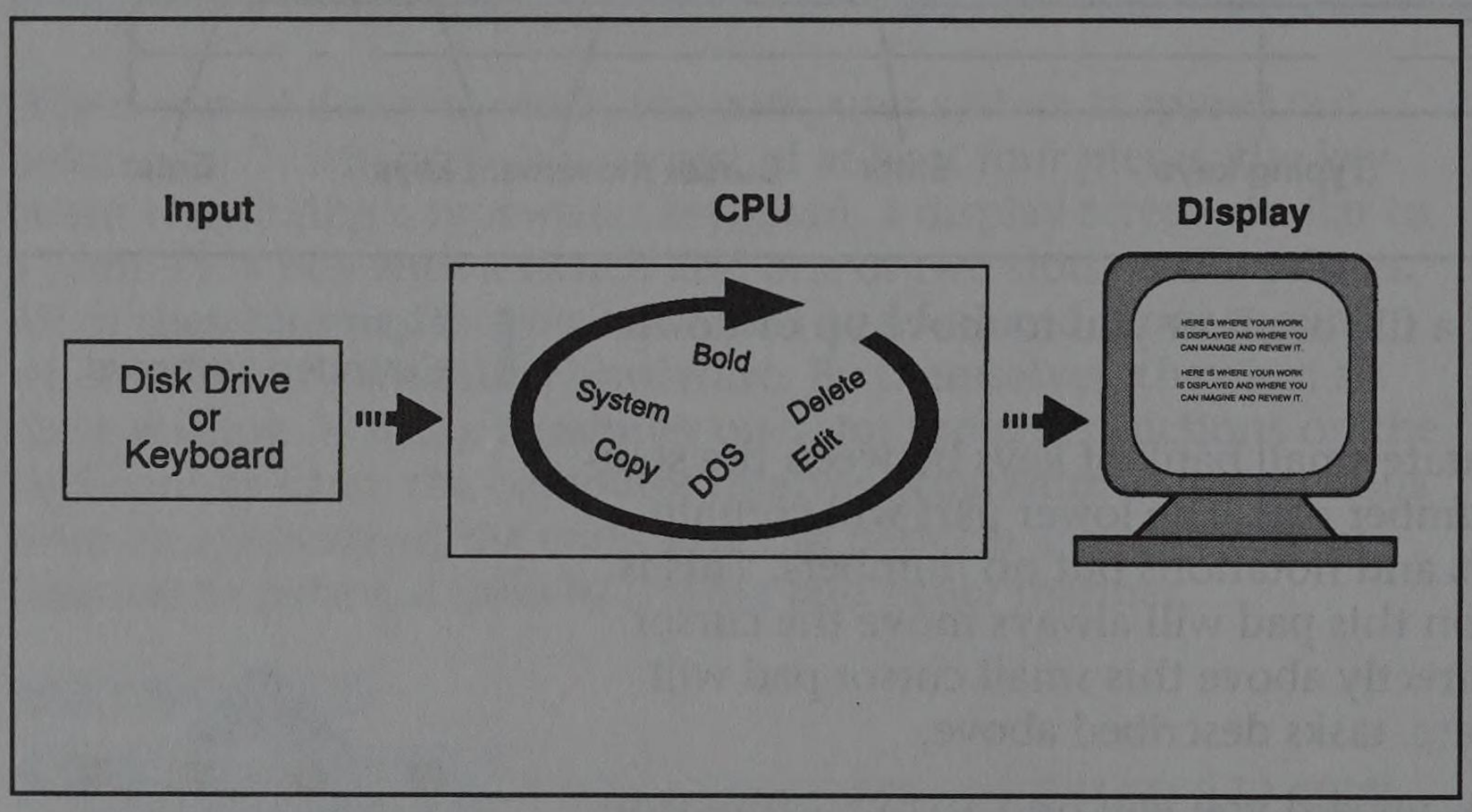


Figure 1.2
Data sequence

MEMORY

The CPU contains two kinds of memory: ROM and RAM. **ROM** stands for *read-only memory*. It resides in a chip in the system unit and never stops working. The instructions that reside in the ROM chips start the computer system and application programs.

RAM stands for *random-access memory*. All RAM is located and manipulated in a set of small chips in the CPU. The number and capacity of the chips will determine how much memory your computer has to use. The amount of RAM present in a computer varies. Every new generation of computers is capable of accessing more RAM, and every new update of application programs requires more RAM to handle increasingly complex instructions and tasks.

BITS AND BYTES

The computer stores data in units called bits and **bytes**. Eight bits make up one byte, but for practical purposes you can think of one byte as the equivalent of one letter, one number, or one symbol.

Memory in RAM and in storage is measured in terms of how many bytes it can hold. With the tremendous increases in RAM memory and hard disk or floppy disk storage memory, no one thinks of storage in terms of bytes. Storage is now measured in **kilobytes (K)** or **megabytes (MB)**. One kilobyte is equal to 1,000 bytes, which would fill about one-third of a typewritten page. One megabyte is equal to 1,000 kilobytes, or 1 million bytes, and would fill approximately a 300-page book. See Figure 1.3.

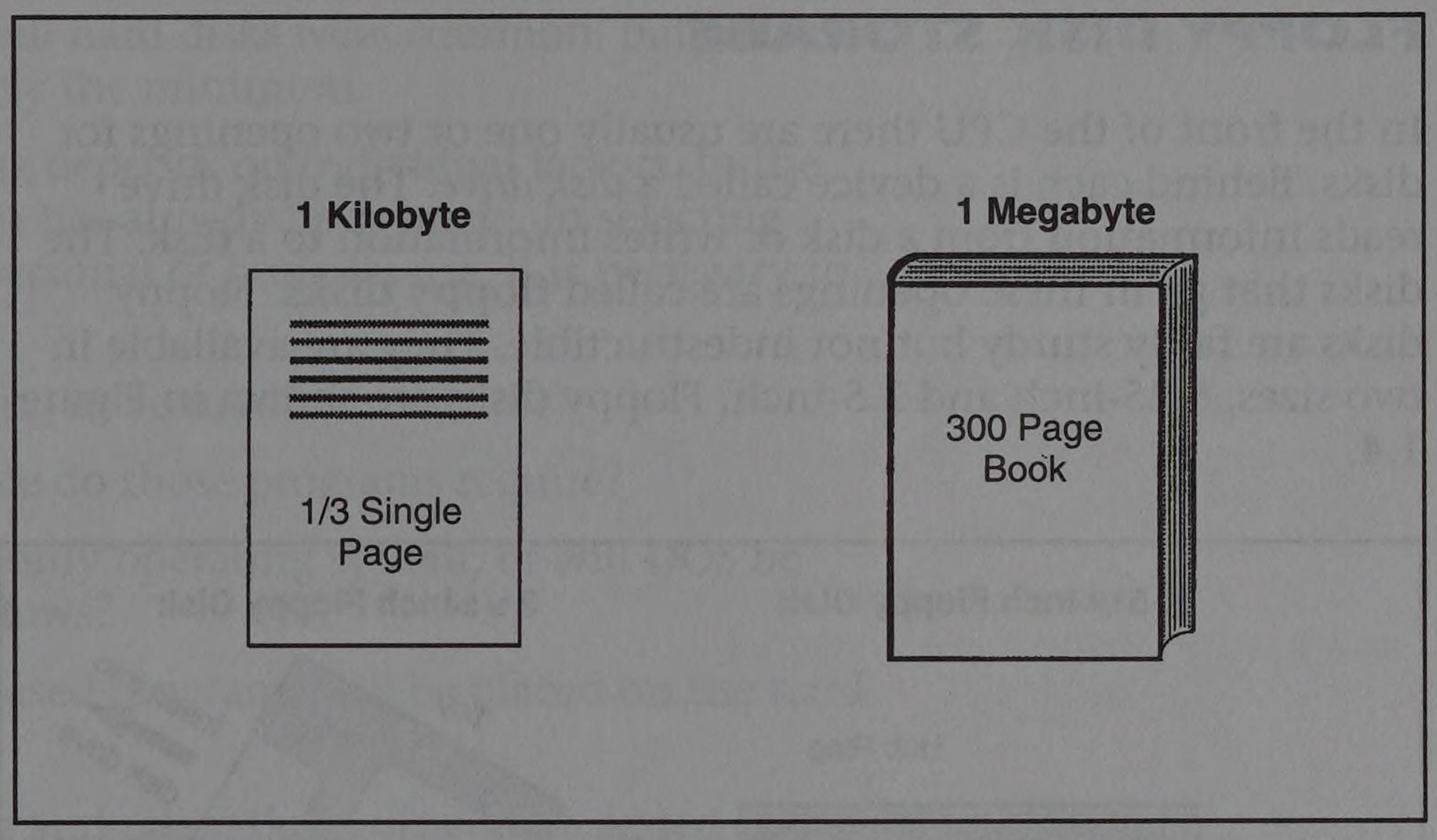


Figure 1.3
Kilobyte/megabyte comparison

The term *kilobyte* is abbreviated as *K*. To write or talk about 512,000 bytes of storage, for example, you would refer to "512K," which would be read as "512 kay." The term *megabyte* is abbreviated as *MB* and is attached after the number in the same manner as "K." When you read or talk about megabytes of storage, you refer to "meg" or "megs."

RAM MEMORY

All programs need memory to run. RAM memory provides temporary storage for programs and data and the DOS files to manage the processing. The amount of RAM memory storage available will affect the programs you can work on, how fast they run, and how much data they need to process at one time. 640K is considered standard, conventional memory, but in this age of huge programs, much more is needed. It is not uncommon for machines to have 4MB or even 8MB of RAM storage.

One fact about RAM memory must be remembered at all times: If power is disrupted or the computer is turned off, everything in RAM memory will disappear. Save your work to disk frequently so that if a power break does occur, you only will have to reconstruct a limited amount of data.

STORAGE

You have two options for permanent data storage at this time: floppy disk storage and hard disk storage. Disk storage is measured in kilobytes or megabytes.

FLOPPY DISK STORAGE

In the front of the CPU there are usually one or two openings for disks. Behind each is a device called a *disk drive*. The disk drive reads information from a disk or writes information to a disk. The disks that go in these openings are called **floppy disks**. Floppy disks are fairly sturdy but not indestructible. They are available in two sizes, 5.25-inch and 3.5-inch. Floppy disks are shown in Figure 1.4.

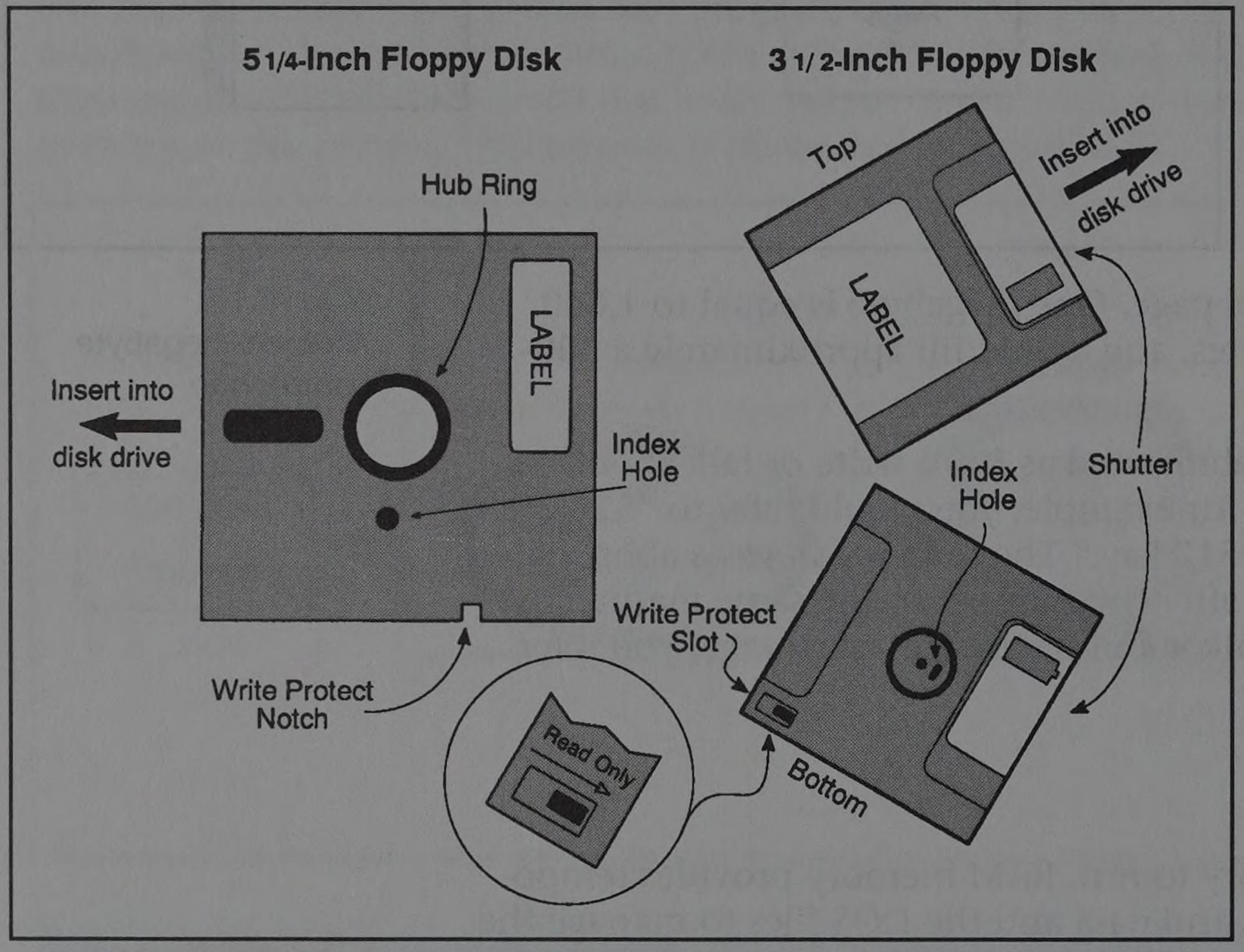


Figure 1.4
Floppy disks

The 5.25-inch disk is enclosed in a heavy paper cover. When the disk is placed in the disk drive, it spins in its cover and the read/write heads in the disk drive read or write data via the slot at the leading edge of the disk. This type of disk is flexible and will store a minimum of 360K of data. If your machine is classified as a 386 or 486, you probably have a high-density disk drive that can handle high-density disks with 1.2MB of storage.

The 3.5-inch disk is in a rigid plastic case but is still called a floppy. It can contain 720K or 1.4MB of storage, depending on the capability of the disk drive.

HARD DISK STORAGE

You probably have another form of disk storage called a **hard disk**. The hard disk is a sealed unit, installed in the computer so that it cannot be removed. The capacity of the hard disk is measured in

megabytes. In the past, small hard disks were common, but today a 40MB hard disk is absolutely the minimum.

The size of the hard disk depends on individual factors. In the classroom, the size decision has already been made. In selecting hard disk storage size for personal or business use, it is necessary to consider these factors:

- What programs are going to be used?
- How much storage space do those programs require?
- Is DOS going to be the only operating system, or will DOS be supplemented by Windows?
- How many Windows-based programs will be placed on the hard disk?
- Are a few games for fun and relaxation going to be added and how much storage space do they require?

Hard disks have many advantages. They run faster than floppy disks and make applications easier to handle. You can create a directory or subdirectory for each application program and load all the instructions for each program into its individual subdirectory. A hard disk permits you to manage your files by categories.

CONFIGURATION

Configuration is the word used to describe a particular computer system's combination of hardware and memory/storage capacity. The hardware configuration specifies the number of disk drives and how they are named. The first (or single) floppy drive is named drive A:. If you have a second, it is called drive B:. The hard drive is named drive C:. If the hard drive is partitioned, you may also have D: and E: drives. Figure 1.5 shows some typical hardware configurations. A mouse is also part of the hardware configuration. The mouse is a highly desirable piece of equipment, not only for DOS 6.0 and 6.2, but for Windows, any application utilizing Windows, and most of the more recent DOS-oriented application programs.

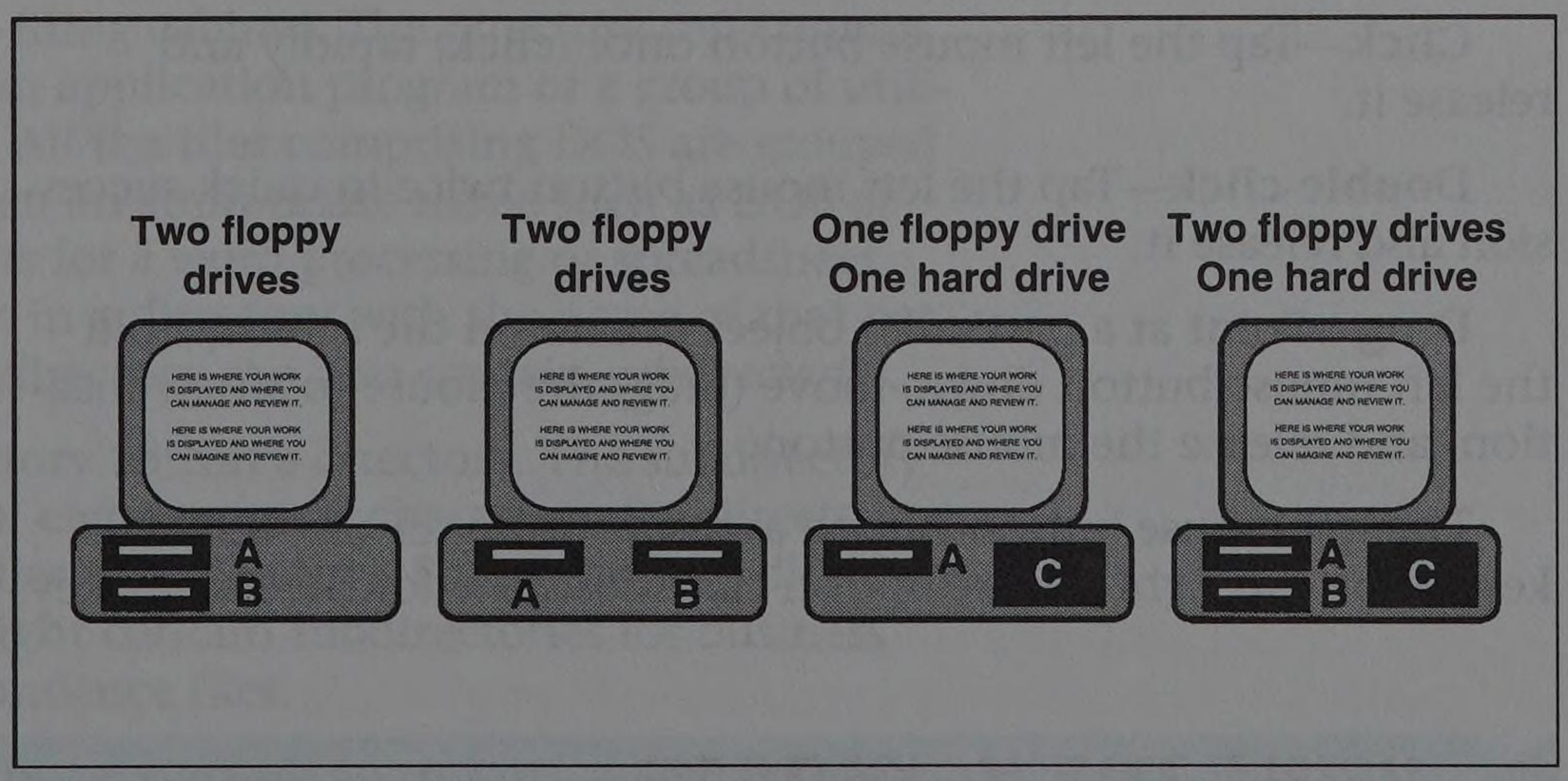


Figure 1.5
Typical hardware configurations

The memory/storage configuration specifies the capacity of the RAM memory and the size of hard drive storage.

DOS 6.0 and 6.2 can actually run on any PC machine. Bare minimum requirements are listed in the *Introduction* to this text-workbook, but to fully utilize the features, as well as run the high-powered application programs that use these versions of DOS, a computer should have a minimum of 640K memory, a hard drive with at least 40 MB (preferably 80MB or more), and at least one floppy drive.

The instructions in this book assume that the computer has the above minimum configuration.

USING A MOUSE

The **mouse** is a hand-held pointing device that gets its name from the long, thin cable that attaches the mouse to the back of the computer, which supposedly resembles the tail of a mouse. The mouse has two or three buttons and controls the movement of a pointer on the screen. The mouse pointer usually resembles an arrow but can change its shape depending on its position on the screen and the task being performed. See Figure 1.6.

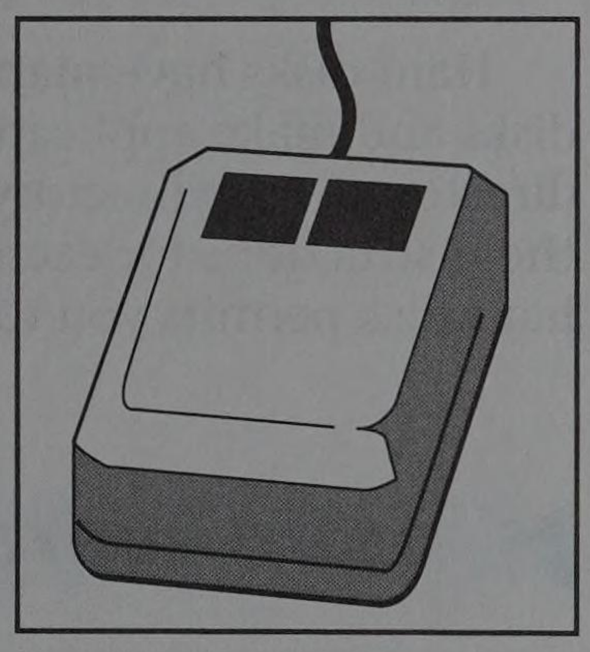


Figure 1.6
Mouse

When the mouse is moved on the desktop or on the mouse pad beside the computer, the mouse pointer on the screen also moves. Using the mouse to point and select commands provides a convenient and quick way to carry out a task.

The mouse has its own set of actions and vocabulary.

Point—Move the mouse so that the mouse pointer is positioned at a specific spot or item on the screen.

Click—Tap the left mouse button once (click) rapidly and release it.

Double-click—Tap the left mouse button twice in quick succession and release it.

Drag—Point at a particular object or area on the screen, hold the left mouse button down, move (drag) the mouse to a new location, and release the mouse button.

The left mouse button is used as a substitute for the <ENTER> key, while the right mouse button can substitute for the Escape key.

USING THE KEYBOARD

If you are using the keyboard instead of a mouse, or in combination with the mouse, follow these steps to select items from menus:

1. Press the **Alt** key.
2. Press the first letter in the name of the desired menu. For example, for the File menu, press **F**. The menu will open.
3. Tap the down arrow key until the command you want is selected (highlighted). Press **<ENTER>**.

   You can also press the highlighted letter in the name of the command.
4. Some commands show a shortcut key sequence on the right side of the menu box. These shortcut keys can also be used for the commands.

An ellipsis (three periods) following a command indicates there is an additional dialog box requesting further information.

TREE STRUCTURE FOR FILE MANAGEMENT

The computer world has a habit of taking commonly used words and either modifying their meanings or giving them new meanings that relate specifically to computer usage. Before you can fully comprehend DOS's file management system, you will need to master a few definitions.

- **File**: A series of data saved together under one name. The data could be a set of instructions, text for word processing, numbers for a spreadsheet, or information for a database. Files are usually stored together in subdirectories. A file name can be no longer than eight characters.
- **Directory**: A group of files having something in common, similar to a file folder in a filing cabinet. The directory can contain all of the files to run an application program or a group of utility or instruction files. All the files comprising DOS are grouped in a directory and given an appropriate name such as DOS or DOS6. The instructions for a word processing or spreadsheet program would be put in a directory with the name of that particular application. A directory can also contain *subdirectories*.
- **Subdirectory**: A directory within a directory. The subdirectory is also given a name of eight or fewer characters. Subdirectories further organize the files in a directory. For example, a directory named CORRESPD might contain subdirectories for business and personal correspondence files.
- **Root Directory**: This is the starting point from which all other directories branch out. Technically speaking, all other directories are actually subdirectories of the root directory but since this directory is not given a name, it is merely referred to as

"the root" and the other divisions become directories and subdirectories. The root directory is created when the disk or drive is formatted. The root is represented by a *backslash* (\). Since it is the base for other directories, the root cannot be deleted.

Now that you have been introduced to some file management terminology, you can visualize more easily the structure of stored files and directories. Imagine a tall tree that has been pulled out of the ground and has been hung upside down. The small root ball is at the top and the main trunk of the tree extends down toward the ground. This root ball and trunk represents the root directory on a disk.

The main branches extend from the trunk of the tree. These branches are like the directories off the root directory. A number of smaller branches or twigs grow from the main branches of the tree. These are the subdirectories. The leaves attached to these smaller branches represent individual files. This structure is called a *hierarchy* because each item can contain other items. If the root directory of your computer was diagramed, it might resemble Figure 1.7.

The C:\> at the top is the *command prompt*, which shows the current directory. The vertical line from the C:\> is the root directory in the C: drive of the hard disk. Each item leading from the root—DOS, WordPerf, and Lotus—is a directory containing the program files required to run that application. The WordPerfect and Lotus directories have subdirectories containing various categories of files.

This is a simplified version of the tree structure. Not shown are files that reside in the root directory, such as the CONFIG.SYS, the AUTOEXEC.BAT, and mouse driver files.

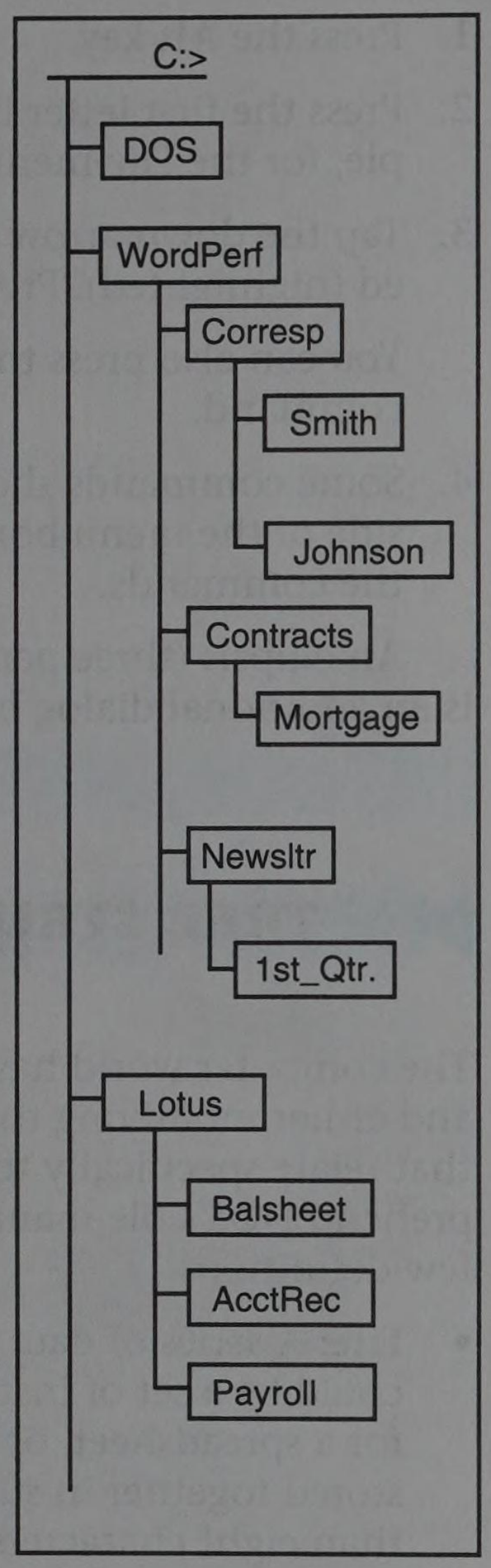


Figure 1.7
Tree structure

GENERAL CONVENTIONS

As you work through the instructions and exercises in this textworkbook, follow these guidelines:

1. The square bullets (■) at the left margin indicate instructions that are to be carried out on the computer. This is a ***DO IT*** signal.
2. It is usually necessary to press the <ENTER> key after a command. The <ENTER> key can also be named RETURN or represented by a bent arrow on your keyboard.
3. If you are using a mouse, the usual way to <ENTER> is to point at the OK button with the mouse pointer and click the left mouse button.

4. This text-workbook will use a floppy disk for storage so the hard disk does not become cluttered with numerous exercises that will have to be removed later. You should save to a hard disk only on a personal computer or with the approval of the instructor.
5. DOS recognizes both upper and lower case. In this book, commands will be shown in upper case for clarity.
6. To complete the exercises in this book you will need the following:
   a. An MS/PC compatible computer with a hard drive and at least one disk drive.
   b. Two floppy disks with files that are no longer needed. These disks will eventually be formatted and all files will be erased.
   c. A mouse is desirable but not required.

BOOTING UP

Booting up is the term used to describe the process of turning on the computer and getting it ready to run any program you wish to use. Follow the instructions below to boot your computer at the beginning of each work session.

1. Turn on the computer and the monitor. Do not place a disk in the floppy drive yet.
2. Some computers contain a clock that keeps track of date and time. You may be prompted to enter the current date if your machine does not contain a clock. If the date is not accurate, key the current date (use MM/DD/YY format) and press **<ENTER>**.
3. If asked, key the time (use HH:MM format) and press **<ENTER>**.
4. The C:\> should now be displayed on the screen. This is called the command prompt or the C prompt. This indicates that drive C: is your **default** drive and you are "logged into" drive C:.
5. Place your used floppy disk in drive A: and close the latch or the button. This is the disk on which you will save your work.

NOTE

NOTE: The term *default* indicates the drive or settings that the computer will revert to and use unless you change them.

ENDING A PRACTICE SESSION

At the end of a lesson or, if time is short, you wish to stop before reaching the end of a lesson, complete the current problem, then key:

```
CD\ <ENTER>
```

The computer will return to the root directory prompt. **Turn off the machine.** You will be finished for this practice session.

REVIEW

SECTION A

Vocabulary

The following words and phrases were found in this lesson. Find each of these in the glossary in Appendix A and define them.

Booting up	File	Megabyte (MB)
Byte	Floppy disk	Mouse
Configuration	Function keys	Output device
CPU	Hard disk	RAM
Ctrl key	Hardware	ROM
Default	Input device	Root directory
Directory	Kilobyte (K)	Subdirectory

SECTION B

True/False

In the blank before each sentence, enter a **T** if the statement is true and an **F** if the statement is false.

_____ 1. The CPU is an input device.

_____ 2. A kilobyte is 1,000 bytes.

_____ 3. Data in ROM storage is lost when the machine is turned off.

_____ 4. Hard disk storage is measured in bytes.

_____ 5. The root directory on a hard disk is denoted by A:\>.

_____ 6. A directory can contain many subdirectories.

_____ 7. Holding down the Ctrl key tells the computer that what follows is not text.

_____ 8. A floppy disk drive is both an input and output device.

_____ 9. The system has three kinds of memory: ROM, RAM, and CPU.

_____ 10. The arrow keys are also called cursor keys.

REVIEW

SECTION C

Completion

Briefly answer the following questions or statements:

1. What purpose do disks serve?

2. Define *hardware*.

3. List a typical hardware configuration.

4. What is the difference between RAM and ROM?

5. Why does a computer need an operating system?

6. Name four parts of the keyboard.

7. Explain the term *root directory*.

REVIEW

8. What are the differences between hard and floppy disks?

_____

_____

_____

9. Define the word *tree* in reference to computer usage.

_____

_____

_____

10. Explain the relationship of directories and subdirectories.

_____

_____

_____

LESSON 2

Basic DOS Commands

LEARNING OBJECTIVES

In this lesson you will:

- List files on a disk
- List directories
- Use switches when listing directories
- Use wildcards
- Clear the screen
- Use the print screen feature
- Learn the difference between internal and external commands
- Format a disk
- Create a path

VOCABULARY

Watch for the following words and phrases in this lesson:

CD
CLS
DIR
Drive designator
Extension
External commands
FAT table
Formatting
Internal commands
Logged drive
/P
Parameter
PATH
Print Screen
/S
Switch
/W
Wildcards

OVERVIEW

DOS is the *disk operating system* that manages your internal computer system and coordinates the external attachments such as the keyboard and printer. One of the primary tasks that DOS performs is managing the files and directories that you create. It provides you with a way to create files, direct the saving and printing procedures, and retrieve files from storage when you want to edit them. DOS has certain rules that it follows to run efficiently, and you must follow those rules or DOS gets cranky and bombards you with error messages until you do follow them. In this lesson, you will learn how to look at stored files and directories, name files, prepare a disk by formatting, and determine the difference between two kinds of DOS files—internal and external.

BOOTING UP

If you have not already done so, boot up your computer. If you need help with this process, refer to the steps in Lesson 1.

The prompt C:\> should show on your screen. This prompt indicates that C: is the default drive created when the hard disk was formatted and that you are in the root directory of drive C:.

LISTING DIRECTORIES

No one expects you to remember the names and locations of all the files that you create and save. Unless you have only a few files on the computer—an unlikely occurrence—you will probably need to look at a list of file names before you can select the proper file to work on. DOS provides a command (**DIR**), the *directory* command that displays on your screen a list of files from a particular directory or disk.

- Key **DIR** and press **<ENTER>**.

You will see a list of the names of all the files and directories in the root of drive C:. Depending on how your system is set up, you may have only a few names in your directory or so many that the first part of the list scrolled off the top of the screen. Look at the sample in Figure 2.1. Your list will not be exactly the same, but it will show the five columns, the total number of files, the bytes used, and the bytes free.

The five columns of information can be summarized as follows:

Figure 2.1
Sample root directory

```
DOS            <DIR>          06-20-91   2:32a
UTIL           <DIR>          06-20-91   2:33a
MOUSE          <DIR>          06-27-91  12:47p
WINDOWS        <DIR>          06-28-91   3:45p
XTREE          <DIR>          06-28-91   4:23p
OLD_DOS  1     <DIR>          10-01-93   3:57p
FBW            <DIR>          08-14-92  10:07a
AUTOEXEC 01            336 10-11-93   8:53a
CONFIG   SYS           278 10-28-93   9:45a
CHKLIST  MS            162 10-28-93  11:21a
AUTOEXEC BAT           376 10-28-93  10:42a
AUTOEXEC CHS           505 03-10-93   2:59p
CONFIG   CHS           174 10-11-93   8:56a
AUTOEXEC BAK           505 03-10-93   2:59p
COMMAND  COM         52925 03-10-93   6:00a
HIMEM    SYS         11304 05-01-90   3:00a
CONFIG   OLD           123 08-16-91  10:20a
IMAGE    DAT         50688 08-24-93   3:01p
WINA20   386          9349 03-10-93   6:00a
AUTOEXEC NEW           443 08-02-93   3:50p
       20 file(s)     127168 bytes
                    3753984 bytes free

C:\>
```

1. *File names:* The first column contains the names of the files or directories. Most of them were located in the root during installation of various programs. We don't need to pay particular attention to them.
2. *Extension:* The second column contains a three-letter **extension** for each file. The three letters identify the type of file. Later, when you create text files, you will designate an extension to help identify the files. The extensions shown in the root directory are ones reserved by DOS for its own use. Some names are followed not by an extension but by the designation <DIR> (Figure 2.2). This indicates that the name represents a directory which may have subdirectories and files of its own.
3. *Size:* The next column shows the size of the file in bytes. Size of the directories is not shown.
4. *Date:* The next column shows the date the file was created or the last time it was edited. The importance of having an accurate date is one reason for either having an automatic clock in your computer system or entering the date when booting up. This column helps identify old files that are no longer used and need to be deleted.
5. *Time:* The last column shows the time the file was created or last edited.

```
 Volume in drive C is ST1102 89Mb
 Volume Serial Number is 1B41-812C
 Directory of C:\

DOS            <DIR>          06-20-91   2:32a
UTIL           <DIR>          06-20-91   2:33a
MOUSE          <DIR>          06-27-91  12:47p
WINDOWS        <DIR>          06-28-91   3:45p
XTREE          <DIR>          06-28-91   4:23p
OLD_DOS  1     <DIR>          10-01-93   3:57p
FBW            <DIR>          08-14-92  10:07a
AUTOEXEC 01            336 10-11-93   8:53a
CONFIG   SYS           278 10-28-93   9:45a
CHKLIST  MS            162 10-28-93  11:21a
AUTOEXEC BAT           376 10-28-93  10:42a
AUTOEXEC CHS           505 03-10-93   2:59p
CONFIG   CHS           174 10-11-93   8:56a
AUTOEXEC BAK           505 03-10-93   2:59p
COMMAND  COM         52925 03-10-93   6:00a
HIMEM    SYS         11304 05-01-90   3:00a
CONFIG   OLD           123 08-16-91  10:20a
```

Figure 2.2
Beginning of root directory showing <DIR> listings

Having the list of names roll off the top of the screen is not going to do you much good if you want to identify and use a file at the beginning of the list. To make the list easier to read, you are going to add a *parameter* called a *switch*.

A **parameter** is additional information keyed after the command to refine or limit the command. One example of a parameter is the letter name of each disk (A:, B:, or C:), called a **drive designator.** By adding a drive designator after the command, you are telling DOS where the command is to be carried out.

A **switch** is a special parameter that signals DOS to carry out the command in a specific way. The switch starts with a forward slash (/). In the following sections, you will explore several common switches.

SWITCH /P

First, let's examine the actions of the /P switch. The *P* stands for *pause*.

- Key **DIR /P** and press **<ENTER>**.

Note what happens. The directory fills one screen, then *pauses* for you to read the entries. A prompt at the bottom of the list

instructs you to press any key to continue (see Figure 2.3). This process can be repeated until all the file names and information have been viewed.

- Press any key and continue to do so until all files have been displayed and the prompt disappears.

```
 Volume in drive C is ST1102 89Mb
 Volume Serial Number is 1B41-812C
 Directory of C:\

DOS            <DIR>          06-20-91   2:32a
UTIL           <DIR>          06-20-91   2:33a
MOUSE          <DIR>          06-27-91  12:47p
WINDOWS        <DIR>          06-28-91   3:45p
XTREE          <DIR>          06-28-91   4:23p
OLD_DOS  1     <DIR>          10-01-93   3:57p
FBW            <DIR>          08-14-92  10:07a
AUTOEXEC 01          336 10-11-93   8:53a
CONFIG   SYS         278 10-28-93   9:45a
CHKLIST  MS          162 10-28-93  11:21a
AUTOEXEC BAT         376 10-28-93  10:42a
AUTOEXEC CHS         505 03-10-93   2:59p
CONFIG   CHS         174 10-11-93   8:56a
AUTOEXEC BAK         505 03-10-93   2:59p
COMMAND  COM       52925 03-10-93   6:00a
HIMEM    SYS       11304 05-01-90   3:00a
CONFIG   OLD         123 08-16-91  10:20a
IMAGE    DAT       50688 08-24-93   3:01p
WINA20   386        9349 03-10-93   6:00a
Press any key to continue . . .
```

Figure 2.3
Sample directory using /P switch

LOOKING AT DOS FILES

On the list of files in the root directory DOS is shown as **DOS <DIR>** to indicate that all the files which make up DOS are grouped together in a directory.

- Key **CD\DOS** and press **<ENTER>**.

The command prompt now shows C:\DOS>. This prompt indicates that you are in the DOS directory on drive C:.

- Key **DIR** to run a directory of the DOS files.

Because there are so many files, they will scroll rapidly off the top of the screen. Use the switch **/P** to view the various sections of the DOS directory.

- Key **DIR /P** to pause the display.

NOTE

NOTE: *CD* means *change directory*. This command will be covered in Lesson 3.

SWITCH /W

The **/W** switch offers you another way to view a directory. The *W* stands for *wide*.

■ Key **DIR /W** and press **<ENTER>**.

This time the directory shows you only the names and extensions of each file but spreads the information across the screen so you can see all the files at once (see Figure 2.4). If you are just looking for a particular file name, this type of directory display will suit your needs.

```
 Volume in drive C is ST1102 89Mb
 Volume Serial Number is 1B41-812C
 Directory of C:\DOS

[.]             [..]            DBLSPACE.BIN    FORMAT.COM      NLSFUNC.EXE
COUNTRY.SYS     KEYB.COM        06209112        KEYBOARD.SYS    ANSI.SYS
ATTRIB.EXE      CHKDSK.EXE      EDIT.COM        EXPAND.EXE      MORE.COM
MSD.EXE         QBASIC.EXE      EDLIN.EXE       RESTORE.EXE     SYS.COM
UNFORMAT.COM    NETWORKS.TXT    MIRROR.COM      README.TXT      OS2.TXT
SMARTDRV.SYS    GWBASIC.EXE     DEBUG.EXE       FDISK.EXE       DOSSHELL.VID
AUTOEXEC.UMB    LINK.EXE        DOSSHELL.GRB    CHOICE.COM      MODE.COM
DEFRAG.EXE      DEFRAG.HLP      PACKING.LST     DOSSWAP.EXE     EGA.CPI
EGA.SYS         HIMEM.SYS       RECOVER.EXE     MEM.EXE         XCOPY.EXE
DELTREE.EXE     MSHERC.COM      MOVE.EXE        GORILLA.BAS     MONEY.BAS
NIBBLES.BAS     REMLINE.BAS     RAMDRIVE.SYS    SMARTDRV.EXE    BACKUP.EXE
DISPLAY.SYS     COMP.EXE        DOSHELP.HLP     DOSSHELL.COM    DOSSHELL.EXE
FASTHELP.EXE    EDIT.HLP        HELP.HLP        FASTOPEN.EXE    HELP.COM
4201.CPI        4208.CPI        5202.CPI        ASSIGN.COM      POWER.EXE
GRAFTABL.COM    PRINT.EXE       QBASIC.HLP      JOIN.EXE        LCD.CPI
PRINTER.SYS     EXE2BIN.EXE     SHARE.EXE       SETVER.EXE      APPEND.EXE
DELOLDOS.EXE    DISKCOMP.COM    APPNOTES.TXT    DISKCOPY.COM    DRIVER.SYS
FC.EXE          FIND.EXE        GRAPHICS.COM    GRAPHICS.PRO    LABEL.EXE
SMARTMON.EXE    SMARTMON.HLP    SORT.EXE        LOADFIX.COM     MWBACKUP.EXE
Press any key to continue . . .
```

Figure 2.4
Partial wide DOS directory

In an extremely large directory, you can use both switches (DIR /P/W).

■ Key **DIR /P/W**. This will enable you to view the DOS files in a wide format one screen at a time.

WILDCARDS

Just as there are wildcards that substitute for anything when you are playing cards, there are wildcards for computer use. **Wildcards** can be extremely useful, especially when you want to perform a particular task with a group of files that have something in common in their names or extensions.

There are two commonly used wildcards: **?** and *****. The **?** can stand for only one single character. This limits its use for practical purposes, and it will not be described here. The * wildcard, commonly called *star*, can stand for any number of characters.

By combining the * wildcard with the DIR command, you can view a group of files that have some feature in common. Try the following:

■ Key **DIR *.COM** and press **<ENTER>**. All the files that end in .COM (command files) should be displayed on the screen.

■ Key **DIR *.EXE/W** and press **<ENTER>**. This command displays all the files with an .EXE extension (Figure 2.5).

■ Key **DIR D*.*/W** and press **<ENTER>**. You now have all the files starting with the letter *D* displayed on the screen (Figure 2.6).

■ Key **DIR *.SYS** and press **<ENTER>**. Now all the system files are displayed.

```
C:\DOS>dir *.exe/w

 Volume in drive C is ST1102 89Mb
 Volume Serial Number is 1B41-812C
 Directory of C:\DOS

NLSFUNC.EXE     ATTRIB.EXE      CHKDSK.EXE      EXPAND.EXE      MSD.EXE
QBASIC.EXE      EDLIN.EXE       RESTORE.EXE     GWBASIC.EXE     DEBUG.EXE
FDISK.EXE       LINK.EXE        DEFRAG.EXE      DOSSWAP.EXE     RECOVER.EXE
MEM.EXE         XCOPY.EXE       DELTREE.EXE     MOVE.EXE        SMARTDRV.EXE
BACKUP.EXE      COMP.EXE        DOSSHELL.EXE    FASTHELP.EXE    FASTOPEN.EXE
POWER.EXE       PRINT.EXE       JOIN.EXE        EXE2BIN.EXE     SHARE.EXE
SETVER.EXE      APPEND.EXE      DELOLDOS.EXE    FC.EXE          FIND.EXE
LABEL.EXE       SMARTMON.EXE    SORT.EXE        MWBACKUP.EXE    REPLACE.EXE
SUBST.EXE       UNDELETE.EXE    MWUNDEL.EXE     DBLSPACE.EXE    INTERLNK.EXE
INTERSVR.EXE    MSCDEX.EXE      EMM386.EXE      MEMMAKER.EXE    SIZER.EXE
MWAV.EXE        MWAVTSR.EXE
      52 file(s)     2585341 bytes
                     3753984 bytes free

C:\DOS>
```

Figure 2.5
Directory of .EXE files

```
C:\DOS>dir d*.*/w

 Volume in drive C is ST1102 89Mb
 Volume Serial Number is 1B41-812C
 Directory of C:\DOS

DBLSPACE.BIN    DEBUG.EXE       DOSSHELL.VID    DOSSHELL.GRB    DEFRAG.EXE
DEFRAG.HLP      DOSSWAP.EXE     DELTREE.EXE     DISPLAY.SYS     DOSHELP.HLP
DOSSHELL.COM    DOSSHELL.EXE    DELOLDOS.EXE    DISKCOMP.COM    DISKCOPY.COM
DRIVER.SYS      DOSKEY.COM      DBLSPACE.EXE    DBLSPACE.HLP    DBLSPACE.INF
DBLSPACE.SYS    DBLWIN.HLP      DOSSHELL.HLP    DEFAULT.SET     DOSSHELL.INI
DEFAULT.SLT
      26 file(s)     1049399 bytes
                     3753984 bytes free

C:\DOS>
```

Figure 2.6
Directory of files starting with letter *D*

In each case, the * wildcard was used to substitute for all the letters in the name or all the letters following a specific letter. The wildcard could also be used to substitute for all files having a particular extension in common. Whenever you want to deal with a group of files having something in common, the wildcard is a handy shortcut.

USING DRIVE DESIGNATORS

Earlier in this lesson you were briefly introduced to drive designators as examples of parameters. Learning how to use drive designators is an important part of mastering DOS. The drive designator C:\ denotes the root directory of the hard drive, A: is the drive designator for the primary floppy drive in the system, and B: is the drive designator for a second floppy drive.

When you want DOS to carry out a command on a drive other than the one you are currently using (commonly called the current

logged drive), you must specify both the command and the drive designator.

- Place one of the old data disks (with unwanted files) in drive A: and close the latch.
- Key **DIR A:** and press **<ENTER>**. You now have a directory of all the miscellaneous files on the disk in drive A:.

CLEARING THE SCREEN

You have probably noticed by now that your screen is becoming cluttered with directory listings and commands from previous exercises. If you find the clutter confusing, you can clear the screen and start over using the **CLS**, or *clear screen,* command.

- Key **CLS** and press **<ENTER>**. The screen is cleared and the command prompt is located at the top left corner of the screen.
- Key **CD** and press **<ENTER>**. This returns you to the root directory of drive C: and the prompt should read C:\>.
- For practice, change to the DOS directory.
- Run a wide directory on the DOS files. If necessary clear the screen and run the directory again.
- Experiment with the **DIR** command. Use the **/P** and **/W** switches alone or in combination. Use the **CLS** command to see the effect.

NOTE

NOTE: Remember, DOS will recognize either upper or lower case.

PRINT SCREEN

There are a number of ways to print files from the computer. The printed piece of paper is called *hard copy* because you can actually feel it, carry it around, or mark on it. The way you choose to print will depend on how the hard copy is to be used and whether you want to print a document, a full page or more in length, or whether just the material shown on the screen is sufficient.

When the material shown on the screen is sent to the printer it is known as a **print screen** or *screen dump*. The printer will print everything that is shown on the screen. The screen dump terminology comes from the idea that the screen content is being *dumped* into the printer.

The print screen key may be abbreviated *PrtSc* and is located in the upper right area of the keyboard. On some computers merely pressing the PrtSc key will send the screen contents to the printer. On other machines, it may be necessary to hold down the Shift key while pressing the PrtSc key.

- List the DOS directory using the **/W** switch.
- Make sure the printer is turned on and is loaded with paper.
- Press the **PrtSc** key. If no action occurs, press **Shift+PrtSc**.

The printer should produce a copy of the screen contents. Notice that all the extra characters are also printed. These include the command prompt, the DIR command, and the information about space remaining.

If for any reason neither of these two methods of screen printing works, consult the printer manual to see if another key combination or adjustment is needed.

NOTE: Some printers will not eject the paper after a PrtSc command. If this occurs, press the Paper or Line Feed button on the printer.

INTERNAL AND EXTERNAL COMMANDS

There are two types of DOS commands: *internal commands* and *external commands*. When the computer is turned on, the instructions in ROM memory look for three specific files: COMMAND.COM, IO.SYS, and MSDOS.SYS. The two latter files are called *hidden files* because they do not appear in a directory. These three files are required for operation of the system. The computer will look first in drive A: for the files, and if it does not find them there it will look in drive C:. These three files are all that is needed to "boot up" the computer. They are loaded into RAM memory and stay there until the computer is turned off.

The COMMAND.COM part of this trio contains a group of DOS files. Because these files are contained within COMMAND.COM and not listed separately, they are called **internal commands**. There are close to 30 of these internal commands. They are the DOS commands most frequently used and are always available when COMMAND.COM is present. The DIR, CLS, and CD commands you have used in this lesson are examples of internal commands.

There are additional DOS commands that are part of the DOS program but not contained within COMMAND.COM. These commands are part of the DOS package that was purchased with your computer. These additional commands, not included in COMMAND.COM, are called **external commands**. External commands are not needed to run the system. Each has a separate name that usually reflects its use. You saw the file names of the external commands when you listed the DOS directory. External commands are used for functions such as formatting disks, comparing disks, copying information from one disk to another, printing files, etc.

A complete list of internal and external commands can be found in Appendix B.

FORMATTING A DISK

If you have closely examined a 5.25-inch computer disk, you have noticed that the disk surface resembles an old-fashioned 45-rpm record. Music recorded on the 45-rpm record is placed in one long, continuous track. When the record is played, the music is "retrieved" in the same long, continuous track.

You may think that the computer records data in much the same way, placing every byte of a file in a continuous track. But because the computer disk is spinning at a very high speed, the drive cannot record the data in a continuous track. The drive "writes" the information in numerous locations all over the disk.

You are probably wondering how the computer can find all those bits of information to recreate your file when you want to retrieve it. Two DOS features help to control this process.

The first feature is called **formatting**. The surface of a new, unused disk must be prepared so DOS will recognize how to store and retrieve data. *Formatting* is the process of preparing the surface. Some disks are sold as *preformatted* disks. This means that the process of preparing the disk has been done at the factory. You merely have to place the disk in the drive and use it.

The formatting process is controlled by the DOS FORMAT command. FORMAT carries out the following tasks:

1. Creates the structure for a directory for the disk, referred to as the root directory.
2. Checks for any defects in the disk.
3. Completely erases any previously recorded data.
4. Prepares the surface so DOS can write to and read from the disk and recognize where all the segments of each file are located.
5. Copies a file allocation table (FAT) to keep track of and map the location of all the files on the disk.

Whenever you have an old disk, and the files are no longer needed, you can format the disk and start over with a freshly cleaned disk.

Figure 2.7 gives you a visual picture of a formatted disk. The surface is divided into tracks, much like the tracks on records, and the tracks are divided by sectors. Each sector and track is numbered so data can be located. DOS "maps" the surface so the operating system can recognize the numbers.

The **FAT table** (file allocation table), mentioned above, is the second DOS feature that allows the computer to find all the parts of your file. The FAT table keeps track of the locations of all the pieces

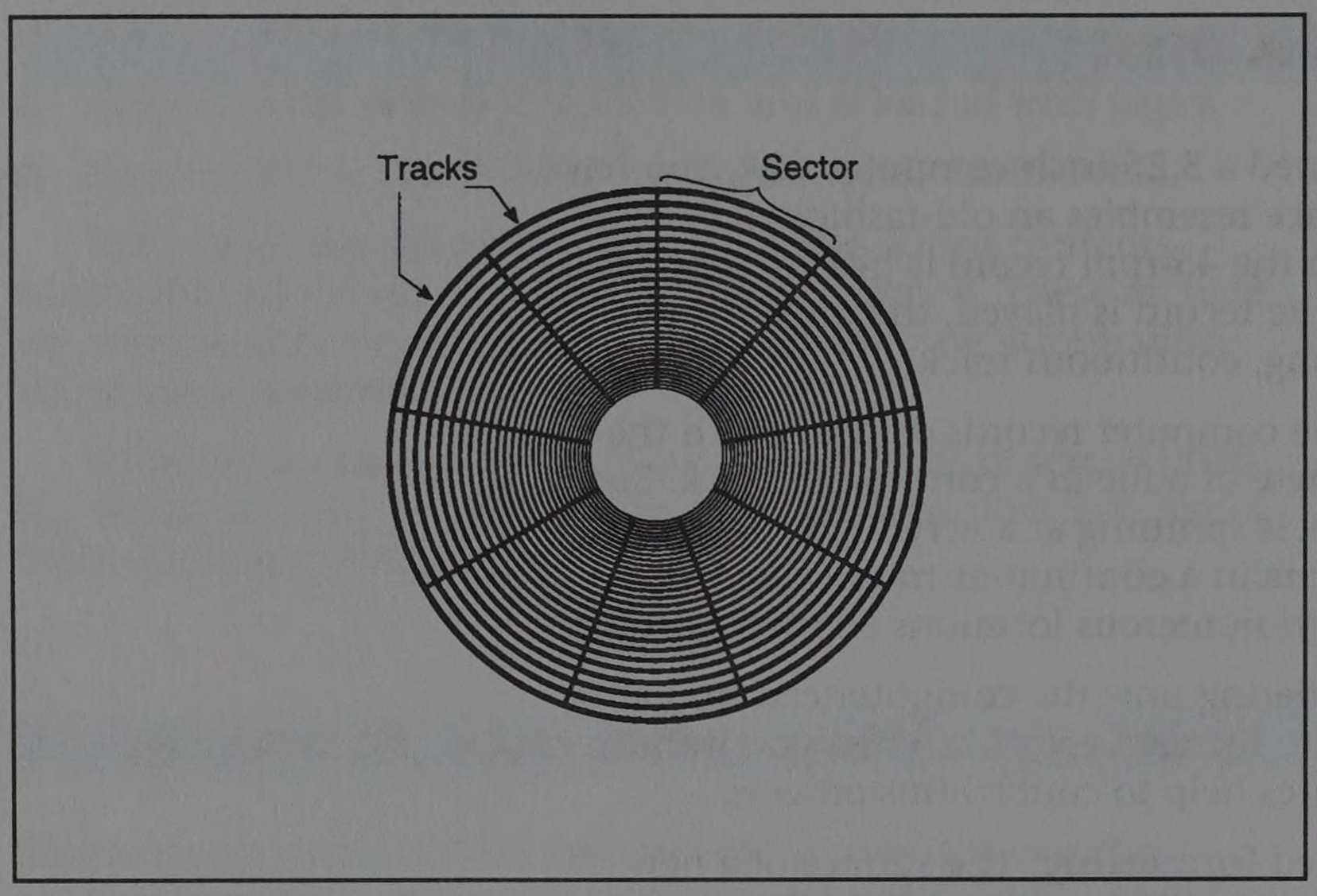


Figure 2.7
Sectors and tracks

of the files on the disk. When you ask DOS to retrieve a particular file, DOS consults the FAT table to find where each part of the file is stored.

The FAT table that DOS creates and the directories you create enable DOS to recognize and organize the files on your disk, as shown in Figure 2.8. The FAT table keeps track of the location of the files, while a directory keeps track of the file names, sizes, and dates of creation.

As indicated above, the formatting process creates a root directory on the floppy disk. This means you can create directories and

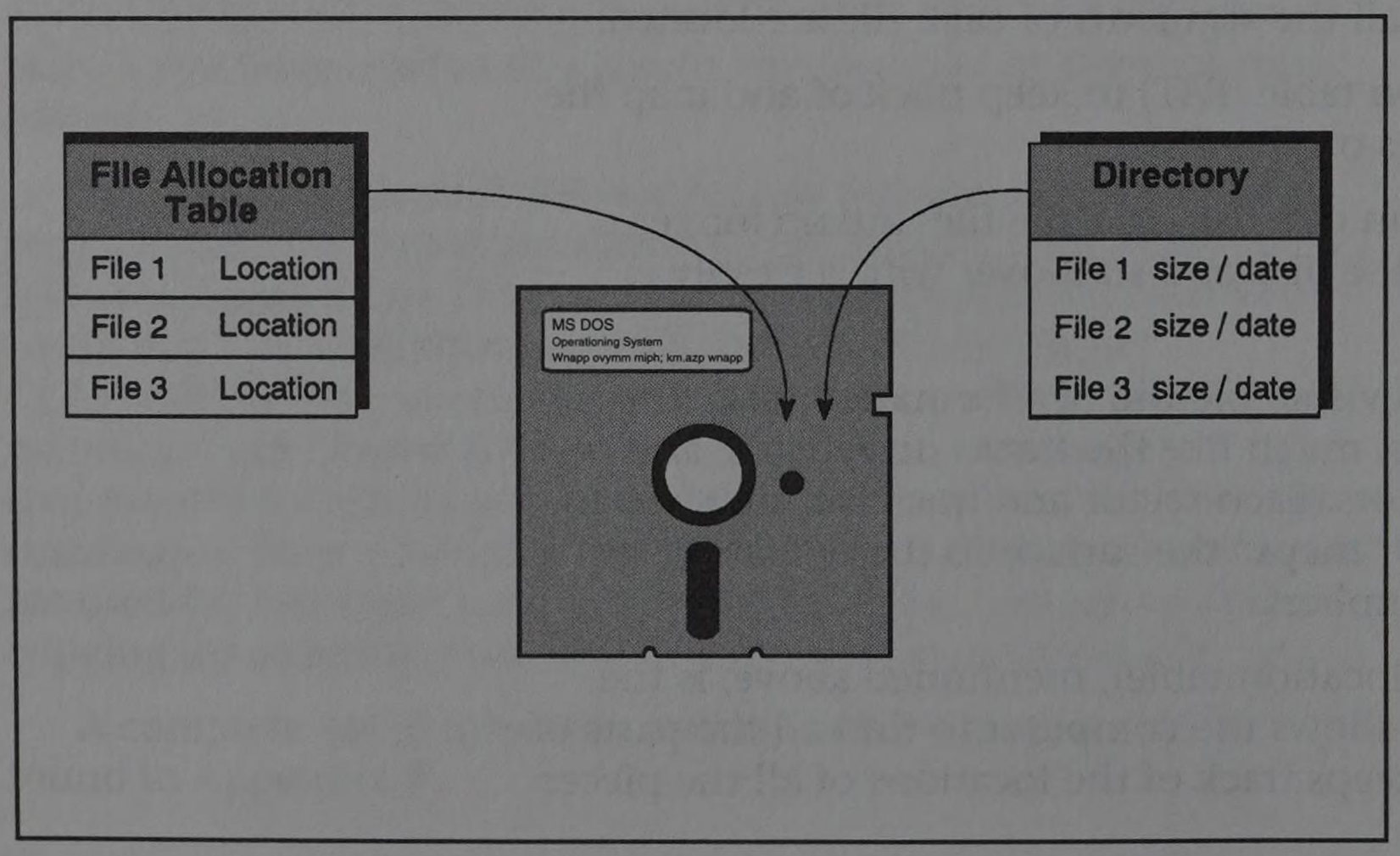


Figure 2.8
Disk management structure

subdirectories on a floppy disk just as you do on the hard disk. You will have an opportunity to make directories on a floppy disk later in this lesson.

DISK LABELS

Both 5.25- and 3.5-inch disks are usually sold by the box. A manufacturer's label and logo may be pasted on each new disk. Usually the box will also contain a set of blank labels and, with the 5.25-inch disks, black or silver tabs called *write-protect tabs*. The labels permit you to label new disks with a description of disk contents or relabel used but newly formatted disks. On each disk label, write a name or general title for the contents on the disk, a description, the approximate date files were created, and any information helpful for identification.

A few general precautions are necessary when using floppy disks. If possible, write on the label before you place it on the disk, especially for 5.25-inch disks. If the label is already on the disk, use a felt pen. Disks can be damaged by a sharp point or excessive pressure. Disks are very sensitive to magnetism or any object with an electrical current. Even a simple magnetic paper clip holder can ruin disk content. Heat is another danger. Don't leave disks on a window sill in the sun, near a radiator, or in the trunk of a car.

FORMATTING PROCESS

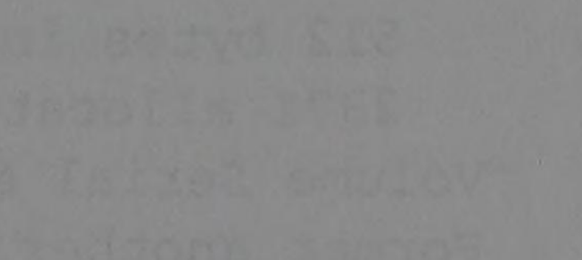
You are going to use one of your old disks to practice the FORMAT command.

- Place one of the used disks in drive A:. Check the disk's directory to make sure you do not need any of the files listed because the FORMAT procedure will erase the disk.
- Check the command prompt to verify that you are in the DOS directory. The prompt should read C:\DOS>. If it does not, change to the DOS directory as you did when practicing the DIR command.

CAUTION, CAUTION, CAUTION!!! Always use the *drive designator* when using the FORMAT command to indicate which drive contains the disk to be formatted. This is especially important when you are using a hard disk drive. Remember that all data will be completely erased. If you accidentally keyed FORMAT without the drive designator, you would format the hard drive and completely erase everything on it. DOS will give you some instructions and warning messages, so take the time to read them.

- Key **FORMAT A:** and press **<ENTER>**.

After you have pressed <ENTER>, you will see the following prompt:



NOTE: Use either upper or lower case. DOS recognizes both.

```
Insert new diskette for drive A:
and press ENTER when ready. . .
```

- Since you have already placed the disk in drive A:, press **<ENTER>**.

The operating system will begin formatting the disk. The prompts report information as the disk is being formatted.

```
Checking existing disk format.
Saving UNFORMAT Information.
Verifying 1.2M
____% completed.
```

- In the event you see the following message, press **Y** for **yes** to continue.

```
Checking existing disk format.
Existing format differs from that specified.
This disk cannot be unformatted.
Proceed with Format (Y/N)?
```

- When the formatting is complete, a prompt asks for a volume label. At this time, press **<ENTER>** for none.

The following report appears. The numbers may vary slightly.

```
Volume label (11 characters, ENTER for none)?
  1213952 bytes total disk space
  1213952 bytes available on disk
  512 bytes in each allocation unit.
  2371 allocation units available on disk.
Volume Serial Number is 2B66-ICFE
Format another (Y/N)?
```

This report tells you the number of bytes of total disk space and the number of bytes available and asks if you wish to format another disk.

- Press **N** and **<ENTER>**.

CAUTION: If you are using a high-density disk drive, you should use a high-density disk. A high-density drive can read a low-density disk but a low-density drive cannot read a high-density disk. To format a low-density disk in a high-density drive, use the following command: FORMAT A:/4

If the system detects any bad sectors or tracks during the formatting, it will report how many bytes on the disk are unusable. The computer can work around the bad areas, but with the reasonable price of disks, why take a chance? Throw away the disk with the bad sectors and format another one.

NOTE

NOTE: The number of bytes available will vary depending on the size (3.5- or 5.25-inch) and density (high-density or low-density) of the disk you are formatting.

- Write **DOS EXERCISES** on a label and place it on the formatted disk. Place the disk back in drive A:.

- List the directory of the newly formatted disk. The following message should appear:

```
Volume in drive A has no label
Volume Serial Number is XXXX-XXXX
Directory of A:\
File not found
```

All of the old files have been erased, and the disk is ready to receive new data.

PATH COMMAND

Use the disk that you just formatted as you work through the remainder of this lesson. You are going to try the FORMAT command a few more times and use some variations. It won't hurt the disk to be formatted again.

Before continuing, you need to change your logged drive. At the moment your command prompt shows C:\> or C:\DOS>. This indicates your current logged drive.

- Key A: and press <ENTER>.

Your command prompt has now changed and shows A:\>. Drive A: is now your logged drive. Remember that the logged drive is the one that the computer is reading from and writing to. Changing drives is just that easy: Key the drive designator, a colon, and press <ENTER>.

Now you are going to format the disk in the logged drive. It's the same disk, but that's okay.

- Key **FORMAT A:** and press <ENTER>.

What happened? You probably got one of DOS's famous error messages:

```
Bad command or file name
```

or

```
Path Not Found
```

Consider again the concept of internal and external DOS commands. The internal commands are part of the COMMAND.COM file and are loaded into memory with that file. Thus, the internal commands are always available while you are working. But FORMAT is an external command and is part of the DOS subdirectory on the C: drive. The operating system has to have access to that

NOTE

NOTE: For this exercise you have been logged into drive A:. When you are in the root directory of the hard drive, you do not need a PATH to the DOS subdirectory. DOS 6.0-6.2 automatically searches for the FORMAT command. However, the PATH command is used for many tasks other than FORMAT.

external file before it can carry out the command. Since you are no longer in the DOS directory, the computer doesn't know where the file is or how to find it.

The solution to this is the use of **PATH**, an internal command that creates a path to the DOS directory. As part of the PATH command, you must specify which disk the path is to go to and the name of the directory or subdirectory that contains the DOS files.

- Key **PATH C:\DOS** and press **<ENTER>**.

This path is now in memory and will stay there ready for use until you have finished your present session and turned the computer off. Later in the book you will learn how to create a special file known as a *batch file* that contains a PATH command. The batch file will automatically load the PATH into memory each time the computer is booted.

- Try the FORMAT command again. Don't forget to specify the drive designator.

ADDING A VOLUME LABEL

When you asked for a directory of the files on drive A:, the first line read **Volume in drive A: has no label.** You may want to give your disk a name, or *label*, because the paper label on the outside of the disk can come off or be unintentionally removed. DOS gives you two ways to enter a label on the internal tracks of the disk. This label can be a name or classification or any set of characters that helps identify the content of the files. When you list the disk's directory, the volume label name will show and help identify the disk, saving you the trouble of searching through numerous files.

The first method of adding a label is when using the FORMAT command. After the formatting is complete, the following prompt appears:

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

You can then type any appropriate identifying label.

DOS 6 has added this request as a normal part of the formatting procedure.

- Format the disk in drive A: and this time, when a volume name is requested, enter your name.
- List the directory of this newly formatted disk. Your name should appear where the volume label is listed.

If you are working in a classroom or lab situation, you may want to enter your name as the volume label. If you are working in a business environment and are storing various classifications of

data, you may want to enter account titles or classifications as the volume labels.

If you have not entered a volume label and later change your mind, the LABEL command provided by DOS can be used to enter a label. This command will be explained in Lesson 10.

ADDING SYSTEM TRACKS

There is one more switch that can be used with the formatting procedure. This is the /S switch. The *S* stands for *system tracks*. You learned earlier in this lesson that the computer needs three files in order to boot up: COMMAND.COM, MSDOS.SYS, and IO.SYS. These three files can be transferred to a floppy disk during formatting. That floppy disk then becomes bootable. Later, if you wish, the files from an application program can be transferred to the floppy so that you have a bootable program disk. This becomes important in the event that one of your computers does not have a hard disk, or if the hard disk crashes (becomes temporarily unusable). With a bootable disk you do not have to find the DOS directory each time you want to boot the computer.

You are currently logged into drive A: and have created a path to the DOS directory in drive C:. The "system tracks," composed of COMMAND.COM and the two hidden files, pose the following problem. You cannot access these files by merely creating a path to them. You must log to the drive containing these files so they can be transferred during the formatting procedure.

- Log back to the DOS directory on drive C:.

REMINDER: To log to the DOS directory, change to drive C: and type: **CD\DOS <ENTER>**. To log back to the root of drive C: type: **CD\ <ENTER>**.

- From the DOS directory, format the disk in drive A:, using the **/S** switch, and key a volume name of your initials and the word **EXERCISES**. Don't key any spaces between your initials and the word.
- Respond **N** when you're asked if you want to format another disk.
- Leave the newly formatted disk in drive A:.

WARM BOOT

Until this point, booting up your machine has consisted of turning on the power switch and waiting while the internal mechanisms sparked everything into action and finally produced the C:\>

prompt on the screen. This is known as a *cold boot* because the system was "cold" and had no power before you turned on the switch.

Sometimes you simply want, or need, to start the computer again without using the power switch. One example of when you might need to restart is the mind-boggling, nerve-wracking situation known as "freezing." Something happens in the system, or keyboard, or some unknown place, and the computer freezes, and no matter what you do, nothing will move or work. The monitor just sits there and stares at you.

The only recourse is the *warm boot*. This is the process of rebooting the system without turning off the power. To do a warm boot, press the Ctrl, Alt, and Delete keys simultaneously. The system will then go through the same routine it does when you first turn on the power, except it is faster.

If the keyboard "freezes," you have no other choice but to press the reset button or turn the computer off and start over.

- Hold down the **Ctrl** and **Alt** keys with the left hand. At the same time press the **Delete** key with the right hand. Release all three keys at one time.

The system will reboot. The system looks first at drive A: for COMMAND.COM and two hidden files, known as the system files. This time it will find the system files on the newly formatted floppy, showing that your floppy is now "bootable."

- Run a directory of drive A:. (Your initials)EXERCISES should appear as the volume label. COMMAND.COM will be the only file displayed in the directory.

PRACTICE

Try the following exercises. Try to do them without looking back in the book. Use your second old disk for these exercises. Write EXERCISES BACKUP on a paper label and attach it to the disk.

EXERCISE 2–1

1. Place your BACKUP disk in drive A:.
2. Format the disk using the external FORMAT command.
3. Give the disk a volume label of EXERBAK.
4. List a directory of the newly formatted disk.
5. Use print screen to print the directory.

EXERCISE 2–2

1. Log to the appropriate drive for creating a bootable disk.
2. Place your EXERBAK disk in the drive for formatting.

3. Format the disk and add the system tracks and the volume name EXERBAK.
4. Create a path, if necessary.
5. List a directory of the disk.
6. Print the screen.

EXERCISE 2–3

1. Place the newly formatted disk in drive A:.
2. Do a warm boot.
3. List a directory of the disk in drive A:.
4. Print the screen.

EXERCISE 2–4

1. Leave the newly formatted disk in drive A:.
2. Using drive A: as the logged drive, list a wide directory of the DOS directory in drive C:.
3. Print the screen.

REVIEW

SECTION A

Vocabulary

The following words and phrases were found in this lesson. Find each of these in the glossary in Appendix A and define them.

CD
CLS
DIR
Drive designator
Extension
External commands
FAT table
Formatting
Internal commands
Logged drive
/P
Parameter
PATH
Print Screen
/S
Switch
/W
Wildcards

SECTION B

True/False

In the blank before each sentence, place a T if the statement is true and an F if the statement is false.

_____ 1. FORMAT is part of COMMAND.COM.

_____ 2. A disk can be made bootable during the format procedure.

_____ 3. You must format a disk each time you use it.

_____ 4. A formatted disk has a root directory.

_____ 5. When using DIR, a drive designator is not needed for a directory of the current directory.

_____ 6. There are three classifications of DOS commands: internal, external, and system.

_____ 7. You must be in or create a path to the DOS files to use external commands.

_____ 8. Names for a volume label must be limited to eight characters.

_____ 9. DIR and CLS are internal commands.

_____ 10. Wildcards can be used when formatting a disk.

REVIEW

SECTION C

Commands

Write the commands you would use for the following situations. Assume that the DOS files are in a directory named DOS on the hard drive.

1. Clear the screen, log to the DOS files, and format a disk in drive A: with a volume name of ACCT-REC. Commands:

   _____

   _____

   _____

2. Log to drive A:. Create a path to the DOS files, and format the disk with the system tracks. Commands:

   _____

   _____

   _____

3. Clear the screen, list a directory for a floppy in drive A:, and print the screen. Commands:

   _____

   _____

   _____

4. Clear the screen, run a wide directory of the files in the root directory of drive C:, and print the screen. Commands:

   _____

   _____

   _____

5. Log to the DOS directory. Run a directory of all the files with an extension of .EXE. Print the screen.

   _____

   _____

   _____

LESSON 3

Files and Directories

LEARNING OBJECTIVES

In this lesson you will:

- Make a new directory or subdirectory
- Change directories
- Create files in a new directory
- Name a file
- Create a file
- Copy a file
- Combine two files
- Copy files using wildcards
- Look at the contents of a file
- Print files
- Copy files to subdirectories
- Remove directories

VOCABULARY

Watch for the following words and phrases in this lesson:

Appending	COPY	MD
Backslash (\)	Ctrl-Z	PRN
CD	Device	RD
Concatenating	F6	TYPE

OVERVIEW

The MD, CD, and RD commands form the foundation for managing the data you create with a computer. Some sort of system has to be established for organizing information regardless of whether it is data created with word processing, spreadsheet, database, game, or utilities programs. If a file has to be retrieved and edited or duplicated, it has to be found. If files are old and no longer needed, they should be deleted to make room in storage for new files. But to delete the old files, you have to be able to find them. Saving and then finding is the name of the game for disk management.

Many of the moving, copying, and deleting tasks can be accomplished with the DOS Shell, which is the main emphasis in Lesson 4. Although many of the tasks can be carried out faster with the Shell, it is essential that you have both a thorough understanding and a mental picture of how your computer system organizes and how you can make it work for you before you start working with the Shell.

One method of organizing is to use floppy disks. You can organize your files by using a separate disk for each category of data: address files for mailing labels, inventory records, personal correspondence, income tax information, form letters, etc. The categories you choose will depend on whether the data is for business or personal household use.

There is one problem with using floppy disks: Your work speed will slow down because it takes far longer for the computer to read and write to a floppy than it does to read and write to a file created on the hard disk. The solution is to create subdirectories and files on the hard disk and then periodically transfer data to floppies for long-term storage.

In this lesson, you are going to create directories and subdirectories, create and copy files, move files, and look at the content. These are the basics of file organization and management.

DIRECTORY STRUCTURE

In Lesson 1 you looked briefly at the structure for file management. This structure was compared to a tree turned upside down. Figure 3.1 shows an expanded tree structure.

You are familiar with the C:\> prompt for the root directory. This directory should be kept as small as possible. The root will contain COMMAND.COM, a few other system files such as AUTOEXEC.BAT and CONFIG.SYS, and the names of each of the directories created for various programs. When you listed the root

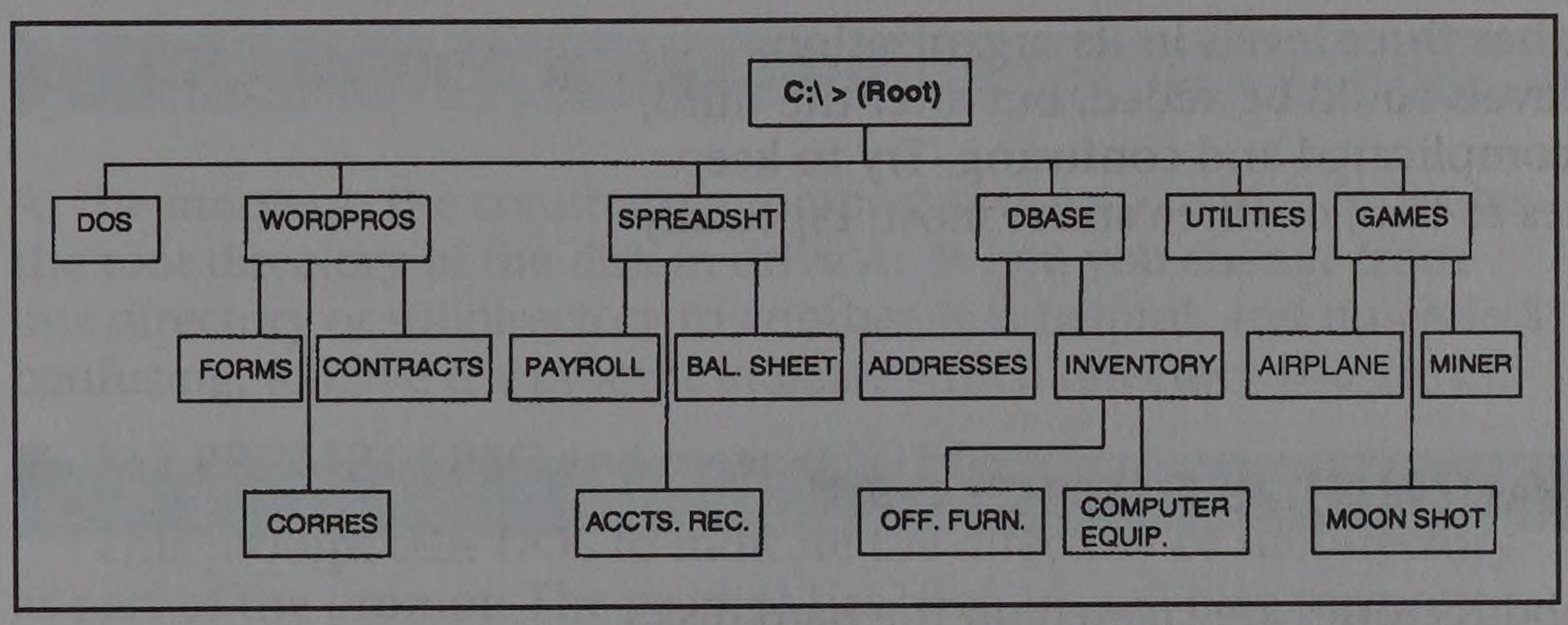


Figure 3.1
Tree directory structure

directory, you saw that the program directories were denoted by <DIR> instead of a three-letter extension.

Figure 3.2 shows the kind of structure that you will see when using the DOS Shell. In Figure 3.2, each of the horizontal lines below the C:\> is a directory containing subdirectories for varying classifications of data. Notice the DBASE directory. It has subdirectories for addresses and inventories. The INVENTORY subdirectory is further divided into inventory of office furniture and computer

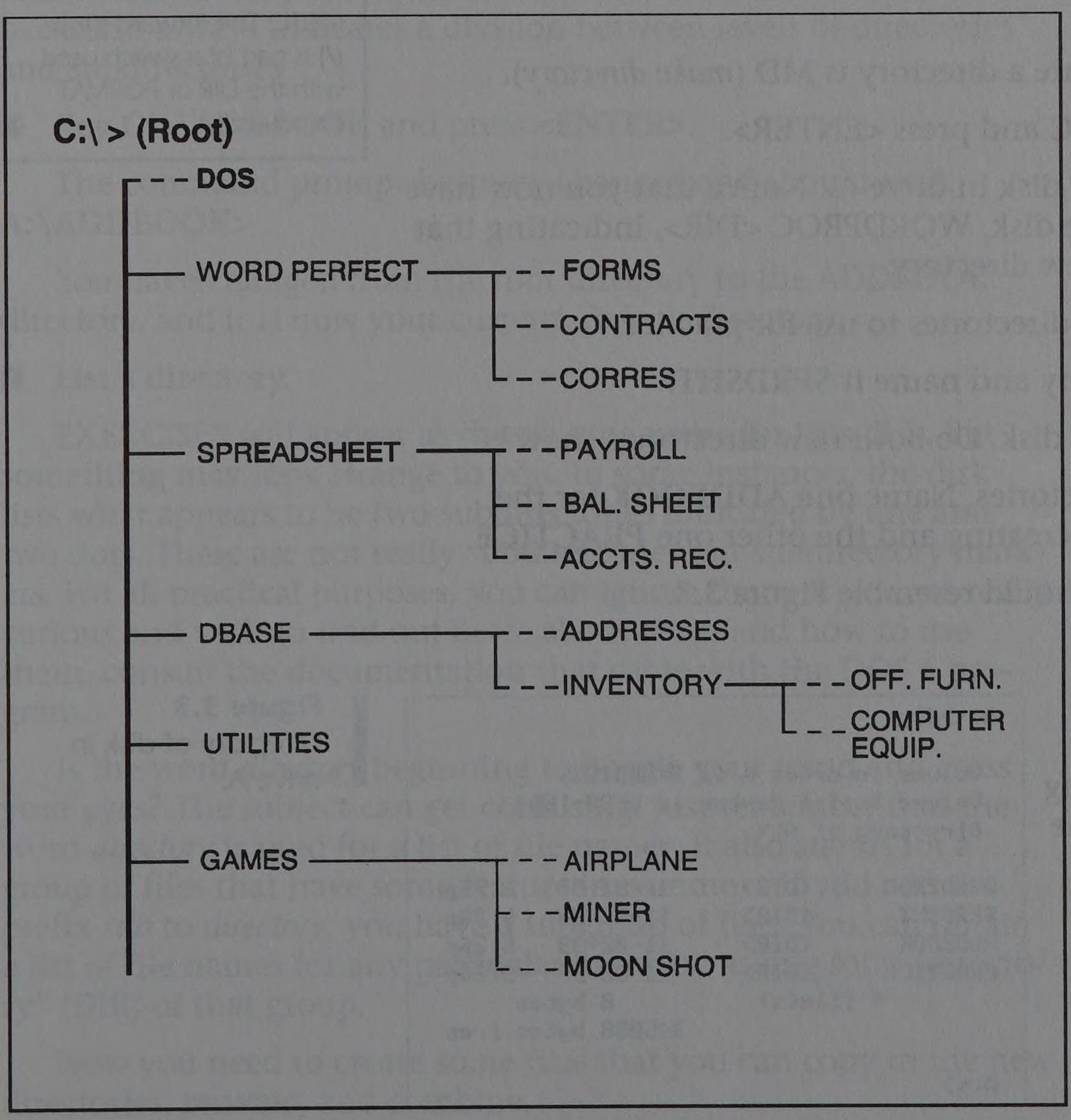


Figure 3.2
Screen directory structure

equipment. DBASE, then, has three levels in its organization. Theoretically, additional levels could be added, but after the third, the organization can get complicated and confusing. Try to keep the level of your directories to two, or three at the most, especially when you are beginning.

CREATING (MAKING) A DIRECTORY

Usually directories and subdirectories are created on the hard disk. You can, however, also create directories on a floppy disk. For purposes of these exercises, you are going to use drive A: for creation of directories.

- Check your computer. You should be logged into drive A: and have your EXERCISES disk in the disk drive.

When you use directory commands, you key the name of the command, a **backslash** (\), and the name of the directory. The backslash denotes the name of the directory or subdirectory. It is used to show separation between levels in the tree structure of the drive.

The command to create a directory is **MD** (*make directory*).

- Key **MD\WORDPROC** and press **<ENTER>**.
- List a directory of the disk in drive A:. Notice that you now have another listing on the disk, WORDPROC <DIR>, indicating that you have created a new directory.

You need a few more directories to use for practice.

- Make another directory and name it **SPRDSHT**.
- List a directory of the disk. Do both new directories show?
- Create two more directories. Name one **ADDBOOK** for the address book you are creating and the other one **PRACTICE**.
- List the directory. It should resemble Figure 3.3.
- Print the screen.

Save the hard copy of the directory. When you start working with existing files, you need to have the exact spelling of the file and directory names and extensions. A printout of the list can be helpful.

NOTE

NOTE: The forward slash (/) is part of a switch used with the DIR or FORMAT commands.

```
A:\>dir

 Volume in drive A is EXERCISES
 Volume Serial Number is 0F30-16D4
 Directory of A:\

WORDPROC       <DIR>      11-02-93   5:25p
SPRDSHT        <DIR>      11-02-93   5:26p
ADDBOOK        <DIR>      11-02-93   5:26p
PRACTICE       <DIR>      11-02-93   5:26p
        4 file(s)              0 bytes
                          345088 bytes free

A:\>
```

Figure 3.3
Directory of disk in drive A:

CHANGING DIRECTORIES

At the moment, the command prompt shows A:\>, which indicates the root directory of the disk in drive A:. When you change from one directory or subdirectory to another, it is helpful, and much less confusing, to have the prompt indicate which directory you are in.

■ Key **PROMPT PG** and press **<ENTER>**.

This prompt tells DOS to indicate the directory or subdirectory as part of the prompt. The prompt has been loaded into memory and will stay there for the remainder of your work session. Later you will learn how to include this prompt in a batch file so that it will automatically be loaded each time you boot your computer.

When you want to use files in a particular directory, you will find that your work is easier if you change to that directory. The command that allows you to change directories is CD, which stands for *change directory*. You used this command in Lesson 2 to change to the DOS directory. The CD is followed by the backslash and then the name of the directory to which you wish to change. This indicates the path to the subdirectory. Remember that the backslash always indicates a division between levels of directories and subdirectories.

■ Key **CD\ADDBOOK** and press **<ENTER>**.

The command prompt has now changed and should read:

A:\ADDBOOK>

You have changed from the root directory to the ADDBOOK directory, and it is now your current, default directory.

■ List a directory.

EXERCISES will appear as the volume name for this disk. But something may look strange to you. In some instances, the disk lists what appears to be two subdirectories indicated by one and two dots. These are not really subdirectories but subdirectory markers. For all practical purposes, you can ignore them. If you are really curious and wish to find out more about them and how to use them, consult the documentation that came with the DOS 6 program.

Is the word *directory* beginning to boggle your mind and cross your eyes? The subject can get confusing. Just remember that the word *directory* is used for a list of file names. It also stands for a group of files that have some feature in common. If you add the prefix *sub* to *directory*, you have a subgroup of files. You can obtain a list of file names for any particular group by asking for a "directory" (DIR) of that group.

Now you need to create some files that you can copy to the new directories, rename, and combine.

NAMING A FILE

A file can contain a great variety of information. It can be a letter created in a word processing program, a balance sheet from a spreadsheet program, a database address file, or text created in DOS. In each case, a file is text or data saved under one name.

Each file must be given a unique name so that the operating system will be able to locate it. Generally, the file name is assigned before the file is created, but some application programs ask for the name during the saving process. As you become more experienced with various programs, you'll learn how each program handles this process.

In DOS, the file name is assigned before the file is created. All programs using DOS have rules about naming a file. File names can contain up to eight letters, special symbols, and/or numbers. Spaces cannot be included. If you really want to give the appearance of a space, use the underline character instead.

The following symbols cannot be used in file names:

" \ / [ ] : | < > + ; ,

In addition to the eight characters for the name, you can add a period, commonly called a *dot*, and a three-letter extension. The three-letter extension helps identify the type of file, or group of files. For example, .LTR could indicate letters, .MEM could stand for memos, .REP could represent reports, and .FRM could designate forms. The extension also aids in copying, moving, or deleting an entire group of files.

Some extensions are reserved by DOS for its own use. These extensions are sometimes added automatically by DOS. Others have special meanings and use for a programmer. Some reserved file extensions are:

.BAK	=	backup file
.COM	=	command file
.EXE	=	executable file
.SYS	=	system file

.BAT, which stands for batch file, is reserved in that the system recognizes the extension .BAT as being used only for batch files. However, batch files can be created by any user. A batch file is a small program that tells the computer to carry out a specific task.

You may encounter a few other extensions, but this gives you a brief overview of extensions that you cannot use.

CREATING A FILE

The COPY command is probably one of the most frequently used DOS commands. As the name implies, you can copy a file from one

disk to another, from one subdirectory to another, or to any combination of places. COPY is an internal command that gives you a lot of flexibility. Using COPY, you can create a file, combine two or more files, copy entire directories, change the names of the files, and print to the printer.

COPY also allows you to create simple text files. This can be a very convenient feature when you do not want to take the time to load a word processing program.

- Boot up the computer if you have not already done so.
- Place your EXERCISES disk in drive A:.
- Log to drive A:.

Lesson 1 included a brief review of the various components making up the "hardware" of the computer system. You'll remember that hardware includes the CPU, the keyboard, the monitor, and the printer. DOS refers to each of these components as a **device**. Each device has a different name. The device name DOS assigns to the keyboard is CON, which stands for *console*.

Using the command COPY CON, you can direct the computer to copy the material you type on the keyboard into memory and then to disk. After you key COPY CON, you must key the name of the file you wish to use. Then you enter the contents of the file. When you have finished keying information, you signal the computer by pressing **<Ctrl-Z>** or the **<F6>** key.

As you key the data below, do not enter the drive designator. <ENTER> indicates that you are to press the <ENTER> key. Do not key the individual letters of the word ENTER. If you make a mistake before pressing the <ENTER> key, use the backspace key to erase the incorrect letters, then retype the correct data. If you notice a mistake after the <ENTER> key has been pressed, ignore it. You will learn how to edit and make corrections later in this text-workbook.

- Enter the text shown in Figure 3.4.
- Press **<Ctrl-Z>** or **<F6>** then **<ENTER>**. This will signal the computer that the file is finished. The computer provides the message: "1 file(s) copied."

Figure 3.4
Text for EXAMP1.TXT

```
A:\> COPY CON EXAMP1.TXT <ENTER>
(Your name) <ENTER>
(Your address) <ENTER>
(City, State, ZIP) <ENTER>
<ENTER>
This file will be an address database <ENTER>
consisting of information for friends <ENTER>
and relatives. <ENTER>
<ENTER>
This file is created using the <ENTER>
COPY CON command and is an example of <ENTER>
a simple text file. <ENTER>
```

- List a directory of the disk. You should see a new file named EXAMP1.TXT.
- Create a second file using the COPY CON command. Use the title EXAMP2.TXT. Use the text shown in Figure 3.5.
- Press **<Ctrl-Z>** or **<F6>**, followed by **<ENTER>**, to end the file.
- Run a directory of the disk. You should see the names of both the files listed.

Figure 3.5
Text for EXAMP2.TXT

```
A:\> COPY CON EXAMP2.TXT <ENTER>
Dear (a friend's name) <ENTER>
<ENTER>
I am creating an address file on my <ENTER>
computer. My address book shows your <ENTER>
name and address as I have listed <ENTER>
below. If there have been any changes
<ENTER>
please let me know. <ENTER>
<ENTER>
(A friend's name) <ENTER>
(The address) <ENTER>
```

Notice that when you created these two example files you did not use a drive designator. This was because you had already logged to drive A: and the files were to be saved in the logged drive. If you had wanted to save them on a different drive you would have included the drive designator. For example:

```
COPY CON C:MYFILE.TXT
```

or

```
COPY CON B:REPORT.DOC
```

TYPE

When you run a directory of the disk, you know you have two files because you can see the names listed. But you also need a way to view the files to check their content and accuracy.

The **TYPE** command permits you to look at the content of a file. The TYPE command is an internal command, so it is always available for use while you are working. When you use this command, followed by the name of the file, you are instructing the operating system to "type" the content of the file on the screen for you to view.

- Key **TYPE EXAMP1.TXT** and press **<ENTER>**. The content of your first file should appear on the screen.
- Follow the same steps to view your second file. This time, key **TYPE EXAMP2.TXT** and press **<ENTER>**.
- Print the screen.

Both of your files should now be printed on one sheet of paper. The problem is that everything else on the screen is also printed on the page: the default prompt, the commands, and any other characters on the screen.

PRINTING

Sending the text to the printer will solve this problem. The printer will only print the content of the file and not all the "junk" on the screen. There are two ways to send data to the printer. One method uses the COPY command and the other uses the TYPE command.

Just as CON was the DOS device name for the keyboard, **PRN** is the DOS device name for the printer. For each method of printing, you first key the command, followed by the file name, and then the name of the device. Try the following sequence:

- Make sure the printer is on and has paper.
- Key **COPY EXAMP1.TXT PRN** and press **<ENTER>**.

The file containing your name and address should now print out on the printer and again the computer gives the message: "1 file(s) copied."

The second method, using the TYPE command, has one additional step. A greater than sign (>) must be added just before the PRN to redirect the output from the screen to the printer.

- Key **TYPE EXAMP2.TXT >PRN** and press **<ENTER>**.

Your second file should now print out. Notice that you have not added drive indicators in the command because you are only dealing with files in the default drive indicated by the command prompt.

NOTE

NOTE: If you are using a laser printer, it may be necessary to press the Form Feed button to eject the paper. If this doesn't produce the copy, press the On/Off Line button to take the printer off-line, and then press the Form Feed button.

EXERCISES

You will need some additional files for use in the exercises in the balance of this lesson. Use the COPY CON procedure you learned above. You should still be logged into drive A: and using the EXERCISES disk.

- Create three files and name them ADD1.LST, ADD2.LST, and ADD3.LST. Each of these should be an address listing for one of your friends or relatives. It should include the name, address, city, state, ZIP, and the phone number. These will eventually be added to your "address book" file. Remember to enter either the <Ctrl-Z> or the <F6> to close each file.

- Create a file and name it SCHED.NOV. This should be a schedule for a day to start your holiday shopping. It should list approximate times for the day's activities, at least four or five stores you intend to visit, and a tentative gift you might look for at each store. There should be at least seven entries.
- Create another file and name it SCHED.JUN. In this schedule create an itinerary for a vacation to one of the national parks. It should include departure time, method of travel, activities, and arrival home time.

COPYING TO A DIRECTORY

- Change to the ADDBOOK directory. You are going to create a new file in this directory.
- Use COPY CON to create a new file named ADDRESS.SUM. Enter the text shown in Figure 3.6 for the file. Remember to press **<ENTER>** at the end of each line.

```
Address Book Summary
This book is the property of
(your name)
If found, please call the
following number:
(Your phone number)
```

Figure 3.6
Text for ADDRESS.SUM

- List a directory. Your new file appears in the ADDBOOK directory as shown in Figure 3.7.

```
A:\ADDBOOK>dir

 Volume in drive A is EXERCISES
 Volume Serial Number is 0F30-16D4
 Directory of A:\ADDBOOK

.            <DIR>      11-02-93   5:26p
..           <DIR>      11-02-93   5:26p
ADDRESS  SUM        121 11-02-93   5:33p
        3 file(s)          121 bytes
                        350208 bytes free

A:\ADDBOOK>
```

Figure 3.7
Directory of A:\ADDBOOK

- Key CD\ and press **<ENTER>**. This will return you to the root directory of the disk.

```
 Volume in drive A is EXERCISES
 Volume Serial Number is 0F30-16D4
 Directory of A:\

WORDPROC     <DIR>      11-02-93   5:25p
SPRDSHT      <DIR>      11-02-93   5:26p
ADDBOOK      <DIR>      11-02-93   5:26p
PRACTICE     <DIR>      11-02-93   5:26p
EXAMP1   TXT        245 11-03-93   8:47a
EXAMP2   TXT        254 11-03-93   8:48a
ADD1     LST         55 11-03-93   8:49a
ADD2     LST         69 11-03-93   8:49a
ADD3     LST         67 11-03-93   8:50a
SCHED    NOV        162 11-03-93   8:50a
SCHED    JUN        138 11-03-93   8:52a
       11 file(s)          990 bytes
                        350208 bytes free

A:\>
```

Figure 3.8
Directory of root of drive A:

- List a directory of the root. As you can see in Figure 3.8, your new file does not show because it is part of the ADDBOOK subdirectory.

CHANGING FILE NAMES

While you are in the root directory, you are going to copy some of the files, change the file names, combine files, and then copy some of these files to the new directories.

You cannot have two files on a disk or in a directory with exactly the same name. If you wish to keep the original copy, you must change the name slightly when you use the COPY command. The original is sometimes known as a *backup* copy.

As an example, assume that you want to copy a file on drive B named FIRSTDOC so that you can edit it. If you intend to copy the file into the same directory, you have to change the name of the copy. The command to copy the file to the same location with a different name would be:

```
COPY B:FIRSTDOC B:SECNDDOC
```

- You should still be at the A:\> prompt with the EXERCISES disk in drive A:.
- Key **COPY EXAMP1.TXT EXAMP1A.TXT** and press **<ENTER>**.
- List a directory. Both EXAMP1.TXT and EXAMP1A.TXT should be listed in the directory.

NOTE

NOTE: If you are copying files on the presently logged drive, it is not necessary to use the drive designator as part of the command. However, be extremely careful when copying files to the same disk and using a new name. DOS will not check to see if the new name is presently in use by another file. If a file does exist with the new name you wish to use, DOS will simply replace the existing file with the new one.

COPYING TO A SECOND DISK

Transferring a copy of one file or a group of files from one disk to another is the most frequent use of the COPY command. If you create files on a hard disk, they should be periodically transferred to a floppy for storage. This is known as making a *backup* or *backing up* your files. If the hard disk crashes, loses its files, is corrupted by a virus, or is accidentally deleted, the backup files can be copied back to their original location. The only additional work would be updating any information from the current date to the date of the last backup.

Whenever you buy a new application program, you should always make copies of the disks. The originals should be stored in a safe place and the backups used to install the program.

The procedure for copying a file from one disk (or the hard drive) to another disk is as follows:

1. Type the command (COPY).
2. Type the drive designator of the file to be copied.

NOTE

NOTE: Since no name change was made for the new copy, only the destination drive designator was necessary. The new file will have the same name as the old file.

3. Type the name of the file.
4. Type the drive designator to which the file is to be copied.
5. Type the file name or the new name if you are making a change in the name.

If you have only one floppy drive, you can copy both from and to drive A:. The computer will prompt you when to switch disks.

- Place your EXERCISES disk in drive A:.
- Place your EXERBAK disk in drive B: or keep it on hand to use when prompted.
- Key **COPY A:EXAMP1.TXT B:** and press **<ENTER>**.

On a two-floppy system, the light beside drive A: will light up while it copies the file into memory. Then the light beside drive B: will light up while the computer writes the file from memory to the disk in drive B:.

If you are using a single floppy system, the light by drive A: will light up while it reads the file into memory. The computer will prompt you to switch disks, and then the red light will go on again while it writes the copy to the backup disk.

- Check the directory on the EXERBAK disk to see that the file was copied.

USING WILDCARDS

Earlier you used wildcards to list a directory of names with a common feature. You can also use the wildcard to help in copying files. You created three small files with information for the address book. They had a common extension, .LST.

- Make sure the EXERCISES disk is in drive A:.
- Key **COPY A:*.LST B:** and press **<ENTER>**.
- If necessary, follow the same procedure above for switching disks.
- List a directory of the EXERBAK disk to verify that the three files have been copied.
- Use the TYPE command to verify that the three new files are actually copies of the three files you created.

CONCATENATING AND APPENDING FILES

The COPY command can also be used to combine two or more files into one larger file. When two files are combined and the resulting

larger file is given a new name, the process is called **concatenating**. If you do not give the larger file a new name, the second file listed in the command will be added to the end of the first. This process is called **appending**.

- Log to drive A: if you are not already there. Check that your EXERCISES disk is in drive A:.
- Key **COPY ADD1.LST + ADD2.LST ADD.MAS** and press **<ENTER>**. The computer lists the two files and then states: **1 file(s) copied**.
- Use the TYPE command to view the contents of the new file ADD.MAS.

The address information that you created for your first two friends should now be combined into the new master address list.

This time try the appending method of combining.

- Key **COPY ADD.MAS + ADD3.LST** and press **<ENTER>**.
- Use the TYPE command to view the new ADD.MAS master address file. The third set of address information should have been added.

COPYING TO A DIRECTORY

You can use the same steps for copying to copy files to another directory or another disk. You must include the path. The procedure is as follows:

1. Type the drive designator of the file to be copied.
2. Type the name of the file.
3. Type the path of the location the file is to be copied to.
4. Type the file name to be used for the copy.

There are a couple of small exceptions to this procedure that do save a few keystrokes. If the file name is to remain the same when it is copied, the file name does not have to be repeated. Remember that file names cannot be the same when they are in the same directory. If the file is in a different directory or on a different disk, the names can be identical.

The second small exception is that if you are copying a file from the current logged drive, you do not have to specify where the file is coming from. (You are already there.) If you are copying material from another disk, directory, or drive to the current logged drive (the one you are in), you do not have to specify the path to the current logged drive. Some examples will help.

- Key **COPY ADD.MAS A:\ADDBOOK** and press **<ENTER>**.

The ADD.MAS file you wanted to copy was in the root directory. Since you were *in* the root directory you did not specify the drive designator when you specified the file to be copied.

- Key **COPY ADD*.* A:\ADDBOOK** and press **<ENTER>**.
- Log to the ADDBOOK directory. List a directory. It should resemble Figure 3.9.

By using ADD*.* you copied all files in the root starting with ADD to the ADDBOOK directory. Notice that ADD.MAS, which was already in the ADDBOOK subdirectory, does not appear a second time. Since two files cannot have the same name in a directory or subdirectory, DOS copied only those that did not already appear in the ADDBOOK directory.

Figure 3.9
Directory of ADDBOOK

```
A:\ADDBOOK>dir

 Volume in drive A is EXERCISES
 Volume Serial Number is 0F30-16D4
 Directory of A:\ADDBOOK

.            <DIR>          11-02-93   5:26p
..           <DIR>          11-02-93   5:26p
ADDRESS  SUM                121 11-02-93   5:33p
ADD      MAS                192 11-03-93   8:59a
ADD1     LST                 55 11-03-93   8:49a
ADD2     LST                 69 11-03-93   8:49a
ADD3     LST                 67 11-03-93   8:50a
        7 file(s)             504 bytes
                           344064 bytes free

A:\ADDBOOK>
```

- Log to the PRACTICE directory.
- Key **COPY A:\SCHED.*** and press .

This time you were already logged into the PRACTICE directory and wanted to copy the two SCHED files from the root directory. You had to enter the drive designator for the root (A:\) and the name of the files to be copied. You did not have to specify the PRACTICE directory because it was already the current logged drive.

This time you are going to copy files from the ADDBOOK directory to the PRACTICE directory and do it from the root directory.

- Key **CD** and press **<ENTER>**. This always returns you to the root.
- Key **COPY A:\ADDBOOK\ADD*.* A:\PRACTICE** and press **<ENTER>**.
- Key **COPY SCHED.NOV A:\PRACTICE\HOLIDAY.LST** and press **<ENTER>**.
- Log to the PRACTICE directory and list the files. Do a print screen. It should be similar to Figure 3.10.

Figure 3.10
Directory of PRACTICE

```
A:\PRACTICE>dir

 Volume in drive A is EXERCISES
 Volume Serial Number is 0F30-16D4
 Directory of A:\PRACTICE

.            <DIR>          11-02-93   5:26p
..           <DIR>          11-02-93   5:26p
SCHED    NOV                162 11-03-93   8:50a
SCHED    JUN                138 11-03-93   8:52a
ADDRESS  SUM                121 11-02-93   5:33p
ADD      MAS                192 11-03-93   8:59a
ADD1     LST                 55 11-03-93   8:49a
ADD2     LST                 69 11-03-93   8:49a
ADD3     LST                 67 11-03-93   8:50a
HOLIDAY  LST                162 11-03-93   8:50a
       10 file(s)             966 bytes
                           335872 bytes free

A:\PRACTICE>
```

PRINTING A LISTING

Remember that you can redirect the output from the screen to the printer by using >PRN. You can use the same procedure to get a hard copy of the subdirectory listing.

■ Key **DIR\PRACTICE >PRN** and press **<ENTER>**.

For a hard copy of the root directory, log to that directory and key **DIR > PRN**.

REMOVING A DIRECTORY

To remove a directory, you must first remove (delete) all the files in that directory. Files can be removed by using the DEL command (delete) at the command prompt or by using the Shell. You will learn to delete using the Shell in Lesson 5.

Once all the files in a directory have been removed, the directory name can be removed. The steps for removing a directory are:

1. Log to the designated directory.
2. Delete all files in that directory.
3. Log back from the designated directory to the next higher directory on the tree.
4. Remove (delete) the name of the directory.

Remember your image of an upside-down tree with the root directory being the highest, or main directory, from which the others are created. Think of the root level as level 1, the directories off the root as level 2, the files in those directories as level 3, etc.

You currently have a subdirectory, WORDPROC, that has no files in it. You will use the WORDPROC directory for practice. The command to remove a directory is **RD** (*remove directory*) or RMDIR, followed by a backslash and the name of the directory to be removed.

■ Log to the root directory of the disk in drive A:.

■ Key **RD\WORDPROC** and press **<ENTER>**.

■ List a directory of the root, A:\ to see if the WORDPROC directory has been removed. If for any reason it is still there, try using RMDIR, the backslash, and the name of the directory.

NOTE

NOTE: DOS 6 provides a new command, DELTREE, which will delete both files and directory in a single command. DELTREE is not a Shell option; it must be done from the prompt. It is fast and thorough if you are willing to be very cautious. It may delete files that you are not aware of, such as hidden files. DELTREE will be discussed more completely in Lesson 10.

PRACTICE

Try the following exercises. Use your EXERCISES disk for these problems.

EXERCISE 3-1

1. Change to the PRACTICE directory.
2. Copy the three EXAMP files to this directory.
3. List the directory to make sure they have been copied.
4. Print the screen.

EXERCISE 3–2

1. Copy all ADD files from the root to the ADDBOOK directory.
2. List all the files in the ADDBOOK directory.
3. Do a print screen of the list.

EXERCISE 3–3

1. Make a new directory. Name it SUMSCHED.
2. Create a new file in this directory and name it ITINERY. Put the following text into the file:

```
Summer Vacation Possibilities
Specifications:
Time length: 4 - 6 weeks
Transportation: Plane + rental car
Destination: ???
Money: ???
```

3. Copy the SCHED.JUN file from the root directory.
4. Append SCHED.JUN to the ITINERY file.
5. Print a copy of the ITINERY file to the printer.

EXERCISE 3–4

1. Remove the directory SPRDSHT from the root of drive A:.

EXERCISE 3–5

1. Change to the DOS directory on drive C:.
2. Print a listing of the files in the DOS directory.

EXERCISE 3–6

1. Change to the root directory of drive A:.
2. Copy the ADD.MAS file and give the new file the name PRIVATE.LST.

REVIEW

SECTION A

Vocabulary

The following words and phrases were found in this lesson. Find each of these in the glossary in *Appendix A* and define them.

Appending	COPY	MD
Backslash (\)	Ctrl-Z	PRN
CD	Device	RD
Concatenating	F6	TYPE

SECTION B

True/False

In the blank before each sentence, place a **T** if the statement is true and an **F** if the statement is false.

_____ 1. Wildcards can be used to display the names of files or to print a group of files.

_____ 2. The prompt PG indicates when you are in the root directory.

_____ 3. The backslash denotes the change between levels of directories or files.

_____ 4. When you wish to delete a directory, you delete the directory name and then the files in the directory.

_____ 5. File names and volume names can use up to eleven letters or numbers.

_____ 6. TYPE MENU.FRM PRN will print the file.

_____ 7. When copying, it is not always necessary to indicate the drive designator.

_____ 8. You can display the content of a file by using the TYPE command.

_____ 9. Concatenating two files gives them a new file name.

_____ 10. Ctrl-Z ends creation of a file.

REVIEW

SECTION C

Commands

Write the commands you would use for the following situations. Assume that the DOS files are in a subdirectory named DOS on a hard disk system or drive A: of a floppy system. It is not necessary to enter these problems into the computer.

1. Clear the screen, FORMAT a disk in drive A: (drive B: if you are using a floppy system) and add the system tracks, list a directory, and print the screen.

2. Log to drive A: (hard disk system) or drive B: (floppy system). Create a PATH to the DOS files, and FORMAT a disk with the system tracks and a volume label of HSINVENTORY.

3. You want to format a floppy and give it the volume name MAILING. You want to create two directories on this floppy named PERSONAL and BUSINESS. What are the steps and commands you would use?

4. For preliminary data for the MAILING floppy that was created in problem 3, it is necessary to copy the ADDRESS.SUM file from the ADDBOOK subdirectory on the EXERCISES disk to the PERSONAL subdirectory on the new MAILING disk. Copy the ADD.MAS file from the ADDBOOK subdirectory to the BUSINESS subdirectory on the new MAILING floppy. Show the steps and commands you would use.

LESSON 4

Exploring the DOS Shell

LEARNING OBJECTIVES

In this lesson you will:

- Define the DOS Shell
- Move within the Shell using the keyboard
- Use the mouse
- Explore menus and commands
- Change the views of the Shell
- Exit the Shell

VOCABULARY

Watch for the following words and phrases in this lesson:

Dialog box	Mouse pointer	Selection cursor
Dual File Lists	Scroll bar	Shell
Ellipsis	Select	

OVERVIEW

All DOS commands can be initiated from the command prompt as you have done in the last few lessons. Not all commands and actions can be done from the Shell, but for those that can, the Shell provides a quick visual means of dealing with one file or a group of files in one operation.

To take the fullest advantage of the features provided by the Shell, it is essential to feel comfortable with and knowledgeable about the information provided and understand the means for moving between the various parts. The Shell provides a great deal of information sorted into individual windows. This information includes a list of files, a list of directories, some commands, and some things you've never seen before and will probably never use. At first glance, the Shell can be rather confusing and intimidating. This lesson is intended to help you sort out the various parts.

WHAT IS A SHELL?

The DOS **Shell** is a series of menus that provide a visual alternative to the information shown when you enter commands using the command prompt. The Shell reduces the necessity of knowing the syntax for each command. It can display directories, drives, and files, and permits you to delete, copy, move, run, rename, etc. at the click of a mouse button.

You can run an application program from within the DOS Shell, and you can switch between the application program and the DOS Shell commands without leaving either one.

Let's start by calling up the DOS Shell to show you how it looks on the screen.

- Boot up the computer to the C:\> prompt.
- Key **DOSSHELL** and press **<ENTER>**.

With minor variations, your screen should correspond to Figure 4.1. If your screen does not show the four windows plus information at the top, do the following:

1. Press **Alt+V**, tap the down arrow key three times to Program/File Lists, and press **<ENTER>**.
2. Press **Alt+O**. The Enable Task Swapper should have a small mark in the left margin. If it does not, tap the down arrow key four times and press **<ENTER>** to activate it.

SHELL BASICS

The first order of business is to familiarize yourself with the screen. As you read the explanation below for each area, find that area on

the screen and familiarize yourself with the content. Then you will be ready to learn how to select commands using the keyboard or the mouse.

SCREEN DISPLAY

Figure 4.2 shows the top four lines of the screen display. Included in this area of the screen are the following:

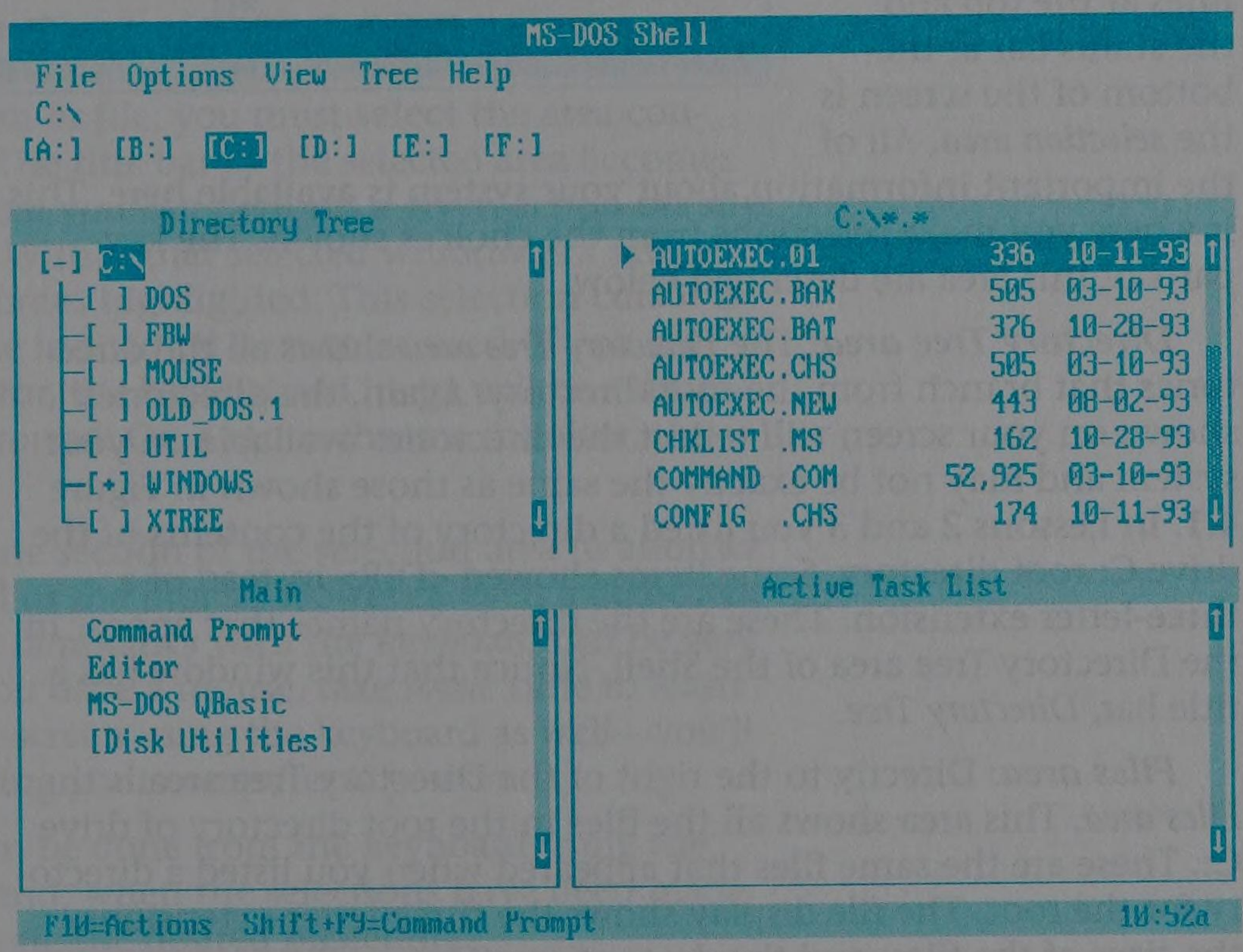


Figure 4.1
DOS Shell screen

Title bar: The title bar is the top line on the screen. It identifies the screen contents. Occasionally, other programs and utilities will run on the screen. Each appears in a window and has its own unique title bar.

Menu bar: The menu bar is directly beneath the title bar. The menu bar lists the various menus available for this screen. Each menu contains various commands and choices that can be selected to carry out specific tasks. You will explore these menus in a few moments.

Current drive/directory: The third line displays the current drive and directory if one has been selected. Figure 4.2 displays the root directory C:\. This line changes as you change drives or directories.

Drives area: This line lists the various drives available on your particular system. There will be the drive A:, possibly drive B:, and drive C:. Whether or not there are any others will depend on the capacity and division of your hard drive. The drives list shown in Figure 4.2 is for a system with two floppy drives (A: and B:) and a hard disk that has been divided into four parts (C:, D:, E:, and F:). Selecting one of the available drive designators is equivalent to typing the drive designator at the command prompt and pressing the <ENTER> key.

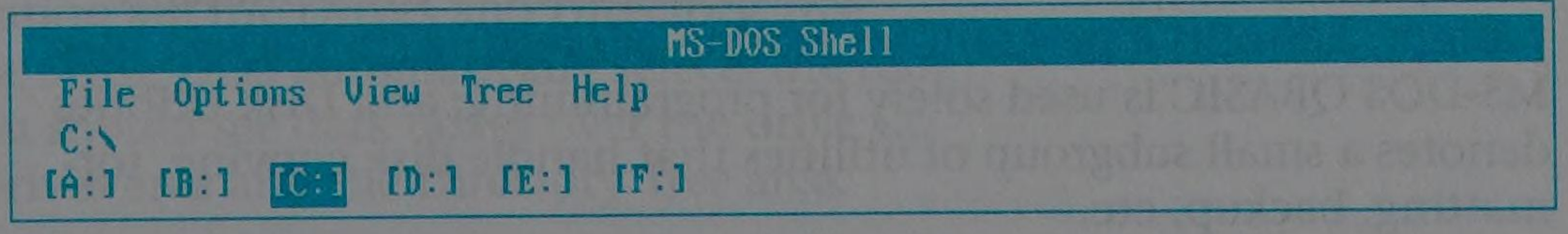
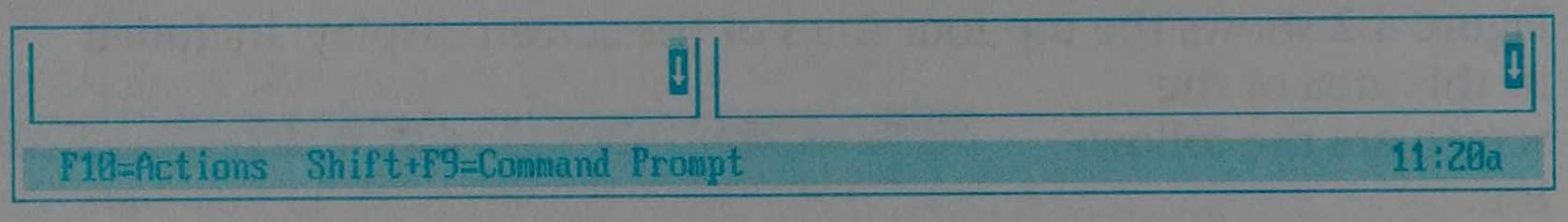


Figure 4.2
Top lines of screen display

Figure 4.3 shows another area of the screen that supplies you with important information. The *status bar* is the bottom line on the screen. It generally remains the same no matter what you are doing elsewhere on the screen. It reminds you of what you can do with two important function keys. The F10 key will move the selection cursor to the menu bar to activate one of the menus. Shift+F9 will take you out of the Shell and to the command prompt.

Figure 4.3
Status bar



Between the four lines at the top and the status bar at the bottom of the screen is the *selection area*. All of the important information about your system is available here. This is where you make selections from the choices shown. The key parts of this area are described below.

Directory Tree area: The *Directory Tree area* shows all the directories that branch from the root directory. Again, the directories shown on your screen will reflect the directories available on your system and may not be exactly the same as those shown in Figure 4.1. In Lessons 2 and 3 you listed a directory of the contents of the drive C: root directory. Some items showed <DIR> instead of a three-letter extension. These are the directory names that appear in the Directory Tree area of the Shell. Notice that this window has a title bar, *Directory Tree*.

Files area: Directly to the right of the Directory Tree area is the *Files area*. This area shows all the files in the root directory of drive C:. These are the same files that appeared when you listed a directory for the root. The file display shows the three-letter extensions, the sizes of the files, and the dates of creation or editing, just as when you listed the files from the root directory using the DIR command. If you have a hard copy of the root directory, compare it with the items listed in this window.

Notice that the title bar for this area shows the directory name that contains these files. The C:*.* indicates all the files (the wildcards indicate all names and all extensions) for drive C:\.

Program area: The window on the lower left is called the *Program area*. It lists programs or groups of programs that are available. At the moment, the menu bar displays Main. This title designates the group of programs listed below the title bar: Command Prompt will take you out of the Shell and back to the command prompt; Editor is a program for editing or creating simple text files; MS-DOS QBASIC is used solely for programming; and Disk Utilities denotes a small subgroup of utilities that handle disk copying, formatting, backup, etc.

Active Task List: This is the area on the lower right side of the screen. At the moment it is empty. As you run various programs or tasks within the Shell, the names of currently running programs

will appear in this window. One important item to remember is that when you want to exit from the Shell and shut down the computer for the day, you MUST be certain to close down (exit) each item listed in the Task List area first. DOS 6 will not let you exit the Shell before doing the necessary housekeeping chores. Merely turning the computer off is not the proper or safe way to guard your data.

SELECTING WITH THE KEYBOARD

To choose a particular item or file, you must **select** the area containing that item or file. The title bar of the selected area becomes highlighted, indicating that you can perform a given action on any of the items in that area. Within that selected window is a **selection cursor** that also becomes highlighted. This selection cursor is then used to highlight the individual item to be used. If you are working on a color monitor, the highlighted items will be a different color from the background. On a monochrome monitor, the highlight is black.

You can move from one section of the selection area to another using either the keyboard or the mouse. However, even a dedicated mouse user will find that familiarity with the keyboard can be very convenient at times. If you have a mouse, take some time to learn how to move around the screen using the keyboard as well—you'll feel more comfortable using your computer if you do.

All of the selecting can be done from the keyboard using the Tab key, the arrow keys, and, when the selections have been made, the <ENTER> key to activate the desired procedure.

In the following short exercises, you will be instructed to do a particular operation, and then you will read an explanation of the results. In each instance, follow the directions for "doing" and then compare your screen with the explanation to be sure you recognize what is happening. DO NOT tap the <ENTER> key. If you do, the computer will try to activate a command or task and things might get a little confusing.

DRIVES AND DIRECTORY AREAS

Your first areas of exploration are the Drives and Directory Tree areas. When you start the Shell, DOS automatically selects the root directory on drive C:. You should see dark boxes over the drive C: designator in both the Drives area and the Directory Tree area.

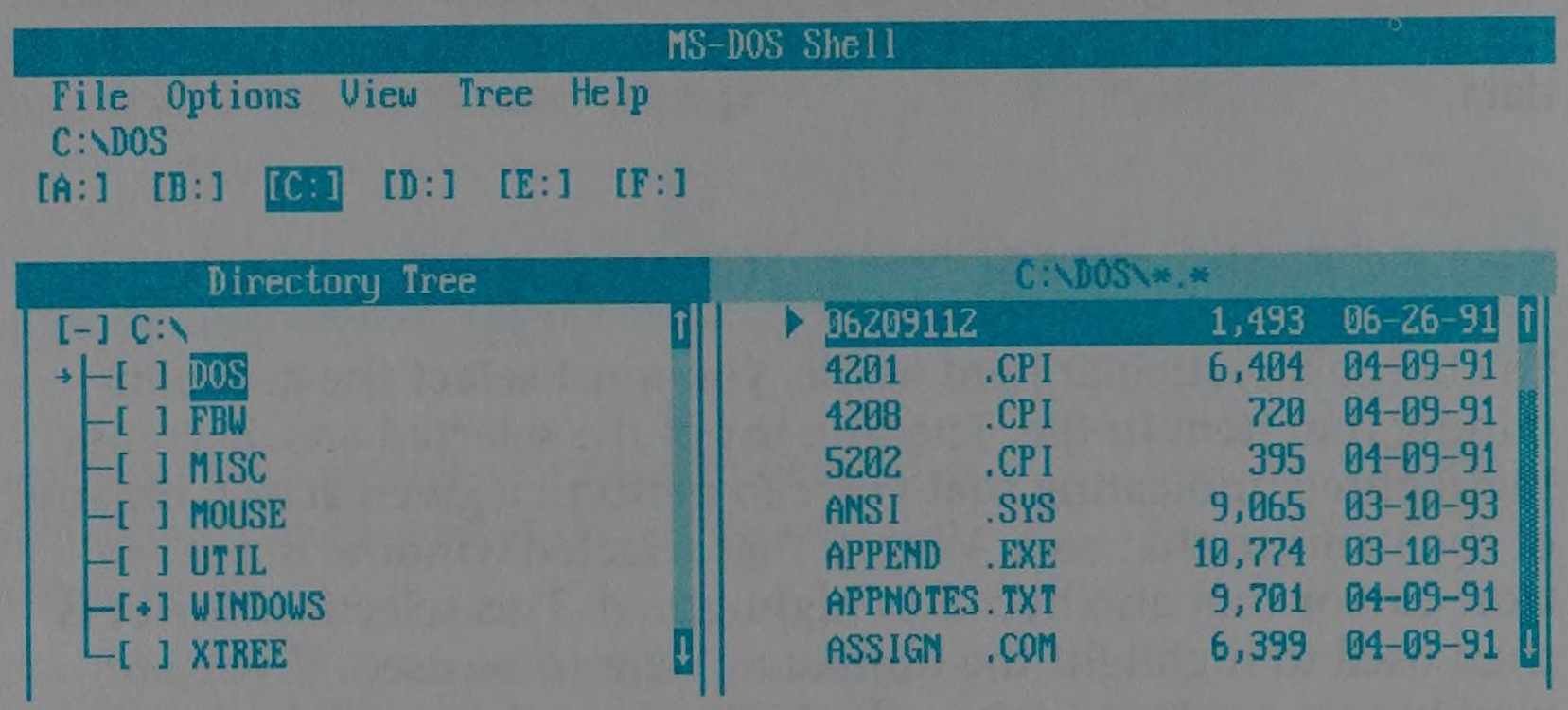
- Press the **Tab** key.

The highlight moves from the Drives line to the title bar of the Directory Tree area. The Directory Tree area has been *selected*. In

order to choose an item in an area, that area must be SELECTED and HIGHLIGHTED.

- Use the down arrow key to move the selection cursor to the DOS directory. Your screen should resemble Figure 4.4.

Figure 4.4
Directory Tree and Files area



A small arrowhead has moved down along the left edge of the directory tree to indicate which directory has been selected.

Notice the Files area. The title bar has changed to indicate the DOS directory, and the list of files has changed to include all the files in the DOS directory. These are the same files you saw when you listed the DOS directory at the command prompt.

- Use the up or down arrow key to move to a different directory, if you have one. Note the changes in the Files area.
- Move the selection cursor back to the DOS directory.
- Press the **Tab** key.

The highlight on the Directory Tree title bar has now moved to the title bar of the Files area. The Files area has now been *selected*. You can now use the up and down arrow keys to move the selection cursor to the various file names.

Notice that the small arrowhead that indicated the directory in the Directory Tree area has now moved to the Files area and is indicating where the selection cursor is located.

- Use the up and down arrow keys and move the selection cursor to several file names.

SCROLL BAR

It is time to explore the **scroll bar**, which helps you to move around in an area. The scroll bar is a narrow bar at the right side of each area, with an up-pointing arrow at the top and a down-pointing arrow at the bottom (see Figure 4.5). Whenever you see a window with a scroll bar, it means that there are more items in that window than can be displayed on the screen.

- Use the down arrow key to move to the bottom of the Files area list. Keep pressing the down arrow key until the list scrolls off the top of the window.

■ Press the **PgDn** key. The list of files shows the next windowful of file names.

Notice what happens in the scroll bar as you move through the list of files. The *scroll box*, the light-colored rectangle on the scroll bar, moves downward along the bar to show you your relative position in the file list.

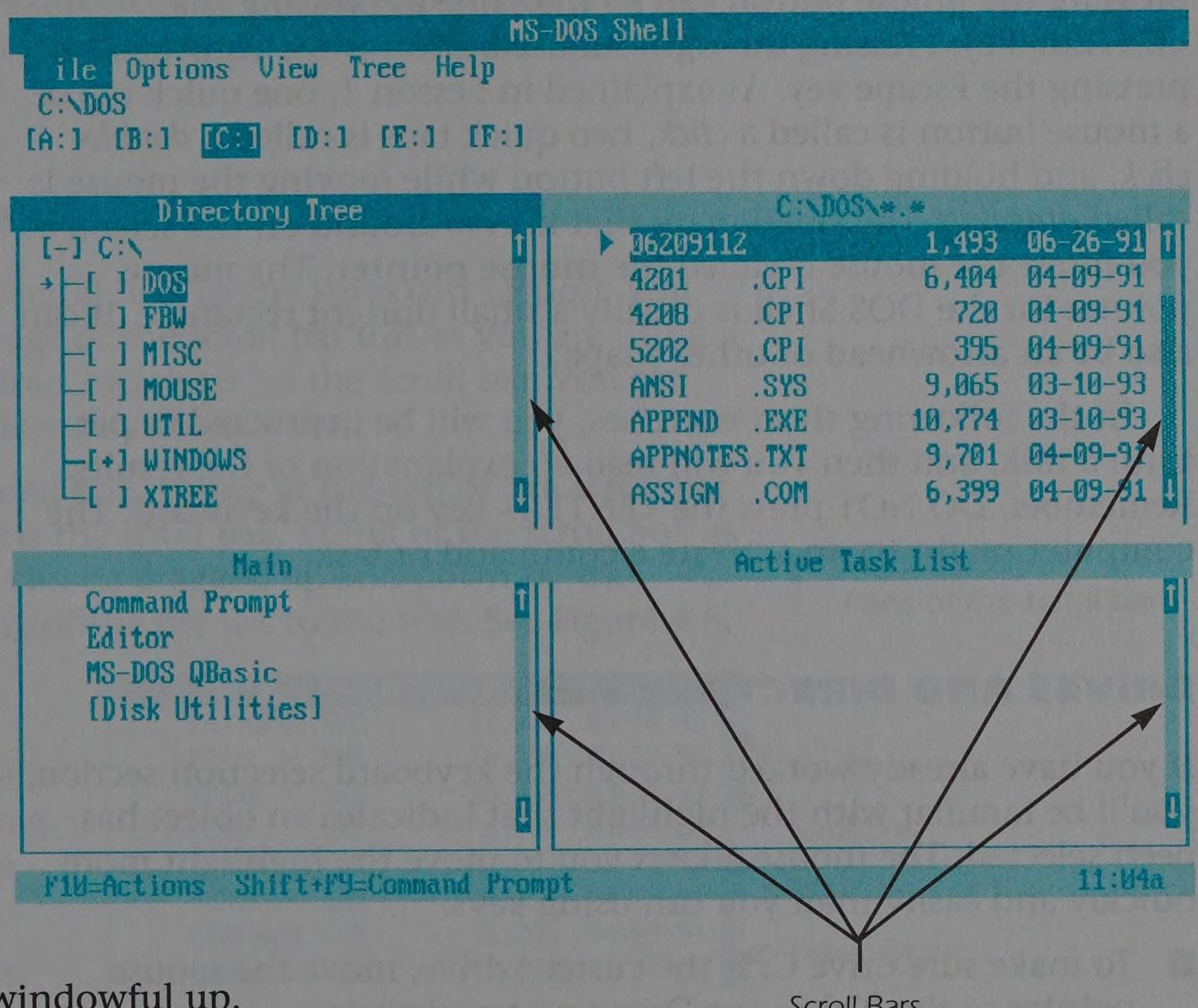
■ Press the **End** key. The list in the Files area jumps to the last file in the DOS list. The scroll box is all the way at the bottom of the scroll bar.

■ Press the **PgUp** key. The list in the window shows the next windowful up.

■ Press the **Home** key. The list of files jumps back to the first file in the list.

You can use the cursor pad keys to scroll up and down through the list of files just as you can use the cursor keys in a word processing program.

Figure 4.5
Scroll bar



SELECTING WITH THE MOUSE

If you have been practicing using the keyboard and now want to experiment with the mouse, perform the following housekeeping tasks to return your screen to its original settings:

1. Press the **Tab** key three times. The Directory Tree title bar is highlighted.
2. Use up arrow until C:\ is highlighted.
3. Press the **Tab** key three times. The highlight should be in the Drives area resting on drive [C:].

You can move from one section of the selection area to another by using the mouse. The mouse usually has two buttons. When you place your hand on the mouse, the first two fingers of your right (or left) hand fall comfortably over the two buttons.

Pressing the left button on the mouse is the equivalent of selecting the item the mouse pointer is resting on. In some instances, pressing the mouse button can be the same as pressing the <ENTER> key. Pressing the right mouse button is the equivalent of pressing the Escape key. As explained in Lesson 1, one quick tap of a mouse button is called a *click*, two quick taps is called a *double-click*, and holding down the left button while moving the mouse is called *dragging*. The small mark that moves around on the screen as you move the mouse is called the **mouse pointer**. The mouse pointer for the DOS Shell is usually a small upright rectangle. It can also be an arrowhead or other shape.

In the following short exercises, you will be instructed to perform a task, and then you will read an explanation of the results. Remember, DO NOT press the <ENTER> key on the keyboard. The computer might try to activate a command or task.

NOTE: If your mouse has three buttons, ignore the middle one for now. If you are left handed and you are the only one using the mouse, consult the documentation that came with the mouse for switching the two buttons for left-hand use.

DRIVES AND DIRECTORY AREAS

If you have already worked through the keyboard selection section, you'll be familiar with the highlight that indicates an object has been selected. The mouse allows you to move the highlight more quickly and easily than you can using keys.

- To make sure drive C: is the current drive, move the mouse pointer to the [C:] in the Drives area and click.
- Move the mouse pointer to the title bar in the Directory Tree area and click.

The highlight moves from the Drives line to the Directory Tree area. The Directory Tree area is now selected.

- Move the mouse pointer to the DOS directory and click.

Notice that the same small arrowhead appears to indicate that the directory is selected. The highlight on the DOS directory is the selection cursor. When you are using a mouse, you move the selection cursor by moving the mouse pointer and clicking rather than using the up or down arrow keys.

The Files area now shows the files in the DOS directory.

- Move the mouse pointer to a different directory and click. Note the changes in the Files area.
- Move the selection cursor back to the DOS directory and click.
- Move the mouse pointer to the title bar in the Files area, and click on the C:*.*.

The Files area has now been selected. You can now use the mouse pointer to move the selection cursor to various file names.

- Move the mouse pointer to APPEND.EXE and click.

NOTE: Unless otherwise instructed, a *click* or *double-click* refers to the left mouse button.

The selection cursor has moved to the file APPEND.EXE, and that file name is highlighted. Notice that the small arrowhead which pointed to the DOS directory in the Directory Tree area has now moved to the Files area and indicates which file has been selected.

SCROLL BAR AND MOUSE

Although you read about scroll bars in the keyboard section, you cannot really take advantage of the scroll bar unless you are using a mouse. By clicking at various locations on the scroll bar, you can move around in the window in various ways.

The small lighter colored box resting at the top of the scroll bar just under the arrowhead is the *scroll box*. Think of the scroll box as a miniature elevator that can be dragged up and down by the mouse from the beginning of the file list to the end. See Figure 4.6.

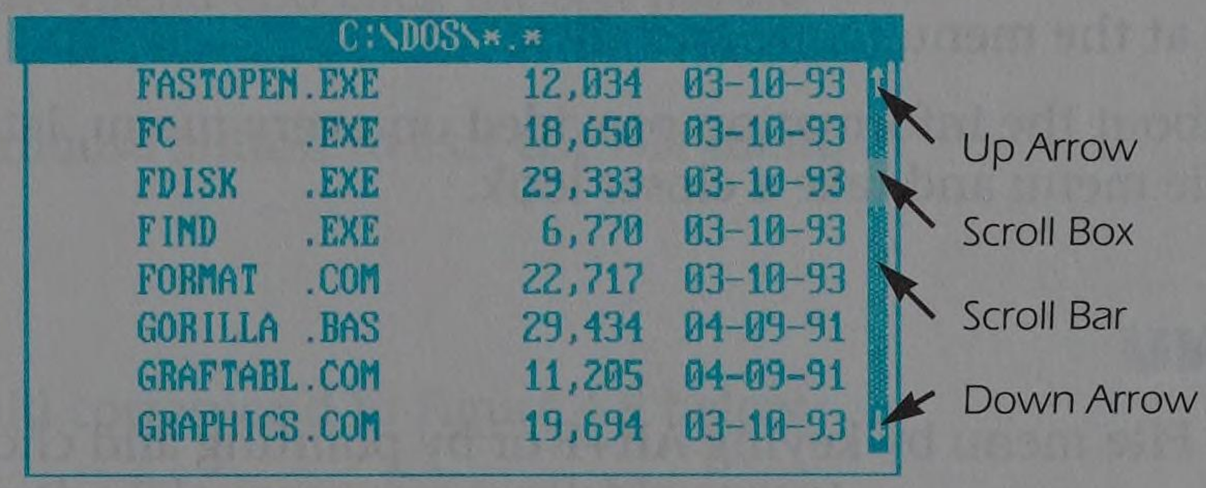


Figure 4.6
Parts of the scroll bar

- Position the mouse pointer on the scroll box, hold down the left mouse button, and drag the box to the bottom of the scroll bar.

Look at the list of files. The end of the list shows in the Files area window.

- Position the mouse pointer midway between the scroll box and the top arrow and click. Repeat two or three times.

The list of files changes and shows the next screen of files above. This is the equivalent of the PgUp key. If you position the mouse pointer between the scroll box and the bottom arrow and click, the list of files moves to the next window down.

- Position the mouse pointer on the bottom arrow marker and click once. Repeat the single clicks two or three times.

The list of files scrolls one file name at a time. If you position the mouse pointer on the top arrow and click once, the file names at the top will advance one at a time with each click.

- Position the mouse pointer on the scroll box and drag it to the top of the scroll bar.

MOVING TO OTHER PARTS OF THE SELECTION AREA

The remaining parts of the selection area—the Program area and the Active Task List area—can be selected in the same manner,

either by pressing the Tab key or pointing and clicking with the mouse. For now, we'll move back to the Directory Tree area as we begin exploring the Shell menus.

- Select the Directory Tree area.

EXPLORING THE MENUS

Five menus are listed directly below the title bar: File, Options, View, Tree, and Help. Each menu displays a list of possible choices or commands. The choices actually available will depend on which area and/or file has been selected and what task you wish to perform.

To select a menu using the keyboard, hold down the Alt key and strike the first letter of the menu. To select a menu using the mouse, point at the menu name and click.

To learn about the information provided on every menu, let's choose the File menu and take a closer look.

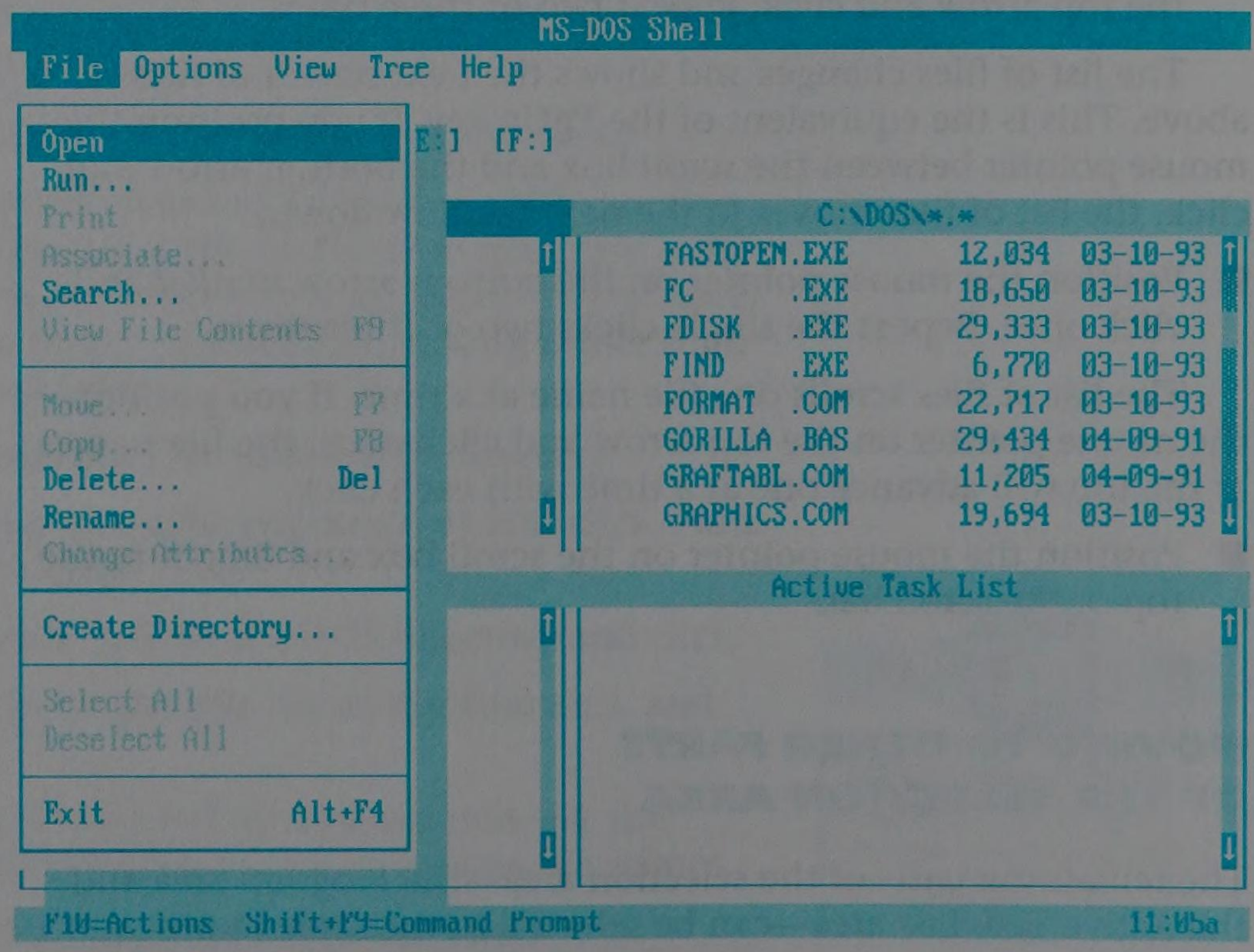
FILE MENU

- Select the **File** menu by keying **Alt+F** or by pointing and clicking.

Your screen should resemble Figure 4.7 below.

Notice that some of the choices are solid black and others are gray. The choices that are solid black are those that are available at the moment. The gray choices are not available.The Directory Tree area is the area presently selected, so the File menu shows only those choices that can be used with the directories in the Directory Tree area. These include Open, Run, Search, Delete, Rename, Create Directory, and Exit.

Figure 4.7
File menu



While you have the File menu open, let's explore some standard menu features, listed below.

1. Any menu choice followed by an **ellipsis** (the three dots that follow Run, for example) means that a **dialog box** requesting more information will appear after you choose the command.
2. The key combinations shown at the right side of the menu box are keyboard shortcuts to carry out the choice and can be used instead of highlighting the item. For example, pressing Alt+F4 allows you to exit the Shell.
3. A letter in each choice is highlighted. This letter can be used with the Alt key to select that particular choice.
4. When a menu is showing, you can select a different menu by using the arrow keys to move to the desired menu.
5. To close a menu without making a choice, press the Esc key or press the right mouse button. You can also move the mouse pointer anywhere outside the menu and click the left mouse button.

NOTE

NOTE: If you are working in monochrome, the unavailable choices may not show up on the menu.

- Press **Esc** or click the right mouse button to exit the File menu.
- Select the **Files** area.
- Select the **File** menu again.

  This time your screen should correspond to Figure 4.8 below.

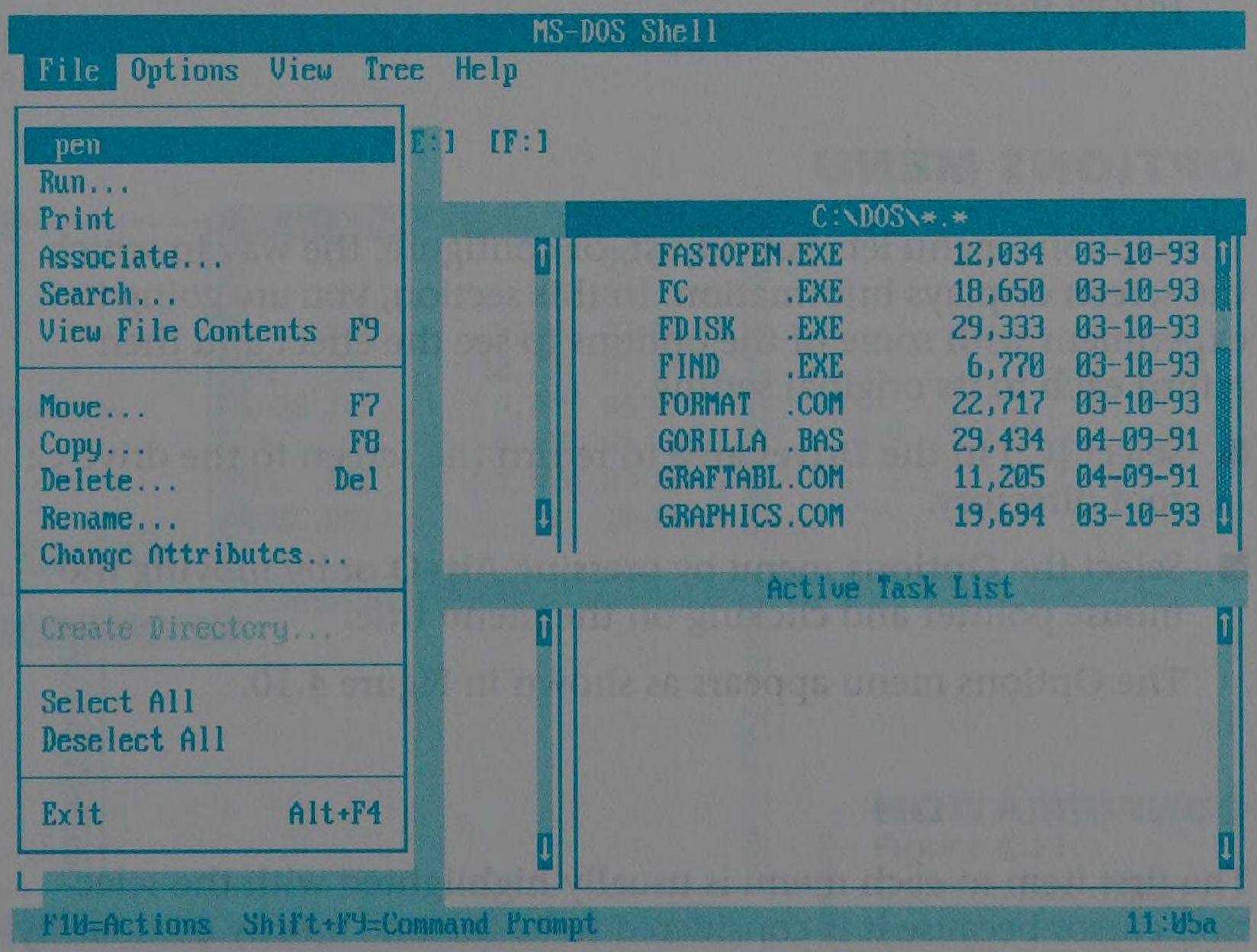
This time all the choices on the File menu are available except Create Directory. These choices are for dealing with files instead of directories as in the previous example.

Figure 4.8
File menu for Files area

- Use the right arrow key to move to each of the menus or use the Alt+letter or the mouse. Look at the various choices available.

You will experiment with a few of the choices now. The other menu choices will be discussed later in the book.

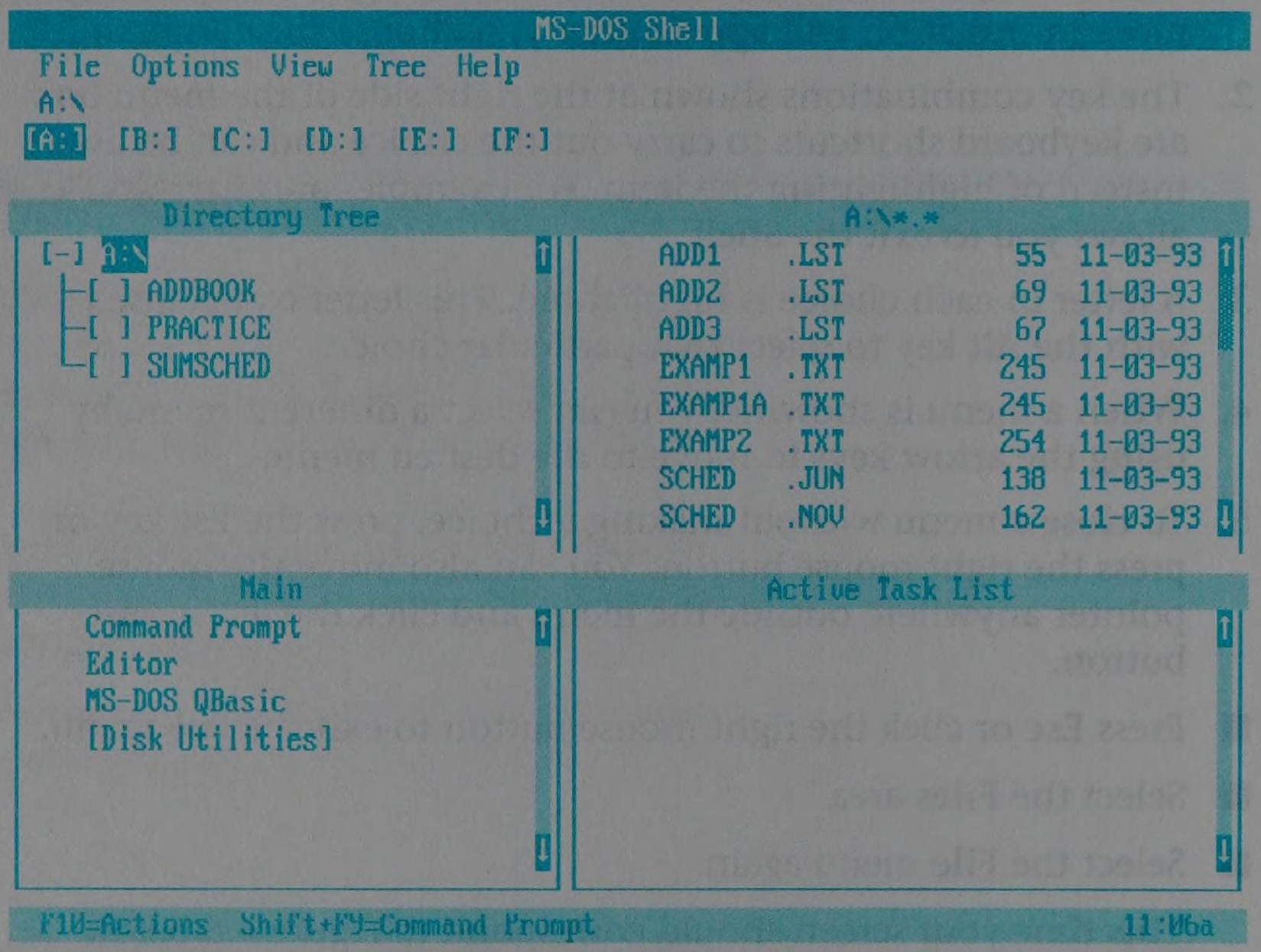
- Place your EXERCISES disk in drive A:.
- Press the **Esc** key or right mouse button to get rid of any menu that is displayed.



- Move the selection cursor to the Drives area (fourth line from top of screen) and select drive A:.

  Your screen should now look like Figure 4.9.

Figure 4.9
Files for drive A:



In the Directory Tree area you now have the root directory and the list of directories you created in Lessons 2 and 3 on the EXERCISES disk. The Files area shows all the files in the drive A: root directory.

- Select the Directory Tree area and the ADDBOOK directory.

  The files you created for this directory—ADD.MAS, ADD1.LST, ADD2.LST, ADD3.LST, and ADDRESS.SUM—are shown in the files window.

- Select each of the other directories on the A: drive and verify that the files you created at the command prompt are in their proper directories.

OPTIONS MENU

The Options menu lets you adjust, or configure, the way in which the screen displays information. In this section, you are going to experiment with some of the options to see the effect and then return each to its original setting.

- Select [C:] in the Drives area to return the screen to the drive C: root directory.
- Select the **Options** menu by pressing **Alt+O** or by moving the mouse pointer and clicking on the menu title.

  The Options menu appears as shown in Figure 4.10.

CONFIRMATION

The first item in each menu is usually highlighted with the selection cursor because it is considered to be the one mostly commonly

used or changed. Notice that the word *Confirmation* is followed by the three dots (ellipsis) that indicate a dialog box will appear requesting further information.

- Press the <ENTER> key or click on the command with the mouse. The dialog box shown in Figure 4.11 will appear.

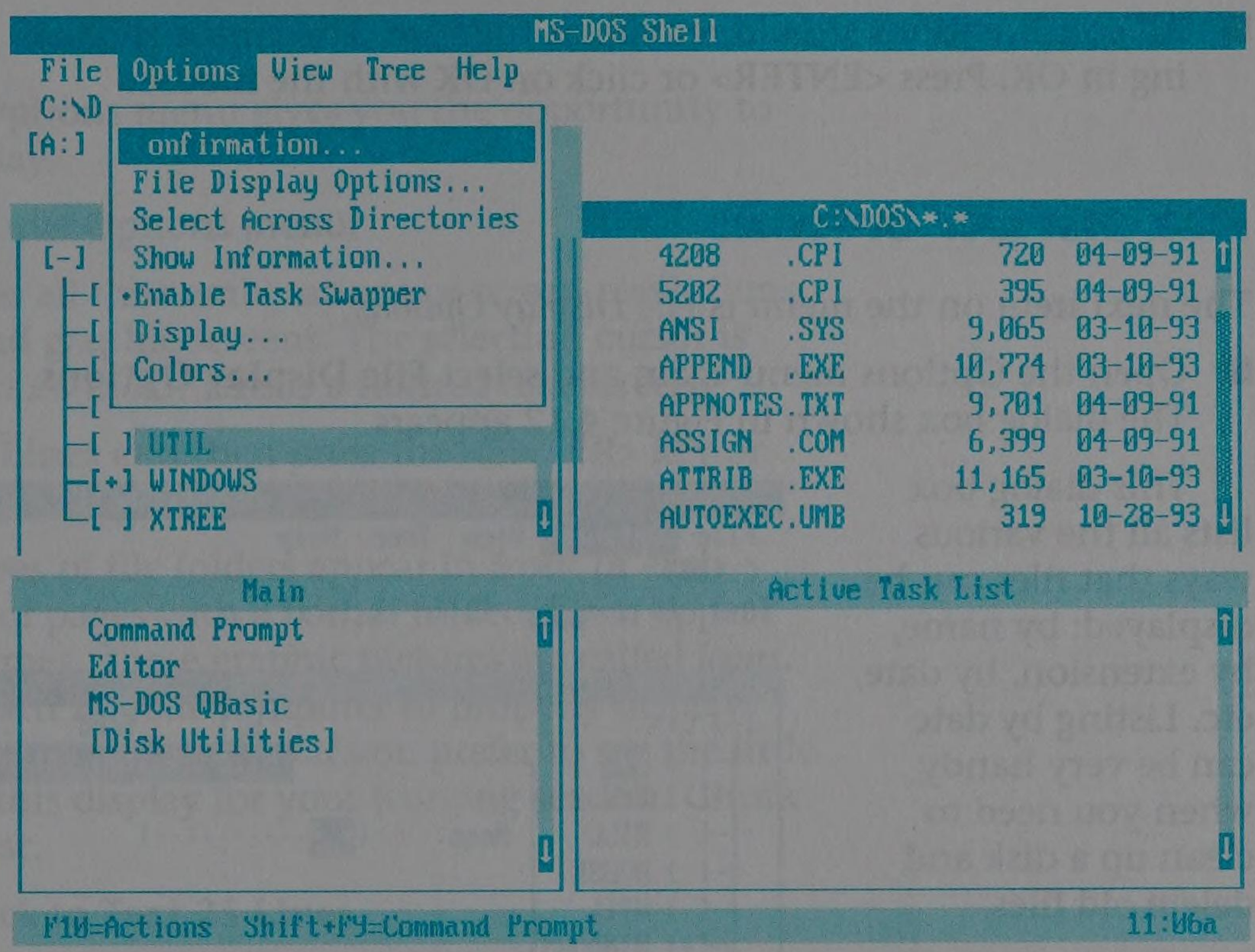


Figure 4.10
Options menu

The dialog box provides the opportunity to fine-tune the confirmation process. Each of the items has an X in front of it, meaning that it is active.

Confirmation is a preventive measure to slow you down a little and hopefully help you avoid disaster. In each of the listed areas, the computer will stop and ask you to confirm (Y/N) that you really mean what you say and that you do want the task carried out.

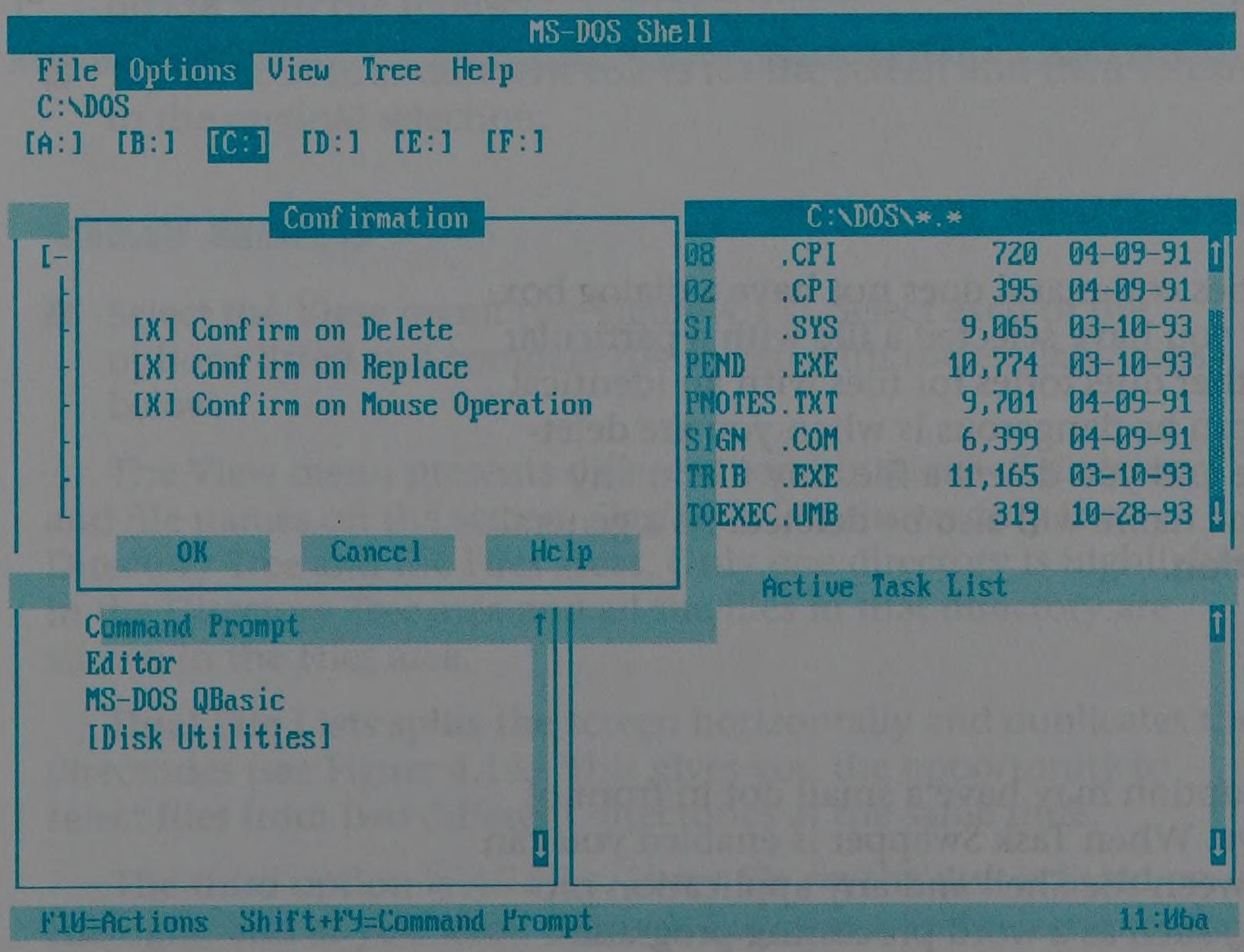


Figure 4.11
Confirmation dialog box

■ All confirmations should remain as they are. The cursor is blinking in OK. Press **<ENTER>** or click on **OK** with the mouse.

FILE DISPLAY OPTIONS

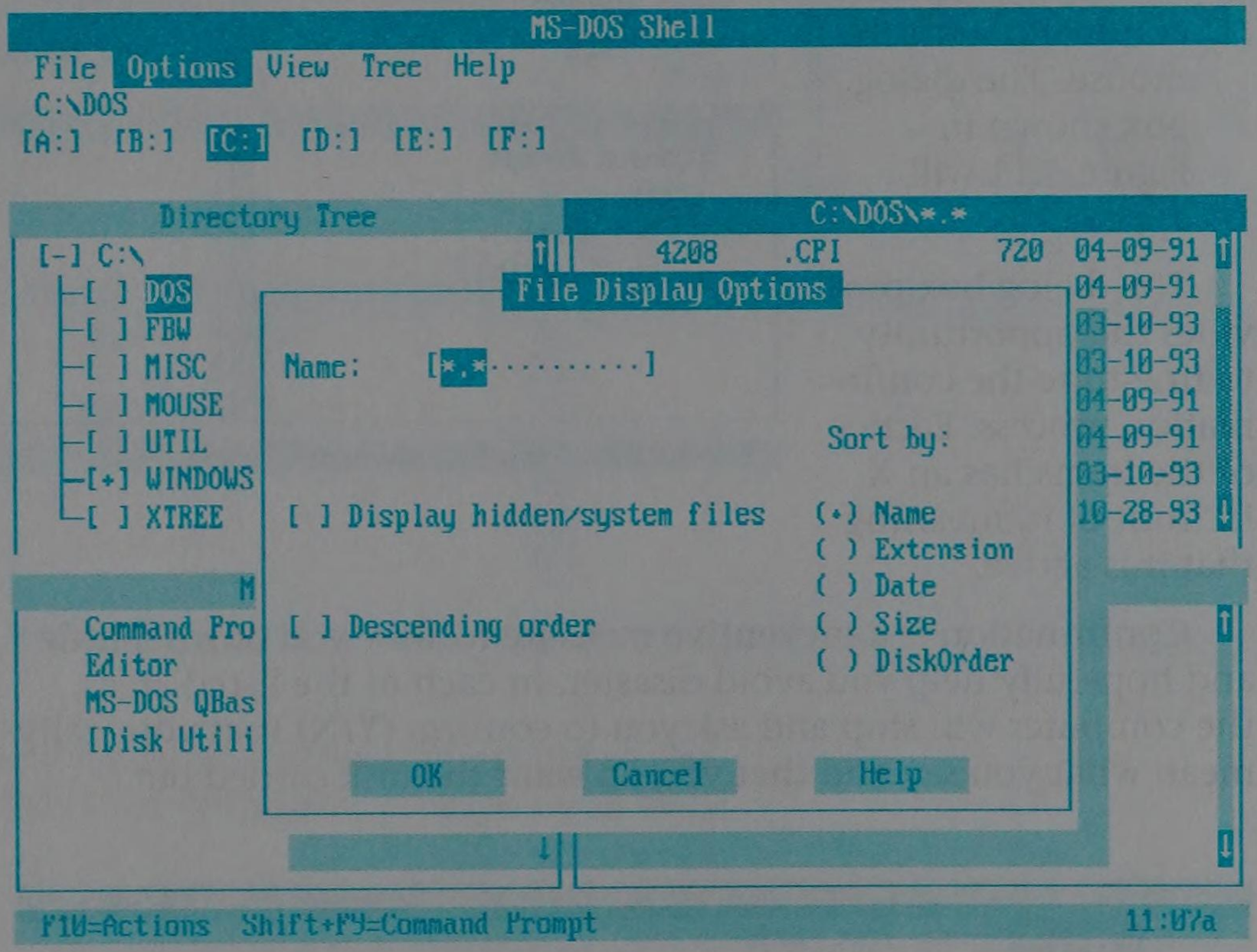
The next item on the menu is *File Display Options*.

■ Open the Options menu again and select **File Display Options**. The dialog box shown in Figure 4.12 appears.

This dialog box lists all the various ways that files can be displayed: by name, by extension, by date, etc. Listing by date can be very handy when you need to clean up a disk and delete old files.

■ Press **Esc** and return to the Options menu.

Figure 4.12
File Display Options dialog box



SELECT ACROSS DIRECTORIES

The Select Across Directories command does not have a dialog box. This merely means that if you have selected a file with a particular name, DOS will look in other directories for files with an identical name. The one time this can be dangerous is when you are deleting. If this option is active and you delete a file, any file in any other directory by the same name will also be deleted. As a general rule, do not select this option.

TASK SWAPPER

The Enable Task Swapper option may have a small dot in front of it. This indicates it is active. When Task Swapper is enabled you can switch back and forth between the Shell and any application program you may be running, such as a word processing program.

DISPLAY

The next item on the Options menu gives you the opportunity to adjust your screen display.

- Select **Display** from the Options menu.

This dialog box gives all the combinations of screen resolutions for both text screens and graphic screens. The selection cursor is probably resting on *Text 25 Lines*. This is a normal text screen.

- Select **Graphics 25 Lines** and then press the **<ENTER>** key or click on **OK**.

Small graphic pictures of file folders appear in front of each directory, and pictures of pages with a corner folded down appear in front of some file names. These graphic pictures are called *icons*. You need a graphics board in your computer to properly display icons. After this lesson is complete, and if you prefer to see the little folders, you can select this display for your working session. Check with your instructor first.

- For now, change back to **Text 25 Lines**.

COLORS

This option is fun to play with.

- Select the **Options** menu and the **Colors** option.
- Note the color selection where the cursor is presently located. Try a different color selection. Press the **<ENTER>** key or click on **OK** with the mouse.
- Try three or four different colors for the screen and then return to the original selection.

VIEW MENU

- Select the **View** menu (see Figure 4.13). Select each of the options listed and compare the screen with the explanations below.

The View menu presents different combinations of directory and file names on the screen. *Single File List* shows only the Directory Tree and the Files areas. Only one directory is highlighted in the Directory Tree area and all the files in that directory are shown in the Files area.

Dual File Lists splits the screen horizontally and duplicates the directories (see Figure 4.14). This gives you the opportunity to select files from two different directories at the same time.

The third option is *All Files*. Every file on the disk is listed on the right, and as you scroll through the names and select one, the

information for that file is shown on the left. There is no need for the directory names in this option. The files are shown alphabetically in ascending order.

The next option, *Program/File Lists*, is what you have been using. Keep in mind that the top half of this screen, the Directory Tree and Files areas, as well as the various forms of listing directories and file names, is part of the Shell's ability to help you manage the files. The bottom half of this screen represents the ability to manage programs. In the lower left window are listed a number of very helpful utilities and the lower right window will show various tasks such as word processing, spreadsheet, etc. that you may be working on at the same time (if Task Swapping is enabled).

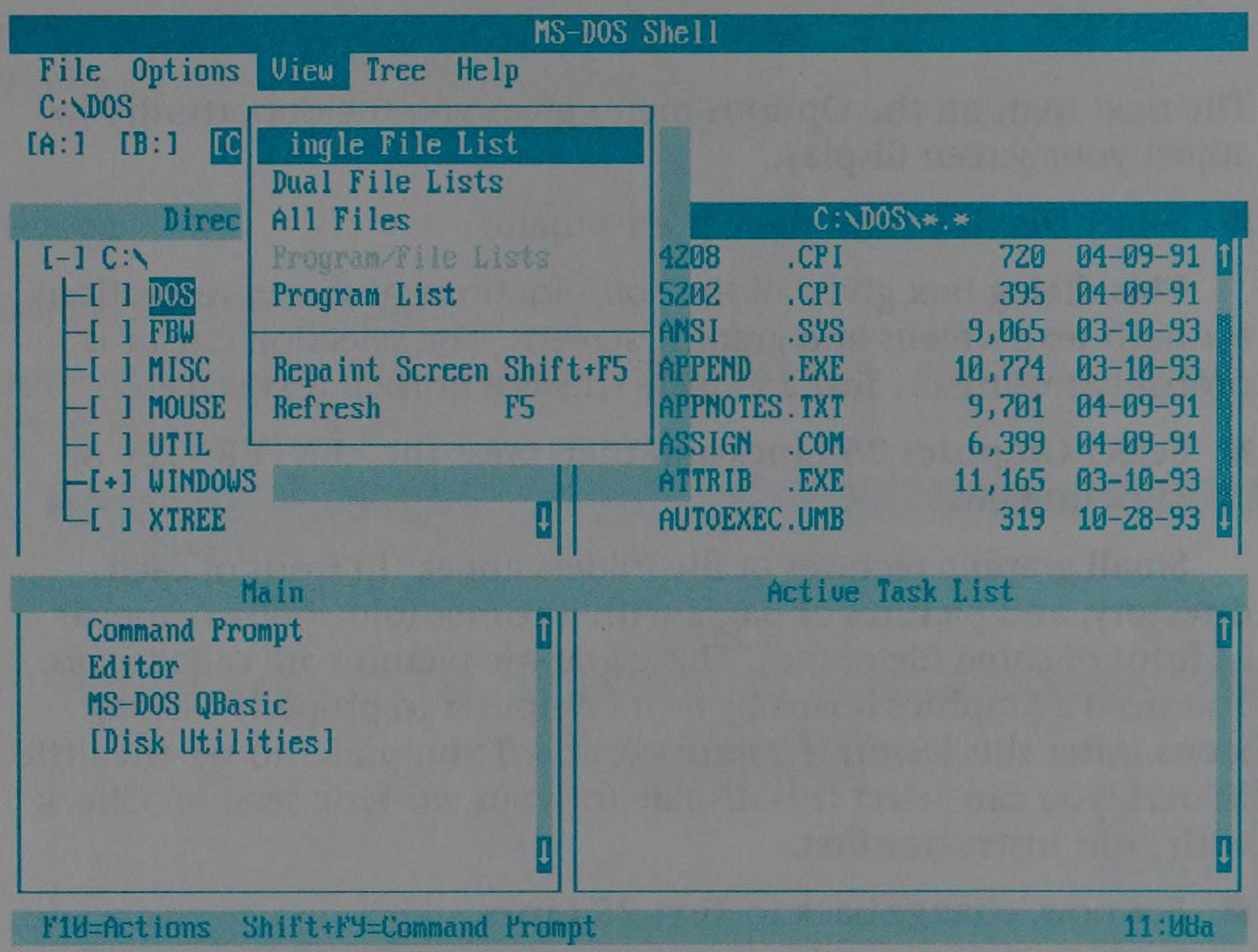


Figure 4.13
View menu

The View menu shows two further commands: Repaint and Refresh. Ignore the Repaint selection. The Refresh is a useful but somewhat more advanced concept. When you first boot up the computer and bring up the Shell, it accurately represents the directory and file structure. If you have used the Command Prompt in the lower left window to make changes in files and directories, the Shell may not always catch up and show accurately the new changes. Refresh will bring everything up to date. The F5 key will also serve the same purpose.

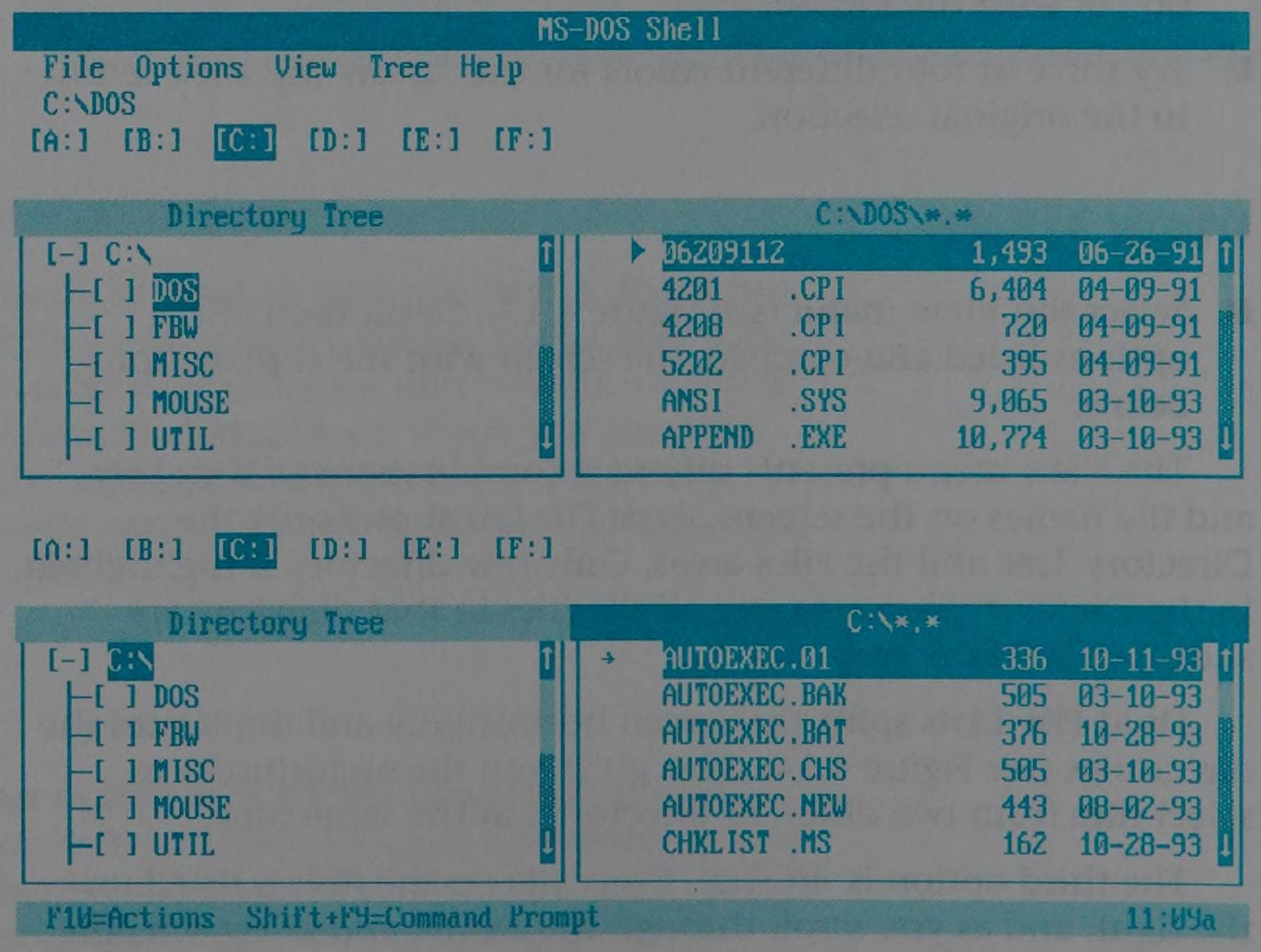


Figure 4.14
Dual File Lists option

TREE MENU

The Tree menu shows various levels of the directory structure in much the same way as Figure 1.8 in Lesson 1. The levels shown will depend on the structure and content on the drive C: root directory.

- Select the **Tree** menu and then try the various options. Experiment with other drives that might be available on your computer system.

HELP MENU

The Help menu will be discussed thoroughly in Lesson 6.

EXITING THE SHELL

1. Before exiting the DOS Shell, all tasks shown in the Active Task List must be closed. Check the Task List window to be sure it is empty.
2. Select the **File** menu.
3. Move the selection cursor to **Exit** or click on **Exit** with the mouse. Alt+F4 is the keyboard shortcut.
4. The command prompt appears. Key **EXIT** and press **<ENTER>**.
5. If the command prompt reappears with no messages, the Shell has been completely exited.

Keying EXIT at the command prompt is a precautionary safety measure. When you are switching between the Shell and the command prompt or between an application and the Shell, it is extremely easy to have two Shells in memory. If this has happened, keying EXIT at the command prompt will take you back to the Shell so you can repeat the EXIT.

- Using the above steps, exit from the Shell.

PRACTICE

Try the following exercises. Use your EXERCISES disk in drive A:. DO NOT USE THE <ENTER> KEY FOR THESE EXERCISES. (NOTE: On many printers the solid lines on the screen will not show as solid lines on the hard copy. Do not be alarmed if another character or symbol is substituted.)

EXERCISE 4–1

1. Boot up the computer. Bring up the DOS Shell.
2. Select the [A:] drive and the ADDBOOK directory.
3. Select the **Single File List** from the View menu.
4. Print the screen.

EXERCISE 4–2

1. Select the **Program/File Lists** from the View menu.
2. Select the [A:] drive and the PRACTICE directory.
3. Select the file SCHED.NOV from the Directory area.
4. Pull down the **File** menu.
5. Print the screen.

EXERCISE 4–3

1. Select the **Dual File Lists** view from the View menu.
2. Select drive [C:] and the **DOS** directory for the top Directory Tree window.
3. Select and highlight the HELP.HLP file in the Files area.
4. Select drive [A:] and the ADDBOOK directory for the lower Directory Tree.
5. Select the ADDRESS.SUM file in the Directory Tree.
6. Print the screen.

EXERCISE 4–4

1. Select drive [C:] and the DOS directory for the Directory Tree.
2. Select EDIT.COM in the Files area.
3. Select **Display** from the Options menu.
4. The selection cursor should indicate *Text 25 Line Low Resolution*. If it does not, select this line.
5. Print the screen.

EXERCISE 4–5

1. Select drive [C:] and the **DOS** directory from the Directory Tree window.
2. Select the **Single File List** from the View menu.
3. Select the **View** menu again so that it shows the menu with the selection cursor properly located.
4. Print the screen.

REVIEW

SECTION A

Vocabulary

The following words and phrases were found in this lesson. Find each of these in the glossary in Appendix A and define them.

Dialog box	Mouse pointer	Selection cursor
Dual File Lists	Scroll bar	Shell
Ellipsis	Select	

SECTION B

True/False

In the blank before each sentence, place a T if the statement is true and an F if the statement is false.

_____ 1. When using DOS 6 you must use the Shell to execute commands.

_____ 2. The main advantage of the Shell is file management.

_____ 3. The Shell is an alternative to the command prompt.

_____ 4. The mouse can be used both at the command prompt and the Shell.

_____ 5. Both the window and item must be highlighted before action can occur.

_____ 6. The scroll bar is used to select an item within a window.

_____ 7. The Alt key plus a letter is an alternate way to select a menu.

_____ 8. The Options menu changes the number of windows on the screen.

_____ 9. The ellipsis means a dialog box will appear.

_____ 10. Selecting results in highlighting.

REVIEW

SECTION C

Task Solving

Starting with the highlight in the Drives area, explain how you would solve each of the following tasks. Use either the keyboard or the mouse description in the explanation. Since directory and file names may vary, there is no need to include file names, only the steps to accomplish the problem.

1. Determine the files contained in the fifth directory of drive C:.

   _____

   _____

   _____

2. Change the screen color from its present color to green.

   _____

   _____

   _____

3. Change the screen display so that the same tree directory and files windows appear in both the top and bottom half of the screen.

   _____

   _____

   _____

4. Exit the program and confirm that there are not two Shells in memory.

   _____

   _____

   _____

5. Activate the second directory on drive D: and select the tenth file.

   _____

   _____

   _____

LESSON 5

Using the Shell for File Management

LEARNING OBJECTIVES

In this lesson you will:

- View files
- Move files
- Copy files
- Select multiple items
- Delete files
- Identify paths
- View and print the structure

VOCABULARY

Watch for the following words and phrases in this lesson:

Copy	Overwrite	View
F9	/F	
Move	Rename	

OVERVIEW

One of the major advantages of using the Shell is the increased ease with which you are able to manage the files and file structure on the various drives. You have looked at the various drives, directories, and files on your system and learned how to select them under various screen displays. Now you need to be able to perform the most common file operations: viewing, moving, copying, selecting multiple items, and creating directories. All of these major file operations can be done from the command prompt, but the Shell provides a visual picture of what you are doing while you are doing it and reduces the need to remember command syntax. In this lesson, you will continue to use the EXERCISES and EXERBAK disks to practice these operations.

VIEWING A FILE

Both files and disks seem to grow in number at a ratio of ten to one every two to three months. The best intentions to create meaningful file names and every other precaution don't seem to help. Sometimes you need to clean up your disks and delete old files, and sometimes you need to copy or move files into groups. But can you remember what is in each one?

The Shell provides a way to **view** the contents of any readable text file. Some executable files are not readable and some program files will contain special coding, but for most files the View File Contents in the File menu will do the trick. This command can be selected from the keyboard or with the mouse. The shortcut key is **F9**. You can view only one file at a time.

The steps are: select the file in the Files area, pull down the File menu, and select the View File Contents.

- Boot up the computer and bring up the DOS Shell.
- Select drive [**A:**]. Select the file PRIVATE.LST in the Files area.
- Pull down the **Files** menu. Select **View File Contents**. Press **<ENTER>**.

  This file contains the names, addresses, and phone numbers for three people. It should resemble Figure 5.1.
- Press **Esc** to return to the Shell when you've finished reading.
- View the contents of three or four other files.

CREATING DIRECTORIES AND SUBDIRECTORIES

In Lesson 3 you used the MD command to make a directory. At the command prompt you listed the command and then a backslash

and the name of the directory. Since you were creating one on the disk in drive A:, you included the drive designator.

You need additional directories and subdirectories on both the EXERCISES disk in A: and the EXERBAK disk in B: so you will have some places to move and copy files. It's much easier to create directories using the Shell.

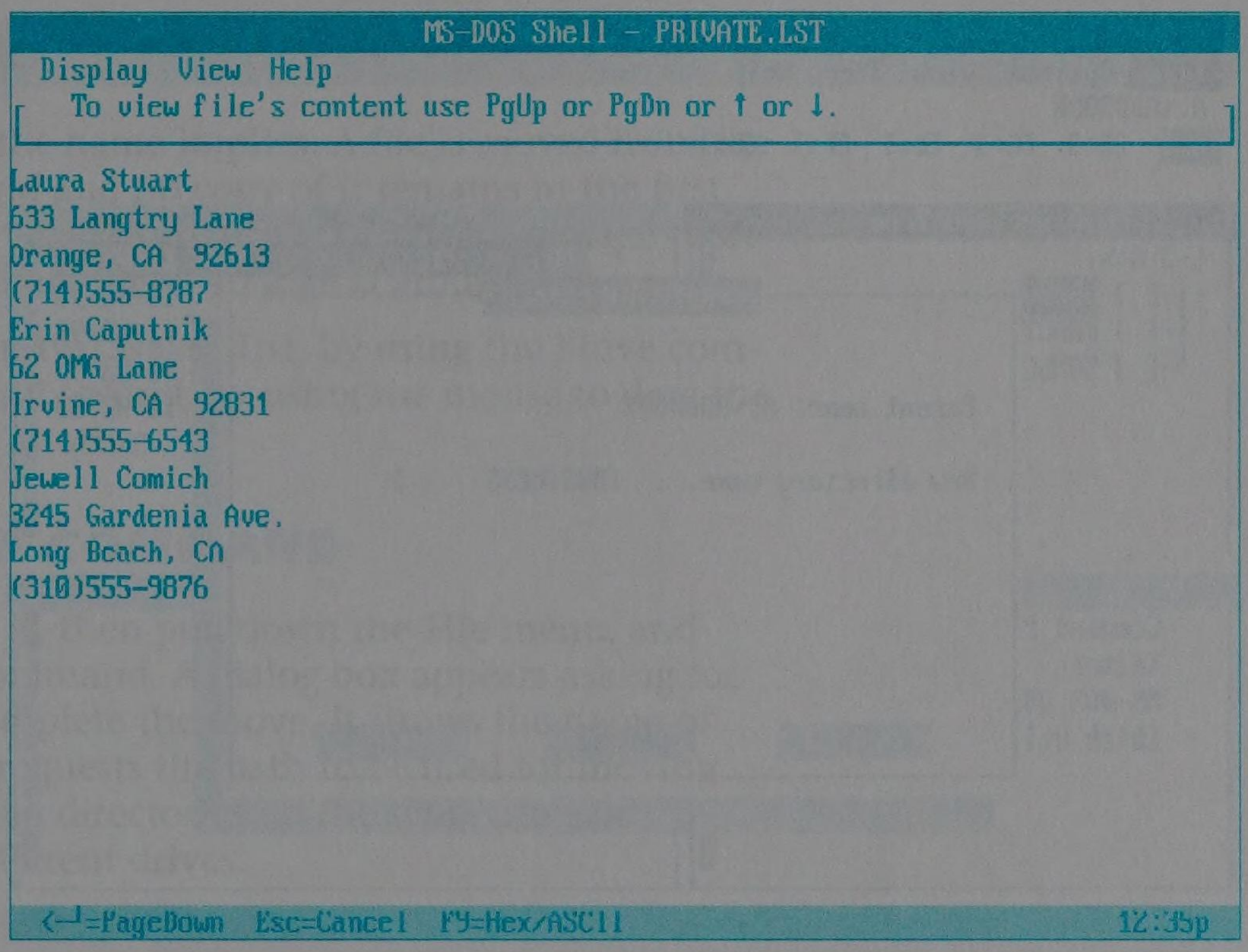


Figure 5.1
View File Contents

- Select [A:] in the Drives area.

The Directory Tree area shows three directories—ADDBOOK, PRACTICE, and SUMSCHED—that you have already created. You are going to create two subdirectories to the ADDBOOK directory.

- Select the ADDBOOK directory in the Tree area.
- Pull down the **File** menu and select **Create Directory**.
- The dialog box appears asking for the name. Key **BUSINESS** (see Figure 5.2) and tap **<ENTER>** or use the mouse to click on **OK**.

The new subdirectory BUSINESS should appear in the Directory Tree area under ADDBOOK.

- Repeat the above process and create another subdirectory of ADDBOOK and name it **PERSONAL**.

When you want to create a main directory off the root directory, you select the root directory before pulling down the File menu.

- Select **A:** in the Directory Tree area.
- Pull down the **File** menu and select **Create Directory**.
- When the dialog box appears, key **RECIPES**.
- Select the RECIPES directory.
- Create two subdirectories to the RECIPES directory and name them **COOKIES** and **SALADS**.

The Directory Tree should now look like Figure 5.3.

NOTE

NOTE: If only the three main directories show, select Expand Branch from the Tree menu.

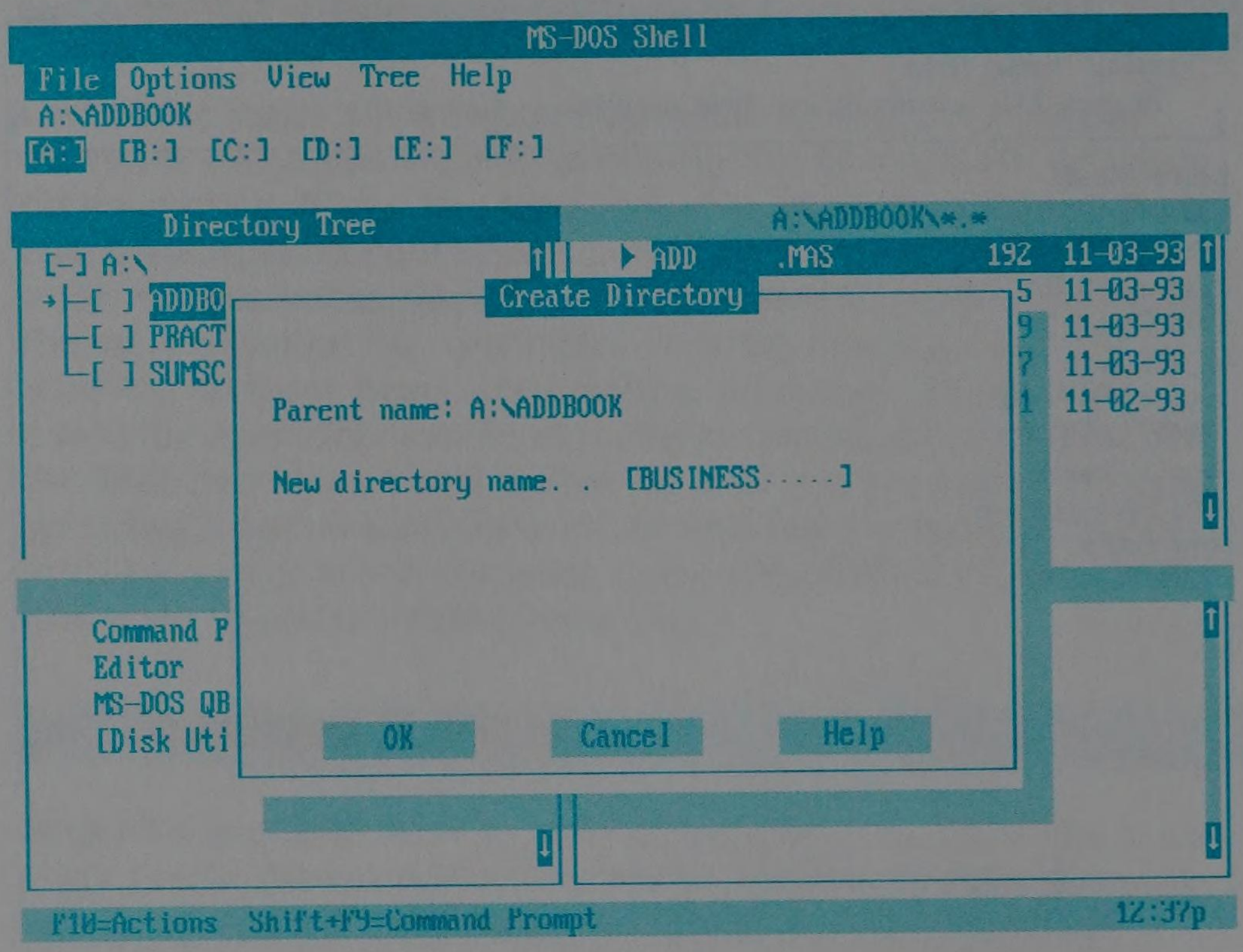


Figure 5.2
Create Directory dialog box

You will now create some directories for the EXERBAK disk in drive B:

- Place the EXERBAK disk in drive B:.
- Follow the procedure above and create three directories off the root of drive B:\. Name them **CORRESP**, **PHONE**, and **VACATION**.

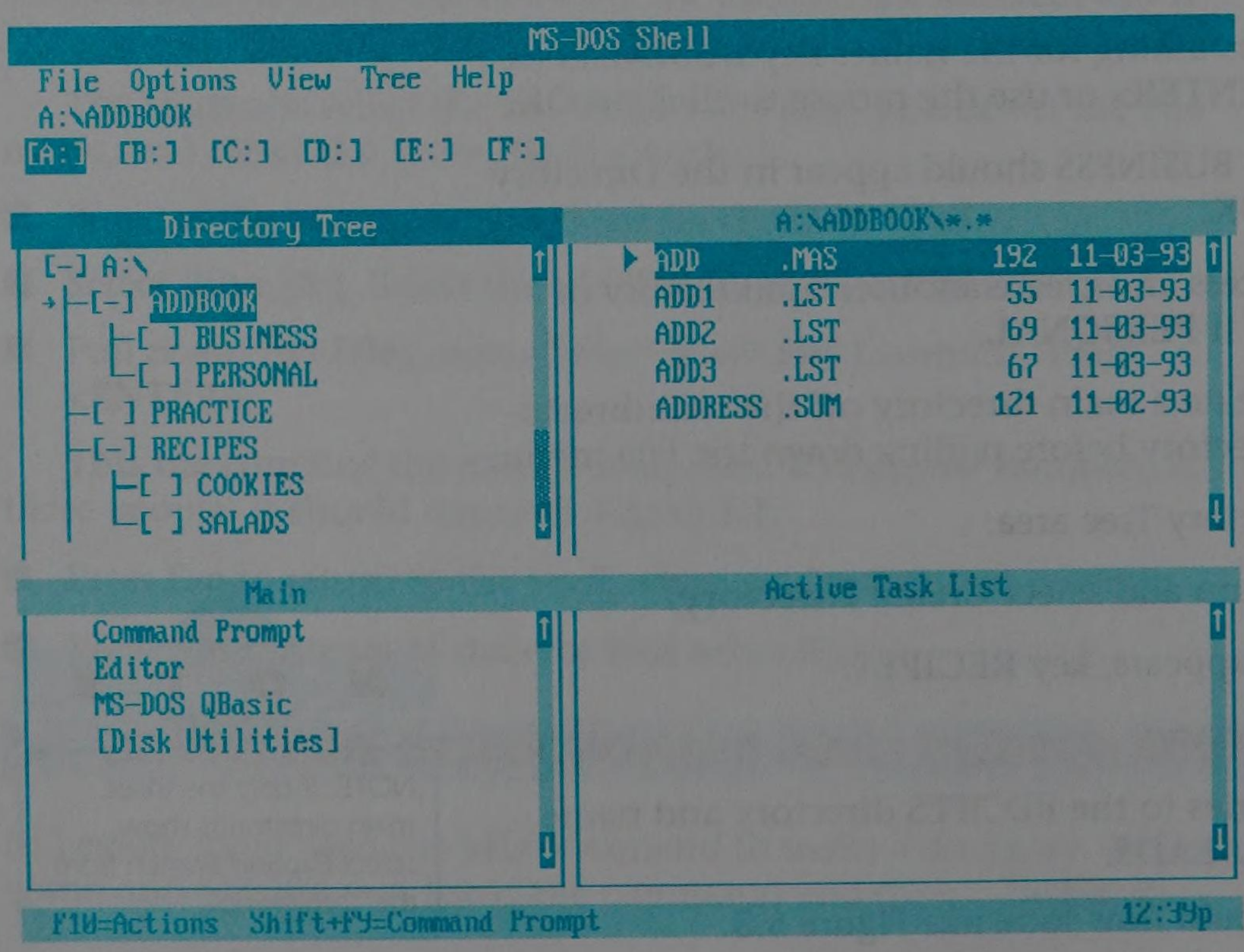


Figure 5.3
Tree of drive A:

MOVING FILES

Moving files is just what the name implies. A file is moved from the first directory to the second and no copy of it remains in the first directory. Moving can be very handy when you need to make more space on a disk or consolidate files into logical groups.

Moving can be done in two ways: first, by using the Move command in the File menu, and second, by using the mouse to drag the file from one directory to another.

USING THE MOVE COMMAND

To move a file, first select it, then pull down the **File** menu, and finally select the **Move** command. A dialog box appears asking for further information to complete the move. It shows the name of the file to be moved and requests the path to be used for moving. Files can be moved between directories on the same drive or between directories on different drives.

- Select **Dual File Lists** from the View menu.
- In the top Directory Tree area select the [A:] drive. In the bottom Directory Tree, select the [B:] drive.
- Be sure the Directory Tree areas show both the directories and subdirectories that were just created.

To move a file from one directory to another in the Shell, the name of the target directory must be showing. You are going to move the ADD.MAS file from the root directory to the PERSONAL subdirectory under ADDBOOK.

- Select and highlight the ADD.MAS file in the Files area.
- Pull down the **Files** menu. Select **Move** and press **<ENTER>**. The Move File dialog box will appear, as shown in Figure 5.4.
- The ADD.MAS file shows as the one to be moved and the dialog box requests the path to where you want it moved. Key: **A:\ADDBOOK\PERSONAL** and press **<ENTER>**.

The path starts at the root, goes to the ADDBOOK directory, and then to the PERSONAL subdirectory. The backslash separates each level of the path.

- Check the directory of the root. ADD.MAS is no longer shown. Check the PERSONAL subdirectory. ADD.MAS should now be located there.

Next you are going to move a file from a directory on one drive to a directory on a second drive. You want to move the ADDRESS.SUM file from the PRACTICE directory on drive A: to the PHONE directory of drive B:. See if you can plan the steps before reading on.

- Select the PRACTICE directory in the Directory Tree area and then highlight the ADDRESS.SUM file in the Files area of drive A:.
- Pull down the **File** menu and select **Move**. The Move File dialog box appears.
- Key the path **B:\PHONE**.
- Check each directory to verify that the file was moved.

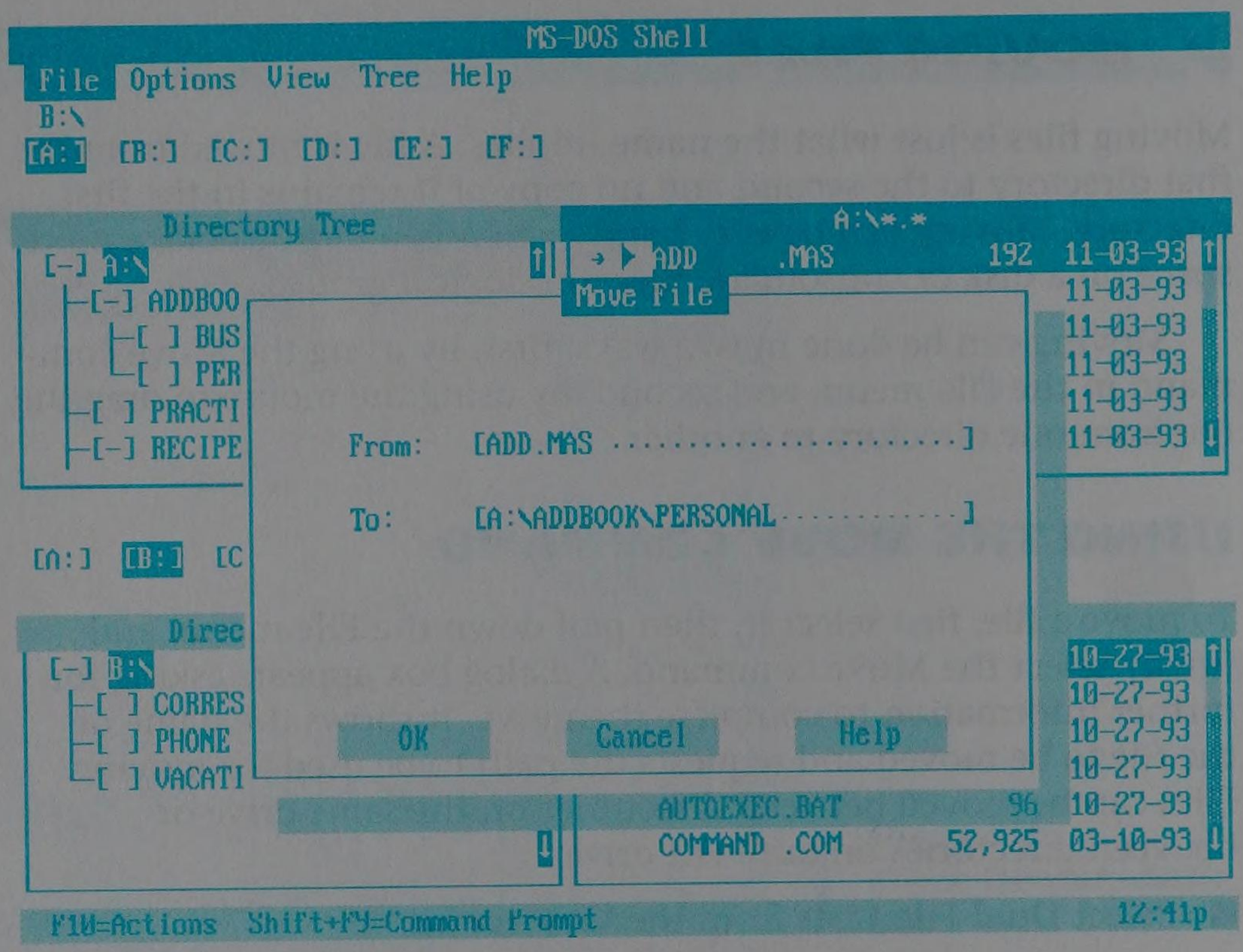


Figure 5.4
The Move File dialog box

USING THE MOUSE

The mouse can be used to drag a file from one directory to another. Be sure both directories are showing on the screen, highlight the file to be moved, hold down the Alt key, and use the mouse to drag the file to the new directory location.

Remember the Confirmation dialog box that you looked at? A confirmation box will now appear asking you to confirm that the named file is to be moved. Answer *yes* by either pressing the <ENTER> key or by clicking on the OK.

- Dual File Lists should still be showing with drive A: selected for the top and drive B: selected for the bottom.
- Select A:\ for the drive A: root directory.
- Be sure that the Tree menu shows all subdirectories.
- Select and highlight ADD1.LST in the Files area.
- Position the mouse pointer on the file, hold down the Alt key, hold down the left mouse button, and drag the mouse pointer from the file name to the PERSONAL subdirectory in the Directory Tree area (see Figure 5.5).
- Click on **OK** to confirm the move. Wait a few seconds and the file name will disappear from the Files area.
- Click on the PERSONAL subdirectory to confirm that the file has been moved.

NOTE

NOTE: The file name will not look, at first, as if it has moved. The mouse pointer will change slightly. If you have selected the graphics display, the mouse pointer will show a file folder being dragged. If you are using a text screen, the mouse pointer will show a small dot in the center of the vertical rectangle.

The same procedure can be used to drag a file from one drive to another.

- Select and highlight the file EXAMP1A in the Files area.
- Hold down the Alt key and use the mouse pointer to drag the file name down across the screen to the PHONE directory on drive B:.
- Verify the results.

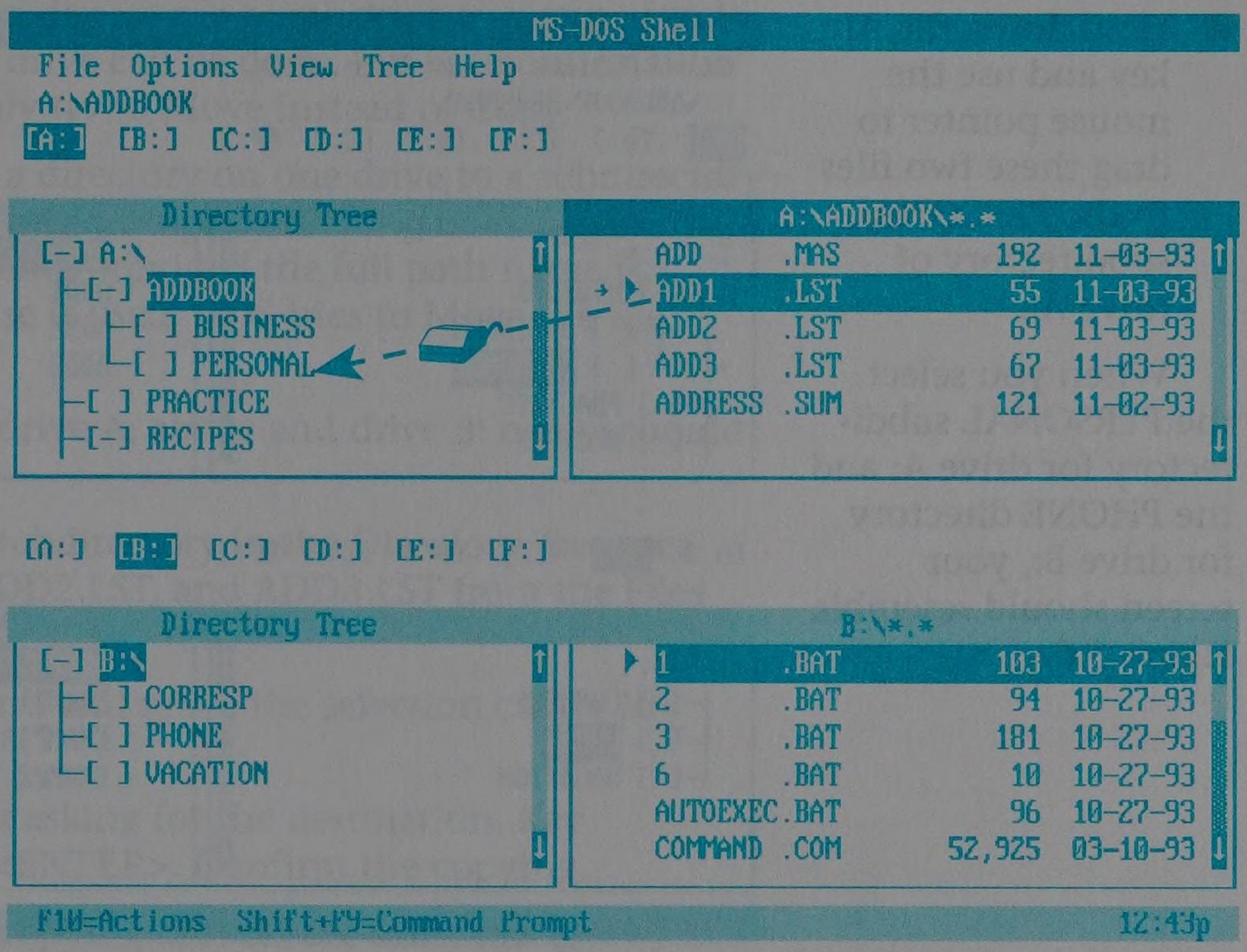


Figure 5.5
Dragging with a mouse

SELECTING MULTIPLE FILES

When you are dealing with a group of files and wish to carry out the same task for the entire group, you can select the entire group from the list in the Files area, carry out the move, copy, or other command, and the command will be performed on all the indicated files.

To select a group of files that are adjacent on the list, select the first file in the group either by moving the selection cursor or by clicking on it with the mouse. Then hold down the Shift key and either use the down arrow to move to the last file in the group or click on the last file in the group with the mouse. The entire group will highlight to indicate all of those particular files have been selected.

To select nonadjacent files hold down the Ctrl key and use the mouse to click on each of the files. Selecting nonadjacent files with the keyboard is a little troublesome, but it can be done. Move the selection cursor to the first file, and press Shift+F8. Move the selection cursor to the next file, and press Ctrl+Spacebar. Repeat this last step for each file to be selected.

- Select EXAMP1 and EXAMP2 from the Files area of drive A:.
- Hold down the Alt key and use the mouse pointer to drag these two files to the PHONE directory of drive B:.
- Select ADD2.LST and ADD3.LST from the Files area of drive A:.

NOTE

NOTE: When using the commands from the File menu, it is acceptable to use wildcards to select a group of files with a common feature.

- Hold down the Alt key and use the mouse pointer to drag these two files to the PERSONAL subdirectory of drive A:.

When you select the PERSONAL subdirectory for drive A: and the PHONE directory for drive B:, your screen should resemble Figure 5.6.

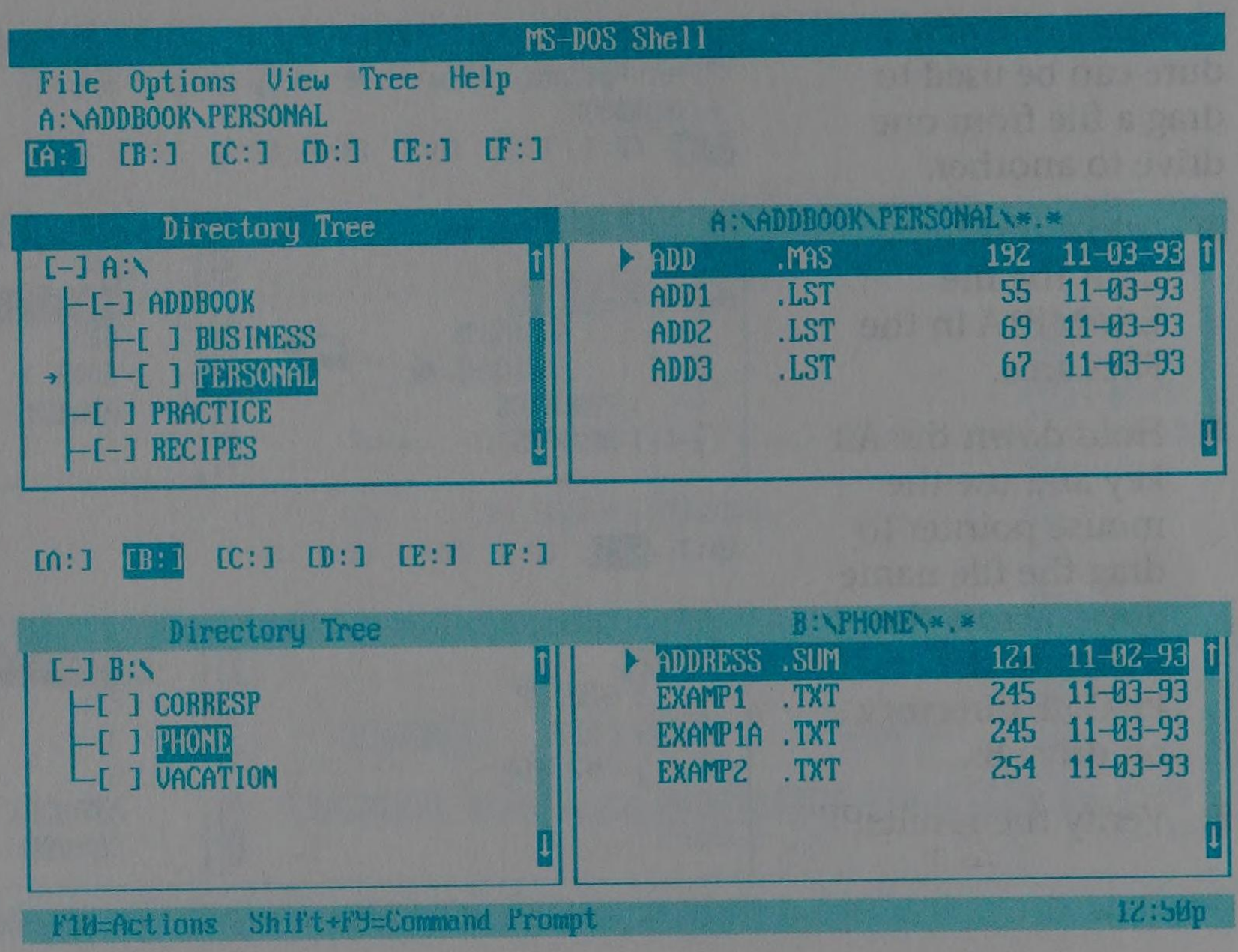


Figure 5.6
Directories on drives A: and B:

COPYING FILES

The process for copying files is much the same as the process for moving files. The only difference in the result is that copying produces a duplicate of the file in the new location and the original remains in the original location.

To copy a file, you can either use the **Copy** command from the File menu or use the mouse pointer to drag the file. You can also copy multiple files just as you did with the Move command.

Problem: To prevent any confusion, there is one small problem you should be aware of. Earlier lessons pointed out that DOS will not tolerate two files with identical names on the same floppy storage disk or in the same directory. If you move or copy a file to a location where a file of the same name exists, the file being moved will **overwrite** the existing file and that original will be lost. Overwriting is fine if one file is merely a backup and a newly edited, updated file is replacing an outdated file. If the files contain different data, one set will be lost.

DOS 6 tries to protect you from accidentally losing data. With the above information in mind, the following list shows what may happen during the copying process.

1. Copying a file(s) from a directory on one drive to a directory on another drive can be done using either the command or mouse.

2. Copying a file(s) from a directory on one drive to a same-level directory on the same drive can be done, but the confirmation dialog box will probably try to Move instead of Copy.
3. Copying a file(s) from a directory on one drive to a subdirectory on the same drive can be accomplished using the Copy command from the File menu, provided the full path name is keyed. When the mouse is used, DOS tries to Move the file instead of Copy.

- The dual list showing drive A: above and drive B: below should still be on the screen.
- Select the PERSONAL subdirectory in the Directory Tree area and files ADD1.LST, ADD2.LST, and ADD3.LST from the Files area.
- Pull down the **File** menu and move the selection cursor to **Copy**.
- The dialog box appears asking for the destination. Key **B:\PHONE** and press **<ENTER>**. Confirm the copying.

This time you will try copying files on the same drive.

- Select the PERSONAL subdirectory in the Directory Tree window. Select and highlight the files ADD1.LST, ADD2.LST, and ADD3.LST in the Files area.
- Use the mouse and try to drag the three files across to the SALADS subdirectory of RECIPES. The confirmation dialog box will probably ask to confirm a MOVE. Say NO.
- Pull down the **File** menu and select **Copy**.
- In the destination dialog box, type the full path: **A:\RECIPES\SALADS** and press **<ENTER>**. The files should copy.

Don't be concerned about a salads subdirectory being an odd place for address files. You'll get rid of them shortly.

- Copy SCHED.NOV from A:\ to the \ADDBOOK\PERSONAL subdirectory.
- Copy SCHED.JUN from A:\ to the B:\VACATION directory.

RENAMING FILES

Renaming files is a way to give a file a more meaningful name or to preserve two copies of the same file. The main feature of the renaming process is that you start with one file in one place and end up with exactly the same file in the same place but with a different name. The content of the file is not moved or copied.

- Select the \ADDBOOK\PERSONAL subdirectory on drive A: and highlight the file SCHED.NOV.
- Pull down the **File** menu and select **Rename**. A dialog box appears.
- Key **HOLIDAY.LST**.

The Rename File dialog box shows the current name of the file and the new name you just keyed in. It should look like Figure 5.7.

- Press **<ENTER>**.
- Select the VACATION directory on drive B: and the file SCHED.JUN.
- Rename this file **ALASKA.VAC**.

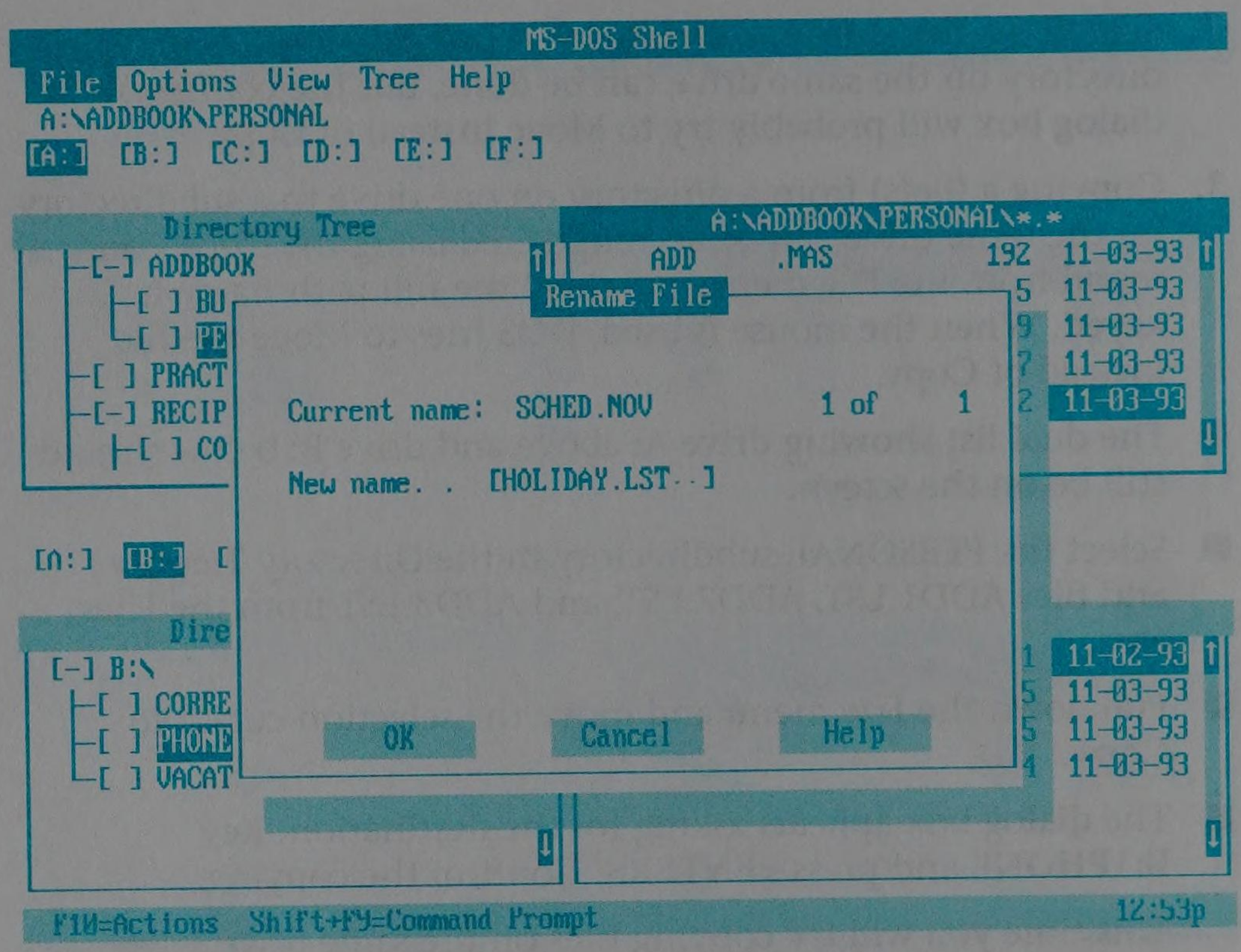


Figure 5.7
Rename File dialog box

DELETING FILES

Deleting old, out-of-date files is the easiest way to clean up a disk and gain more space. One way of deciding which files should go is to screen the date of creation shown when you run a directory of the disk.

The process of deleting is like that for moving or copying. You select a directory and the file in that directory you wish to delete. There are two ways you can delete: pull down the File menu and select Delete or simply press the Delete key. You can delete files one at a time or by groups just as you did with moving and copying.

- Select the SUMSCHED directory on drive A: and the SCHED.JUN file.
- Pull down the **File** menu, select **Delete**, and confirm at the dialog box.

  The delete process is complete and the file is gone.
- Select the SALADS directory on drive A: and the file ADD1.LST.
- This time press the Delete key. The confirmation dialog box still appears, and you should confirm the deletion.

- This time try two files. Select both ADD2.LST and ADD3.LST. Remember how? Press the Delete key and confirm when the dialog box appears.

A NEAT TRICK TO REMEMBER

In the exercise for practice that follows you are going to rename and rearrange the files into a more sensible pattern. But to do so you have to have a good idea of where everything is located.

There is a neat trick to print the tree of a disk or drive, but it needs to be done from the command prompt.

- In the status line at the bottom of the Shell screen is the reminder that Shift+F9 will take you to the command prompt. Hold down the **Shift** key and press the **F9** key.

The Shell screen will disappear and you will see the command prompt. The prompt will probably reflect the directory and subdirectory you were in. You should be at the root directory.

- Key **CD** and press **<ENTER>**. Remember what this is? This is the change directory command to take you to the root directory.
- Check your printer to see that it is on and has paper.
- Key **TREE A:/F >PRN** and press **<ENTER>**.

You are telling the computer to list all the items in the tree for drive A: and send it to the printer. The /F switch indicates all directories and all files, and >PRN is the parameter to send the information to the printer.

- Repeat the request for a printout of the tree, but this time ask for the tree of drive B:.

You should now have two sheets of paper showing the directories and files for both drives A: and B:. You can use this for the following practice exercises.

NOTE

NOTE: This is a forward slash denoting a switch and not the backwards slash denoting a directory that you have been using.

PRACTICE

Try the following exercises.

EXERCISE 5-1

Create a new directory on the B:\ drive and name it **MISCTASK**.

EXERCISE 5-2

Rename one copy of each of the following files:

ADD.MAS to **PHONE.LST**
ADD1.LST to **STUART.LTR**

ADD2.LST to **CAPUTNIK.LTR**
ADD3.LST to **COMICH.LTR**
PRIVATE.LST to **CLIENTS**

EXERCISE 5–3

Below is a directory tree for drives A: and B:. Use the printout that was made of the two drives to decide which files have to be moved, copied, or deleted so that the result will duplicate the trees shown below.

```
A:\                          B:\
  PRIVATE.LST                CORRESP
  SCHED.NOV                    STUART.LTR
  ADDBOOK                      CAPUTNIK.LTR
    BUSINESS                   COMICH.LTR
      CLIENTS                MISCTASK
    PERSONAL                   HOLIDAY.LST
      ADDRESS.SUM            PHONE
      EXAMP1.TXT               ADD1.LST
      EXAMP2.TXT               ADD2.LST
  PRACTICE                     ADD3.LST
  RECIPES                      PHONE.LST
    COOKIES                  VACATION
    SALADS                     ALASKA.VAC
SUMSCHED
    ITINERY
```

REVIEW

SECTION A

Vocabulary

The following words and phrases were found in this lesson. Find each of these in the glossary in Appendix A and define them.

Copy
Overwrite
View
F9
/F
Move
Rename

SECTION B

True/False

In the blank before each sentence, place a T if the statement is true and an F if the statement is false.

_____ 1. Commands for major file operations can be done from the system prompt or the Shell.

_____ 2. A file can be viewed from the Shell or command prompt.

_____ 3. The Shell can be used to create both directories and subdirectories.

_____ 4. Files can be in both the root directory and directories off the root.

_____ 5. Moving a file with the mouse can be done by merely dragging the file with the mouse pointer.

_____ 6. Files can be copied or moved between drives using the mouse.

_____ 7. You can drag files to a new directory using the keyboard.

_____ 8. You can select multiple files that are adjacent or scattered.

_____ 9. Renaming creates a duplicate file with a new name.

_____ 10. It is possible to print the tree of a drive using the Shell.

REVIEW

SECTION C

Task Solving

Starting with the highlight in the Drives area, explain how you would solve each of the following tasks. Do not actually do the problems on the computer but explain using either the keyboard or mouse description in the explanation.

1. A directory is to be added to the drive A: disk named LEGAL.PAP.

2. Two subdirectories are created in the LEGAL.PAP directory named WILL and INVENTORY.

3. The three letters in the CORRESP directory on drive B:, STUART, CAPUTNIK, and COMICH, are to be copied to the BUSINESS subdirectory on drive A:.

4. A directory named SPORTS and three files, BADMIN.SPT, SWIM.SPT, and TENNIS.SPT, are to be deleted.

5. A file named POSTER in the directory CIRCUS on drive A: needs to be checked for accuracy by viewing the file contents. A print screen is to be made.

LESSON 6

Editing with the Editor

LEARNING OBJECTIVES

In this lesson you will:

- Change existing files
- Create new files
- Learn cursor movements for editing
- Use the Editor from the Shell
- Use the Editor from the command prompt
- Install the PRINT command
- Print text from the File menu
- Explore getting help

VOCABULARY

Watch for the following words, phrases, and command keys in this lesson.

Context sensitive	F6	Save As
EDIT	Hypertext	Shift+F9
Editor	Refresh	Spool queue

OVERVIEW

One of the primary purposes of a computer is to perform word processing tasks. Computers are extremely good at manipulating text and there are many different word processing application packages available, ranging from simple features and low price to high-powered, multi-featured programs that range from medium priced to very expensive. These application programs contain all the extra features anyone could want: pagination, margin control, spell check, copying, moving, editing, indexing, scalable fonts, and desktop publishing features.

DOS has always had line editing capabilities to create or edit simple text files with COPY CON. This editing command was called Edlin; experienced users tolerated it and beginners struggled with it.

When the Shell was originally introduced in DOS 5, it included a feature called EDITOR. DOS 6 has now polished this feature with **EDIT**. EDIT provides a full-screen, menu-oriented program that can use basic cursor movements to create text-based files, edit existing files, space for programming in BASIC, and create batch files. It doesn't provide all the bells and whistles of the sophisticated word processing programs, but it does provide a quick and easy method for creating files to be used by your system, or data files that can be used by other programs.

A technical point in vocabulary: EDIT is the name of the actual command. Whenever the actual command is used or referred to, the word EDIT will be used. However, this particular command does so much more than simply edit a file that the feature can be more accurately described as **Editor**. In fact, the Program List on your Shell screen lists Editor. So, the term *Editor* will be used to refer to the overall process.

GETTING STARTED WITH EDIT

EDIT is an external command that can be invoked from the command prompt or the Shell. In the Shell it is listed in the lower left Program area. A dialog box will ask for the name of the program (or text file) you wish to edit or create. If the name given is a currently existing file, the Editor will display it on the screen ready to be changed. When entering the name, it is necessary to give the full path.

If you wish to create a new file, you have the choice of naming the file before creation at the dialog box, or waiting until you are ready to save it.

EDITING AN EXISTING FILE

Before you begin editing a file, you need to know some editing basics. The following list describes how to get around the Editor and how to insert and delete text.

TO DO THIS	PRESS
Move one character to right	Right arrow
Move one character to left	Left arrow
Move one word to right	Ctrl+right arrow
Move one word to left	Ctrl+left arrow
Move one line up	Up arrow
Move one line down	Down arrow
Move to beginning of line	Home
Move to end of line	End
Move to first line of text	Ctrl+Home
Move to last line of text	Ctrl+End
Delete character at cursor	DEL
Delete character to left	Backspace
Delete entire line	Ctrl+Y
Delete word	Ctrl+T
Enter blank line	<ENTER>
Enter new text	Position cursor and type

You have a file named CLIENTS in the BUSINESS subdirectory of ADDBOOK. You are going to edit this file, which contains the names, addresses, etc. of three of your friends.

- Boot up the computer and call up the DOS Shell.
- Check that the view is Program/File Lists. The Program area should be displayed in the lower left corner.
- Select the Program area and then the item **Editor** or double click on **Editor** with the mouse. The dialog box appears requesting a name.
- Key the full path: **A:\ADDBOOK\BUSINESS\CLIENTS**. Your screen should look like Figure 6.1.
- Press the **<ENTER>** key. The Editor's screen appears and should contain your file of three names and addresses.

Since you concatenated the three original files, there is probably no space separating the three addresses. It should resemble Figure 6.2.

You are going to insert a blank line between each, give each person a title (Mrs., Ms., etc.), add company names, and change the address of the third person.

Make the following changes to the CLIENTS file:

- Position the cursor on first letter of the first name and key an appropriate title. Move to the end of name and press **<ENTER>**.

- Key the company name **Orange Machine and Tool Co.** in the blank line. Move the cursor to the end of the first phone number and press **<ENTER>**. This provides a blank line.
- Key a title and company name, **Fairy Tale Publishing Co.**, for the second name. Enter a blank line between the second and third name blocks.
- Key a title and company name, **Imperial Oil Co.**, for the third person. Change the address to: **1022 Grover Ln., Largo, FL 34640**. Change the area code for the phone number to **813**.

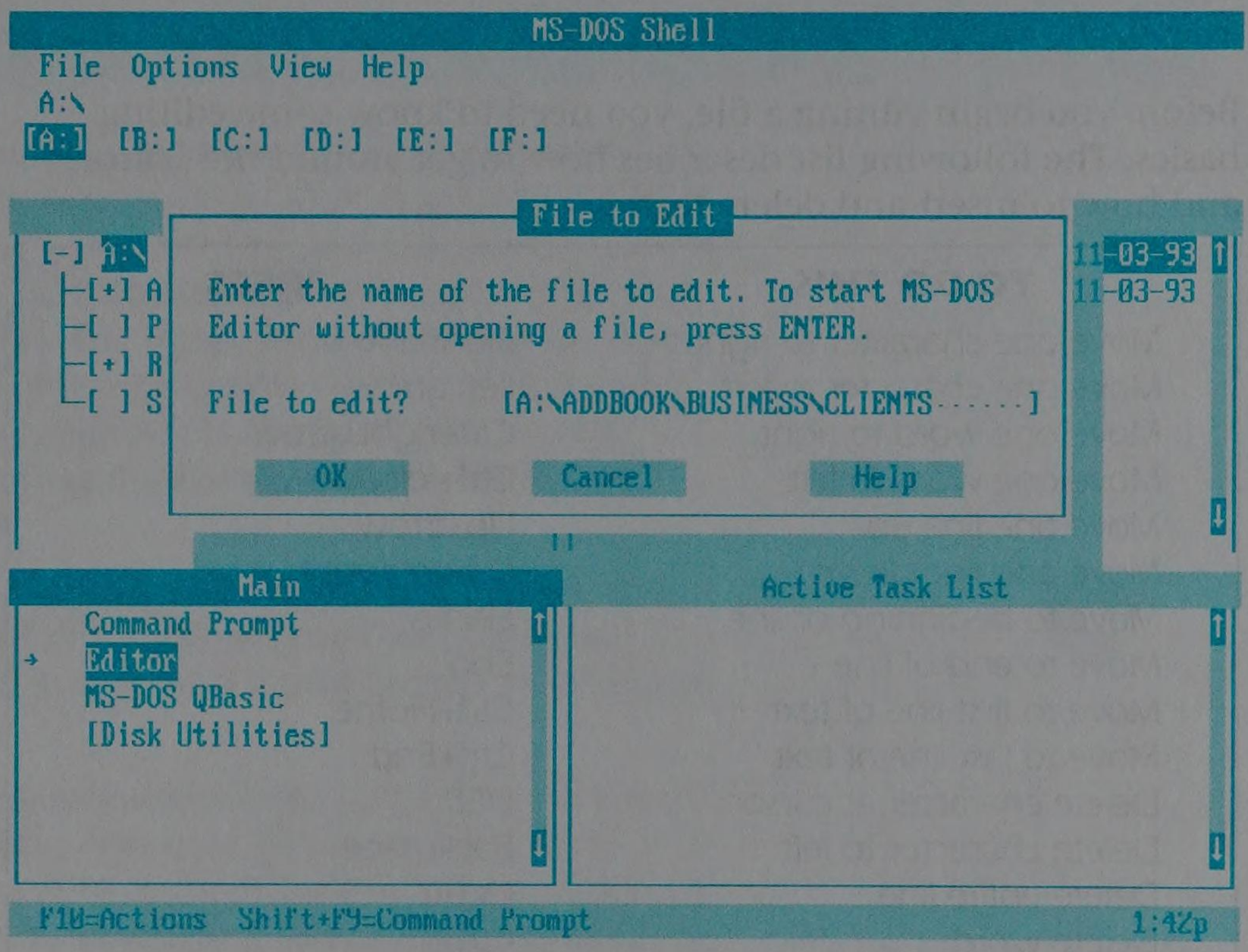


Figure 6.1
File to Edit dialog box

You have completed the editing changes for the CLIENTS file. It should resemble Figure 6.3.

Now it is ready to be saved. Notice that the Editor screen has a menu bar just as does the DOS Shell screen.

- Pull down the **File** menu by using the Alt+F from the keyboard or clicking with the mouse. Figure 6.4 shows the File menu. The choices available on this menu are discussed below.

  This time you want to use the **Save As** option and give the file a new name of CLIENTS2. This is one way of preserving the original while also creating a newly edited copy.

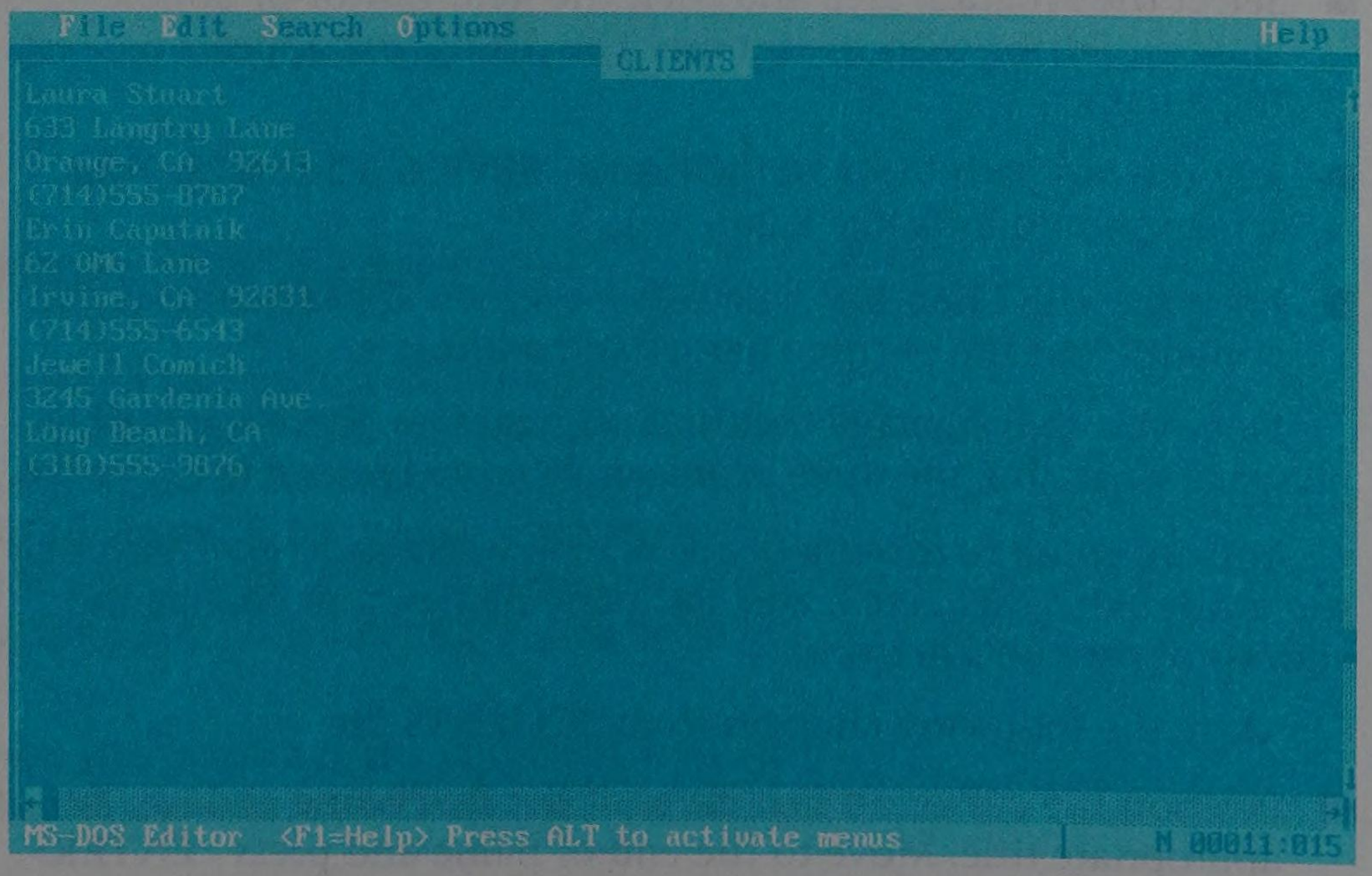


Figure 6.2
CLIENTS file to edit

- Select the **Save As** option and when the dialog box appears, key the new name, **CLIENTS2**. Press **<ENTER>**.
- Return to the Shell by selecting the **File** menu and then the **Exit** option.

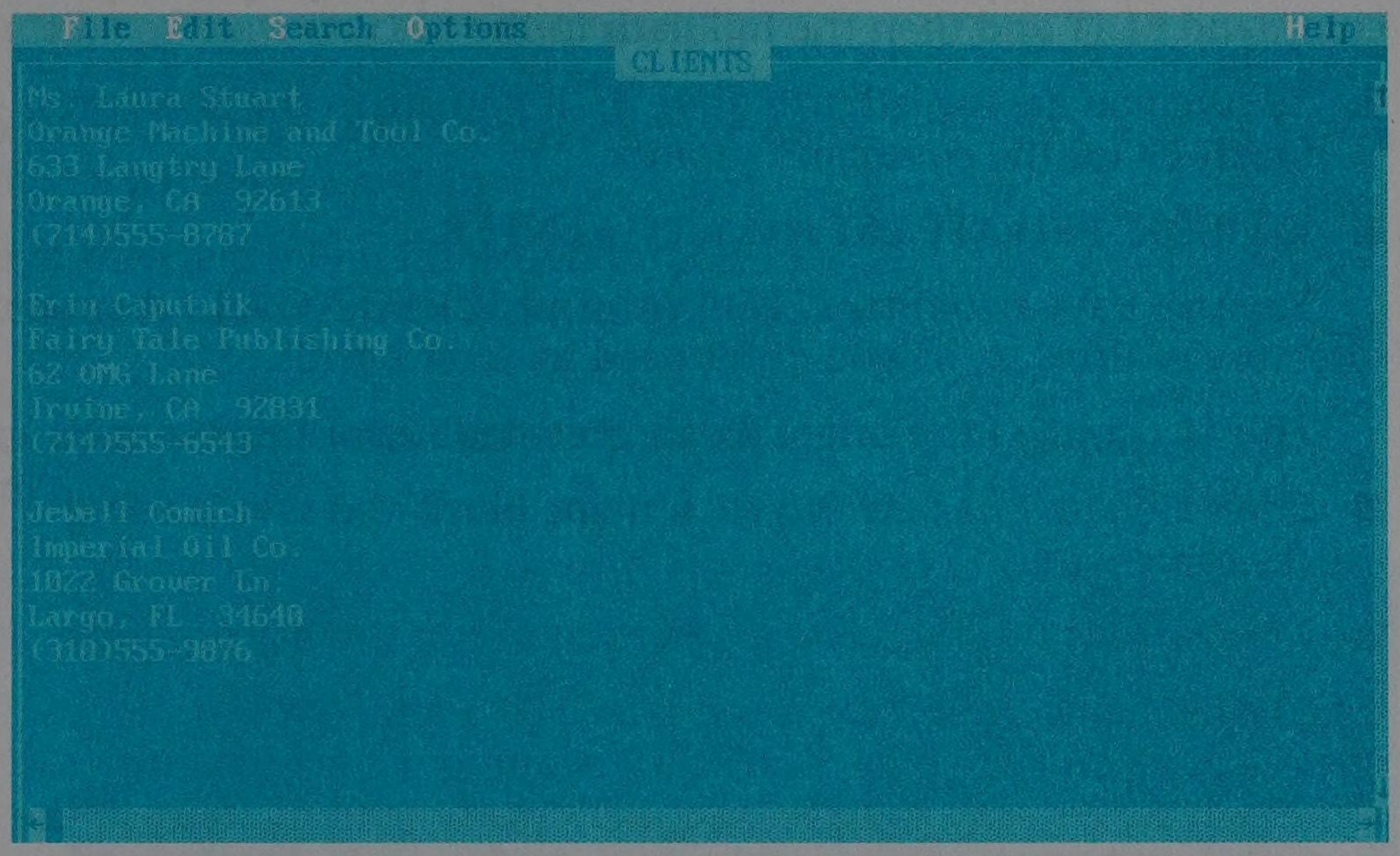


Figure 6.3
Edited CLIENTS file

Do you notice something strange? The new name CLIENTS2 probably doesn't show on the Shell in the Files area. This is one of those cases, mentioned earlier, where you have finished a particular task but the Shell has not caught up with the action. To force the Shell to display the changes, select the **Refresh** option.

- Select **Refresh** from the View menu or use the keyboard shortcut and press F5. The screen should refresh itself and the new name appear in the Files area.

NOTE

NOTE: Creating new files will be discussed in the next section.

EDITING FROM THE COMMAND PROMPT

The Editor can also be used from the command prompt. Existing files can be edited or new ones created just as they can from the Shell.

Remember that you are learning about all the features of the Shell in order to be able to use them when that is the quickest and easiest method for you to carry out some task. You do not HAVE to use the Shell. You have a choice. To switch from the Shell to the command prompt at any time, you can always use the shortcut key **Shift+F9**.

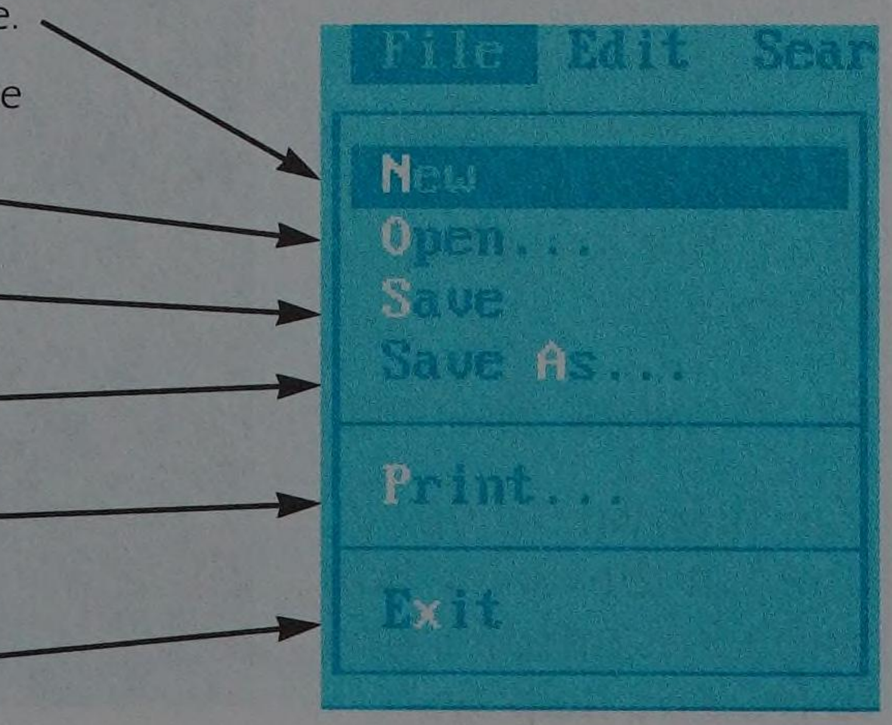


Figure 6.4
The Editor File menu

When using the Editor from the command prompt, you key the command EDIT and then the full path to the file you want to edit.

- Be sure you are logged into drive A:. If you are in the Shell press **Shift+F9** for the command prompt.
- Key **EDIT PRIVATE.LST** and press **<ENTER>**.

You still have two files, PERSONAL and SCHED.NOV, in the root directory of drive A:, so you don't need to enter a path.

This is a copy of the original concatenated file of three names.

- Enter a blank line between each name block and save it using the same name.
- Choose **Exit** from the File menu to return to the A:\ prompt.

CAUTION!!! Once you have typed DOSSHELL and invoked the Shell for use, do NOT type DOSSHELL again under any circumstances. It is very easy to have two Shells running in memory at the same time, which can not only be very confusing, but also uses a tremendous amount of memory and can make it very hard to find your way back to your starting position. The magic word is EXIT. Always use EXIT to return to the Shell or verify the return to the beginning command prompt.

CREATING A NEW FILE FROM THE COMMAND PROMPT

A new file can be created with the Editor at the command prompt or from the Shell. When you start Editor, a dialog box appears asking for the name of the file. You actually have a choice: indicate the name and path for the new file or press <ENTER> and wait to name the file until you are ready to save it.

- Key **EDIT** at the command prompt and press **<ENTER>**.

Since no name was specified for the file, the opening screen for the Editor looks like Figure 6.5.

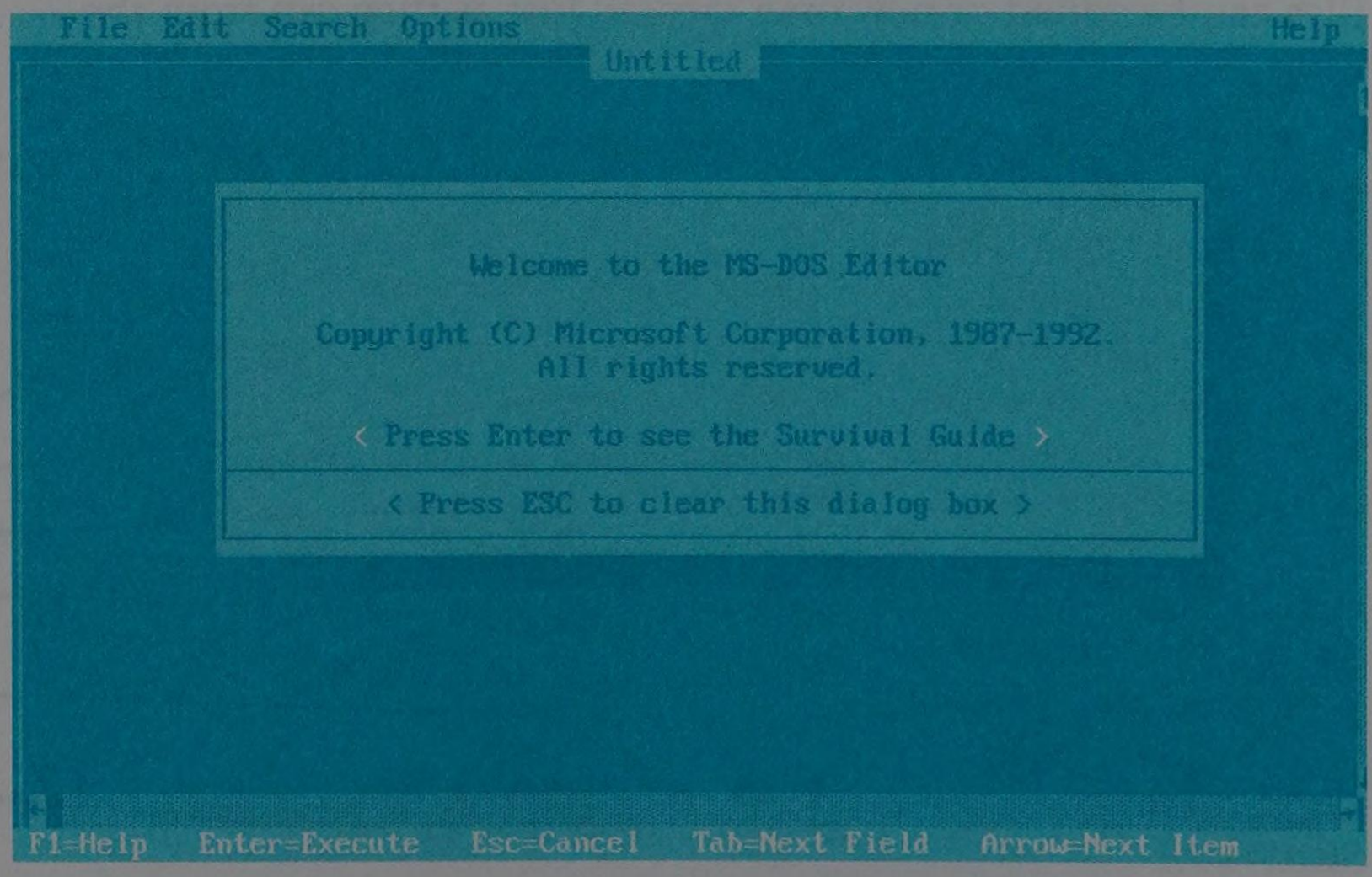


Figure 6.5
Editor opening screen

SURVIVAL GUIDE

The Survival Guide listed in the dialog box is the first introduction to DOS 6's help sys-

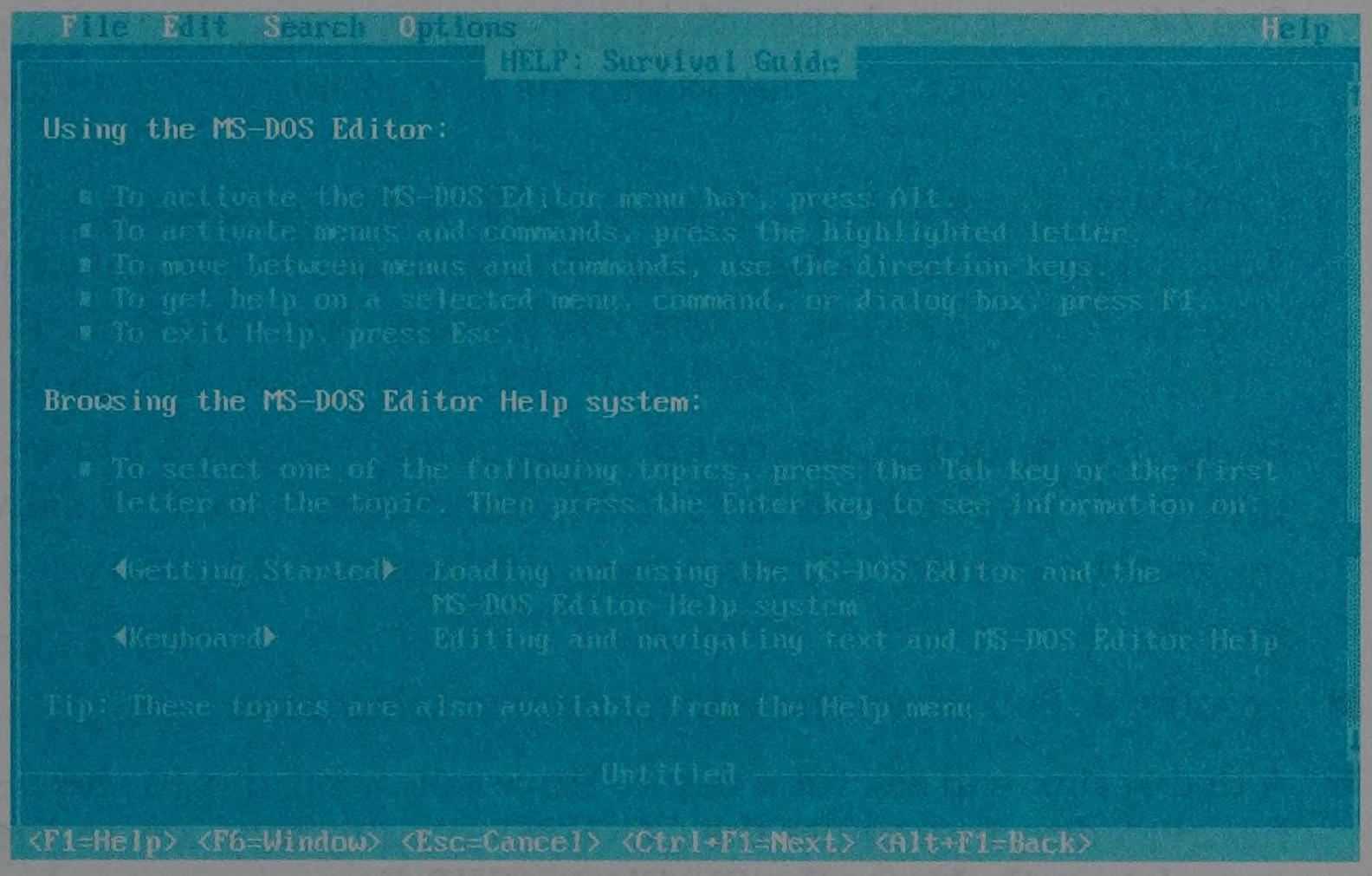
tem. This help system, like the help system for DOS and the Shell, is a series of linking text screens. The text screen shown will give you immediate help and then list related subjects or areas that can be accessed for more information. This interlocking system of help subjects and screens is called a **hypertext** system.

You will explore some of the Help menu information later in this lesson, but take a moment to look at some of the help items for the Editor.

- Press the **<ENTER>** key to see the Survival Guide. Your screen should resemble Figure 6.6.

Figure 6.6
Opening screen for the Survival Guide

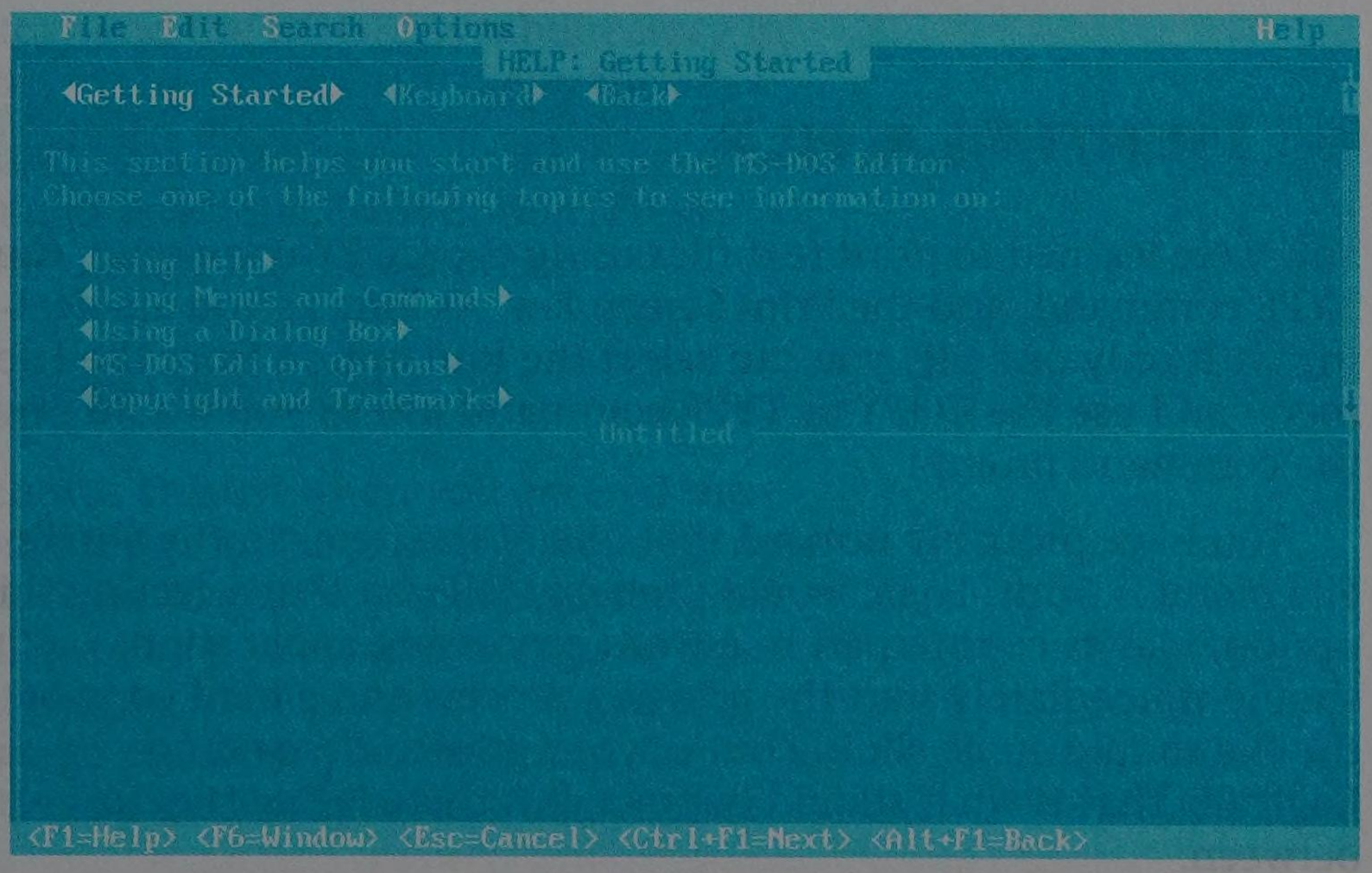
The top part of the screen shows some general instructions for using the Editor, and the bottom part gives you related topics for more help. A blinking cursor is located at the Getting Started prompt, assuming that this will be the next subject needed.



- Press the **<ENTER>** key.

DOS 6 now does a very neat thing. It splits the screen in two, as shown in Figure 6.7. The top half of the screen shows related subjects, and the blank screen in the bottom half is where you can start creating a new file.

Figure 6.7
Split Editor screen



Notice that a new item has been added in the status line: the **F6** key titled *Window*. Pressing this key permits you to switch back and forth between the help portion at the top and the writing portion at the bottom.

- In the bottom half of the screen key the following chocolate chip cookie recipe:

```
CHOCOLATE CHIP/NUT COOKIES

1 tsp. baking soda
1 tsp. salt
1 c. soft margarine
3/4 c. brown sugar
3/4 c. white sugar
1 tsp. vanilla
2-1/4 c. flour
2 eggs
2-1/4 c. chocolate chips
1-1/4 c. nuts

Combine first six items. Mix until creamy.
Add eggs, mix, then add flour. Beat until
smooth and creamy. Add chips and nuts.

Drop by spoonfuls onto ungreased cookie sheet.
Bake in preheated 375 degree oven,
approximately 10 minutes, or until lightly
brown.
```

- Proofread. Pull down the **File** menu and select **Save**.
- A dialog box will ask for a name. Since you want this in the RECIPES directory under the COOKIES subdirectory, key in the complete path. Name the file CHOCCHIP. Key: **A:\RECIPES\COOKIES\CHOCCHIP** and press **<ENTER>**.
- Select **Exit** from the File menu or choose **Back** a couple of times and then Exit. You should be at the A:\ prompt.

NOTE: When using the EDITOR the text will not automatically word wrap to the next line when it reaches the end of the line. You must press <ENTER> at the end of each line.

PRINTING A FILE

You have learned to print text files using the COPY command, the TYPE command, and the Print Screen key. As long as you are dealing with only one file, you can select the Run option from the File menu and use the COPY or TYPE command just as you would from the command prompt.

You have probably noticed that one of the items in the Shell's File menu is Print. Logic would probably tell you that selecting this option, like its counterpart in a word processing application, should immediately start the printing process and a hard copy of the file should come sliding out of your printer. Yes and no. Logically that is what should happen, but there is one step in between.

THE PRINT COMMAND

To use the Print option you must execute the PRINT command from the command prompt. It only has to be done once during the session to set up the *print spool queue*. The **spool queue** can be a series of files waiting to be printed. In Lesson 7 you will create a batch file to load the PRINT command when you begin your work session.

- You should be at the A:\ prompt. Key **EXIT**. This will return you to the DOS Shell screen. Exit from the File menu in the same manner you would if you were quitting this work session.
- At the command prompt key **EXIT** again as a precautionary measure. If the command prompt reappears, you are completely out of the Shell.
- Key **PRINT** and press the **<ENTER>** key. PRINT is an external DOS command and must have access to the DOS directory. You originally entered a path to DOS on the A: drive. If an error message appears, key **C:**, press **<ENTER>**, and repeat the PRINT command.

  The following message will appear on the screen:

```
A:\> PRINT
Name of list device [PRN]:
```

(Press **<ENTER>**.)

```
Resident part of PRINT installed
PRINT queue is empty
```

The PRINT command is now installed and will remain in memory until the machine is turned off.

- Key **DOSSHELL** to reinstate the Shell.
- Select the RECIPES directory and the COOKIES subdirectory in the Directory Tree area. Select the CHOCCHIP file in the Files area.
- Pull down the **File** menu and select the **Print** option. Press **<ENTER>**. The CHOCCHIP cookie file should print.

PRINTING MULTIPLE FILES

The print spool queue, which was created when you entered the PRINT command, creates something similar to a long line of people waiting at the duplicating machine to get their copies reproduced. You can select a number of files to be printed and the queue lines them up, just like the line of people, to be printed to the printer. The nice thing is that you can go on about your tasks and the queue takes care of the printing in the background while you are working on other things.

- Select the PERSONAL subdirectory on drive A:.
- Select and highlight all three files in the Files area: ADDRESS.SUM, EXAMP1.TXT, and EXAMP2.TXT.
- Pull down the **File** menu and select the **Print** option. Press <ENTER>. The three files will print to the printer.

EXPLORING THE HELP SYSTEM

You briefly explored the Survival Guide portion of the help system when you used the Editor. Now you should get acquainted with other aspects of the help system.

CONTEXT-SENSITIVE HELP

Whenever you are using the Shell and have one of the graphics screens showing, such as a dialog box, you can always get help by pressing the F1 key. The explanation that is shown will relate to the subject on the screen. This is called **context-sensitive** help.

- Select the Directory Tree area on the Shell screen. Press **F1**. You will see the screen shown in Figure 6.8.

Notice that the help screen has a scroll bar just like the ones in the Shell. You can use the mouse to scroll up and down or use the down arrow key to move to the bottom of the text, and repeat the down arrow to see the remainder.

If you have selected several screens, the Back button will back the screen up to the last screen. When you get back to the first one, you will have to use the Close button. The other buttons at the bottom of the help screen give a variety of messages.

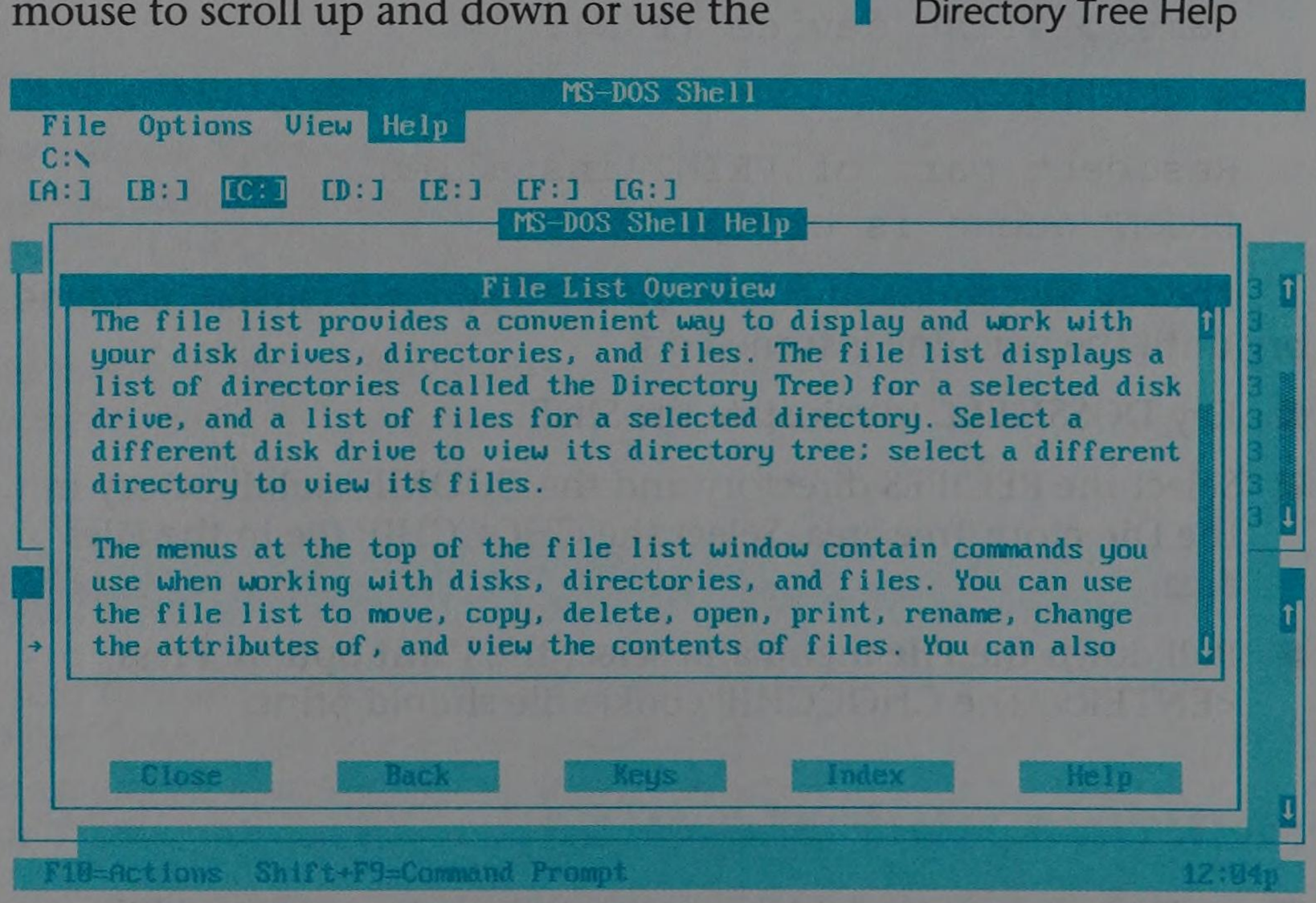


Figure 6.8
Directory Tree Help

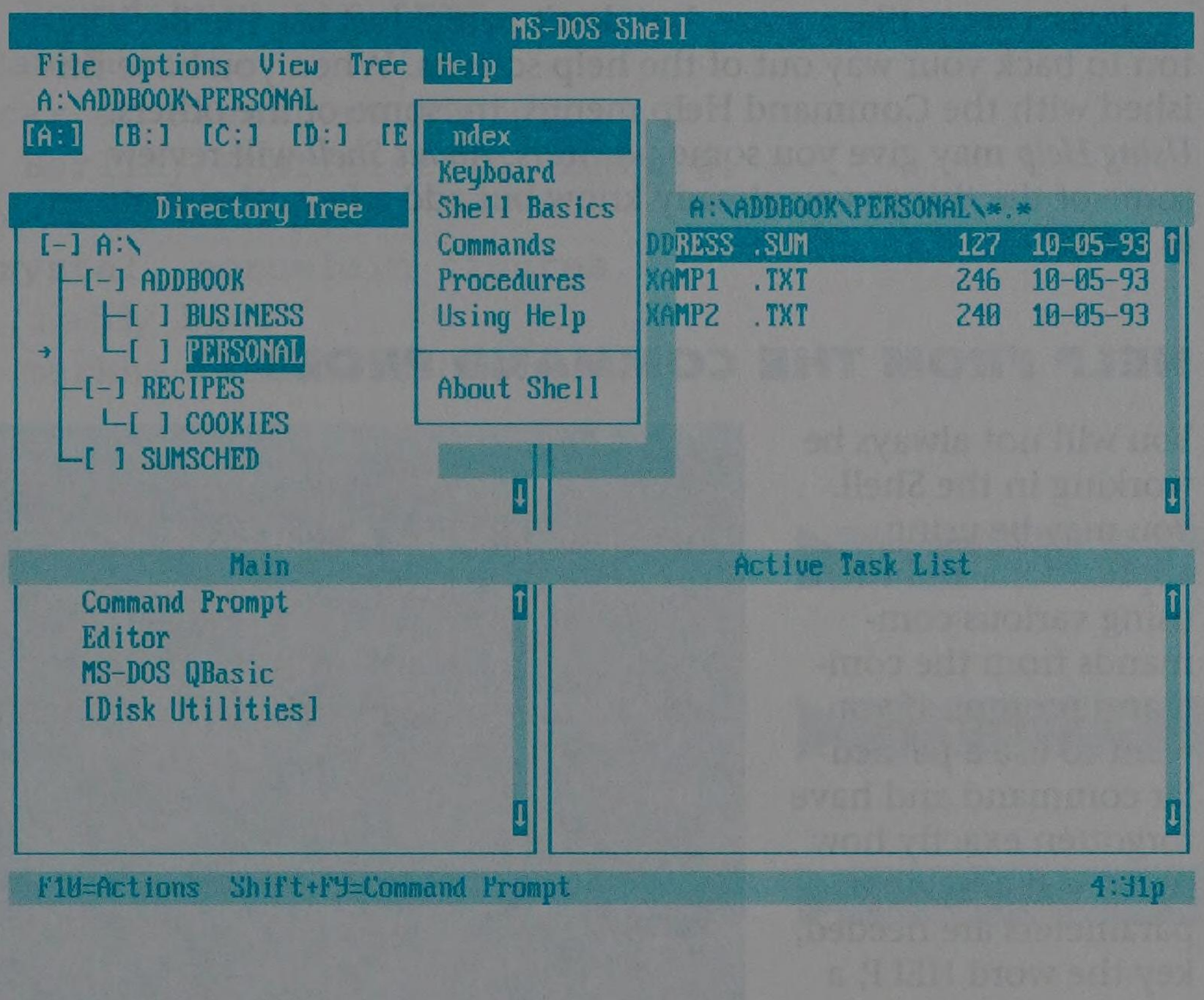
- Try the various buttons at the bottom. Close this help screen. Highlight other areas of the Shell and press **F1**.

USING THE HELP MENU

After you have explored some of the various uses of the F1 key, the next area to seek help is the Help menu.

■ Pull down the **Help** menu. Your screen should look similar to Figure 6.9 below.

Figure 6.9
The Help menu



The Help menu lists the major topic areas for which help is available. Each time you make a selection, an information screen related to the subject appears. In addition, that screen will also list related topics that might be of help or interest.

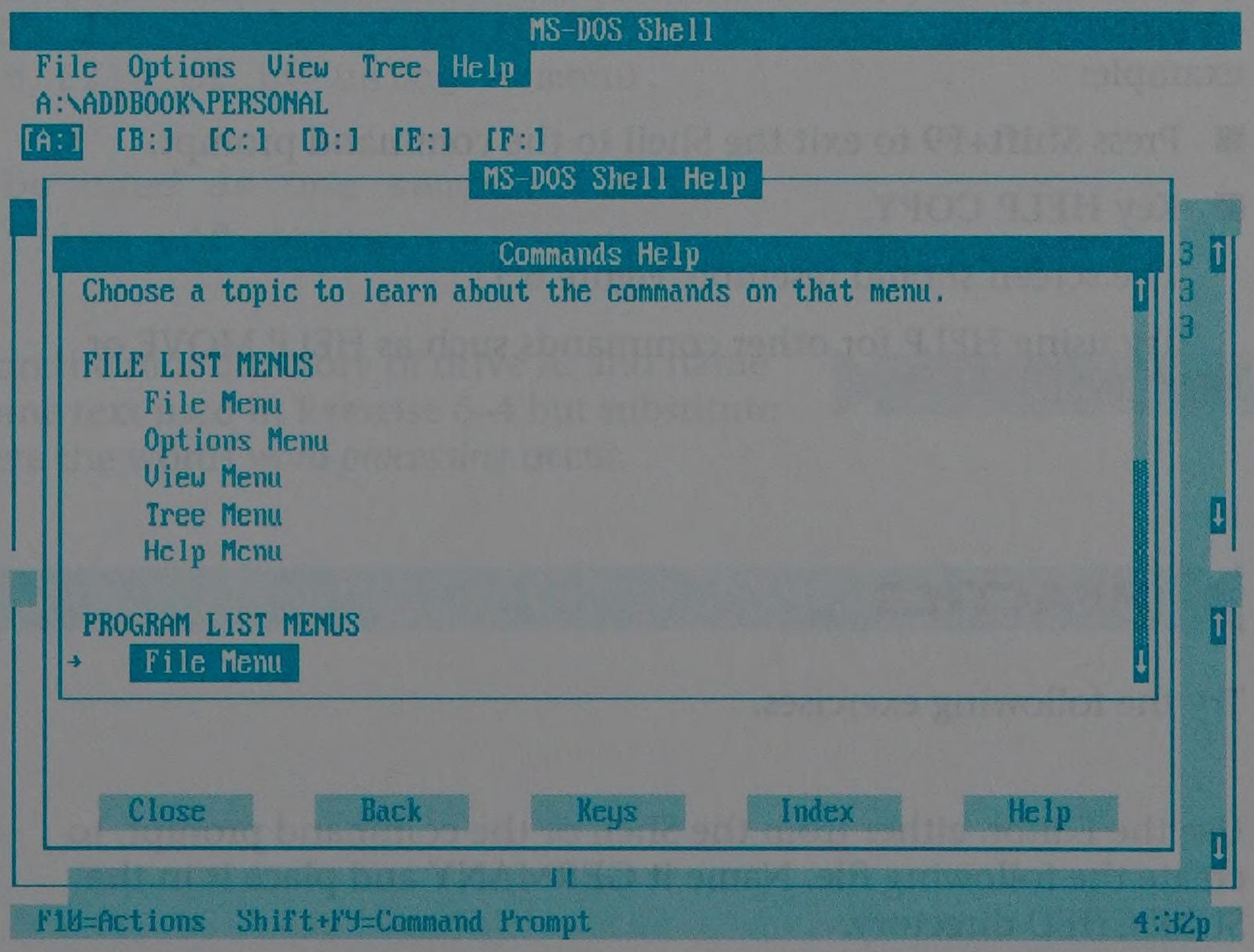
■ Select **Commands** from the Help menu by using the down arrow key or by clicking on it with the mouse.

Figure 6.10 shows you the next screen, which lists the File List menus, the Program List menus, and the View Screen menus. Use the scroll bar or the down arrow key to view the entire list.

■ Under FILE LIST MENUS select the **File** menu. You then have a list of each of the options shown in the File menu.

■ Next select the **Print** command. This will give you an explanation similar to the one you followed when you installed the PRINT command so it could be run from the File menu.

Figure 6.10
Commands Help screen



- Experiment with other selections. Try some of the related topics that are given.

It may seem like a maze, but don't panic. Just use the Back button to back your way out of the help screens. When you have finished with the Command Help menus, try some of the others. *Using Help* may give you some pointers. *About Shell* will review some of the things you already know but add a few other features as well.

HELP FROM THE COMMAND PROMPT

You will not always be working in the Shell. You may be using applications and then using various commands from the command prompt. If you want to use a particular command and have forgotten exactly how to word it and what parameters are needed, key the word HELP, a space, and then the name of the command. You immediately get a sample of the command syntax. For example:

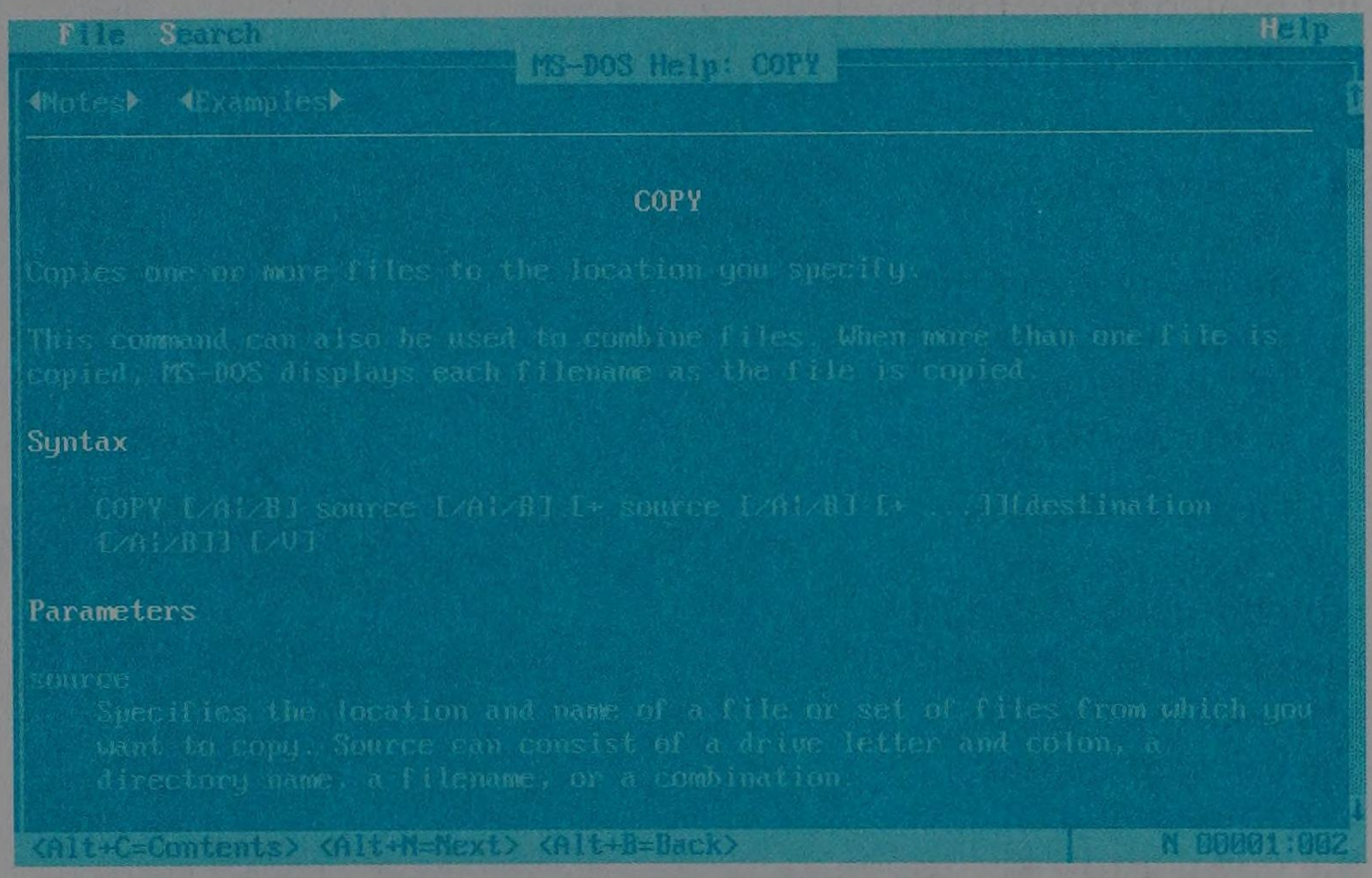


Figure 6.11
System help for COPY

- Press **Shift+F9** to exit the Shell to the command prompt.
- Key **HELP COPY**.

The screen should resemble Figure 6.11.

Try using HELP for other commands such as HELP MOVE or HELP TYPE.

PRACTICE

Try the following exercises.

EXERCISE 6-1

Use the Editor, either from the Shell or the command prompt, to create the following file. Name it **GERMANY** and place it in the SUMSCHED directory.

```
Possible Destination Germany
Time: Leave June 17, return August 12
Transportation: Round trip air from
   Seattle to Frankfurt
Pick up rental car at Frankfurt Airport
Possible stops: Berlin, Staffelstein, Bamburg,
   Nuremburg, Cologne, Munich
Shopping: Cut crystal, porcelain figures,
   cuckoo clock, teddy bear
Money: Deutsche marks--travelers checks
   and cash
```

View all the files on drive A: and use the Editor to make any necessary corrections in spacing or typographic errors.

EXERCISE 6–2

Delete the directory MISCTASK on drive B: and the directory PRACTICE on drive A:.

EXERCISE 6–3

Create a new file on the root directory of drive A: and name it **WORDPRO**. Key the following text:

EXERCISE 6–4

```
WORD PROCESSING APPLICATION

This file represents any one of the popular
word processing application programs on
the market today. It could be called up
by using a batch file or by using a menu.

This file will be used as one sample for
Lesson 7 batch files and menus.
```

Create another new file on the root directory of drive A: and name it **SPDSHEET**. Use the same text used in Exercise 6–4 but substitute the word *spreadsheet* where the words *word processing* occur.

EXERCISE 6–5

REVIEW

SECTION A

Vocabulary

The following words, phrases, and commands were found in this lesson. Find each of these in the glossary in Appendix A and define them.

Context sensitive	F6	Save As
EDIT	Hypertext	Shift+F9
Editor	Refresh	Spool queue

SECTION B

True/False

In the blank before each sentence, place a T if the statement is true and an F if the statement is false.

_____ 1. F1 gives context-sensitive help.

_____ 2. The Editor is only available from the Shell.

_____ 3. Hypertext is used for the help system.

_____ 4. Printing from the File menu is always available.

_____ 5. Spool queue is files waiting to print.

_____ 6. The Back button exits help menus.

_____ 7. Help for commands is available at the command prompt.

_____ 8. F6 flips from the Editor to the Shell and back.

_____ 9. Edit provides word processing without the bells and whistles.

_____ 10. A complete path must be given for a file name on an alternate drive.

REVIEW

Starting with the highlight in the Drives area, explain how you would solve each of the following tasks. Explain the necessary steps using either the keyboard or mouse description in the explanation.

SECTION C

Task Solving

1. Help is needed for using Shell basics. What steps should be followed?

   _____

   _____

   _____

2. An invitation needs to be created for a business luncheon. The text file should be placed in the BUSINESS subdirectory of ADDBOOK on drive A:.

   _____

   _____

   _____

3. The existing AUTOEXEC.BAT file needs to be edited and saved. What steps are necessary?

   _____

   _____

   _____

4. The screen displays a dialog box for a selection in the Options menu. The dialog box seems confusing. How is help obtained?

   _____

   _____

   _____

5. The Shell has been used for creating and saving material on drive A:. What is the procedure to return to the root directory and turn off the machine?

   _____

   _____

   _____

LESSON 7

Practical Matters

LEARNING OBJECTIVES

In this lesson you will:

- Write batch files
- Use the PAUSE, REM, and ECHO statements
- Run a simple batch file
- Create an AUTOEXEC.BAT file
- Create a menu
- Use PROMPT variations
- Explore task swapping

VOCABULARY

Look for the following words, phrases, and commands in this lesson:

.BAT	.EXE	REM
Batch file	Executable file	Task swapping
.COM	PAUSE	
ECHO	PROMPT	

OVERVIEW

You have learned a number of basic DOS commands, have explored the Shell, and have practiced some of the features of file management. But the question arises as to just how all of these commands can be put to use. In general, the average computer user is interested only in getting through the day-to-day tasks as quickly and easily as possible.

Computers are dumb. They cannot think or reason, but they are fantastic at what they *can* do and that is handle and process all sorts of data. The things you have been learning and practicing are part of the foundation elements that make using a computer and the glamorous word processing and spreadsheet programs smooth, quick, and efficient. They help automate repetitive tasks and do much of the tedious work in the background unseen and unnoticed by you. These commands, procedures, and shortcuts are the support elements in this computing foundation you are building.

The most common use you, as a beginner, will have for these skills is to create **batch files**. A batch file is a series of ordinary DOS commands that the computer can carry out automatically as a group instead of one at a time. You create a batch file to automate DOS activities that require more than one DOS command.

In this lesson, you are going to create and run batch files including an AUTOEXEC.BAT file, create a menu using batch files, explore prompt variations, and lastly, explore task swapping with the aid of the Shell.

SIMPLE BATCH FILES

Batch files are named following the normal rules for naming: eight or fewer characters and no reserved symbols. It is wise to keep the name very short so you can easily remember it. Once the batch file is created, merely typing the name will automatically carry out the sequence of commands in the batch. Any task that is being done repeatedly can be automated with a batch file. This cuts down on time and keystrokes.

All batch files must have a **.BAT** extension. Batch files can be placed in the root directory, in the application program subdirectory, or any place that is convenient. DOS has to have a way to find them, so their location must be included in the path. .BAT is one of three extensions the computer automatically looks for when booting up.

DOS has a systematic way in which it goes about its tasks. When you type in a command, DOS first looks to see if there is an internal command by that name. If that name does not appear

among the internal commands, DOS next looks to see if that name appears with a **.COM** extension. Next it searches for the name with an **.EXE** extension and then for the name with a .BAT extension. If the name can't be found in any of these four places, DOS then searches through the rest of the DOS commands.

Files with any of these three extensions can be loaded into memory and run (executed) by entering the name of the file only. They are called **executable files**. There is no need to key the extension.

RULES FOR BATCH FILES

1. Use the Editor to create and save the batch file.
2. Use a short name that is meaningful enough to be remembered.
3. Do not use a name already used for one of DOS's standard commands.
4. Add the extension .BAT.
5. List the commands to achieve the task, ONE command on each line.
6. End each line with an <ENTER>.
7. Include only commands that work at the DOS prompt.

NOTE: You are going to use your EXERCISES disk and pretend that it is your hard drive. Batch files have to be saved to disk. If you saved these files to the hard drive, you would have to spend time and effort later to search for and delete them.

CREATING A SIMPLE BATCH FILE

You are going to create a batch file to list the directory of the drive containing the data files. In this instance, it will be your drive A:.

- Boot up your computer if you have not already done so.
- Log to drive A:.
- Either go to the Shell, select **Editor** from the Program area, and key the name **D.BAT** in the dialog box, or key **EDIT D.BAT** from the command prompt.
- The Editor screen appears. Key **DIR A:** and press **<ENTER>**. If you are using drive B: for the data files, substitute **B:**.
- Save the file and exit.

You have now completed a very simple batch file that will automatically list a directory for drive A:. Check the Shell to see if D.BAT is listed in the Files area. You may have to refresh.

- To run the file, double-click on the D.BAT file, move the selection cursor to the file, and press **<ENTER>**, or go to the command prompt, strike the letter **D**, and then press **<ENTER>**.

The directory of the data files will appear on the screen with a prompt in the lower corner to press any key to return to the Shell.

You are now going to modify this file to list the files in the DOS directory on drive C: and add the switch to display them across the width of the screen. Cover the following instructions and, using a pencil and paper, see if you can write the batch file.

- When you have completed the planning, edit the D.BAT file. Run the batch file to confirm that it works. Remember that you only have to key the name which, in this case, is one letter. If your batch file doesn't work, check it against the following correct command: DIR C:\DOS/W

USING ECHO

You may have noticed that as you ran the above batch files, each command in the file showed and remained on the screen. This can cause the screen to get cluttered and messy. This is the result of the **ECHO** command, which is another of the internal DOS commands.

The default setting for ECHO is ON. Each line, as it is being carried out, is ECHOED on the screen. In other words, as the command is being carried out internally by the computer, each line of instruction is being shown simultaneously (echoed) on the screen. The lines will remain on the screen until the screen is cleared or until there is enough content that the lines roll off the top of the screen.

When you are carrying out tiny batch files with only one or two command lines, the appearance of the screen doesn't make much difference, but as the batch files become more complicated, it is better to opt for the neat and clear appearance on the screen.

The simple solution is to turn the ECHO command off by simply entering ECHO OFF. The batch file instructions are carried out but nothing appears on the screen except the original ECHO OFF command and the results of the batch file.

If you want a particular line of information to appear on the screen as a prompt or as user information, use ECHO followed by the information. The word ECHO does not appear but the information following the command does. That information has been "echoed."

For example: A golfer maintains a record of his golfing scores in a file named PUTT. This file is located on drive D: in a directory named GAME. He creates a batch file in the root directory of drive C: named P.BAT. When he keys **P**, the PUTT file is automatically accessed and ready for the next set of scores. The batch file might look like this:

```
D:
CD\GAMES
PUTT
```

As each line is carried out internally, it appears on the screen.

A modified P.BAT file would read:

```
ECHO OFF
D:
CD\GAMES
PUTT
```

This would accomplish the same thing but only the words ECHO OFF would appear on the screen. If you modified the command to @ECHO OFF (see item 3 below), none of the command lines would appear.

There are a number of ways that the ECHO command can be used:

1. *ECHO ON:* The commands will appear on the screen as the operating system is processing them. This is the default setting.
2. *ECHO OFF:* The commands will not appear on the screen with the exception of the original ECHO OFF command.
3. *@ECHO OFF:* Used as the first line in the batch file, this command will suppress all display of the lines including the first ECHO OFF line.
4. *ECHO:* When used on individual lines, any text following the command, with the exception of ON or OFF, will be displayed for that line only.
5. *ECHO followed by <ENTER>:* This asks the system whether ECHO is ON or OFF. The <ENTER> must immediately follow ECHO, with no intervening spaces.
6. *ECHO followed by a period (.):* This will force a blank line to appear. The period must immediately follow ECHO.

■ Modify the D.BAT file to resemble the following:

```
ECHO Off
CLS
DIR C:\DOS/W >PRN
```

Can you guess what is going to happen? Save the file and run it.

■ This time modify the file by adding @ in front of ECHO OFF and deleting the >PRN. How will this be different from the batch file above? Save the file and run it. Was your guess correct?

PRACTICE

The following small file is for practice in determining what the results of various uses of the ECHO command will be.

- Key the following batch file. Name it **EXP.BAT**. After it is on the screen but before you run it, use a pencil and paper to write down your guess as to the results of each line.

```
ECHO OFF
ECHO ECHO HAS NOW BEEN TURNED OFF
ECHO.
PAUSE Will this line appear?
ECHO Will this line appear?
ECHO What is the current condition of ECHO?
ECHO<ENTER>
ECHO.
ECHO (your name)
```

- Save the file. After you finish your pencil predictions, run the file.
- Check the appearance of the screen against your predictions to see if they were accurate.

This is what your batch file should have done:

Line 1—The ECHO OFF command appears.

Line 2—The words "ECHO has now been turned off" appear because they follow the ECHO command even though the command itself does not appear.

Line 3—There is a blank line.

Line 4—"Press any key to continue . . ." appears. Do you remember where you have seen this prompt before? Right. When you used the **/P** switch with DIR to pause at each screen. On this line you had a PAUSE command, but the text "Will this line appear?" didn't appear because ECHO was OFF.

Line 5—"Will this line appear?" does appear because it was preceded by the ECHO command.

Line 6—This line also appears because it is preceded by the ECHO command.

Line 7—The ECHO command followed by <ENTER> asks for the status of the command. The system returns the information that ECHO is OFF.

Line 8—There is another blank line.

Line 9—Your name appears.

PAUSE AND REM

The **PAUSE** command and the **/P** switch, used when listing a directory, creates a temporary pause in the running of a file. It is intended to give the user time to perform a task such as switching disks, inserting a new disk, or reading instructions on the screen. It shows the prompt "Press any key to continue . . ." and sits and waits for you to take as much time as you need. When you are ready, you press a key and the program continues toward completion.

The **REM** command stands for **REMARK**. As long as ECHO is ON, any text after the REM command will show on the screen. The REM command itself does not show. The text following this command can be used to prompt a user to perform a task, warn about a possible danger or error, or give general information about what is happening. You must remember that you will not always be the one using the computer or the programs. It is only fair to give the next user some idea of what is happening. Besides that, after two or three months of computer use, you might not even remember what some of the files are intended to do.

COMMON BATCH FILES

Any frequently occurring task can be automated by a batch file. The ones you have just completed and the rest of those covered in the book are relatively simple. As you begin to create your own batch files, you may want to explore some of the advanced features available: using variables, redefining function keys, making decisions, conditional and unconditional transfers, etc. Decide how you are going to use your computer and what you need to accomplish, then gradually start adding to your knowledge and technique.

BATCH FILE FOR FORMATTING

You have used the FORMAT command from the command prompt and you have used it from the Shell. This may be sufficient for you. But are you the only one who uses the computer? Are there enough prompts and warnings for anyone to accomplish the task with a minimum of help? Remember that you have to tailor things to the way you work.

The following batch file and its modification will give you some practice in creating and running a batch file. This one is to format a disk. You will create a batch file to format drive A: or B:. If you have only one floppy drive, you will have to create the batch file on drive C: and later delete it. If you have two disk drives, place your

EXERCISES disk in drive A: and write your batch file to format a disk in drive B:.

REMINDER: Never format drive C:. You will erase ALL the information on your hard disk.

- Use the Editor to create the following file. Name it **F.BAT**.

```
REM This will carry out the formatting of a
  disk in drive A: (B:)
PAUSE Remember that all files on the disk will
  be destroyed
FORMAT A: (or FORMAT B:)
```

- Save and run the batch file. When the screen prompts you to insert a disk, insert any new or used disk that can be erased.

Did the batch file run properly? Did the pause give enough time to read the warning? Hopefully, it got the job done, but how did it look on the screen? You are now going to modify the F.BAT file.

- Using the Editor and the same name, modify (or rekey) the F.BAT file so that it looks like the one below.

```
@ECHO OFF
ECHO This file will carry out the formatting of
  a disk in drive A: (B:)
ECHO.
ECHO Remember that formatting will destroy all
  data on the disk
PAUSE
ECHO.
CLS
FORMAT A: (B:)
```

- Save the batch file and run it.

Did the batch file still run correctly? Was the screen less cluttered and easier to read? The third and sixth lines insert blank lines so that the screen is easier to read. In the Practice section at the end of the lesson you will have the opportunity to create some batch files on your own for various purposes.

NOTE

NOTE: On the screen, each command line will appear as one line across the screen.

CONFIGURING YOUR SYSTEM

When you turn on the computer, it is similar to turning the ignition switch on an automobile. You expect it to run. You expect all the parts to work together. You want to be able to accomplish the tasks or jobs at hand without worrying about what is going on in the background. Just as a mechanic makes sure all the parts of the

car work together, someone has to make sure all the parts of your computer system work together.

The process of making sure that all parts are talking to each other and working together is called *configuring the system*. Configuring sets up your system so that DOS, all the parts of the hardware, and the applications work the way you want them to work. This has already been done by the instructor or a computer technician, but you should be aware of what was done and how it was done in case you wish to experiment on a disk in drive A: or on a computer at home.

Most of the configuration information is stored in two files: CONFIG.SYS and AUTOEXEC.BAT.

THE CONFIG.SYS FILE

This file name stands for *CONFIGuration of the SYStem*. This file is a text file that contains commands to enable DOS and the application programs to use the hardware components. These components include memory, keyboard, display, printer, mouse, etc.

When the computer is turned on, this is the first file the computer runs. DOS reads the CONFIG.SYS file only when the computer is first started. If any changes are made to this file, THE COMPUTER MUST BE RESTARTED FOR THE CHANGES TO TAKE EFFECT.

When DOS is first installed and the DOS Setup is run, a basic CONFIG.SYS file is created and placed in the root directory. When application programs or updated versions of programs are installed, some modifications may be made in the CONFIG.SYS file.

The CONFIG.SYS file can be edited, but a certain amount of caution is required. To explore more about the CONFIG.SYS file and memory components, refer to Appendix C.

CAUTION!!! Both the CONFIG.SYS and the AUTOEXEC.BAT files are text files, but NEVER use a conventional word processing program to create or edit these two files. Word processing programs save files in a different format. If you edited these files in a word processing program, you would soon discover that your computer would not run properly.

THE AUTOEXEC.BAT FILE

The AUTOEXEC.BAT file is probably the most important batch file you will create in the beginning stages of your computer career. As you can guess, AUTOEXEC.BAT stands for *AUTOmatic EXECution*. This batch file contains all the commands and procedures you want carried out every time you sit down to use the computer. When you boot up, this is the file the computer looks for immediately after

CONFIG.SYS, and then it carries out the instructions in exactly the same manner as for other batch files.

Remember that at one point you created a PATH to the DOS directory so the computer would know where to find the external DOS files. You also created a PROMPT PG so that you would always know which directory you were in. You executed the PRINT command at the DOS prompt so that you could use the Print option in the File menu. All these items can go in the AUTOEXEC.BAT file.

Your machine probably asks for the date and time. You can put a date prompt in the AUTOEXEC.BAT file and leave the time out. If you are working almost exclusively in one application program, such as a word processor, you can put this in the AUTOEXEC.BAT file and have the application automatically loaded. Or you can create a menu from which to choose various tasks. These are the kinds of instructions that you want in the AUTOEXEC.BAT file. You can include any command that you would ordinarily enter at the command prompt. Do everything once and then you don't have to worry about any of them for the balance of your work session.

You are going to create an AUTOEXEC.BAT file on the EXERCISES disk in drive A:. Your hard drive already has an AUTOEXEC.BAT file on it. If you have a computer at home, you can view and experiment with that file. If you are in class, follow the directions of your instructor. You may want to examine the AUTOEXEC.BAT file for the hard drive to see what is included. Many times during the installation of application programs, the install or setup programs for the application will automatically make modifications to the AUTOEXEC.BAT and the CONFIG.SYS files.

NOTE

NOTE: If you want to edit the AUTOEXEC.BAT file on your computer at home, first copy it to a new name, such as AUTOEXEC.OLD. Then, if you make a mistake, you still have the original batch file.

To summarize, here is a list of items you might want to include in your AUTOEXEC.BAT file:

1. *ECHO:* You decide if you want ECHO ON or ECHO OFF.
2. *PROMPT:* This is a must.
   a. Use: PROMPT PG
   b. Result: The name of the current default directory followed by >.
3. *DATE:* This is necessary so that each file created or edited will show the date when files were created, updated, or edited. Use: DATE
4. *TIME:* This is your choice. If your computer has a clock, it may enter the time automatically.
5. *PRINT:* This is necessary so the Print option can be used. In the AUTOEXEC.BAT file, the form to use is PRINT /D:PRN. The D stands for device and PRN is the device name for the printer.

6. *PATH:* This is also a must.

   a. Parts: Each part of the path must refer to only one thing. This one thing may be the root directory, the DOS directory, a utility subdirectory, or an application program.

   b. Configuration: Each part must list the drive designator where the part is found, followed by a colon, followed by a backslash, and then the name of the directory or subdirectory. Each part is separated by a semicolon. For example: C:\;C:\DOS;C:\UTIL

In creating a path for yourself, don't forget that you are working in drive A: and creating a path on your bootable disk. The C: drive shown in the example would be where these files are located. UTIL is an illustration of a directory that you would probably have and that would be on drive C:.

A few comments need to be made about the content of a path. Some people try to include everything they will be using in the path. This is really not necessary. When you enter a command or file name, the computer starts a search of the items in the path. In the example above, the computer would search through every item in the root directory, then through every file in the DOS directory, and finally through every file in the UTIL directory. If you add a word processing or spreadsheet application program, you are adding another 5 to 15 megabytes of files for the computer to search through.

You don't need the application programs in the PATH to load and run them. You can call them from the root directory by entering CD\(name of the program) and then entering the command to start the program. You can create mini-batch files in the root directory to load applications with one or two keystrokes. You can also start the application programs from the Shell by selecting the Run option from the File menu and then entering in the dialog box the command to start the program. Or you can double-click on the name of the program in the Directory Tree window.

- On the EXERCISES disk in drive A: create an AUTOEXEC.BAT file that includes the date, the prompt, the PRINT command, and a path that includes the root directory of drives A: and C:, the DOS directory, and the PHONE directory on drive A:. Now when the EXERCISES disk is used for booting, the AUTOEXEC.BAT file will automatically be loaded into memory and ready for use.

CREATING A MENU

One very practical use for the batch file skills you have been learning is to create a customized opening menu. There are usually two

or three application programs and two or three disk procedures that you use on a daily basis. By creating a menu and placing a batch file in the AUTOEXEC.BAT file that will call the menu when you boot up, you have one-key access to most of the work you will be doing.

GENERAL PROCEDURE

1. Decide which items you would like to include on a menu. This will probably include a word processing program, a disk formatting utility, a spreadsheet program, and possibly a favorite game.
2. Add one additional option to return from the menu to DOS.
3. Create a menu. Use the Editor to design and create the menu. Give each option a number. Name this menu MENU.TXT or any appropriate name. Include a line of instruction asking the user to select the option and press the corresponding number. Save the menu in the root directory of the drive where you work.
4. Add a command at the end of the AUTOEXEC.BAT file that will clear the screen and bring up the menu.
5. Create a batch file for each option, giving the batch file a name that corresponds to the number in the menu: 1.BAT, 2.BAT, 3.BAT, etc. Each batch file should carry out the appropriate task indicated on the menu.
6. End each batch file, except the last one, with a command to CLS and TYPE MENU.TXT. This will clear the screen and return the screen to the menu for the next selection.
7. The last batch file, to return to DOS, should end with a CLS and CD\ to return to the DOS command prompt.

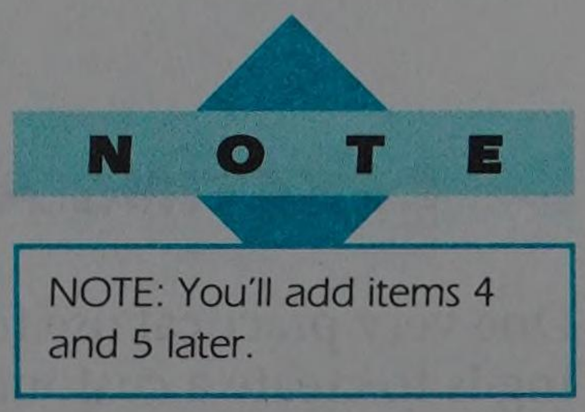
This is the general procedure you are going to step through to create a menu on the EXERCISES disk in drive A:.

You have already created a batch file to format a disk, and you created two files, WORDPRO and SPDSHEET, to simulate application programs. Starting with these three items, you will create a menu and a batch file to place in your newly created AUTOEXEC.BAT file.

- Use the Editor to create the menu shown in Figure 7.1. The border is optional. Save the file and name it MENU.TXT.
- Add a command at the end of the AUTOEXEC.BAT file you created that will clear the screen and bring up the menu.

  This should be easy. You would add:

```
CLS
TYPE MENU.TXT
```



- Do a warm boot (Ctrl+Alt+Del) to see if the menu appears. If it does, you are ready to rename and/or create the batch files for each of the items.

BATCH FILES FOR MENU

A batch file will continue to run until all of the commands are carried out. When the batch file carries out a particular task, and that task is completed, the system returns to the batch file to see if there are any more instructions. In the case of the menu, each batch file that completes the task must also have additional lines that will clear the screen and return to the menu AFTER the task is completed.

- You need a batch file to load the word processing program. The file that is going to simulate word processing is named WORDPRO. Since this is item 1 on the menu, the name for the batch file has to be 1.BAT.

Figure 7.1
Sample menu

```
**************************************
*                                    *
*                                    *
*              M E N U               *
*                                    *
*        1.  Word Processing         *
*                                    *
*        2.  Spreadsheet             *
*                                    *
*        3.  Format Disk in A:       *
*                                    *
*        4.                          *
*                                    *
*        5.                          *
*                                    *
*        6.  Return to DOS           *
*                                    *
*        Please make a selection by  *
*        pressing the appropriate    *
*        number and then ENTER.      *
**************************************
```

For example, if using the WORDPRO simulation file, you would key:

```
@ECHO OFF
REM This batch file calls the word processing
CLS
TYPE WORDPRO
CLS
TYPE MENU.TXT
```

If you were creating a batch file to add the WordPerfect 5.1 program to your menu, you would use the sample below:

```
@ECHO OFF
ECHO Insert data disk in drive B
PAUSE
```

NOTE

NOTE: If you actually have a word processing application package installed on the hard drive, you can substitute the actual name of the file and the letters to boot the program.

```
B:
C:\WP51\WP
CLS
TYPE MENU.TXT
```

The first three commands are obvious. WordPerfect users usually log to the drive containing the data disk and then boot the program. If this menu was going to be on the hard drive and the data disk in A:, you would log to A: and then boot the program from C:. Since you are experimenting and trying to avoid cluttering the hard drive, you are using B: for the data disk. If you have only one floppy drive, check with your instructor about how this should be handled.

The program is loaded from the hard drive C: by showing the directory name and then the letters that WordPerfect uses to start the program. After you have finished the word processing and exit WordPerfect, the system returns to the batch file and completes the instructions by clearing the screen and returning to the menu.

- Now a batch file is needed for a spreadsheet program. Use the same general procedure you did above and create a batch file named 2.BAT that will either call the SPDSHEET simulation file or an actual spreadsheet program from the hard drive.
- A batch file for formatting a disk in drive A: has already been created. It now needs to be renamed from F.BAT to 3.BAT. You can use the Shell to rename the file or key **REN F.BAT 3.BAT** at the drive A: root directory command prompt.

BATCH FILE TO RETURN TO COMMAND PROMPT

You need one more batch file to return you to the DOS command prompt. This file will be 6.BAT. You actually have a DOS prompt below the menu, but again the neat and tidy way is better. This menu option will clear the screen, return to the root directory and place the prompt at the top of the screen ready for the next entry.

- Use the Editor to create 6.BAT. Key the following:

```
CLS
CD\
```

- When you have completed the menu, try each of the numbered options to see that each one works. Strike a number key and press <ENTER>. After the menu option has performed its task, exit to return to the batch file and the menu.

PROMPT VARIATIONS

When you first boot the computer, the prompt for the current default drive appears. If you are using the hard drive the prompt is

C: followed by a greater-than sign (>). If you are booting with a floppy disk, the prompt is A: followed by the greater-than sign.

When you typed PROMPT PG, and later put this in the AUTOEXEC.BAT file, you changed the way the prompt was displayed. **PROMPT** is an internal DOS command and is changed by using a two-character string called a *meta-string*. This meta-string is the dollar sign, $, followed by a letter. The letter tells DOS what action or display is supposed to be carried out. Remembering the name *meta-string* is not nearly as important as remembering $ followed by a letter.

The most common, and usually considered the most helpful, prompt is the PG that you used early in the lessons. It would be extremely confusing and possibly disastrous if there were no way to see which directory or subdirectory you were currently working in. The *P* part of the PG prompt tells DOS to display the names of the default drive and the directory. The *G* part of the prompt tells DOS to display the greater-than sign.

The various possibilities for the prompt are as follows:

$D	displays the current date
$G	displays the greater-than (>) character
$H	displays a backspace, erasing the character at the cursor
$L	displays the less-than (<) character
$N	displays the default drive
$P	displays the names of the default drive and directory
$T	displays the current time
$_	displays a carriage return and line feed, moving the cursor to the beginning of the next line

In addition, if you key the word PROMPT and then follow with some text, the text will be displayed in place of the prompt. You can have fun experimenting with various combinations of the PROMPT command. You have already placed the PG in the AUTOEXEC.BAT file. Any experimenting you do and any changes you make at the command prompt will temporarily override this command and be placed in memory only for the duration of your work session or until you reboot the computer. Then the prompt will revert to that contained in the AUTOEXEC.BAT file.

TASK SWAPPING

There is one more very handy and practical tool that was introduced in DOS 5 and has been kept and polished in DOS 6. This is **task swapping**. Up to this point, whenever you have been working on a particular program, you have had to finish and exit that program and then change to another. This does not refer to changing

from the Shell to the command prompt and moving around in the Shell, but rather to using a word processor, then using one of the utilities, such as CHKDSK, then playing a computer game, then using a spreadsheet.

DOS 6 permits you to open a number of programs and switch back and forth between them. They are not running at the same time, but are being held in the background in memory, and you can switch, or swap, between them. For example, suppose you are using a word processing program to put together a financial report for the end of the quarter. The figures, graphs, and supporting information are in various sheets in the spreadsheet program. You would use the Shell and activate both the word processing program and the spreadsheet program. As you create the report in word processing, you can switch to the spreadsheet program to verify figures or information needed, then switch back to the word processor to continue the report.

To enable task swapping you must choose the Enable Task Swapper from the Options menu.

- Bring the Shell to the screen.
- Pull down the **Options** menu and select **Enable Task Swapper**. A small diamond should appear just in front of the name showing that this option has been selected.

The one part of the Shell that we have ignored since Lesson 4 is the Active Task List area in the lower right part of the Shell screen. After the Task Swapper is enabled, this area becomes active and is labeled *Active Task List*. This area shows a list of all programs that have been activated and are being held in memory waiting to be called when needed. Figure 7.2 shows three programs that have been activated: Lotus 1-2-3, dBASE, and WordStar.

CAUTION!!! DOS WILL NOT LET YOU EXIT THE SHELL UNTIL ALL ITEMS IN THE ACTIVE TASK LIST HAVE BEEN EXITED.

For the remainder of this lesson, you are going to practice switching between various programs that are on the hard disk. Exercise care so that no unwanted data is entered or deleted.

You are working on a computer with a hard drive. If you are a beginner and this is your first computer, you probably paid the vendor to install some of the most useful application programs to get you started on your computing career. If you are in a classroom situation, the instructor, or the lab technician, has undoubtedly installed a variety of programs on the hard disk. Up until now, you have been avoiding using the hard disk. Now you are going to explore at least the opening screen of some of these programs. You have already selected Enable Task Swapping, so you are ready to begin swapping.

- Pull down the **View** menu and select the **Program/File Lists**

N O T E

NOTE: The number of applications that are activated is limited by the amount of RAM in your computer. You'll see an error message if you try to load too many applications.

option. This view gives you access to both the Directory Tree area and the Active Task List window.

- Select drive [C:] in the Drives Area.

In the Directory Tree area is a list of all the programs and files on the hard drive. Examine the list. You are going to need at least two and preferably three programs. Your instructor may tell you which ones to use. This book is going to use a word processor, a spreadsheet, and a database program. For ease in use, and because they are so common, WordPerfect, Lotus 1-2-3, and dBASE will be used. If your hard disk contains programs with different names, substitute them or select other program applications. You are not going to be doing any work in the programs, only calling them up and examining them.

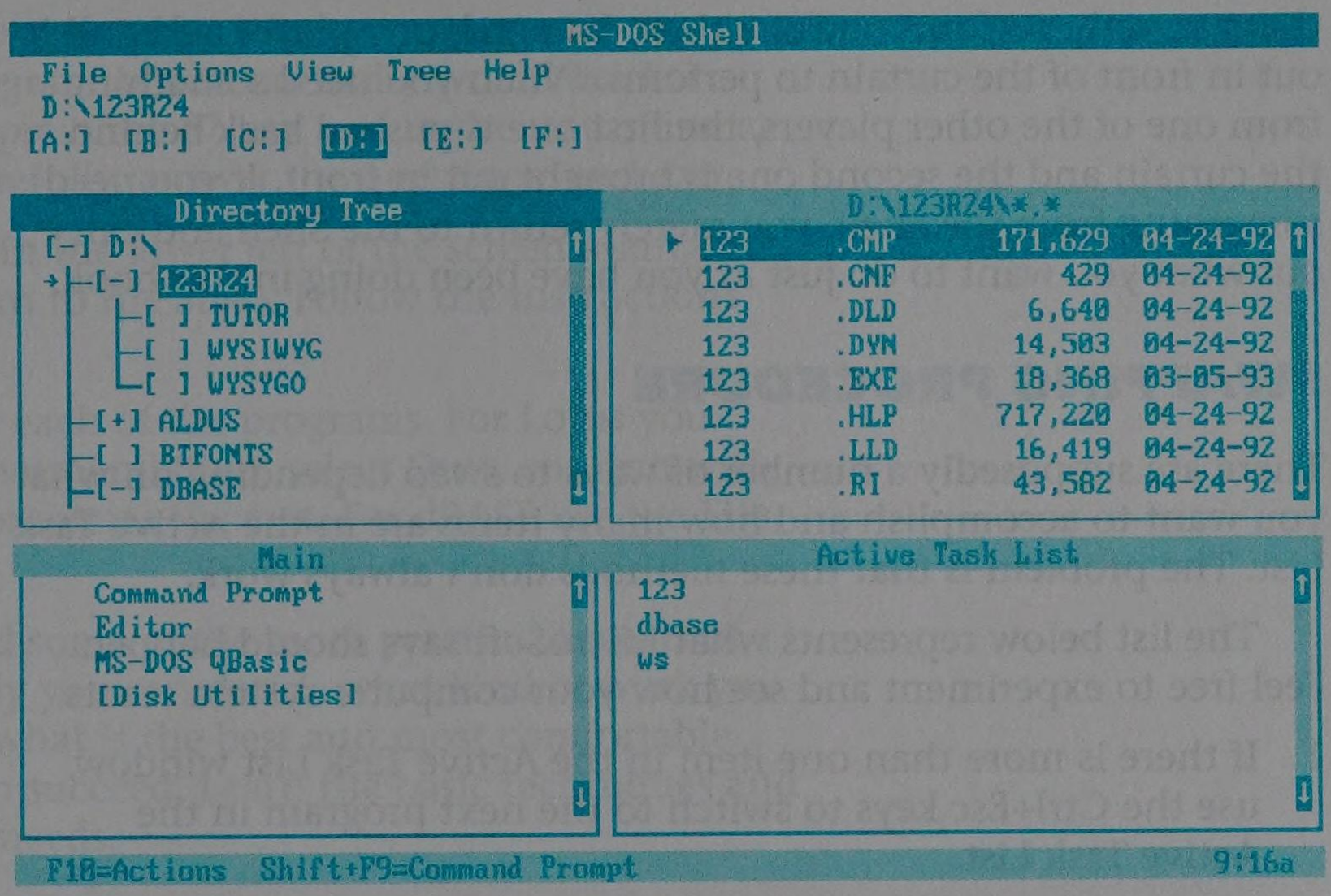


Figure 7.2
Active Task window

- Select WordPerfect in the Directory Tree area.
- Pull down the **File** menu, select **Run**, and in the dialog box key **WP**.

You now have the opening WordPerfect screen which is basically blank with the status line at the bottom. Imagine that you are going to be creating a report here.

- Press the **Alt+Esc** keys. You are returned to the Shell.
- Look at the Active Task List. You now see a WP notation signifying that WordPerfect has been activated.
- Select **Lotus 1-2-3** from the Directory Tree, **Run** from the File menu, and key **123** in the dialog box. You will now get a blank spreadsheet on the screen.

NOTE

NOTE: If you are using a different application, select that program and then key the letters used to boot the program.

- Press the **Alt+Esc** keys. You are again returned to the Shell. You now have two notations in the Active Task List showing both 123 and WP.
- Repeat the process and this time select a data processing program or any other program that your instructor directs. Return to the Shell.

You now have three active tasks listed. You can swap between these three at any time. The various tasks are like actors in a play

that can only perform one at a time. You grab one player and pull it out in front of the curtain to perform. When you need something from one of the other players, the first one is pushed back behind the curtain and the second one is brought out in front. If you need something from the Shell, you merely return to the Shell and carry out what you want to do just as you have been doing in this book.

SWAPPING PROCEDURE

There are supposedly a number of ways to swap depending on what you want to accomplish and how many items are in the Active Task List. The problem is that these methods don't always work.

The list below represents what MicroSoft says should happen. Feel free to experiment and see how your computer system reacts.

1. If there is more than one item in the Active Task List window, use the Ctrl+Esc keys to switch to the next program in the Active Task List.
2. Hold down the Alt key and press the Tab key and a blank screen will appear with the name identifying the next task at the top.
3. By holding down the Alt and repeating the Tab key you can cycle through the various tasks. As soon as you release the Alt key the screen drops immediately into the program shown in the title line.

You can swap between files with far less trouble by doing the following:

1. Select the task in the Active Task List you wish to use. Click on it with the mouse or highlight it and press <ENTER>. The screen switches to the application.
2. Perform the chores you need to do, save as a precaution but do not exit, and press Alt+Esc. You will be returned to the Shell.
3. Decide on the next task in the Shell and then double-click on the program initials in the Active Task List. This will return you to the program application in exactly the same spot you left it.
4. Repeat these steps of selecting the task in the Active Task List to work in the application and then use Alt+Esc to return to the Shell.

- Experiment with these steps listed above until you feel comfortable with the swapping process and find what works best for you.

EXITING FROM TASK SWAPPER

Each of the items in the Active Task List must be closed before you can exit the Shell. It is a one-by-one process to exit just as it was to open the programs.

Select any one of the active tasks. When it appears on the screen, exit from that program as you normally would do. For example, in WordPerfect press the F7 key, watch the status line at the bottom left corner carefully, answer the questions, and exit.

A prompt will appear in the lower left of the screen asking that you press any key to return to the Shell. Follow the instructions and press any key.

- Repeat the process for each of the programs. For Lotus you would bring up the command lines, select **Quit**, confirm with **Yes**, and the screen completes the exit. For dBASE use the **File** menu and select **Exit**.

You have now covered some of the more practical aspects of working with DOS 6. Only you can decide what kind of work you want to accomplish and what is the best and most comfortable manner in which you can succeed. Learn the basic techniques and then tailor them to your needs.

PRACTICE

Try the following exercises.

EXERCISE 7-1

Some housekeeping needs to be done. Move the remaining two directories, CORRESP and PHONE, on the EXERBAK disk in drive B: to drive A:. You may have to create the directories on drive A: first, and then move the various files.

Verify that the directories and files are now located on drive A:.

EXERCISE 7-2

You are going to create a directory where a variety of games could be stored. You will create a menu listing three games and an option to return to the command prompt. Then you will create a batch file in the root directory of drive A: that will change to the game directory and call up the menu. This will all be done on the EXERCISES disk in drive A:.

The three games that will be listed on the menu are only imaginary. There is no reason to create batch files to load these games from the menu.

1. Create a new directory on the disk in drive A: and name it GAMES.
2. Create a file in that directory to display a menu. Name it GMENU.TXT. This will be similar to the directory you created to run the various utilities. On the menu list: 1. PUTT, 2. GOLF, 3. DETECT, and 4. RETURN TO DOS.
3. Prepare a batch file named 4.BAT that will return the program to the drive A:\ prompt.

4. Create a batch file in the root of drive A: that will automatically switch to the GAMES directory and load the GMENU.TXT file.
5. Check the accuracy of the work by pressing the number 4 choice on the menu to see if the program returns to the A:\ prompt.

REVIEW

SECTION A

Vocabulary

The following words and phrases were found in this lesson. Find each of these in the Glossary in Appendix A and define them.

.BAT	.EXE	REM
Batch file	Executable file	Task swapping
.COM	PAUSE	
ECHO	PROMPT	

SECTION B

True/False

In the blank space before each sentence, place a T if the statement is true and an F if the statement is false.

_____ 1. A prompt always displays the date and time.

_____ 2. Batch files are fast and cut down on keystrokes.

_____ 3. ECHO echoes text that follows.

_____ 4. Files with .BAT extensions can run by typing the name only.

_____ 5. An AUTOEXEC.BAT file is limited to date, time, and path.

_____ 6. Task swapping is limited to no more than three programs.

_____ 7. PAUSE provides time for reading instructions.

_____ 8. REM remarks show on the screen.

_____ 9. PG is the only prompt in an AUTOEXEC.BAT file.

_____ 10. Task Swapper allows multiple programs in memory.

REVIEW

SECTION C

Task Solving

Starting with the highlight in the Drives area, explain how you would solve each of the following tasks. Explain the necessary steps using either the keyboard or mouse description in the explanation.

1. On drive A: create a path that will include DOS on the hard disk, a spreadsheet (123) on the hard drive, a word processing application (WP51) on drive A:, and Utilities on drive A:.

2. Create an AUTOEXEC.BAT file on drive A: that includes a prompt, the path from problem 1 above, the date, and loads a menu named SELECT.TXT.

3. Create a batch file to load the menu SELECT.TXT.

4. Swap tasks from the command prompt to the 123 application, to the WP application, and back to the command prompt.

5. The Active Task List shows Command Prompt, 123, and WS. How do you exit so that the computer can be turned off?

LESSON 8

Utilities and Other Handy Commands

LEARNING OBJECTIVES

In this lesson you will:

- Review memory and storage
- Run CHKDSK
- Defragment a disk
- Review MEMMAKER
- Format a disk using the Shell
- Use Quick Format
- Unformat a disk
- Use DISKCOPY
- Delete a directory with DELTREE

VOCABULARY

Look for the following words, phrases, and commands in this lesson:

CHKDSK	Fragment	Target disk
DEFRAG	MEMMAKER	UNFORMAT
DELTREE	Quick Format	
DISKCOPY	Source disk	

OVERVIEW

You have covered the preliminary steps for formatting a disk, copying and moving files, and deleting files and directories. These, with a few other utilities, form the basis for file management. In addition to file management, one of the most important areas of concern is memory management. The objectives in disk and file management are to enable your computer and programs to run at maximum efficiency, to utilize disk space to the greatest advantage, and to manage the essentials in a quick and effortless manner so that you can get on with whatever your major task might be. These objectives can be met if you understand how the parts work together to achieve this efficiency.

This lesson will review the subject of memory and storage, the utilities that help optimize these areas, and some of the utilities that DOS 6 provides to do the standard tasks more easily.

MEMORY MANAGEMENT

In Lessons 1 and 2 you were introduced to random access memory (RAM) and disk storage on a hard or floppy disk. RAM is where all the work is done, and disks provide the long-term storage when you're finished with a task. It would seem obvious that the more memory a computer contains, the more work it can do and the more complicated items it can handle. Since memory must access storage, such items as the CONFIG.SYS and AUTOEXEC.BAT files have a direct relation to the amount of memory left after loading these and any other needed files.

If problems occur in running a program or an error message such as *insufficient memory* or *out of memory* occurs, it means there is not enough space in RAM to handle everything. This leaves you with two choices: buy extra RAM chips and have them installed, or try to maximize the memory you have.

The amount of memory available will depend on your particular situation: Is this a classroom where each computer is running individually? Are the computers networked together so that they all use a central computer for loading and storing programs? Is this a personal, at-home computer, and if so, how much memory was purchased?

CHECK THE MEMORY OF YOUR MACHINE

- Boot up the computer, if necessary. The screen should show the command prompt for the root directory, C:\>.

- Key **MEM** and press **<ENTER>**.
- Do a print screen of the screen content.

Your screen may resemble Figure 8.1 or a part of it. This is your memory's configuration. If your report shows only 640K of memory, you have only the basic, *conventional* amount of RAM to run the computer. If the figure for total memory starts with a 4, 6, 8, or more it means that extra memory chips have been added.

```
C:\>mem

Memory Type        Total =  Used  +  Free
----------------  -------  -------  -------
Conventional         640K      80K     560K
Upper                187K      45K     143K
Adapter RAM/ROM        0K       0K       0K
Extended (XMS)      3269K    1241K    2028K
----------------  -------  -------  -------
Total memory        4096K    1365K    2731K

Total under 1 MB     827K     124K     703K

Largest executable program size       560K  (573824 bytes)
Largest free upper memory block       142K  (145664 bytes)
MS-DOS is resident in the high memory area.

C:\>
```

Figure 8.1
Memory configuration

THE 640K BARRIER

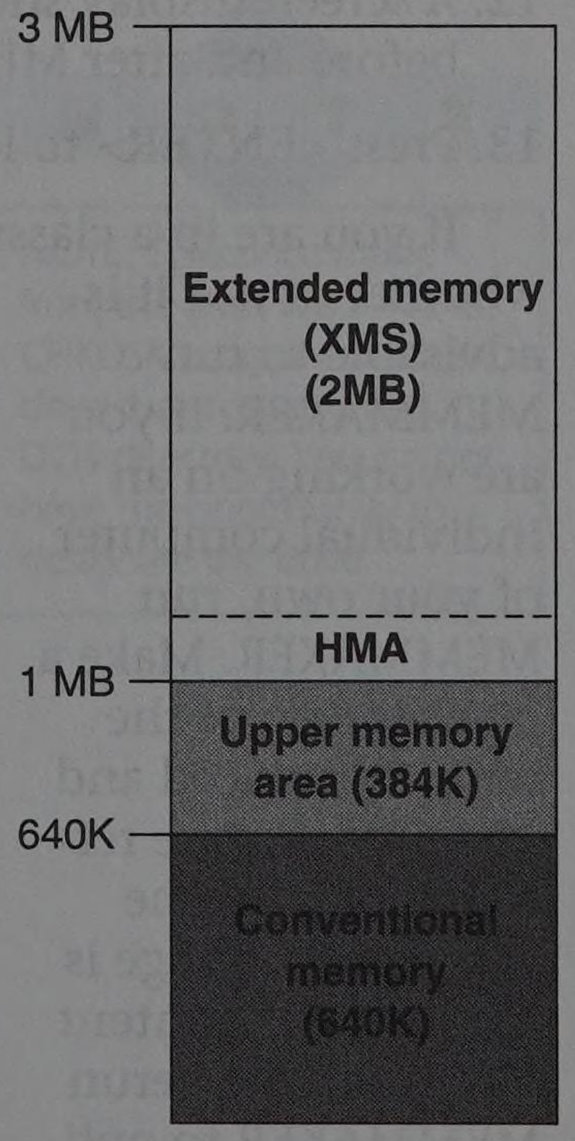
There is a problem. The 640K known as conventional memory is all that DOS has available to run programs. Even if extra megabytes of memory have been installed, they can't be used for running programs. You can imagine what happens to conventional memory after the CONFIG.SYS file, device drivers, DOS, and an application program are loaded.

Since DOS can't ignore the 640K barrier, it has ways of getting around it. Figure 8.2 shows a general diagram of RAM memory.

The objective is to reassign to upper memory some of the tasks that would normally be placed into conventional memory and thereby free up space in conventional memory. This reassignment can be done in the CONFIG.SYS file, or it can be done by the memory optimizer command **MEMMAKER**.

For a more complete discussion of memory management and CONFIG.SYS see Appendix C.

Figure 8.2
A diagram of RAM memory



THE MEMMAKER COMMAND

MEMMAKER should be run any time there has been a change in the computer system. Any time an application program or a utility program is added or removed from the system, there may be modifications to the CONFIG.SYS.

The MEMMAKER utility surveys the system and automatically makes decisions about how best to use the existing memory. It determines which items can be placed in high memory, thus freeing conventional memory.

MEMMAKER offers both Express and Custom Setup. For most purposes, the Express Setup is sufficient.

STEPS FOR RUNNING MEMMAKER

1. Make sure that CONFIG.SYS and AUTOEXEC.BAT do not automatically start any unnecessary programs such as the Shell or an application.
2. Quit all programs that are running.
3. Start any hardware or memory-resident programs usually used. If you are using a network, start the network.
4. At the command prompt key **MEMMAKER.** You will see the opening screen shown in Figure 8.3.
5. Press **<ENTER>** to continue from the welcoming message.
6. A choice between Express and Custom Setup is presented. Choose **Express** and press **<ENTER>**.
7. Choose **No** in response to the expanded memory question.
8. Follow directions by pressing **<ENTER>** to restart the computer.
9. Follow instructions to restart the computer again by pressing **<ENTER>**.
10. Read the screen for any error messages. If none appear, choose **Yes** and press **<ENTER>**.
11. If error messages appear, press the space bar to select **No** and then press **<ENTER>**. Follow instructions on the screen.
12. A screen display shows the amount of each type of memory before and after MEMMAKER was run.
13. Press **<ENTER>** to leave MEMMAKER.

NOTE

NOTE: As the computer restarts, MEMMAKER is analyzing how memory requirements are allocated. MEMMAKER uses this information to fit device drivers and memory resident programs into upper memory. MEMMAKER then makes any necessary changes to the CONFIG.SYS and AUTOEXEC.BAT files.

If you are in a classroom situation, the instructor will indicate whether or not it is advisable to run MEMMAKER. If you are working on an individual computer of your own, run MEMMAKER. Make a print screen of the report produced and save it for future reference. Each time any major change is made in the content of the system, rerun MEMMAKER to optimize memory and free the maximum conventional memory possible.

Figure 8.3
MEMMAKER welcome screen

```
Microsoft MemMaker

Welcome to MemMaker.

MemMaker optimizes your system's memory by moving memory-resident
programs and device drivers into the upper memory area. This
frees conventional memory for use by applications.

After you run MemMaker, your computer's memory will remain
optimized until you add or remove memory-resident programs or
device drivers. For an optimum memory configuration, run MemMaker
again after making any such changes.

MemMaker displays options as highlighted text. (For example, you
can change the "Continue" option below.) To cycle through the
available options, press SPACEBAR. When MemMaker displays the
option you want, press ENTER.

For help while you are running MemMaker, press F1.

              Continue or Exit? Continue

ENTER=Accept Selection  SPACEBAR=Change Selection  F1=Help  F3=Exit
```

CHKDSK (CHECK DISK)

The **CHKDSK** utility is a very handy program when working with the file structure. This utility checks a drive and gives a report of its condition: size of total disk space, size and number of hidden files, number of directories, and amount of available disk space. Sometimes there will also be a notation about lost clusters or lost allocations.

Lost clusters or allocations are not usually very serious, but they can waste disk storage space. This happens when space is set aside on a disk for some purpose but the program has not completed its housekeeping chores or finished with the proper steps. Sometimes this will happen if the computer is turned off without properly exiting, a disk crashes, or there is a power break. If you have used an /F switch, meaning *files*, or you answer yes to the question "Convert lost chains to files?", the disk space taken up by lost clusters and the data that the space might contain is gathered up into files for you to inspect later.

These files will be created in the root and have the extension .CHK. Examining these files and trying to save some of the lost data can be rather discouraging. The data will be in ASCII format. If your word processor can handle ASCII characters, you may have some luck. Give it a try.

The CHKDSK/F command can be run in a number of various ways:

1. From the basic command prompt
2. From the Shell by selecting the DOS directory and CHKDSK.EXE in the Files area
3. By double-clicking with the mouse on the CHKDSK.EXE file
4. By selecting the CHKDSK.EXE file and pulling down the File menu to select *Open*
5. By pulling down the File menu, selecting the Run option, and, when the dialog box appears, keying the path to the drive you want checked

NOTE

NOTE: Selections made from the Shell will run the CHKDSK program on the drive that contains the DOS directory. You do not have the opportunity to designate the drive.

A Word of Caution: If the Task Swapper has been activated from the Options menu or you have Windows running, you may get an error screen which states that CHKDSK cannot be run in a multitasking environment. If this happens, exit the Shell to the basic command prompt, not the command prompt in the Shell. Then run CHKDSK. It should then work.

- Place your EXERCISES disk in drive A:.
- Press **Shift+F9** to exit the Shell to the command prompt.

- Key **CHKDSK A:/F** and press **<ENTER>**. If a message appears stating that the command can't be run, rekey **CHKDSK A:** and press **<ENTER>**.

Figure 8.4 represents a report that might be shown for a high-density 1.2M floppy disk. The numbers on your report will vary slightly, but what they stand for will be the same.

The first four lines indicate the total amount of bytes available on the disk and how it is allocated. The bytes in the directories, user files, and available add up to the total disk space. Notice that the total disk space is not an exact 1.2 million bytes. 1.2M is actually a rounded number.

Figure 8.4
CHKDSK Report

```
Volume XXEXERCISES created 10-23-1993 2:30p
Volume Serial Number is 1B37-14F4

1.    1213952   bytes total disk space
2.       4608   bytes in 9 directories
3.      10240   bytes in 20 user files
4.    1199104   bytes available on disk

5.        512   bytes in each allocation unit
6.       2371   total allocation units on disk
7.       2342   available allocation units on
          disk

8.     655360   total bytes memory
9.     552592   bytes free
```

Lines 5, 6, and 7 report how the bytes are allocated on the disk. In Lesson 1, it was pointed out that a disk is divided into sectors and tracks so that the computer will know where data is saved and where it can be recalled. Think of an allocation unit as one of these sectors. If you multiply 512 bytes in each allocation unit by the total number of units on the disk, you will get the bytes in total disk space from line 1. The allocation units available multiplied by 512 will give you the bytes available on the disk shown on line 4.

Lines 8 and 9 refer to RAM, not to space on the disk. Conventional RAM is considered to have 640K bytes. But 640 is also a rounded number. A kilobyte of memory actually contains 1,024 bytes. (This has to do with multiples of 8 bits to a byte, etc., which is better to ignore.) If the 1,024 bytes is multiplied by 640, you have the number of bytes of memory shown. The last line, bytes free, represents what is left in memory after the CONFIG.SYS, AUTOEXEC.BAT, and setup programs are loaded.

It is a good practice to run CHKDSK before running DEFRAG, which follows. This frees any "lost" space that might have become separated from real disk files. This wasted space can be combined by the DEFRAG command.

DEFRAG

When a file is deleted from the disk, it is not actually physically deleted. DOS deletes the first letter of the file, and this signals the operating system that the space occupied by that file is now available for new material. When a file is created and saved to disk, it is not always saved in one long uninterrupted sequence of characters. Pieces of it are saved into the "holes" created when material was deleted. DOS splits, or **fragments**, and saves a file in many different "holes" in many tracks and sectors on the disk. This kind of file that is "all in pieces" is referred to as *fragmented*. The more fragments to the file, the longer it takes the read/write heads to move to all the locations when accessing the file.

There are utility programs that analyze a disk and carefully move the pieces of a file around so that the parts are combined into adjoining areas. These programs are referred to by a variety of names: disk optimizers, disk organizers, or compaction or defragmentation utilities.

DOS 6 has provided, and built in, such a program, called **DEFRAG**. The executable file is DEFRAG.EXE. When you key DEFRAG and the drive letter, DOS will analyze the drive, report the state of the drive, and, if defragmentation is needed, it will provide two choices: *Unfragment Files Only* or *Full Optimization*.

Unfragment Files Only will deal only with individual files in the root directory and will ignore other directories and subdirectories. Full Optimization condenses directories as well as files and eliminates any gaps between them.

A Word of Caution: If the Task Swapper has been activated from the Options menu or you have Windows running, you may get an error message that states that DEFRAG cannot be run in a multitasking environment. If this happens, exit the Shell to the basic command prompt, not the command prompt in the Shell. Then run DEFRAG. It should then work.

- Place your EXERCISES disk in drive A:.
- Press **Shift+F9** for the command prompt.
- Key **DEFRAG A:** and press **<ENTER>**. You should see the screen shown in Figure 8.5.

If an error message occurs, exit the Shell to the basic command prompt and reenter the command.

- Run DEFRAG on either the EXERBAK disk or another disk to see the results.

An Optimize menu is provided at the top of the DEFRAG screen (see Figure 8.6). These menu choices help customize the program

and even give some help in *About Defrag*. There are a number of switches that can be added to the command for more customizing, but for practical purposes the two choices mentioned above are sufficient.

When the computer is finished with DEFRAG, a final menu appears giving the options shown in Figure 8.7.

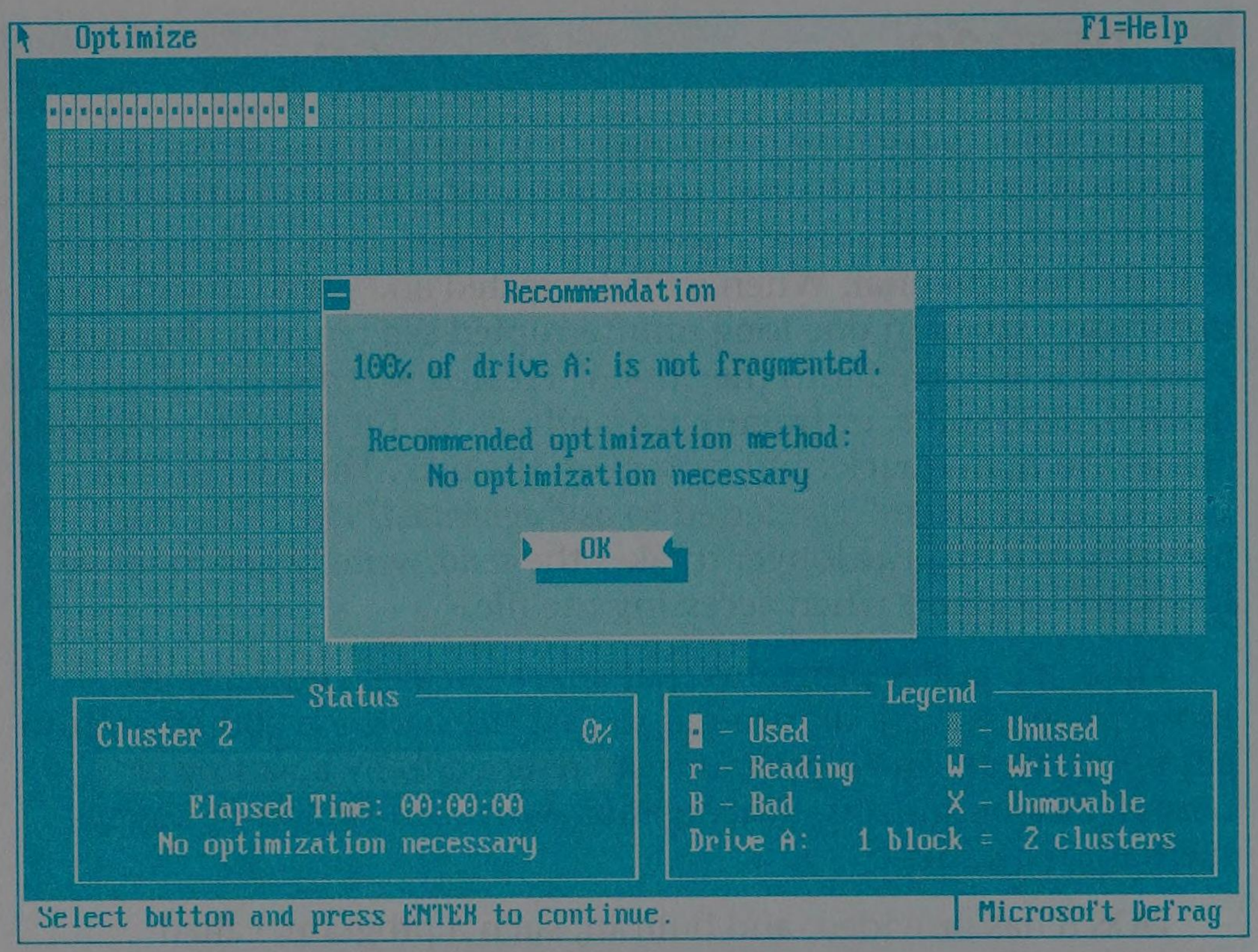


Figure 8.5
DEFRAG screen

The small light squares in the upper left corner represent the files that have been defragmented. Since this was done on drive A:, the rearranged files do not represent much memory. If DEFRAG had been run on drive C:, most of the squares would be light colored.

Running DEFRAG on a regular schedule is most advisable. Keeping fragmentation to a minimum means that individual files

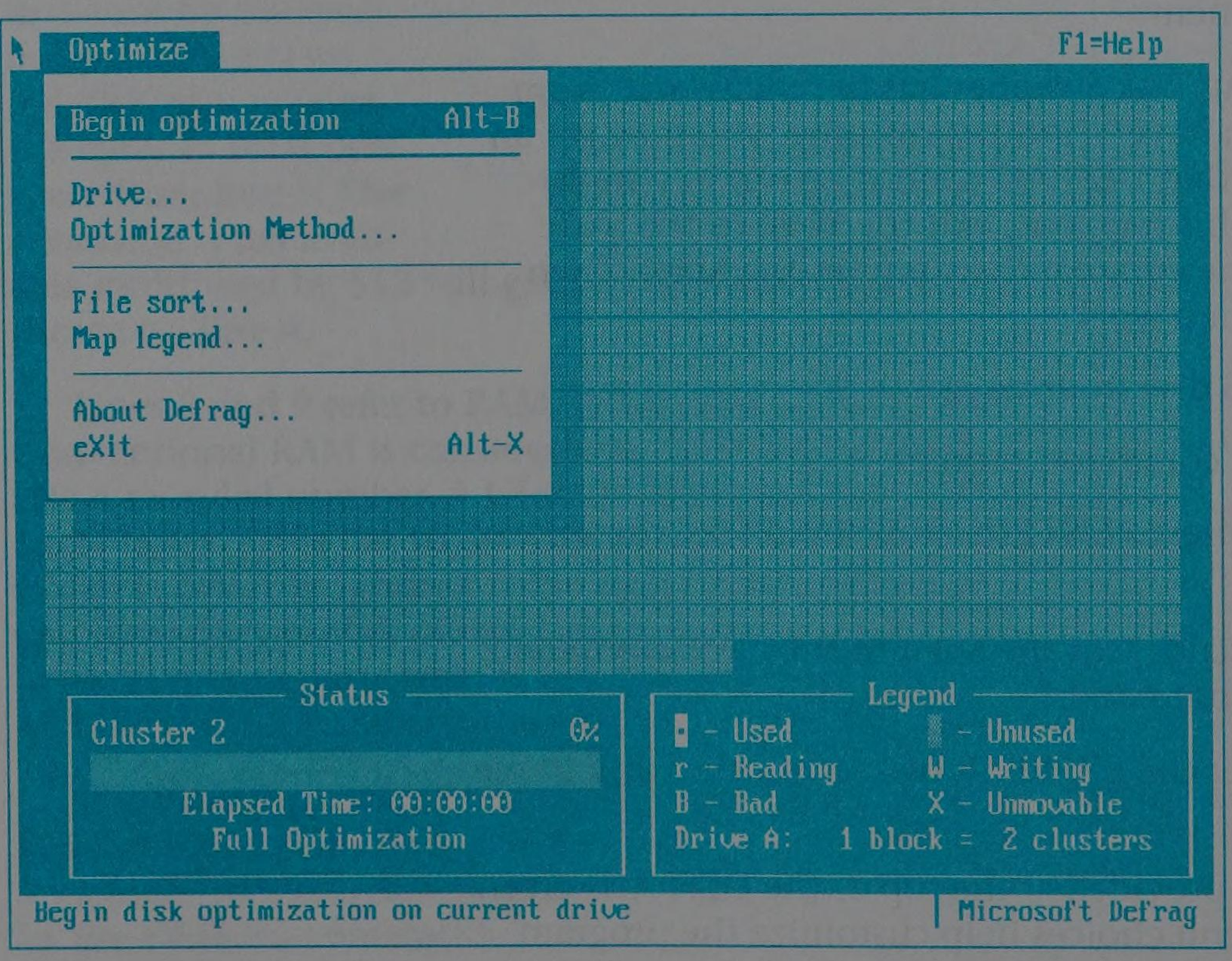


Figure 8.6
DEFRAG Optimize menu

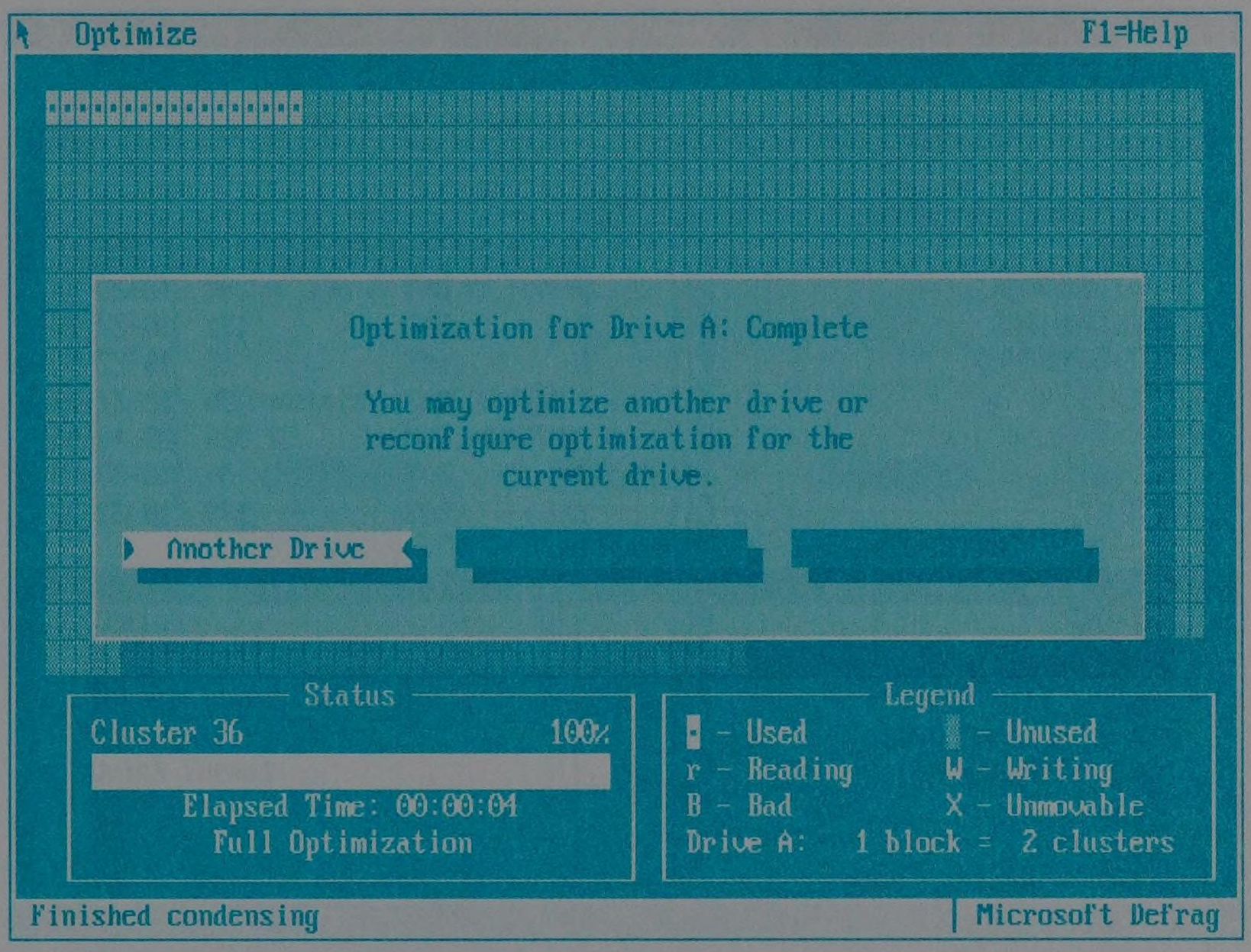


Figure 8.7
Final DEFRAG screen

can be retrieved more quickly, new files can be written more quickly, and various utility programs perform more efficiently.

OTHER UTILITIES

In the Program area of the Shell you see the title bar Main. You have already used the Editor and the Command Prompt from this area and in this lesson you will use the Disk Utilities.

- Boot up the computer and bring up the Shell on the screen.
- Select the Program area in the lower left part of the screen. Move the selection cursor to [Disk Utilities] and press <ENTER> or double-click on the item with the mouse.

The title bar changes to display Disk Utilities, as shown in Figure 8.8.

FORMAT AND QUICK FORMAT

In Lesson 2 you formatted a disk from the command prompt. You learned how to add the /S switch for the system tracks to make a disk bootable and add a volume name on the disk for identification.

The Shell gives you two formatting options: Format and Quick Format. Before we explore these commands, let's review what formatting is. Formatting:

1. Creates the structure known as the root directory for the disk.
2. Checks for any defects in the disk.
3. Erases previously recorded data.
4. Prepares or maps the surface so DOS can write to and read from the disk.
5. Copies a file allocation table (FAT) to keep track of the location of all the files on the disk.
6. Transfers the system tracks to the disk if the /S switch is used, making the disk bootable.

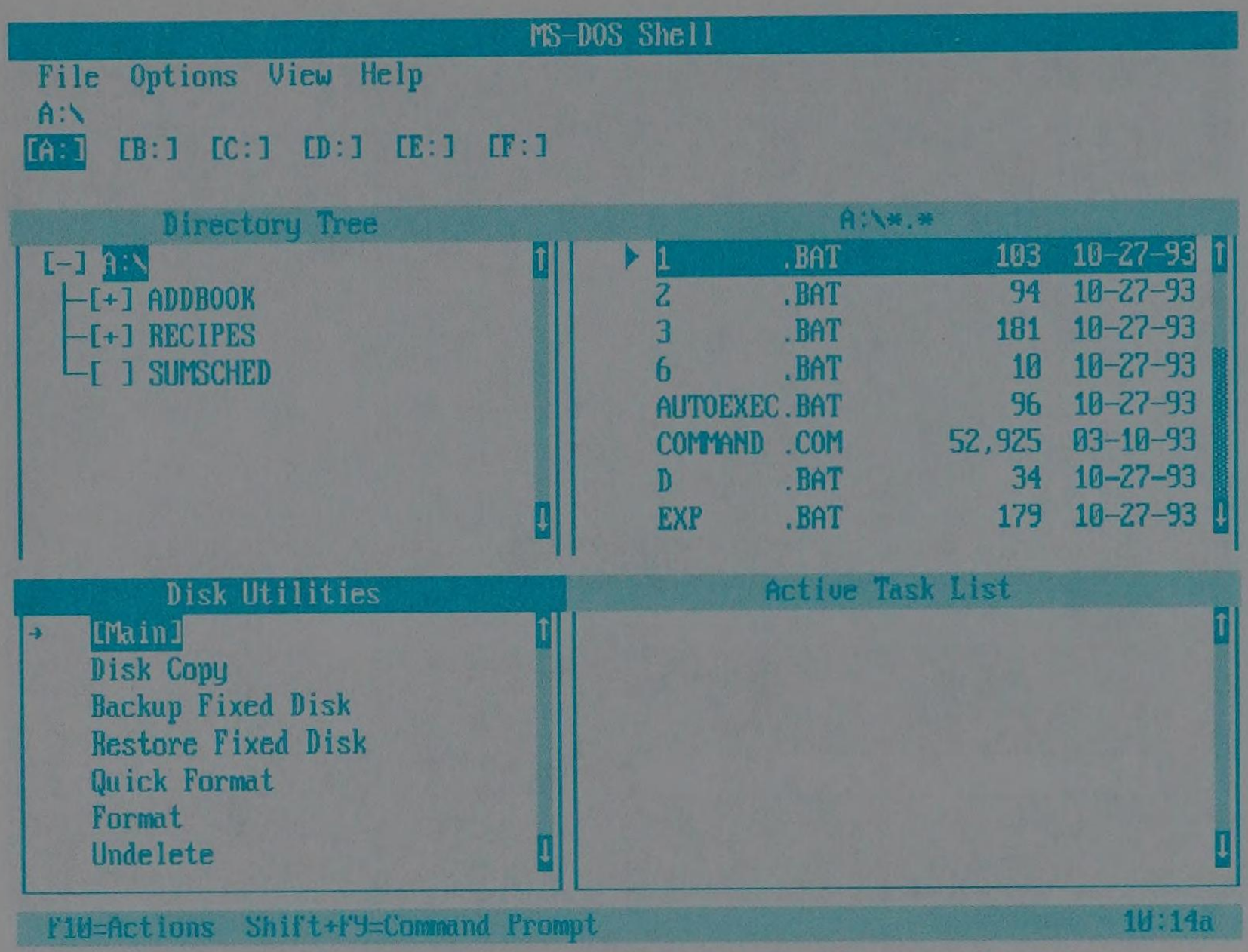


Figure 8.8
Disk Utilities menu

A complete format does all of the above tasks and reports on the screen the condition of the disk. Any bad areas are also reported, and DOS restricts those areas from being used.

A **Quick Format** can only be done on a disk that has previously been formatted. It skips over the track and sector work and only wipes out the disk's root directory and FAT table. It is quicker, but it does not lock out bad areas of the disk. If data is written to any of the bad sectors on the disk, it can't be retrieved. Important data can be lost forever. For this reason, the Quick Format option leaves something to be desired.

- You should have available a third disk with unwanted files on it. If you have a single floppy drive, place this disk in drive A:. If you have a dual floppy system, place the disk in drive B:.
- List a directory of the contents of this disk. It is probably easiest to use the /W switch. Then do a print screen.
- Move the selection cursor to **Format** and press <ENTER> or double-click on this option with the mouse. Include the drive name.
- The dialog box appears and automatically shows A: as the destination drive (Figure 8.9). If you are using drive B:, substitute that letter. Press <ENTER>. Use a volume name of PRACTICE.

The Shell screen changes to a blank screen and the same steps will be followed that were used when you formatted from the com-

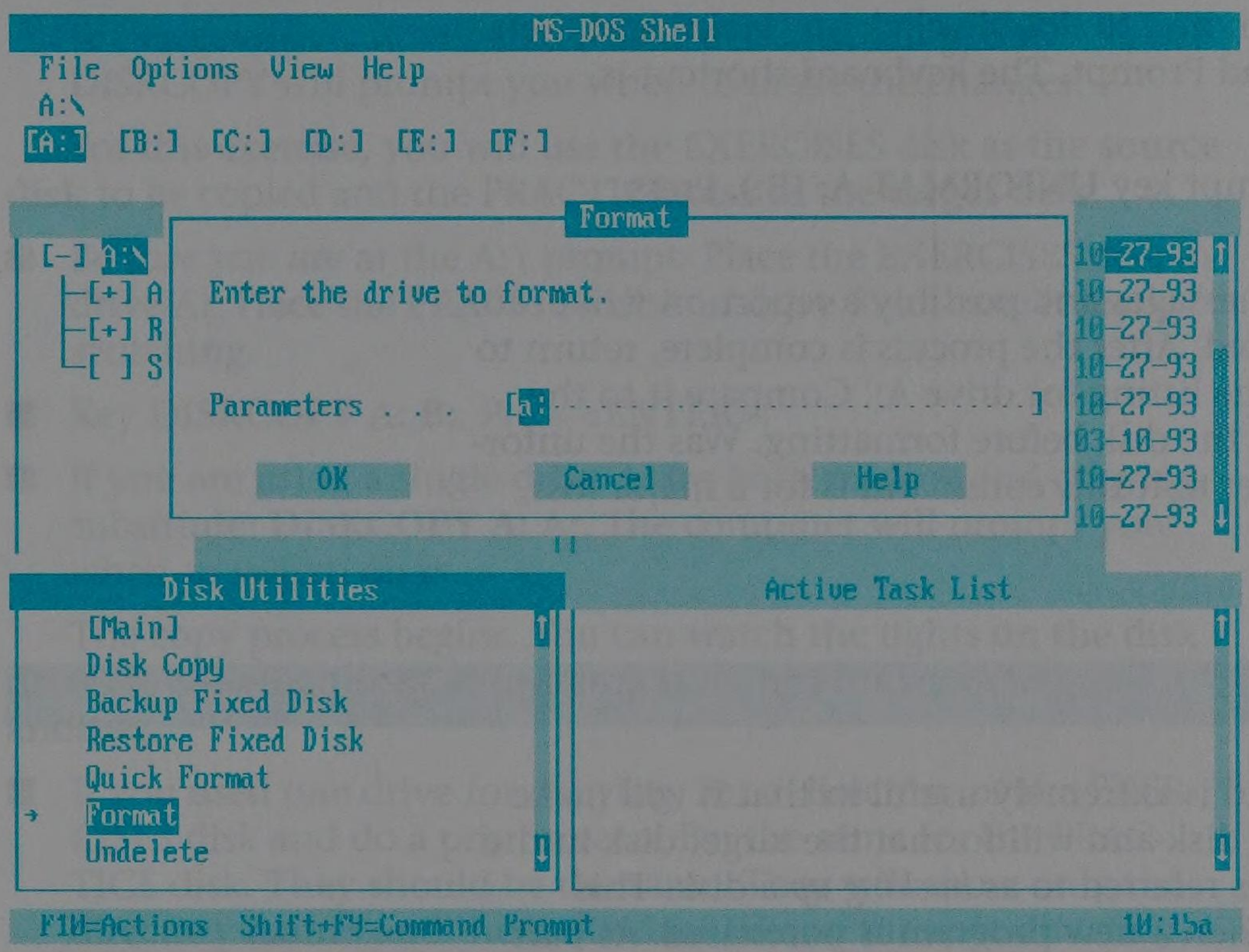


Figure 8.9
Format dialog box

mand prompt. A report is given on the status of the disk and space available, and you will then be asked if you want to format another. With a No answer, a prompt appears directing you to press any key to return to the Shell.

UNFORMAT

At the same time it is formatting the disk, DOS 6 creates and writes a hidden file named UNFORMAT.DAT. The **UNFORMAT** command can attempt to restore files on a disk that has been formatted accidentally. Files that are fragmented, with pieces saved in many sectors, are harder to recover, and UNFORMAT is not always entirely successful.

UNFORMAT is not a command to be used carelessly. It is actually designed to be used on a hard disk. It should be used only to restore a disk after the accidental format and before any additional data has been saved.

You are going to unformat the disk you just formatted for practice. This has to be done from the command prompt. The syntax for the command is:

```
UNFORMAT [drive:]
```

- Select [Main] in the Program area and press **<ENTER>**. Then select **Command Prompt** and press **<ENTER>**.

You can also use the mouse to double-click on [Main] and then double-click on Command Prompt. The keyboard shortcut is Shift+F9.

- At the command prompt key **UNFORMAT A: (B:)**. Press **<ENTER>**.

You will see various messages and possibly a report on what can and cannot be unformatted. After the process is complete, return to the Shell screen. Check the listing for drive A:. Compare it to the screen print you made of the disk before formatting. Was the unformat successful? Remember that this command is for a major loss, such as the entire disk.

DISKCOPY

The **DISKCOPY** command is extremely useful in that it will make an exact copy of a source disk and will format the target disk in the process. This is sometimes referred to as *backing up* a disk. This should always be done when a new program is purchased. As part of the licensing agreement with the software companies, you are entitled to make one backup of all new program disks. The originals should then be put away in a safe place and the backup disks used for installing the program.

If you are using floppy disks for storing and categorizing your files, periodic backups of these file disks should be made. DISKCOPY is the easiest and quickest way to accomplish the backup.

A few general rules to keep in mind:

1. DISKCOPY makes an *exact* copy of a disk. It does not copy one file at a time and put the pieces of that file together as the COPY command does on a new formatted disk. DISKCOPY is similar to making a photocopy. It is an exact duplicate. For this reason, it is always good to do a CHKDSK and then DEFRAG on a data disk before doing a DISKCOPY of it. When making a backup of new program software, DISKCOPY should be used.
2. DISKCOPY can copy only from one size and density disk to an identical size and density disk. You cannot copy from a 5.25-inch high-density to a 3.5-inch high-density disk or vice versa. If you must copy files to unmatching disks, format the target disk first and then use the COPY command. Use wildcards whenever possible.
3. You cannot use DISKCOPY to copy files from a hard disk to a floppy disk.
4. If you have only one floppy disk drive or unmatching dual floppies, you can use one drive to act as both the source drive and

the target drive. It will take a little disk switching, but DISKCOPY will prompt you when to make the changes.

For this exercise, you will use the EXERCISES disk as the **source disk** to be copied and the PRACTICE disk as the **target disk**.

- Be sure you are at the A:\ prompt. Place the EXERCISES disk in drive A:. Place the PRACTICE disk in drive B: or have it ready for switching.
- Key **DISKCOPY A: B:**. Press **<ENTER>**.
- If you are using a single drive A: for both reading and copying, substitute: **DISKCOPY A: A:**. The computer will prompt you when to switch disks.

The copy process begins. You can watch the lights on the disk drives to see when they are reading from one and copying to another.

- If you used one drive for copying, list a directory of the EXERCISES disk and do a print screen. Do the same for the PRACTICE disk. They should be the same. They will show only the directory names and the individual files in the root directory.
- If you used two drives, bring up the Shell and select **Dual File Lists** from the View menu and **Expand All** from the Tree menu.
- Select drive A:\ for the top windows and drive B:\ for the lower windows. Compare the contents, file sizes, and dates for the two disks.

DELTREE

DELTREE was mentioned briefly in an earlier lesson as a quick and easy method for deleting a directory and all of the file contents in one single step. Because it really does what it is supposed to do, it is a command that should be used with caution.

DELTREE is not an item on the Shell. It has to be used from the basic command prompt. In its default state, it requires confirmation. If you really want to live and work dangerously, you can arrange for it to skip the confirmation, but it is not advisable.

If you have been working with the Shell or will use the Shift+F9 to access the command prompt, check the Option menu and make sure that Select Across Directories does not have a small diamond mark in front of it. The small diamond mark means that that option has been selected. If the diamond is showing, deselect it by moving the selection cursor to it and pressing <ENTER> or clicking on it with the mouse.

- Use the DELTREE command from the command prompt and delete the COOKIES subdirectory on drive A:. Be sure to include the full path.

NOTE

NOTE: Select Across Directories is a very powerful tool. It can cause files that have the same name and that are located in different directories to be acted upon by a command such as delete. Things can happen to files in other directories without your realizing it.

- Use DELTREE to delete the VACATION directory from drive B:.
- Check the Directory Tree in the Shell to verify that these directories have been deleted.

PRACTICE

Try the following exercises.

EXERCISE 8–1

Create a batch file which will DEFRAG a disk in drive A: or B: and then run a CHKDSK on the disk.

1. Use ECHO commands where necessary.
2. Use a REM statement to instruct the user to insert the disk in the appropriate drive, and a PAUSE command to give time to read the message.
3. Add commands to clear the screen and return to the menu after the procedure is completed.
4. Give the batch file the name **4.BAT**. Edit the MENU.TXT file to add **DEFRAG & CHKDSK disk in A: (B:)** to item 4 of the menu.

EXERCISE 8–2

Create a batch file that will do a DISKCOPY procedure.

1. Give the batch file the name **5.BAT**.
2. Use ECHO commands where appropriate.
3. Use a REM statement to remind the user that the program formats the disk as it copies. Use a PAUSE command to give time to read the message.
4. Add the appropriate commands to clear the screen and return to the menu after the DISKCOPY is complete.
5. Use any other techniques you feel would enhance the batch file.
6. Edit the MENU.TXT file to include this batch file under number
5.

EXERCISE 8–3

Use the DELTREE command to delete the remaining two directories on the EXERBAK disk.

REVIEW

SECTION A

Vocabulary

The following words, phrases, and commands were found in this lesson. Find each of these in the glossary in Appendix A and define them.

CHKDSK
DEFRAG
DELTREE
DISKCOPY
Fragment
MEMMAKER
Quick Format
Source disk
Target disk
UNFORMAT

SECTION B

True/False

In the blank space before each sentence, place a **T** if the statement is true and an **F** if the statement is false.

_____ 1. Quick Format does a complete, thorough format quickly.

_____ 2. CHKDSK formats as it copies.

_____ 3. DELTREE can be run from the Shell or the command prompt.

_____ 4. DEFRAG puts pieces of files together on disk.

_____ 5. DISKCOPY creates an exact duplicate of a disk.

_____ 6. All data have been permanently erased on a newly formatted disk.

_____ 7. Formatting creates a FAT table.

_____ 8. Two disks of the same size but different densities can be used for DISKCOPY.

_____ 9. DEFRAG gives options for files only or directories and files.

_____ 10. CHKDSK reports on bad sectors and lost clusters.

REVIEW

SECTION C

Task Solving

Starting with the highlight in the Drives area, explain how you would solve each of the following tasks. Explain the necessary steps using either the keyboard or mouse description in the explanation.

1. Run a CHKDSK on a disk in drive A: and then defragment the same disk.

2. Explain when and why MEMMAKER should be run on drive C:.

3. When is the best time to run UNFORMAT and why might it not work?

4. A disk in drive A: needs to be checked and then an exact duplicate made to a disk in drive B:. What is the procedure?

5. A directory on drive A: titled CLASNOTE.TXT contains 20 files of notes from various classes. The classes are finished and the notes have been transcribed. The entire directory and all the files need to be removed.

LESSON 9

Protecting Your Directories and Files

LEARNING OBJECTIVES

In this lesson you will:

- Check for a computer virus
- Learn the difference between VSAFE and MSAV
- Scan drives for viruses
- Examine different types of Backup
- Use MSBackup for disks
- Use the UNDELETE command
- Prevent formatting of the hard drive

VOCABULARY

Look for the following words, phrases, and commands in this lesson:

Attribute	Read-only	Virus
Backup	Restore	VSAFE
MSAV	UNDELETE	

OVERVIEW

Not only is a great deal of money invested in purchasing a computer, software, and all the extras for an operational system, but a tremendous amount of time and energy is spent creating and saving all the records, correspondence, financial information, database files, etc., that make up the information portion of a personal or business life. Nothing is more wrenching than losing or having destroyed something that has taken hours to create.

Things will happen. No person or machine is perfect. The best defense is a good offense: taking every possible precaution to protect the work that has been created. This lesson will deal with two positive steps that can be taken; namely, protecting against a variety of viruses, and backing up the information on your system. A new command, UNDELETE, will be introduced to give you one more helpful tool to preserve your data (and your sanity), and the lesson ends with a little trick to prevent formatting your hard drive.

VIRUSES

A computer **virus** is similar to a virus in the human body. Sometimes it can cause a minor annoyance equivalent to a sneeze or a runny nose, and other times it can be extremely destructive.

A virus is usually a small block of computer coded instructions that, when introduced into the system, invades and takes control of the CPU and directs it to do strange and unusual things. Sometimes, the virus is merely a funny or strange message, but many times it can start a chain of events that can destroy files and/or your hard disk.

There are three different categories of viruses classified by how they affect the system. They invade the system by different methods, and the extent of the protection you choose will depend on how you use your system and how much contact you have via disks or modem with other people and other systems.

If a virus is in a data file, and you borrow and use that file, the virus can be introduced into your system. If you use a modem to exchange messages, programs, or data with bulletin boards or friends, any virus in the sending system will result in an infection in your system. Once a virus has entered your system, it can spread in a variety of ways.

The three categories of viruses are:

1. *Boot sector virus:* The boot sector is that part of the hard disk that controls how your system starts when you turn the computer on. A boot sector virus replaces the disk's original boot

sector with its own and loads the virus into memory. Once there, it can infect every disk on your system, including each new diskette that is used on any drive.

2. *File infector virus*: The file infector virus is a block of code added to executable files that run programs, such as those with .COM, .EXE, and .SYS extensions. When the program is run, the virus is activated. It becomes memory resident and can spread to other programs.

3. *Trojan horse virus*: A Trojan horse virus is visible but is usually disguised as a legitimate program. This type of virus is much more likely to destroy or damage files and disks. It can even format your entire hard drive.

PREVENTIVE MAINTENANCE

DOS offers two programs, **VSAFE** and **MSAV**, which can monitor your equipment continually and/or scan and clean files. Below are some suggestions for prevention, but what and how thorough a preventive program you decide to use will depend on how you use your system and what is practical for you.

1. Don't use programs that come from bulletin board systems (BBS), user groups, or friends unless they are first scanned to be sure they do not contain a virus. A certain amount of common sense has to be used about how and where you get your programs.

2. Use write-protection (tabs for 5.25-inch disks and slide switches for 3.5-inch disks) on all original program disks. Put the originals away for safe keeping and do not store any data on these original disks.

3. Write-protect your COMMAND.COM file. Since all systems must contain a COMMAND.COM, this is one of the most frequent targets for a virus.

4. Inspect and scan any new disks. DOS provides the MSAV program for this. See below.

5. If you frequently use programs from other systems, install a sentry-type program that will monitor continually for virus infection. DOS provides the VSAFE program for this purpose. You must decide, based on usage, whether this is necessary or whether to rely on MSAV.

MSAV

If used regularly, the MSAV virus protection program can help reduce damage to the computer memory and disks. This program

gives two choices: detect or detect and clean. You are going to use the EXERCISES disk in drive A: and scan it for viruses. Later, if you have a computer of your own, or if your instructor so directs, you can scan other drives for viruses.

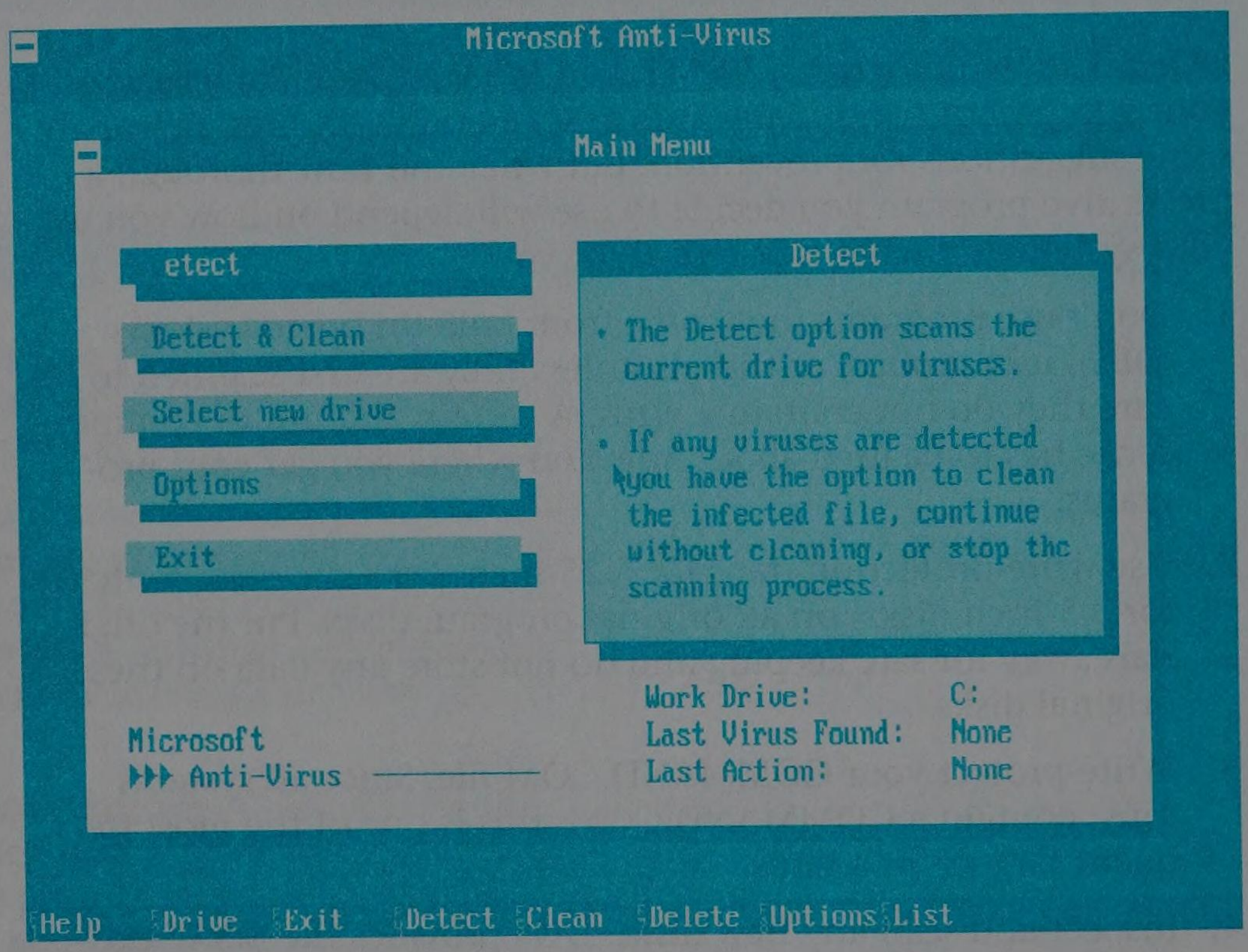
NOTE

NOTE: If your Anti-Virus program is installed in Windows, see Lesson 10 for instructions on use.

- Go to the command prompt and key **MSAV**. Press **<ENTER>**. The Main menu for Anti-Virus appears.

1. The first option, and the one highlighted, is *DETECT*. In the lower right-hand corner is a notation showing Work Drive:. This will register the current default drive. See Figure 9.1. If you choose this option and the program does detect a virus, it will provide a dialog box giving you the choice to clean, continue, stop, or delete.
2. The second option is for *Detect & Clean*. Since this is the whole objective in searching for a virus, it is the most practical choice.
3. Next is *Select new drive*. If you want to scan various drives on the hard drive or floppies, enter a different drive letter.
4. The Options selection is for customizing your virus scan.

Figure 9.1
Anti-Virus menu



- Choose **Detect & Clean**. If drive A: is showing in the Work Drive: area in the lower right corner, press **<ENTER>**. If drive A: is not showing, move to the third selection, enter A:, and then press **<ENTER>**.

When the program has finished scanning the drive, a status screen similar to Figure 9.2 appears giving a status report and what action occurred.

- Choose **OK**.

Scanning for a virus is that simple with MSAV. This procedure should be done for any new program disk, or any disk being introduced to your system for the first time.

- Switch disks and insert the EXERBAK disk. Repeat the virus scanning procedure.

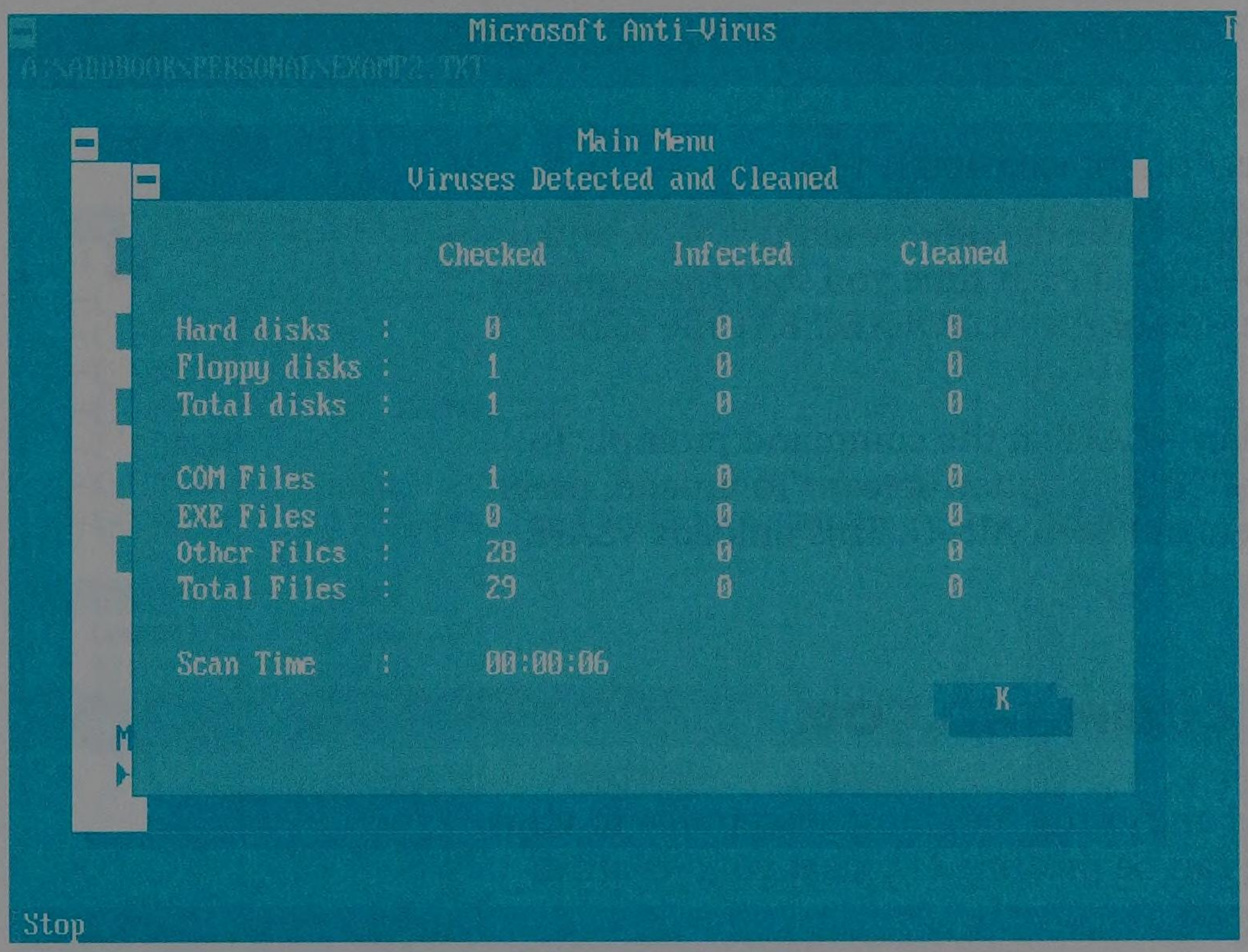


Figure 9.2
Virus report

- Check with your instructor to see whether it is permissible to scan a drive on the hard disk.

  You can configure the MSAV anti-virus program to scan the system automatically each time you boot up. An additional line needs to be added to the AUTOEXEC.BAT file:

  ```
  msav /p/l
  ```

  In this particular case the **/p** switch uses display mode as opposed to graphics mode and the **/l** scans all drives other than A: or B:.

NOTE

NOTE: This does not apply to networks.

VSAFE

VSAFE is a memory-resident program, sometimes called a sentry program, that constantly monitors your system for any indication of a virus. If you are on a network, use a BBS, or use a modem for downloading data from other sources, this may be the best way for you to protect your data. There are a number of different options available with VSAFE:

1. Warns of hard-disk low-level format.
2. Warns of resident virus.
3. Provides general write protection to prevent programs from writing to the disk.
4. Checks executable files opened by DOS.
5. Checks for boot-sector viruses.

6. Protects the hard disk boot area.
7. Protects the floppy disk boot area.
8. Establishes write protection for executable files.

When VSAFE is first loaded, the default for items 1, 4, 5, and 6 above is On. VSAFE can be loaded each time you start the computer, or it can be placed in a line of the AUTOEXEC.BAT file to be loaded automatically.

To load the program, key **VSAFE** at the command prompt. To change options, press **Alt+V** for an option screen. To unload, press **Alt+V** for the option screen and then **Alt+U**. This unloads VSAFE from memory.

PROTECTING COMMAND.COM

Since COMMAND.COM is one of the files most susceptible to virus attack, COMMAND.COM can be protected by changing its attributes.

An **attribute** is the characteristic of a disk file. Some of the possible attributes are:

Hidden, so the file does not appear on the screen.

System, which identifies the file as a DOS system file.

Archive, which indicates when a file has been modified.

Read-only, which prevents a file from being changed or modified.

By changing the attribute of the COMMAND.COM file to **read-only**, you can prevent any virus from invading that particular file.

To change the attribute of COMMAND.COM, follow these steps:

1. Select DOS in the Directory Tree area.
2. Select COMMAND.COM in the Files area.
3. Pull down the Files menu and select **Change Attributes**. You'll see the screen shown in Figure 9.3.
4. Select the **Read only** option and press **<ENTER>**.

N O T E

NOTE: This information is intended for general information and not as a hands-on exercise. Good judgment and circumstances should dictate use for a personal computer. In a classroom, the instructor is the final authority for use.

BACKING UP YOUR FILES

The reason for backing up your files, especially on a hard drive, is to be able to rewrite them in the horrible event that the hard disk crashes, files are deleted, destroyed, or corrupted, or older versions need to be updated. Mentally take inventory of all the programs

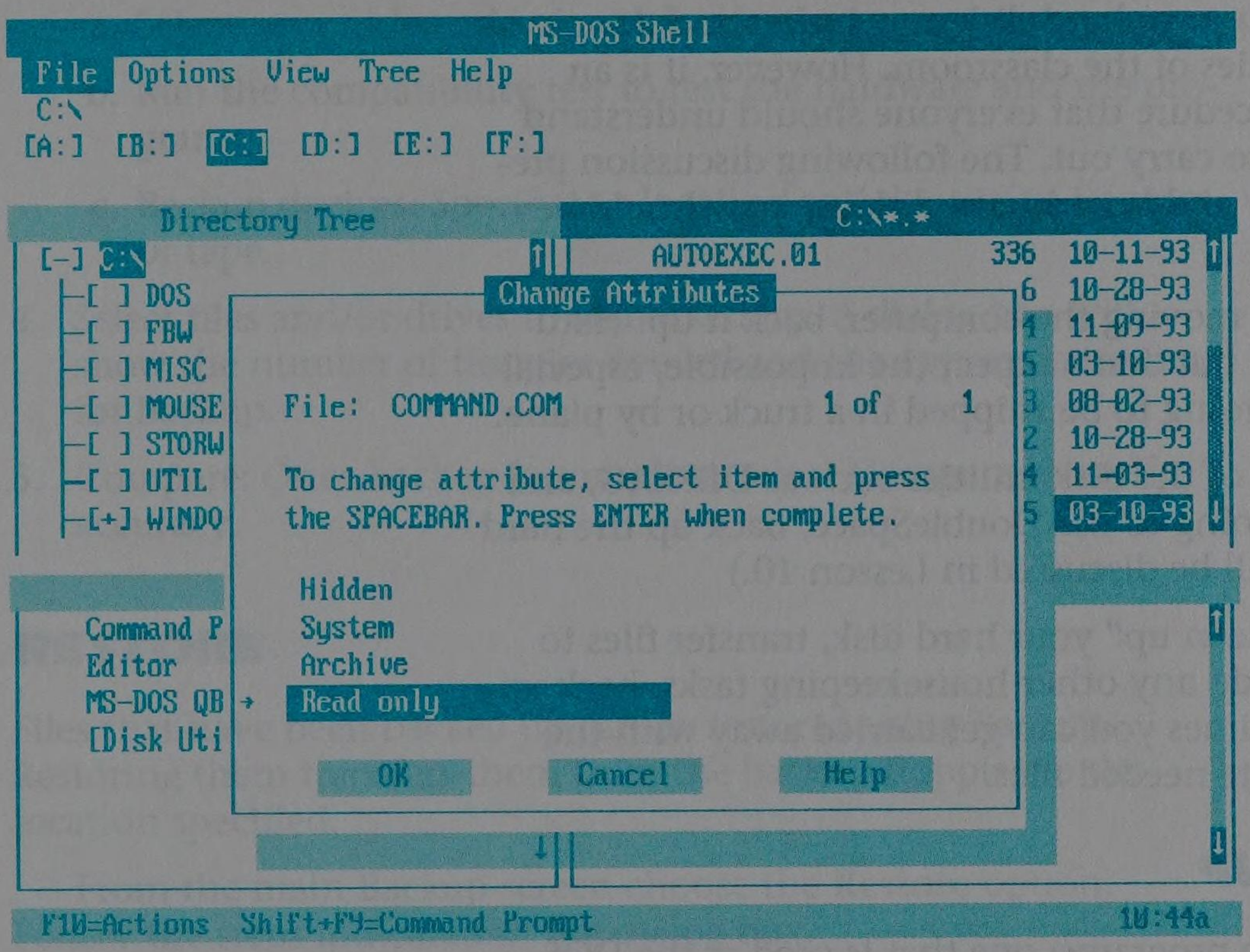


Figure 9.3
Change Attributes dialog box

and information you have on your system and think how much time and money it would take to recreate them. **Backup** files are an inexpensive protection against hardware or software failure.

BACKING UP DISKS

You have already covered copying files from one disk or directory to another and using the DISKCOPY command to make an identical copy of a disk. This is essential when new programs are purchased. The original disks should be copied and put away in a safe place. The duplicate disks should then be used for installation.

Storing files on disk should follow a plan that meets individual requirements. Old, outdated files that you do not want to destroy can be copied to disk and stored. The original files can be deleted from the hard disk, thus freeing up needed space. If the "stored" files contain data that might be needed for legal purposes, the disks should be backed up (duplicated) and the two copies stored separately.

If material is being revised constantly, the files should be backed up so that in the event of a system failure, the file would not have to be rebuilt from the beginning, but only from the last revision.

BACKING UP THE HARD DISK

In a classroom situation, the practical approach to backing up data is to back up all data disks, original program disks, and any indivi-

dual student files. Backing up a hard disk may be beyond the physical capabilities and supplies of the classroom. However, it is an extremely important procedure that everyone should understand even if it is not possible to carry out. The following discussion presents an overview of why and how a hard disk backup should be performed.

1. If you are going to be moving the computer, back it up. Hard disks are fairly sturdy, but don't expect the impossible, especially if the computer is going to be shipped in a truck or by plane.
2. If you are using some of the disk utilities such as DEFRAG, and especially if you are going to use DoubleSpace, back up the hard disk. (DoubleSpace will be discussed in Lesson 10.)
3. If you are going to "clean up" your hard disk, transfer files to disk, delete files, and do any other housekeeping tasks, back up the hard drive. Sometimes you can get carried away with the cleanup task and delete needed files.

TYPES OF BACKUP

DOS provides two backup programs: one that is used at the DOS prompt and intended for DOS files, and a second program to back up Windows files. (The Windows backup will be discussed in Lesson 10.) There are three types of backup, and the method you choose depends on how often new files are generated or old files updated.

1. A *full backup* copies all of the files you indicate, regardless of whether there have been any changes since the last backup.
2. An *incremental backup* will record changes made since the last full or incremental backup.
3. A *differential backup* makes copies of all files changed since the last full backup.

PROCEDURE

1. Setup file: Before starting Backup you must select files, settings, and options. These can be stored in a setup file for standardization. The choices include which drives to back up, what type of backup media is being used (floppies, tape, or removable hard drive), which files to back up, what type of backup, and which options. A default setup will be used if no options are listed.
2. Start MSBACKUP: This can be done from the command prompt or by selecting the Back Up Fixed Disk option from the Disk Utilities in the Shell. A dialog box appears giving the choices: Backup, Restore, Compare, Configure, and Exit.
3. Configure: This is done the first time or when hardware is changed.

a. Select your video and mouse hardware.

b. Run the compatibility test to test the hardware and the program.

c. Backup devices: Specify the location and density of floppies or tape.

4. Select files and/or drives to be backed up. A dialog box will show the number of floppies needed and the approximate time for backup.

5. Compare: Once backup is complete, select Compare to verify accuracy.

RESTORE

Files that have been backed up can be restored using Backup. Restoring them transfers them from the backup floppies to the location specified.

From the main Backup screen choose the **Restore** option. Follow the steps indicated in the dialog box.

UNDELETE

The time will come when a file is accidentally deleted. Both versions 5 and 6 of DOS have provided an **UNDELETE** command that can come to the rescue.

An earlier lesson explained that when a file is deleted only the first letter of the name of the file is actually deleted. This deletion signals the operating system that this particular section of the disk is now available for saving a new file. The new file overwrites the space occupied by the deleted file.

If you delete a file and then continue working, creating and saving new material, the chances of recovering that deleted file are practically nil. If, however, you realize immediately that a file has been deleted accidentally and very little new work has been done, you have a hope of recovering your file.

The UNDELETE procedure offers two alternatives: One is called sentry protection, and the other is known as standard protection. Sentry protection is a more advanced technique and can be found in the DOS 6 *User's Guide* or a reliable reference book.

The standard protection requires no special setup or preparation. Although UNDELETE can be done from the Shell by selecting the item in the Disk Utilities group, the standard method of undeleting is a little easier from the command prompt. To undelete a file by this method, type:

```
UNDELETE [file name] /DOS
```

The file name must be the complete path to the location of the deleted file. The **/DOS** switch forces UNDELETE to use the first-letter-erased technique for recovery purposes.

- Boot up the computer, if necessary, and check that the EXERCISES disk is in drive A:.
- Select **Expand All** from the Tree menu and the CORRESP subdirectory.
- Delete the CAPUTNIK.LTR file. Be sure that it is no longer showing in the Files area.
- Exit to the command prompt. You are now going to UNDELETE the CAPUTNIK file.
- At the command prompt key: **UNDELETE A:\CORRESP\CAPUTNIK.LTR**

This gives the command plus the complete path to where the file was located.

- A screen appears showing information about UNDELETE, the notation *Using the MS-DOS directory method*, and then the name of the file with a question mark in place of the first letter. The message is:

```
Please type the first character for
?APUTNIK.LTR:.
```

- Key the letter C and press **<ENTER>**. A message appears: "File successfully undeleted."
- Return to the Shell by typing EXIT and check the CORRESP directory. You may have to use the Refresh option.

  Your deleted file is now restored.

NOTE

NOTE: An earlier discussion of deleting files noted that the first letter of the file is actually deleted, which signals the system that that space is now available for new data. When attempting to undelete, the system searches for a name that corresponds as closely as possible to the one specified. Furnishing the first letter helps to confirm the selection.

PREVENT FORMATTING OF THE HARD DRIVE

One of the most horrifying things that can happen when you are using a hard drive system is formatting a disk and suddenly realizing that because you did not give the drive indicator, you have formatted your hard disk. There is the UNFORMAT command, but anything involving an entire hard drive is risky. Better the proverbial ounce of prevention.

When formatting a disk, the disk is usually placed in drive A:. The idea is to make sure that any time the command FORMAT is typed, it formats only on drive A:. One renamed file and a small batch file can safeguard the hard drive.

1. Change the name of the FORMAT command in the DOS directory to FRMAT or something similar.
2. Create a batch file named FORMAT.BAT so that any time the word FORMAT is typed it will activate this batch file.
3. The content of the batch file is FRMAT A:.

This simple procedure will prevent any disk being formatted except in drive A:. As long as you are using only one size disk and do all formatting in drive A:, this will prevent any accidental formatting of the hard drive.

If you have two disk drives, A: and B:, and they are different sizes, you have to create two batch files, one for each.

4. Create a batch file named FORMATA.BAT. The content of the batch file is FRMAT A:.
5. Create a second batch file named FORMATB.BAT. The content of this batch file is FRMAT B:.

Steps 4 and 5 are optional. Surely the necessity of keying FORMATA or FORMATB would alert you to use the drive designator. The objective is to prevent any accidental formatting of any drive on the hard disk. You will have to be guided by the equipment you use. An extra word of precaution: Don't forget and leave a good data disk in drive A: or drive B:.

PRACTICE

Try the following exercises.

EXERCISE 9–1

Delete the file CLIENTS2 from the ADDBOOK/BUSINESS subdirectory. Check the Files area window to be sure it is deleted. Then use UNDELETE to restore this file. Be sure to use the complete path.

Do a print screen of the A: directory after the file has been deleted and another print screen after the file has been undeleted.

EXERCISE 9–2

Using the MSAV command, scan and clean the EXERBAK disk. DEFRAG this disk and then do a DISKCOPY using the PRACTICE disk as the target disk.

REVIEW

SECTION A

Vocabulary

The following words, phrases, and commands were found in this lesson. Find each of these in the Glossary in Appendix A and define them.

Attribute	Read-only	Virus
Backup	Restore	VSAFE
MSAV	UNDELETE	

SECTION B

True/False

In the blank space before each sentence, place a **T** if the statement is true and an **F** if the statement is false.

_____ 1. A virus takes control of the CPU.

_____ 2. MSAV will only detect a virus.

_____ 3. VSAFE continuously monitors files for viruses.

_____ 4. Read-only is an attribute.

_____ 5. A full backup should always be done.

_____ 6. UNDELETE will only restore a directory.

_____ 7. A Trojan horse virus masquerades as a legitimate program.

_____ 8. You cannot change the names of external DOS files.

_____ 9. A virus can be introduced on a data disk or modem.

_____ 10. Using a write-protect tab helps prevent viruses.

REVIEW

SECTION C

Task Solving

Starting with the highlight in the Drives area, explain how you would solve each of the following tasks. Explain the necessary steps using either the keyboard or mouse description in the explanation.

1. A file containing a list of items to be included in a will needs to be protected by making the file read-only.

_____

_____

_____

2. A file named PENSION.FND has been erased accidentally. How would you attempt to get the data back?

_____

_____

_____

3. You purchased a public domain disk at the local computer swap meet. You want to check it for any viruses before putting it on your computer. What procedure would you use?

_____

_____

_____

LESSON 10

DoubleSpace, Windows, Plus Miscellaneous

This lesson is not an exercise in the hands-on sense that the previous lessons have been. There are two additional, very important features of DOS 6, DoubleSpace and three applications for Windows, with which you need to be acquainted. Use of these may or may not be applicable to your present situation. However, you should be aware of what they can and cannot do.

You have already covered the essential commands, procedures, and use of the Shell in managing your directories and files. The balance of the items described here are for handy reference. Read through them so that you will be acquainted with their features. If the need for these items arises, or if the names occur, you will be familiar enough to look here, in the *User's Guide*, or in a reference manual for further clarification.

DOUBLESPACE

In the early 1980s, when personal computers first became popular, everyone thought that 64K of RAM memory and two floppy drives were the ultimate in processing equipment and that no one would ever need more. WRONG! WRONG! WRONG!

In the last 12 or so years, software has progressed from the point where an application program could be contained on one 360K floppy disk to the point where many applications require 15 or more megs of disk memory just to install. The 10, 20, or even 40MB hard drive is now out of date and struggles to store some of the smaller applications. RAM memory, which started at 64K, now needs to be 1 or 2MB to process most applications, and if you are running Windows and Windows applications or the high-powered DOS desktop programs, you will need at least 4 to 8MB of RAM.

Memory, both RAM and disk storage, has become the limiting factor in what you can run and what you can store.

You have been using floppy disks because they are an easy and convenient way to store exercises temporarily. Actually, to force the computer to read and write to floppies during the running of an application program is a waste of time, both yours and the computer's. The swapping that has to be done between the operating system and the floppies slows down the processing time. It makes more sense to work on the hard drive until a project is finished, and leave the floppies for the storage and backup of completed or outdated material.

The use and size of the hard disk space is now the most important consideration when buying a computer. Second is the amount of system (RAM) memory, and third is how fast the computer runs in terms of its internal processing chip. By the time you load a moderately high-powered word processing program, a spreadsheet program, DOS, possibly Windows, a few utility programs, the virus checker, and possibly one or two games, you will be pushing the limits of a 100MB hard drive. There will be room for storage of data files, and you'll have to pay attention to file management, but it won't be long before you'll want more.

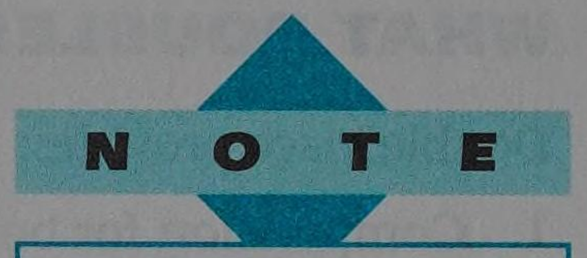
In the last few years, a number of software makers have developed programs that will "compress" data. The methods used vary with the program, but the desired result is the same: optimize the disk space available and put more data in the same space.

DOS 6 has now included a compression utility called DoubleSpace as part of the basic package. The DoubleSpace utility has the neat feature of not requiring the user to actually compress the files. When a new or edited file is saved, the saving process compresses the data as much as 50% so that it takes less space on the disk. When the compressed file is retrieved from disk storage it is uncompressed so that it can be processed in the normal manner. All of this compressing and uncompressing is done in the background "on the fly." The user is not aware of it and doesn't have to take any extra steps to direct the process.

The DoubleSpace utility is one of the new and/or upgrade features that version 6 offers. DoubleSpace has received a great deal of publicity and has been advertised as the main attraction of DOS 6. It is an outstanding feature. Most of the time it does what it says it will do, but there are times when it doesn't. Some users have complained about "bugs," so a few precautions and a great deal of common sense are necessary before plunging into the installation of DoubleSpace.

Most of the concerns were addressed when MicroSoft released DOS 6.2 in November 1993. For example, a diagnostic utility in version 6.2 prevents compressed data from being written on bad

sectors and attempts to repair the bad sectors. A feature called DoubleGuard prevents applications from accidentally storing data on compressed files. When the computer is turned off immediately after returning to the C:\> prompt, data is sometimes lost because DOS has not had time to complete its housekeeping chores. This is remedied in DOS 6.2.



NOTE: The actual command for the DoubleSpace program is DBLSPACE.

To the ordinary beginning or intermediate DOS user, there is no apparent difference between versions 6.0 and 6.2. All the things you have been learning are exactly the same. The main precaution when installing DoubleSpace is not to try it on your own. If DoubleSpace is for you, and disk compression will help solve your problems, get advice from your friendly computer technician.

The following sections will give an overview of the DoubleSpace program and then a few of the little extras that you should be aware of before installing DoubleSpace.

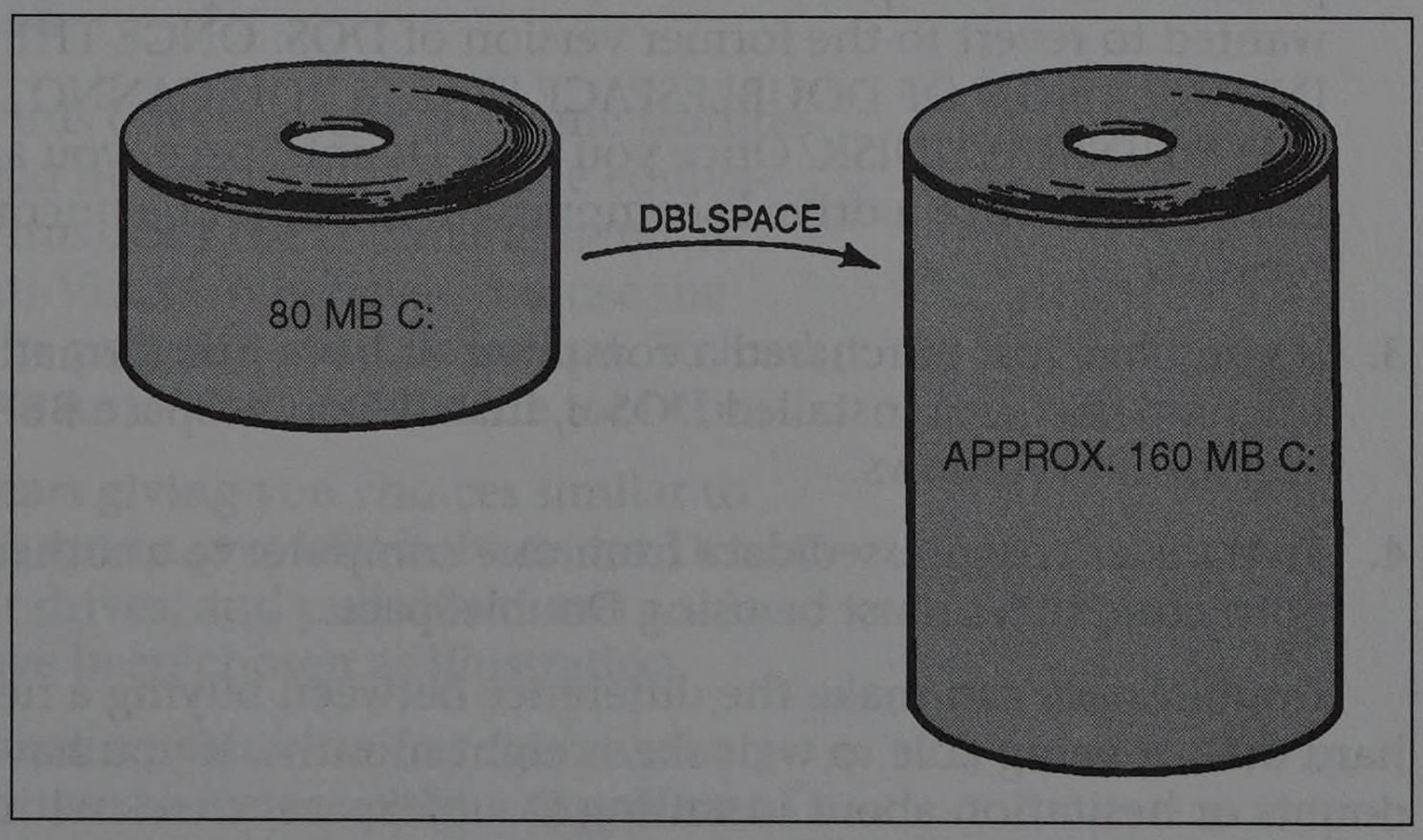
WHAT DOUBLESPACE DOES

The DoubleSpace utility compresses the free space on the disk so that it looks as if it can store almost twice the amount of data. Since different types of files will compress at different ratios, DoubleSpace estimates what the ratio will be for each file. The guess is usually about twice the space. To the user it would look like Figure 10.1 below.

WHAT ACTUALLY HAPPENS

All of the uncompressed files and directories on what was formerly drive C: are compressed and become a *compressed volume file*, and are named DBLSPACE.000. As this is taking place, a couple of megs (a small slice) of the uncompressed space is sliced off and becomes a new uncompressed file where any files that cannot or should not be compressed are stored. DoubleSpace searches for an unused drive designator, assigns it to this uncompressed segment, and instructs DOS that this is now the physical drive that permits booting and any other hardware-related activities.

Figure 10.1
DoubleSpace appearance



After DoubleSpace is installed, every time the computer is booted up a DBLSPACE.BIN file is loaded. This is the control portion that gives you access to the compressed files.

WHAT DOUBLESPACE PROVIDES

DoubleSpace provides:

1. Compression for both hard drives and floppy drives.
2. Pull-down menus:
   a. The Drive menu permits you to redefine drives and mount and unmount floppies and removable drives.
   b. The Compress menu gives details and estimates of compression.
   c. The Tools menu offers DEFRAG, CHKDSK, and other options.
   d. The Help menu offers help.
3. A new switch, /C, to use with DIR for information on compressed drives.
4. The ability to compress files on-the-fly without involving the user.

PRECAUTIONS

Take the following precautions before using DoubleSpace:

1. Back up the files on your computer, or at least the files on drive C: before you begin DoubleSpace. Each drive has to be done separately. Drive C: can be done with the Express option, the others with the Customize option. No software vendor of compression software will take any responsibility for lost data. Don't take chances—back up.
2. When you started the setup for DOS 6 you were instructed to make an *uninstall disk*. This disk was to be used if anything happened and the setup for DOS 6 could not be completed or if you wanted to revert to the former version of DOS. ONCE THE INSTALLATION OF DOUBLESPACE STARTS YOU CANNOT USE THE UNINSTALL DISK. Once you start DoubleSpace, you are committed. Once a drive is compressed, it cannot be uncompressed.
3. If you have just purchased a computer or have just formatted the hard disk and installed DOS 6, install DoubleSpace BEFORE you install Windows.
4. To transfer compressed data from one computer to another, both computers must be using DoubleSpace.

DoubleSpace can make the difference between buying a new hard disk or being able to wait six or eight months. If you have any doubts or hesitation about installing DoubleSpace, check with the

vendor from whom you purchased DOS 6, or better yet, find yourself an experienced computer "techy" that you can trust.

WINDOWS APPLICATIONS

DOS 6 provides a Windows version of Backup, Undelete, and Anti-Virus. At the time you are originally installing DOS 6 using the Setup program, a Setup screen will be shown to help you decide whether to install these features. This screen will show each of the programs and approximately how much space each would require and how much space is available.

At the time of the Windows installation, a new group window is created with icons for Anti-Virus, Backup, and Undelete (see Figure 10.2).

These graphics-oriented programs work only within Windows. Windows operates with a *graphical user interface* (GUI). This is pronounced "gooey interface." It uses the graphical icons to represent various tasks that can be performed. The three additional programs provided by DOS 6 also use the icon feature.

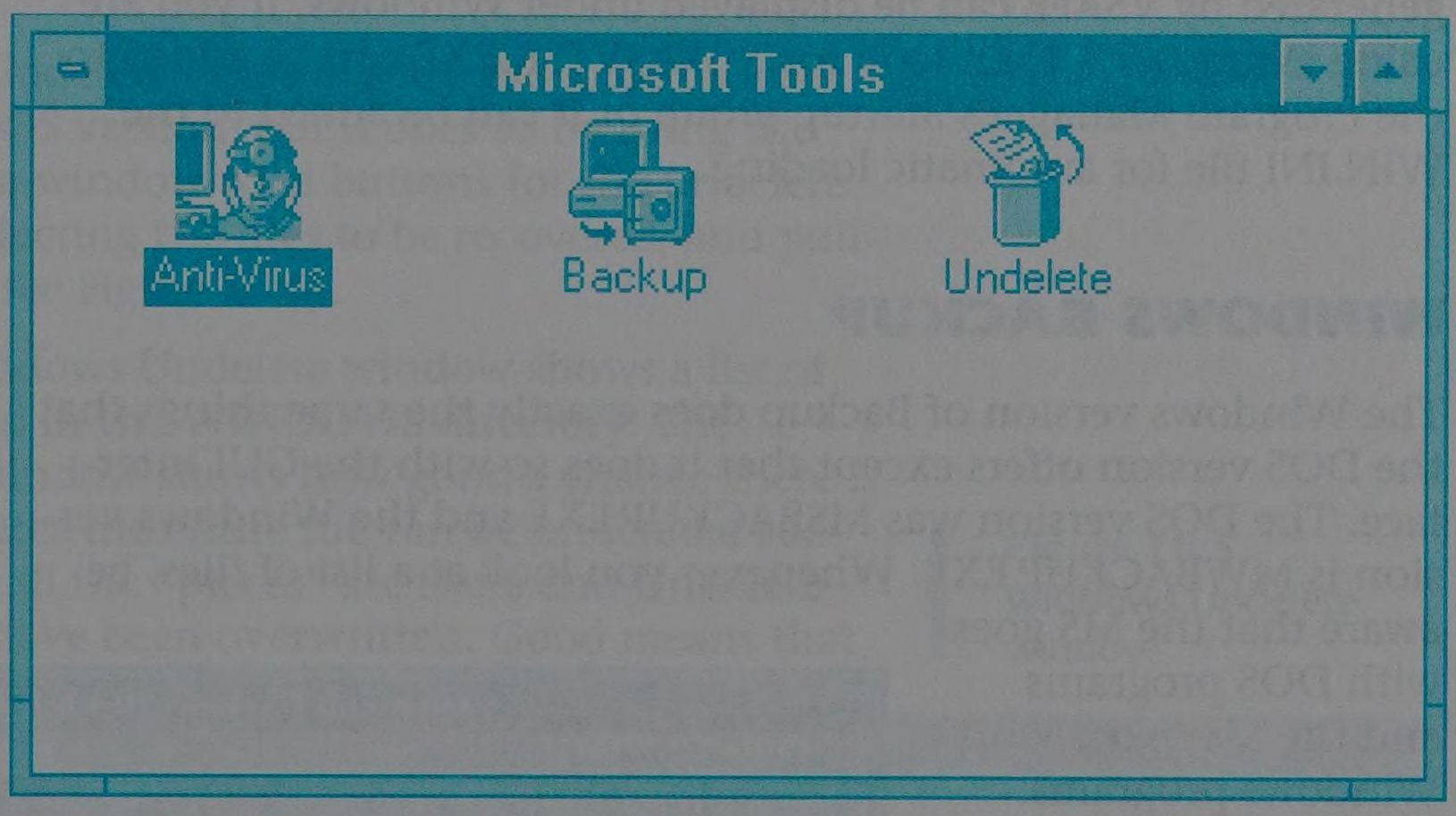


Figure 10.2
Windows tool box

NOTE

NOTE: There is also an icon available for a disk caching monitor, but that is best left until you are more advanced.

WINDOWS ANTI-VIRUS

The Windows version of Anti-Virus offers exactly the same features as the DOS version you examined in Lesson 9. This is the equivalent of MSAV (MicroSoft Anti-Virus), but the command name is MWAV (Microsoft Windows Anti-Virus). Whenever you use the DOS or the Windows version, the program must be loaded. To load the program, double-click on the Anti-Virus icon in the tool box.

A Windows GUI screen appears giving you choices similar to the ones you had for MSAV. The screen provides buttons for Detect or Detect and Clean, choices for drives, and pull-down menus. In Figure 10.3, drives C: and D: have been chosen as illustration.

The Status portion of the screen updates itself as soon as the scan is complete. If you have chosen to Detect only, a supplemen-

tary screen will report progress and any possible detection of a virus. After the Detect only phase, the Scan menu from the Anti-Virus Window can be pulled down. It gives choices such as Detect, Clean, Virus List, and Exit Anti-Virus.

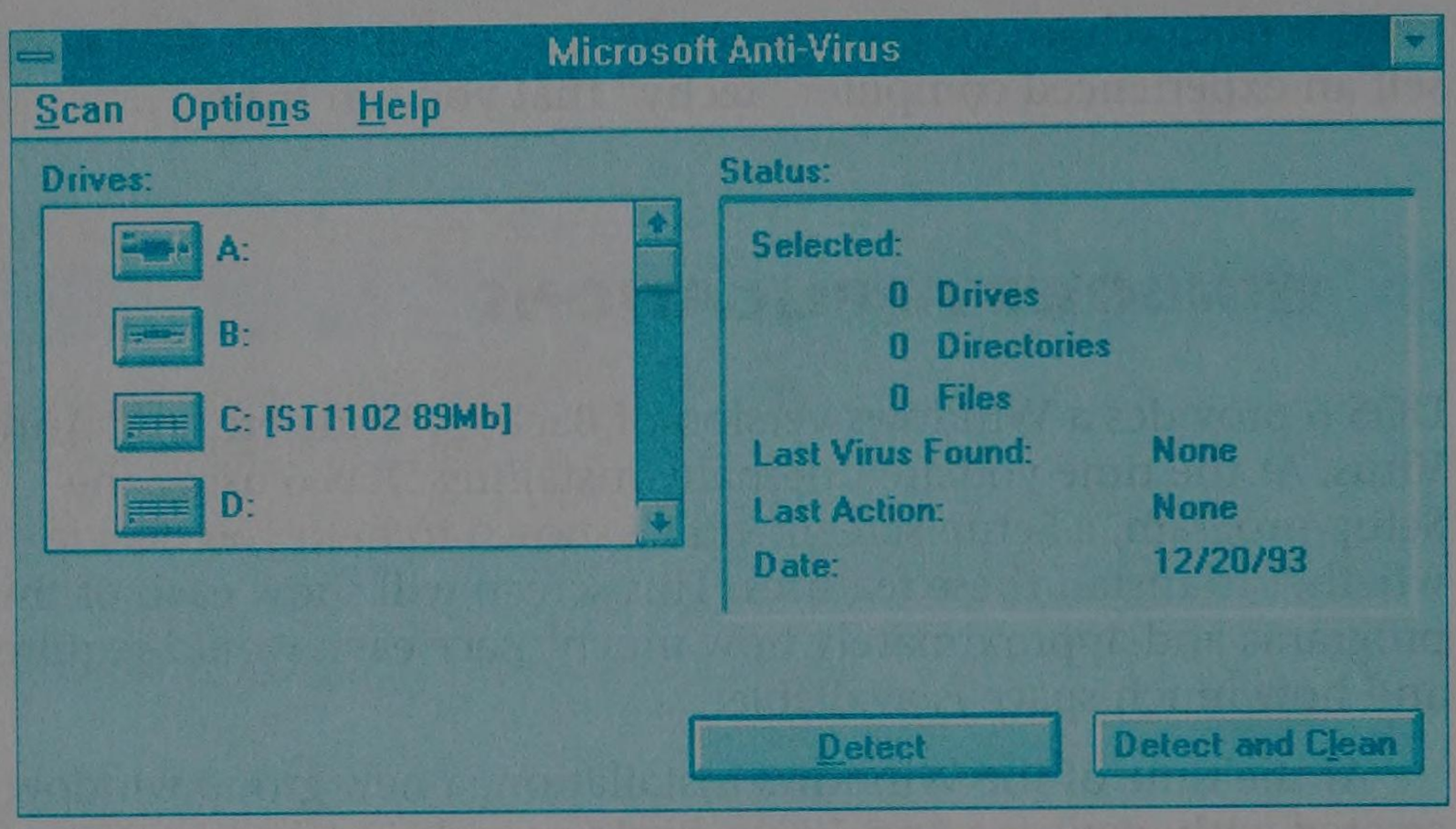


Figure 10.3
Windows Anti-Virus window

If continuous virus monitoring has been chosen and VSAFE installed, Windows users must also install MWAVTSR.EXE. This latter program communicates with VSAFE so that any message generated by VSAFE can be displayed under Windows. If you are using Windows 3.1, an icon for MWASVTSR.EXE can be added to the Program Manager's Startup group or it can be added to the WIN.INI file for automatic loading.

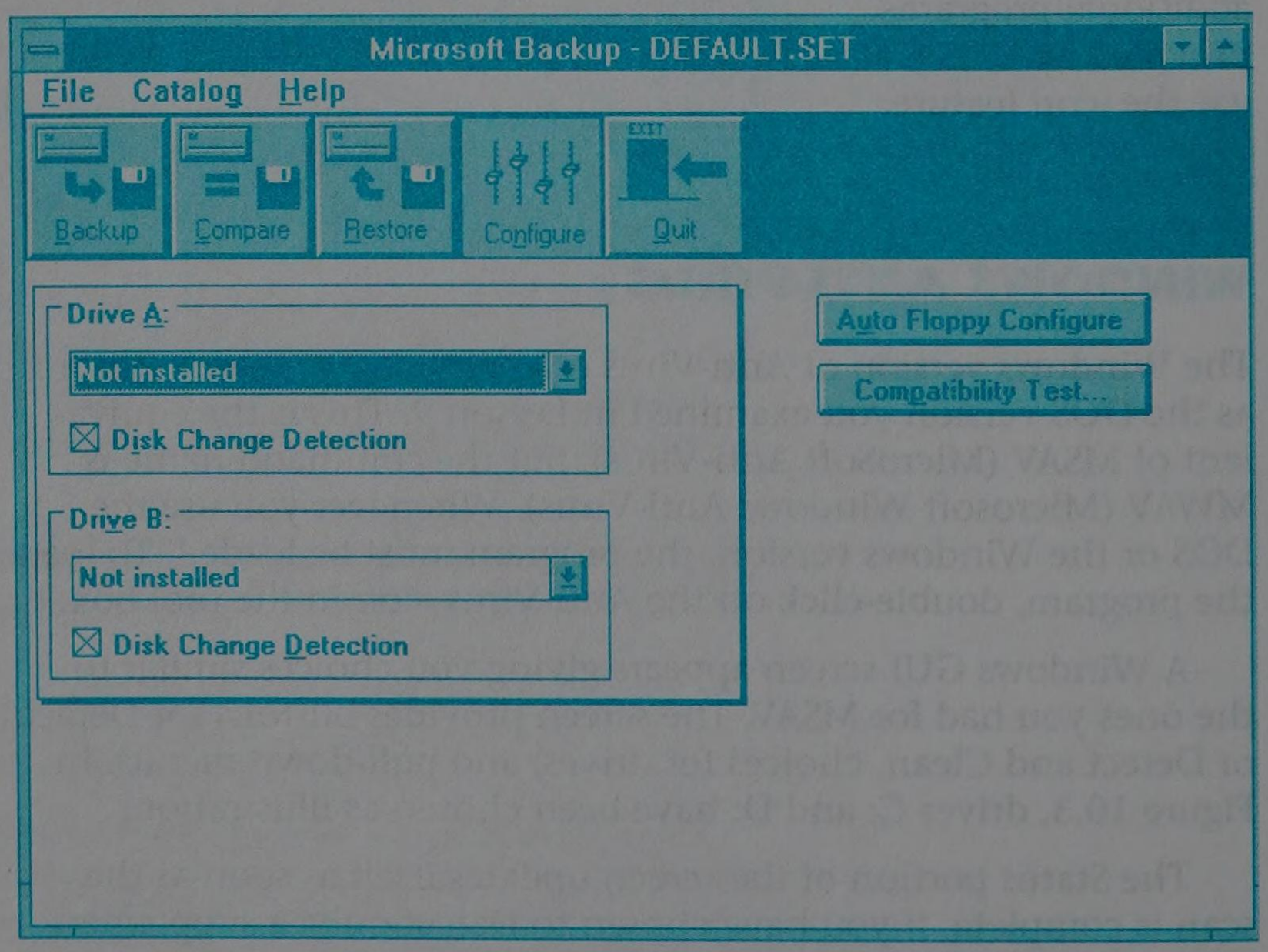
WINDOWS BACKUP

The Windows version of Backup does exactly the same things that the DOS version offers except that it does so with the GUI interface. The DOS version was MSBACKUP.EXE and the Windows version is MWBACKUP.EXE. Whenever you look at a list of files, be aware that the MS goes with DOS programs and the MW goes with Windows programs.

Figure 10.4
The Microsoft Backup opening screen

The Windows Backup program offers the same choices that the DOS program does: *Full, Incremental,* or *Differential* backups.

You start Windows Backup by double clicking on the Backup icon in the tool box. A traditional GUI screen appears (see Figure 10.4) offering the same choices you had with the DOS Backup in Lesson 9.



WINDOWS BACKUP SCREEN

If this is the first time that you have used Windows Backup, a box appears informing you that Backup has to be configured. You can either choose the Configure button at the top of the Main Backup menu when you begin, or you can answer yes when asked at the box if you want MWBACKUP to configure the system. It can automatically detect what type of drives have been installed on the system. Follow any instructions on the screen.

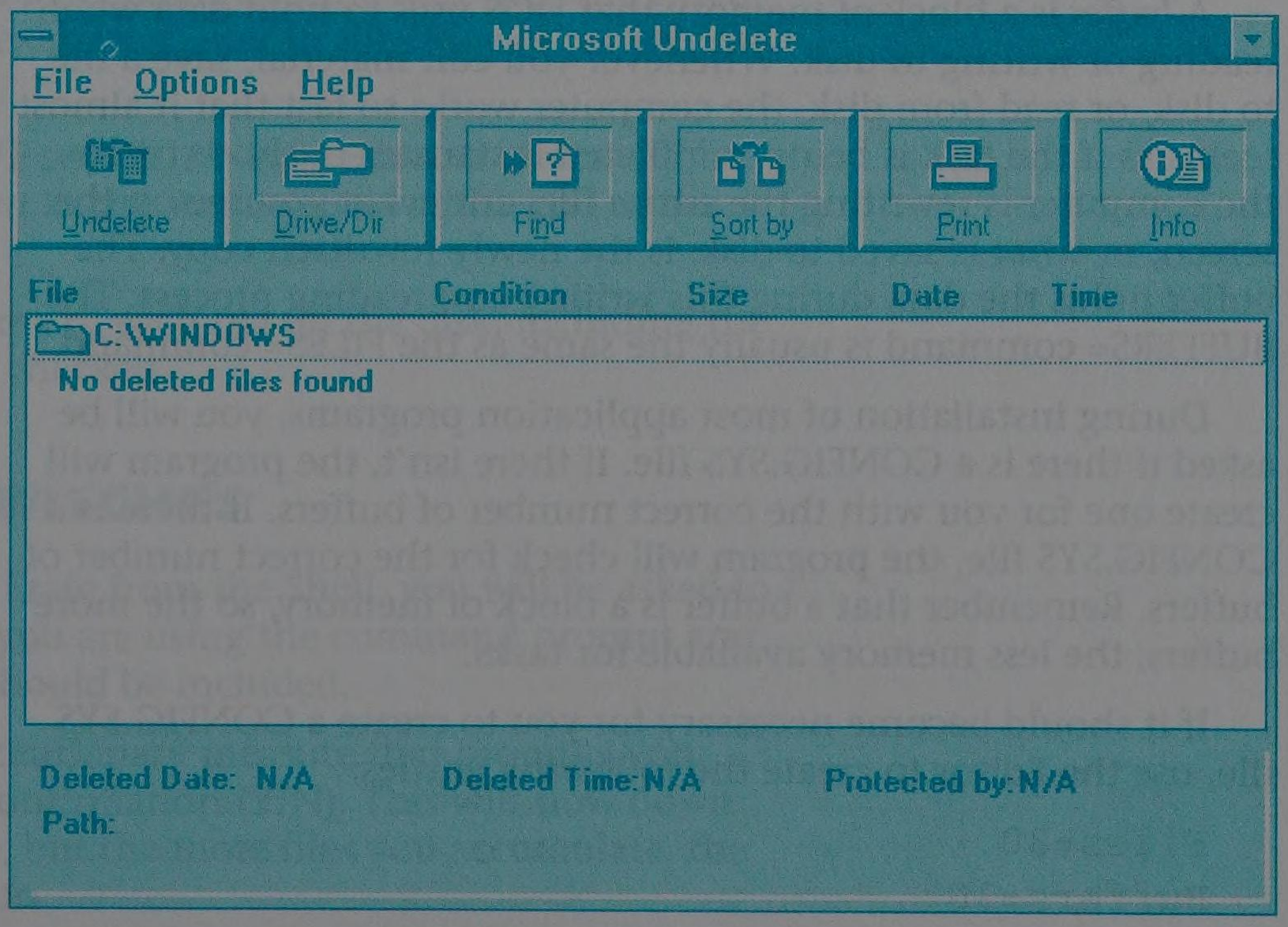
After Backup is configured, choose a drive in the Backup From: box and then select the *Select Files* button. A screen showing the directories and files on the selected drive appears and a selection of files to back up can be made.

WINDOWS UNDELETE

The Windows version of Undelete offers exactly the same procedure and features as the DOS version, but it does so by using the GUI interface. It provides a window with buttons for the undelete functions, a list box for selecting the files to be recovered, and pull-down menus for options (see Figure 10.5).

The list box in the Windows Undelete window shows a list of files that have been deleted in the WINDOWS directory. The *Condition* column of the window shows how good a chance there is for recovery. Perfect indicates the entire file can be undeleted successfully. Excellent means all the "pieces" are there and Undelete will be successful if none have been overwritten. Good means that some of the data has probably been lost. Poor indicates that recovery will probably be unsuccessful.

Figure 10.5
Windows Undelete window



A handy feature is the Print button. Clicking on this will send a list of the deleted files to the printer so that it is easier to select which files should be undeleted. The final selection on screen will then be easier and faster.

If a deleted file was part of a directory that was deleted, you must

first find and undelete the deleted directory, and then locate the deleted file.

As you can readily see, there are techniques to do many things to recover lost and deleted files, but they can get involved and complicated. The proverbial ounce of prevention should prevail at all times.

THE CONFIG.SYS FILE

CONFIG.SYS stands for *CONFIGuration of the SYStem*. This file was mentioned briefly in the discussion of MEMMAKER. It configures the system for running applications or special devices, e.g., the mouse. This is the first file that is loaded after you turn on the computer.

Sometimes, when an application program is installed, the program will automatically make necessary changes to the CONFIG.SYS file. Instructions for various devices are best left to the person installing your equipment and should be added to the file if and when they are needed.

The two most common instructions contained in a CONFIG.SYS file, and in which you might be involved, are *files* and *buffers*. The FILES= command tells DOS how many files can be accessed by the system at any one time. In the past, this command was usually set at 20. With the increase in power of the application programs during the last few years, it is now usually set at FILES=30.

A *buffer* is a block of memory that DOS uses to hold data when reading or writing to disk. Whenever you edit material, save a file to disk, or read from disk, the computer works so fast that it almost seems as if the task is being completed instantaneously. Actually the computer is rewriting the entire file, and what you see on the screen, or what is saved to disk, is the newly rewritten copy. The buffer holds the data during this writing and reading process. The BUFFERS= command is usually the same as the FILES= command.

During installation of most application programs, you will be asked if there is a CONFIG.SYS file. If there isn't, the program will create one for you with the correct number of buffers. If there is a CONFIG.SYS file, the program will check for the correct number of buffers. Remember that a buffer is a block of memory, so the more buffers, the less memory available for tasks.

If it should become necessary for you to create a CONFIG.SYS file, use the Editor to create the following entries:

```
Files=30
Buffers=30
```

NOTE

NOTE: When you are reading or talking about this file, the name includes the word *dot* for the period. It would be pronounced "config dot sys."

You will find a more in-depth discussion of memory and the CONFIG.SYS file in Appendix C.

SWITCHES

You are familiar with the concept of switches, the forward slash followed by a letter telling DOS to carry out the command in a particular way.

With the DIR command, you used:

/P to stop the display after each screen
/W to display the directory across the wide portion of the screen

With the FORMAT command, you used:

/S to copy the system tracks and make the disk bootable

CHKDSK COMMAND SWITCHES

Two switches are used with the CHKDSK command when using the command prompt: **/F** and **/V**. Each switch follows the command in the same manner as in the DIR and FORMAT commands.

The **/F** switch will fix any errors that are found on the disk, such as lost clusters. A message will usually appear stating:

```
XXX lost clusters found in XX chains. Convert
lost chains to clusters? (Y/N)
```

If you respond yes, the lost chains become files with the extension .CHK, which can be examined later in the hope of recovering data.

If you do not use the **/F** switch, no correction of errors will be made, but errors are shown in the status report at the end of the operation.

The **/V** will list the name of each file on the disk, including the hidden files, as it is being checked.

DEL OR ERASE SWITCHES

If you are using Delete or Erase from the Shell, you will be asked to confirm each deletion. If you are using the command prompt and wildcards, the **/P** switch should be included.

The **/P** switch is a precautionary measure that prompts you before each deletion for confirmation (Y/N). This will slow down the deleting process some, but the more files you accumulate, the greater the need for caution.

The /C switch is used when requesting a DIR on compressed files. This switch will give information about the compressed files on the drive you are listing.

MISCELLANEOUS COMMANDS

The sections that follow list several DOS commands that you may find useful.

INTERNAL COMMANDS

VER—*VER* stands for *version*. Keying VER at the DOS prompt prompts the computer to tell you what version of DOS is running.

VOL—This stands for *volume*. When entered at the DOS prompt, VOL will tell you the volume label name put on the disk during formatting. If any serial numbers exists, it will also relay that information.

DATE and **TIME**—In all probability, your computer has a built-in clock that will keep track of and report the date and time. If not, it is advisable to include at least the DATE command in the AUTOEXEC.BAT file so that files can be properly dated as they are created or edited. To either check or reenter the date or the time, type the command at the DOS prompt. The present date or time being used by the computer will be reported and you will be given the opportunity to enter a correction.

EXTERNAL COMMANDS

LABEL—This command will create a volume label name if you did not do so during formatting. It can change or delete an existing volume name. Remember that you can use up to 11 characters in a volume name and may include spaces but not tabs.

When you use this command you will get a prompt showing the present name or asking for a new name. You can key the new name and then press <ENTER>. If you wish to delete a name, press <ENTER> immediately and it will prompt you to confirm the deletion.

CHOICE—You constructed a menu for the EXERCISES floppy in drive A:. If you are seriously considering creating an opening menu for the hard drive, seriously consider studying and using the CHOICE command. It can give more sophisticated menu choices.

MEM—This was introduced with the discussion of MEMMAKER. This external command will produce a report of the kinds of memory in the system and how much is being used.

You have completed the instructions and exercises for the basic DOS commands and the DOS Shell.

Appendix A is a glossary of the vocabulary words that have appeared in each lesson. When you have finished defining these words and phrases, you will have a ready reference for the terms that are generally associated with DOS in general and DOS 6 in particular. Add any new terms you encounter as you increase your skill and knowledge of computers.

Appendix B is a list of internal commands for DOS 6 and a comparison of external commands for DOS 3.3, 4.0, 5.0, and 6.0. Many of the commands are for advanced purposes and use by system managers and programmers.

Appendix C is a discussion of RAM memory, extended memory, and how the CONFIG.SYS file configures the system.

If your interest lies in the direction of computers and what they can do, enroll in an advanced DOS or advanced systems class. If not, you have a good foundation for using a computer for personal or business uses. Add additional features and techniques as you need them. Experiment and enjoy.

Appendix A

GLOSSARY

Appending (3)

Attribute (9)

Backslash (3)

Backup (9)

.BAT (7)

Batch file (7)

Booting up (1)

Byte (1)

CD (2) (3)

CHKDSK (8)

CLS (2)

.COM (7)

Concatenating (3)

Configuration (1)

Context sensitive (6)

Ctrl key (1)

COPY (3)

Copy (5)

CPU (1)

Ctrl-Z (3)

Default (1)

DEFRAG (8)

DELTREE (8)

Device (3)

Dialog box (4)

DIR (2)

Directory (1)

DISKCOPY (8)

Drive designator (2)

Dual File Lists (4)

ECHO (7)

EDIT (6)

Editor (6)

Ellipsis (4)

.EXE (7)

Executable file (7)

Extension (2)

External commands (2)

/F (5)

F6 (3) (6)

F9 (5)

FAT table (2)

File (1)

Floppy disk (1)

Formatting (2)

Fragment (8)

Function keys (1)

Hard disk (1)

Hardware (1)

Hypertext (6)

Input device (1) _____

_____

Internal commands (2) _____

_____

Kilobyte (K) (1) _____

_____

Logged drive (2) _____

_____

MD (3) _____

_____

Megabyte (MB) (1) _____

_____

MEMMAKER (8) _____

_____

Mouse (1) _____

_____

Mouse pointer (4) _____

_____

Move (5) _____

_____

MSAV (9) _____

_____

Output device (1) _____

_____

Overwrite (5) _____

_____

/P (2)

Parameter (2)

PATH (2)

PAUSE (7)

Print Screen (2)

PRN (3)

PROMPT (7)

Quick Format (8)

RAM (1)

RD (3)

Read-only (9)

Refresh (6)

REM (7)

Rename (5)

Restore (9)

ROM (1)

Root directory (1)

/S (2)

Save As (6)

Scroll bar (4)

Select (4)

Selection cursor (4)

Shell (4)

Shift+F9 (6)

Source disk (8)

Spool queue (6)

Subdirectory (1) _____

_____

Switch (2) _____

_____

Target disk (8) _____

_____

Task swapping (7) _____

_____

TYPE (3) _____

_____

UNDELETE (9) _____

_____

UNFORMAT (8) _____

_____

View (5) _____

_____

Virus (9) _____

_____

VSAFE (9) _____

_____

/W (2) _____

_____

Wildcards (2) _____

_____

Appendix B

DOS COMMANDS

External Commands				Internal Commands
VERSION 3.3	VERSION 4.0–4.01	VERSION 5.0	VERSION 6.0	VERSION 6.0
APPEND	APPEND	APPEND	APPEND	BREAK
ASSIGN	ASSIGN	ASSIGN		CALL
ATTRIB	ATTRIB	ATTRIB	ATTRIB	CD or CHDIR
BACKUP	BACKUP	BACKUP		CHCP
CHKDSK	CHKDSK	CHKDSK	CHKDSK	CLS
			CHOICE	COPY
			COMMAND	CTTY
COMP	COMP	COMP		DATE
			DBLSPACE	DEL
DEBUG	DEBUG	DEBUG	DEBUG	DIR
			DEFRAG	ECHO
			DELOLDOS	ERASE
			DELTREE	EXIT
DISKCOMP	DISKCOMP	DISKCOMP	DISKCOMP	FOR
DISKCOPY	DISKCOPY	DISKCOPY	DISKCOPY	GOTO
			DOSHELP	IF
		DOSKEY	DOSKEY	LH or LOADHIGH
		DOSSHELLL	DOSSHELL	MD or MKDIR
		EDIT	EDIT	PATH
EDLIN	EDLIN			PAUSE
		EMM386	EMM386	PROMPT

External Commands				Internal Commands
VERSION 3.3	VERSION 4.0–4.01	VERSION 5.0	VERSION 6.0	VERSION 6.0
EXE2BIN	EXE2BIN			REM
		EXPAND	EXPAND	REN or RENAME
FASTOPEN	FASTOPEN	FASTOPEN	FASTOPEN	RD or RMDIR
		FC	FC	SET
FDISK	FDISK	FDISK	FDISK	SHIFT
FIND	FIND	FIND	FIND	TIME
FORMAT	FORMAT	FORMAT	FORMAT	TYPE
GRAFTABL	GRAFTABL	GRAFTABL		VER
GRAPHICS	GRAPHICS	GRAPHICS	GRAPHICS	VERIFY
		HELP	HELP	VOL
			INTERLNK	
			INTERSVR	
JOIN	JOIN	JOIN		
KEYB	KEYB	KEYB	KEYB	
LABEL	LABEL	LABEL	LABEL	
			LOADFIX	
		MEM	MEM	
			MEMMAKER	
			MICRO	
MODE	MODE	MODE	MODE	
MORE	MORE	MORE	MORE	
			MOVE	
			MSAV	
			MSBACKUP	
			MSD	
			MWAV	

External Commands			
VERSION 3.3	**VERSION 4.0–4.01**	**VERSION 5.0**	**VERSION 6.0**
			MWAVTSR
			MWBACKUP
			MWUNDEL
NLSFUNC	NLSFUNC	NLSFUNC	NSLFUNC
		POWER	POWER
PRINT	PRINT	PRINT	PRINT
RECOVER	RECOVER	RECOVER	
REPLACE	REPLACE	REPLACE	REPLACE
RESTORE	RESTORE	RESTORE	RESTORE
SELECT	SELECT	SELECT	
			SETUP
		SETVER	SETVER
SHARE	SHARE	SHARE	SHARE
			SIZER
			SMARTDRV
			SMARTMON
SORT	SORT	SORT	SORT
SUBST	SUBST	SUBST	SUBST
SYS	SYS	SYS	SYS
TREE	TREE	TREE	TREE
		UNDELETE	UNDELETE
		UNFORMAT	UNFORMAT
			VSAFE
XCOPY	XCOPY	XCOPY	XCOPY

Appendix C

MEMORY AND CONFIG.SYS

MEMORY

Computer users are much like automobile drivers. If it is bigger, faster, fancier, and has more features, it is better. Computer and software manufacturers are happy to comply. Computer technology has progressed to a point where the internal chips operate hundreds of times faster than they did in the early 1980s, floppy disks can now hold more than a million characters, and hard disks have added extra speed and tremendous storage capacity. The conventional RAM memory for processing started at a mere 64K, then jumped to 256K. When it reached 640K, everyone was ecstatic and thought more would never be necessary.

Software manufacturers wouldn't be left behind. They revised, updated, upgraded, and enhanced their programs to offer more and more features. Programs that once fit on one or two 360K floppy disks now take four to ten 1.2MB floppies. Most application programs today will take between 5 and 15MB of storage space on a hard drive just to load and install the program. The bigger the program, the more RAM memory is needed to process all the features offered.

Computers are usually classified by their internal chips: 80286, 80386, or 80486. The technicalities of the machines are not important. What is important is that when one of these machines is purchased, it very seldom has less than 1MB of RAM memory. The most common configuration has 2 or 4MB of RAM, and power users usually will have 8MB of RAM.

This sounds wonderful, but as with most wonderful things there is a drawback. The conventional memory that handles all the processing is limited to 640K. This is the 640K barrier that was discussed briefly in Lesson 8. This appendix will give an overview of what happens to all the rest of that RAM memory above the 640K mark and how the CONFIG.SYS file is used to put it to the most efficient use.

You have used the MEM command to give a report on the memory configuration of your machine. This report shows the kinds of memory, how much is being used, and how much is free. Figure C.1 illustrates the types of memory available in a typical system. These types of memory are discussed briefly below.

Conventional memory: All MS-DOS programs require conventional memory for processing functions. DOS manages conventional memory so no additional memory manager is needed.

Upper memory area: This is the 384K of memory between the conventional 640K and the 1MB level. The upper memory area is used by system hardware such as the monitor adapter. Any unused portion of upper memory is called *upper memory blocks* (UMB) and can be used by device drivers, such as the mouse driver, and memory-resident programs. For any memory above the conventional 640K you must have a memory manager. One example of a memory manager is named *EMM386*.

Extended memory: Any memory above the 1MB level is called *extended memory* and requires an extended memory manager such as *HIMEM*. If your machine has Windows and Windows-based application programs, you must have extended memory. Many of the powerful application programs require extended memory to run.

High memory area: The first 64K of extended memory is called the *high memory area*. If you have extended memory, the setup program for DOS installs DOS to run in the high memory area instead of in conventional memory. This frees up space for processing.

All of this conventional and extended memory resides in the chips in the computer, and the quantity depends on how many chips were purchased and installed.

Expanded memory: In addition to all this extended memory, there is *expanded memory*. Expanded memory comes on an expanded memory board that is installed in the computer. It usually consists of 1MB of memory that is used in 64K chunks by using a part of the upper memory area. Along with the expanded memory board comes an expanded memory manager. Since this type of memory can be used only in small pieces at a time, it is slower than the extended memory.

If you do not have expanded memory, there is no need to worry. The EMM386 memory manager or Windows can simulate expanded memory if needed.

This description of the different kinds of memory may seem complicated. Keep in mind the diagram in Figure C.1. The objective of all these various kinds of memory is to utilize the space in such a manner that the maximum amount of conventional memory is free for processing.

CONFIGURING THE SYSTEM

The computer has to be told how to carry out the configuration for these portions of memory. This is done with the CONFIG.SYS and

AUTOEXEC.BAT files. You are acquainted with these two files. When the computer is first turned on, it looks for these two files and carries out all the instructions that they contain.

Instructions for the CONFIG.SYS and AUTOEXEC.BAT files can be entered manually by the user and they can be entered automatically by the setup portion of an application during installation.

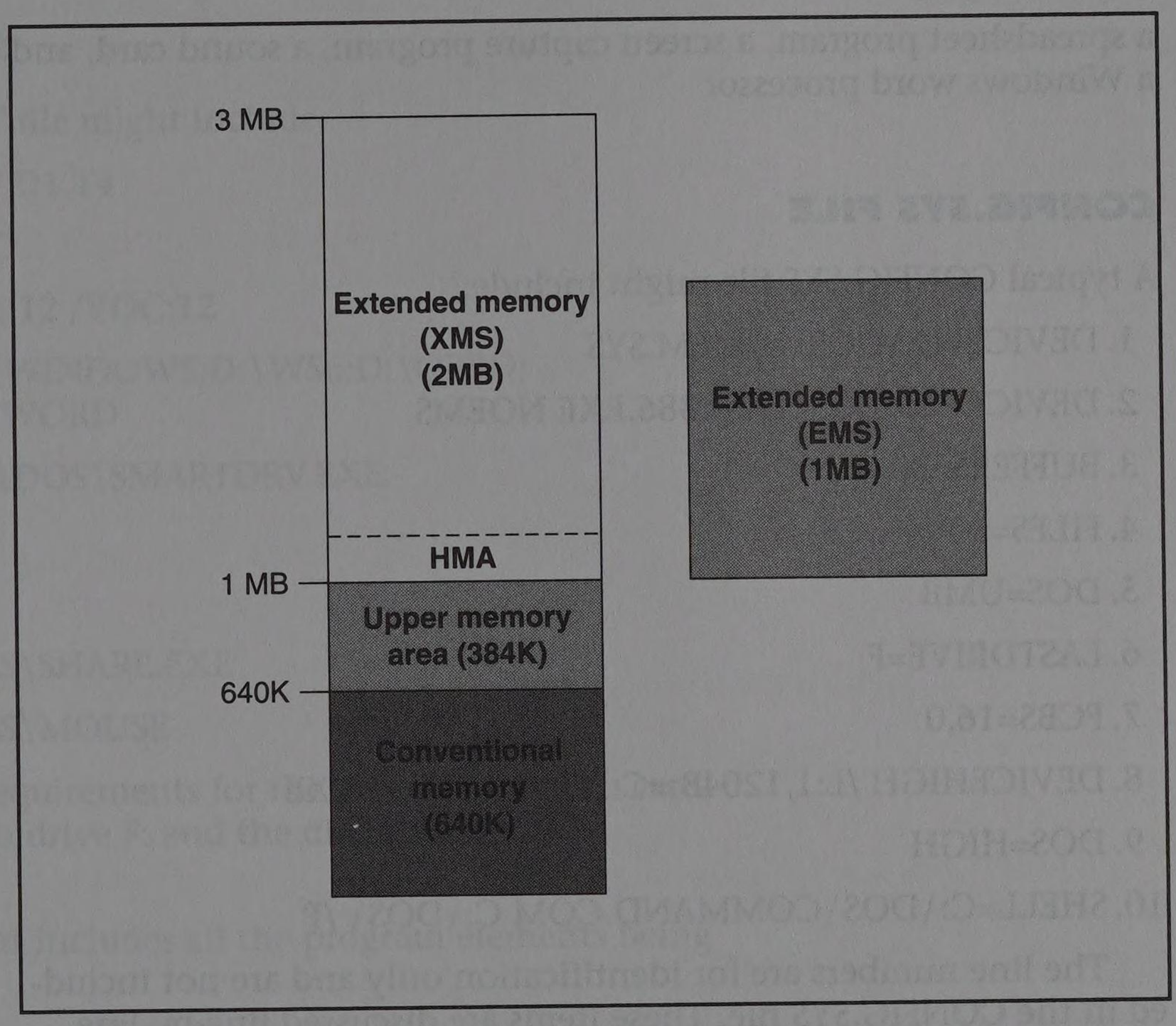


Figure C.1
Typical memory configuration

If creation of the CONFIG.SYS and AUTOEXEC.BAT file is being done manually, it is preferable to have a professional computer technician do the configuration. If a new application is being installed, the setup program will check these two files to see if they contain needed instructions for running the program in the appropriate memory location. If the two programs do not contain the necessary configuration items, setup will automatically modify them.

MEMMAKER

After the items are placed in the CONFIG.SYS or the AUTOEXEC.BAT file, MEMMAKER will automatically make decisions about how best to use existing memory. As a precaution, you should always make a copy of the CONFIG.SYS and AUTOEXEC.BAT files and have a bootable disk available.

Optimizing the available memory is a complex procedure involving hundreds of possible combinations. If the system does not reestablish itself after running MEMMAKER, the boot disk and file copies can be used to reboot the system and reestablish the system as it was before running MEMMAKER.

TYPICAL CONFIGURATION

The following sections provide a typical configuration for a system that includes DOS, Windows, a mouse, a word processing program,

a spreadsheet program, a screen capture program, a sound card, and a Windows word processor.

CONFIG.SYS FILE

A typical CONFIG.SYS file might include:

```
1. DEVICE=C:\DOS\HIMEM.SYS
2. DEVICE=C:\DOS\EMM386.EXE NOEMS
3. BUFFERS=30
4. FILES=30
5. DOS=UMB
6. LASTDRIVE=F
7. FCBS=16,0
8. DEVICEHIGH /L:1,12048 =C:\DOS\SETVER.EXE
9. DOS=HIGH
10. SHELL=C:\DOS\COMMAND.COM C:\DOS\ /P
```

The line numbers are for identification only and are not included in the CONFIG.SYS file. These items are discussed line-by-line below.

1. This loads the extended memory manager HIMEM.SYS, which can be found on drive C: in the DOS directory.
2. This loads the upper memory manager EMM386.EXE, which can be found on drive C: in the DOS directory. NOEMS indicates that there is no expanded memory.
3. BUFFERS provide space for storing data as it is moved between parts of the system.
4. FILES is the number of files that can be open at any one time.
5. This loads DOS into upper memory blocks.
6. This informs the system that the last drive on the hard drive is drive F:.
7. This sets the File Control Blocks to 16.
8. This gives an address in high memory in which to put the SETVER.EXE program found on drive C: in the DOS directory. After SETVER.EXE is installed in the CONFIG.SYS it allows you to specify earlier versions of DOS if required by older programs. The DOS 6 setup automatically installs this.
9. This loads DOS into high memory.
10. This creates a shell containing COMMAND.COM so that it will be available for the entire system.

AUTOEXEC.BAT FILE

A typical AUTOEXEC.BAT file might include:

1. SET BLASTER=A220 I5 D1 T4
2. SET SOUND=F:\SBPRO
3. F:\SBPRO\SBP-SET /M:12 /VOC:12
4. PATH C:\;C:\DOS;C:\WINDOWS;D:\WS6;D:\QPRO; E:\SNAPPRO; E:\WINWORD
5. LH /L:0;1,42400 /S C:\DOS\SMARTDRV.EXE
6. PROMPT PG
7. SET TEMP=C:\DOS
8. LH /L:1,13984 C:\DOS\SHARE.EXE
9. LH /L:1,56928 C:\DOS\MOUSE

Lines 1, 2, and 3 set requirements for the SoundBlaster Pro card. The program is located on drive F: and the directory name is SBPRO.

Line 4 is the PATH that includes all the program elements being used.

Line 5 gives the Load High memory location for the SmartDrv cache program, which is found on drive C: in the DOS directory.

Line 6 is the PROMPT command to display the current default drive.

Line 7 sets the location of any temporary files that DOS might create to drive C:.

Line 8 loads into high memory at the indicated address the SHARE.EXE program, which is a file locking device allowing two files to be open at the same time. It tells the system that this program is located on drive C: in the DOS directory.

Line 9 loads into high memory at the indicated address the software to run the mouse.

There are many other items that can be included in the CONFIG.SYS or the AUTOEXEC.BAT files. They give the directions to load these items and configure your system for working each time the computer is turned on.

This description is intended as an overview of configuration. Hopefully, it will give a more vivid picture of how the computer system works. If you decide that computer science is for you, this is one of the areas with which you will become very familiar. If you decide that applications and production are for you, then a cursory understanding of computer configuration is sufficient.

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DOS 6: Quick Course introduces you to the DOS commands that you will need in order to use your computer efficiently. The text stresses the most frequently-used commands to help you quickly improve your productivity at the computer.

Each lesson provides an overview, vocabulary, description, exercises, and review. Screen displays illustrate how to enter the commands. Hands-on exercises provide practice in using the commands.

DOS 6: Quick Course by Raylene Dill includes these features:

- Vocabulary list at the beginning of each lesson
- Spiral binding for ease-of-use at the computer
- Ten lessons that help even the beginning computer user gain DOS expertise quickly
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- Guidance on system configuration
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