

MICROSOFT®

# MS-DOS® for the *eazy pc*™

MS-DOS® Setup and User's Guide

HEATH

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WHEN TOTAL PERFORMANCE IS THE ONLY OPTION

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### Essential requirements for using MS-DOS:

- a. Distribution Media: One 3.5-inch 720 Kb.
- b. Machine Configuration (minimum): eaZy pc, 256 K memory, one floppy disk drive, and CRT.

ZENITH DATA SYSTEMS CORPORATION  
ST. JOSEPH, MICHIGAN 49085

HEATH COMPANY  
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**DESKTOP COMPUTER SYSTEMS**

## SOFTWARE/HARDWARE DATA SHEET

This form should be completed when this software is installed on your computer, and updated if your hardware or software environment changes. If you require assistance in the use of your software, please contact your local store, dealer, or contract representative. To receive assistance you will need the information listed below:

### Software:

Model # \_\_\_\_\_ Serial # \_\_\_\_\_

Name \_\_\_\_\_ Ver. \_\_\_\_\_

### Hardware:

Computer Model# \_\_\_\_\_ ROM Ver. \_\_\_\_\_

Base Memory \_\_\_\_\_ K Ex. Memory \_\_\_\_\_ K

Video Type: CGA ( ) EGA ( ) MDA ( ) Hercules ( ) Other ( ):

\_\_\_\_\_

Monitor vendor \_\_\_\_\_ Model # \_\_\_\_\_

Video card vendor \_\_\_\_\_ Model # \_\_\_\_\_

Description \_\_\_\_\_

Any other add-on cards (vendor, model #, and description)

\_\_\_\_\_

\_\_\_\_\_

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**Printer, plotter or other peripheral:**

Vendor \_\_\_\_\_ Model # \_\_\_\_\_

Description \_\_\_\_\_

Interface: (Parallel or serial, baud rate, handshaking, etc.)

Vendor \_\_\_\_\_ Model # \_\_\_\_\_

Description \_\_\_\_\_

Interface: (Parallel or serial, baud rate, handshaking, etc.)

Vendor \_\_\_\_\_ Model # \_\_\_\_\_

Description \_\_\_\_\_

Interface: (Parallel or serial, baud rate, handshaking, etc.)

**Operating System:**

Model # \_\_\_\_\_ Serial # \_\_\_\_\_

Name \_\_\_\_\_ Ver. \_\_\_\_\_ IO.SYS/BIOS \_\_\_\_\_

**Basic (if required)**

Model # \_\_\_\_\_ Serial # \_\_\_\_\_

Name \_\_\_\_\_ Ver. \_\_\_\_\_ Vendor \_\_\_\_\_

**Operating Environment:**

(List all other software in use concurrently: windowing, notepad, calendar, network, communications, etc. Also, list contents of config.sys file and the autoexec.bat file.)

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*MS-DOS® for the easy pc™*

MS-DOS® Setup Guide

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# WELCOME TO MS-DOS

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## What Is MS-DOS?

Microsoft® MS-DOS® is like a translator between you and your computer. Basically, this translator is a series of programs, making up what is called the MS-DOS operating system. MS-DOS is used to control and communicate with your computer, disk drives, and any other devices you may have connected to your computer (for example, a printer).

MS-DOS is more than just a translator, though. It is also a *disk operating system*. This means that you can use MS-DOS programs on computers with floppy or hard disks. Once you have loaded MS-DOS into your computer's memory, you can compose letters and reports, run programs and languages such as Microsoft GW-BASIC™, and use devices such as printers and telephone modems.

## Using the MS-DOS Documentation

The following three parts are provided in two manuals: *MS-DOS Setup and User's Guide* and *Using MS-DOS Manager*.

- *MS-DOS Setup Guide* describes how to use the SETUP program to make backup copies of your MS-DOS distribution disks. SETUP creates some special configuration files for you that make it easier to use MS-DOS with your system. In addition, SETUP lays the foundation for understanding MS-DOS by presenting basic concepts and procedures to follow when using MS-DOS.
- *MS-DOS User's Guide* describes the most commonly used MS-DOS commands. This guide, for the beginning user, contains easy-to-follow examples for working with files, directories, disks, and printers. It contains a detailed command dictionary

as well as information on creating and using MS-DOS batch files to make repetitive tasks easier. There is a glossary of terms to make your task of understanding MS-DOS easier. A detailed section on MS-DOS messages describes the messages MS-DOS displays on your screen and includes information on how to avoid making errors.

- *Using MS-DOS Manager* describes how to use the MS-DOS Manager, an interactive program that makes using MS-DOS easy. The Manager lets you choose common MS-DOS commands from a set of drop-down menus on your screen. This is an easy way of using MS-DOS because you do not have to worry about memorizing any commands.

Included with the MS-DOS Manager is an interactive tutorial program that lets you learn about the Manager at your own pace.

You should begin by using the SETUP program described in the *MS-DOS Setup Guide*, then progress into the book. If you are a first-time computer user, you will probably want to use the MS-DOS Manager until you are comfortable with MS-DOS. As you become more experienced, or when you wish to learn more about MS-DOS, you may want to proceed to the *MS-DOS User's Guide*, and use actual MS-DOS commands to accomplish your tasks.

## Related Publications

The most commonly used MS-DOS commands were selected for documentation in this manual. In other reference books on MS-DOS, you will find MS-DOS commands not listed in this manual. Most of these commands are seldom used by anyone but experienced users of MS-DOS.

For additional information on using MS-DOS, we recommend the following publications:

- *MS-DOS Reference Manual*, manual number: 595-3927  
Zenith Data Systems, Hilltop Rd, St. Joseph, MI 49085

This manual contains information on all of the MS-DOS commands as well as information on EDLIN, the MS-DOS text editor; DEBUG, a program debugger; and LINK and LIB, the MS-DOS programming utilities.

The *MS-DOS Reference Manual* can only be ordered by mailing the tear-out order form included with this manual.

- *Learning DOS*  
Microsoft Press: Redmond, WA

*Learning DOS* consists of an interactive tutorial program that allows you learn at your own pace important concepts and techniques for learning more about MS-DOS. Included is a reference book that contains information on using the tutorial and tips on using MS-DOS.

This publication can be ordered directly from the Microsoft Company.

## ABOUT THE SOFTWARE

The software for the eaZy pc™ is shipped on two disks. One of the disks contains MS-DOS software and the other disk contains the MS-DOS Manager and tutorial program as well as the GW-BASIC Interpreter software. GW-BASIC is a popular, easy-to-learn programming language that is used by many application programs. This software has been included for compatibility with any programs you might use that require BASIC.

The following files are included as part of the GW-BASIC software:

*basica.exe*  
*basica.com*  
*hbasic.exe*  
*font.com*  
*demo.bas*

If you need to use GW-BASIC, use the COPY command as described in the *MS-DOS User's Guide*, to copy the GW-BASIC files from the SETUP/TUTORIAL/BASICA disk to your working disk.

To use GW-BASIC with an application program, you would enter a command entry form as follows:

*d*:BASICA *d*:*program*

where *d*: specifies the drive where the *program* files are located and *program* is the name of the program you want to run under GW-BASIC.

For example, to run the sample program included with GW-BASIC, you would enter:

*d*:BASICA *d*:DEMO

where *d*: specifies the drive where the GW-BASIC program files are located.

#### Note

Zenith Data Systems is offering the documentation for GW-BASIC at a reduced price. The documentation includes the *GW-BASIC Interpreter User's Guide*, the *GW-BASIC User's Reference*, and the *GW-BASIC Quick Reference Guide*.

This documentation is not needed if you only use BASIC to run programs. It is only useful if you intend to develop your own programs in the BASIC language. This three-volume set can *only* be ordered by mailing the tear-out card included with this manual.

**SPECIAL OFFER**

Zenith Data Systems is pleased to offer the *MS-DOS Reference Manual* (manual number 595-3927) at a reduced price of \$20. This manual, intended for the more advanced MS-DOS user, contains information on using EDLIN, DEBUG, LINK, LIB, EXE2BIN, MS-DOS programming utilities, and additional MS-DOS commands.

To order your copy, send your check or money order along with this form to:

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St. Joseph, MI 49085

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# GETTING STARTED

---

Before you can use MS-DOS or MS-DOS Manager for the first time, you need to set up, or install, the MS-DOS software on your computer. When you perform the Setup procedure, MS-DOS will do the following:

- Make a backup copy of your MS-DOS and SETUP/TUTORIAL/BASICA disks. Always keep backup disks (exact copies) of your disks in case you lose a disk or accidentally damage it.
- Create working disks for your application programs. You will probably want to create a working disk for each of the application programs you will use. The working disk will contain MS-DOS files, the application program files, and the data files you create when you run the application program.
- Prepare your hard disk for use with MS-DOS, if your computer has a hard disk drive. Setup copies the MS-DOS files to your hard disk. Then later, you can copy your application programs and data files to the hard disk.

## What You Need

To set up MS-DOS on your computer, you need:

- the SETUP/TUTORIAL/BASICA disk.
- the MS-DOS disk.

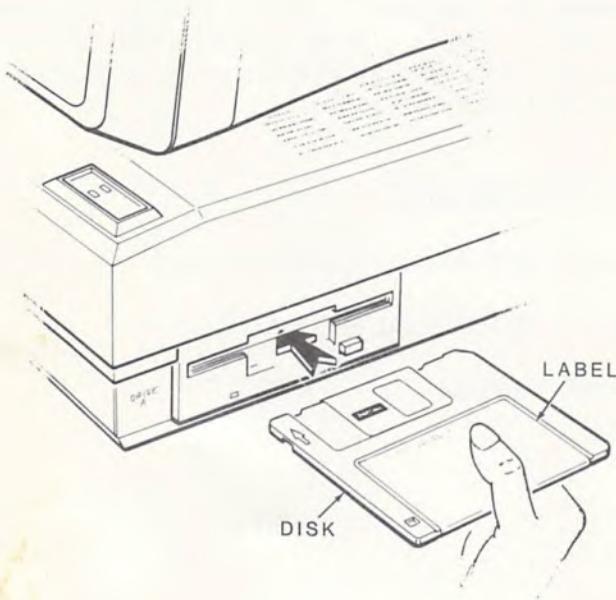
three blank floppy disks if you are using a computer with one or two floppy disk drives. You will use one disk to make a backup copy of the MS-DOS disk, one to make a backup copy of the SETUP/TUTORIAL/BASICA disk, and one to make a working disk. If you want to make working disks for more than one application program, you will need additional blank disks.

or

two blank floppy disks if you are using a computer with a hard disk drive. You will use one disk to make a backup copy of the MS-DOS disk and one to make a backup copy of the SETUP/TUTORIAL/BASICA disk. Your hard disk will be your working disk.

## Setting Up MS-DOS on Your Computer

To start the Setup procedure, insert the SETUP/TUTORIAL/BASICA disk in drive A and close the drive door. Always insert the metal part of the disk into the drive first with the label facing up.



Turn on your computer.

When you start your computer, a process called *booting*, it looks for the MS-DOS files on your disk. If the files are not there, the computer will not boot.

A disk that contains the MS-DOS files is called a *bootable disk*. Both the SETUP/TUTORIAL/BASICA and MS-DOS disks are bootable disks.

When the computer finds the MS-DOS files on the disk and boots, MS-DOS asks you to enter the current date and time. When you create or modify a file, MS-DOS transfers the date and time to that file so you can find out when you last changed the file.

## Entering the Date

MS-DOS displays the following message to ask you to enter the current date:

```
Current date is Fri 07-24-87
Enter new date (mm-dd-yy):
```

Type the date in the following format:

```
mm-dd-yy
```

where *mm* stands for the month (January is 01, February is 02, and so on), *dd* is the day of the month, and *yy* is the last two numbers in the year. Remember to separate the month, day, and year with hyphens (-). Press RETURN.

If the date you entered is not valid, MS-DOS displays a message and asks you to enter a valid date.

## Entering the Time

After you enter the time, MS-DOS displays the following message to ask for the current time:

```
Current time is 14:23:45.26
Enter new time:
```

Type the current time in the following format:

```
hh:mm:ss
```

where *hh* is the hour (see the following note), *mm* is the minutes past the hour, and *ss* is the seconds. When MS-DOS displays the time, it also displays the number of seconds past the minute and the hundredths of a second. You only need to enter the hour and minutes. Remember to separate the parts of the time with colons (:). Press RETURN.

If you enter an invalid time, MS-DOS displays a message and asks you to enter a valid time.

### Note

MS-DOS uses a 24-hour clock. That is, the clock does not start over again with 1:00 when it reaches noon as a normal household clock or watch does, so 1 p.m. is 13 hours, 2 p.m. is 14 hours, and so on. At midnight, the clock starts over at 00 hours.

## Starting Setup

After you enter the date and time, MS-DOS asks you if you want to run the Setup program or Learning MS-DOS Manager, the MS-DOS Manager tutorial. Press S to select the Setup program.

The Setup procedure begins. Follow the directions you see on the screen.

If you are using a computer with one floppy disk drive, Setup will ask you to swap your disks in and out of the disk drive several times so it can copy the files from one disk to another. Make sure you label your disks so that when Setup prompts you, you can insert the correct disk.

## When Setup is Done

When the Setup procedure ends, you should have backup copies of both your MS-DOS and SETUP/TUTORIAL/BASICA disks, as well as a working floppy disk or a prepared hard disk.

Put your original disks in a safe place, away from direct light or heat. You can also put away your backup MS-DOS disk, since the MS-DOS files you need are now on your working floppy disk or hard disk.

Leave your SETUP/TUTORIAL/BASICA disk in drive A for now, so you can work through Learning MS-DOS Manager, an interactive tutorial that will help you become familiar with MS-DOS Manager.

*Using MS-DOS Manager* explains how to start the Learning MS-DOS Manager tutorial. Before you begin the tutorial, however, you should learn how to boot your computer from the disks you made with Setup.

## Booting Your Computer

**From a Floppy Disk** — To boot your computer from a working floppy disk you prepared with the Setup procedure, insert the disk in drive A and close the drive door. When booting from a floppy disk, always remember to place the disk in drive A, since that is where the computer looks first.

**From a Hard Disk** — To boot from a hard disk you prepared with the Setup procedure, you do not need to use a floppy disk. Setup already copied the MS-DOS files from the floppy disk to your hard disk. When booting from a hard disk, always make sure that there are no disks in your floppy disk drives, since the computer first looks for the MS-DOS files in the floppy disk drives.

## Boot Methods

Use one of the following methods to boot your floppy or hard disk:

- If your computer is turned off, turn on the power. The disk boots automatically. MS-DOS prompts you for the date and time.
- If your computer is already on, hold down the CONTROL and ALT keys at the same time, then press the DEL key. Release all three keys at the same time to boot from the disk. MS-DOS prompts you for the date and time.

## When the Computer Boots

When you boot the computer from your working floppy disk or prepared hard disk and enter the date and time, MS-DOS Manager appears on your screen. You can use MS-DOS Manager to select common MS-DOS Manager commands, run your application programs, and work with your files. MS-DOS Manager also lets you exit to MS-DOS to use additional MS-DOS commands.

Go to *Using MS-DOS Manager* to start the Learning MS-DOS Manager tutorial and learn about MS-DOS Manager. When you complete the tutorial, you should be ready to start working with MS-DOS Manager.

Refer to the *MS-DOS User's Guide* when you are ready to learn about and use MS-DOS commands.

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## INTRODUCTION

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The *MS-DOS User's Guide* describes how to use the most common MS-DOS commands. It is divided into the following chapters and appendixes:

Chapter 1, "Getting Started," provides basic information about using MS-DOS. It describes some important keys you should become familiar with to use MS-DOS. It also tells you how to create backup copies of your disks and how to start an application program.

Chapter 2, "Using MS-DOS," describes the commands needed to work with files, disks, and directories. It also explains how you can redirect command input and output and how to configure MS-DOS for use with printers or modems.

Chapter 3, "MS-DOS Commands," provides details about the most commonly used MS-DOS commands. The commands are presented in alphabetical order.

Appendix A, "Batch Processing," discusses MS-DOS batch files and the special commands that can be used in batch files to make repetitive tasks easier.

Appendix B, "Configuring Your System," describes the configuration commands you can put in the *config.sys* file to make MS-DOS and your computer work more effectively with your application programs.

Appendix C, "MS-DOS Messages," describes the messages displayed by MS-DOS.

Appendix D, "MS-DOS Editing Keys," describes how you can reuse and edit a previously entered MS-DOS command.

Appendix E, "Tips on Using MS-DOS," lists some common mistakes made by users and tips on how to avoid them.

The Glossary lists and defines terms used in this manual.

## Conventions Used in this Manual

Please keep the following conventions in mind as you use this manual:

- MS-DOS commands and control switches are shown in uppercase letters. This convention is used to help you become familiar with MS-DOS commands and to distinguish MS-DOS commands and switches from input you must provide to execute a command. For example, in the following command, COPY is the MS-DOS command needed to copy the file *accounts.jun* from the default, or active, drive to a file named *accounts.jul* on drive B.

```
COPY accounts.jun b:accounts.jul
```

You can type MS-DOS commands in any combination of upper- and/or lowercase letters.

- Italics are used to represent required input that you must provide. For example, *filename* means you should enter the name of your file in place of *filename*.

Italics are also used for emphasis and to identify file and directory names.

- Brackets ( [ ] ) are used to indicate optional item(s). Enter only the text enclosed in brackets and not the brackets themselves.
- A vertical bar ( | ) is used to separate optional items, from which you can choose only one. For example:

```
BREAK [ON | OFF]
```

The brackets indicate optional items. The vertical bar separating ON and OFF means that you can use only one of the parameters; that is, you can enter either BREAK ON or BREAK OFF.

- The words *type* and *enter* have special meaning when used with the examples in this manual. *Type* means you should type the command as shown without pressing RETURN. *Enter* means you should type the command as shown and press RETURN to execute the command.
- The terms *source* and *target* have special meaning. *Source* refers to the master copy of a file or disk. *Target* refers to where you are moving the disk or file. For example, in the command `COPY myfile.doc b:yourfile.doc`, *myfile.doc* is the source file, and *b:yourfile.doc* is the target disk and filename respectively.

# CHAPTER 1

## GETTING STARTED

---

### Overview

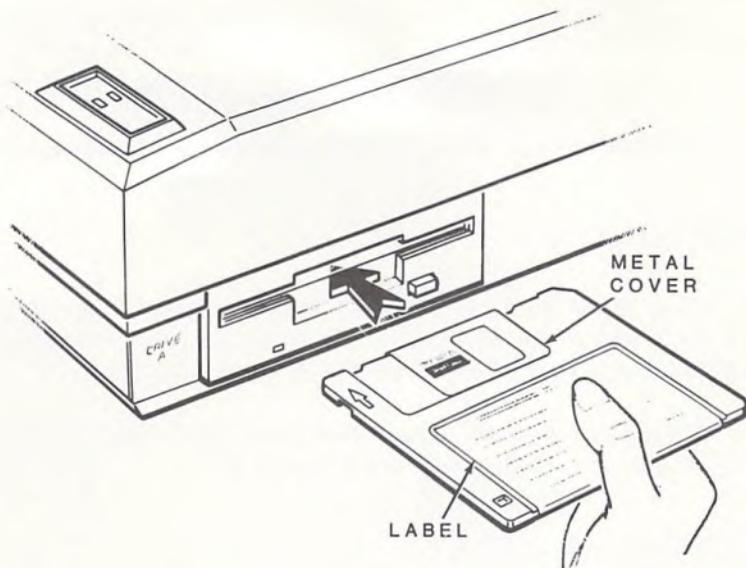
This chapter presents information to help you get started using MS-DOS. It is presented without a lot of explanation. Instead, examples are used to help you quickly learn and start using MS-DOS.

Later, if you have problems remembering the basic rules for using MS-DOS, you can use this chapter for reference.

### Starting MS-DOS

Before you can use your computer you must load MS-DOS into your computer's memory. This process is commonly called *booting*.

To start MS-DOS from a floppy disk drive, insert the MS-DOS disk in drive A (as shown in Figure 1.1) and turn on your computer. If you have a hard disk installed in your computer, make sure there is no floppy disk in drive A, then turn on your computer.



**Figure 1.1. Starting MS-DOS from a Floppy Disk**

## Restarting MS-DOS

At times, you may need to reload (*reboot*) MS-DOS while the computer is on. To reset the computer and reload MS-DOS:

1. Insert the MS-DOS system disk in drive A (skip this step if you have a hard disk).
2. Press and hold the CTRL and ALT keys, press the DEL key, then release all three keys at once. This key sequence resets your computer, erases everything in memory, and reloads MS-DOS.

## Entering the Date and Time

When you boot MS-DOS, it prompts you for the date as follows.

```
Current date is Tue 6-16-87
Enter new date (mm-dd-yy):
```

If the date shown is correct, press RETURN.

If the date shown is not correct, for example, if today's date is July 19, 1987, enter:

```
7-19-87
```

Refer to the DATE command in Chapter 3, "MS-DOS Commands," for more information on setting the date.

Next, MS-DOS prompts you for the time in the following format:

```
Current time is 9:30:12.04
Enter new time:
```

If the time shown is correct, press RETURN.

If the time shown is not correct, for example, if it is 3:45 in the afternoon, enter:

```
15:45
```

### Note

MS-DOS uses a 24-hour clock. The clock does not start over when it gets to noon as a normal household clock does. That is, 1 p.m. is 13 hours, 2 p.m. is 14 hours, and so on. At midnight the clock starts over at 00 hours.

Refer to the TIME command in Chapter 3, "MS-DOS Commands," for more information on setting the time.

## The System Prompt

After you have entered the date and time, MS-DOS displays its prompt. For example:

```
A>
```

This is the system prompt. The A means drive A is the working drive. If you started MS-DOS from a hard disk, C> would be the prompt.

Whenever you see the system prompt, it means that MS-DOS is ready to work for you. You enter commands and start application programs from this prompt.

For information on changing the prompt to different settings, refer to the PROMPT command in Chapter 3, "MS-DOS Commands."

## Entering MS-DOS Commands

You tell MS-DOS what to do by typing special instructions, called *system commands*, at the prompt. You enter commands the same way you entered the date and time: you type the command name at the system prompt and press RETURN to execute the command.

You can enter a command in upper- or lowercase letters (or a combination of both). For example:

```
date  
DATE  
Date
```

It is especially easy to enter commands in lowercase letters.

You *must* press RETURN before MS-DOS and your computer will respond to the command entered.

## Correcting Typing Mistakes

If you make a mistake while typing a command, press the BACKSPACE key to erase any mistakes. BACKSPACE erases one character to the left of the cursor each time you press it.

If you incorrectly enter a command, MS-DOS displays the following message:

```
Bad command or file name
```

This message means MS-DOS could not understand the command you entered (maybe it was misspelled) or that the command file was not on the disk in the default drive. Reenter the command, being careful to enter it correctly. Make sure the MS-DOS system disk is in the correct drive if you are working with floppy disks.

## Introduction to Special Keys

In addition to the keys you find on a typewriter, your computer keyboard has some keys that have a special meaning to MS-DOS.

### Alphanumeric Keys

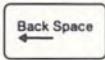


Your computer understands the difference between a one and a lowercase L. Be sure you do not type a lowercase L when you mean a one.

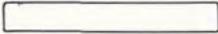


Zero and capital O may look alike, but they mean different things to your computer. Your computer displays a zero with a diagonal line through it (Ø). Make sure you type the correct letter or number when you enter commands.

## Special Keys



Press BACKSPACE to erase typing mistakes on the current command line. BACKSPACE erases one character to the left of the cursor each time it is pressed.



Press SPACEBAR to move the cursor to the right. A space is most commonly used as a delimiter between MS-DOS commands and command parameters.



Press RETURN after you type commands. MS-DOS does not perform any functions for you until you press RETURN.

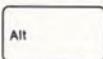
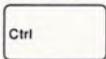


Press SHIFT-PRT SC to print the information that is currently displayed on your screen.

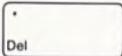
## Ctrl Key Sequences

The CTRL key has a special task. It lets you give complex commands to your computer by pressing only two or three keys. Hold down the CTRL key, then press another key. That is, use the CTRL key as you would the SHIFT key.

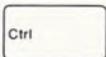
The following summarizes the special CTRL key combinations:



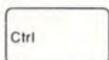
Press and hold the CTRL and ALT keys, then press the DEL key. This key combination resets your computer and loads MS-DOS into memory.



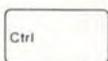
Press CTRL-BREAK to immediately stop the command being executed.



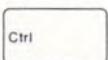
Performs the same function as CTRL-BREAK, except it may not take effect as quickly.



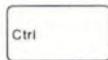
Press CTRL-NUM LCK to immediately, but temporarily, stop a long display from scrolling upward off the screen. To restart the screen display, press any key (such as SPACEBAR).



Performs the same function as CTRL-NUM LCK, except it may not take effect as quickly. Press any key to restart the display.



Press CTRL-PRT SC to print all subsequent screen display text on your printer. This includes what you type in from the keyboard as well as the contents of files as they are displayed to the screen. Press CTRL-PRT SC again to stop printing.



Performs the same function as CTRL-PRT SC.

## Changing Disk Drives

When the system prompt is A>, it means that drive A is the working drive. By default, MS-DOS only looks for files and programs stored on the working drive. To work with files on another drive, change to that drive by entering the name of the drive followed by a colon (:). For example, to make drive B the working drive, enter B: at the system prompt, as shown:

```
A>b:
```

This changes the working drive from A to B, as indicated by the new system prompt:

```
B>
```

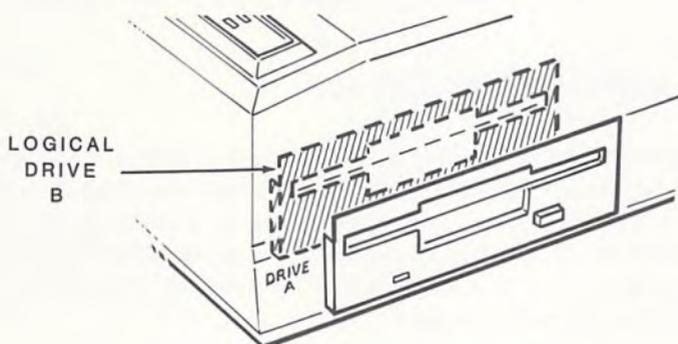
Now when you enter a command, MS-DOS looks on the disk in drive B for the file or program.

If your computer has a hard disk, enter C: to make it the working drive.

## Using Single-Drive Computers

Even if your computer has only one floppy disk drive, you can still use the MS-DOS commands that use more than one drive (for example, DISKCOPY). MS-DOS accomplishes this by creating a *logical drive*—a second drive identifier that refers to a floppy disk drive that already has a drive name assigned to it.

When you start MS-DOS, the letter A is automatically assigned to the first floppy disk drive. If your system has another floppy disk drive, MS-DOS assigns the letter B to that drive. But, if your system has only one floppy disk drive, MS-DOS also assigns the logical drive name B to the one floppy drive (Figure 1.2). That is, MS-DOS treats your system as though it has two disk drives even though it only has one.



**Figure 1.2. Single-Drive Computers and MS-DOS**

Use a system with a single floppy drive just as you would a two-drive system. When a command requires more than one drive, specify drive B as if it were there. MS-DOS displays the following message when it needs to access logical drive B; that is, when it needs you to put disk B in drive A:

```
Place Disk B in Drive A:  
Press RETURN when ready
```

This process uses drive A as both the *source* and *target* drive.

For example, to copy the file *budget.jun* from drive A to another disk using a single drive, enter:

```
COPY a: budget.jun b:
```

MS-DOS reads a portion of the file in drive A, asks you to put disk B in drive A, then writes that portion to a file with the same name on disk B. If the file is large, you may be asked to swap disks more than once.

## Quitting MS-DOS

When you have finished working with MS-DOS, you can end the work session by following these steps:

1. Make sure the system prompt is displayed (for example, A>).
2. Remove the disk(s) from the floppy drive(s).
3. Turn off the computer.

### Caution

Always remove your floppy disks from the drives before turning off the computer. You can damage your disks as well as the disk drive's read heads by leaving a disk in the drive.

If you have a hard disk, wait until the light on the drive goes out before turning your computer off.

## Making Backup Copies of Floppy Disks

As you learned when you ran the SETUP program, it is a good idea to get in the habit of making copies of all your important disks—including MS-DOS. Then, if a disk becomes damaged or if files are accidentally erased, you still have the original information on the master disk.

Use the DISKCOPY command when you want to make an exact copy of a disk. This is the same command used by the SETUP program to make a working copy of MS-DOS for you.

Whenever you make a backup copy of a disk, you will need the master (source) disk and a blank (target) disk. It is best to use a new disk for the backup disk.

The following steps explain how to use DISKCOPY to make a backup copy of a floppy disk.

1. At the system prompt, enter:

```
DISKCOPY a: b:
```

2. Watch the screen. MS-DOS prompts you to insert each disk as needed to create the backup disk.

### Note

Be careful in choosing the disk to copy files to. DISKCOPY *permanently* erases any files you may have on the target disk before it makes the new copy. For this reason, it is best to use only new, blank disks when making backup copies.

Refer to the DISKCOPY command in Chapter 3, “MS-DOS Commands,” for more information on using DISKCOPY.

## Labeling Floppy Disks

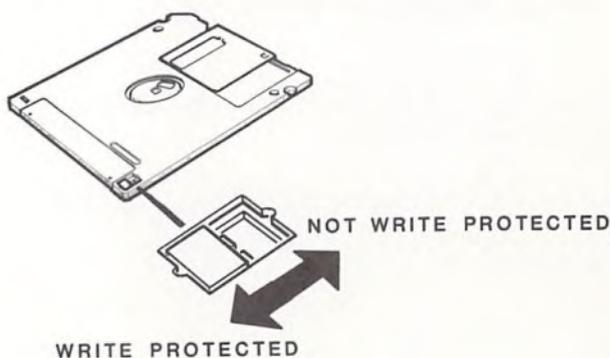
You should always label each floppy disk you use to identify what files are on the disk and remind you that the disk has been formatted and has information stored on it. Place the label on the front of the plastic cover, at the top of the disk, so that the label does not interfere with the sliding metal cover of the 3.5-inch disk.

Include the date and any relevant information that makes identifying the disk's contents easier for you. It is a good idea to write on your labels before putting them on the disk. Use a felt-tip pen when writing on labeled disks—a pencil or ballpoint pen can damage the disk if you press too hard.

## Write Protecting Disks

Another important safeguard for your disks and files is to always write protect your disks, especially if they have important files on them that you do not want to be changed. When a disk is write-protected, you are unable to write to (change the contents of) the disk; you can only read it.

To write protect your disks, slide the small tab on the bottom of the disk toward the bottom edge of the disk until it clicks open as shown in Figure 1.3.



**Figure 1.3. Write Protecting Your Floppy Disks**

To copy information onto a write-protected disk, first close the write-protect tab. Slide the tab upward, away from the bottom edge of the disk. However, you should consider why the disk was write-protected before you change its contents. After you have changed a disk that was write-protected, it is a good idea to open the write-protect tab.

Many application programs come on write-protected disks to protect the files from being accidentally erased.

## Formatting Floppy Disks

Before you can use a new floppy disk with MS-DOS, you must first prepare the disk so that MS-DOS can write files to it. This step is called *formatting*. Formatting a new disk divides the disk up into manageable sections called *sectors*. MS-DOS then uses these sectors as organizers to store and retrieve files that you put on the disk.

Use the `FORMAT` command to format disks. The following steps explain how to format a disk.

### Caution

You should only format new, blank disks. Use care when formatting any other disk, as `FORMAT` *permanently* erases any files you may have on the disk.

1. Put your MS-DOS system disk in drive A. (If you have a hard disk, you can skip this step.)
2. Enter the following command at the system prompt:

```
FORMAT/V
```

3. MS-DOS then prompts:

Drive to format? :

Type the drive name where the disk you want to format is located. For example, if you want to format a disk in drive B, type B.

4. Next, MS-DOS prompts:

Insert new disk in drive B:  
and press RETURN when ready

Insert a new, blank disk in drive B. (If you have a single disk drive, put the disk in drive A. Remember, MS-DOS lets you use drive A as drive B in single-drive systems.)

Press RETURN to begin formatting.

5. MS-DOS displays the following message as it begins to format your disk:

Head:0 Cylinder:1

This message tells you the side (0 or 1) and the cylinder (1–80) of the disk being formatted.

6. After MS-DOS has finished formatting your disk, it prompts:

Format complete  
Enter desired volume label (11 characters,  
RETURN for none)?

A *volume label* is a special name you can assign to the disk. This is another method you can use to help remember what the disk contains. For example, if you are going to use the disk to store games, you could name it *games*.

7. MS-DOS then displays a message similar to the following:

```
730112 bytes total disk space
730112 bytes available on disk
```

This message tells you the total amount of disk space (about enough to hold 700 typewritten pages of text), the number of bytes that are unusable (if any), and the amount of space available for storing information.

8. As the last step in formatting, MS-DOS prompts:

```
Do you want to format another disk (Y/N)?
```

Press Y (for Yes) to format another disk or N (for No) to stop FORMAT and return to MS-DOS.

9. Put a label on your newly formatted disk to identify it as being formatted.

### Note

It is a good idea to format several new disks at once. This way, you always have formatted disks available for use.

You should always put a label on a formatted disk so that you have a way of identifying the disk as being formatted.

Refer to the FORMAT command in Chapter 3, "MS-DOS Commands," for information on using optional control switches with FORMAT.

## Using Internal and External Commands

When you start MS-DOS, some MS-DOS commands are loaded into your computer's memory. The rest of the MS-DOS commands remain on the disk as command files. The computer responds to *internal* (stored in memory) and *external* (stored on disk) MS-DOS commands. Internal commands are always available for use because they are a part of MS-DOS in memory. You can use internal commands with any disk in any drive; these commands are always available for use.

External commands remain on the disk until they are needed. To use an external command, you must tell MS-DOS where the command is located.

One way to identify external MS-DOS commands is to use the DIR command to look at the directory listing of the MS-DOS disk. External commands all have a filename extension of *.com*, *.exe*, or *.bat*.

## How to Recognize When You Need an MS-DOS Disk

If you see the following message after entering an MS-DOS command, it means MS-DOS could not find the command file:

```
Bad command or filename
```

Insert the MS-DOS disk in drive A (if you are using a floppy-drive system) and reenter the command. Note that this is the same message displayed if you incorrectly enter a command.

If you have a hard disk, you should not see this message because the PATH command (telling MS-DOS the directory name containing the external files) was put in your *autoexec.bat* file during the SETUP process.

You should not try to remember which commands are internal and external. Instead, concentrate on becoming familiar with your computer and MS-DOS. As you use the system, you will become familiar with the different commands.

The following sections describe how to specify a drive or define a search path for MS-DOS so that it always has access to the commands it needs.

## Floppy-Disk Systems

When you want to use an external MS-DOS command, make sure the MS-DOS disk is in the working drive or else specify the drive name as part of the command. For example:

```
b: DISKCOPY
```

The B: tells MS-DOS to look on drive B for the *diskcopy.com* command file. If it finds the file, MS-DOS loads it into memory and runs DISKCOPY for you.

It is best to keep the working drive set to the drive where the MS-DOS disk is located. Another method is to use the PATH command to tell MS-DOS to search for commands in both drives A and B.

For example, to tell MS-DOS to search the disks in drives A and B on a system with two floppy disk drives for external commands, you would enter:

```
PATH a;;b:
```

Now, when you enter an external command, MS-DOS still searches the working drive (A or B, as indicated by the system prompt), but it also searches the disk in the other drive as well.

Refer to the PATH command in Chapter 3, "MS-DOS Commands" for more information on using PATH.

## Hard-Disk Systems

When you ran the SETUP program, an *autoexec.bat* file was created for you. One of the commands put in the file was PATH, the command that tells MS-DOS the search path to follow when looking for external commands. If you have a hard disk drive, PATH was set as follows:

```
PATH c:\bin
```

*c:\bin* is the directory where SETUP stored the external commands for you. Now, no matter what directory or disk you are working with, MS-DOS will know where to find its commands.

Refer to the PATH command in Chapter 3, "MS-DOS Commands" for more information on using PATH.

## Running Applications Under MS-DOS

Before you can use an application program (for example, a word processing package) on your computer, you must load MS-DOS. (You know MS-DOS is loaded when you see the system prompt displayed on the screen.)

## Using an Application Setup Program

Some application programs come with setup programs similar to the one you used to set up MS-DOS. You should check the documentation that comes with your application program to see if there is a setup program. If there is, follow the directions for using it to set up the application for use with your computer.

## Starting an Application Program

The following steps explain how to start an application program.

1. Insert the application disk in drive A.
2. Make sure MS-DOS is currently set to read drive A (indicated by the A> prompt). If not, change to drive A by entering A:.
3. Enter the command to start the application program. For example, to start the *Microsoft Word* word processing program, you would type *word*. Press RETURN to start the program.
4. Once the program is loaded, you will use the application program's commands while the program is running, not MS-DOS commands.

## Saving Your Work

One of the most important things you will want to do when running applications is to save your work. Most applications have a command that lets you save your work. When you save your work, it is stored as an MS-DOS file so that you can use the same data at another time. Refer to the documentation provided with the application to find out the command needed to save your work.

## Quitting an Application Program

After you are finished with the application program and have saved your work, you are ready to return to MS-DOS. You should always return to MS-DOS before turning your computer off. This safeguards any of the files that you used with the application program. By properly exiting from the application, you ensure that the program properly closes all files and does the necessary "housekeeping" so that you can run the application using the same data another time.

Refer to your application's documentation for the correct command to exit from the program.

Once you see the system prompt, remove your application and data disks and store them in a safe place.

### Note

When you quit an application, you may see the following message:

```
Insert disk with \COMMAND.COM in drive A  
and strike any key when ready
```

If you see this message, it means that the application program used some of the memory normally reserved for MS-DOS. Put your MS-DOS disk in drive A and press any key to reload MS-DOS.

# CHAPTER 2

## USING MS-DOS

---

### Overview

This chapter describes MS-DOS commands commonly used when working with files, directories, and disks. In addition, it describes how you can redirect command input (where a command receives its information) and output (where a command sends information after it is processed), and how to configure MS-DOS to work with your hardware.

### Working with Files

This section describes the rules and commands needed to:

- create and name files.
- copy files to the same disk or another disk.
- change the name of a file.
- view the contents of a file without changing the file.
- delete files from a disk.

### Creating Files

Every file you create or use with MS-DOS must have its own unique name. An MS-DOS filename has two parts: the *filename* and the *extension* (*filename.ext*). The *filename* consists of one to eight characters. The extension (*.ext*) is optional and, if used, consists of a period (.) and one to three characters. It is a good idea to use extensions to group similar files together. For example, you might use the extension *.t87* for all files that relate to taxes for the year 1987.

You can use the letters of the alphabet, certain special characters, and the numbers 1 through 9 for your filenames. Using only numbers for filenames is not recommended, however, because it makes it hard to remember what is in the file.

MS-DOS reserves three extensions for program files and batch files. These extensions are: *.exe*, *.com*, and *.bat*.

MS-DOS converts all filenames to uppercase letters.

## Filename Characters

Some characters cannot be used in filenames. For example, a period cannot be used because it is the filename delimiter.

The following symbols *cannot* be used as part of a filename:

|     |                 |
|-----|-----------------|
| .   | period          |
| ?   | question mark   |
| *   | asterisk        |
| /   | slash           |
| \   | backslash       |
| [ ] | brackets        |
| "   | quotation marks |
| <>  | angle brackets  |
| +   | plus sign       |
| =   | equal sign      |
| ;   | semicolon       |
| ,   | comma           |
|     | vertical bar    |

If you use any of these symbols when creating filenames, MS-DOS displays:

```
File creation error
```

Enter a new name for your file, being careful not to use any of the illegal symbols.

If you specify more than eight characters for a file name, MS-DOS truncates the file name to the eighth character. For example, *sales-budget.doc* would be shortened to *salesbud.doc*.

## Illegal Filenames

There are certain names you cannot use for your files. MS-DOS reserves the following names for specific devices your computer uses:

|           |   |
|-----------|---|
| CON       | Short for console, this device provides input from the keyboard and output to the screen.   |
| NUL       | A null device. Output sent to NUL is discarded. Use NUL when you do not want to create a file, but a command requires an output filename. |
| PRN, LPT1 | Refers to printer devices. PRN and LPT1 both refer to the same device.  |
| AUX, COM1 | Refers to serial communications devices. AUX and COM1 both refer to the same device.  |
| CLOCK\$   | Refers to the CLOCK device driver.  |

These names are always associated with devices, even if you add an extension to them. For example, *con.bdp* still refers to the console and cannot be used as a filename.

## Tips on Naming Files

Keep the following in mind when choosing names for your files:

- Be descriptive. Give each file a name that helps identify what is in the file. You only have eight characters to work with for a filename; try to make each name say as much as possible about what is in the file.

- Use unique names. No two files in the same directory can have the same name. Suppose you have a file called *sales.jun* on a disk and you put a second file called *sales.jun* in the same directory on that disk. The second file overwrites the first file, thus *permanently* erasing the first file from the disk.
- Be consistent. Give files within a group similar names. This makes it easier when you want to work with groups of similar files.
- Use as few letters as possible to identify the file's group. For example, B can be used for budget, F for forecast, and W for word processing.
- Include a date only for files that are updated regularly. You could use the numbers 1 through 6 to represent the months January through June and the first letter of the month for the months July through December.

## Referring to Groups of Files

Often, you may want to work with a group of files. This is easy to do if you use a consistent naming convention and group related files together by using similar filenames and extensions.

MS-DOS has two special characters that let you find groups of files having similar filenames or extensions. These characters are:

- ? Represents any character in a filename.
- \* Represents all characters in a filename.

Think of these two symbols like wildcards in a card game. Since they can represent any character(s) when you are searching for a file, they cannot be used as part of a filename.

Wildcard characters are most often used with the COPY, DEL, DIR, and RENAME commands.

## Examples of Referencing Groups of Files

The following examples illustrate the use of the wildcard characters.

| Entry               | Description  |
|---------------------|--|
| *.*                 | All files with all extensions.   |
| *.ltr               | All files with the extension <i>.ltr</i> .   |
| <i>sales.*</i>      | All files beginning with <i>sales</i> and ending with any extension (for example, <i>sales.doc</i> , and <i>sales.aug</i> ). |
| *.?                 | All files with a one-character extension (for example, <i>test.1</i> ) or no extension (for example, <i>test</i> ).          |
| <i>sales???.doc</i> | All five-, six-, and seven-character filenames beginning with <i>sales</i> and ending with the extension <i>.doc</i> .       |

MS-DOS ignores any characters after the asterisk. Use ? as a placeholder for the mismatched filename characters. For example, to copy the files *cshsales.jul*, *crdsales.jul*, and *comsales.jul* to a disk in drive B, you would enter:

```
COPY ???sales.* b:
```

Do not enter a command as follows:

```
COPY *sales.* b:
```

Since MS-DOS ignores all characters after the asterisk, this command will copy all files, whether or not they contain *sales* anywhere within the name.

## Copying Files

Copying files is one of the most common tasks you will do on your computer.

Use the COPY command when you want to copy a file. COPY creates an identical file for you. There are two parts to the COPY command, as shown in the following entry form:

```
COPY source target
```

*Source* refers to the file you are copying. If it is not on the disk in the working drive, you must specify the drive name where the file is located. *Target* specifies the drive to which you are copying the file and, optionally, the new name for the file if it is different than *source*.

### Tips on Copying Files

- You must tell MS-DOS where the file you are copying is located (*source*) and, optionally, where the copy is being sent (*target*). If you do not specify a target, MS-DOS assumes the working drive or directory. For example, COPY *b:myfile.doc* copies the file *b:myfile.doc* to the current working directory.
- When you copy files from one disk to another, the target disk *must* be formatted.
- You must type a space between the name of the file you are copying and the target specification (for example, COPY *myfile.doc b:*).
- If your system has only one floppy disk drive, use the following entry form for COPY when copying files to another disk:

```
COPY a:source b:target
```

MS-DOS will prompt you for disk B when it needs it.

- You *cannot* copy a file to the same disk and keep the original name of the file. If you do, MS-DOS displays:

```
File cannot be copied onto itself
      0 Files(s) copied
```

You must specify a new name when copying a file to the same disk or working directory.

- A file from the source disk is written over any existing file on the target disk that has the same name. Be careful when copying files to different disks. Use the DIR command to check the target disk to make sure there is no file with the same name as the file you are copying.
- If a drive name is immediately after the word COPY in the command line, MS-DOS copies from that drive. If the drive name is after the first filename, it is the target and the copy is made to that drive.

## Examples of Copying Files

To copy the file *sales.jun* from the working drive to a disk in drive B and keep the same name, you could enter one of the following:

```
COPY sales.jun b:sales.jun
COPY sales.jun b:
```

If you do not specify a filename after the target drive name, MS-DOS copies the file to the drive keeping the same name as the source (in this example, *sales.jun*).

To copy a file and give it a new name, specify the new name as part of the target specification. For example to copy the file *order.jun* on the working drive to a file named *orders.jul* on the disk in drive B and rename it *orders.jul*, you would enter:

```
COPY order.jun b:orders.jul
```

The following command copies *sales.jun* to *sales.jul* on the same disk (note that you must specify a different filename when copying to the same disk or directory).

```
COPY sales.jun sales.jul
```

To copy all of the files on the disk in the working drive to a disk in drive B, you would enter:

```
COPY *.* b:
```

If you omit the target specification, MS-DOS copies the file(s) to the disk in the working drive. For example:

```
COPY b:sales.aug
```

This command copies the file *sales.aug* from the disk in drive B to the disk in the working drive and gives it the same name.

## Renaming Files

MS-DOS allows you to change the name of a file as often as you like.

Use the RENAME command to change the name of a file. RENAME uses the following entry form:

```
RENAME oldfile newfile
```

*Oldfile* is the existing name of the file and *newfile* is the new name you have chosen for it.

For example, to change the name of the file *letter.doc* on the working drive to a more descriptive name of *grammar.ltr*, you would enter:

```
RENAME letter.doc grammar.ltr
```

Only the name of the file is changed; RENAME does not change the contents of the file.

## Note

You cannot rename files across disks. That is, you cannot enter a command as follows:

```
RENAME letter.doc b:grammar.ltr
```

Instead, use the COPY command to put a copy of the file *letter.doc* on drive B and specify a different name for the target file.

Remember to specify the drive name as part of the filename if the file you are working with is not on the working drive. For example, if the working drive is A and you want to change the name of the file *letter.doc* on drive B, you would enter:

```
RENAME b:letter.doc grammar.ltr
```

You must enter the complete name of the file you are renaming (for example, *letter.doc*).

If you try to change the name of a file to a filename that already exists, MS-DOS displays:

```
Duplicate file name or File not found
```

This message means that no two files in the same directory can have the same name.

## Examples of Renaming Files

To rename the file *letter.doc* on the working drive to *grammar.ltr*, you would enter:

```
RENAME letter.doc grammar.ltr
```

Suppose you wanted to change the name of *letter.doc*, but you wanted to keep the existing extension. You would enter RENAME as shown:

```
RENAME letter.doc mpltr.*
```

To change the name of all files having the extension *.ltr* to the same name, but with the extension *.doc*, you could enter:

```
RENAME *.ltr *.doc
```

## Viewing Files

To quickly display what is in a file, use the TYPE command. TYPE continuously displays the contents of a file on the screen. TYPE is useful for viewing a file without editing it.

For example, to view the contents of the file *sales.jun* on the disk in the working drive, enter:

```
TYPE sales.jun
```

To suspend the display so that you can read it, press CTRL-NUM LCK or CTRL-S. Press any other key to resume the display. Press CTRL-BREAK or CTRL-C to stop the display and end the TYPE command before all of a file's contents have been displayed.

Refer to Redirecting Command Input and Output, later in this chapter, for information on how you can more easily view a file one screen at a time.

## Deleting Files

You should remove unwanted and outdated versions of files from your disks and directories. This should be done on a regular basis to avoid confusion over filenames and save disk space for future files.

Use the DEL command to remove your unwanted files. When you remove a file with DEL, it is *permanently* removed. Make sure you want to delete the file *before* you enter the command.

ERASE can be used in place of DEL. For example, to delete the file *sales.aug* from the disk in the working drive, you could enter either of the following commands:

```
DEL sales.aug
ERASE sales.aug
```

By using wildcard characters (? or \*), you can delete groups of files. You should first use the DIR command to display a list of files using the same wildcards you plan to use. This way, you know which files will be deleted, and can take action to save any that are important.

Suppose you wanted to delete a group of files that ended with the extension *.ltr*. First, use the DIR command to display a list of these filenames. Enter:

```
DIR *.ltr
```

Check the listing for any files you may want to keep. If there are files to keep, use RENAME to rename them or COPY to copy them to another disk before you use DEL.

To delete the group of unwanted files, you would enter:

```
DEL *.ltr
```

## Displaying a Directory of Files

When you create files, MS-DOS stores them on disk. Use the DIR command to display a listing of files on the screen.

For example, to display a list of files stored on the disk in drive B, you would enter:

```
DIR b:
```

The B: is needed to tell MS-DOS to read the disk in drive B and display the names of the files on that disk.

To display a list of files on the disk in the working drive, you would enter:

```
DIR
```

If the disk you want the file listing for is in the working drive, you can omit the drive name as part of the DIR command. MS-DOS assumes the working drive if no drive name is specified.

## What Does the DIR Command Display?

Suppose you entered DIR and MS-DOS displayed the following in response:

```
Volume in drive A is BUSINESS
Directory of A:\

BUDGET      JUN   23868  6-19-87      12:18p
SALES       JUN   12876  6-16-87      11:19a
SALES       CRD   9897   8-06-87      1:23p

3 File(s)   640639 bytes free
```

The display shows you the volume label (BUSINESS) assigned to the disk when it was formatted, the names of the files on the disk (for example, *budget.jun*), and the date and time the file was created or last changed.

The last line of the display shows the number of files on the disk and the amount of free space left on the disk.

DIR is useful for checking to see if a disk has been formatted, to see what files are on a disk, and to see how much space is left on a disk. Refer to the DIR command in Chapter 3, "MS-DOS Commands," for more information on using DIR.

## Working with Files in Different Drives

Sometimes you need to work with files in different drives. Having to change drives each time you want to work with a file on another drive soon becomes bothersome. However, there is an easier way to work with files on different drives. If you want MS-DOS to look for files on a drive other than the working drive, enter the drive name as part of the command. You do not have to change drives each time you want to work with files on another disk.

For example, suppose drive A is the working drive. To display the files on the disk in drive B, enter:

```
DIR b:
```

This tells MS-DOS to look on drive B for the files.

If drive B was the working drive and you wanted a list of the files in drive A, you would enter:

```
DIR a:
```

The same is true if drive C was the working drive. To view files on another drive, type the drive name as part of the command, as shown:

```
DIR a:
```

## Working with Directories

This section describes how to create and use directories for managing your files and programs. If your system has only one or two floppy disk drives (no hard disk), you may want to skip reading this section. (Although you can create directories on floppy disks, we recommend you not use directories because of the limited disk space.) Directories are most often used with hard disks to take advantage of its large storage space to organize files and programs.

When two or more people share a computer, or when you are working on several different projects, the large number of files on a disk can become cumbersome. You may want to keep your files separate from a coworker's, or you may want to organize your programs into convenient categories.

In an office, you can separate and organize files that belong to different people or that relate to specific projects by putting them in different file cabinets. For example, you might put your accounting information in one file cabinet and your letters in another. You can do the same thing with MS-DOS by putting your files into separate areas called *directories*.

Using directories is one way of dividing your files into more manageable groups. Any one directory can contain many files. This directory may also contain other directories, called *subdirectories*. This directory structure is referred to as a *multilevel* or *tree structured* directory system.

The first level in the directory structure is called the *root* directory. This directory is created automatically for you each time you format a disk. All directories under the root are subdirectories. As you create new directories, the directory system grows. Within each new directory, you can add new files or create new subdirectories.

Another way to think of the directory structure is to imagine a tree. The root is the trunk of the tree, the directories are branches, and the files in each directory are the leaves.

You move around in a multilevel directory structure by starting at the root and traveling through the intermediate subdirectories (branches) to find a specific file (leaf). Conversely, you can start anywhere within the file system and travel toward the root. Or you can go directly to any directory without traveling through the intermediate levels.

The directory you are working in is called the *working directory*. When you start MS-DOS, you are placed in the root directory, which remains the working directory until you change to a new directory.

A *parent* directory is the directory that is one level above your working directory. A *child* directory refers to any subdirectory of your working directory.

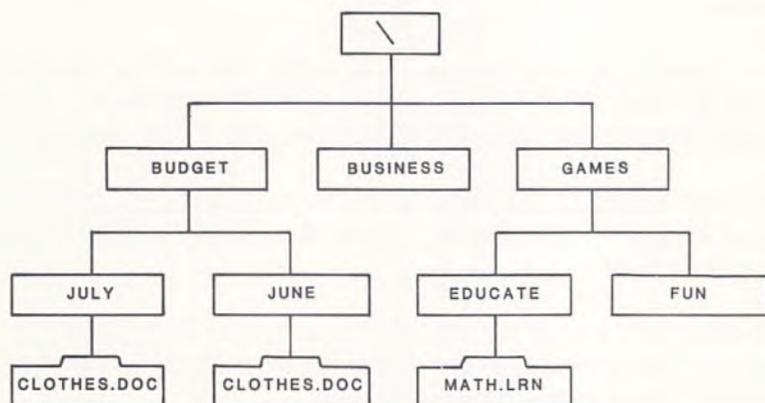
MS-DOS provides special shorthand notations for the working directory and the parent directory and automatically creates these two entries whenever you create a directory:

. (dot)                Refers to the working directory.  
.. (dot dot)        Refers to the parent directory.

When you use DIR to display a directory listing, the working and parent directories are represented by entries similar to the following:

```
. <DIR> 6-19-87 7:27p  
.. <DIR> 6-19-87 7:27p
```

Since you can put files in different directories, you can have files with the same names, but with unrelated content. Figure 2.1 illustrates a typical directory structure.



**Figure 2.1. Sample MS-DOS Directory Structure**

In the example in Figure 2.1, three subdirectories have been created under the root directory. These directories include:

- A directory of household budget information, called *budget*.
- A directory of business information, called *business*.
- A directory of games, called *games*.

As you can see, the directory *budget* contains two subdirectories (child directories) called *june* and *july*. Both of these directories have files called *clothes.doc*, even though the file in the *june* directory is unrelated to the one in the *july* directory. The directory *budget* is the parent directory of the *june* and *july* directories.

This organization of files is not important if you only work with files in your own directory. However, when you start working with several projects at once, the concept of separate directories becomes very useful.

## Directory Paths

When you work with directories, you move from using one directory to another by means of *paths*. A path is a sequence of directory names, each separated by a backslash (\). The entry form for specifying paths is:

```
[\[dirname][\[dirname[...]]]
```

*Dirname* refers to the name of an intermediate subdirectory.

If a path begins with a backslash (\), MS-DOS begins the search at the root of the directory structure. Otherwise, MS-DOS begins the search in the working directory and continues from there.

A path that begins at the root (\) is called a *full path*. One that begins with the working directory is called a *relative path*.

Use a full path to specify a directory that is closer to the root or in a different branch of the directory tree. Using the example Figure 2.2, when the working directory is *budget*, you should use a full path name to reference any directory not in bold.

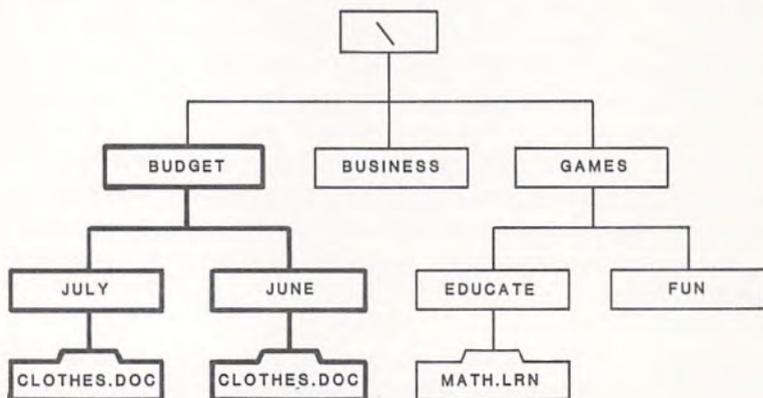


Figure 2.2. Traversing Directory Paths

A relative path starts from the working directory and leads MS-DOS to one of the subdirectories. For example, when the working directory is *budget*, you can use a relative path to specify either of the subdirectories in bold.

A relative path *never* begins with a backslash (\). Start a relative path by typing the name of a subdirectory within the working directory.

## Examples of Full and Relative Paths

The following command uses a full path to direct MS-DOS from the root directory to the file *clothes.exp* in the `\budget\june` directory. After MS-DOS finds the file, it is deleted.

```
DEL \budget\june\clothes.exp
```

The following command uses a relative path to direct MS-DOS from the working directory *budget* to the file *clothes.exp*:

```
DEL june\clothes.exp
```

## Setting a Command Search Path

When you ran the SETUP program, an *autoexec.bat* file was created for you. If you have a hard disk, one of the commands placed in the file was PATH, the command used to tell MS-DOS the search path to follow when looking for external command files not found in the working drive or directory. As you create your directories, you may put different application programs in each directory. For example, if you have a word processing package, you might create a directory called *wp* to store the program(s) that make up the package. In another directory called *sprdsht*, you might have a spreadsheet application.

To run these applications from any working directory or disk, update the PATH command with the full path names where the applications are stored. Do not remove any of the previous paths unless they are no longer valid. For example, you might use the following command:

```
PATH c:\bin;c:\wp;c:\sprdsht
```

Suppose you were working in *sprdsht*, and you wanted to run your word processing program. To do so, you would just enter the command needed to start the application. For example, to start *Microsoft Word*, you would enter *word*. MS-DOS would first look in the working directory (*sprdsht*) for the command file. When MS-DOS did not find it there, it would search *c:\bin* and then *c:\wp* to locate *word*.

Refer to the PATH command in Chapter 3, "MS-DOS Commands," for more information on using PATH.

## Making Directories

Use the MKDIR command to create a new directory. When you create a directory, MS-DOS automatically creates entries for the parent and working directories (*..* and *.*).

Like filenames, directory names must be eight characters or less. If you specify more than eight characters, MS-DOS truncates the name to the eighth character. Extensions are allowed as part of a directory name; if used, they are limited to three characters. You cannot use any of the following characters as part of your directory names:

|     |                 |
|-----|-----------------|
| .   | period          |
| ?   | question mark   |
| *   | asterisk        |
| /   | slash           |
| \   | backslash       |
| [ ] | brackets        |
| "   | quotation marks |
| <>  | angle brackets  |
| +   | plus sign       |
| =   | equal sign      |
| ;   | semicolon       |
| ,   | comma           |
|     | vertical bar    |

If you use any of these symbols when creating directories, MS-DOS displays:

```
Unable to create directory
```

MD can be used as an abbreviation for MKDIR. For example, to create a subdirectory called *school* under your working directory, enter either of the following commands:

```
MKDIR school
MD school
```

After the command has executed, you will have a subdirectory called *school* under your working directory.

You can create a directory anywhere in the directory structure by specifying a full pathname. For example, to create a directory called *math* under the directory *\school\lessons*, you would enter:

```
MKDIR \school\lessons\math
```

The subdirectory *math* is added to the *\school\lessons* directory regardless of the working directory because the full path specified told MS-DOS to start at the root directory. Note that the directories *\school\lessons* must exist before you can add *math* as a subdirectory.

To put files in the directory, use the COPY command to copy existing files from other directories or disks. You can also create and save files with your application programs.

## Changing Directories

An easier way to work with files in different directories (rather than using full and relative pathnames) is to change the working directory.

Use the CHDIR command when you want to display or change the working directory. CD can be used as an abbreviation for CHDIR.

For example, to display the name of the working directory, enter:

```
CHDIR
```

Suppose you are currently working in the root directory of drive C. To change the directory to *budget*, you could enter either of the following commands:

```
CHDIR budget
CD budget
```

Note that you do not need a backslash (\) in front of *budget*. This is because you are starting from the parent directory (in this case, the root) and changing to a directory that is one level away.

If you were in the root directory and wanted to change to the directory *budget\july*, you would enter:

```
CHDIR budget\july
```

In this example, a backslash is needed to tell MS-DOS that *july* is a subdirectory of *budget*. Now the directory *july* is the working directory.

To return to the parent of *july* (*budget*) you would enter:

```
CHDIR ..
```

The .. is shorthand notation for the parent of the current working directory.

To return to the root directory, you would enter:

```
CHDIR \
```

## Removing Directories

As with files, there may come a time when you no longer need a particular directory. Use the RMDIR command to remove any unwanted directories.

RMDIR lets you remove any directory by specifying its path. The directory must be *empty* except for the . and .. entries. This prevents you from accidentally deleting files and directories.

RD can be used as an abbreviation for RMDIR.

To remove all of the files in a directory, use the DEL command and specify the directory path. For example, to delete all files in the `\school\lessons\math` directory, you would enter:

```
DEL \school\lessons\math
```

In response, MS-DOS would prompt:

```
Are you sure (Y/N)?
```

You could press Y (for Yes) to delete the files or N (for No) to stop the process.

Once the directory was empty, you could remove the directory by entering either of the following commands:

```
RMDIR \school\lessons\math  
RD \school\lessons\math
```

### Note

You cannot remove the root or working directory. That is, you cannot remove a directory you are currently working in. Change to the parent directory (by entering CHDIR `..`), then remove the unwanted directory.

Also note that you cannot remove a directory if it contains subdirectories. You will have to remove each of the subdirectories before you can delete the unwanted directory.

## Renaming Directories

There is no command that specifically renames a directory in MS-DOS. You can, however, rename a directory that has no subdirectories. Suppose you wanted to rename the directory `\school\lessons` to `\school\studies`. The following steps describe how to do this:

1. Create the new directory, `\school\studies`, by entering:

```
MKDIR \school\studies
```

2. Copy all of the files from the old directory to the new directory by entering:

```
COPY \school\lessons\*. * \school\studies
```

3. Delete the contents of the unwanted directory by entering:

```
DEL \school\lessons
```

4. Remove the unwanted, empty directory by entering:

```
RMDIR \school\lessons
```

## Working With Disks

As you learned earlier, MS-DOS stores bookkeeping information about files in directories. In addition to directories, MS-DOS uses an area of the disk called the File Allocation Table (FAT). When you format a disk with the `FORMAT` command, MS-DOS copies the FAT onto the disk and creates the root directory. On each of your disks, the directories store the files and the FAT keeps track of their location, the amount of free space left on the disk, and how much space is needed to store a file.

These two disk areas, the directories and the FAT, enable MS-DOS to recognize and organize the files on your disks. You should occasionally check these disk areas for consistency and errors.

To check a disk for errors, use the CHKDSK command. CHKDSK verifies that the file information in each directory is correct, all disk space is accounted for, and no files overlap. CHKDSK then displays a status report for the disk, telling you:

- How much disk space is in use
- How much disk space is free
- The number of files on the disk
- The number of hidden files on the disk
- The number of bad sectors (if any) that are on the disk
- How much of your computer's internal memory is free for use

For example, to check the hard disk, you would enter:

```
CHKDSK c:
```

If you do not specify a drive name, CHKDSK assumes the default or working drive. The disk you want to check must be in the specified drive. CHKDSK does not wait for you to insert a disk.

To check a disk in drive B of the computer, you would enter:

```
CHKDSK b:
```

In response, MS-DOS checks the disk for errors, then displays the status of the disk as shown in the following example:

```
Volume CLIENTS created June 16, 1987 9:24a

730112 bytes total disk space
 47104 bytes in 3 hidden files
   512 bytes in 2 directories
 30720 bytes in 8 user files
651776 bytes available on disk

524288 bytes total memory
 53152 bytes free
```

The first five lines give the status of the disk. Note that this disk has three hidden files: the MS-DOS system files and the volume label (CLIENTS) assigned to the disk when it was formatted.

The last two lines of the status report show the amount of internal Random Access Memory (RAM) your system has and the amount remaining for use.

Refer to the CHKDSK command in Chapter 3, "MS-DOS Commands," for information on using CHKDSK's optional control switches.

## Comparing Floppy Disks

Use the DISKCOMP command when you want to compare the contents of two floppy disks to see if they are identical. (DISKCOMP compares floppy disks only. It does not work with files or hard disks.)

The DISKCOMP entry form is as follows:

```
DISKCOMP source target
```

*Target* refers to the disk you are comparing against *source*.

For example, to compare a disk in drive A with a disk in drive B, you would enter:

```
DISKCOMP a: b:
```

If the disks do not compare, DISKCOMP displays an error message telling you where the mismatch occurred. If the disks are the same, DISKCOMP displays nothing.

Refer to the DISKCOMP command in Chapter 3, "MS-DOS Commands," for more information on using DISKCOMP to compare floppy disks.

## Redirecting Command Input and Output

When you start your computer, MS-DOS assumes that all input comes from the keyboard and all output goes to the screen (the CON device). The keyboard is referred to as the *standard input device* and the screen is referred to as the *standard output device*.

MS-DOS allows you to redirect this flow of input and output. For example, you may want your input to come from a file instead of from the keyboard, or you may want to send the output to a file rather than the screen.

### Redirecting Output

If you want to send the output of a command somewhere other than the screen, use a greater-than sign (>) to redirect the output. For example, to redirect the output of DIR to a file, you could enter:

```
DIR > mydir.doc
```

If the file does not exist, MS-DOS creates it. If the file already exists, MS-DOS replaces what is in the file with the new data.

If you wanted to send the output of DIR to your printer (to keep a paper listing of the files on your disk, perhaps), you could enter:

```
DIR > PRN
```

If you want to append the contents of one file to another (instead of replacing the entire file), use two greater-than signs (>>) for redirection. This tells MS-DOS to add the output to the end of the specified file rather than overwrite it.

For example, the following command appends the directory listing to an existing file named *mydir.doc*:

```
DIR b: >> mydir.doc
```

## Redirecting Input

Often, it is useful to have command input come from a file instead of from the keyboard. You can specify this by using a less-than sign (<). For example, the following command sorts the contents of the file *names* and sends the sorted output to a file called *namelist*:

```
SORT < names > namelist
```

## Using Filters

A *filter* is a command that reads your input, transforms it in some way, and then outputs it. In this manner, the input is *filtered* by the command.

Two of the MS-DOS filters are MORE and SORT:

**MORE** Displays information one screen at a time.

**SORT** Alphabetically organizes a text file or directory.

Both the MORE and SORT commands are generally used with pipes and input/output redirection.

## Using Pipes

*Pipes*, represented by a vertical bar ( | ), let you create a logical input/output path between commands. The output from one command becomes the input for another. This is referred to as *piping*. Piping is done by separating commands with the pipe symbol.

For example, the following command sends all output generated by the DIR command as input to the SORT command. The result is an alphabetically sorted listing of your working directory or disk on the screen.

```
DIR | SORT
```

You can also use piping with redirection if you want to send the final output to a file. For example, the following command redirects a sorted directory listing to a file called *dir.lst* on the working drive rather than displaying it on the screen:

```
DIR | SORT > dir.lst
```

You can also specify a drive other than the working drive. Suppose you wanted to send the sorted directory listing to a file called *dir.lst* on drive B. To do this, you could enter:

```
DIR | SORT > b:dir.lst
```

A pipeline can consist of more than two commands. The following command sorts your working directory and displays it one screen at a time.

```
DIR | SORT | MORE
```

MORE displays the following message at the bottom of the screen when there is more output to be seen:

```
-More-
```

Press any key to continue the display.

As mentioned earlier, the TYPE command lets you view the contents of a file without having to edit it. To display a long file one screen at a time, pipe the output from TYPE to the MORE filter, as shown:

```
TYPE myfile.doc | MORE
```

## Configuring MS-DOS for Your Hardware

Use the MODE command to configure MS-DOS for use with your monitor (screen), printer, or a serial communications device, such as a modem.

MODE lets you:

- control the speed at which your computer operates.
- adjust the settings for a serial printer or a telephone modem.
- adjust the screen display a few columns to the left or right.
- control the column width and the line spacing on a printer connected to your computer.
- enable or disable the optional modem/serial/memory module.

MODE settings remain in effect until you turn off your computer, restart MS-DOS, or execute another MODE command with new settings.

To have your mode settings adjusted automatically each time you start MS-DOS, include the MODE commands you need in your *autoexec.bat* file (refer to Appendix A, "Batch Processing," for information on how to do this).

## Configuring the Speed of the Computer

Your computer is designed to run at two different speeds, slow and fast. The slow setting is provided for compatibility with existing applications that cannot run at the faster setting. To set the speed, use MODE with an entry form as shown:

```
MODE SPEED [SLOW | FAST]
```

The default setting is FAST. To set your computer to run slower, enter:

```
MODE SPEED SLOW
```

To display the current speed setting, enter:

```
MODE SPEED
```

To set the speed back to the fast setting, enter:

```
MODE SPEED FAST
```

## Configuring the Optional Modem/Serial/Memory Module

If your computer has an optional modem/serial/memory module installed, you will need to use the MODE command to turn off the modem setting when you want to use the card for serial communications. The default setting is MODEM ON. That is, the port is configured for use with a modem.

The command entry form for setting the port is:

```
MODE MODEM [ON | OFF]
```

To display the current setting for the port, enter:

```
MODE MODEM
```

To turn off the modem and use the port as a standard serial port (COM1), enter:

```
MODE MODEM OFF
```

To turn on the modem, enter:

```
MODE MODEM ON
```

## Configuring Printers

Some printers require special MODE settings, depending on how your printer is connected to your computer.

### Parallel Printers

Parallel printers are connected to the parallel printer port of your computer. Parallel printers require no special mode settings.

### Serial Printers

If you have the optional modem/serial/memory module card installed in your system, you can disable the modem and connect a serial printer to the port. Serial printers *always* require special MODE settings.

For a serial printer, you have to enter two MODE commands. The first MODE command tells MS-DOS which serial port to use (COM1) and how to configure it for use with the printer. The information you need to configure the port can be found in the documentation provided with your printer.

The second MODE command is needed to redirect the printer information from the parallel printer port (the default port) to serial port COM1.

The following steps describe how to configure a serial printer connected to the modem/serial port on your computer. The settings used in this example may not be the same as those your printer uses. Refer to your printer manual for the settings you need.

1. Disable the modem so that the port can be used with a printer by entering:

```
MODE MODEM OFF
```

2. Configure the serial port (COM1) for use with your printer by entering:

```
MODE COM1:9600,n,8,1
```

This command configures the port for 9600 baud, no parity, 8 data bits, and 1 stop bit. Again, refer to your printer manual for your printer's settings.

3. Redirect the printer output from the default parallel printer port (LPT1) to the serial port by entering:

```
MODE LPT1:=COM1
```

## Printing Files

After you have configured your system for use with your printer, you are free to print any files on it. Use the PRINT command when you want to print a command while working with MS-DOS. Use your applications' commands to print files when working in these programs.

Suppose you wanted to print the file *sales.aug* located on the working drive. To print it, you would enter:

```
PRINT sales.aug
```

The first time you execute PRINT after starting MS-DOS, it prompts you for the name of the print device:

```
Name of list device [PRN]:
```

PRN refers to the parallel printer port on the back of your computer. PRN and LPT1 refer to the same device.

Press RETURN to print the file. If you have a parallel printer connected to the port, the output is sent directly to the printer. For serial printers, MS-DOS redirects the output from PRN to serial port COM1. Note that you must have disabled the modem on COM1 and redirected the output from the parallel port (LPT1) to the serial port (COM1). See the preceding section if you are having trouble.

To print the file *homework.alg* located in the directory `\school\lessons\math` on drive C while you are working on drive B, you would enter the following command, specifying a full path to the file:

```
PRINT c:\school\lessons\math\homework.alg
```

## Configuring Serial Devices

Connections to other computers, either through a modem or direct serial communications, always requires exact MODE settings.

Each time you add a serial device, refer to its installation manual for the MODE settings you need, then use the MODE command to configure the device for use with your computer. Refer to the MODE command in Chapter 3, "MS-DOS Commands," for more information on using MODE to configure serial devices.

Keep the following tips in mind when using MODE to configure a serial device:

- The MODE command name comes first in the command line followed by a space.
- The second part of the command line indicates one of three types of hardware:

COM (communications or serial printers) plus the port number and a colon.

LPT (parallel printer) plus a port number.

display name, such as BW80, BW40, or MONO.

- Punctuation immediately follows the hardware name, for example: COM1: or LPT1:.

Include every setting, and separate each setting with a comma.

- Entering MODE ? will display help on using the MODE command.

# CHAPTER 3

## MS-DOS COMMANDS

---

### Overview

This chapter describes the most commonly used MS-DOS commands in alphabetical order. Special commands for batch processing are contained in Appendix A, "Batch Processing."

Using MS-DOS commands, you can tell your computer to:

- Compare, copy, display, erase, and rename files.
- Compare, copy, and format disks.
- Run application programs.
- Set printer and screen options.
- Print files while your computer does other work.
- Control the display of information to the screen.
- Set a new system prompt.
- Sort text data.
- Set the date and time.
- Create, change, and remove subdirectories.
- Display a listing of directories and files on a disk.
- Check a disk for errors.
- Reassign a drive name to another drive so that you can use application programs with any drive.
- Set switches that let you stop a program or command at any time.
- Verify disk write operations.

## Types of MS-DOS Commands

There are two types of MS-DOS commands: *internal* and *external*.

Internal commands are the simplest, most commonly used commands. When you enter internal commands, MS-DOS executes them immediately. This is because they are built into MS-DOS and are loaded into your computer's memory each time you start MS-DOS. You cannot see internal command files when you display a directory of the MS-DOS disk; they are part of the *command.com* file.

External commands are not automatically loaded into memory when you start MS-DOS. You must load an external command from disk when you want to use it. When you enter an external command, MS-DOS looks for it in the working directory. If it is found, MS-DOS executes the command. If it is not found, MS-DOS displays the message:

```
Bad command or file name
```

Retype the command, specifying where the command file is located, or set the command search path (using the PATH command) to the disk or directory where the external commands are located. For example, if you had your external commands on a disk in drive B and you wanted to use the DISKCOPY command, you would enter B:DISKCOPY so that MS-DOS would know to look in drive B for the command file.

Any filename with the extension *.com*, *.exe*, or *.bat* is considered an external command. For example, commands such as *format.com* and *diskcopy.com* are external commands. Batch files (files with the extension *.bat*) allow you to create new commands and add them to MS-DOS (for example, you can create an *autoexec.bat* command file to simplify MS-DOS operations).

When you use an external command, you do not need to enter its filename extension.

## Syntax Notation

The following notation is used to show the entry forms for MS-DOS commands and options:

**CAPS** Words shown in capital letters are keywords. MS-DOS command names are keywords. You can type these keywords using any combination of upper- and/or lowercase letters (for example, BReak).

[ ] Items inside brackets are optional. You do not have to type these items to execute the command. To include these items, type only the text and not the brackets.

| Items separated by a vertical bar mean you are to choose only one of the items. For example, ON | OFF means that you should type either ON or OFF, but not both.

*italics* Items shown in italics mean you are to replace a variable with your own data. For example, *filename* means you should type the name of your file in place of the word *filename*. Italic items inside brackets are optional.

... Elipses indicate that you can repeat an item.

Include all punctuation such as commas, equal signs, question marks, asterisks, colons, slashes, and backslashes. Punctuation inside brackets is optional.

## Information Common to All MS-DOS Commands

The following information applies to all MS-DOS commands:

- Commands are usually followed by one or more parameters.
- Commands and parameters may be entered in any combination of upper- and lowercase letters, unless specifically noted.
- Commands and parameters *must* be separated by delimiters. You can use a space, comma, semicolon, or equal sign. Different delimiters can be used within one command line. For example:

```
DEL myfile.ltr
DEL=myfile.ltr
RENAME,myfile.ltr yourfile.ltr
RENAME myfile.ltr;yourfile.ltr
```

In this manual, a space is used as the delimiter.

- Commands are not executed until you press RETURN.
- You can stop commands while they are running by pressing CTRL-BREAK or CTRL-C. CTRL-BREAK and CTRL-C are recognized only when programs are reading from the keyboard or writing to the screen unless you have set BREAK=ON in your *config.sys* file (see Appendix B, “Configuring Your System”) or entered a BREAK ON command at the system prompt. If BREAK is OFF, the command may not stop when you press CTRL-BREAK or CTRL-C.
- For commands that display large amounts of output on the screen, you can press CTRL-NUM LCK or CTRL-S to suspend the output. Press any key except CTRL-BREAK or CTRL-C to resume the display.

- When MS-DOS displays

Press any key to continue

press any character key or the SPACEBAR.

- The default system prompt is the default drive name followed by a greater-than sign (for example, A>). You can change the prompt by using the PROMPT command.
- MS-DOS editing and function keys can be used when entering commands. Refer to Appendix D, "MS-DOS Editing Keys," for more information on using these keys.
- Disk drives are referred to as *source drives* and *target drives*. A source drive is the drive you transfer information from. A target drive is the drive you transfer information to. The source and target can be the same drive.
- When you enter an external command, MS-DOS searches for it in the working directory of the default or specified drive. If it is not found, MS-DOS continues searching for it in the directories listed in the most recent PATH command.
- You can specify a drive and/or path name before an external command. This means that the command can be in a directory other than the working directory. For example, if the file *format.com* is in the directory *\bin* on drive B, you can enter the following to execute the FORMAT command:

```
B:\BIN\FORMAT
```

- Wildcard characters (? and \*) are not allowed as part of a command name. You can only use them to refer to filenames and filename extensions.
- If you type a <, >, or | character as part of a command, MS-DOS treats them as redirection or piping characters. For more information on using these symbols, refer to Redirecting Command Input and Output in Chapter 2, "Using MS-DOS."

# MS-DOS Command Dictionary

The most commonly used MS-DOS commands are listed below. These commands are described in detail in the remainder of this chapter.

| Command | Description   |
|---------|---|
| ASSIGN  | Temporarily assigns a drive name to another drive.  |
| BACKUP  | Backs up one or more files from one disk to another.  |
| BREAK   | Tells MS-DOS when to check for CTRL-BREAK or CTRL-C.  |
| CHDIR   | Changes or displays the working directory.  |
| CHKDSK  | Checks directories and files on the specified disk and displays a disk and memory status report.                  |
| CLS     | Clears the screen display.  |
| COMMAND | Starts the specified command processor.   |
| COMP    | Compares the contents of one file to those of another file, or compares groups of files to other groups of files. |
| COPY    | Copies or concatenates (joins together) one or more files to another file or device.                              |
| CTTY    | Changes the device MS-DOS uses for standard Input and Output (I/O).   |
| DATE    | Displays and sets the date.   |
| DEL     | Deletes the specified file(s) from your disks.  |
| DIR     | Lists the files and subdirectories in the working or specified directory.   |

## MS-DOS Command Dictionary *continued*

| Command  | Description   |
|----------|---|
| DISKCOMP | Compares the contents of two floppy disks.  |
| DISKCOPY | Copies the contents of one disk to another disk.  |
| DSKSETUP | Optionally configures the type of disk drives in your system and protects your hard disk from being reformatted accidentally. |
| EXIT     | Exits secondary command processor and returns to the previous command processor.  |
| FOR      | Repeats a command during an interactive process.  |
| FORMAT   | Formats a disk for use with MS-DOS.   |
| KEYBxxx  | Loads a foreign keyboard device driver program.   |
| MKDIR    | Makes a new directory.  |
| MODE     | Sets the operation mode for peripheral devices.   |
| MORE     | Displays screen output one screen at a time.  |
| NOSTACK  | Temporarily disables part of MS-DOS so you can run incompatible programs.   |
| PATH     | Sets and displays the search path MS-DOS uses to find external commands.  |
| PRINT    | Lets you print files while your computer is processing other MS-DOS commands.   |
| PROMPT   | Changes the system prompt.  |
| RENAME   | Renames one or more files.  |

## MS-DOS Command Dictionary *continued*

| Command | Description   |
|---------|---|
| RESTORE | Restores files that were backed up using the BACK-UP command.   |
| RMDIR   | Removes subdirectories from a disk or multilevel directory.   |
| RTCLOCK | Sets and reads the optional real-time clock device.   |
| SET     | Sets one string of characters in the environment equal to another string for use in programs.   |
| SHIP    | Moves the read and write heads of a hard disk to an area where they cannot destroy stored data if they are damaged while moving the computer. |
| SORT    | Reads data from the standard input device, sorts the data, then writes the sorted data to the standard output device.                         |
| SYS     | Transfers MS-DOS system files from the disk in the default drive to the disk in the specified drive.  |
| TIME    | Displays and sets the time.   |
| TYPE    | Displays the contents of a text file on the screen.   |
| VER     | Displays the MS-DOS version number.   |
| VERIFY  | Verifies that your files were written to a disk correctly.  |
| VOL     | Displays disk volume label or volume ID, if one exists, of the default or specified drive.  |
| ZCOM    | Transfers files between two computers using direct serial communications or modems.   |

# ASSIGN

**Type** External MS-DOS command.

**Purpose** Temporarily assigns a drive name to another drive.

**Entry Form** ASSIGN [*x y*[...]]

Where:

- x* specifies the drive where disk read and write requests are currently being sent (for example, A).
- y* specifies the drive to which you now want to send disk read and write requests (for example, B).

**Comments** Some application programs are designed to perform their disk read and write operations on a specific drive. ASSIGN lets you use these applications with any disk drive. The first drive name, *x*, is assigned to the second drive name, *y*.

Enter ASSIGN without any parameters to reset all drives back to their original assignments.

## Note

The ASSIGN command hides the true disk drive from commands and programs that require actual drive information. You should only use drive reassignment when necessary to run an application and not during normal use of MS-DOS.

If you will be creating application programs, you should avoid assigning drives within the program. Instead, allow the user to specify the drive(s) to be used when running the program.

## ASSIGN *continued*

**Examples** To assign drive requests for drive A to drive B, you could enter one of the following commands:

```
ASSIGN a b  
ASSIGN a=b
```

To assign drive requests for drives A and B to drive C, enter:

```
ASSIGN a c b c
```

To reset all drives back to their original drive name assignments, enter:

```
ASSIGN
```

# BACKUP

**Type** External MS-DOS command.

**Purpose** Backs up one or more files from one disk to another.

**Entry Forms** BACKUP ?

```
BACKUP [d:][path][filename[.ext]]  
        [+ [d:][path][filename[.ext]]...] d:[/x...]
```

BACKUP

Where:

? displays help on using BACKUP.

*d:path* specifies the drive and the directory where the files you want to back up are located.

*filename.ext* specifies the name(s) of the file(s) you want to back up. Separate more than one filename with a + character.

*d:* specifies the drive to which you are backing up files.

*/x* is one or more switches that control the backup process. These switches are described in the following section.

**Comments** BACKUP is most commonly used to back up files stored on hard disks because it allows you to copy a file that is larger than a single floppy onto multiple floppy disks. You should use the DISKCOPY or COPY command to back up floppy disks.

## BACKUP *continued*

You can use BACKUP in two ways: with interactive entries you make in response to the BACKUP prompt (>) or with a command line containing all of the filenames and parameters. To use the interactive method, enter BACKUP without any other parameters. When the BACKUP prompt (>) is displayed, you can enter command lines of up to 127 characters, including spaces.

If you want to display help on using BACKUP, enter:

```
BACKUP ?
```

### Note

Any files you save with BACKUP are unusable as data files until they are recovered from the backup disk by using the RESTORE command. Refer to the RESTORE command in this chapter for information on restoring files.

### Control Switches

The following switches can be used with BACKUP.

**/A**

Appends additional files to those already on a backup disk. If /A is not specified as part of BACKUP, *all* previous information stored on the backup disk is deleted.

**/B:[date]**

Backs up only those files dated on or before the specified date.

**/D:[date]**

Backs up only those files dated on or after the specified date.

`/E:[d:][path]filename[.ext][ + [d:][path]filename[.ext]...]`  
Excludes the specified file(s) from being backed up. Separate more than one filename with a plus sign (+).

`/F`  
Formats all destination disks without prompting you to format the disks.

`/G or /S`  
Globally backs up files in all subdirectories as well as the files in the working directory.

`/M or /W`  
Backs up only those files that have been modified since the last backup.

`/N`  
Skips formatting the target disks before backing up files to them. The target disk(s) *must* already be formatted to store files.

`/Q`  
Queries you as to whether you want to back up each file; enter Y (for Yes) or N (for No) for each filename displayed.

`/R`  
Rings a bell when your help is needed during the backup process.

`/T`  
Backs up only those files with today's date.

`/V`  
Verifies that the files were written to the target disk correctly.

### Default Switch Settings

If you do not enter any switches, BACKUP uses the following default conditions:

- You are queried as to whether you want the target disk(s) to be formatted. Turn this feature off using the /F or /N switch.
- BACKUP does not ask you for each filename before backup. Change this by using the /Q switch.
- BACKUP does not verify the write to the target disk(s). Change this by using the /V switch.

When backup files are stored across more than one disk, each separate disk is called a *volume* and is assigned a volume number, beginning with 1. BACKUP prompts you to change disks as they are filled. You should label and number each disk consecutively so that you can properly restore the files with the RESTORE command.

BACKUP writes the backed up files to the root directory of the target floppy disks. If you are using a hard disk as a target disk, a directory called `\backup` is created for the files.

You can use wildcard characters (? or \*) in BACKUP command lines. Separate multiple filenames in the command line with a plus sign (+).

BACKUP displays the name of each file as it is backed up. As each backup disk is filled, the following message is displayed:

Insert another disk in drive *d* for backup and press RETURN when ready or press any other key to abort.

You can cancel the backup process at this point by pressing any key except RETURN. In interactive mode, you can end BACKUP by entering RETURN or by pressing CTRL-BREAK or CTRL-C at the > prompt.

If you include the /V switch in the command line and BACKUP finds a discrepancy between the original and the backed up file version, the following message is displayed:

Verify error, try BACKUP again (Y/N)?

Enter Y (for Yes) to try the backup process again for the file in question. Enter N (for No) to abort the backup process and to proceed to the next source file.

You can use BACKUP to collect selected files from several directories and write them to the same backup disk. You specify the directories in the command line, separated by backslashes (\). For example:

```
BACKUP c:\myprogs\*.bas+a:\mylets\*.doc b:/R
```

## BACKUP *continued*

As a result, MS-DOS copies all of the files with a *.bas* extension in the *myprogs* directory in drive C, and all of the files with a *.doc* extension from the *mylets* directory in drive A. The files are then copied to a disk in drive B, with a bell sounding when the disk is full.

BACKUP returns the following exit codes:

- 0 Normal completion
- 1 No files were found to back up
- 3 Terminated by user
- 4 Terminated due to error

### Examples

To display help on using BACKUP, enter:

```
BACKUP ?
```

To use interactive mode, enter:

```
BACKUP
```

In interactive mode, you can enter separate command lines (up to 127 characters each) for the files you want to back up. For example:

```
>c:\games\*. * a:
```

This entry backs up all of the files contained in the directory *games* in drive C and writes them to a disk in drive A.

If you want, you can run BACKUP from a batch file to automate routine backups. For example, you can use the COPY command to create the following batch file called *back.bat*.

```
COPY CON back.bat  
BACKUP %1*.* %2/T/V/R
```

Press CTRL-Z, then RETURN to save the file. Now, at the end of each day you could enter the following command to run the batch file and back up all of today's files from one disk to a disk in another drive:

```
BACK c:\mydir\ a:
```

The following command will back up all files and sub-directories on drive C:

```
BACKUP c:*.* a:/G
```

Refer to Appendix A, "Batch Processing," for more information on creating and using batch files.

# BREAK

**Type** Internal MS-DOS command.

**Purpose** Tells MS-DOS when to check for CTRL-BREAK or CTRL-C.

**Entry Form** BREAK [ON | OFF]

Where:

ON turns on frequent CTRL-BREAK checking.

OFF turns off frequent CTRL-BREAK checking.  
This is the default BREAK setting.

**Comments** When BREAK is OFF, MS-DOS checks for CTRL-BREAK and CTRL-C only when reading from the keyboard or writing to the screen or a printer. Setting BREAK ON extends the checking to other functions such as disk reads and writes. This lets you interrupt, or stop, programs that perform few read and write operations to the keyboard and screen.

Type BREAK without any parameters to display the current BREAK setting (ON or OFF).

To turn on extended checking each time you start MS-DOS, put the BREAK ON command in your *config.sys* file. For more information on this file, see Appendix B, "Configuring Your System."

**Examples** To turn on CTRL-BREAK checking, enter:

```
BREAK ON
```

To display the current BREAK setting, enter:

```
BREAK
```

- Type** Internal MS-DOS command.
- Purpose** Changes or displays the working directory.
- Entry Forms** CHDIR [*d:*][*path*]  
CD [*d:*][*path*]

Where:

*d:* is the drive where the disk whose working directory you want to change or display is located (for example, A:).

*path* is the pathname of the directory you want to make the new working directory (for example, `\sales\june`). The path cannot be more than 64 characters long.

- Comments** Each disk formatted for use with MS-DOS has a working directory that MS-DOS remembers. MS-DOS looks in this directory to find files whose names are entered without a path. The CHDIR command can be used to switch to a different directory.

CD can be used as an abbreviation for CHDIR.

Enter CHDIR without a path to display the name of the working directory.

To return to the parent directory of the working directory, enter CHDIR followed by two periods (`..`). To return MS-DOS to the root directory of the specified drive, enter CHDIR `\.`

## CHDIR *continued*

**Examples** To change the working directory of the default drive to the root directory, enter either of the following:

```
CHDIR \  
CD \
```

To change the working directory of drive C to `\sales\credit`, enter:

```
CD c:\sales\credit
```

To change the working directory of drive C to the `\reports` subdirectory of the current directory (`\sales\credit`), enter:

```
CD c:reports
```

This makes `\sales\credits\reports` the new working directory.

The following example displays the working directory of drive C:

```
CHDIR c:
```

The following example returns MS-DOS to the parent directory of the working directory:

```
CD ..
```

The following example returns MS-DOS to the root directory of drive C:

```
CHDIR c:\
```

**References** Refer to the MKDIR command for information on creating directories. See the PROMPT command for information on changing the system prompt so that it displays the working directory.

# CHKDSK

**Type** External MS-DOS command.

**Purpose** Checks directories and files on the specified disk and displays a disk and memory status report.

**Entry Form** CHKDSK [*d:*][*path*][*filename*[.ext]] [/F] [/V]

Where:

*d:*[*path*][*filename*[.ext]] is the drive name and, optionally, the full pathname of the directory or file you want to check (for example, *A:\jessie\books*). If you omit this parameter, CHKDSK checks the disk in the default drive.

/F tells CHKDSK to fix any errors that are found during the check.

/V displays all files on the default or specified drive.

**Comments** You should occasionally run CHKDSK on each of your disks (including your working copy of MS-DOS) to check them for errors. When you run CHKDSK, it scans the directories and files on the disk and checks that they are correct. After checking the disk, CHKDSK displays a status report for the disk and also displays the amount of memory you have available for use in your computer.

If you specify a filename, CHKDSK checks for non-contiguous (nonsequential) areas occupied by the file or files. Noncontiguous files do not indicate an error or problem with the file. However, badly fragmented files (those with many noncontiguous areas) slow down system performance because MS-DOS cannot read the files sequentially.

You can use wildcard (? or \*) characters when specifying the filename.

The /F switch tells CHKDSK to fix any errors that are found during the check.

### Note

Depending on the severity and type of error found by CHKDSK, /F may not be able to correct the error.

If CHKDSK finds lost pieces of files on the disk, it asks if you want to recover the lost data into files. If you say yes, and /F was used, CHKDSK recovers pieces of lost data into files whose names takes the form:

```
FILExxxx.CHK
```

where xxxx is a sequential number starting at 0000. The recovered files are placed in the root directory of the specified drive. Later, you can check these files to see if they contain any useful data.

CHKDSK does not wait for you to insert a disk in the drive. It assumes the disk you want to check is in the specified drive. If you are using a single-drive system, it is important that you specify a drive other than the default drive unless you want to check the MS-DOS system disk.

### Note

CHKDSK does not look for or fix errors in files. It only checks that the disk contains valid MS-DOS files and is usable for storing files.

### Examples

To check a disk that is in drive B, you would enter:

```
CHKDSK b:
```

In response, CHKDSK would display a status report similar to the following:

```
Volume CLIENTS created Jun 16, 1987 9:24a
```

```
730112 bytes total disk space  
47104 bytes in 3 hidden files  
512 bytes in 2 directories  
30720 bytes in 8 user files  
651776 bytes available on disk
```

```
524288 bytes total memory  
53152 bytes free
```

The first five lines give the status of the disk. Note that this disk has three hidden files: the volume label and the two MS-DOS system files.

The last two lines of the status report show the amount of internal Random Access Memory (RAM) the system has and the amount remaining for use. Note that any resident utility programs you may have installed in your system (for example, MS-DOS Manager) decrease the amount of memory available for use.

## CHKDSK *continued*

Suppose CHKDSK found errors on the disk in drive B. To correct them, you could enter another CHKDSK command, as follows:

```
CHKDSK b:/F
```

To check all of the files on drive B, enter:

```
CHKDSK b:*.*
```

## CLS

**Type** Internal MS-DOS command.

**Purpose** Clears the display screen.

**Entry Form** CLS

**Comments** The CLS command clears your display screen and moves the cursor to the upper left-hand corner of the screen. CLS is useful when you want to clear the screen before you execute a command or program.

**Example** To clear the screen, enter:

```
CLS
```

## COMMAND

**Type** External MS-DOS command.

**Purpose** Starts a command processor.

**Entry Form** `COMMAND [d:][path][cttydev][E:n][P][C string]`

Where:

*d:path* specifies the drive name and directory path where the command processor you want to start is located.

*cttydev* specifies a different device (such as AUX) for input and output.

*/E:n* specifies the environment size, where *n* is the size in bytes. The size may range from 128 to 32,768 bytes. The default size is 128 bytes.

*/P* causes the new command processor to remain in memory permanently. If you specify */P*, control does not return to the primary command processor. You must restart MS-DOS to remove the secondary command processor.

*/C string* allows you to pass a string containing an MS-DOS command and then automatically return control to the primary command processor after the command is executed. If used, */C* must be the last parameter in the command line.

**Comments** COMMAND starts a new command processor (the program that contains all MS-DOS internal commands). The use of COMMAND assumes an advanced knowledge of MS-DOS.

When you start a new command processor, you also create a new command environment. This new environment is a copy of the old, parent environment. However, you can change the new environment without affecting the old one.

The command processor is loaded into memory in two parts: *transient* and *resident*. Some applications write over the transient memory part of *command.com* when they run. When this happens, the resident part of the command processor prompts you for the *command.com* file on disk so that it can reload the transient part:

Insert disk with \COMMAND.COM in drive x  
and strike any key when ready.

When you use the /E:n switch, if *n* is less than 128 bytes, MS-DOS defaults to 128 bytes and displays the following message:

Invalid environment size specified

If *n* is greater than 32,768 bytes, MS-DOS displays the same message, but defaults to 32,768 bytes.

**Examples** The following example starts a new copy of *command.com* but with an environment size of 1024 bytes. Since the /P switch was used, the new copy becomes permanent, replacing the old one. This is useful when running application programs that require a large environment space.

COMMAND /E:1024 /P

## COMMAND *continued*

The following command tells the MS-DOS command processor to start a new command processor under the current program, run the command CHKDSK B:, then return to the first command processor:

```
COMMAND /C CHKDSK b:
```

**Reference** Refer to the EXIT command for information on returning control to the previous command processor.

|                    |  |
|--------------------|--|
| <b>Type</b>        | External MS-DOS command.   |
| <b>Purpose</b>     | Compares the contents of one file to that of another file, or compares groups of files to groups of files.           |
| <b>Entry Forms</b> | COMP [?]<br>COMP [ <i>d:</i> ][ <i>path</i> ][ <i>sourcefile</i> ] [ <i>d:</i> ][ <i>path</i> ][ <i>targetfile</i> ] |

Where:

- ? displays the COMP help screen.
- d:path* specifies where the file(s) are located.
- sourcefile* specifies the file you want to compare.
- targetfile* specifies the file you want to compare the *sourcefile* to.

Use the COMP command when you want to compare individual files or groups of files. (You should use the DISKCOMP command to compare the contents of two entire disks.) COMP can be run after you have used the COPY command to make sure that the new file is identical to the one you copied.

The files being compared do not need to be in the same directory or on the same disk. Any two files you specify for comparison should be the same size. Files that are not the same size are considered by COMP to be different files. By using wildcard characters (? or \*) you can use COMP to compare two groups of files.

## COMP *continued*

If you enter COMP with no parameters, COMP prompts you for the information it needs. You should use this method if your computer has only one disk drive and the file(s) you want to compare are not on the same disk as the COMP command.

COMP displays an error message for every mismatch found. If more than 10 mismatches are found, COMP stops the comparison and displays the following message:

```
10 Mismatches - ending compare
```

In all comparison operations, COMP checks the last byte of the files being compared to make sure that each file contains a valid End-of-File (EOF) marker. If the EOF marks are found, COMP continues the comparison. If the EOF marks are not found, COMP displays the following message before it continues the comparison:

```
Eof mark not found
```

Many files do not contain EOF markers. This message does not indicate an error.

### Examples

Suppose you have just used the COPY command to copy the file called *memos.jun* on drive A to a new file called *letters.jun* on drive B and you want to compare the files to make sure they are identical before deleting the file from the disk in drive A. To verify the contents of the two files, you could enter:

```
COMP a:memos.jun b:letters.jun
```

If there are no errors, COMP displays the following message:

```
Files compare OK
```

COMP then asks you if you want to compare any more files. Press Y (for Yes) if you do or N (for No) if you do not want to compare more files.

You could enter the following to compare a group of files that have the filename extension *.txt* to a group of files that have the same filename, but the filename extension *.bak*:

```
COMP a:*.txt b:*.bak
```

The following example compares all the files in the subdirectory *\jessie\books* with the files in the subdirectory *\jessie\backup* on the default drive:

```
COMP \jessies\books \jessie\backup
```

**Reference**

For information on comparing the contents of one disk to another, refer to the DISKCOMP command.

# COPY

**Type** Internal MS-DOS command.

**Purpose** Copies or concatenates file(s) to a specified file or device.

**Entry Forms** To copy files:

```
COPY [/A][/B][d:][path][sourcefile] [d:][path][targetfile]
[/A][/B][/V]
```

To concatenate files:

```
COPY [/A][/B][d:][path]sourcefile +
[d:][path]sourcefile[ + ...]
[d:][path]targetfile
```

Where:

*d:path* specifies the drive and path where the file you are copying is located. Used before *targetfile*, it specifies the drive and path to which you are copying *sourcefile*.

*sourcefile* specifies the file you want to copy.

*targetfile* specifies the file to which you want to copy *sourcefile*.

*/A* indicates you are copying an ASCII file. The switch applies to the filename preceding it and to all remaining filenames in the command line until a */B* switch is encountered.

*/B* indicates you are copying binary files. The switch applies to the filename preceding it and to all remaining filenames in the command line until an */A* switch is encountered.

- `/V` verifies that the copy was done correctly.
- `+` concatenates the sourcefile(s) and places the result in the targetfile.

**Comments**

Use the COPY command when you want to copy or concatenate files to the same disk or another disk. If the source and target files are both in the current directory, you do not need to specify a drive or path.

COPY can also be used when you want to copy data between any of the system devices. For example, you can use the COPY command to copy what you type at the keyboard to a disk file. An example of this is described in Appendix A, "Batch Processing."

When copying files, the `/A` and `/B` switches work as follows:

- When used with a *sourcefile*, `/A` copies the data in the file up to, but not including, the EOF marker.
- When used with a *targetfile*, `/A` places an EOF marker as the last character in the file.
- `/A` is the default switch applied to both the source and target files when you concatenate files.
- When used with a *sourcefile*, `/B` copies the entire file including any EOF marker.
- When used with a *targetfile*, `/B` prevents the EOF marker from being added to the file.
- `/B` is the default switch applied to both the source and target files during normal file copies (no concatenation).

The /A and /B switches apply to the file preceding the option and to all subsequent files until a different switch (/A or /B) is specified.

Using /V adds time to the copy operation, but is useful when you are copying important files and need to verify that the copy was done correctly.

The two ways in which you can use COPY—to copy one or more files to create new files or to concatenate (join together) two or more files into one file—are described in more detail in the following sections.

### Copying Files

When copying files, you can use wildcard characters (? or \*) for the source and target file names. If you use wildcard characters for the source filename, COPY displays the names of the files as they are copied.

If the file you want to copy is on the default drive and you do not specify a destination (*drive*, *path*, and/or *targetfile*), the COPY command aborts and the following error message displays:

```
File cannot be copied onto itself
Ø File(s) copied
```

The destination can take one of three forms:

- If the destination is a drive name only, the source file is copied to the specified drive to a file with the same name as the source file. For example, the following command copies the file *memo.doc* from the default drive to drive B and gives it the same name:

```
COPY memo.doc b:
```

- If the destination is a filename only, the source file is copied to the specified file in the default drive. For example, the following command makes a copy of *memo.doc*, names it *letter.doc*, and places it on the default drive:

```
COPY memo.doc letter.doc
```

- If the destination includes a drive letter and filename, MS-DOS copies the original file to the file on the specified drive. For example, the following command makes a copy of *memo.doc* on the default drive, names the copy *letter.doc*, and places the copy on the disk in drive B:

```
COPY memo.doc b:letter.doc
```

### Concatenating Files

COPY also allows you to concatenate files. You list the files you want to concatenate as parameters to COPY (separating each file from adjacent files with a plus sign [+]) and then specify a *targetfile* to send the combined files to.

## COPY *continued*

As an example, the following command combines files named *intro.rpt* and *body.rpt* on the default drive with the file *sum.rpt* on drive B and writes them to a file called *report* on the default drive. If you omit the *targetfile* parameter, MS-DOS concatenates the source files and places them in the first source file specified.

```
COPY intro.rpt+body.rpt+b:sum.rpt report
```

You can also combine several files into one by using wildcards. For example, the following command takes all files with the filename extension *.txt* and combines them into one file named *combin.doc*:

```
COPY *.txt combin.doc
```

In the next example, each file that matches *\*.txt* is combined with its corresponding *.ref* file. The result is a file with the same filename, but with the extension *.doc*. Thus, *file1.txt* is combined with *file1.ref* to form *file1.doc*, *xyz.txt* with *xyz.ref* to form *xyz.doc*, and so on:

```
COPY *.txt+*.ref *.doc
```

The following COPY command combines all files matching *\*.txt* and all files matching *\*.ref*, into one file named *combin.doc*:

```
COPY *.txt+*.ref combin.doc
```

**Caution**

Do not try to concatenate files if one of the source filenames has the same extension as the target. For example, if the file *all.txt* already exists, the following command is an error:

```
COPY *.txt all.txt
```

MS-DOS would not detect the error until it tried to append *all.txt*. But at that point, COPY might already have destroyed the original contents of *all.txt* by overwriting the file.

During concatenation, COPY compares the source filenames with the target filename. If they are the same, the source file with the same name is skipped, and MS-DOS displays the error message:

```
Contents of destination lost before copy
```

Further concatenation proceeds normally. The following command concatenates *\*.txt* files (except *all.txt*) to *all.txt*:

```
COPY all.txt+*.txt
```

This sample command will not produce an error message because the target file is the first file in the series of files to be concatenated.

**Examples**

The following sample command copies a file called *reports.jun* on the default drive to drive B:

```
COPY reports.jun b:
```

## COPY *continued*

To copy a file called *report.jun* on the default drive to drive B and rename it *report.jul*, you could enter one of the following commands:

```
COPY report.jun b:report.jul
COPY report.jun b:*jul
```

The next example copies all the files with the extension *.rpt* on drive A to drive C:

```
COPY a:*.rpt c:
```

Suppose you ran CHKDSK on a disk and it showed that the disk contained errors. You could use the *\*.\** wildcard designation to copy all the files to a new disk:

```
COPY *.* b:
```

This example copies all the files on the default drive to drive B but does not copy the bad areas of the disk.

The following example copies all the files on drive B with the extension *.jun* to the directory *\sales\june* on drive C:

```
COPY b:*jun c:\sales\june
```

The following example concatenates all files on drive A with the extensions of *.jan*, *.feb*, and *.mar* and writes the result to a file named *sales.qtr* on drive B:

```
COPY a:*.jan+a:*.feb+a:*.mar b:sales.qtr
```

You could use the COPY command to copy what you type in at the keyboard to a file on a disk on drive B, as follows.

```
COPY CON b:myfile.dat
```

When creating a file like this, you can type as many lines as you want at the keyboard; just end each line by pressing RETURN. After the last line, press CTRL-Z then RETURN to save the file. You can press CTRL-BREAK or CTRL-C at any time to stop the copy process; CTRL-BREAK or CTRL-C does not save any of the data you may have typed.

The following example copies a file from drive A to a printer:

```
COPY myfile.dat LPT1
```

### Reference

For information on comparing the contents of two files (useful when copying important files), refer to the COMP command in this chapter. See the DISKCOPY command for information on copying the contents of one disk to another.

# CTTY

**Type** Internal MS-DOS command.

**Purpose** Changes the device MS-DOS uses for input and output.

**Entry Form** CTTY *device*

Where:

*device* is any character device capable of input and output. The following are the most common ones:

AUX or COM1 Primary serial communications port (serial port 1).

CON Keyboard input and screen output.

**Comments** When you start MS-DOS, it recognizes the keyboard and screen as the standard command Input/Output (I/O) device. This default configuration is called CON (short for console). Use CTTY when you want to change from CON to another device capable of doing I/O.

CTTY is useful when you want to change from working on one device to another, such as from your keyboard to a modem or remote terminal. Use the command CTTY CON to direct I/O back to the original default device.

The device specified in the command line must be capable of both input and output functions, so a device like a printer should not be named.

## CTTY *continued*

The CTTY command accepts the name of any character-oriented device. This enables you to install a custom device driver and specify its name in the command line.

### Examples

You could enter the following command to switch the standard I/O device to AUX. This would cause all input and output to be performed across the serial port. (You should only do this if there is a terminal connected to the AUX port):

```
CTTY AUX
```

To reset all standard I/O operations to the computer keyboard and screen, you could enter the following command on the AUX device:

```
CTTY CON
```

# DATE

**Type** Internal MS-DOS command.

**Purpose** Displays or changes the date.

**Entry Form** DATE [*mm-dd-yy*]

Where:

*mm* specifies the month; use a number in the range 1–12.

*dd* specifies the day; use a number in the range 1–31.

*yy* specifies the year; use a number in the range 80–99 or 1980–2099.

**Comments** Use the DATE command to change or display the date. You can set the date from the keyboard or from within a batch file. The date, month, and year entries may be separated by hyphens (-), periods (.), or slashes (/).

If you use an *autoexec.bat* file, MS-DOS does not display a prompt for the date unless you include the DATE command in the file.

MS-DOS is programmed to change months and years correctly, whether the month has 31, 30, or 28 days. MS-DOS also adjusts for leap years.

You can change the format in which the date is displayed and entered. Use the COUNTRY command in the *config.sys* file to change the date format to the European standard *dd-mm-yy*. If you do not select a country code, the system defaults to the United States setting. For more information on the *config.sys* file, see Appendix B, "Configuring Your System."

If you use an invalid date format or invalid delimiters, MS-DOS displays the following error message:

```
Invalid date
Enter new date (mm-dd-yy):
```

### Note

If your system has a real-time clock installed, the DATE command only sets the date used by MS-DOS. Use the RTCLOCK command to set the date for the clock.

**Examples** To display the currently set date, enter:

```
DATE
```

In response, MS-DOS returns a display similar to the following:

```
Current date is Sun 6-14-87
Enter new date (mm-dd-yy):
```

Press RETURN if you do not want to change the date, or enter a new date at the prompt, as follows:

```
6-16-87
```

You could use the following command to change the date without first displaying the current date:

```
DATE 6-16-87
```

**Reference** For information on setting the date for a real-time clock, refer to the RTCLOCK command. See the TIME command for information on setting the time.

# DEL

**Type** Internal MS-DOS command.

**Purpose** Deletes the specified file(s) from your disks.

**Entry Forms** DEL [*d:*][*path*]*filename*[.ext]  
ERASE [*d:*][*path*]*filename*[.ext]

Where:

*d:* specifies the drive name containing the the file you want to delete.

*path* specifies the path for the directory containing the file(s) you want to delete.

*filename.ext* specifies the file(s) you want to delete.

**Comments** You can use the DEL command to delete a file or files from a disk or directory. Once you have deleted a file, you cannot recover it. It is a good idea to use the DIR command to display a list of your filenames to make sure you only delete those files you want deleted.

ERASE is a synonym that can be used in place of the command name DEL.

When using DEL, you should be aware of how MS-DOS treats the use or omission of command parameters:

- MS-DOS assumes the default drive if you do not specify a drive.
- MS-DOS assumes the working directory if you do not specify a path.

- If you specify only a directory, \*.\* is assumed and *all* files are deleted from the directory. If you include a filename, only that file is deleted.

You can use the ? and \* wildcard characters to delete more than one file at a time. However, be very careful in how you use the wildcard characters as you could accidentally delete multiple files with one command.

If you use the wildcard characters \*.\* to delete all of the files on a disk or in a directory, MS-DOS displays the following prompt:

```
Are you sure (Y/N)?
```

Press Y (for Yes) and then RETURN to delete all the files in the specified directory. If you do not want to delete all of the files, press N (for No).

### Examples

You could use the following command to delete a file named *vacation* from the default drive:

```
DEL vacation
```

Suppose you have two files named *vacation.feb* and *vacation.apr*. To delete both of them with one command, you could enter either of the following:

```
ERASE vacation.*  
DEL vacation.*
```

## DEL *continued*

The following command deletes all of the files from the disk in drive B:

```
DEL b:*.*
```

Compare this example to the next, which deletes all of the files from the directory `\user\caleb` on drive C:

```
DEL c:\user\caleb
```

### Reference

For information on removing an empty directory, refer to the RMDIR command.

|                   |  |
|-------------------|--|
| <b>Type</b>       | Internal MS-DOS command.   |
| <b>Purpose</b>    | Lists the files in a directory.                                    |
| <b>Entry Form</b> | DIR [ <i>d:</i> ][ <i>path</i> ][ <i>filename</i> [.ext]] [/P]/[W] |

Where:

*d:* specifies the drive whose working directory you want to list (for example, A:).

*path* specifies the path to the directory whose contents you want to list (for example, \sales\records).

*filename.ext* specifies the file or files whose directory you want to list (for example, memos.\*).

/P displays one screen of information at a time. Press any key except CTRL-BREAK or CTRL-C to continue the listing.

/W displays only filenames and subdirectory names in a wide display format. Up to five files are displayed on each line.

**Comments** Use the DIR command when you want to display the names of the files and subdirectories on a disk or in a specified directory. The display shows the filenames and their extensions, the size of the files (in bytes), the time and date of the most recent change to the file, and the amount of free space left on the disk.

## DIR *continued*

If you enter DIR without any parameters, MS-DOS displays all files and subdirectories in the working directory on the default drive.

If you specify a drive name only, MS-DOS displays all entries in the working directory of the specified drive.

If you do not specify a filename extension, MS-DOS displays all matching filenames. If you specify a full filename (for example, *sales.jun*), MS-DOS displays information for that file only.

You can use wildcard characters (? and \*) with the DIR command. If you omit either the filename or extension, MS-DOS assumes the \* wildcard.

The following DIR commands are equivalent:

| Command             | Equivalent Command    |
|---------------------|-----------------------|
| DIR                 | DIR *.*               |
| DIR <i>filename</i> | DIR <i>filename.*</i> |
| DIR <i>.ext</i>     | DIR <i>*.ext</i>      |

To display a file that does not have an extension, type the filename followed by a period (.) so that MS-DOS does not default to the wildcard extension.

### Examples

You could use the following command to display all files and subdirectories in the working directory on drive B:

```
DIR b:
```

## DIR *continued*

The following command would display all the entries in the directory `\user\caleb` on drive B:

```
DIR b:\user\caleb
```

You could enter the following command to display the entries for the working directory on the default drive one screen at a time:

```
DIR /P
```

The following example displays all of the directories and filenames that do not have filename extensions on drive A:

```
DIR a: .
```

# DISKCOMP

**Type** External MS-DOS command.

**Purpose** Compares the contents of two floppy disks.

**Entry Form** DISKCOMP [*d1:*] [*d2:*] [/I]/8[/R]

Where:

*d1:* specifies the drive containing the source disk.

*d2:* specifies the drive containing the target disk.

/I causes DISKCOMP to compare only the first side of the disks.

/8 causes DISKCOMP to compare the first 8 sectors of a track regardless of the sector-per-track size of the disk.

/R causes DISKCOMP to ring a bell when your response is needed to complete the command.

**Comments** Use DISKCOMP when you want to compare the contents of two floppy disks. (Use the COMP command to compare individual files.) DISKCOMP is useful when you used DISKCOPY to create a backup disk and you want to make sure that the copy is correct.

DISKCOMP compares floppy disks only. It does not work with individual files or hard disks.

If you enter DISKCOMP with no parameters, you are prompted for the source drives.

If you specify only one drive, DISKCOMP uses it as both the source and the target drive. DISKCOMP does a comparison using one drive and prompts you to insert the source disk and then the target disk as required.

If the target disk is not the same type as the source disk, DISKCOMP displays the following error message:

```
Incompatible media - Can not continue
```

If the disks do not compare, DISKCOMP displays an error message telling where the mismatch was found. If the disks are the same, DISKCOMP displays no message.

In interactive mode, DISKCOMP ends the disk comparison with the following prompt:

```
Do you want to compare more disks (Y/N)? <N>
```

If you want to compare more disks, press Y (for Yes) and DISKCOMP will prompt you to insert more disks to be compared. Press N (for No) or RETURN to end DISKCOMP.

Depending on the amount of data stored on the disk, DISKCOMP may overwrite a portion of MS-DOS in memory. In cases such as this, you are prompted:

```
Insert disk with \COMMAND.COM in drive x  
and strike any key when ready
```

### Note

When comparing a disk with a backup disk that you made with the COPY command, you may receive an error message even if the files on the disks are identical. This is because COPY duplicates the information in files but does not necessarily put it in the same location on the target disk.

### Examples

To compare two disks on a single-drive system, enter:

```
DISKCOMP
```

MS-DOS prompts you to insert each disk, as required.

You could use the following command to compare the disk in drive A with the disk in drive B:

```
DISKCOMP a: b:
```

### Reference

Refer to the COMP command for information on comparing the contents of two or more files.

# DISKCOPY

**Type** External MS-DOS command.

**Purpose** Copies the contents of one disk to another disk.

**Entry Form** DISKCOPY [*d1:*] [*d2:*] [/V] [/F] [/1] [/R]

Where:

*d1*: specifies the drive containing the disk you want to copy.

*d2*: specifies the drive containing the disk to which you want to copy the *d1*.

/V verifies that the contents of the source and target disks agree.

/F formats the disk in the target drive (whether it needs it or not) before copying the source files to it.

/1 copies only one side of the disk.

/R causes DISKCOPY to ring a bell when your response is needed to complete the command.

**Comments** Use DISKCOPY when you want to copy the contents of a disk to another disk and retain the exact format of the disk. This command does not copy individual files. (Use COPY to copy single files.) DISKCOPY cannot copy hard disks.

If you enter DISKCOPY with no parameters, you are prompted for the source and target drives.

## DISKCOPY *continued*

If you specify only one drive, DISKCOPY uses it as both the source and the target drive. DISKCOPY uses the specified drive and prompts you to insert the source and target disks as needed.

DISKCOPY checks the target disk before it starts the copy process. If the disk needs to be formatted, DISKCOPY formats it before copying the contents of the source disk to it. If you use the /F switch, however, DISKCOPY formats the target disk whether it needs it or not before copying files to it.

In all cases, DISKCOPY overwrites the information on the target disk.

If you do not include any parameters in the command line, DISKCOPY prompts you with the following message after finishing the disk copy:

```
Do you want to copy another disk (Y/N)? <N>
```

Press Y (for Yes) to copy more disks. DISKCOPY prompts you for the source and target drives and to insert the source and target disks before performing the next copy. Press N (for No) or RETURN to end the copy session.

DISKCOPY uses the source drive and disk to determine the number of sides to copy unless you enter the /1 switch. If you enter this switch, DISKCOPY copies one side only.

### Examples

You could enter the following command to copy the contents of the disk in drive A to the disk in drive B:

```
DISKCOPY a: b:
```

DISKCOPY prompts you to insert the disks and press any key to begin copying.

To reformat the target disk before copying, use the /F switch, as shown:

```
DISKCOPY a: b: /F
```

To verify that the contents of the source disk are copied correctly to the target disk, use the /V switch, as shown:

```
DISKCOPY a: b: /V
```

### Reference

For information on copying individual files, refer to the COPY command. The DISKCOMP command describes how to compare the contents of one disk to another.

# DSKSETUP

**Type** External MS-DOS command.

**Purpose** Helps prevent accidental erasure of your files stored on a hard disk, enables you to assign a single partition or up to four separate partitions, and tells MS-DOS what type of floppy drives are installed in your system.

**Entry Form** DSKSETUP

**Comments** DSKSETUP is an interactive command that is used to describe the configuration of your disks to MS-DOS.

DSKSETUP performs three functions:

- Lets you change the partition assignment flag which will let you divide your hard disk into multiple partitions (for systems with hard disks greater than 32 megabytes in size).
- Describes the type of floppy disk drives you have installed in your computer.
- Allows your hard disk to be reformatted.

When you enter DSKSETUP, a menu of configuration options is displayed that describes the types of disks installed in your system and their current settings. Use the following options to change the configuration of your disks:

- A. Change partition assignment flag
- B. Configure floppy drive type
- C. Change hard disk format protection
- D. Exit with no changes

Enter selection (A-D):

The following sections describe these options.

### Changing the Partition Assignment Flag

On systems with hard disks of more than 32 megabytes in size, it is useful to change how MS-DOS assigns partitions to the hard disk. The default is the automatic assignment of drive name C to your hard disk with no other drive names available for use in referring to your hard disk.

Your hard disk was shipped from the factory already prepared. You will not have to change the setting.

### Configuring Floppy Drives

By default, MS-DOS knows at startup what type of floppy disk drives you have installed in your system (3.5-inch). On some systems, you can add different types of floppy disk drives. Option B lets you tell MS-DOS the type of extra floppy drives installed.

MS-DOS is already set up for the floppy disk drive(s) in your system and does not require you to change the setting.

### Guarding against Accidental Reformatting

When your hard disk was formatted, FORMAT set a flag preventing the disk from being reformatted. This feature guards against your accidentally reformatting the disk and losing all of the data stored on it.

You should never have to change the setting of the format protection flag during normal use of your computer. However, should your disk start to show an abnormal number of device errors, you should perform the following steps:

- Back up the files on the disk using the BACKUP command
- Change the format protection flag using option C in the DSKSETUP menu
- Reformat the disk using the FORMAT command
- Restore the files using the RESTORE command

To change the format protection flag, choose C from the menu. DSKSETUP displays the following sub-menu:

```
ENABLE/DISABLE Format Protection
```

```
Use one of the following to select  
the drive to be changed.
```

- A. Hard disk drive 0
- B. Exit to main menu with no changes

```
Enter selection (A-B):
```

Choosing A displays the current configuration for your hard disk and the following message:

Use one of the following options to select the partition to be changed:

- NOTE - Changes will be recorded immediately.

A. Enable/Disable Format Protection on Hard Disk Partition 1

B. Exit back to main menu

Enter option (A-B):

To change the flag, press A, then B to return to the main menu. To return to the main menu without changing the flag, just press B.

### Note

Any changes you make in changing the format protection flag are recorded immediately, regardless of how you save changes in the main menu.

## DSKSETUP *continued*

### Exiting From DSKSETUP

After you change the format protection flag, return to the main menu. It is the same menu that was displayed when you entered DSKSETUP, except that now several modification options may be listed under the main options. Select D to exit from DSKSETUP without saving changes you may have made.

# EXIT

- Type** Internal MS-DOS command.
- Purpose** Exits a secondary command processor.
- Entry Form** EXIT
- Comments** The EXIT command works in conjunction with COMMAND, the command that started the secondary command processor. If you have started a secondary command processor, you can use the EXIT command to return control to the previous command processor. However, if you used the /P switch with COMMAND, EXIT does not return control to the previous command processor. In this case, you have to restart MS-DOS in order for the primary command processor (*command.com*) to regain control.
- You can also use the EXIT command to exit to the MS-DOS command processor and then return to your program.
- Example** To return control to the primary command processor, enter:
- ```
EXIT
```
- Reference** For information on starting a secondary command processor, refer to the COMMAND entry in this chapter.

# FOR

**Type** Internal MS-DOS command.

**Purpose** Repeats a command during an interactive process.

**Entry Form** FOR %c IN (*set*) DO *command* %c

Where:

*c* is any character except the numbers in the range 0–9.

*set* is one of the following:

*filename.ext* specifies a file in the working directory of the default drive (for example, *lessons.mth*).

*pathname* specifies the complete pathname of a file (for example, *B:\caleb\games\spaceman.exe*)

*command* specifies any valid MS-DOS command you want run on *set*.

**Comments** The FOR command is useful when you want to perform the same MS-DOS command on a specified *set*, where *set* can be one of the parameters enclosed in parentheses as described above.

A variation of the FOR command can be used in batch processes. For more information on using FOR in batch files, refer to Appendix A, “Batch Processing.”

This command sequentially sets the `%c` variable to each member of *set*, and uses the variable to evaluate *command*. If a member of *set* is an expression involving a wildcard (`?` or `*`), then the variable is set to each matching item from the disk.

### Examples

Suppose you want to create a file that contains a listing of all the files and subdirectories on drive C. You can easily do this using FOR, as shown:

```
FOR %x IN (c:\caleb, c:\caleb\games, c:\jessie,  
          c:\jessie\books) DO DIR %x >> dir.lst
```

When MS-DOS executes this command, it creates a file called *dir.lst*, then places a list of files and subdirectories contained in the specified set in that file. You can then use the TYPE or MORE command to display the file's contents on the screen or you can use the PRINT command to print out the listing.

# FORMAT

**Type** External MS-DOS command.

**Purpose** Formats a disk for use with MS-DOS files.

**Entry Form** `FORMAT d: [/1][/4][/8][/D][/V][/N][/B][/S]`

Where:

*d:* specifies the drive containing the disk you want to format.

*/1 – /S* are switches that control the formatting process. These switches are discussed in the following section.

**Comments** Before you can use a disk with MS-DOS, you must format it so that MS-DOS can read from and write to it. FORMAT checks a disk for defective areas and prepares the disk to accept MS-DOS files.

When formatting disks, you must specify the drive containing the disk you want to format. If you omit the drive name from the command line, FORMAT prompts you for it. FORMAT uses the drive type to determine the default format for a disk.

## Note

FORMAT erases all existing data on a disk (if the disk has been used previously). You should use the DIR command to make sure that the disk you are about to format does not contain any files you may want to save.

### Control Switches

The following switches can be used with FORMAT. The most commonly used switch is /S, the rest are used only in special cases.

/1

Format disk for single-sided use regardless of the drive type.

/4

Format a double-sided, double-density disk on a high-capacity drive. Note that if you are using a single- or double-sided drive, you may not be able to read disks formatted with this switch.

/8

Format 8 sectors per track. If you do not specify /8, FORMAT defaults to either 9 or 15 sectors per track, depending on the type of drive being used. MS-DOS always creates either 9 or 15 sectors per track; however, when you specify /8, FORMAT tells MS-DOS to use only 8 sectors per track.

/B

Format disk for 8 sectors per track and allocate space for the MS-DOS system files. It does not put the system files or the command processor (*command.com*) on the disk. Use this switch to create disks on which any version of MS-DOS can be placed through that version's SYS command. If /B is not used, you will not be able to add the system files later with the SYS command.

You cannot use /B with the /S switch.

## FORMAT *continued*

**/D**

Format 3.5-inch disks with 80 tracks. Normally, a 3.5-inch disk is formatted double-sided, 9 sectors per track, 80 tracks per side. However, if you specify the /1 or /8 switch, only 40 tracks per side will be formatted. When you use /D with the /1 or /8 switch, you can format all 80 tracks single-sided and/or 8 sectors per track.

**/N**

Suppresses FORMAT's prompts for inserting disks and the display of formatting statistics.

**/S**

Copies MS-DOS system files from the default drive to the newly formatted disk.

**/S** must be the last switch to appear in the command line.

**/V**

Causes FORMAT to prompt you for a volume label. When prompted, press RETURN if you do not want a volume label for the disk, or enter a volume label of up to 11 characters.

The following switches can be used with 720K disks:

**/1, /4, /8, /B, /N, /V, /D, /S**

The following switches can be used with hard disks:

**/N, /V, /S**

When formatting is complete, and you did not include the /N switch, FORMAT displays a message showing the total disk space, any space marked as defective, the total space used by MS-DOS (when you use the /S switch), and the space available for your files.

### Examples

The following examples describe the most commonly used FORMAT commands.

The following command formats a 3.5-inch disk in drive B and causes FORMAT to prompt you for a volume label:

```
FORMAT b: /V
```

The following command formats a 3.5-inch disk in drive A and puts the MS-DOS system files on it (thus making it a bootable disk):

```
FORMAT a: /S
```

The following command formats a hard disk (drive C) and places MS-DOS system files on it:

```
FORMAT c: /S
```

### Reference

For information on copying the MS-DOS system files to a disk formatted with the /B switch, refer to the SYS command.

## KEYBxxx

- Type** External MS-DOS command.
- Purpose** Loads a foreign keyboard device driver program.
- Entry Form** KEYBxxx

Where:

xxx is one of the letter codes shown in Table 3.1.

- Comments** Use the KEYBxxx command when you want to load the keyboard driver for a country other than the United States.

Table 3.1 lists the valid keyboard codes. If there is no code for the language you will be using, choose the most similar one.

**Table 3.1 Foreign Keyboard Codes**

| Code | Keyboard Language       |
|------|-------------------------|
| US   | Australian              |
| DA   | Danish                  |
| US   | Dutch                   |
| UK   | English, United Kingdom |
| US   | English, United States  |
| SW   | Finnish                 |
| FR   | French                  |
| GR   | German                  |
| GK   | Greek                   |
| IT   | Italian                 |
| NO   | Norwegian               |
| SP   | Spanish                 |
| SW   | Swedish                 |
| CHF  | Swiss/French            |
| CHG  | Swiss/German            |

You can switch from the KEYBxxx program to the default (United States) format at any time by pressing CTRL-ALT-F1. Then you can return to the memory-resident keyboard program by pressing CTRL-ALT-F2.

If you want to load the same keyboard driver each time you start MS-DOS, put the KEYBxxx command in an *autoexec.bat* file.

### Examples

The following example loads the keyboard driver for the French language:

```
KEYBFR
```

### Reference

For information on configuring MS-DOS to use the international time, date, currency, and case conversions, refer to the COUNTRY command in Appendix B, "Configuring your System."

# MKDIR

**Type** Internal MS-DOS command.

**Purpose** Makes a new directory.

**Entry Forms** MKDIR [*d:*]*path*

MD [*d:*]*path*

Where:

*d:path* specifies the drive, path, and name of the new directory.

**Comments** Use MKDIR when you want to create a new directory. Remember though, that when you create directories with MKDIR, they always appear under the working directory unless you explicitly specify a different path in the MKDIR command line.

MD can be used as an abbreviation for MKDIR.

**Examples** You could use the following command to create a subdirectory named *sales* under the root directory of drive C:

```
MKDIR c:\sales
```

Next, you could enter the following to create the subdirectory *reports* under the subdirectory *\sales* on drive C:

```
MD c:\sales\reports
```

Note that if the working directory on drive C was *\sales*, you could omit *\sales* from the command line. This is because MS-DOS always begins at the working directory.

**References** Refer to the CHDIR command for information on changing working directories, the DIR command for information on displaying the files and subdirectories in a directory, and the RMDIR command for information on removing an empty directory.

# MODE

- Type** External MS-DOS command.
- Purpose** Sets the operation mode for peripheral devices.
- Entry Forms** There are six different entry forms for MODE. Each is discussed in the following section.
- Comments** Use the MODE command to configure MS-DOS and your computer to use external peripheral devices (for example, a printer or modem).

The following sections describe the different ways you can use MODE and the entry forms for each.

## Displaying Help on Using MODE

MODE has a series of help screens that describe valid command line entry forms and the configuration options supported. To see the help screens, enter:

```
MODE ?
```

A general help menu displays options you can select to see more detailed information about parallel devices, monitors, serial devices, and remapping output.

**Configuring Parallel Printer Modes**

To configure for a parallel printer, enter a command in the form:

```
MODE LPT#:[n],[m],[P]
```

Where:

- # specifies the parallel printer port: LPT1.
- n* specifies the number of characters per line: 80 or 132.
- m* specifies the vertical spacing (lines per inch): 6 or 8.
- P* specifies that MODE should try continuously to send output to the printer if a time-out error occurs. This option causes part of MODE to remain resident in memory.

**Note**

The *n* and *m* options are only valid for printers with compatible Epson<sup>™</sup> printer functions.

The default settings for parallel printers are LPT1, 80 characters per line, and 6 lines per inch. When /*P* is entered, you can break out of a time-out loop by pressing CTRL-BREAK or CTRL-C.

## MODE *continued*

### Configuring Serial Communication Ports

To configure for a serial communications port, enter a command in the form:

```
MODE COMn:baud[, [parity]][, [databits]  
[, [stopbits], P]]]
```

Where:

- |                 |                                                                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>n</i>        | specifies the serial communications port number: COM1.                                                                                                             |
| <i>baud</i>     | specifies the transmission rate: 110, 150, 300, 600, 1200, 2400, 4800, or 9600. You must enter at least the first two digits of the baud rate.                     |
| <i>parity</i>   | specifies the parity: N (none), O (odd), or E (even).                                                                                                              |
| <i>databits</i> | specifies the word length in bits, exclusive of any parity or stop bits: 7 or 8.                                                                                   |
| <i>stopbits</i> | specifies the number of stop bits: 1 or 2.                                                                                                                         |
| P               | specifies that MODE is using the COM port for a serial printer and retries if time-out errors occur. This option causes part of MODE to remain resident in memory. |

The default settings for serial communications are COM1, even parity, and 7 data bits. If the baud rate is 110, then the default number of stop bits is 2; otherwise, the default is 1 stop bit.

**Redirecting Parallel Printer Output to a Serial Port**

To redirect parallel printer output to a serial port, enter the following command.

```
MODE LPT1:=COM1:
```

Redirection causes part of MODE to remain resident in memory.

**Note**

Before you can redirect parallel output to a serial device, the COM device must be defined with a MODE command line using the form described for configuring a serial port.

## MODE *continued*

### Configuring Monitor (Screen Display) Modes

To configure the screen display mode, enter the MODE command using the following form:

```
MODE [n],[m],[T],[s]
```

Where:

*n* is one of the following display modes:

- |      |                                                                                        |
|------|----------------------------------------------------------------------------------------|
| 40   | Sets the display width to 40 characters per line.                                      |
| 80   | Sets the display width to 80 characters per line.                                      |
| BW40 | Sets the display mode to black and white (disables color) with 40 characters per line. |
| CO40 | Sets the display mode to color with 40 characters per line.                            |
| CO80 | Sets the display mode to color with 80 characters per line.                            |
| GR40 | Sets the display mode to medium-resolution graphics mode with 40 characters per line.  |
| GR80 | Sets the display mode to medium-resolution graphics mode with 80 characters per line.  |

- MONO** Sets the display mode to monochrome. In this mode, the screen display width is always 80 characters per line (not valid for eaZy pc).
- HGC** Sets the display mode to Hercules compatible monochrome (not valid for eaZy pc).

*m*, specifies the direction you want to shift the display: R (right) or L (left). For an 80-character display, *m* shifts the display two character positions. For a 40-character display, *m* shifts the display one character position.

This option causes part of MODE to remain resident in memory.

**T** specifies a test pattern for aligning the display. If you specify T, MODE asks if the screen is aligned properly. If you press N, MODE repeats the shift and asks if the screen is aligned properly. The test pattern ends when you press Y.

**s** specifies one of three scroll modes:

- 0 Software scroll (default scroll mode, allows greatest compatibility with application programs)
- 1 Jump scroll (not available for the eaZy pc).
- 2 Hardware scroll (not available for the eaZy pc).

## MODE *continued*

### Configuring Your Computer's Clock Speed

To configure your computer to run at a different clock speed, enter a command using one of the following forms:

```
MODE SPEED [FAST | SLOW]
```

Where:

**SPEED** displays the current speed setting, fast or slow.

**FAST** specifies the normal operating speed of the computer.

**SLOW** specifies the slower operating speed.

Some time-dependent or copy-protected software packages may not run correctly when the eaZy pc is running at the default FAST speed. If you have problems with a program, try running the computer at the slower clock speed.

### Configuring Modem/Serial/Memory Module

There is an optional modem/serial port card available for the eaZy pc. If your system has this option installed, it is configured for use with a modem by default. To turn off the modem setting, enter a MODE command in the following form:

```
MODE MODEM [ON | OFF]
```

Where:

MODEM displays the current setting, either on or off. On is the default setting.

ON turns on the modem connector.

OFF turns off the modem connector and allows you to use the port for serial communications.

To disable the modem and allow the port to be used for other serial communications, enter

```
MODE MODEM OFF
```

## MODE *continued*

### Configuring a Hercules Graphics Card

#### Note

Hercules graphics support is not currently available for the eaZy pc.

The MODE command can also be used to configure the video memory on a Hercules compatible graphics adapter using a command of the following form:

```
MODE HGC,[FULL | HALF]
```

Where:

HGC, specifies Hercules support.

FULL configures the graphics adapter to use the full video memory, providing two video pages.

HALF configures the graphics adapter to use half of the video memory, providing one video page.

#### Examples

If you want your computer to send printer output to a serial printer, you need to use the MODE command twice. The first MODE command is needed to specify parameters for the serial communication port, and the second MODE command redirects the computer's parallel printer output to the serial port specified in the first MODE command.

## MODE *continued*

For example, if your serial printer is connected to serial port COM1 (the first serial port on your computer) and operates at 4800 baud with even parity, you could enter:

```
MODE COM1:48,e,,P
MODE LPT1:=COM1:
```

If you redirected parallel printer output from LPT1 to COM1, then decided that you wanted to print a file using LPT1, you could enter the following to disable the redirection:

```
MODE LPT1:
```

Suppose you want your computer to print on a parallel printer connected to your computer's parallel printer port (LPT1). If you want to print 80 characters per line and 8 characters per inch, you could enter one of the following commands:

```
MODE LPT1:80,8
MODE LPT1:,8
```

Note that 80 characters per inch is the default.

Suppose you wanted your computer to keep trying to print a file until the printer is ready to print. You would enter:

```
MODE LPT2:80,8,P
```

To stop print retrys, you could press either CTRL-BREAK or CTRL-C, or you could enter the MODE command without the P option.

### Note

If you print files every time you start MS-DOS, you may want to include MODE configuration commands in your *autoexec.bat* file. See Appendix A, "Batch Processing," for more information about creating an *autoexec.bat* file.

To configure your system to run at a slower clock speed, you enter:

```
MODE SPEED SLOW
```

The following command disables the modem on the optional modem/serial/memory module and configures it for use as a standard serial port:

```
MODE MODEM OFF
```

# MORE

|                   |                                                                                                                                                                                                                                                                                                                                                     |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type</b>       | External MS-DOS command.                                                                                                                                                                                                                                                                                                                            |
| <b>Purpose</b>    | Displays output one screen at a time.                                                                                                                                                                                                                                                                                                               |
| <b>Entry Form</b> | MORE                                                                                                                                                                                                                                                                                                                                                |
| <b>Comments</b>   | MORE is a filter that displays information to the screen one screen at a time. By using MORE, you can view data without having to press CTRL-NUM LCK (or CTRL-S) to stop the screen display. MORE sends one screen of data to the output device, then if there is more data, pauses and displays the following message at the bottom of the screen: |

—More—

To continue displaying information, press any key except CTRL-BREAK or CTRL-C.

To hold input information until it is displayed, the MORE command creates a temporary file on the disk. If the disk is full or write protected, the MORE command will not work.

Use CTRL-BREAK or CTRL-C to terminate the MORE command.

The MORE command is used most often with redirection and pipes. For information on using these features, refer to Redirecting Command Input and Output in Chapter 2, "Using MS-DOS."

## MORE *continued*

**Examples** The following command displays the contents of the file *clients.new* one screen at a time:

```
MORE < clients.new
```

The following command displays the same information as the previous example, but it shows how you can pipe the output of an MS-DOS command to the MORE filter:

```
TYPE clients.new | more
```

The following example uses the SORT command to sort, in alphabetical order, the list of names in the file *clients.new*. The sorted list is then piped to MORE, which displays the data one screen at a time.

```
SORT < clients.new | MORE
```

# NOSTACK

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type</b>       | External MS-DOS command.                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Purpose</b>    | Temporarily disables part of MS-DOS so you can run incompatible programs.                                                                                                                                                                                                                                                                                                                                                           |
| <b>Entry Form</b> | NOSTACK                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Comments</b>   | Some application programs (for example, Hayes Smartcom II and The Software Link MultiLink Advanced) may contain code that is incompatible with MS-DOS. If you are having problems using an application program (if the computer temporarily becomes inoperable or displays strange data on the screen), try using NOSTACK to correct the problem. NOSTACK temporarily disables a part of MS-DOS so that you can use these programs. |

If you are experiencing problems with any of your application programs, perform the following steps to try and correct the problem:

1. Press CTRL-ALT-DEL to reset your system and restart MS-DOS.
2. Enter NOSTACK to disable a part of MS-DOS.
3. Restart your program.

If you are still having problems after using NOSTACK, your program is most likely defective.

The easiest way to run these types of programs is through a batch file that executes NOSTACK, then runs the program. The batch file cannot have the same primary filename as the program file because of the order in which MS-DOS recognizes *.com*, *.exe*, and *.bat* files for execution.

## NOSTACK *continued*

### Examples

Assume you have an application program named *spell.com* that will not work correctly unless you first use NOSTACK. To simplify use of the spell program, you could create a batch file named *sp.bat* that contains the following commands:

```
NOSTACK  
spell
```

To run the spell program, you could then enter the name of the batch file, as shown:

```
sp
```

### Reference

Refer to Appendix A, "Batch Processing," for information on creating and using batch files.

# PATH

- Type** Internal MS-DOS command.
- Purpose** Sets and displays the search path(s) that MS-DOS uses to find external commands.
- Entry Forms** `PATH [d:][path][;[d:][path]...]`  
`PATH ;`

Where:

`d:path` is a list of one or more drive and directory path names (separated by semicolons) that MS-DOS searches to find command files (for example, `A;; C:\caleb\games`).

`;` sets a null search path—that is, MS-DOS will only search the working directory for a command file.

**Comments** Use the PATH command to specify a list of directory paths that MS-DOS should search for external command files (`.com`, `.bat`, or `.exe` extension). MS-DOS searches the working directory first, then searches the paths in the order specified in the PATH command.

To display the current search path, enter PATH with no parameters.

If you enter PATH and a semicolon (`;`), MS-DOS sets the search path to null (no search path) and searches only the working directory of the default drive. This is the default search path when you start MS-DOS.

## PATH *continued*

### Note

MS-DOS will not find errors in the PATH command until it searches the paths. If you specify an invalid path or a path that no longer exists, MS-DOS ignores that path and goes on to the next specified path name.

If the file is not found in any of the specified paths or errors are found in the PATH command, MS-DOS displays the following message:

```
Bad command or file name
```

To set the search path each time you start MS-DOS, put the PATH command in your *autoexec.bat* file.

### Examples

The following command tells MS-DOS to search the directories `\user\caleb` and `\user\jessie` on the default drive and `\user\aaroon` on drive B:

```
PATH \user\caleb;\user\jessie;b:\user\aaroon
```

MS-DOS searches the paths in the order specified in the PATH command.

Use the following command to display the name of the current search path:

```
PATH
```

The following command sets a search path for a system with a hard disk (drive C):

```
PATH c:\bin;c:\bin\tools;c:\games
```

# PRINT

- Type** External MS-DOS command.
- Purpose** Prints file(s) while your computer is processing other MS-DOS commands (usually called *background printing*).
- Entry Form** PRINT [[*d:*][*path*][*filename*[*.ext*]][/*x*]...]
- Where:
- d:path* specifies the drive and directory path where the files you want to print are located (for example, *B:\memos*).
- filename.ext* is the name of the file you want to print (for example, *minutes.jun*).
- /x* is one or more switches that specify print format specifications. The switches are discussed in the following section.
- Comments** The PRINT command lets you place up to 32 files in a print queue for background printing. That is, the files are printed on a time-available basis while your computer performs other tasks.
- Once PRINT has been executed and there are files in the print queue, you can alter the contents of the queue without having to enter the entire command sequence again.

## PRINT *continued*

### Print Formatting Switches

The following formatting switches can be used with the PRINT command (most files require no switches to print):

*/A*

Cancels the associated file and all following file specifications (until a */S* switch is encountered) from the print queue.

*/B:n*

Sets the byte size of the internal buffer. The default value is 512 bytes; *n* can be any decimal number up to 16,384. */B* can *only* be used the first time you use the PRINT command after startup.

*/C:n*

Produces *n* copies of the associated file; *n* can be any value in the range 1–255.

*/D:dev*

Names the print device. The default device is PRN. */D* can *only* be used the first time you use the PRINT command after startup and it *must* be the first switch used in the PRINT command line.

*/F*

Sends a form feed to the printer after printing the associated file.

*/L:n*

Sets the left margin for the associated file at the *n*th column.

### */M:n*

Specifies how many clock ticks PRINT is allowed to print on the print device. *n* can be any number in the range 1–255; the default is 2. */M* can *only* be used the first time you use the PRINT command after startup.

### */N:n*

Sets the time-slice value. *n* can be any value in the range 1–255; the default is 8. */N* can *only* be used the first time you use the PRINT command after startup.

### */P:n*

Sets the page length for the associated file at *n* lines.

### */Q:n*

Specifies how many files you can have in the print queue at a time. *n* can be any number in the range 1–32; the default is 10. */Q* can *only* be used the first time you use the PRINT command after startup.

### */R:n*

Sets the right margin for the associated file at the *n*th column.

### */S*

Adds the associated file and all following file specifications (until a */A* switch is encountered) to the print queue.

### */T*

Terminates PRINT by eliminating all files from the print queue.

## PRINT *continued*

*/U:n*

Specifies how long PRINT waits until the print device is available. *n* can be any number in the range 1–255; the default is 1. */U* must precede any filenames and can *only* be used the first time you run PRINT after startup.

No delimiter other than the slash (/) should be used between the filename and associated switch(es). If more than one filename is entered on a command line, each filename and its associated switches are separated from the adjacent ones by a space. When a switch requires a value (number) as part of its entry, a colon must be placed between the switch and the value. For example:

```
PRINT b:mybrief.doc/P:25
```

In this example, the */P* switch sets the page length for *b:mybrief.doc* to 25 lines.

Switches relevant to printing a given file *must follow immediately* after that file; switches cannot be placed at the end of the command line for all files in a series. If you type all switches at the end of the command line when you specify a series of files, they will affect only the printing of the last file in the series.

Default parameters are set in MS-DOS for many print features. You can adjust some parameters at any time by using switches in the PRINT command line. Other parameters can be adjusted only in the first PRINT command line you enter after starting MS-DOS on your system.

## PRINT *continued*

Initial entry switches set the default print device, the print timing mechanisms, and the buffer size. These switches and their default values are: /B:512, /D:PRN, /M:2, /N:8, /Q:10, /U:1. The following sample command line changes the defaults:

```
PRINT /B:640/D:LPT1/M:20/N:16/Q:32/U:10
```

Other switches and file specifications can be entered on the same command line.

Anytime you want to review the contents of the print queue, enter PRINT with no filenames or switches.

Wildcard characters (? or \*) can be used. If you use wildcard characters in a filename and switches are entered following the filename, the switch functions are applied to every file that matches the file specification. You can use up to 121 characters in a PRINT command line.

### Examples

Suppose you have a series of text files on the disk in drive B that you want to print while you continue with other MS-DOS functions.

To print two copies of *letter.ctr* and one copy each of *myfile*, *wom.bat*, and *report.doc*, enter:

```
PRINT b:letter.ctr/C:2/F b:myfile/F  
b:wom.bat/F b:report.doc/F
```

The /F switch following each file specification sends a form feed to the printer after the file is printed so that the next file to be printed starts on a new page.

The first time you run PRINT during a work session, the following prompt is displayed:

```
Name of list device [PRN]:
```

## PRINT *continued*

At this prompt, you can specify any current device as the output device. The default is PRN. To specify the default, press RETURN. To specify another device, type the device name and press RETURN.

After a device is specified, printing begins, and the following is displayed:

```
Resident part of PRINT installed
```

```
B: LETTER .CTR is currently being printed
B: MYFILE .DOC is in queue
B: WOM .BAT is in queue
B: REPORT .DOC is in queue
```

This display changes to reflect the status of files in the queue. When a file has been printed, that file is removed from the top of the list and the next file in the queue is printed.

To review the contents of the print queue at any time, enter PRINT with no filenames or switches. For example:

```
PRINT
```

If there are files in the queue, PRINT displays a list of files in the following form:

```
d:filename.ext is in queue
d:filename.ext is in queue
.
.
.
d:filename.ext is in queue
```

If there are no files in the queue, PRINT displays

```
PRINT queue is empty
```

Once you have run PRINT for a file or files, you can use additional command line entries and switches to add and subtract files from the print queue.

To clear the print queue of all files and end the PRINT command, enter:

```
PRINT /T
```

Also note that you could empty the print queue and put more files in the queue with one command, such as:

```
PRINT /T *.rpt
```

This command clears the print queue, terminates the current PRINT command, then adds all files on the default disk with the extension *.rpt* to the print queue (up to the maximum of 32 files).

# PROMPT

**Type** Internal MS-DOS command.

**Purpose** Changes the MS-DOS system prompt.

**Entry Form** PROMPT [*prompt-text*]

Where:

*prompt-text* specifies the text for the new system prompt. You can use any ASCII characters you like in *prompt-text*.

**Comments** The PROMPT command lets you change the system prompt. If no text is typed with the PROMPT command, the prompt is set to display the default drive name (for example, A>).

You can use the PROMPT command to create special prompts. MS-DOS ignores any spaces between PROMPT and the first alphanumeric character.

## PROMPT *continued*

You can also include any of the following symbols to perform special substitutions in the prompt text you specify. These symbols take the form \$*c*, where \$ is a symbol delimiter and *c* is one of the symbols listed in Table 3.2.

**Table 3.2 special Prompt Symbols**

| Character | Result                                                                                        |
|-----------|-----------------------------------------------------------------------------------------------|
| \$        | Dollar sign (\$)                                                                              |
| -         | CR LF (go to beginning of new line on the screen)                                             |
| b         | Vertical bar (   )                                                                            |
| d         | Current date                                                                                  |
| e         | ASCII code hexadecimal 1B (escape); can be used with ANSI device driver for special functions |
| g         | Greater-than sign (>)                                                                         |
| h         | Backspace; the previous character is erased                                                   |
| l         | Less-than sign (<)                                                                            |
| n         | Default drive                                                                                 |
| p         | Working directory of the default drive                                                        |
| q         | Equal sign (=)                                                                                |
| s         | Space (leading only)                                                                          |
| t         | Current time                                                                                  |
| v         | MS-DOS version number                                                                         |

Any other value for *c* is treated as a null character and is ignored by MS-DOS.

To set a special prompt each time MS-DOS is started, put the PROMPT command in your *autoexec.bat* file.

## PROMPT *continued*

**Examples** You can use the following command to set the prompt to display the drive and working directory:

```
PROMPT $p$g
```

The following command sets the prompt to display the message HELLO:

```
PROMPT HELLO
```

The following command sets a two-line prompt that displays the time and date:

```
PROMPT Time = $t$ _Date = $d
```

The time and date are displayed in the form:

```
Time = (current time)  
Date = (current date)
```

# RENAME

**Type** Internal MS-DOS command.

**Purpose** Renames one or more files.

**Entry Forms** `RENAME [d:][path]sourcefile targetfile`  
`REN [d:][path] sourcefile targetfile`

Where:

*d:path* specifies the drive and directory path where the file you want to rename is located (for example, *b:\memos*).

*sourcefile* is the complete name of the file you want to rename (for example, *myfile.dat*)

*targetfile* is the new name you have chosen for *sourcefile*.

**Comments** Use the RENAME command when you want to change the name of a file. The *sourcefile* is the file whose name you want to change; *targetfile* is the new name.

REN can be used as an abbreviation for RENAME.

You cannot rename files across disk drives. RENAME ignores any drive name that you specify with the new filename. You can use wildcard (? or \*) characters in either option. If wildcard characters appear in the new filename, RENAME does not change the corresponding character positions.

If you omit the drive name, MS-DOS assumes the default drive. If you omit the path, MS-DOS assumes the working directory of the default drive.

## RENAME *continued*

If you try to rename a file to a name that already exists, RENAME displays the message:

```
Duplicate file name or File not found
```

### Examples

The following command changes the name of a file called *chap10.doc* to *part10.doc*:

```
RENAME chap10.doc part10.doc
```

The following command changes the extension of all filenames ending in *.txt* to *.doc*:

```
RENAME *.txt *.doc
```

The following command renames the file *lessons.eng* in the directory *\tutor* on drive B to *english.lsn*:

```
REN b:\tutor\lessons.eng english.lsn
```

The newly renamed file *english.lsn* remains in the *\tutor* directory on drive B.

# RESTORE

**Type** External MS-DOS command.

**Purpose** Restores files that were backed up using the BACK-UP command.

**Entry Forms** RESTORE [?]  
RESTORE *d*:[*path*][*filename*[.ext]] [+ [*d*:][*path*]  
[*filename*[.ext]...]] [/x...]

Where:

? displays a help menu on using RESTORE.

*d*: specifies the drive name where the backed up files are located.

*path* specifies the directory path to where the file(s) you want to restore are located.

*filename.ext* specifies the name of the file you want to restore.

+

is a delimiter used to separate the file names being restored.

/x

is one or more switches that control how the files are restored by RESTORE. These switches are discussed in the following section.

## RESTORE *continued*

**Comments** Files that were backed up to a disk using BACKUP remain unusable as data files until they are recovered from the backup disk with the RESTORE command. RESTORE makes an exact copy of the original files and removes the control information recorded for each file during the backup process.

You can use RESTORE in two ways: with interactive entries you make in response to the RESTORE prompt (>) or with a command line containing all of the filenames and parameters. To use the interactive method, enter RESTORE with no parameters. When the RESTORE prompt (>) is displayed, you can enter command lines of up to 127 characters, including spaces.

### Control Switches

The following switches can be used with RESTORE:

*/B[:date]*

Restores only those files dated on or before the specified date.

*/D[:date]*

Restores only those files dated on or after the specified date.

### Note

The entry form for the date defaults to *mm-dd-yy* unless you executed the COUNTRY command from within the *config.sys* file at startup. See Appendix B, "Configuring Your System," for information on COUNTRY and changing the date format.

`/E:[d:][path]filename.[ext]`

Prevents the specified file(s) from being restored. Separate more than one filename with a plus sign (+).

`/F`

Restores all files to the working directory, regardless of the directory they were in before backup. `/F` does not restore the MS-DOS system files if they are already on the target disk.

`/O`

Restores MS-DOS system files regardless of whether they exist on the target disk.

`/P`

Prompts you to indicate whether you want to restore files that have been marked read-only and whether or not you want to overwrite a more recent version of a file with the backed up file.

`/Q`

Queries you to indicate whether you want to restore each file; press Y (for Yes) or N (for No) for each filename displayed.

`/R`

Prompts you with a bell when your response is needed to complete the command.

`/S`

Globally restores files in all subdirectories as well as the files in the working directory.

## RESTORE *continued*

**/T**

Restores only those files with today's date.

**/V**

Verifies that the files were written to the target disk correctly.

### Default Switch Settings

If you do not use any switches as part of the command line, RESTORE defaults to the following settings:

- You are not queried to indicate whether you want to restore the file(s) being restored. You can change this using the **/Q** switch.
- RESTORE does not verify that the file(s) were written correctly to the destination disk. You can change this using the **/V** switch.

When backup files are stored on several disks, each separate disk is called a *volume* and assigned a volume number, beginning with 1. RESTORE prompts you to change disks as they are restored and displays the names of the files being restored and the drive name to which they are being written. RESTORE displays prompts if any file is duplicated on the source and target disks.

You can use wildcards (? or \*) in RESTORE command lines. Separate multiple filenames in the command line with plus signs (+).

## RESTORE *continued*

If you include the /P switch, RESTORE prompts you as to indicate whether you want to restore files that have been marked read-only or that have been written to since the last backup (meaning the backed up version is no longer the most recent version and that you may overwrite the recent version by restoring the file):

The file *filename* is read-only. Restore it (Y/N)?

Press Y (for Yes) to restore the file; press N (for No) to bypass the file.

If you include the /V switch and RESTORE finds a discrepancy between the backup file and the restored version, it prompts:

Verify error, try restore again (Y/N)?

Press Y (for Yes) to try the restore process again for the file in question. Press N (for No) to abort the restore process for the file and to proceed to the next file.

To exit from the RESTORE command, press RETURN, CTRL-BREAK, or CTRL-C at the command prompt (>).

## RESTORE *continued*

**Examples** To display help on using RESTORE, enter:

```
RESTORE ?
```

The following command restores only those files with extensions of *.rpt* and *.csh* on the backup disk in drive A and writes the files to the current working directory:

```
RESTORE a: c:*.rpt+*.csh/S
```

The /S switch tells RESTORE to search all subdirectories on the backup disk for the specified files.

To use interactive mode, enter:

```
RESTORE
```

In interactive mode, you can enter separate command lines (up to 127 characters each) for the files you want to restore, as shown:

```
>a: c:\games\*.*
```

To restore an entire backup of the hard disk, you would enter:

```
RESTORE a: c:.* /S
```

# RMDIR

- Type** Internal MS-DOS command.
- Purpose** Removes empty directories from a disk.
- Entry Forms** RMDIR [*d:*]*path*  
RD [*d:*]*path*

Where:

*d:* specifies the drive where the directory you want to remove is located.

*path* specifies the pathname of the directory to be removed (for example, `\user\caleb\games`).

- Comments** Use the RMDIR command when you want to remove a directory that is empty. Before you can remove a directory, you *must* delete all of its files and subdirectories.

RD can be used as an abbreviation for RMDIR.

## Note

You cannot remove the current working directory. First use the CHDIR command to change to its parent directory (CHDIR ..), then use RMDIR to remove the unwanted directory.

## RMDIR *continued*

**Examples** Suppose you wanted to remove the subdirectory *games* from the parent directory `\user\caleb` on drive C. First, you would delete all of the files in *games*, as follows:

```
DEL c:\user\caleb\games\*.*
```

Next, you would use RMDIR to delete the directory by entering one of the following:

```
RMDIR c:\user\caleb\games  
RD c:\user\caleb\games
```

If *games* contained subdirectories as well as files, you would first have to remove the subdirectories before *games* could be deleted. To remove the subdirectories, you would perform the same steps as previously described. That is, you would delete all files from each subdirectory, then delete the subdirectory.

# RTCLOCK

**Type** External MS-DOS command.

**Purpose** Sets and reads a real-time clock device.

**Entry Forms** RTCLOCK [?]   
 RTCLOCK [*mm-dd-yy*][*hh:mm:ss*]

Where:

? displays a help screen for using RTCLOCK.

*mm-dd-yy* specifies the date.

*hh:mm:ss* specifies the time.

**Comments** If you have a real-time clock installed in your computer, use the RTCLOCK command to read the current date and set the MS-DOS system clock to that date and time.

You must have a real-time clock installed in your computer to use this command. If you do not have such a device, use the DATE and TIME commands to set the system clock.

To reset the real-time clock, enter RTCLOCK followed by the correct date and/or time. The system clock is also set to the new date and time.

Enter RTCLOCK with no parameters to read the date and time from the real-time clock and set the MS-DOS date and time to those values.

## RTCLOCK *continued*

RTCLOCK only allows you to use certain numbers to specify the date or time. The following numbers can be used for the date:

*mm* = 1-12

*dd* = 1-31

*yy* = 00-99

Date entries can be delimited by hyphens (-) or slashes (/).

Only the last two digits in the year are entered. MS-DOS assumes that the numbers 80–99 represent the years 1980–1999. The numbers 00–79 represent the years 2000–2079.

The following numbers can be used for the time:

*hh* = 0-23

*mm* = 0-59

*ss* = 0-59

Time entries must be delimited by colons (:).

MS-DOS is programmed to change the date appropriately for leap years.

### Examples

If you enter RTCLOCK without specifying a new date or time, the real-time clock's date and time are displayed and the MS-DOS system clock is set.

To change the date or time on the real-time clock, type the RTCLOCK command line with a new date and/or time, or both. For example, you could enter:

```
RTCLOCK 6-16-87 10:56:00
```

## RTCLOCK *continued*

RTCLOCK prompts you to press any key when you are ready to enter the new clock reading. (If you want the time to be precise, you may want to enter the time on the command line a minute or a few seconds ahead of time, then wait until that time occurs before pressing a key.) Your screen will look similar to the following:

```
Press any key to set clock...
```

```
June 16, 1987  10:56:00
```

Press a key when you are ready. MS-DOS displays the new clock reading, and the system prompt appears.

### Reference

Refer to the DATE and TIME commands for information on setting the date and time if your system does not have a real-time clock installed.

# SET

**Type** Internal MS-DOS command.

**Purpose** Sets one string of characters in the environment equal to another string for use in programs.

**Entry Form** SET [*string1* = [*string2*]]

Where:

*string1*, *string2* are strings used within the command processor environment.

**Comments** The SET command is meaningful only if you want to set values that will be used by MS-DOS batch files or by application programs running under MS-DOS. When MS-DOS executes a SET command, it inserts the given string and its equivalent into a part of memory reserved for the command environment. A copy of the environment is made available to all MS-DOS commands and applications. If the string already exists in the environment, it is replaced with the new setting. An application program can check for all values that have been predefined with this command.

When you define a value with SET, that value remains in the command environment until you delete it, redefine it, or turn off your computer.

MS-DOS converts lowercase letters in *string1* to uppercase letters. It does not change *string2*.

If you enter the SET command with no parameters, MS-DOS displays the current environment settings.

If you specify just *string1*, SET removes any existing setting for *string1* from the environment.

You can use the SET command in batch files to define your replaceable parameters by name instead of by number. For example, suppose your batch file contains the following statement:

```
TYPE %file%
```

You can use the SET command to set the name that MS-DOS uses for the replaceable variable `%file%`, thus saving you from having to define the variable each time you run the batch file. In the following command, SET replaces the `%file%` parameter with the filename `taxes.86`:

```
SET file=taxes.86
```

Now, you do not have to edit each batch file to change the replaceable parameter names. Instead, you only have to set `%file%` equal to a new filename. Note that when you use text (instead of a number) as a replaceable parameter, the name must end, as well as begin, with a percent sign.

The SET command is especially useful in an *auto-exec.bat* file, because it lets you automatically set strings or parameters when you start MS-DOS.

## SET *continued*

### Examples

The following command displays the current environment setting:

```
SET
```

You could enter the following command to set the string *include* to *c:\inc* until you change it with another SET command:

```
SET include=c:\inc
```

The following would remove *include = c:\inc* from the environment:

```
SET include
```

You can add any string with the SET command. For example:

```
SET abc=def
```

This command adds the string *ABC = def* to the other strings in the environment. This makes it possible for you to type keywords and parameters meaningless to MS-DOS, but of use to application programs designed to use the environment.

# SHIP

**Type** External MS-DOS command.

**Purpose** Moves the read and write heads of a hard disk to a position where they cannot destroy stored data if they are damaged while moving the computer.

**Entry Form** SHIP

**Comments** Files stored on a hard disk are vulnerable to damage from contact with the read and write heads. To protect your files, you should take special precautions before you ship or physically move your computer.

SHIP protects your disk surface by moving the read and write heads away from the data storage area of the disk. In this position, called the *shipping cylinder*, the heads and disk platter are less prone to damage from vibration or contact.

## Note

The hard disk controller card moves the read and write heads to cylinder 0 the first time you access the hard disk after power-up. Therefore, after you use SHIP, the heads remain near the hub only until you turn the computer on again and access the disk.

## SHIP *continued*

After you enter the SHIP command, the following message displays:

```
Heads moved to shipping cylinder.  
Turn off your computer and  
prepare it for shipping.
```

Your computer is ready to be moved as soon as the power is turned off. The heads will remain at the shipping cylinder while you move the computer.

**Example** To prepare the hard disk for safe movement, enter:

```
SHIP
```

# SORT

**Type** External MS-DOS command.

**Purpose** Reads data from the standard input device, alphabetically and numerically sorts the data, then writes the sorted data to the standard output device.

**Entry Form** SORT [/R][/+*n*]

Where:

*/R* reverses the sort (for example, from Z to A rather than A to Z or from 100 to 0 rather than 0 to 100).

*/+n* sorts the file beginning with column *n*. If you do not specify *n*, the sort begins with column 1.

**Comments** SORT is a filter that can be used to alphabetically and numerically sort a file's contents. The largest file that you can sort is 64,514 bytes.

Filename can be used in the command line to specify input and output files. When sorting from and to files, the output filename can be the same as the input filename.

When sorting alphanumeric text, SORT lists the numeric text first followed by the alphabetical text. The following output shows the order of precedence SORT uses:

```
1
2
2a
a
b1
b
```

## **SORT** *continued*

SORT is most often used with pipes and redirection. (See Redirecting Command Input and Output in Chapter 2, "Using MS-DOS," for more information.)

### **Note**

The SORT command does not distinguish between uppercase and lowercase letters.

### **Examples**

The following command reads the file *expenses.txt*, sorts it in reverse order, and writes the output to a file named *budget.txt*:

```
SORT /R < expenses.txt > budget.txt
```

The following command pipes the output of the DIR command to the SORT filter. SORT then sorts the directory listing starting with column 14 (the column in the directory listing that contains the file size) and sends the output to the screen. The result is a directory display, sorted by file size:

```
DIR | SORT /+ 14
```

The next sample command does the same thing as the previous one, except that the MORE filter gives you a chance to read the sorted directory one screenful at a time:

```
DIR | SORT /+ 14 | MORE
```

### **Reference**

Refer to the MORE command for information on piping the output of commands to the MORE filter.

- Type** External MS-DOS command.
- Purpose** Transfers MS-DOS system files from the disk in the default drive to the disk in the specified drive.
- Entry Form** SYS *d*:
- Where:
- d*: specifies the drive containing the disk to which you are transferring the system files.
- Comments** Use the SYS command when you want to copy the two MS-DOS hidden system files from the disk in the default drive to a disk in the specified drive. This command is useful when you want to update MS-DOS or place it on a blank disk that has space allocated for the MS-DOS system files.
- You must enter a drive name for the target disk. The target disk must be either formatted and completely blank or already contain the MS-DOS system files.
- The MS-DOS system files are hidden files that do not appear when you type the DIR command.
- SYS does not transfer the *command.com* file (the command processor). To transfer *command.com* to the target disk, use the COPY command.

## **SYS** *continued*

**Examples** The following command copies the MS-DOS system files to a disk in drive B that has been formatted to accept them (using `FORMAT /S` or `FORMAT /B`):

```
SYS b:
```

**Reference** Refer to the `FORMAT` command for information on formatting a disk in a manner that allows you to later use the `SYS` command to transfer system files to the disk.

**Type** Internal MS-DOS command.

**Purpose** Displays and sets the time.

**Entry Form** TIME [*hh:mm[:ss[.cc]]*]

Where:

*hh* specifies the hours and is a number in the range 0–23.

*mm* specifies the minutes and is a number in the range 0–59.

*ss* specifies the seconds and is a number in the range 0–59.

*cc* specifies hundredths of a second and is a number in the range 0–99.

**Comments** Use the TIME command when you want to display or change the time. MS-DOS logs the time when you create or update a file, then displays the time of the last update when you do a directory listing (see the DIR command).

In the listing, the time is displayed in a conventional format (for example, 10:27a) even though it must be entered in a 24-hour (military) clock format. The clock does not start over again when it reaches noon. That is, 1 p.m. is 13 hours, 2 p.m. is 14 hours, and so on. At midnight, the clock starts over at 00 hours.

If you enter the TIME command by itself, MS-DOS displays the current time and prompts you for the new time.

## TIME *continued*

Separate the hour and minute entries by a colon. You do not have to type the seconds or hundredths of seconds, but if you do, you must use a colon as a delimiter for seconds and a period as a delimiter for hundredths of a second.

As with the DATE command, you can change the TIME display format by changing the COUNTRY command in the *config.sys* file. Refer to Appendix B, "Configuring Your System," for more information on the COUNTRY command.

### Note

If your computer has a real-time clock installed, the TIME command only sets the time MS-DOS uses. Use the RTCLOCK command to set the real-time clock.

### Examples

To display the current time, enter:

```
TIME
```

In response, MS-DOS displays a message in the following form:

```
Current time is hh:mm:ss.cc  
Enter new time:
```

Press RETURN if you do not want to change the time.

To change the time, type the time and press RETURN. If you enter an invalid time, MS-DOS displays the following message and waits for you to enter a valid time:

```
Invalid time  
Enter new time:
```

## TIME *continued*

To change the time without first displaying the current time, you could enter:

```
TIME 10:27:35
```

### Reference

Refer to the RTCLOCK command for information on setting the time and date for a real-time clock if you have one installed in your system.

# TYPE

**Type** Internal MS-DOS command.

**Purpose** Displays the contents of a text file to the screen.

**Entry Form** TYPE [*d:*][*path*]*filename*[*.ext*]

Where:

*d:path* specifies the drive and directory path where the file you want to display is located (for example, *c:\games*).

*filename.ext* is the name of the file you want to look at (for example, *sales.jun*).

**Comments** Use the TYPE command when you want to look at a text file without modifying it.

TYPE displays the contents of the text file on the screen. Press CTRL-NUM LOCK or CTRL-S to stop the display so you can read it. Press any key other than CTRL-BREAK or CTRL-C to resume the display.

## Note

When you use TYPE to display a file containing tabs, all the tabs are expanded to the next eight-space tab stop.

If you try to display a binary file, you may see strange characters on the screen, including bell and form feed characters and escape sequences.

### Examples

To display the contents of a file called *clients.lst*, you could enter the following command:

```
TYPE clients.lst
```

The following command displays the same information as the previous command, except that it pipes the file contents through the MORE filter, which displays the data one screen at a time:

```
TYPE clients.lst | MORE
```

### Reference

Refer to the MORE command for information on piping the output of a command to the screen one screenful at a time.

# VER

**Type** Internal MS-DOS command.

**Purpose** Displays the MS-DOS version number.

**Entry Form** VER

**Comments** Use the VER command to display the version number of MS-DOS. The display shows a one-digit major version number, a period, and a two-digit minor revision number.

**Examples** The following command displays the MS-DOS version number:

```
VER
```

In response, MS-DOS displays a message similar to the following:

```
BIOS Version 3.xx  
MS-DOS Version 3.xx
```

where *xx* is the minor revision number.

# VERIFY

**Type** Internal MS-DOS command.

**Purpose** Turns the write verification switch on or off.

**Entry Forms** VERIFY [ON | OFF]

Where:

ON turns on the VERIFY switch.

OFF turns off the VERIFY switch. This is the default setting when you start MS-DOS.

**Comments** Setting VERIFY to ON verifies that your files are written correctly to the disk (no bad sectors, for example). When ON, MS-DOS performs a verification each time you write data to a disk. You will receive an error message only if MS-DOS is unable to successfully write your data to a disk.

When VERIFY is set to ON, it takes more time for your write operations to complete. However, you may want to consider using this command if the data you are writing to your disks is important and you need to verify that it was written correctly from within your programs.

Once you set VERIFY to ON, it remains on until you turn it off with the VERIFY OFF command or with a SET VERIFY system call from within an application program.

Enter VERIFY with no parameters to display the current setting of VERIFY.

## VERIFY *continued*

To execute VERIFY ON automatically each time you start MS-DOS, put the command in your *auto-exec.bat* file.

### Examples

To display the current setting for VERIFY, enter:

```
VERIFY
```

To verify disk write operations, enter:

```
VERIFY ON
```

- Type** Internal MS-DOS command.
- Purpose** Displays disk volume label or volume ID, if it exists.
- Entry Form** VOL [*d*:]
- Where:
- d*: specifies the drive containing the disk for which you want the volume label.
- Comments** Use the VOL command to display the disk volume label of the disk in the specified drive. (Use the DIR command to display the names of the files and sub-directories on a disk.) If you do not specify a drive name, MS-DOS displays the volume label of the disk in the default drive.
- Examples** To display the volume label for the disk in the drive B, enter:
- ```
VOL b:
```
- Suppose the disk had the volume label *games*. MS-DOS would display a message similar to the following:
- ```
Volume in drive B is GAMES
```
- Reference** Refer to the FORMAT command for information on creating a volume label when you format a disk.

## ZCOM

- Type** External MS-DOS command.
- Purpose** Transfers files between two computers using direct serial communications or modems.
- Entry Forms** There are three different entry forms for ZCOM. Each is discussed in the following section.
- Comments** ZCOM provides a simple method for transferring files between two computers, either at high speeds, using direct serial communications, or at low speeds, using a modem. ZCOM is especially useful when you want to transfer files from one computer to another that has different storage media (for example, from a 5.25-inch disk to a 3.5-inch disk).

Both computers must be running ZCOM. In addition, one of the two computers must run ZCOM in the *server mode*. This computer runs unattended, allowing easy modem transfers. The other computer runs ZCOM in the *user mode* (that is, you enter commands from this computer).

It is important that both computers use the same baud rate. You can use the MODE command (see MODE, earlier in this chapter) to set the baud rates on each computer, or you can use the SCAN command of ZCOM on the user computer to match the baud rate of the server. SCAN must be entered before you enter any other ZCOM command.

### Displaying a Help Menu

To see a help menu on using ZCOM commands, enter:

```
ZCOM ?
```

A list of valid commands and their entry forms are displayed. You can request help at any time.

### Setting up a Computer as a Server

A *server* is a computer that is set up to run unattended. You can send files to and receive files from the server by using a modem or by direct serial communications. The entry form for configuring a computer in server mode is as follows:

```
ZCOM SERVER [/2][/P][/M]
```

Where:

- /2 specifies COM2 as the serial port to be used for serial communications (the default is COM1).
- /M initializes the server for use with a Hayes-compatible modem. When you use this switch, the server initializes the modem for autoanswer, 300-baud operation and then waits for a connect signal from the modem before beginning normal operation. If the modem loses its carrier, the phone is disconnected.
- /P initializes the server with a password. The same password must be included as part of the PASSWORD command at the user computer before files on the server computer can be accessed. This keeps unauthorized persons from gaining access to the server.

The following message is displayed once the server is successfully initialized:

```
Entering SERVER mode ...
```

## ZCOM *continued*

You can terminate ZCOM at either the user or the server system . To end ZCOM from the server and return control of the computer to MS-DOS, press ESC on the server's keyboard. To end ZCOM from the user, enter an ABORT command at the keyboard.

### Setting up a Computer as a User

To start ZCOM and configure a computer for user mode, enter a command in the following form:

```
ZCOM [/2]
```

Where:

/2 specifies serial port COM2 (the default is COM1).

ZCOM displays an asterisk (\*) as its prompt when it is ready to accept commands from the keyboard.

The following ZCOM commands can be entered at the user computer.

| Command | Description                                                                                                                                           |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| ?       | Displays a help menu of ZCOM commands.                                                                                                                |
| ABORT   | This command is similar to the QUIT command, but also ends ZCOM on the server computer.<br><br>The letter A can be used as an abbreviation for ABORT. |

**Command**BAUD [*value*]**Description**

Sets the baud rate of the communications port if a *value* is given. The current baud rate is reported. This command also attempts to inform the server of the change in baud rate (before actually changing it). A warning message displays if the server does not acknowledge the change. Common baud rates include 300, 1200, 2400, and 9600. Baud rates above 9600 may or may not work, depending on your systems, and are not recommended for use.

The letter *B* can be used as an abbreviation for BAUD.

CONNECT *phone-number*

Initializes a Hayes-compatible modem, dials the number listed, then waits for a connection. If the current baud rate is not 2400, 1200, 600, or 300, CONNECT warns the user and prompts

Are you sure?

**Command**

**Description**

DISCONNECT

If you are using a pulse-only phone line that cannot use touch-tone dialing, type a P before the phone number to indicate pulse dialing.

The letter *C* can be used as an abbreviation for CONNECT.

If a CONNECT command was previously issued and the modem is currently connected, the connection between the two computers is broken.

The letter *D* can be used as an abbreviation for DISCONNECT.

FILES [*d:*][*path*]*filename*[.ext]

Lists the files on the server with names matching *filename*. Wildcard characters are allowed. If no drive or directory path is specified with *filename*, then all of the files matching *filename* in the server's working directory are displayed.

The letter *F* can be used as an abbreviation for FILES.

**Command**

PASSWORD

**Description**

Prompts you for a password, then sends it to the server. If the server has been started with the */P* switch, then the password command must be sent before access to the server is allowed.

The letter *P* can be used as an abbreviation for PASSWORD.

RECEIVE [*d:*][*path*]*filename*[*.ext*]

Copies the server files matching *filename* from the specified drive and path to the working directory of the user. If no drive or path is specified with *filename*, the files are assumed to be in the working directory of the server. Wildcard characters are allowed. If you press ESC while receiving files, the copy operation is aborted.

The letter *R* can be used as an abbreviation for RECEIVE.

**Command**

SCAN

**Description**

Scans all common baud rates until it matches the baud rate at which the server is running. The user is then set to this baud rate. This command is useful in direct connection schemes when the baud rate of the server is not known.

The letter *S* can be used as an abbreviation for SCAN.

TRANSMIT [*d:path*]*filename*[.ext]

Copies the files matching *filename* from the specified drive and directory path of the user's computer into the working directory of the server. If no drive or path is specified with *filename*, the working directory is assumed. The server strips pathnames from files and stores the files in the server's working directory. Wildcard characters are allowed in *filename*. If you press ESC while sending files, the process is aborted.

The letter *T* can be used as an abbreviation for TRANSMIT.

**Command****Description****QUIT**

Terminates ZCOM on the user computer and returns control to MS-DOS. The server computer is informed of the user exit so that it can reset its password control if /P was used. The server does not exit back to MS-DOS, but remains active.

The letter *Q* can be used as an abbreviation for QUIT.

**Examples**

Suppose you want to transfer files between a computer that has 5.25-inch disk drives and your computer, which has 3.5-inch disk drives. The following provides a step-by-step approach to transferring files between the two computers using direct serial communications.

**Note**

Before you can transmit files between the two computers, you will need a compatible RS-232C serial cable (see your dealer). The cable is used to connect the two computers together at their serial ports.

**To configure the server:**

1. Set up the computer with the 5.25-inch drives as the server. Turn on the computer and start MS-DOS. Connect one end of the serial cable to the COM1 serial port.

## ZCOM *continued*

2. Use the MODE command to set the baud rate at 9600 (a common baud rate for direct-connect file transfers). Enter:

```
MODE COM1:9600
```

3. Start ZCOM on the computer by entering:

```
ZCOM SERVER
```

4. The following message displays after ZCOM has been started:

```
Entering SERVER mode...
```

The server is now configured to run at 9600 baud and use serial port COM1. No password is required to access files from this computer.

If you wanted to set the server up with password rights, you could enter the following:

```
ZCOM SERVER /P
```

ZCOM would then prompt you to enter a password. Enter the password you have chosen.

ZCOM prompt prompts you for the password again to verify you specified the right password. Enter the password again. Make sure you enter the same password as you did at the first password prompt.

### To configure the user:

1. Turn on the eaZy pc computer and start MS-DOS.

2. Use the MODE command to configure the modem/serial card as a standard serial port:

```
MODE MODEM OFF
```

3. Connect one end of the serial cable to the COM1 serial port.

4. Use the MODE command to configure the computer to send and receive data at 9600 baud. Enter:

```
MODE COM1: 9600
```

5. Start ZCOM on the user computer by entering:

```
ZCOM
```

ZCOM returns the asterisk (\*) prompt signalling you that it is ready for you to enter commands.

6. To obtain a help screen of ZCOM commands, enter:

```
ZCOM ?
```

If you had set up the server with a password, you would have to enter the PASSWORD command before you could access the server, as follows:

```
PASSWORD
```

ZCOM would prompt you for the password. Enter the same password that was entered at the server. If a different password is given, access to the server is denied. Once access is allowed, you can use ZCOM commands to list, receive, and send files.

7. To see a listing of the files in the working directory on the server's default drive, enter:

```
FILES *.*
```

Entering FILES with no parameters displays a listing of all files and subdirectories in the working directory. To display a listing for a particular directory or file, specify its name with the FILES command. For example, to see a listing of files with the extension *.rpt*, you would enter:

```
FILES *.rpt
```

8. To display a listing of files on the disk in drive B of the server, enter:

```
FILES b: *.*
```

9. Suppose the server has a file called *clients.lst* on the disk in the default drive. To transfer this file to your working directory, you could enter:

```
RECEIVE clients.lst
```

10. To copy all of the files from the disk in the server's default drive to your working directory, enter:

```
RECEIVE *.*
```

11. To copy all of the files on the disk in drive B of the user to the working directory of the server, enter:

```
TRANSMIT b:*.*
```

12. To quit ZCOM and return control to MS-DOS on both the server and user, enter:

```
ABORT
```

# APPENDIX A

## BATCH PROCESSING

---

### Overview

This appendix describes the MS-DOS batch processing commands and presents examples of using batch procedures. In this appendix, you will learn:

- How to create a batch file
- How an *autoexec.bat* file works
- How to use replaceable parameters in a batch file
- How to run a batch file

#### Note

If you are not writing batch procedures, you do not need to read this chapter. However, the information presented on using an *autoexec.bat* file is helpful because it shows you how you can automatically execute MS-DOS commands at startup.

### Using Batch Files

You may often find yourself repeatedly typing the same sequence of commands to perform a common task. With MS-DOS, you can put this command sequence into a special file called a *batch file*, then execute the whole sequence of commands by typing the name of the batch file.

## Note

Batch files can have any name you want; however, they must have a filename extension of *.bat* (for example, *mybatch.bat*). You do not need to type the batch file's extension to execute the batch file. For example, to run a batch file called *mybatch.bat*, you can type *mybatch* and press RETURN.

MS-DOS executes the commands in batch files just as if you had typed them from the keyboard. This is called *batch processing*. By using a batch file, you only have to remember and type one command instead of several. In effect, you use batch files to create personalized commands.

## Creating Batch Files

You can create a batch file by using any text editor or by using the COPY command. The examples in this appendix show you how to use the COPY command to create batch files.

Suppose, for example, that you want to create a batch file to format and check a new disk. The following steps explain how to create the batch file. The batch file will be created on the disk in the default drive. Note that MS-DOS must have access to the FORMAT and CHKDSK command files when you run the batch file. (This example assumes they are on the same disk as the batch file.)

1. Use the COPY command to copy console input (what you type in from the keyboard) to the batch file. Type the following at the system prompt and press RETURN:

```
COPY CON checknew.bat
```

2. Type the following lines, pressing RETURN after each line except the last:

```
REM This is a file to format and  
REM check new disks.  
REM It is named CHECKNEW.BAT.  
FORMAT b: /V  
CHKDSK b:
```

3. After the last line (CHKDSK b:), press CTRL-Z and RETURN to save the batch file.

MS-DOS displays the following message to indicate that it created the file:

```
1File(s) copied
```

4. To execute the batch file, insert the blank disk you want to format in drive B, then enter the name of the batch file:

```
checknew
```

The result is the same as if the lines in the batch file were entered from the keyboard as individual commands.

## Guidelines for Batch Processing

Keep the following in mind when using batch files with MS-DOS:

- You must name each batch file with an extension of *.bat*.
- To execute a batch file, you need enter only its filename and not its extension.
- If you press CTRL-BREAK or CTRL-C while the batch file is running, MS-DOS asks you if you want to terminate the batch file. You can press N (for No) and the batch file will continue executing, or you can press Y (for Yes) to terminate processing.

- If you remove the disk that contains a batch file being run, MS-DOS prompts you to reinsert the disk so that it can continue processing the file.
- You can specify the name of another batch file as the last command in a batch file. With this feature, you can “chain” from one batch file to another when the first has finished.
- You can use pipes ( | ) or any of the redirection symbols (<, >, or >>) in a batch file. See Redirecting Command Input and Output in Chapter 2, “Using MS-DOS,” for more information on using these symbols.
- Changing the working directory or default drive affects every subsequent command in the batch file.
- Setting environment strings from within a batch file affects every subsequent command in the batch file.

#### Note

If you have more than one external command file with the same name, MS-DOS will run only one of them, according to the following order of precedence: *.com*, *.exe*, *.bat*.

Suppose, for example, that your disk includes the files *format.com* and *format.bat*. If you were to enter `FORMAT`, MS-DOS would always run the program *format.com*. To run the batch file *format.bat*, you would have to place it in a separate directory and specify the path along with the batch file's name.

## Using an Autoexec.bat File

With an *autoexec.bat* file, you can run programs automatically when you start MS-DOS. Such a file can be useful when you want to run a specific application under MS-DOS and when you want MS-DOS to execute certain commands each time you start your computer. By using an *autoexec.bat* file, you can accomplish these tasks at startup without having to manually enter a set series of MS-DOS commands.

When you start your computer, MS-DOS searches the root directory of the system disk for the *autoexec.bat* file. If the *autoexec.bat* file is found, MS-DOS immediately processes it.

### Note

MS-DOS does not prompt you for the date and time unless you include the DATE and TIME commands in your *autoexec.bat* file. It is a good idea to add these two commands to your *autoexec.bat* file, since MS-DOS uses this information to keep your directory current. See Chapter 3, "MS-DOS Commands," for more information on the DATE and TIME commands.

Figure A.1 shows what happens when you start MS-DOS:

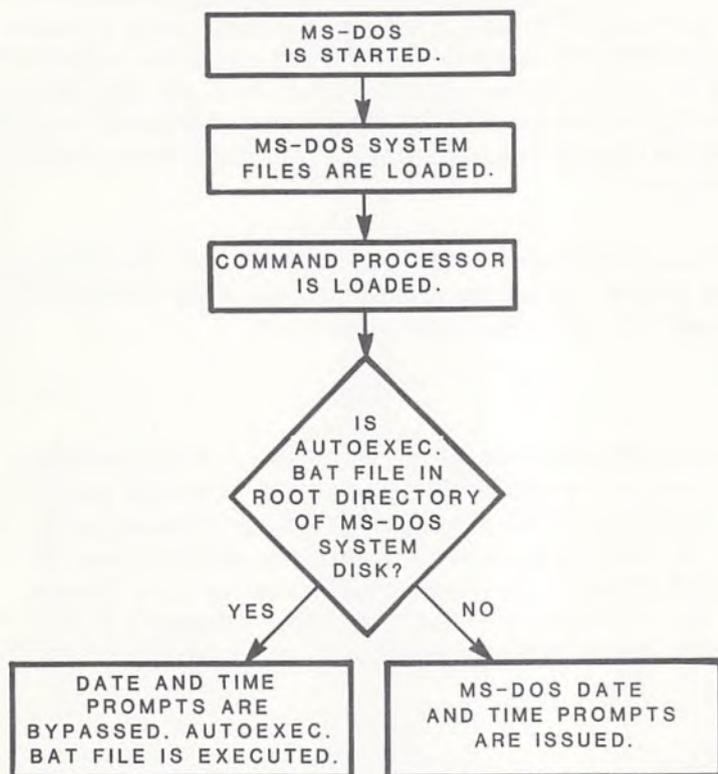


Figure A.1. MS-DOS Startup Sequence

## Creating an Autoexec.bat File

There are many commands you can include in an *autoexec.bat* file to help you use MS-DOS more efficiently. For instance, you will probably want to set the time and date, set up your external command search path, configure your printer port, and specify any other options that you plan to use on a regular basis.

The following is a sample *autoexec.bat* file that you may find useful to run each time you start MS-DOS. MS-DOS displays the lines starting with REM (short for REMARK) as the batch file is executed. Placing these lines in your files makes it easy for you to remember what the batch file does.

To create the file, use the COPY command to copy keyboard input to the *autoexec.bat* file. Note that you must put the *autoexec.bat* file in the root directory on your MS-DOS disk. Type the following and press RETURN:

```
COPY CON autoexec.bat
```

Type the following lines, pressing RETURN after each line except the last:

```
REM Set the date and time
DATE
TIME
REM Set up the search path
PATH=a:\;b:\
REM Set prompt to display drive and working directory
PROMPT $p$g
REM Clear the screen
CLS
```

After the last line, press CTRL-Z and RETURN to save these lines in the *autoexec.bat* file.

Once your *autoexec.bat* file is created as described, MS-DOS will ask you to enter the date and time, set your command search path, then set your prompt to display the default drive and directory each time you boot your system. Finally, MS-DOS will clear the screen before displaying the system prompt indicating it is ready to accept commands from you.

## Creating a Batch File with Replaceable Parameters

There may be times when you want to create a program and run it with different sets of data. These sets may be stored in various MS-DOS files.

With MS-DOS, you can create a batch file with replaceable (dummy) parameters, where a parameter is a command option that you define. These parameters, named %0–%9, hold the place for the values that you supply when you give the batch command. Replaceable parameters make batch files more flexible and easy to use.

The following example illustrates using replaceable parameters to create and run a batch file. The file uses the TYPE command and the MORE filter to display files one screenful at a time:

Use COPY to create the batch file. Type the following and press RETURN after each line:

```
COPY CON examine.bat
FOR %%A IN (%1%2%3) DO TYPE %%A | MORE
```

After the last line, press CTRL-Z and RETURN to save the file.

To execute the file, enter in the name of the batch file followed by the names of the files you want to look at. For example:

```
examine memos.jun sales.jun bills.jun
```

This batch file says: for each parameter specified in the set, let the variable %%A represent one of the set (the filenames) and DO the specified command (TYPE *filename* | MORE) on %%A. The first time through, *memos.jun* becomes the value of %%A, *sales.jun* is next, and *bills.jun* after that. This one command is equivalent to entering the following three commands:

```
TYPE memos.jun | MORE
TYPE sales.jun | MORE
TYPE bills.jun | MORE
```

### Note

You can specify up to 10 replaceable parameters (%0–%9). If you want to specify more than 10, use the SHIFT command. Refer to SHIFT, later in this appendix for information on using more than 10 parameters.

If you use the percent sign as part of a filename within a batch file, you must type it twice. For example, to specify the file *abc%.exe*, you must type it as *abc%%.exe* in the batch file.

The following example batch file is used to concatenate three files into one file, sort the file, and then print the sorted file.

```
COPY CON sorter.bat
COPY %1+%2+%3 %4
SORT <%4 >%4
PRINT %4
```

To execute the batch file, enter the name of the batch file with the names you want to substitute for the parameters. For example:

```
sorter clients.jan clients.feb clients.mar clients.qtr
```

The batch file joins the three files together (concatenates) and places them in the fourth file, sorts the file, and then prints this file for you.

## Using Temporary Files

When using batch files, you often may want to use a temporary file to hold your work. You could use the same name each time you wanted to use a temporary file.

However, if you have more than one batch file using the same temporary file, you might lose the contents of the temporary file. To avoid this problem, you should use a replaceable parameter to specify the name of the temporary file. Then each time you run the batch file, you will be able to substitute a unique filename and not have to worry about information from one batch file getting into another.

It is also a good idea to delete temporary files once you finish using them to avoid taking up space on your disk.

## Batch Processing Commands

This section describes the MS-DOS batch commands. These commands can be executed outside of a batch file. However, you will find that they are most useful in batch files, where they add power and flexibility to your batch processing.

The following batch commands are discussed in the remainder of this appendix.

| Command | Description                                                                              |
|---------|------------------------------------------------------------------------------------------|
| ECHO    | Lets you display (or not display) MS-DOS commands on the screen during batch processing. |
| FOR     | Lets you repeat a command for a set of files.                                            |
| GOTO    | Processes commands starting with the line after the specified label.                     |
| IF      | Lets you specify the conditions under which MS-DOS commands are executed.                |

**PAUSE**

Temporarily stops execution of a batch file.

**REM**

Displays a comment in a batch file.

**SHIFT**

Lets you enter more than 10 replaceable parameters in a batch process.

# ECHO

**Type** Internal MS-DOS command.

**Purpose** Lets you display (or not display) MS-DOS commands on the screen during batch processing.

**Entry Form** ECHO [ON | OFF | *message*]

Where:

ON turns on the display of commands to the screen as they are executed.

OFF turns off the display of commands to the screen.

*message* is a line of text that is displayed with the ECHO command.

**Comments** Normally, each command in a batch file is displayed (echoed) on the screen when it is executed by MS-DOS. You can turn this feature off by using the OFF option with the ECHO command. Similarly, you can turn echo back on by using the ON option.

If you enter ECHO with no parameter, the current setting is displayed.

The command ECHO *message* is only useful if ECHO is OFF and you are using a batch file. This form of ECHO lets you print messages on your screen while your batch file is executing. You can also put several ECHO *message* commands in your batch file to display a message that is several lines in length.

**Examples**

The following example turns ECHO off:

```
ECHO OFF
```

The following is an example of using ECHO to display a batch file message of more than one line:

```
ECHO OFF  
ECHO This batch file  
ECHO formats and checks  
ECHO new disks.
```

# FOR

## Type

Internal MS-DOS command.

## Purpose

Lets you repeat a command for a set of files.

## Entry Form

FOR %%*c* IN *set* DO *command* %%*c*

Where:

*c* can be any character except number in the range 0–9.

*set* is one of the following parameters:

*filename.ext*

specifies the name of a file in the working directory of the default drive (for example, *lessons.mth*).

*pathname*

specifies the complete pathname of a file (for example, *b:\school\studies\lesson.mth*).

*command* specifies any valid MS-DOS command you want to run on *set*.

## Comments

The FOR command sequentially sets the *c* variable to each member of *set*, and uses the variable to execute *command*. If a member of *set* is an expression including a wildcard (\* or ?), then the variable is set to each matching file from the disk.

To avoid confusion with the %0–%9 batch parameters, the variable *c* can be any character except 0–9. You must use two percent signs (%%) in batch files so FOR can distinguish it from one of the replaceable parameters.

Only one FOR command can be specified per command line.

If you are using the FOR command outside of a batch file, use only one percent sign.

For examples of using the FOR command at the system prompt, see the FOR command in Chapter 3, "MS-DOS Commands."

### Examples

The following command replaces the variable *f* with the files ending with *.lst* in the working directory and prints the files.

```
FOR %%f IN (*.lst) DO PRINT %%f
```

The following example replaces the variable *f* with the files named *report*, *memo*, and *address*. It then deletes each of these files:

```
FOR %%f IN (report memo address) DO DEL %%f
```

# GOTO

**Type** Internal MS-DOS command.

**Purpose** Executes commands starting with the line after the specified label.

**Entry Form** GOTO *label*

Where:

*label* identifies the line in the batch file where execution is to begin.

**Comments** GOTO lets you take commands from the batch file beginning with the line after the specified *label*. If the label does not exist in the batch file, the batch file stops executing.

Labels must begin with a colon (:). Labels cannot have spaces, semicolons, or equal signs as part of their name. Only the first eight characters of a label are significant; MS-DOS ignores all other characters. Be careful not to use the same label twice in your batch file. MS-DOS ignores all lines beginning with a colon during batch processing.

**Examples** The following batch file executes the line after *:end* only if no errors occur while formatting a disk in drive A.

```
ECHO OFF
FORMAT a:/S
IF ERRORLEVEL 0 GOTO end
ECHO An error occurred during format-
ting.
GOTO done
:end
ECHO End of batch file.
:done
ECHO ON
```

|            |                                                                                                                                                                                                                                                                                                                       |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type       | Internal MS-DOS command.                                                                                                                                                                                                                                                                                              |
| Purpose    | Performs a command based on the result of a condition.                                                                                                                                                                                                                                                                |
| Entry Form | IF [NOT] ERRORLEVEL <i>number</i> <i>command</i><br>IF [NOT] " <i>string1</i> " = " <i>string2</i> " <i>command</i><br>IF [NOT] EXIST [ <i>d:</i> ][ <i>path</i> ] <i>filename</i> [ <i>.ext</i> ] <i>command</i>                                                                                                     |
|            | Where:                                                                                                                                                                                                                                                                                                                |
|            | NOT causes the command to be executed only if the following condition is false.                                                                                                                                                                                                                                       |
|            | ERRORLEVEL <i>number</i> causes the <i>command</i> to be executed only if the previous program executed by <i>command.com</i> (the MS-DOS command processor) had an exit code equal to <i>number</i> or higher. You can use this condition to perform other tasks that are based on the previous program's exit code. |

`"string1" = "string2"`

If you specify the NOT parameter, the exit code *must* be less than the specified number in order for the *command* to be executed.

causes *command* to be executed only if *string1* matches *string2*. The strings must be enclosed in quotation marks. If you specify the NOT parameter, the two strings must *not* match in order for the *command* to be executed.

`EXIST [d:][path]filename[.ext]`

causes the *command* to be executed only if *filename* exists. If you specify the NOT parameter, the file must *not* exist in order for the *command* to be executed. You can use wildcard characters (? or \*) in *filename*.

**Comments**

The IF statement allows conditional execution of a command. When the specified condition is true, MS-DOS executes the command; otherwise, it ignores the command.

You can use replaceable parameters with the IF command as variables to be replaced with specific values at the time of the batch file's execution.

The case of strings is significant. Lowercase strings match only lowercase strings, and uppercase strings match only uppercase strings.

**Examples**

The following command displays the message "Can't find" if the *product.dat* file does not exist on the disk:

```
IF NOT EXIST product.dat ECHO Can't find
```

The following example prints the message "How are you?" if the string represented by the replaceable variable %1 matches the string Hello:

```
IF "%1" = "Hello"  
ECHO How are you?
```

The following batch file executes the line after *:end* only if no errors occur while formatting a disk in drive A.

```
ECHO OFF  
FORMAT a: /S  
IF ERRORLEVEL 0 GOTO end  
ECHO An error occurred during formatting.  
GOTO done  
:end  
ECHO End of batch file.  
:done  
ECHO ON
```

# PAUSE

**Type** Internal MS-DOS command.

**Purpose** Temporarily stops execution of a batch file.

**Entry Form** PAUSE [*comment*]

Where:

*comment* is any string of characters you want displayed when processing is suspended. You can specify a string of characters up to 121 characters long.

**Comments** When a batch file is running, you may need to change disks, display messages, or perform some other action. The PAUSE command suspends execution of the batch file. To resume execution, press any key *except* CTRL-BREAK or CTRL-C (these keys halt processing).

When the command processor encounters PAUSE, it displays a message in the following form:

```
PAUSE comment
Strike a key when ready ...
```

The *comment* parameter is useful when you want to display a special message. Unless ECHO is OFF, PAUSE displays the comment before the message instructing you to press any key to continue.

The PAUSE command does not display the *comment* line if ECHO is OFF.

If you press CTRL-BREAK or CTRL-C while processing is suspended, MS-DOS displays the following message:

```
Terminate batch job (Y/N)?
```

If you press Y (for Yes), the batch file ends and control returns to the MS-DOS. Therefore, you can use PAUSE to divide a batch file into pieces that allow you to end batch processing at any intermediate point.

### Examples

Suppose you want a program to display a message that asks the user to change disks in one of the drives. To do this you might use the following command:

```
PAUSE Please put a new disk into drive A
```

If ECHO is ON, the following message is displayed when the batch file is executed:

```
PAUSE Please put a new disk into drive A  
Strike a key when ready ...
```

# REM

**Type** Internal MS-DOS command.

**Purpose** Displays comments from within a batch file.

**Entry Form** REM [*comment*]

Where:

*comment* is a line of text that helps you identify and remember what your batch file does. You can specify a string of characters up to 123 characters long.

**Comments** The *comment* is displayed when the REM command is executed. You can include any characters as part of *comment* except the redirection symbols (<, >, >>) and pipe symbol (|).

In your batch file, you can use REM without a comment to add spacing for readability.

**Examples** The following example shows a batch file that uses remarks for both explanation and spacing:

```
REM This file formats and checks new disks
REM
PAUSE Insert new disk in drive B
REM
FORMAT b: /V
REM
CHKDSK b:
```

# SHIFT

**Type** Internal MS-DOS command.

**Purpose** Lets you enter more than 10 replaceable parameters in a batch process.

**Entry Form** SHIFT

**Comments** You can use the SHIFT command to change the positions of replaceable command line parameters.

Usually command files are usually limited to handling 10 parameters, %0–%9. But by using SHIFT, you can access more than 10 parameters. This means that if there are more than 10 parameters given on a command line, all parameters are shifted down by one. You can use the SHIFT command even if you have fewer than 10 parameters.

## Note

There is no backward SHIFT command. Once you have executed SHIFT, you cannot recover the first parameter (%0) that existed before the shift.

## SHIFT *continued*

**Examples** The following file, *delete.bat*, shows how to use the SHIFT command with any number of parameters. It deletes a list of files.

```
REM delete.bat removes any number
REM of files.
REM
REM The command form is:
REM delete <file>[,<file>[,<...>]]
REM
:loop
IF "%1" == " " GOTO done
DEL %1
SHIFT
GOTO loop
:done
```

# APPENDIX B

## CONFIGURING YOUR SYSTEM

---

### Overview

This appendix describes the *config.sys* configuration file and special commands you can put in the file to configure your system at startup.

### Using a Configuration File

*Config.sys* is a configuration file containing certain commands, for execution at system startup. Each time you start MS-DOS, it searches the root directory of the MS-DOS system for a file named *config.sys*.

#### Note

A *config.sys* file was automatically created for you when you ran the SETUP program as described in the *MS-DOS Setup Guide*.

The *config.sys* file is only processed at startup time. If you make changes to *config.sys*, you must restart MS-DOS to cause the changes to take effect.

You can use the *config.sys* file to configure your system with a minimum of effort. For example, you can add device drivers to your system by including special commands in your *config.sys* file.

If your MS-DOS disk does not have a *config.sys* file, you can use the COPY command or any text editor to create one and save it in the root directory on your system disk. If *config.sys* already exists and you want to change it, use a text editor to edit it.

## Config.sys Commands

The following commands can be used in the *config.sys* file. These commands are described in detail on the following pages. For an example of a *config.sys* file, see Sample Config.sys File in this appendix.

| Command   | Description                                                                                |
|-----------|--------------------------------------------------------------------------------------------|
| BREAK     | Sets more frequent CTRL-BREAK and CTRL-C checks.                                           |
| BUFFERS   | Sets the number of disk sector buffers.                                                    |
| COUNTRY   | Allows for international date, time, and currency formats.                                 |
| DEVICE    | Installs a device driver in the system.                                                    |
| DRIVPARM  | Defines parameters for block devices.                                                      |
| FCBS      | Specifies the number of File Control Blocks (FCBs) that can be open at one time.           |
| FILES     | Sets the maximum number of open files that can be accessed by certain MS-DOS system calls. |
| LASTDRIVE | Sets the maximum number of drives that MS-DOS recognizes.                                  |
| SHELL     | Begins execution of the shell from a specific file (usually, <i>command.com</i> ).         |
| STACKS    | Sets the number and size of stack frames.                                                  |

## BREAK

**Purpose** Sets the frequency of CTRL-BREAK and CTRL-C checks.

**Entry Form** BREAK = ON | OFF

Where:

ON turns on more frequent CTRL-BREAK and CTRL-C checks.

OFF turns off CTRL-BREAK and CTRL-C checks except when reading from the keyboard or writing to the screen.

**Comments** Depending on the program you are running, you can use CTRL-BREAK or CTRL-C to stop an activity (for example, to stop sorting a file). Normally, MS-DOS checks to see whether you have pressed CTRL-BREAK or CTRL-C only while it is reading from the keyboard or writing to the screen or printer. Setting BREAK to ON extends the checking to other functions such as disk reads and writes. OFF is the default BREAK setting.

**Example** To turn on more frequent CTRL-BREAK and CTRL-C checking, insert the following command in your *config.sys* file:

```
BREAK = ON
```

# BUFFERS

**Purpose** Sets the number of disk buffers that MS-DOS allocates in memory at system startup.

**Entry Form** BUFFERS =  $x$

Where:

$x$  is the number of disk buffers to be allocated.

**Comments** A *disk buffer* is a block of memory that MS-DOS uses to hold data during read and write operations.  $x$  specifies the number of additional buffers to add to the system. The minimum number of buffers is 2, but  $x$  can be any number in the range 2–255. MS-DOS automatically selects a default number of buffers appropriate for your computer's memory size, but allows you to override the default with the BUFFERS command.

For applications such as word processors, a number between 10 and 20 provides the best performance. If you plan to create a lot of subdirectories, you may even want to increase the number of buffers to a value between 20 and 30. Remember, though, that buffers take up space in memory, so you should not increase their number to a value greater than 30.

**Example** To create 10 disk buffers, insert the following command line in your *config.sys* file:

```
BUFFERS = 10
```

## COUNTRY

**Purpose** Sets the date and time format for a given country.

**Entry Form** COUNTRY = *x*

Where:

*x* is the country code you are selecting.

**Comments** Use the COUNTRY command to specify the date and time format for a given country. COUNTRY also sets the currency symbol and the decimal separator for the country specified.

Values for *x* can range from 001–999. Table B.1 shows the possible values for *x*.

**Table B.1 Country Codes**

| Code | Country        |
|------|----------------|
| 001  | United States  |
| 031  | Netherlands    |
| 032  | Belgium        |
| 033  | France         |
| 034  | Spain          |
| 039  | Italy          |
| 041  | Switzerland    |
| 044  | United Kingdom |
| 045  | Denmark        |
| 046  | Sweden         |
| 047  | Norway         |
| 049  | Germany        |
| 061  | Australia      |
| 351  | Portugal       |
| 358  | Finland        |
| 785  | Middle East    |
| 972  | Israel         |

## COUNTRY *continued*

**Example** The following command sets the country to France and converts the currency, time, and date formats to French conventions:

```
COUNTRY = 033
```

# DEVICE

**Purpose** Installs the specified device driver on the system list.

**Entry Form** `DEVICE = [d:][path]filename[.ext]`

Where:

*d:path* specifies where the device driver you are installing is located.

*filename.ext* is the name of the file containing the device driver.

**Comments** A device driver is a program that drives (controls) peripheral devices. The DEVICE command installs the device driver contained in the specified filename into the MS-DOS device driver list. MS-DOS reads the *config.sys* file and loads the drivers you have specified each time it is started.

You need a separate DEVICE = command line for each device driver you want to load.

The filename specified must be a valid device driver. If no drive or path is specified, MS-DOS assumes the default drive and working directory.

*Ansi.sys* is an installable device driver that is included as part of MS-DOS. this driver provides enhanced screen and keyboard control. *Ansi.sys* is described in *Ansi.sys Device Driver* later in this appendix.

**Example** If you have an application program that requires you to load the *ansi.sys* device driver file, *config.sys* file should contain the following command:

```
DEVICE = ansi.sys
```

This command adds support for ANSI (escape sequences) to keyboard input and screen output.

# DRIVPARM

**Purpose** Defines parameters for block devices when you start MS-DOS.

**Entry Form** DRIVPARM = /x

Where:

x is any of the control switches discussed in the following section.

**Comments** DRIVPARM is used to describe the type of disk drives in your system if other than the standard installed drive types. Setting DRIVPARM overrides any previous block device driver definitions.

## Note

DRIVPARM is not needed to configure the eaZy pc system. Your system was preconfigured at the factory.

If you are using a hardware or software option from a company other than Zenith with the eaZy pc, refer to the option's documentation for information on using it with the eaZy pc.

## Control Switches

You can use any of the following control switches with DRIVPARM.

*/D:dd* specifies a logical drive number; *dd* can be any number in the range 0–255.

*/C* specifies that change-line (doorlock) support is required.

- /F:ff* specifies the form factor index; *ff* can be any one of the following parameters:
- 0 = 320/360K
  - 1 = 1.2MB
  - 2 = 720K
  - 3 = 8" single density
  - 4 = 8" double density
  - 5 = Hard disk
  - 6 = Tape drive
  - 7 = Other
- /H:hh* specifies the maximum head number; *hh* can be any number in the range 1–99. If you do not use */F*, the default is 720K.
- /N* switch specifies a nonremovable block device.
- /S* specifies the number of sectors per track; *ss* can be any number in the range 1–99.
- /T:tt* specifies the number of tracks per side on the block device; *tt* can be any number in the range 1–999.

## FCBS

**Purpose** Determines the number of File Control Blocks (FCBs) that can be opened at one time.

**Entry Form** FCBS =  $x,y$

Where:

$x$  represents the number of files that FCBS can open at one time. The default is 4, but allowed values range from 1–255.

$y$  represents the number of FCB-opened files you want protected from automatic closure. The default is 0, but allowed values range from 1–255.

**Comments** Some application programs open and read files by FCBs but never close them. If you set  $y$  to some number, then that number of files cannot be closed by MS-DOS. If  $y$  is set to 0 and the application makes an FCB request, MS-DOS finds the first-used FCB and closes it.

**Example** To open up to four files by FCBs and to protect the first two files from being closed, insert the following command in your *config.sys* file:

```
FCBS = 4, 2
```

## FILES

**Purpose** Sets the number of open files that the MS-DOS system calls can access.

**Entry Form** FILES = *x*

Where:

*x* specifies the maximum number of open files that MS-DOS system calls can access. the default is 8, but allowed values range from 8–255.

**Comments** MS-DOS automatically opens five files (standard input, standard output, standard error, standard printer, and standard auxiliary device) for each process, leaving three free for applications. For most operating system environments, eight open files is sufficient.

Should your application program display an error message saying there are not enough files, use the FILES command to increase the number of open files in the system.

This command increases the size of MS-DOS in memory.

**Example** If you want MS-DOS to allow 20 open files at one time, insert the following command in your *config.sys* file:

```
FILES = 20
```

## LASTDRIVE

**Purpose** Sets the maximum number of drives you can access on your system.

**Entry Form** LASTDRIVE = *x*

Where:

*x* specifies the last drive letter MS-DOS can accept. *x* can be any alphabetical character from A–Z. The default is E.

**Comments** You can enter a minimum value for LASTDRIVE equal to the number of drives installed for your system. The configuration file ignores any value less than the actual number of drives installed.

### Note

This command does not alter the drive letter to which an external block device driver will be assigned.

# SHELL

**Purpose** Begins execution of the shell (top-level command processor) from a file.

**Entry Form** `SHELL = [d:][path]filename[.ext]`

Where:

*d:path* specifies where the command processor file is located.

*filename.ext* specifies the name of the command file MS-DOS is to load as the new command processor.

**Comments** A command processor (*command.com* is the default) is the part of MS-DOS that interprets the commands you type in at the keyboard.

You can create and name some other file to perform this function and use the SHELL command to load this processor into your system. Then each time you start MS-DOS, this processor will interpret your commands (rather than *command.com*). Note that the use of this command assumes an advanced knowledge of MS-DOS and programming experience.

If no drive or path is specified, MS-DOS assumes the default drive and working directory.

System programmers who write their own command processors for use instead of the MS-DOS *command.com* file should also use SHELL.

**Example** The following command specifies the file *newshell* in the `\bin` as the command processor:

```
SHELL=\bin\newshell
```

# STACKS

**Purpose** Overrides the default stack resources.

**Entry Form** STACKS = *n,s*

Where:

*n* specifies the number of stack frames. The default is 9, but allowed values range from 8–64.

*s* specifies the stack frame size. The default is 128 bytes, but allowed values range from 32–512 bytes.

**Comments** MS-DOS allocates one stack frame from the pool each time a hardware interrupt occurs. When the interrupt has been processed, MS-DOS returns the frame to the pool.

## Note

When you increase stack resources, available memory decreases. Try to increase the number of stacks only when you are trying to alleviate a stack error condition.

**Example** The following command increases the number of stack frames to 12 and the size of each frame to 256 bytes:

```
STACK = 12, 256
```

## Sample Config.sys File

The following is a typical configuration file:

```
BUFFERS = 10
FILES = 10
DEVICE = \bin\ansi.sys
BREAK = ON
```

Note that the `BUFFERS` and `FILES` commands are both set to 10. Extended CTRL-BREAK checking is turned on in this example.

To find the ANSI device driver that is being added to the system, MS-DOS searches the pathname `\bin\ansi.sys`. Make sure that the device file is in the directory that you specify in the device command.

## Ansi.sys Device Driver

When you install the ANSI device driver, it replaces the standard CON device in your system. In addition to the normal screen output and keyboard input provided by CON, ANSI defines a set of escape sequences (special commands) that you can use to add screen functions and affect the movement of the cursor.

Some application programs use these escape sequences and require that you load *ansi.sys* with a DEVICE command in your *config.sys* file. Note that this is the only way that ANSI can be installed and used; it is loaded into memory at startup only if it is specified in the *config.sys* file.

To install the ANSI driver, include the following command in your *config.sys* file:

```
DEVICE=ansi.sys
```

# APPENDIX C

## MS-DOS MESSAGES

---

### Overview

This appendix describes MS-DOS messages. It is divided into two sections.

- **Device Error Messages** describes the messages MS-DOS displays when it detects an error while reading from and writing to devices (for example, disk drives or a printer).
- **General Messages** describes all other MS-DOS messages.

The messages are listed alphabetically in each section.

## Device Error Messages

If a device error occurs during command or program execution, MS-DOS displays an error message in one of the following forms:

*type* error reading *device*  
Abort, Retry, Ignore:

*type* error writing *device*  
Abort, Retry, Ignore:

In these messages, *type* is one of the error messages listed in this section, and *device* is the name of the device where the error occurred (for example, A:). MS-DOS waits for you to make one of the following responses:

- A (Abort) Ends the program requesting the device read or write operation.
- R (Retry) Repeats the operation.
- I (Ignore) Ignores the error condition and continues with the read or write operation. You should avoid choosing this response because it may result in lost data.

Usually, you will want to recover by typing responses in the following order:

- R Try again.
- A End the program and try a new disk.

Device error messages displayed by MS-DOS are as follows:

Bad call format error

The length of the request header passed to the device header was incorrect.

Bad command error

A device driver issued an incorrect command to the device specified in the error message.

Bad unit error

Invalid subunit numbers were passed to the device driver.

Data error

MS-DOS could not read the data from the disk properly. This error is often due to a defective disk. Press R (for Retry) or A (for Abort) to end the program. It is a good idea to make a new copy of the disk, because if it is defective, you may lose information.

FCB unavailable

You tried to open more File Control Blocks (FCBs) than were specified by the FCBS command in *config.sys*. Press A (for Abort) and increase the FCBs specified in your *config.sys* file.

File Allocation Table bad for drive x

This message indicates that one of the allocation tables is pointing to nonexistent blocks. The disk may have been formatted incorrectly or was not formatted before use. If this error continues after you format the disk, the disk is unusable.

General failure error

An unusual error has occurred. Common causes are an improperly formatted disk, a drive door not closed properly, or a drive type that does not match the disk type. Press R (for Retry) or A (for Abort).

#### Invalid disk change error

You changed the disk in a drive when you were not supposed to. Put the correct disk back in the drive and press R (for Retry).

#### Lock violation error

A program tried to access part of a file that another program was using. Press A (for Abort), or wait awhile and press R (for Retry).

#### Non-DOS disk error

MS-DOS does not recognize the disk format because the disk is missing information or is not an MS-DOS system disk. Try running the CHKDSK command to correct the problem. If running CHKDSK does not solve the problem, the disk is unusable and must be reformatted using the FORMAT command.

#### No paper error

The printer is either out of paper or not turned on.

#### Not ready error

The device (usually a disk drive or printer) specified in the error message is not ready to accept or transmit data. This often happens when the disk drive door is open. If this is the problem, close the door and press R (for Retry). If the message displayed when you were trying to print, check to see if the printer is on and ready.

#### Read fault error

MS-DOS is unable to read data from the device (usually a disk drive). Check to see that the disk is properly inserted in the drive; then press R (for Retry).



### Sector not found error

This error usually means a disk has a defective spot and MS-DOS cannot find the requested information on it. Use the COPY command to copy all of the files from the disk onto a good disk, then use the FORMAT command to reformat the defective disk.

### Seek error

MS-DOS is unable to locate the information on the disk. Make sure that the disk is properly inserted in the drive or try a different drive.

### Sharing violation

A program tried to access a file that another program was using. Choose A (for Abort), or wait awhile and then press R (for Retry).

### Write fault error

MS-DOS is unable to write data to the specified device. Make sure that the disk is properly inserted in the disk drive and press R (for Retry). If the error occurs again, press A (for Abort).

### Write protect error

You tried to write data on a write-protected disk. Move the plastic tab on the 3.5-inch disk to the open position. (You should consider first why the disk was write protected.) If the disk does not have a write-protect tab, you cannot write on that disk.

## General Messages

This section describes the remainder of the MS-DOS messages including prompts and informational messages as well as error messages. For error messages, this section describes the commands that cause them and suggested ways to correct them.

### Access denied

While using PRINT, you tried to access a write-protected, read-only, or locked file.

### All files canceled by operator

MS-DOS displays this message when you include the /T switch in a PRINT command.

### Allocation error, size adjusted

CHKDSK found that the size of a file indicated in the directory was not consistent with the amount of data actually allocated to that file. The file was truncated to match the amount of data allocated.

### All specified file(s) are contiguous

This is an informational message from CHKDSK that indicates the specified file or files are written sequentially on the disk.

### Are you sure? (Y/N)

ZCOM displays this message whenever you enter a command to terminate the server program from the remote computer.

### Are you sure (Y,N)?

MS-DOS displays this message if you try to delete all files in a directory by using the \*.\* wildcard. Press Y (for Yes) to delete all the files or N (for No).

## Attempted write-protect violation

FORMAT displays this message when the disk you are trying to format is write protected.

## Bad command or file name

MS-DOS cannot find the command or file you asked it to run. Check to see that you entered the command line properly (press F3) and that the command or file is on the disk or in the specified command search path.

## Bad or missing Command Interpreter

MS-DOS cannot find the *command.com* file on the disk: either the file is missing from the root directory or the file is invalid. You also receive this message if *command.com* has been moved from the directory it was originally in when you started MS-DOS.

Either restart the system with a disk that contains *command.com* or copy the *command.com* file from your MS-DOS master disk onto the disk used to start MS-DOS.

## Bad or missing filename

You incorrectly specified a device in the *config.sys* file. Check the accuracy of the DEVICE command in your *config.sys* file. Refer to Appendix B, "Configuring Your System," for information on *config.sys*.

## Baud rate set to xxxx

ZCOM displays this message when the internal baud rate has been changed.

BREAK is off

BREAK is on

These messages tell you the current BREAK setting.

Cannot CHDIR to path - tree past this point not processed

CHKDSK is checking the directory structure and is unable to go to the specified directory. No subdirectories beyond this directory will be verified. To correct this error automatically, run CHKDSK again and use the /F switch.

Cannot CHDIR to root

CHKDSK is checking the tree structure of the directory and is unable to return to the root directory. CHKDSK is not able to continue checking the remaining subdirectories. Try to restart MS-DOS. If this error persists, the disk is unusable.

Cannot CHKDSK a SUBSTed or ASSIGNED drive

You tried to run CHKDSK on a drive that has been substituted or assigned. Use the ASSIGN command to reset the drive name to its normal drive.

Cannot communicate with server

ZCOM encountered an error while the user computer was attempting to send a file to the server in response to a receive or transmit command.

Cannot DISKCOMP hard disk media

You tried to use DISKCOMP to compare the contents of a hard disk, which is not possible.

Cannot DISKCOPY hard disk media

You tried to use DISKCOPY to copy the contents of a hard disk. If you are copying groups of files from or to a hard disk, use the COPY command with wildcard characters.

Cannot do binary reads from a device

The COPY command cannot be used in binary mode when you are copying from a device. Either reenter the command without the /B switch, or use the /A switch to specify an ASCII copy.

Cannot format an ASSIGNED drive

You attempted to format a drive that is mapped to another drive by the ASSIGN command. Run ASSIGN again and clear all drive assignments.

Cannot read protection information

DSKSETUP could not read the information about disk protection. Reboot the system and run DSKSETUP again.

Cannot read the Partition Table information  
Hit any key to exit back to main menu

DSKSETUP could not read the partition table information. Reboot the system and run DSKSETUP again.

Cannot recover . entry, processing continued

The . entry (working directory) is defective and cannot be recovered by CHKDSK.

Cannot recover .. entry,  
Entry has a bad attribute (or link or size)

The .. entry (parent directory) is defective and cannot be recovered. If you have specified the /F switch, CHKDSK tries to correct the error automatically.

Cannot write format protection information

DSKSETUP could not write out the format protection information. Reset the system and run DSKSETUP again.

CHDIR .. failed, trying alternate method

When checking the directory structure, CHKDSK was not able to return to a parent directory. It will try to return to that directory by starting over at the root and searching again.

Compare error on head *h*, track *t*

DISKCOMP found a difference on the disk in the specified head *h* or track *t*.

Connection aborted

You pressed ESC during execution of the ZCOM CONNECT command. The command was aborted.

Connection number to dial required

You entered a ZCOM CONNECT command without including a telephone number.

Contains *n* non-contiguous blocks

CHKDSK found that the disk contains fragmented files. If you want a duplicate of this disk's contents, you should use the COPY command instead of DISKCOPY. COPY will store the new files sequentially.

Content of destination lost before copy

The source file that you specified with COPY was overwritten before the copy process completed. Refer to Chapter 3, "MS-DOS Commands," for the proper use of COPY.

Convert lost chains to files (Y/N)?

CHKDSK displays this message if it finds information on the disk that is not allocated properly in the disk's File Allocation Table (FAT).

If you press Y (for Yes) in response to this prompt, CHKDSK recovers the lost blocks it found when checking the disk. CHKDSK then creates a proper directory entry and a file for each lost chain. Each file created is given a name in the form: *filennnn.chk*.

If you press N (for No), CHKDSK frees the lost blocks so that they can be reallocated and does not recover any data that was in those lost blocks.

Copying *t* tracks *n* Sectors/Track, *s* Sides

DISKCOPY displays this status message during copying.

Corrections will not be written to disk

There are errors on the disk you are checking, but CHKDSK will not correct them because you did not specify the /F switch. You must include the /F switch to correct disk errors.

Current date is *mm-dd-yy*  
Enter new date (mm-dd-yy):

DATE displays this message. Enter the correct date and press RETURN.

Current time is *hh:mm:ss.hh*  
Enter new time:

TIME displays this message. Enter the correct time and press RETURN.

Data transmission error

A communications error occurred during data transmission. Reenter the command.

DESTINATION drive not ready

The drive you want to compare files against (while using DISKCOMP) or copy files to (while using DISKCOPY) is not ready for the operation. Check to make sure the disk is in the drive and the drive door is closed.

*d:filename.ext* cancelled by operator

You deleted a file (*d:filename.ext*) from the print queue by using the /A switch in a PRINT command.

Directory is totally empty, no . or ..

This message, displayed by CHKDSK, means the specified directory does not contain references to working and parent directories. Use the RMDIR command to remove the specified directory and then use the MKDIR command to recreate it.

Disk copy failure

The destination disk could not be copied to by DISKCOPY. Bad sectors or other disk media problems might exist.

Disk error reading FAT

Disk error writing FAT

CHKDSK found a defective sector in one of your File Allocation Tables (FATs). MS-DOS automatically uses the other FAT. You should copy all your files onto another disk.

Disk unsuitable for system disk

FORMAT detected a bad track on the disk where system files should reside. You should use this disk to store data only.

(.) Does not exist

(..) Does not exist

This is an informational message from CHKDSK indicating that either the . or .. directory entry is invalid.

Do you see the leftmost 0? (Y/N)

MODE displays this message to help you align the test pattern on your screen. Press Y (for Yes) if you can see the leftmost 0 in the test pattern, or press N (for No) if you want to shift the display to the right.

Do you see the rightmost 9? (Y/N)

MODE displays this message to help you align the test pattern on your screen. Press Y (for Yes) if you can see the rightmost 9 in the test pattern, or press N (for No) if you want to shift the display to the left.

Do you want to compare more disks (Y/N)? <N>

You can press Y (for Yes) now if you want to compare additional disks with DISKCOMP command. If not, press N (for No) or accept the default of N by pressing RETURN.

Do you want to copy another disk (Y/N)? <N>

You can use DISKCOPY to copy additional disks using the DISKCOPY command without reentering the command by pressing Y (for Yes) to this question. If you do not want to copy more disks, press N (for No) or press RETURN to accept the default, of N.

Do you want to format another disk (Y/N)?

FORMAT displays this message when it has finished formatting a disk. Press Y (for Yes) if you want to format another disk, or press N (for No) if you do not. If you accidentally press Y, you can abort the format process by pressing CTRL-BREAK or CTRL-C in response to the message press RETURN when ready.

## Drive not ready

An error occurred when PRINT tried to access a disk. When this happens, PRINT continues to try to access the disk unless another error occurs. Any other error causes printing of the current file to be canceled and the message filespec Canceled to be displayed.

## Drive not ready – Cannot continue.

The drive is not ready, so the DISCOMP OR DISKCOPY command cannot be processed. Be sure you have inserted a disk in the drive and closed the drive door.

## Duplicate file name

You tried to use RENAME to change the name of a file to a filename that already exists or the name you specified could not be found.

ECHO is off

ECHO is on

These messages tell you the current status of ECHO.

## Entry has a bad attribute (or link or size)

This CHKDSK message may be preceded by one or two periods to show which subdirectory is invalid. If you have specified the /F switch, CHKDSK tries to correct the error.

## Error in data reception

ZCOM detected a communications problem at the system receiving data during a receive or transmit operation.

## Error in .EXE file

The .exe file you have asked MS-DOS to load has an invalid internal format. You cannot run the program. Check to make sure that you are using the correct version of MS-DOS.

### Error making connection

The modem returned an error code as it attempted a connection with the remote during execution of a ZCOM CONNECT command. This error should not occur. Contact your dealer for assistance.

Errors found, F parameter not specified  
Corrections will not be written to disk

CHKDSK found errors on the disk. If you did not specify the /F switch, CHKDSK continues printing messages, but does not correct the errors. You should run CHKDSK with the /F switch if you want to correct the problems encountered.

Errors on list device indicate that it may be off-line.  
Please check it.

You entered a PRINT command and your printer is not turned on.

### Error writing to device

You tried to send too much data to a device. MS-DOS was unable to write the data to that device.

### EXEC failure

MS-DOS either found an error when reading a command, or the FILES command in the *config.sys* file is set at too low a value. Increase the value of the FILES command in the *config.sys* file and restart MS-DOS.

### File allocation table bad

The disk you are using may be defective. Run CHKDSK to check the disk.

### File allocation table bad drive x:

CHKDSK displays this message if the disk was not formatted or was formatted improperly. It could also mean that an operating system other than MS-DOS is on the disk. Run CHKDSK to check the disk. If this message is displayed again, you must reformat the disk.

### File cannot be copied onto itself

The source filename you specified in a COPY command is the same as the target filename. Reenter the command using a different name for the target file.

### File creation error

You tried to add a new file or replace a file that already exists in the directory, or there was not enough space for the file. If the file already exists, it is a read-only file and cannot be replaced. This error message displays if the root directory is full or out of files or if the filename is the same as a volume, directory, or a hidden (system) file.

### File *filename* canceled by operator

MS-DOS displays this message when you specify the /A switch with the PRINT command.

### File not found

MS-DOS could not find the file that you specified for the CHKDSK, PRINT, or RENAME command, or you tried to rename a file to a name already in the directory. Check to see that the you entered the filename correctly.

### File not in PRINT queue

The file that you specified in a PRINT command line was not in the print queue, so you cannot remove it from the queue. Check to make sure that you entered the filename correctly.

File reception aborted

While using ZCOM you or the remote computer operator pressed ESC during a file exchange. The message displays on the receiver's screen.

*filename* File not found  
Compare more files (Y/N)?

A file you specified is not on the default or specified disk or in the current or specified directory. Make sure that you entered the correct file specification and that the appropriate disk is in the drive. Perform the desired file comparison by pressing Y (for Yes) at the prompt and the correct file specifications at the COMP prompts.

Files are different sizes  
Compare more files (Y/N)?

Only files that are the same size, as reflected in the files' directory entries, can be compared with COMP. The files you specified for comparison are not the same size.

If you want to compare other files, press Y (for Yes) at the prompt and continue with COMP. If you do not want to compare any other files, press N (for No).

First cluster number is invalid, entry truncated

The file directory entry examined by CHKDSK contains an invalid pointer to the data area. If you specified the /F switch, the file is truncated to a zero-length file.

For cannot be nested

You cannot nest FOR commands in a batch file.

Format complete

FORMAT displays this message when it has finished formatting the disk in the specified drive.

### Format failure

MS-DOS could not format the disk. This message is usually displayed with an explanation of why the command failed.

### Format not supported on drive *x*:

You cannot use FORMAT to format the disk in the specified drive. You may have specified device parameters that your computer cannot support.

### Formatting while copying

DISKCOPY displays this message if the target disk has never been formatted.

### Hard READ ERRORS have occurred, DESTINATION disk may be unusable.

Bad sectors or a damaged floppy disk may have caused a bad comparison (DISKCOMP) or copy procedure (DISKCOPY).

### Has invalid cluster, file truncated

The file directory entry examined by CHKDSK contains an invalid pointer to the data area. If you specified the /F switch, the file is truncated to a zero-length file.

### Head:*hhh* Cylinder:*ccc*

FORMAT displays the head and cylinder number of the track currently being formatted.

### Illegal device name

Your computer does not recognize the device name you included in the MODE command line.

Incompatible media. Cannot continue.

You attempted to run DISKCOMP or DISKCOPY using a source disk that is a different type from the target disk. For example, this error displays if you tried to use DISKCOPY to copy a floppy disk onto a hard disk partition.

Incompatible system size

The system files occupy more space on the source disk than is available on the target disk. You cannot use the SYS command to transfer the system files to this disk.

Incorrect DOS Version

Some MS-DOS utilities will not run on older versions of the operating system, and many are written to run only on the exact version of MS-DOS that they were created for. These include CHKDSK, DISKCOMP, DISKCOPY, FORMAT, MODE, MORE, PRINT, SORT, and SYS. You must use the correct version of MS-DOS to run these commands.

Incorrect parameter

One of the drive names you specified in the ASSIGN command is wrong.

Infinite retry on parallel printer timeout

MODE displays this message when your printer is off line or not ready. If the printer appears to be ready, you may have to press CTRL-ALT-DEL to reset the computer.

Insert backup diskette *n* into drive *x*:

This message prompts you for the *n*th backup disk while you are using the BACKUP or RESTORE command. Put the next volume into the specified drive. Be sure to label each backup disk in the appropriate order for use when you restore the files.

Insert destination disk in drive x:  
and strike any key when ready...

This message displays when you are using SYS to transfer the operating system in a single-drive system. You should insert the target disk in the appropriate drive and press any character or number key to begin processing.

Insert disk x in drive y:  
Press any key when ready.

This message displays when MS-DOS is copying and formatting. This message is most common on single floppy drive systems when the operation references logical drive B. You should insert the requested disk in the appropriate drive and press any character or number key to begin processing.

Insert disk with batch file  
and press any key when ready

The disk containing your batch file is not in the drive you originally specified. Reinsert the disk that contains the batch file in the appropriate drive.

Insert DOS disk in drive x:  
and press RETURN when ready

You entered the FORMAT /S command, but the disk in the default drive does not contain MS-DOS system files.

Insert a disk containing the MS-DOS system files in the drive and press any key to continue.

Insert last backup disk in drive x:  
Strike any key when ready

BACKUP prompts you for the final backup disk. After you have inserted the final backup disk in the specified drive, press any key to continue the backup procedure.

Insert restore target diskette into drive x:

RESTORE displays this prompt if you are restoring files to a floppy disk. Insert the target disk in the specified drive.

Insert source disk

BACKUP prompts you to put the source disk in the disk drive.

Insert system disk in drive x:  
and strike any key when ready

SYS needs a disk from which to read the MS-DOS system files. Insert a system disk in the specified drive and press any character or number key to start the system copy process.

Insufficient disk space

The disk you are using is full and does not contain enough room to perform the specified operation.

Insufficient memory

There is not enough memory in your computer to perform the specified CHKDSK, DISKCOMP, DISKCOPY, or SORT function. Before retrying this operation, you must free memory by deleting files.

Insufficient memory for system transfer

Your system's memory configuration is insufficient to transfer the MS-DOS system files with the FORMAT /S switch.

Insufficient room in root directory.

Erase files in root and repeat CHKDSK

CHKDSK always recovers lost files into the root directory. This message displays when your root directory is full. Delete some files from your root directory or move them to another directory to make room for CHKDSK to recover the lost files.

### Intermediate file error during pipe

The MS-DOS pipe operation uses temporary disk files that are deleted automatically once the piping process is complete. An error has occurred in one of these files.

Make sure that there is enough room on the disk for the temporary file and that the disk is not write protected, then try the command again.

### Internal error

This message indicates an error in the MODE utility. Reenter the command.

### Invalid baud rate specified

You have specified an incorrect baud rate with the MODE command. Valid choices are 110, 150, 300, 600, 1200, 2400, 4800, and 9600. You must specify at least the first two digits of a valid baud rate.

### Invalid characters in volume label

FORMAT displays this message when you specify an invalid volume label. The volume label should contain only up to 11 alphanumeric characters.

### Invalid COMMAND.COM

Insert/COMMAND.COM disk in default drive and strike any key when ready

The program you just executed used a portion of memory reserved for MS-DOS. MS-DOS must now reload the *command.com* file from disk. However, either MS-DOS cannot find *command.com* on the disk, or the copy found is the wrong version. Insert a disk that contains a copy of *command.com* in the default drive and press any key.

### Invalid country code

In your *config.sys*, file you have specified a country number that is not in the table of country codes supported in this version of MS-DOS. Country codes must be in the range 1–99.

### Invalid current directory

This CHKDSK message means your disk has an invalid directory on it. You may be able to recover some of the files on this disk by copying them with the COPY command. Otherwise, you must replace the disk.

### Invalid date

You specified an invalid date in response to the DATE command prompt. Enter a valid date. Refer to Chapter 3, "MS-DOS Commands," for the proper date entry format.

### Invalid Date/Time

You specified an invalid date with one of the BACKUP command switches. Refer to Chapter 3, "MS-DOS Commands," for the proper date and time entry formats for the BACKUP command.

### Invalid date/time specified

You specified an invalid date or time when using RTCLOCK to set the real-time clock. Refer to Chapter 3, "MS-DOS Commands," for the proper date and time entry formats for the RTCLOCK command.

### Invalid device

An invalid device name was specified. The most common device names are CON, NUL, AUX, and PRN.

### Invalid device parameters from device driver

FORMAT displays this message when the number of hidden sectors is not evenly divisible by the number of sectors per track (that is, the partition does not start on a track boundary). This might happen if you try to format a hard disk that was previously formatted with MS-DOS version 2.x without first running PART, or if you have set the device driver parameters incorrectly. Check the *config.sys* file for incorrect DEVICE or DRIVPARM commands.

### Invalid directory

The directory you specified either does not exist or is invalid. Check to make sure you entered the directory name correctly.

### Invalid drive in search path

A drive specified in the search path does not exist.

### Invalid drive specification

The drive you specified is incorrect or does not exist. Enter a valid drive name.

### Invalid environment size specified

You gave an invalid number of bytes with the /E switch when you entered COMMAND. You must specify a number between 128 and 32,768 bytes.

### Invalid number of parameters

Either you did not specify an option or string or you specified the wrong number of options in the BACKUP or RESTORE command line.

### Invalid parameter(s)

One of the switches you specified in the command line is wrong or does not exist. Refer to Chapter 3, "MS-DOS Commands," to make sure you are using the correct switches.

#### Invalid path (or file not found)

You have entered a pathname or filename in the COPY, BACK-UP, or RESTORE command line that does not exist. Reenter the command with a valid pathname or filename.

#### Invalid path, not directory, or directory not empty

You cannot remove the directory specified for one of the reasons listed in the message.

#### Invalid sub-directory entry

The subdirectory that you specified in the CHKDSK command line does not exist or is invalid. Check to make sure you entered the subdirectory name correctly (press F3).

#### Invalid time

You specified an invalid time. Refer to Chapter 3, "MS-DOS Commands," for the correct time entry form and try the TIME command again.

#### Invalid value for /x ignores

You entered an invalid or unacceptable value for one of the PRINT switches requiring a numeric parameter (that is, the /C:n, /L:n, or /R:n switch). When this occurs, the switch is ignored and the PRINT command proceeds as though the switch had not been entered.

#### Invalid Volume ID

FORMAT displays this message if you enter a volume label that does not match the label on the hard disk you want to format. It then quits the format process. Use the VOL command to find out what the volume label for the hard disk is, then try the command again.

### Label not found

Your batch file contains a GOTO command to a nonexistent label.

### Line does not answer

The Smartmodem 1200 or 2400 did not get an answer during execution of the ZCOM CONNECT command.

### Line is busy

The Smartmodem 1200 or 2400 detected a busy signal during execution of the ZCOM CONNECT command.

### List output is not assigned to a device

When you first enter the PRINT command, MS-DOS asks you what device you want to specify as a printer. This message appears if PRINT is set up for a device that does not exist.

x lost cluster(s) found in y chains  
Convert lost chains to files (Y/N)?

CHKDSK displays this message if it finds information on the disk that is not allocated properly in the disk's File Allocation Table.

If you press Y (for Yes) in response to this prompt, CHKDSK recovers the lost blocks it found when checking the disk. CHKDSK then creates a proper directory entry and a file for each lost chain, using a filename in the form *filennnn.chk*. If you did not specify the /F switch, CHKDSK displays: x bytes would be freed. If you press N (for No), CHKDSK frees the lost blocks so that they can be reallocated and does not recover any data that was in those lost blocks. If you did not specify the /F switch, CHKDSK does nothing.

LPT#: not redirected

MODE could not redirect the parallel printer port. Most likely, an invalid serial port was specified. Check to make sure you have specified the proper options.

LPT#: redirected to COM#:

The MODE command you entered has been executed, and output on the parallel printer port will now be sent to this serial port.

LPT#: set for 80

The MODE command you entered has been executed, and the parallel printer port has been set for 80 columns.

LPT#: set for 132

The MODE command you entered has been executed, and the parallel printer port has been set for 132 columns.

Memory allocation error.  
Cannot load MS-DOS, system halted

Restart MS-DOS. If this error continues, make a new copy of the MS-DOS disk from your master copy of the system disk.

Modem not connected

You entered a ZCOM DISCONNECT command without first establishing a connection.

MORE: Incorrect DOS version

MORE does not run on MS-DOS versions before 2.0.

MS-DOS bios version incorrect-  
Press any key to continue...

The disk you are using to record DSKSETUP information contains the wrong MS-DOS system file. Use the same version of MS-DOS system file and *disksetup.com* file.

Must specify ON or OFF

The command you entered requires either an ON or an OFF argument.

Name of list device [PRN]:

This prompt appears the first time that PRINT is run and the /D switch is not specified. You can specify the name of any valid device, which then becomes the PRINT output device. If you press RETURN, MS-DOS uses the default list device (PRN).

No Carrier

No answer was detected at the remote after you dialed its number. Check to make sure that you entered the ZCOM CONNECT command correctly.

No COM: ports

Your computer does not have a serial communications port available for use. Use MODE MODEM OFF to make one available.

No dial tone received

When you used a Smartmodem 1200 or 2400, the modem did not detect a valid dial tone as it executed the ZCOM CONNECT command.

No free file handles.

Cannot start COMMAND.COM, exiting

Restart MS-DOS. If this message persists, increase the files value specified with the FILES command in the *config.sys* file.

No hard drives are available –  
press any key to continue

The option you selected using DSKSETUP requires hard disk drives and none are installed on your system.

No MS-DOS partitions are available

While using DSKSETUP, you entered information that required hard disk partitions and your system does not have any.

Non-system disk or disk error

Replace and strike any key when ready

Replace the disk with the proper disk and press any alphanumeric key to continue.

No path

You typed PATH and pressed RETURN to find out what the search path is, but you have not set a command search path.

No real-time clock found

You attempted to use RTCLOCK to set or read a real-time clock hardware device not present in your system.

No room for system on destination disk

You entered a SYS command but there is not enough room for the system files on the target disk. Delete some files to make room for the system files or use another disk. You may need to reformat the disk to put the system on it.

No such file or directory

One or more of the files or directories that you specified does not exist.

\*\*\* Not able to back up (or restore) file \*\*\*

BACKUP displays this message to let you know it detected an error in the file being backed up or on the backup disk. Use the CHKDSK command on the source disk to see if you can determine the problem.

Out of environment space

There is not enough room in the program environment to accept more data. To increase the size of the existing environment, use the /E switch with the COMMAND or use the SET command to remove some of the existing environment variables.

Packet received is not proper command

The file transmission or reception protocol specified by ZCOM has been corrupted. An error in communications can cause this error.

Packet received is not type K\_CMD

The file transmission or reception protocol specified by ZCOM has been corrupted. An error in communications can cause this error.

Parameters not compatible

You have specified FORMAT command switches that cannot be used together.

Parameters not compatible with fixed disk

You have used a FORMAT command switch that is not compatible with the specified drive.

Parameters not supported

You have specified FORMAT parameters that MS-DOS does not support.

Parameters not supported by Drive

FORMAT displays this message when the device driver for the specified drive cannot perform the type of function specified.

Passwords do not match. Try again

The two passwords entered in response to ZCOM prompts were not the same.

*pathname* - Invalid path  
Compare more files (Y/N)?

A directory *pathname* you entered in the COMP command line either is not a valid *pathname* or does not exist on the default or specified disk. If you want to continue with COMP, press Y (for Yes) at the prompt and respond to the prompts with valid entries. If you do not want to continue with COMP, press N (for No) at the prompt.

Path not found

You specified an invalid *pathname* in the CHKDSK command line.

Path(name) too long

The *pathname* you specified in the PRINT command was too long. You may have to change directories to use this command with files in deep subdirectories. The maximum number of characters allowed in a *pathname* is 64.

Phone connection broken

The ZCOM server received a no connection status message from the modem after answering a phone call. This occurs when the operator at the other end has hung up.

Press any key to begin formatting x:

FORMAT issues this prompt before disk formatting begins. Press any key to begin the format process. Or, if you want to end this command, press CTRL-C.

Press RETURN when ready . . .

This prompt gives you time to insert the appropriate disks before copying them. When you have inserted the disks into the appropriate drives, press any key to begin the diskcopy process. Or if you wish to end this command, press CTRL-C.

## Printer error

The printer specified in the MODE command line is off or is not ready.

## Printer lines per inch set

MODE has set the number of lines per inch for the printer as you specified.

## PRINT queue is empty

PRINT displays this message when there are no files waiting to be printed.

## PRINT queue is full

There is only room for 10 files in the print queue as it is now configured. You can make room for more by using the PRINT /Q switch. The limit is 32 files.

## Probable non-DOS disk Continue (Y/N)?

The disk for which you are running CHKDSK is not recognized by this version of MS-DOS. The disk was either created on another system with a format that is not supported on this version of MS-DOS, or it is not an MS-DOS disk.

Do not continue processing if CHKDSK returns this message for a floppy disk. If this message displays for a hard disk, the information describing the characteristics of the disk to MS-DOS has been destroyed. In this case, you may continue CHKDSK processing by pressing Y (for Yes). This error may mean that the File Allocation Table (FAT) is bad and that the disk is unusable.

## Processing cannot continue

There is not enough memory in your computer to run CHKDSK for this disk. You must obtain more memory to run CHKDSK. Remove unnecessary entries from the *config.sys* and *autoexec.bat* files to obtain more memory.

### Program too big to fit in memory

You need more memory to run your application. It is possible that some programs you have run are still using some memory. Restart MS-DOS and try to run the application again. If you still receive this message, you need to install more more memory.

### Read error on DESTINATION drive

During the comparison or verification process performed by DISKCOMP, the target disk could not be read. The target disk should be copied again. If the error persists, the target disk may have bad sectors.

### Read error on SOURCE drive

The disk in the source drive you specified for DISKCOMP may have bad sectors or other media problems.

### Read error on SOURCE1 drive

The system could not read information from the source1 drive you specified for DISKCOMP or DISKCOPY.

### Read error on SOURCE2 drive

The system could not read information from this source2 drive you specified for DISKCOMP or DISKCOPY.

### Receiver can not create the new file

ZCOM displays this message if the computer receiving a transmitted file could not create the file on disk. Possible causes are access failure, sharing failure, or a full disk.

### Receiving file *filename*

ZCOM displays this message on the receiver's screen to inform the operator that a file is being received from another computer.

**Reinsert diskette for drive x:**

**Reinsert the disk being formatted in the indicated drive.**

**Requested Screen Shift out of range**

**You cannot use the MODE command to shift the display any farther.**

**Resident portion of MODE loaded**

**Part of the MODE program is now resident in memory and MODE has reserved some memory for its use.**

**Restore file sequence error**

**You have tried to restore files in the wrong order with the RESTORE command. You must insert the backup disks in the same order that they were backed up.**

**\*\*\* Restoring files from drive x: \*\*\*  
Diskette: n**

**RESTORE displays this message during the restore process.**

**Scan for server completed**

**The ZCOM SCAN sequence is complete; it may or may not have been successful.**

**Scan unsuccessful**

**The ZCOM SCAN command was unable to locate a baud rate that allowed it to communicate with the server. Causes include no server currently active or a server set to a nonstandard baud rate.**

**Sector size too large in file *filename***

**The specified device driver loaded by *config.sys* uses a sector size larger than that of any other device driver on the system. You cannot run this device driver.**

Sending file *filename*

ZCOM displays this message to tell the server and user system that a file is being sent.

Server aborted by user

While using ZCOM, the user pressed ESC on the server keyboard.

Server . . . Packet command not valid

The transmission to the server from the remote was interpreted as a command, but the command is not recognized by ZCOM.

Server . . . Packet received is not command

The server end of ZCOM received data from the serial port that was not a proper ZCOM setting.

SERVER session terminated by remote

The server operator wants to terminate the ZCOM connection and has entered an ABORT command.

SORT: Incorrect DOS version

SORT does not run on MS-DOS versions before version 2.0.

SORT: Insufficient disk space

The disk is full and SORT cannot complete execution.

SORT: Insufficient memory

There is not enough memory in your system to run SORT as specified.

Source and target drives are the same

You specified the same drive for the source and target disks as part of a BACKUP or RESTORE command.

Source disk is Non-removable

This is an informational message displayed by BACKUP.

Source dos not contain backup files

RESTORE displays this message when you attempt to restore files from a disk that does not contain backup files.

Source is a floppy disk

Source is a hard disk

These are informational messages displayed by RESTORE.

Specified MS-DOS search directory bad

The SHELL command in the *config.sys* file is incorrect. Make sure that the *command.com* file exists and that MS-DOS can find it.

Strike a key when ready...

This prompt occurs during command processing and is always accompanied by another message. This message also is displayed if you have inserted a PAUSE command in a batch file. Usually, MS-DOS asks you to insert disks in appropriate drives before this prompt. To begin command processing, press any character, any number key, SPACEBAR, or RETURN.

Syntax error

You have entered a command incorrectly. Check to make sure you have typed the command correctly.

System transferred

The MS-DOS system files were transferred during FORMAT or SYS command processing.

Target cannot be used for backup

BACKUP displays this message when the target disk has either an unrecognizable format or is bad. Try to format the disk with FORMAT or run CHKDSK on it to determine the problem.

Target disk is Non-removable

This is an informational message displayed by BACKUP.

Target is a floppy disk

Target is a hard disk

These are informational messages displayed by BACKUP.

Target is full

RESTORE displays this message when there is not more room on the target disk for restored files.

Target is Non-Removable

This is an informational message displayed by RESTORE.

Terminating transmission

You or the remote operator pressed ESC during a ZCOM file transmission. This message displays on the sender's screen.

The last file was not restored

RESTORE displays this message when there is not enough room on the target disk for the file, or the last file is bad. Use the CHKDSK command to determine the problem.

This partition is format-protected

Format protection is active on the partition that you are trying to format.

### Too many open files

MS-DOS could not open the files that you want to compare due to the lack of available system file handles. Increase the value specified in the FILES command in the *config.sys* file.

### Track 0 bad – disk unusable

FORMAT can accommodate defective sectors on the disk except for those near the beginning. You must use another disk.

### Transmission error breaking link with LIST command

The ZCOM server is unable to terminate the list of filenames being sent to the remote during execution of a FILES command. The probable cause is a communications error.

### Transmission error sending data

ZCOM detected a communications error at the remote while the password was being sent to the server.

### Transmission error sending list file

ZCOM detected a communications error while the server was attempting to send a filename in response to a FILES command request.

### Unable to break connection with server

While running ZCOM, you requested that the server terminate the connection, but the remote was unable to send the command to the server either because of communications problems or because no server was active.

### Unable to create directory

MS-DOS could not create the directory you specified. Check to see that there is not a name conflict. You may have a file with the same name, or the disk may be full.

Unable to create file

The ZCOM receiver was unable to create the new file being sent to it.

Unable to erase

BACKUP could not erase the files on the target disk. Check to see that the files on the backup disk are not read-only and that the disk is not write protected.

Unable to open file

A file you are trying to send with ZCOM cannot be located. This may indicate defective media.

Unable to shift Screen

MODE is unable to shift the test pattern on the screen any farther.

Unknown command given. Use '?' for help

While running ZCOM, you entered an unrecognized command in response to the remote computer's prompt.

Unrecognized command in CONFIG.SYS

There is an invalid command in your *config.sys* file. Refer to Appendix B, "Configuring Your System," for a list of valid commands.

Unrecoverable error in directory

Convert directory to file (Y/N)?

This message is displayed if CHKDSK is unable to correct an error in a directory. If you press Y (for Yes) at this prompt, CHKDSK converts the bad directory into a file. You can then fix the directory or delete it. If you press N (for No) to this prompt, you may not be able to write to or read from the bad directory.

Verifying *t* tracks  
*n* sectors per track, *s* side(s)

DISKCOMP displays this message to confirm the format of the disks that you are comparing.

VERIFY is off  
VERIFY is on

These messages tell you the current setting of the VERIFY command.

Volume in drive *x*: has no label

This is an informational message displayed in response to the DIR or VOL command.

Volume in drive *x*: is *name*

This is an informational message displayed in response to the DIR or VOL command.

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

This message appears when you try to format a hard disk that already contains data. If you press Y (for Yes) the data on the disk will be erased. If you do not want the files on your hard disk erased, press N (for No). Copy the files to a floppy disk and repeat the FORMAT command.

Warning: Baud rate is unusual

You entered a ZCOM CONNECT command, but the baud rate was not within the usual values of 300, 600, 1200, or 2400. This message prompts you to check that you entered the correct number.

Warning! Diskette is out of sequence  
Replace diskette or continue if okay  
Strike any key when ready

RESTORE displays this message to tell you to restore the diskettes in the order that you backed them up.

Warning! File *filename*  
is a hidden (or read-only) file  
Replace the file (Y/N)?

RESTORE displays this message to prompt you to indicate whether you want to replace a hidden or read-only file. Press Y (for Yes) if you want to restore the hidden or read-only file from the backup disk. Press N (for No) if you do not want to restore this file.

Warning! File *filename*  
was changed after it was backed up  
Replace the file (Y/N)?

RESTORE displays this message to prompt you to indicate whether you want to replace a backup file that has been changed. Press Y (for Yes) if you want to restore this file or N (for No) if you do not.

Warning! Files in the target drive  
\BACKUP (or root) directory will be erased

BACKUP found files in the target drive, and you did not specify the /A switch to append files.

Warning! No files were found to back up

BACKUP did not find any files to back up on the disk you specified.

Warning! No files were found to restore

RESTORE did not find the file that you want to restore from the backup disk.

Warning: Server does not acknowledge change

While running ZCOM, the user was not able to inform the server of the changed baud rate specified with the BAUD command. The user changed its baud rate, but the server was not been informed of the change.

Write error on destination drive

DISKCOPY displays this message when your target disk is write-protected or has bad sectors.

Write protect error on destination drive

The target disk has a write-protect tab covering the notch, or it does not have a write-protect notch. If you want to erase any existing information on the disk, remove the write-protect tab and enter the DISCOPY command again. If the disk does not have a write-protect notch, you cannot use it as a target disk.

# APPENDIX D

## MS-DOS EDITING KEYS

---

### Overview

This appendix describes how to use the MS-DOS editing keys to edit and reuse the previously entered command line.

### MS-DOS Edit Keys

When you type a command and press RETURN, MS-DOS sends the command to the command processor for execution. At the same time, MS-DOS stores a copy of the command in a special storage area called a *template*.

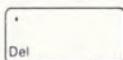
You can use the following special keys to reuse or edit the command in the template.

| Key | Editing Function                                                         |
|-----|--------------------------------------------------------------------------|
| F1  | Displays the previously entered command one character at a time.         |
| F2  | Followed by a character, displays the command up to the character typed. |
| F3  | Displays the previously entered command in its entirety.                 |
| F4  | Followed by a character, skips all characters up to the character typed. |
| F5  | Makes what is on the command line the new entry in the template.         |
| F6  | Puts an end-of-file character in the template.                           |

## MS-DOS Editing Keys *continued*

### Key

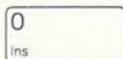
### Editing Function



Skips copying a character from the template.



voids the current input and leaves the template unchanged.



Enters and exits insert mode.

## Sample Edit Session

Suppose you had just executed the following DIR command:

```
DIR B:SALES.JUN
```

The template contains the line DIR B:SALES.JUN.

To repeat the command, press F3 and RETURN. MS-DOS stores the command in the template and sends it to the command processor for execution.

To copy the first character from the template to the command line (in this case the letter D), press F1. Each time you press F1, another character is copied from the template until you have copied all of the characters in the template.

Suppose you want to display information about a file named *sales.may*. Press F2 followed by the letter J to copy all characters up to but not including the letter J to the command line. MS-DOS displays the following on the command line:

```
DIR B:SALES.
```

Now to display information on the file *sales.may*, type *may* to get the following result:

```
DIR B:SALES.MAY
```

The command DIR B:SALES.MAY is now ready to be sent to the command processor. Press RETURN to execute the new command.

Now, suppose you want to run the following command:

```
TYPE B:SALES.MAY
```

To do this, type the word **TYPE** and then press the following four keys:



As you type, the characters appear on the command line, overwriting their corresponding characters in the template. When you press the **INS** key, this automatic replacement feature is turned off. So in the template the word **TYPE** replaces the word **DIR**. Note also that the space following the word **DIR** is overwritten by the letter **E** in **TYPE**.

To insert a space between the word **TYPE** and the filename *sales.may*, press **INS** and then **SPACEBAR**. Finally, to copy the rest of the template to the command line, press **F3** and **RETURN** to execute the command.

Suppose you had misspelled **TYPE** as **PYTE**. MS-DOS would have issued a **Bad command or file name error** message. Still, instead of throwing away the whole command, you could save the misspelled line by pressing **F5** *before* pressing the **RETURN** key. This creates a new template:

```
PYTE B:SALES.MAY
```

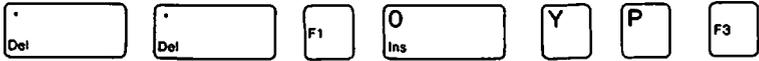
You can now correct this error by pressing the following four keys:



For this example, the **T** replaces the first letter (**P**) in the template, **F1** copies the **Y** from the template, **P** replaces the **T**, and **F3** copies the remainder of the template to the command line, resulting in the correct command:

```
TYPE B:SALES.MAY
```

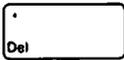
Alternatively, you could have used the following keys to correct the problem:



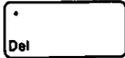
To illustrate this method, compare the key pressed with its result on the command line.

Suppose the template contains `PYTE B:SALES.MAY`

If you press:



The first character in the template is skipped.



The second character in the template is skipped.



Copies the third character in the template to the command line.

T



Inserts two characters, Y and P, from the keyboard to the command line.

TYP



Copies the rest of the character from the template to the command line.

TYPE B:SALES.MAY

To execute this command, press RETURN.

# APPENDIX E

## TIPS ON USING MS-DOS

---

### Overview

This appendix contains tips on using MS-DOS. The information listed here has been presented in earlier chapters. It is listed here, in a condensed format, for you to reference more easily.

### Starting MS-DOS

- If you have a floppy-disk system (no hard disk) and you see the following message when you turn on your computer

```
Non-system disk
Correct and strike any key when ready
```

it means the disk in drive A (or drive B if you have two floppy disk drives) is not an MS-DOS system disk.

Put the MS-DOS disk in either drive A or drive B and press any key to start MS-DOS.

- If your computer does not display a prompt for the date and time, check your *autoexec.bat* file. MS-DOS does not prompt you for the date and time unless you put the DATE and TIME commands in the file.

## Restarting MS-DOS

- To reload MS-DOS while the computer is on, press and hold the CTRL and ALT keys, press the DEL key, then release all three keys at once. This resets the computer and reloads MS-DOS into memory.
- Sometimes your computer may crash or hang, making it impossible for you to enter any commands. A power surge or a problem with one of your application programs can cause this.

To correct the problem, turn your computer off, wait a few moments, then turn your computer back on (with the MS-DOS system disk in drive A or drive B if you do not have a hard disk).

## Quitting MS-DOS

Never turn off your computer when the disk drives are in use (when any drive light is on). You could lose all of the data stored on the disk. To quit MS-DOS, first make sure the system prompt is showing on the screen, then remove your floppy disk(s) from the disk drive(s) and turn off your computer.

## Using an Autoexec.bat File

A general rule to follow in putting commands in the *autoexec.bat* file is to put only those commands you want executed every time you start MS-DOS. Some of the commands you might want to put in your *autoexec.bat* file include:

- One or more MODE commands to adjust the settings for your printer or telephone modem.
- The DATE and TIME commands (unless you have a real-time clock installed in your system). You are not prompted for the date and time unless you have these commands in the file.

- The PATH command, telling MS-DOS the search path to follow when looking for external command files.
- You might include any command needed to start a memory-resident utility program (for example, MS-DOS Manager) that stays active while your other applications are running.

## Using MS-DOS Documentation

If you are having problems understanding an MS-DOS concept or command, refer to one of the following manuals:

- *Learning MS-DOS Manager*, the on-line, interactive tutorial included with the MS-DOS Manager software. Refer to *Using the MS-DOS Manager* for information on starting the tutorial.
- *MS-DOS User's Guide*, Chapters 1, 2, and 3. These chapters describe basic MS-DOS commands and rules for using MS-DOS. Examples are included showing you how to create backup disks; copy, delete, and rename files; create and remove directories; and configure a printer. Chapter 3 contains a detailed command dictionary of the most common MS-DOS commands.

## Controlling Screen Displays

This section describes ways to stop and resume the display of information to your screen.

- To stop the display of information to the screen, (for example, a long directory listing), use either CTRL-NUM LCK or CTRL-S to stop the display so that you can read it. Press any key to resume the display.
- Use the TYPE command with the MORE filter to look at a file one screen at a time without editing it. For example:

```
TYPE filename | MORE
```

## Using MS-DOS Commands

- Internal MS-DOS commands reside in memory and execute as soon as you press RETURN. External commands reside on disk until they are needed. You must specify where an external command is located before you can use it. For example:

```
A: DISKCOPY
```

- By default, MS-DOS only looks in the working drive or directory for external commands (this includes MS-DOS commands as well as commands needed to run application programs). If you enter a command and MS-DOS cannot find it, the following message displays:

```
Bad command or filename
```

To correct the problem, reenter the command, making sure you enter it correctly and that you specify where the command is located.

An easy way for users with hard disks to do this is to use the PATH command and list all of the directories that contain external command files. Then you can use a command from within any directory or drive. (Refer to Setting up a Command Search Path in Chapter 2 for more information.)

- If you see the following message:

```
Not ready error reading drive x
Abort, Retry, Ignore?
```

Your disk may not be inserted into the drive properly. Try inserting the disk again and press R (for retry).

If reinserting the disk does not work, the disk may be damaged or not formatted. Try saving the files on the disk by copying them to another formatted disk, then reformat the bad disk.

- Having problems with a command or cannot get the command to work at all?

Check that you entered the command or filename correctly (press the F3 function key to retrieve the previously entered command).

Is the correct disk in the drive?

Did you accidentally put spaces between the parts of the filename (*filename.ext*, not *filename. ext*).

Did you forget the file name extension?

Did you include a colon (:) immediately after the drive name?

Did you specify the correct path to where the command is located?

## Working with Files

To help you remember what files are stored on a disk, keep the following tips in mind:

- Use filenames that are descriptive of a file's contents. For example, *letter.doc* changed to *grammar.ltr* says a lot more about what is in the file.
- Print out a directory listing for each of your floppy disks and keep it with the disk. To print the listing, use the DIR command as follows:

```
DIR [d:] > PRN
```

where *d*: specifies the drive name if different than the working drive.

- Use wildcard characters when working with groups of related files. For example, to copy all files with the extension `.ltr` on the working drive to drive B, enter:

```
COPY *.ltr b:
```

## Working with Disks

This section contains tips on using MS-DOS when working with disks.

- Having problems writing to a floppy disk? Check the disk to see if it is write protected. Refer to Chapter 1, "Getting Started," for information on write-protecting a disk.
- If you see the following message, it most likely means the floppy disk you are using is defective:

```
Disk read error  
Correct and strike any key when ready
```

Make a backup copy of the disk. Use the `COPY` command to copy individual files, not `DISKCOPY`. `DISKCOPY` makes an exact duplicate of the disk, including the bad areas, whereas `COPY` only copies files.

- When copying files to the same disk as the source files, you must specify a different filename when copying to the same directory.

Use care that you do not overwrite (and thus erase) a file on the target disk by copying a file with the same name onto that disk. Display a list of files on the target disk with the `DIR` command before you make the copy.

- 
- **Make backup copies of all your important disks and application software. Then, if a disk becomes damaged, you can still use the original copy to make another backup. Use the backup copy for everyday use.**
  - **Periodically, you should run CHKDSK on each of your disks (including your hard disk if your system has one) to check them for disk errors.**

# GLOSSARY

---

## OVERVIEW

This appendix lists commonly used terms and their definitions as used in this manual.

**\*.\*** This abbreviation means all files. The command `COPY A:*.* B:` means copy all files from the disk in drive A to the disk in drive B.

**Application software** Another name for software or application programs. Software is written in a computer language and consists of a series of instructions that tell the computer to perform tasks.

**ASCII** American Standard Code for Information Interchange. An industry standard used for representing alphabetical and numerical information in computer equipment.

**Autoexec.bat file** A special MS-DOS batch file that you can use to execute MS-DOS commands and applications each time you boot MS-DOS. Refer to Appendix A, "Batch Processing," for information on creating and using an *autoexec.bat* file.

**Background printing** The process of printing files while your computer and MS-DOS are doing other tasks.

**Backup disk** A copy of any disk you make with the `BACKUP`, `DISKCOPY`, or `COPY` command. You should always make a backup copy of the MS-DOS distribution disk before you begin using MS-DOS. Store the distribution disk in a safe place and use the copy for your work.

**Batch files** A collection of MS-DOS commands that are placed in a file and collectively executed by entering the name of the batch file. Refer to Appendix A, "Batch Processing," for more information on creating and using batch files.

**Batch processing** Refers to the process of executing one or more MS-DOS commands from within a batch file.

**Bit (Binary digit).** The smallest unit of information in binary notation.

**Booting** The process of loading MS-DOS into your computer's memory.

**Byte** A unit of information (typically eight bits) on a computer. You can use the DIR command to see how many bytes, or characters, are in a file.

**Character** A letter, number, or symbol that you type at your keyboard or see on your screen.

**Child directory** A directory that is one level below your working directory. For example, in the directory path *c:\school\studies*, *\studies* is the child directory of *c:\school*.

**Command** A program that tells MS-DOS how to do a specific task.

**Command environment** Stores the parameters that control the command processor.

**Command line entry** The process of entering an MS-DOS command and all the information needed to execute the command on one command line.

**Command processor** The program that contains all the MS-DOS internal commands and processes MS-DOS commands. This is usually *command.com*.

**Command redirection** The process of redirecting MS-DOS command input and output. Refer to Redirecting Command Input and Output in Chapter 2, "Using MS-DOS," for information on redirection.

**Communications channel** See Serial Port.

**Concatenate** Join two or more files together and save as one file. COPY lets you concatenate (join together) files. For example, the following command concatenates *myfile.doc* and *yourfile.doc* and saves them as one file, *ourfile.doc*:

```
COPY myfile.doc+yourfile.doc ourfile.doc
```

**Config.sys file** A special configuration file that MS-DOS uses to configure your system at startup. Refer to Appendix B, "Configuring Your System," for more information on using a *config.sys* file.

**Console** A term used to refer to your computer's keyboard and display screen. CON is the device name for console.

**COPY** An MS-DOS command that copies one or more files on the same disk or from one device to another.

**COUNTRY** A configuration command you put in the *config.sys* file to change the date, time, and currency display format to the country desired. For example, COUNTRY=033 changes the display format to French.

**CTRL key** Used in combination with other keys to give MS-DOS special commands such as stop the last command and stop the display from scrolling. Press the CTRL key at the same time you press another key.

**CTRL-BREAK** A control key sequence that immediately stops a command that is running.

**CTRL-C** A control key sequence that stops a command while it is running; CTRL-C is not always as immediate in effect as CTRL-BREAK.

**CTRL-NUM LCK** A control key sequence that stops the scrolling of the screen display. Press any nonfunction or noncontrol key to resume scrolling.

**CTRL-P** A control key sequence that sends any subsequent characters typed or information displayed on the screen to the printer. Pressing CTRL-P again will turn it off.

**CTRL-S** A control key sequence that stops or restarts the scrolling of the screen display. Its action is identical to CTRL-NUM LCK.

**Current directory** See Working Directory.

**Cursor** A blinking underline, rectangle, or other symbol that marks your place on the screen.

**Default disk drive** The drive where MS-DOS searches for the filenames you type. MS-DOS looks for files in the default drive unless you specify a different drive. The standard prompt contains the default drive letter. For example, if the prompt is A>, then drive A is the default drive.

**DEL** An MS-DOS command that tells MS-DOS to delete one or more files. A synonym for del is ERASE.

**Delimiter** A separator (usually a space or comma) used to separate commands and parameters.

**Device errors** Errors that MS-DOS displays while reading from or writing to devices on your computer. A device can be, for example, a printer, a disk drive, or a monitor. Refer to Appendix C, "MS-DOS Messages," for a list of device errors.

**DIR** An MS-DOS command that means "directory." When you enter dir, MS-DOS displays the working directory of the disk in the default drive. The command dir b: displays the contents of the working directory of the disk in drive B.

**Directory** A table of contents for a disk. The directory contains the names of your files, the sizes of the files, and the dates they were created or last changed.

**Disk** See Floppy disk and Hard disk.

**Disk drive** A piece of hardware that is part of your computer. A disk drive can be either a floppy or a hard drive. You insert floppy disks into floppy disk drives. Usually, hard disks are built into the computer.

Floppy disk drives are commonly referred to as the A and B drives. A hard disk is usually the C drive. Your computer owner's manual will tell you how your drives are labeled.

**Disk Operating System (DOS)** A group of programs that acts as a translator between you and your computer. MS-DOS is a disk operating system. *See* Operating system.

**Diskcopy** An MS-DOS command that copies disks. `diskcopy` formats a disk before copying files onto it.

**Drive name** Shown on the screen as a letter and a colon, it tells MS-DOS where to search for the file. For example, the command type `a:progress.rpt` contains a drive name (`a:`) that tells MS-DOS to look on the disk in drive A for the file called `progress.rpt`.

**Editor** A program that allows you to manipulate text and data with the computer. Editors allow you to move text, add and delete characters and lines, and save files.

**End-of-File (EOF)** A character (usually CTRL-Z) that specifies the end of a file. An EOF can be generated by pressing either CTRL-Z or the F6 function key.

**ENTER key** *See* RETURN key.

**ERASE** A synonym for the MS-DOS `del` command. *See also* DEL.

**Error messages** Onscreen messages that describe a problem that an application or MS-DOS has detected in a program or command. Refer to Appendix C, "MS-DOS Messages," for the appropriate response to each operating system error message. Your application's manual should describe program-specific error messages.

**Exit codes** A one- or two-digit number returned by some commands upon completion of the command. For example, `BACKUP` returns an exit code of 0 upon normal completion of the backup task. Exit codes can be used in batch files. *See* Appendix A, "Batch Processing," for information on creating and using batch files.

**External Commands** MS-DOS commands that are *not* loaded into memory when you start MS-DOS. To use an external command, you must specify where the file is located (for example, A:FORMAT).

**File** A collection of related information stored as a unit on a disk. A disk file can be compared to a file folder in a desk drawer. For example, a file folder named *friends* might contain the names and addresses of your friends. A disk file could contain the same information and could also be named *friends*. Programs also are stored in files.

**File Allocation Table (FAT)** An internal table that MS-DOS places on each disk. The FAT keeps track of a file's location and is used to set aside (allocate) free space when you create new files.

**Filename** A filename can be from one to eight characters in length and can have an extension of one to three characters separated from the filename by a period (.). An example of a complete filename is *progress.rpt*. Certain filenames are reserved by MS-DOS and should not be used for your filenames. Refer to Chapter 2, "Using MS-DOS," for more information on valid and invalid filenames.

**Filename extension** A filename extension consists of a period and one to three characters. Most application programs supply their own extensions for files they create. For example, all GW-BASIC files use a filename extension of *.bas*. *See also* Filename.

**Filter** An MS-DOS command that reads your input, transforms it in some way, and then outputs it. This process is called *filtering*.

**Fixed disk** *See* Hard disk.

**Floppy disk** A 3.5-inch or 5.25-inch removable storage medium used to record programs and files. The eaZy pc uses 3.5-inch floppy disks.

**Formatting** The process of preparing blank disks so that MS-DOS can store data on them. You must format every blank disk before it can be used with MS-DOS.

**Fragmentation** The process of storing a program in nonsequential areas of disk space to make the best use of storage space.

**Full directory path** A directory path that begins at the root directory. For example, *c:\school\studies\math.lsn* specifies a full directory path to the file *math.lsn*.

**Fully-qualified file reference** Includes the information needed to access a file. This includes the drive name, directory path, and complete filename (for example, *a:\bin\tools\myfile.txt*). Also known as a *file specification*.

**GW-BASIC** A general-purpose version of the BASIC computer language. Often, BASIC is the first computer language that people learn.

**Hard disk** Sometimes called a fixed disk, a disk that is built into the computer. A hard disk can store much more information than a floppy disk, and the computer can retrieve information from it faster.

**Hidden files** Those files that are not listed when you display a listing of files with the DIR command. The MS-DOS system files are hidden files, as is the volume label you assign to a disk when you format it.

**Input/Output (I/O)** A term describing the transmission of data into or out of a computer.

**Interactive entries** Entries you make in response to command prompts. Some MS-DOS commands allow you to use interactive entries for ease of use (for example, BACKUP).

**Internal commands** These commands are loaded into memory each time you start MS-DOS. They are always available for use and you do not need to specify where the command is located to use it.

**KEYBxxx** An MS-DOS command that lets you load a keyboard device driver for a country other than the United States. For example, if you want to load the driver for the French language, you would enter KEYBFR.

**Logical drive** Refers to the assignment of the drive name B to drive A on systems with only one floppy disk drive. That is, MS-DOS lets you use the one floppy disk drive as both drive A and drive B.

**LPT1** Refers to the computer's parallel printer port.

**Memory** Another name for computer storage.

**Modem MODulator DEModulator.** A device that converts (modulates) the digital signals from a computer into audio tones for transmission over telephone lines and then converts the modulated signals to digital when received.

**Monitor** The computer screen.

**MS-DOS distribution disks** MS-DOS is distributed on floppy disks (called *distribution disks*) along with the user's manuals. Before you start using MS-DOS on a routine basis, you should always make a backup copy of the distribution disks. Then you only use the distribution disks to make new working copies for everyday use.

**Multilevel directory structure** Refers to the MS-DOS directory structure and the way MS-DOS allows you to create and use directories for storing file information. Sometimes called a *tree-structured* directory.

**Operating system** A series of programs that translate your commands to the computer, helping you perform such tasks as creating files, running programs, and printing documents. *See* also Disk Operating System.

**Parallel port** The physical port on the computer where you connect a parallel printer cable. LPT1 and PRN both refer to the parallel port.

**Parameters** Refers to optional data you can enter as part of certain MS-DOS commands to control how a command is to be executed.

**Parent directory** The directory that is one level above your working directory. For example, in the directory path *c:\school\studies*, *\school* is the parent directory of *\studies*. MS-DOS lets you use the shorthand notation *..* to refer to the parent directory.

**PATH** An MS-DOS command that sets and displays the search path used to locate external commands. External commands refers to application program commands as well as MS-DOS commands.

**Piping** The process of using the output of one command as the input for another command. For example, *TYPE myfile.doc | MORE* uses the output of the *TYPE* command as input for the *MORE* command.

**PRINT** An MS-DOS command that prints files on your printer.

**Printer** A printing device that is attached to your computer. It prints files so that you have a paper copy, or printout, of them.

**Program** A set of instructions, written in computer language, that tells the computer how to perform some task. *See also* Application software.

**Prompt** A word or symbol that MS-DOS displays on the screen to tell you it is ready for you to enter commands. The standard system prompt consists of the default drive name (usually A, B, or C) and a greater-than sign. An example of the MS-DOS prompt is *A>*.

**Random Access Memory** A term that refers to the internal memory in your computer. Commonly referred to as RAM.

**Real-time clock** An optional piece of hardware that you can add to your system that always keep track of the date and time for MS-DOS. If you have a real-time clock installed, you need not worry about MS-DOS writing the wrong date and time when you create and save files.

**Relative directory path** A directory path that starts with the working directory. Relative paths never begin with a \. For example, if your working directory was *c:\school*, you need only specify the relative path *studies\math.isn* to work with the file *c:\school\studies\math.isn*.

**RENAME** An MS-DOS command that renames files. You can use its abbreviation, *ren*, in place of the full command name.

**RETURN key** The key you usually press after typing data, text, or an MS-DOS command. Sometimes referred to as **ENTER**.

**Root directory** The first level in the MS-DOS directory structure; referred to in directory paths as \. MS-DOS creates a root directory on each disk you format.

**Scrolling** The movement of text on your screen as it rolls up and off the top of the screen. Press **CTRL-NUM LCK** or **CTRL-S** to stop the scrolling text. Press any nonfunction or noncontrol key to resume scrolling.

**Serial port** Usually **COM1**, this is the port where you would connect a modem or mouse for use with your eaZy pc.

**Setup program** A special program that is included with MS-DOS and some application programs and is used to create working copies of the software.

**SHIFT-PRT SC** The key sequence that immediately sends the current text contents of the screen to the printer.

**Software** The programs, routines, or instructions that tell the computer which tasks to perform and how to perform them. Some examples of software include: operating systems, word processing programs, and spreadsheet programs.

**Source disk** Refers to the disk containing the file(s) you want to work with.

**Sourcefile** Refers to the file you want to copy or rename.

**Standard I/O** Input comes from the computer's keyboard and output goes to the monitor.

**Standard input device** Refers to your keyboard. By default, MS-DOS receives all command input from the keyboard unless you specify otherwise.

**Standard output device** Refers to your monitor (screen). By default, MS-DOS sends all command output to the screen unless you redirect the output elsewhere.

**Target disk** Refers to the disk where you are sending data.

**Targetfile** Refers to where you want to copy or rename a file.

**Task** Something your computer does when you give it a command. Sorting a file's contents in alphabetical order is an example of a task.

**Track** The portion of a disk that one read/write head passes over while in a stationary position. Track density is measured in tracks per inch (tpi).

**TYPE** An MS-DOS command that displays the contents of files on the screen. If you press CTRL-P before you enter a type command, the file's contents are printed on your printer.

**Volume label** An internal name of up to 11 characters that helps you identify the purpose of a disk. You should create a volume label when you format each of your disks to help you identify them. Refer to the FORMAT command in Chapter 3, "MS-DOS Commands," for more information on creating volume labels.

**Volume** Refers to the disks used to store files during a backup process using the BACKUP command. Each disk is referred to as a volume.

**Working directory** Refers to the directory that MS-DOS searches first for files and programs. MS-DOS lets you use the shorthand notation . (dot) to refer to the working directory. Also called the *default directory* or *active directory*.

**Write-protect tab** On 3.5-inch floppy disks, the write-protect hole in the lower left-hand corner of the front of the disk causes the disk to be write-protected when the built-in plastic tab is moved away to expose the hole. *See also* Write-protected disk.

**Write-protected disk** For 3.5-inch floppy disks, the hole on the bottom left-hand corner of the front of the disk is open (the plastic tab is not visible through the hole) when the disk cannot be written to. When the hole is visible, they are write-protected. If the disk does not have a write-protect tab, you cannot change the information on the disk. Data disks should not be write protected when you want to add, delete, or change data stored on them.



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