Tandy 3000

MS-DOS®
Handbook

TANDY®

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Handbook

ABOUT THIS MANUAL

This handbook is an introduction and guide to the basic operation of MS-DOS®, your disk operating system. The handbook is divided into two parts. Each part has a different purpose.

What is in Part 1

Part 1 of this handbook is designed to teach you the MS-DOS functions you **need** to know for the setup and use of your computer and disk drives.

What is in Part 2

MS-DOS has many commands and functions that you can use to create and manage data. If you want to learn more about how the operating system works, and if you like to explore, Part 2 is for you. The information in it prepares you to make use of all the MS-DOS functions and commands outlined in the *MS-DOS Reference Manual*.

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Part 2 / More Ways To Use MS-DOS

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Part 1
What You Need To Know About MS-DOS

WHAT IS AN OPERATING SYSTEM?

MS-DOS is a *Disk Operating System*. An operating system is a group of programs acting as an interpreter and manager for your computer, monitor, and peripheral equipment. A *disk* operating system, or *DOS*, is one that can direct information to a computer's disk drives, and interpret information received from the drives.

A computer can do only what you instruct it to do. That is why MS-DOS is so important; it conveys your instructions to the computer so the computer can work for you. You can think of the operating system as an office manager. You give the orders, and MS-DOS sees that they get done.

How Much Do You Need to Know About MS-DOS?

How much you need to know about MS-DOS depends on how you plan to use your computer. If you want to use it only for running application programs, you need to know little about the operating system. On the other hand, if you plan to use advanced operating system features, or if you want to create your own programs, you should become quite familiar with the operating system. In addition, you need to be familiar with any features of MS-DOS that are designed specifically for use with any optional equipment your system might have.

Regardless of how you intend to use your computer, you must know certain basic procedures, including how to:

● Start and exit MS-DOS

● Enter MS-DOS instructions

● Prepare a diskette for information storage

● Copy files (operating system, program, and data files) from one diskette to another

● Duplicate a diskette

This manual presents this information and a few other items you might find helpful.

Entering MS-DOS Instructions

The instructions you give MS-DOS are called *commands*. You type commands at the *system prompt* displayed on the screen (usually A>). The prompt indicates that MS-DOS is at the *command level,* ready to accept commands.

The drive that MS-DOS is set to access when you enter commands is called the *current drive.* You can access information on a drive other than the current drive by including a drive reference when you enter a command. MS-DOS regards Drive A as the current drive unless you specify otherwise. (See "Changing the Current Drive" in Chapter 3 if you want to change the current drive.)

Because your computer carries out the MS-DOS commands exactly as you give them, your entries must be precise and must have perfect *syntax* (spelling and form). You can type your instructions in either upper- or lowercase letters. However, pay special attention when typing keys that are interchangeable on a typewriter keyboard. These keys are not interchangeable on the computer keyboard. For example, never type the letter O for 0 (zero) or the lowercase letter l for 1 (one). Be sure you type commands exactly as they are shown.

This manual uses a simple method of notation to distinguish between what you enter and what you see on the screen.

Example	Description
BACKSPACE	Boxed characters represent keys that you press. These are usually function or command keys. You do not need to press ENTER after you press a key.
CTRL C	Two or more boxed keys together represent a *key sequence* that you press. For a key sequence, hold down the first key shown and—while holding down that key—press the second key.
format ENTER	Text you type is shown in a different typeface than the body of the manual. You must press ENTER after you type the text.
A>	Text that appears on the screen, such as the system prompt, is also shown in a different typeface.

If you make a mistake while typing, and have not yet pressed [ENTER], you can use [←] to move back to the error. Then, simply retype the line from that character on.

Using Application Programs With MS-DOS

Application programs are designed to accomplish specific tasks. There are programs for word processing, data processing, accounting, and much more. There are hundreds of application programs that you can operate on your computer with MS-DOS.

Most of your computer's application programs require that you use an MS-DOS system diskette to start up your computer. A few of application programs have the MS-DOS system on the application program diskette. In such cases, you can start the program directly from the application diskette. Different programs might require different procedures. Check your application program's documentation for specific instructions.

When you load an application program, the operating system prompt disappears. The program has its own prompts and menus. When you are operating from an application program, the program passes your instructions to MS-DOS. MS-DOS manages your computer's operations in the background, and its functions are invisible to you.

HOW TO START
AND EXIT YOUR SYSTEM

Starting MS-DOS

Starting your computer and initializing an operating system is called *booting*. The term refers to the concept of pulling yourself up by your bootstraps.

To boot your system with MS-DOS, follow these instructions:

1. Turn on your computer, monitor, and any *peripherals,* such as a printer or extra drives.

2. Remove the MS-DOS system diskette that came with this manual from its protective envelope. (Diskettes require special handling. Be sure to read the section on diskette care in your *Installation and Operation Manual.*)

3. Place the diskette, label side up, into Disk Drive A. The square notch should be on the left as you insert the diskette. (If you cover this notch with a foil tab, the diskette is *write-protected* so that you cannot change or delete the information on it. Refer to Chapter 3 for more information.)

4. Close the drive latch. Press the red Reset button on the front of the computer to start loading MS-DOS. The red light on the front of Drive A lights as the computer loads the operating system.

5. When a message asking for the date and time appears, use the sample format on the screen to enter the information. If you do not want to change the date and time from those shown, press ⌈ENTER⌋ at the prompts.

    MS-DOS completes the boot procedure, and displays the system prompt. This is the current drive reference, followed by a greater-than symbol (A>). You can now enter operating system commands to instruct MS-DOS to perform tasks and run application programs.

Exiting MS-DOS

In the same manner that you use MS-DOS to start operations, you should use MS-DOS to exit or close operations. For instance, if you are in the middle of a process, it is unwise to suddenly turn off your computer. Doing so can destroy files or garble disks.

You can usually cancel an operation by pressing [CTRL] [C]. In some instances, you must let an operation complete its function before you can regain control of MS-DOS. If you are using an application program, that program's manual tells you how to exit the program to return to the MS-DOS command level.

You should always be at the MS-DOS command level to turn off your computer. When the system prompt is on the screen, follow these these steps:

1.   Remove any floppy diskette(s) from the disk drive(s), put them back in their protective envelopes, and store them in a safe place.

2.   Turn off your computer, monitor, and other equipment. If you plug your equipment into one power strip, you can use the power strip switch to turn off all equipment at one time.

> **Note:** If your system has a hard disk, you should wait at least 15 seconds before turning the computer on again.

WHAT YOU NEED TO KNOW
TO USE FLOPPY DRIVES

Floppy diskettes are sensitive. To avoid losing information, handle them with care, as described in your computer's *Installation and Operation Manual.*

Write Protection for Diskettes
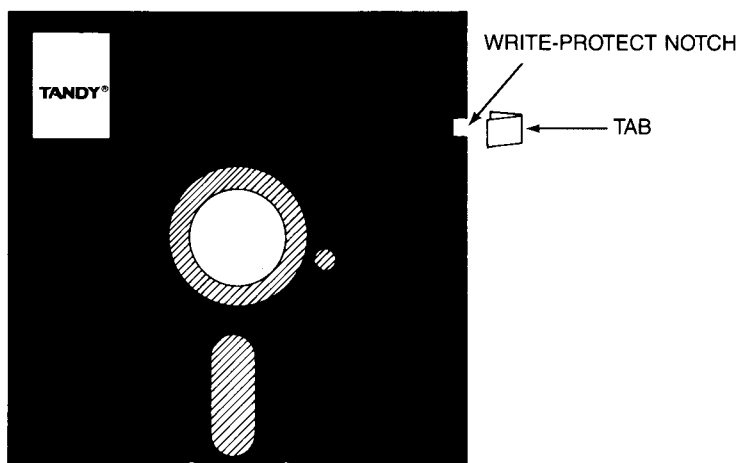
Most diskettes have a square notch cut from one side. This is a *write-protect* notch. If you fold a special adhesive tab (supplied with diskettes) over this notch, your computer can no longer write (store) data on the diskette. The tab protects the diskette from inadvertent destruction of data.

Removing the tab permits MS-DOS to write data on the diskette again.

Types of Floppy Disk Drives

Tandy's latest computers support more than one type of floppy disk drive. Your drive types depend on your computer. For example, the Tandy 3000 HL's Drive A is installed at the factory as a *standard drive* (double-sided, 5 1/4-inch, 360-kilobyte). The Tandy 3000's Drive A, on the other hand, is a *high-capacity drive* (double-sided, 5 1/4-inch, 1.2-megabyte). Both computers can have an optional Drive B, which can be either standard or high-capacity.

The type of diskettes you can use in a drive depend on that drive's type:

- You can use only *standard, double-sided diskettes* (Cat. No. 26-412) in standard drives.

- You can use either *high-density diskettes* (Cat. No. 26-422) or standard diskettes in high-capacity drives. High-capacity drives can read from and write to both kinds of diskettes. (Standard diskettes written to in high-capacity drives require a special format, which is discussed later in this chapter.)

Backing Up Diskettes

The magnetically stored information on diskettes can be destroyed by exposure to a magnetic field or by improper use or handling. Therefore, you should make several copies of important diskettes. If anything happens to a backup diskette, immediately make another.

There are two ways to *back up* diskettes. Depending on the types of drives you have, you use either the COPY command or the DISKCOPY command. If you use COPY, you must first use the FORMAT command to prepare the *target* diskette for information storage. (The target is the diskette to receive the information.) If you use DISKCOPY, you do not need to format the target diskette. DISKCOPY automatically formats the diskette for you.

> **Note:** MS-DOS now has an enhanced COPY command, XCOPY, which you might find handier than COPY for backing up diskettes that contain *subdirectories*. But for the MS-DOS system diskette and other diskettes that don't contain subdirectories, COPY is simpler to use than XCOPY. (For more information on XCOPY, see "Copying Files and Directories" in Chapter 6.)

Before making copies of any diskette, place a tab over the diskette's write-protect notch (as shown in the illustration at the beginning of this chapter). This precaution ensures that you do not accidentally alter or destroy data on the diskette. If you want to store data on the protected diskette after copying, be sure to first remove the tab.

We strongly suggest that you now make at least two back-ups of your MS-DOS system diskette, using the appropriate command sequence from the table of backups in this chapter. To use the table, you need to be aware that the MS-DOS system is distributed on a standard diskette. Also, note that you need to include the /S *switch* if you use the FORMAT command.

> **Note:** A switch is an indicator you add to a command that changes the command's operation in some way. All MS-DOS switches begin with a a slash (/).

> When used with FORMAT, /S causes FORMAT to copy the two invisible system files and the file COMMAND.COM to the target diskette as it formats the target. The system files are *boot files*. You must have them on any diskette from which you want to boot the system. The COPY command can transfer other files from the system diskette, but it cannot transfer the system files. Therefore, you must transfer the system files during the formatting.

Preceding the table of backups are instructions for use of the FORMAT command. Following the table are two sample procedures for backing up diskettes. The samples are provided to familiarize you with the order of events and the prompts you might see on the screen. Use them for background, but use the table to determine the particular commands that **you** need. All the commands display screen prompts to lead you through the procedures.

Formatting With One Floppy Disk Drive

The following is a general procedure for formatting a diskette for any type of data storage.

When formatting a diskette, the system writes to the diskette information that the diskette needs in order to store data. Therefore, the diskette's write-protect notch must **not** be covered during formatting.

1. If your computer is off, turn it on, and boot MS-DOS as outlined in Chapter 2.

2. At the system prompt (A>), enter the FORMAT command that is appropriate for your drive and *media* (diskette type):

    a. To format a standard diskette in a standard Drive A, or to format a high-density diskette in a high-capacity Drive A, type:

        `format a: [ENTER]`

        Note: If you want to copy the boot tracks from the system diskette, which you must do to back up the system, include the /S switch before pressing [ENTER]. For example, type:
        `format a: /s [ENTER]`.

    b. To format a standard diskette in a high-capacity Drive A, include the /4 switch in the FORMAT command, as shown here:

        `format a: /4 [ENTER]`

        The /4 switch causes a standard-density format in a high-capacity drive.

        Note: If you want to copy the boot tracks from the system diskette, which you must do to back up the system, include the /S switch before pressing [ENTER]. For example, type:
        `format a: /4/s [ENTER]`.

3. The following prompt appears:

        Insert new diskette for drive A:
        and strike ENTER when ready

4.   Replace the system diskette in Drive A with the diskette you wish to format, and press [ENTER]. FORMAT informs you of its progress by displaying numbers corresponding to the different disk areas as it formats them.

5.   When FORMAT ends, a prompt appears, giving you the option to format another diskette in the same way. To format another, press [Y]. Then, at the Insert new diskette prompt, replace the newly formatted diskette with another blank diskette, and press [ENTER]. If you don't want to format another, press [N].

6.   Pressing [N] causes the A> prompt to return to the screen.

7.   Store formatted diskettes in a safe place until you are ready to use them.

Formatting With Two Floppy Disk Drives

The following is a general procedure for formatting a diskette for any type of data storage. It describes how to format a diskette in Drive B. To format a diskette in Drive A, follow the steps under "Formatting With One Floppy Disk Drive," above.

When formatting a diskette, the system writes to the diskette information that the diskette needs in order to store data. Therefore, the diskette's write-protect notch must **not** be covered during formatting.

1.   If your computer is off, turn it on and boot MS-DOS as outlined in Chapter 2.

2.   At the system prompt (A>), enter the FORMAT command that is appropriate for your drive and *media* (diskette type):

     a.   To format a standard diskette in a standard Drive B, or to format a high-density diskette in a high-capacity Drive B, type:

          format b: [ENTER]

          Note: If you want to copy the boot tracks from the system diskette, which you must do to back up the system, include the /S switch before pressing [ENTER]. For example, type:
          format b: /s [ENTER].

b. To format a standard diskette in a high-capacity Drive B, include the /4 switch in the FORMAT command, as shown here:

```
format b: /4 ENTER
```

The /4 switch causes a standard-density format in a high-capacity drive.

Note: If you want to copy the boot tracks from the system diskette, which you must do to back up the system, include the /S switch before pressing ENTER. For example, type:
```
format b: /4/s ENTER.
```

3. FORMAT asks you to insert the diskette to be formatted in Drive B. When ready, press ENTER, and formatting begins. FORMAT informs you of its progress by displaying numbers corresponding to the different disk areas as it formats them.

4. When FORMAT ends, a prompt appears, giving you the option to format another diskette in the same way. To format another, press Y. Then, when prompted for the diskette to format, replace the newly formatted diskette with another blank diskette, and press ENTER. If you don't want to format another, press N.

5. Store formatted diskettes in a safe place until you are ready to use them.

Table of Backups

Note: The following table includes the basic commands for backing up your MS-DOS system diskette.

Drive Configuration		Media		Command Sequence
source → *target*		*source* → *target*		
Drive A → Drive A standard → standard		standard → standard		diskcopy [ENTER]
Drive A → Drive A high-cap. → high-cap		standard → high-den.		format a: /S [ENTER] copy a:*.* b: [ENTER]
		standard → standard		diskcopy [ENTER]
		high-den. → standard		format a: /4 /S [ENTER] copy a:*filename* b: [ENTER]
		high-den. → high-den.		diskcopy [ENTER]
Drive A → Drive B standard → standard		standard → standard		diskcopy a: b: [ENTER]
Drive A → Drive B high-cap. → high-cap.		standard → high-den.		format b: /S [ENTER] copy a:*.* b: [ENTER]
		standard → standard		diskcopy a: b: [ENTER]
		high-den. → standard		format b: /4 /S [ENTER] copy a:*filename* b: [ENTER]
		high-den. → high-den.		diskcopy a: b: [ENTER]
Drive A → Drive B standard → high-cap.		standard → standard		diskcopy a: b: [ENTER]
		standard → high-den.		format b: /S [ENTER] copy a:*.* b: [ENTER]
Drive A → Drive B high-cap. → standard		standard → standard		diskcopy a: b: [ENTER]
		high-den. → standard		format b: /S [ENTER] copy b:*filename* a: [ENTER]

Sample Backup Procedures

In the following procedures, the *source diskette* is the diskette that contains the programs, system files, or data files that you want to copy. The *target diskette* is the diskette you select to receive the copy.

> **Note:** Some application programs you buy do not let you make copies of program diskettes. Check the program manual for information on protecting the data on these diskettes.

Sample DISKCOPY Procedure

Using the DISKCOPY command is faster than using FORMAT and COPY, but DISKCOPY has limitations. Look at the table of backups. The source diskette must be of the same type as the target diskette for you to use DISKCOPY. Therefore, you cannot use it to copy between standard and high-density diskettes.

> **Note:** If you have a high-capacity drive, and you want to copy your MS-DOS system (on a standard diskette) to a high-density diskette, see "Sample COPY Procedure."

The following DISKCOPY sample assumes the computer has only one floppy disk drive—a standard drive. It illustrates how to back up the MS-DOS system to another standard diskette in that drive.

1. If your computer is off, turn it on, and boot MS-DOS as outlined at the beginning of Chapter 2.

2. At the system prompt (A>), type:

   ```
   diskcopy [ENTER]
   ```

   The screen displays the following prompt:

   ```
   Insert source diskette in drive A:
   Strike any key when ready
   ```

3. To copy the MS-DOS system diskette, leave it in the drive. Otherwise, replace it with the diskette you wish to copy. Press the space bar. The screen displays:

   ```
   Copying 2 sides, 40 tracks, 9 sectors/track
   ```

   Note: This display might vary, depending on the diskette you are copying.

   After a few moments, the screen displays:

   ```
   Insert target diskette in drive A:
   Strike any key when ready
   ```

4. Remove the source diskette. Be sure there is not a write-protect tab on the target diskette. Insert the target diskette in Drive A, and press the space bar.

   In some instances, MS-DOS might request that you swap the source and target diskettes one or more times before DISKCOPY is complete.

   When the DISKCOPY procedure is finished, this message appears:

   ```
   Copy complete
   Copy another (Y/N)?
   ```

5. If you wish to create more copies, press [Y], and again follow the prompts. To ensure the safety of your operating system, make a minimum of two copies of MS-DOS.

   After making the number of the copies you wish, press [N] at the Copy another (Y/N)? prompt. The DISKCOPY procedure ends, and the system prompt reappears.

6. Use one backup diskette as your working diskette. Store the original diskette and any additional backups away from heat, magnetic sources, and electric motors, in a relatively dust-free environment.

Sample COPY Procedure

The COPY command, unlike DISKCOPY, "does not care" about media types. This is because COPY transfers by *file*; whereas, DISKCOPY transfers an entire diskette *sector-by-sector*, duplicating the format of the source diskette in the process. COPY is the more versatile command.

In the procedure that follows, you see the characters *.* in the COPY command. This sequence of characters tells COPY to transfer all files on a diskette. To back up a diskette, you usually want to transfer all files.

> **Note:** The exception is if you back up a high-density diskette to a standard diskette. Because a high-density diskette can hold so much more data than a standard diskette, you might need to use more than one standard diskette to back up one high-density diskette. If so, you need to copy individual files. This explains why three COPY commands on the table of backups include *filename* instead of *.*. You need to enter the COPY command once for each file you want to copy, and you need to specify the file to copy. (See "MS-DOS Disk Organization" in Chapter 4 to learn about files and filenames.)

The following sample COPY procedure assumes the computer has only one floppy disk drive—a high-capacity drive. It illustrates how to back up the MS-DOS system to a high-density diskette in that drive.

1. If your computer is off, turn it on, and boot MS-DOS as outlined at the beginning of Chapter 2.

2. At the system prompt (A>), type:

   ```
   format a:   /s ENTER
   ```

   This command instructs the system to format a diskette in Drive A, and copy the boot tracks to it.

3. The following prompt appears:

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

4. Replace the system diskette in Drive A with the high-density diskette you wish to format, and press [ENTER].

5. When the format ends, a prompt appears, giving you the option to format another diskette in the same way. Press [Y] to format a second diskette so that you can make two copies of the system diskette. When prompted for the diskette to format, replace the newly formatted diskette with another blank diskette, and press [ENTER].

6. After formatting the second diskette, press [N] when asked if you want to format another diskette.

7. Pressing [N] causes the A> prompt to return to the screen. Remove the formatted diskette from the disk drive, and replace it with the MS-DOS system diskette.

8. Enter the COPY command to copy the remaining files from the system diskette:

```
copy a:*.* b: [ENTER]
```

The operating system reads this command as "copy all files (except boot track files) on Drive A to Drive B." Because you have only one floppy disk drive, it performs a single-drive copy, and it "thinks of" the target diskette as the Drive B diskette.

9. The copy begins. Insert your source diskette whenever the screen asks for the Drive A diskette. Insert your target diskette whenever it asks for the Drive B diskette.

10. When the copy finishes, COPY displays the number of files copied.

11. Re-insert the MS-DOS system diskette in the drive, and enter the COPY command again to copy the system to the second formatted diskette.

At any time, you can use COPY to transfer files to a diskette that already contains data. As long as the files on the target diskette do not have the same names as files on the source diskette, COPY does not affect the files on the target. (If a target file **does** have the same name as a source file, COPY overwrites the target file.)

> **Caution:** Formatting erases all information on a diskette. Do **not** reformat the target diskette.

For example, if you have an application program that takes up two standard diskettes, you might want to transfer the program to one high-density diskette. Further, you might want the high-density diskette to be *bootable* so that you can start up the program without using a separate MS-DOS system diskette. If so, format a blank high-density diskette, being sure to include the /S option. Then, use COPY to transfer the remaining files from the system diskette. Use COPY again to transfer all files from both standard diskettes to the now bootable high-density diskette.

Changing the Current Drive

So far, this manual assumes you are using Drive A as the *current* drive. The current drive is the one from which you operate. Whenever the computer needs a program or data file, it looks for the file on the current drive.

You can, however, operate from drives other than Drive A. If you have two floppy drives, you can change the current drive by typing:

     b: [ENTER]

The screen prompt changes from A> to B>, and the system sets Drive B as the current drive. If you have a hard disk, but started your system using a floppy system diskette, you can change the current drive to Drive C in the same manner (assuming the hard disk is formatted).

Whenever you want to access a drive other than the current drive, you must include the drive name in the command. For example, to execute a program named Datapro in Drive A (if you are not operating from Drive A), type:

     a:datapro [ENTER]

Using Data With Different Computers and Drive Types

As mentioned earlier, Tandy's latest computers support more than one type of floppy disk drive, and the various Tandy computers might come with different types of drives. For example, the Tandy 3000 HL's Drive A is installed at the factory as a standard drive. The Tandy 3000's Drive A, on the other hand, is a high-capacity drive.

Suppose you have a Tandy 3000 HL with no extras (only a standard drive) and a Tandy 3000 with no extras (only a high-capacity drive). Although the computers have different types of drives, they can nonetheless make use of the same data. You simply need to copy the data to the correct type of diskette by following the appropriate set of instructions from one of the next two sections.

> **Caution:** To safeguard your data, follow this rule whenever you work with more than one type of drive: **Never write to a diskette using a drive that is not of the same type as that used to format the diskette.** For example, if you have a diskette that was created on Drive A of the Tandy 3000 HL, do not write information to it using the high-capacity drive of the Tandy 3000.

Copying from Standard to High-Capacity

> **Note:** For the sake of simplicity, this example assumes both computers have only one drive, as in the scenario above.

High-capacity drives can read all standard diskettes—including those formatted in standard drives. Thus, you can transfer data directly from a standard drive in one computer to a high-capacity drive in another computer.

To copy the data, refer to the following illustration. The source is a diskette created in a standard drive. (For safety's sake, this diskette should be a backup copy of the information you want to transfer.) The target diskette is a diskette formatted in a high-capacity drive. It can be either a high-density diskette or a standard diskette. In the target computer's high-capacity drive, use the COPY command to transfer the files from the source diskette to the target diskette.

Standard to High-Capacity

Copy the data from a standard diskette to a high-density diskette, using the target computer.

Standard diskette

TANDY Sales.dat
ORIGINAL or BACKUP

TANDY Sales.dat
WORKING

Copy

Sales.dat

High-density diskette
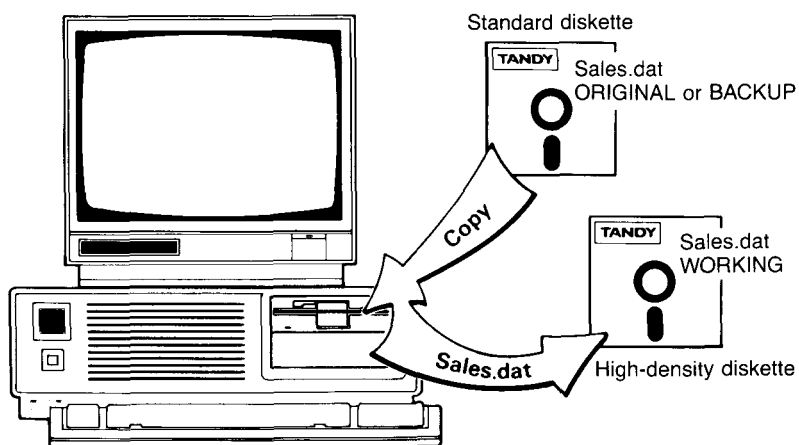
Tandy 3000 with a high-capacity drive

Copying from High-Capacity to Standard

Note: For the sake of simplicity, this example assumes both computers have only one drive, as in the scenario mentioned earlier.

Although a standard drive cannot read a high-density diskette, it **can** read a standard diskette formatted in a high-capacity drive. Because of this capability, you can use a standard diskette formatted in a high-capacity drive as a means of transferring data from a high-capacity drive to a standard drive.

To copy the data, refer to the following illustration. The source is a standard diskette created in a high-capacity drive. This diskette is a copy of either a high-density diskette or of another standard diskette created in a high-capacity drive. (Unless the source diskette is new, you should bulk erase it before copying the data to it.) The target diskette is a standard diskette formatted in a standard drive.

In the target computer's standard drive, use the COPY command to transfer the files from the source diskette to the target diskette. The target diskette becomes your working diskette for standard drives. You might want to make a backup of it, using DISKCOPY.

High-Capacity to Standard

1. Copy the file to a standard diskette, formatted in a high-capacity drive, using the source computer.

High-density diskette or a
standard diskette formatted in
a high-capacity drive

TANDY
Sales.dat
ORIGINAL

Copy

TANDY
Sales.dat
BACKUP

Sales.dat

Standard diskette
formatted in
a high-capacity drive
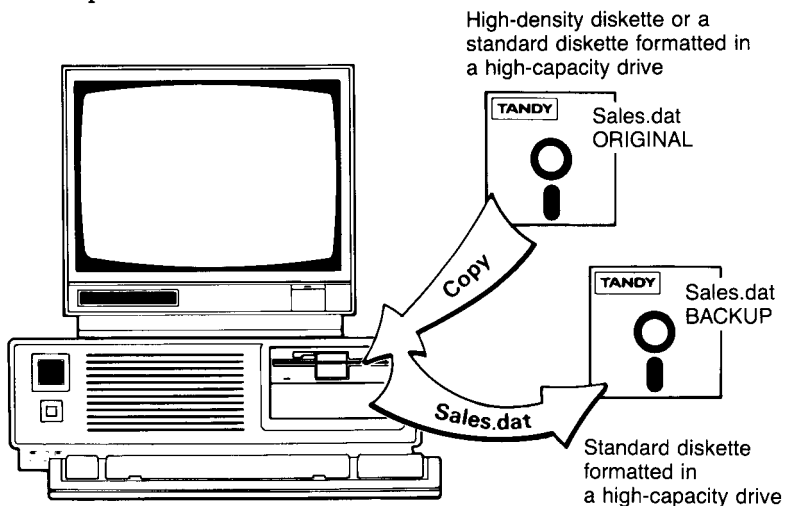
Tandy 3000 with a high-capacity drive

2. Copy the file from the source diskette to a standard working diskette, using the target computer.

TANDY
Sales.dat
BACKUP

Copy

TANDY
Sales.dat
WORKING

Sales.dat

Standard diskette formatted in
a standard drive
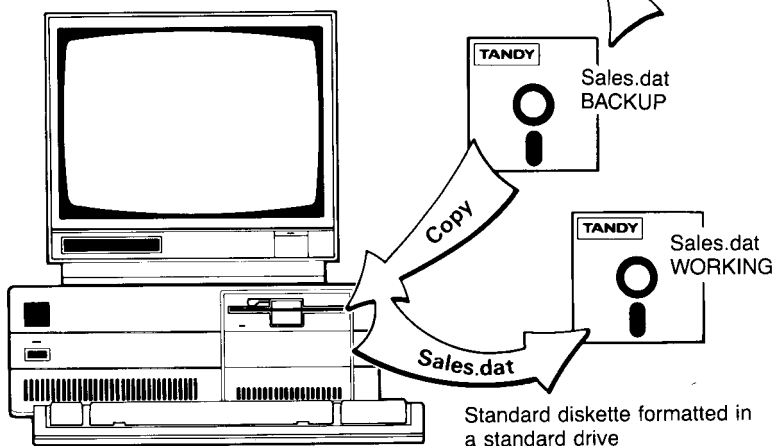
Tandy 3000 HL with a standard drive

WHAT YOU NEED TO KNOW TO USE HARD DISKS

Hard disks greatly expand the capacity of your computer system. They can store much more information than floppy diskettes, and MS-DOS can access data and programs from them more quickly than from floppy diskettes.

MS-DOS Disk Organization

The first step in using your hard disk is to understand how MS-DOS stores and organizes data on disk. This section briefly presents all the information you need so that you can quickly proceed to the next, "Formatting a Hard Disk."

> **Note:** The information presented here is true for both floppy and hard disks, but greater storage capacity makes it particularly important for managing data on a *hard disk-based system* (a computer system that has a hard disk).

About Files

All information on disks is stored in files. In some instances, this file data is a program (information that causes the computer to perform a task). In other instances, files consist of system information, such as what character to display on the screen when you press a key. A file can also contain data you create, perhaps a letter to a friend or information about your checking account.

About Directories

All files on a disk, whether a floppy diskette or a hard disk, reside in a *directory*. A directory is a storage space for filenames, directory names, or both. After you format a disk, it contains one directory called the *ROOT directory*. On your MS-DOS system disk, the commands are contained in the ROOT directory. When you boot your computer using MS-DOS, you are automatically *in* (operating from) the ROOT directory.

If you create another directory, it is a subdirectory of the ROOT directory. For instance, if you create a directory named SALES, it resides in the ROOT directory, and your disk organization looks like this:

ROOT DIRECTORY
|
SALES

You can now store files in the SALES directory. If you create two files named Joesales and Jimsales, the organization looks like this:

ROOT DIRECTORY
|
┌──── SALES ────┐
Jimsales   Joesales
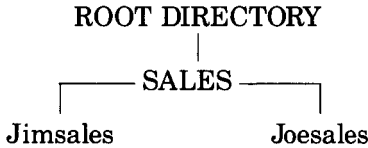
You can also create other directories within the SALES directory. If you create two subdirectories in SALES named REGION1 and REGION2, the organization looks like this:

ROOT DIRECTORY
|
┌──────┬──── SALES ────┬──────┐
   Jimsales   Joesales
REGION1   REGION2
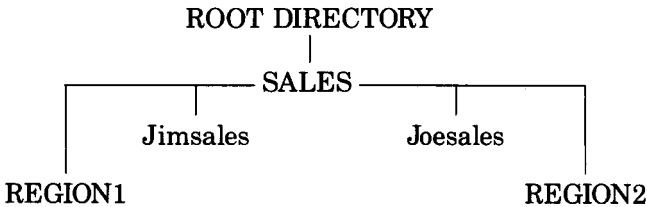
You can continue to create files and directories on a disk until its storage space is filled.

Multiple Directories

There is nothing wrong with storing all your files in the ROOT directory. Doing so makes it easy to access them because you are always in the same directory as your files.

However, organizing a disk into multiple directories makes it easy to keep your data organized when you have many files or if more than one person is using the same disk. Such a multiple-directory organization is especially helpful when using hard disks because hard disks can store hundreds of files.

About File and Directory Names

The file and directory names shown so far consist of letters of the alphabet and of numbers, but you can use other characters and symbols in a file or directory name. The following is a complete list of acceptable characters:

- Uppercase letters: (A-Z)

- Lowercase letters: (a-z)

- Decimal digits: (0-9)

- These symbols: $ & # % ' ( ) - @ ^ { } !

When creating filenames, do not include more than eight characters. MS-DOS ignores any characters after the eighth, and this can cause problems. For example, MS-DOS truncates both Accounts1 and Accounts2 to Accounts. If you save both files in the same directory, MS-DOS overwrites the first file with the second, destroying the first file.

Filename Extensions

Any filename can contain an *extension,* which further identifies the file. An extension is an appendage you add to the end of a filename. It is always preceded by a period.

Extensions can be a maximum of three characters and can include the same characters allowed in filenames. If you attempt to give extensions more than three characters, MS-DOS truncates them to the first three.

One use of extensions is to give different files the same name but different extensions. For example, you can create two files named Accounts.one and Accounts.two without conflict.

Once you include an extension in a filename, you must use that extension whenever you specify the file.

Examples of Filenames

The following are samples of filenames that MS-DOS can recognize:

mydata1	SAMFILE
1.tst	$100GIFT
records.srt	'HELP'.fil
XXX.xx	File#1.txt
10%SALES	par@64.gam
PROG1.BAS	-Check.bal
PROG2.bas	myprog.sor

In addition to several characters and symbols that are not valid in filenames, there are a few special *words* (MS-DOS device names) that you cannot use. These are:

aux	con
prn	nul
lst	

Examples of invalid filenames are:

his*hers ....because * is not a valid character for names.

.DATA ....because you can only use the period to separate filenames and extensions.

regionsales .....because filenames have a maximum of eight characters. MS-DOS truncates the name to Regionsa.

COST + INT .....because + is not a valid character for names.

CON.dat ....because con is a word reserved by MS-DOS.

Formatting a Hard Disk

To *initialize* your hard disk for use, you need to create one or more *partitions* (sections) on the hard disk, format the partition(s), and install MS-DOS. The task involves a number of steps, but normally you do it only once.

The procedure varies, depending on the size of your hard disk and whether or not the disk is a *standard* type. Select the procedure that describes your hard disk.

Procedure A /   A standard hard disk of 32 or fewer megabytes.

Procedure B /   A non-standard hard disk of 32 or fewer megabytes.

Procedure C /   A standard hard disk of more than 32 megabytes.

Procedure D /   A non-standard hard disk of more than 32 megabytes.

To determine whether your drive is standard, compare the number of cylinders and the number of heads for your drive with the numbers in the following table. (Each hard disk drive comes with the information you need.) If your information exactly matches a type in the table, you have a standard drive. If it does not, you have a non-standard drive.

Type	Cylinders	Heads
1	306	4
2	615	4
3	615	6
4	940	8
5	940	6
6	615	4
7	462	8
8	733	5
9	900	15
10	820	3
11	855	5
12	855	7
13	306	8
14	733	7
15	. . . . Reserved	

Before beginning the initialization, note the following about all four procedures:

- They are for a *soft* format of the hard disk. They assume that you first used the SETUP and FORMAT HARD DISK utilities on your Utilities diskette to do a *hard format* as outlined in your *Installation and Operation Manual*.

- They all describe how to format the entire disk for MS-DOS. Some Tandy computers, such as the Tandy 3000, can use the XENIX operating system, as well as MS-DOS. With these computers, you can have both XENIX and MS-DOS residing on one hard disk, in separate partitions. If you want to do this, see your XENIX documentation for more information.

- They are written as if you have only one floppy disk drive. As a result, you can follow the steps exactly, regardless of the number of floppy disk drives on your system. If, however, you have two drives, and you want make more use of Drive B, be sure to specify b: when accessing files on that drive. For example, to run the FDISK program from Drive B, type: b:fdisk (ENTER).

Procedure A
(Standard HD of 32 or Fewer Meg)

1. Boot your system as outlined in Chapter 2.

2. Replace the MS-DOS system diskette in Drive A with your Supplemental Programs diskette.

3. At the system prompt, type:

        fdisk [ENTER]

    The screen displays the following menu:

        Choose one of the following:

                  1.   Create DOS Partition
                  2.   Change Active Partition
                  3.   Delete DOS Partition
                  4.   Display Partition Data
                  5.   Select Next Hard Disk Drive
                  6.   Select Previous Hard Disk Drive

        Enter Selection -->

        Press ESC to exit to MSDOS.

4. Type 1 [ENTER] to select the Create DOS Partition option. The screen displays:

        Do you wish to use the entire hard
        disk for DOS (Y/N) --> Y

5. Type Y [ENTER]. After a moment, the screen displays:

        System needs to reboot
        Insert system disk in Drive A
        Press any key to reset the system

6. Remove the Supplemental Programs diskette from Drive A. Insert the MS-DOS system diskette in Drive A, and press the space bar. The system reboots.

7. Press [ENTER] at the date prompt and again at the time prompt.

8. At the system prompt, type:

    ```
    format c: /s /v [ENTER]
    ```

    The /S switch tells FORMAT to transfer the operating system files to your hard disk.

    The /V switch causes FORMAT to ask you to enter a volume label for Drive C. Labeling the drive helps protect it from accidental erasure because subsequent FORMAT commands require that you enter the correct label before formatting can begin.

    Before MS-DOS begins to format your MS-DOS partition, it displays this warning and prompt:

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

9. Type Y [ENTER] to begin formatting. FORMAT displays numbers corresponding to the various *heads* and *cylinders* on the hard disk as it formats them.

    When the formatting process is finished, the screen displays:

    ```
    Formatting complete
    System transferred

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

10. Type a label containing a maximum of 11 characters, and press [ENTER].

11. Follow the steps outlined in "Copying MS-DOS to Hard Disk," later in this chapter.

Procedure B
(Non-Standard HD of 32 or Fewer Meg)

1. Boot your system as outlined in Chapter 2.

2. Because your disk is non-standard, you need to transfer the HDRIVE.SYS program from your Supplemental Programs diskette to your MS-DOS system diskette. (This program, when *installed*, enables you to use a non-standard disk.)

   a. If you have one floppy disk drive, type:

      copy b:hdrive.sys a: [ENTER]

      When prompted for the Drive B diskette, replace the MS-DOS system diskette with the Supplemental Programs diskette. When prompted for the Drive A diskette, re-insert the system diskette. COPY informs you when it finishes copying the file.

   b. If you have two floppy disk drives, insert the Supplemental Programs diskette in Drive B, and type:

      copy b:hdrive.sys a: [ENTER]

      Almost immediately, COPY informs you that it is finished copying the file. Remove the Supplemental Programs diskette from Drive B.

3. You're now ready to install the HDRIVE.SYS *device driver*. To do this, you put an instruction in a special file called CONFIG.SYS that you create. CONFIG.SYS is a *configuration file,* a file that MS-DOS automatically reads and executes whenever you boot or reset the system. To create the configuration file, type:

   copy con a:config.sys [ENTER]

   Without displaying a prompt, the system waits for you to type the instructions that you want in the file. Type:

   device=hdrive.sys [ENTER]

   Then, press [CTRL] [Z] to end the file.

   The screen displays ^Z. Press [ENTER] to save the file on the system diskette. The screen displays:

   1 File(s) copied

4. Reboot the system so MS-DOS executes CONFIG.SYS. Do this either by pressing the red Reset button or by pressing [CTRL] [ALT] [DEL] simultaneously.

5. Remove the MS-DOS system diskette from Drive A, and insert the Supplemental Programs diskette in Drive A.

6. At the system prompt, type:

    ```
    fdisk [ENTER]
    ```

    The screen displays the following menu:

    ```
    Choose one of the following:

            1.   Create DOS Partition
            2.   Change Active Partition
            3.   Delete DOS Partition
            4.   Display Partition Data
            5.   Select Next Hard Disk Drive
            6.   Select Previous Hard Disk Drive


    Enter Selection -->


    Press ESC to exit to MSDOS.
    ```

7. Type 1 [ENTER] to select the Create DOS Partition option. The screen displays:

    ```
    Do you wish to use the entire hard
    disk for DOS (Y/N)--> Y
    ```

8. Type Y [ENTER]. After a moment, the screen displays:

    ```
    System needs to reboot
    Insert system disk in Drive A
    Press any key to reset the system
    ```

9. Remove the Supplemental Programs diskette from Drive A. Insert the MS-DOS system diskette in Drive A, and press the space bar. The system reboots.

10. Press [ENTER] at the date prompt and again at the time prompt.

11. When the system prompt reappears, type:

       format c: /s /v [ENTER]

    The /S switch tells FORMAT to transfer the operating sys-
    tem files to the disk you're formatting.

    The /V switch causes FORMAT to ask you to enter a vol-
    ume label for Drive C. Labeling the drive helps protect it
    from accidental erasure because subsequent FORMAT com-
    mands require that you enter the correct label before for-
    matting can begin.

    Before MS-DOS begins to format your MS-DOS partition, it
    displays this warning and prompt:

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

12. Type Y [ENTER] to begin formatting. FORMAT displays num-
    bers corresponding to the various *heads* and *cylinders* on
    the hard disk as it formats them.

    When the formatting process is finished, the screen
    displays:

       Formatting complete
       System transferred

       Volume label (11 characters, ENTER for
         none)?

13. Type a label containing a maximum of 11 characters, and
    press [ENTER].

14. You now need to transfer the HDRIVE.SYS program and
    your CONFIG.SYS file from your system diskette to your
    hard disk. To do this, type:

       copy a:hdrive.sys c: [ENTER]
       copy a:config.sys c: [ENTER]

15. Remove the MS-DOS system diskette from Drive A, and
    leave the drive lever open. Reset the system either by press-
    ing the red Reset button on the system unit, or by pressing
    [CTRL] [ALT] [DEL] on the keyboard. The system boots from the
    hard disk.

16. Press [ENTER] at the date prompt and again at the time prompt. The screen displays the C> prompt to indicate that you are operating from the hard disk.

17. Follow the steps outlined in "Copying MS-DOS to Hard Disk," later in this chapter.

Procedure C
(Standard HD of More Than 32 Meg)

1. Boot your system as outlined in Chapter 2.

2. Remove the MS-DOS system diskette from Drive A, and insert the Supplemental Programs diskette in Drive A.

3. When the system prompt reappears, type:

    ```
    fdisk [ENTER]
    ```

    The screen displays the following menu:

    ```
    Choose one of the following:

              1.    Create DOS Partition
              2.    Change Active Partition
              3.    Delete DOS Partition
              4.    Display Partition Data
              5.    Select Next Hard Disk Drive
              6.    Select Previous Hard Disk Drive


    Enter Selection -->


    Press ESC to exit to MSDOS.
    ```

4. Type 1 [ENTER] to select the Create DOS Partition option. The screen displays:

    ```
    Do you wish to use the entire hard
    disk for DOS (Y/N)--> Y
    ```

5. Type Y [ENTER]. After a moment, the screen displays:

    ```
    System needs to reboot
    Insert system disk in Drive A
    Press any key to reset the system
    ```

6. Remove the Supplemental Programs diskette from Drive A. Insert the MS-DOS system diskette in Drive A, and press the space bar. The system reboots.

7. Press [ENTER] at the date prompt and again at the time prompt.

8. When the system prompt reappears, type:

    ```
    format c:  /s   /v [ENTER]
    ```

The /S switch tells FORMAT to transfer the operating system files to the disk you're formatting.

The /V switch causes FORMAT to ask you to enter a volume label for Drive C. Labeling the drive helps protect it from accidental erasure because subsequent FORMAT commands require that you enter the correct label before formatting can begin.

Before MS-DOS begins to format your MS-DOS partition, it displays this warning and prompt:

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

9. Type Y [ENTER] to begin formatting. FORMAT displays numbers corresponding to the various *heads* and *cylinders* on the hard disk as it formats them.

    When the formatting process is finished, the screen displays:

    ```
    Formatting complete
    System transferred

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

10. Type a label containing a maximum of 11 characters, and press [ENTER].

11. When the format is finished, type:

    ```
    c: [ENTER]
    ```

    The screen displays the C> prompt to indicate that you are operating from the hard disk.

12. Your DOS partition can use only the first 32 megabytes on the hard disk. To use the remaining space with MS-DOS, you must create one or more non-bootable (DOS2) partitions.

    Before you can do this, you need to transfer three programs from your Supplemental Programs diskette to your hard disk.

> **Note:** Two of these programs, MLPART.COM and MLFORMAT.COM, enable you to partition and format the area above the first 32 megabytes. The third, MLPART.SYS, is a *device driver* that, when installed, enables you to access that area.

Remove your system diskette from Drive A, and insert the Supplemental Programs diskette in Drive A. At the system prompt, type:

```
copy  a:ml*.*  c: [ENTER]
```

MS-DOS informs you when it finishes copying the three program files.

> **Note:** You can have a maximum of three DOS2 partitions on any hard disk. The remainder of this procedure describes how to create **one** DOS2 partition on Drive C. If you want to create multiple DOS2 partitions, or if you want to create DOS2 partitions on Drive D, see your *MS-DOS Reference Manual.*

13. To later install the MLPART.SYS device driver, you need to put an instruction in a special file called CONFIG.SYS that you create. CONFIG.SYS is a *configuration file,* a file that MS-DOS automatically reads and executes whenever you boot or reset the system. To create the configuration file, type:

```
copy con c:config.sys [ENTER]
```

Without displaying a prompt, the system waits for you to type the instructions that you want in the file. Type:

```
device=mlpart.sys c: [ENTER]
```

Then, press [CTRL] [Z] to end the file.

The screen displays ^Z. Press [ENTER] to save the file on the hard disk. The screen displays:

```
1 File(s) copied
```

14. You are now ready to use MLPART.COM to create the DOS2 partition. At the C> prompt, type:

```
mlpart [ENTER]
```

The screen displays the MLPART menu:

```
    Choose one of the following:
          1.   Create DOS2 Partition
          2.   Delete DOS2 Partition
          3.   Display Partition Data
          4.   Select Next Hard Disk Drive
          5.   Select Previous Hard Disk Drive

    Enter Selection -->


    Press ESC to exit to MSDOS.
```

15. Type 1 [ENTER] to select the Create DOS2 Partition option. MLPART displays a screen like this:

```
    Partition Status  Type   Start  End  Size
         1        A    DOS      0    769  770



    Total hard disk space is  986 cylinders
    Maximum available space is  216 cylinders
    at cylinder 770.
    Enter partition size---->
```

The maximum available space is the maximum for the DOS2 partition you are currently creating. The number is limited by two factors:

● The maximum amount of space allowed for any partition (32 megabytes).

● The amount of space remaining on the disk. This is the case in the sample, which is for a 40-megabyte drive. The DOS partition takes 32 megabytes (equivalent to 770 cylinders on this disk) so that only about eight megabytes (216 cylinders) remain for a DOS2 partition.

16. In answer to the Enter partition size prompt, type the number of cylinders you wish to allot to your DOS2 partition, and press [ENTER]. We recommend using the maximum available space. For this example, you would type:

```
    216 [ENTER]
```

17. A new prompt appears:

```
Enter starting cylinder number---->
```

Enter the number of the cylinder where you wish your
DOS2 partition to begin. You must type a cylinder number
that is the same as or greater than the first cylinder num-
ber in your free disk space. For example, type:

```
770 [ENTER]
```

18. When MLPART returns to its menu, type 3 [ENTER] to select
the Display Partition Data option. MLPART displays a
screen like this so that you can verify the creation of the
DOS2 partition:

```
Partition Status   Type    Start   End   Size
    1        A      DOS       0     769   770
    2        N      DOS2    770     985   216


Total hard disk space is 986 cylinders



Press any key to continue ------------->
```

The Status column tells you which partition, if any, is
active. It displays either an A (for active) or an N (for non-
active). The word DOS under the Type heading indicates
MS-DOS. The final columns list the starting and ending
cylinder of each partition, and the size of each partition.

> **Note:** The DOS partition must be *active* for you
> to boot MS-DOS from the hard disk drive.
> FDISK made it active automatically when you
> indicated that you wanted to use the entire sys-
> tem for MS-DOS. DOS2 partitions cannot be
> active.

19. Press the space bar to return to the MLPART menu.

20. Press ⌈ESC⌉ to return to the MS-DOS commands level. The screen displays:

    ```
    System needs to reboot
    Insert system disk in Drive A
    Press any key to reset the system
    ```

21. Because you already formatted your DOS partition, you can now reboot from Drive C, instead of Drive A. To do this, remove the supplemental diskette from Drive A, and leave the drive lever open. Then, press the space bar.

    Rebooting the system causes MS-DOS to execute the new configuration file so that it can recognize the DOS2 partition. The screen displays a message like this:

    ```
    Tandy MLPART version xx.xx.xx split disk
      drive
    Installing additional drive on C: as Drive
      D:
          --INSTALLED
    ```

    This screen tells you that the system is making your DOS2 partition into a *logical* drive, and assigning it the letter D. From now on, you need to specify D: to access that part of the hard disk.

22. Press ⌈ENTER⌉ at the date prompt and again at the time prompt.

23. At the C> prompt, format your DOS2 partition by typing:

    ```
    mlformat d: ⌈ENTER⌉
    ```

    The screen displays:

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

24. Type Y [ENTER] to begin formatting. A series of dashes appears on the screen. The dashes that refer to the DOS2 partition change to periods as each track formats.

    If a track is flawed, a question mark appears instead of a period. It is common for a few of the hard disk tracks to be flawed. MS-DOS locks out flawed tracks, and the system does not use them.

    After informing you that the formatting is complete, the screen displays information about your disk space in a format like this:

    ```
    9375744 bytes total disk space
    9375744 bytes available on disk
    ```

    The numbers apply to the space in your DOS2 partition.

25. Follow the steps outlined in "Copying MS-DOS to Hard Disk," later in this chapter.

Procedure D
(Non-Standard HD of More Than 32 Meg)

1. Boot your system as outlined in Chapter 2.

2. Because your disk is non-standard, you need to transfer the HDRIVE.SYS program from your Supplemental Programs diskette to your MS-DOS system diskette. (This program, when *installed,* enables you to use a non-standard disk.)

    a. If you have one floppy disk drive, type:

        ```
        copy  b:hdrive.sys  a: ENTER
        ```

        When prompted for the Drive B diskette, replace the MS-DOS system diskette with the Supplemental Programs diskette. When prompted for the Drive A diskette, re-insert the system diskette. COPY informs you when it finishes copying the file.

    b. If you have two floppy disk drives, insert the Supplemental Programs diskette in Drive B, and type:

        ```
        copy  b:hdrive.sys  a: ENTER
        ```

        Almost immediately, COPY informs you that it is finished copying the file. Remove the Supplemental Programs diskette from Drive B.

3. You're now ready to install the HDRIVE.SYS *device driver.* To do this, you put an instruction in a special file called CONFIG.SYS that you create. CONFIG.SYS is a *configuration file,* a file that MS-DOS automatically reads and executes whenever you boot or reset the system. To create the configuration file, type:

    ```
    copy con a:config.sys ENTER
    ```

    Without displaying a prompt, the system waits for you to type the instructions that you want in the file. Type:

    ```
    device=hdrive.sys ENTER
    ```

    Then, press CTRL Z to end the file.

    The screen displays ^Z. Press ENTER to save the file on the system diskette. The screen displays:

    ```
    1 File(s) copied
    ```

4. Reboot the system so MS-DOS executes CONFIG.SYS. Do this either by pressing the red Reset button or by pressing [CTRL] [ALT] [DEL] simultaneously.

5. Remove the MS-DOS system diskette from Drive A, and insert the Supplemental Programs diskette in Drive A.

6. At the system prompt, type:

   ```
   fdisk [ENTER]
   ```

   The screen displays the following menu:

   ```
   Choose one of the following:

              1.    Create DOS Partition
              2.    Change Active Partition
              3.    Delete DOS Partition
              4.    Display Partition Data
              5.    Select Next Hard Disk Drive
              6.    Select Previous Hard Disk Drive


   Enter Selection -->


   Press ESC to exit to MSDOS.
   ```

7. Type 1 [ENTER] to select the Create DOS Partition option. The screen displays:

   ```
   Do you wish to use the entire hard
   disk for DOS (Y/N)--> Y
   ```

8. Type Y [ENTER]. After a moment, the screen displays:

   ```
   System needs to reboot
   Insert system disk in Drive A
   Press any key to reset the system
   ```

9. Remove the Supplemental Programs diskette from Drive A. Insert the MS-DOS system diskette in Drive A, and press the space bar. The system reboots.

10. Press [ENTER] at the date prompt and again at the time prompt.

11. When the system prompt reappears, type:

    ```
    format c: /s  /v  [ENTER]
    ```

    The /S switch tells FORMAT to transfer the operating system files to the disk you're formatting.

    The /V switch causes FORMAT to ask you to enter a volume label for Drive C. Labeling the drive helps protect it from accidental erasure because subsequent FORMAT commands require that you enter the correct label before formatting can begin.

    Before MS-DOS begins to format your MS-DOS partition, it displays this warning and prompt:

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

12. Type Y [ENTER] to begin formatting. FORMAT displays numbers corresponding to the various *heads* and *cylinders* on the hard disk as it formats them.

    When the formatting process is finished, the screen displays:

    ```
    Formatting complete
    System transferred

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

13. Type a label containing a maximum of 11 characters, and press [ENTER].

14. Your DOS partition can use only the first 32 megabytes on the hard disk. To use the remaining space with MS-DOS, you must create one or more non-bootable (DOS2) partitions. Before you can do this, you need to transfer three programs from your Supplemental Programs diskette to your hard disk. Also, transfer HDRIVE.SYS to your hard disk at this time.

Note: Two of these programs, MLPART.COM and
MLFORMAT.COM, enable you to partition and
format the area above the first 32 megabytes.
The third, MLPART.SYS, is a *device driver* that,
when installed, enables you to access that area.

Remove your system diskette from Drive A, and insert the
Supplemental Programs diskette in Drive A. At the system
prompt, type:

```
copy  a:hdrive.sys  c : ENTER
copy  a:ml*.*  c : ENTER
```

Note: You can have a maximum of three DOS2
partitions on any hard disk. The remainder of
this procedure describes how to create **one** DOS2
partition on Drive C. If you want to create multi-
ple DOS2 partitions, or if you want to create
DOS2 partitions on Drive D, see your *MS-DOS
Reference Manual.*

15. To later install the MLPART.SYS device driver, you need to
    put an new instruction in the CONFIG.SYS file. This time,
    create the file on Drive C. Type:

```
copy con c:config.sys ENTER
device=hdrive.sys ENTER
device=mlpart.sys  c : ENTER
CTRL  Z
ENTER
```

16. When the system prompt returns, type:

```
c : ENTER
```

The screen displays the C> prompt to indicate that you are
operating from the hard disk.

17. You are now ready to use MLPART.COM to create the
    DOS2 partition. At the C> prompt, type:

```
mlpart ENTER
```

The screen displays the MLPART menu:

```
Choose one of the following:
     1.    Create DOS2 Partition
     2.    Delete DOS2 Partition
     3.    Display Partition Data
     4.    Select Next Hard Disk Drive
     5.    Select Previous Hard Disk Drive

Enter Selection -->

Press ESC to exit to MSDOS.
```

18. Type 1 [ENTER] to select the Create DOS2 Partition option.
MLPART displays a screen like this:

```
Partition Status   Type   Start   End   Size
      1        A     DOS      0     769   770
```

```
Total hard disk space is 986 cylinders
Maximum available space is  216 cylinders
   at cylinder 770.
Enter partition size---->
```

The maximum available space is the maximum for the
DOS2 partition you are currently creating. The number is
limited by two factors:

• The maximum amount of space allowed for any parti-
  tion (32 megabytes).

• The amount of space remaining on the disk. This is
  the case in the sample, which is for a 40-megabyte
  drive. The DOS partition takes 32 megabytes (equiva-
  lent to 770 cylinders on this disk) so that only about
  eight megabytes (216 cylinders) remain for a DOS2
  partition.

19. In answer to the Enter partition size prompt, type the
number of cylinders you wish to allot to your DOS2 parti-
tion, and press [ENTER]. We recommend using the maximum
available space. For this example, you would type:

```
216 [ENTER]
```

20. A new prompt appears:

    ```
    Enter starting cylinder number---->
    ```

    Enter the number of the cylinder where you wish your
    DOS2 partition to begin. You must type a cylinder number
    that is the same as or greater than the first cylinder num-
    ber in your free disk space. For example, type:

    ```
    770 [ENTER]
    ```

21. When MLPART returns to its menu, type 3 [ENTER] to
    select the Display Partition Data option. MLPART displays
    a screen like this so that you can verify the creation of the
    DOS2 partition:

    ```
    Partition Status   Type   Start   End  Size
         1        A     DOS       0    769  770
         2        N     DOS2    770    985  216


    Total hard disk space is 986 cylinders



    Press any key to continue ------------->
    ```

    The Status column tells you which partition, if any, is
    active. It displays either an A (for active) or an N (for non-
    active). The word DOS under the Type heading indicates
    MS-DOS. The final columns list the starting and ending
    cylinder of each partition, and the size of each partition.

    > **Note:** The DOS partition must be *active* for you
    > to boot MS-DOS from the hard disk drive.
    > FDISK made it active automatically when you
    > indicated that you wanted to use the entire sys-
    > tem for MS-DOS. DOS2 partitions cannot be
    > active.

22. Press the space bar to return to the MLPART menu.

23. Press [ESC] to return to the MS-DOS commands level. The
    screen displays:

    ```
    System needs to reboot
    Insert system disk in Drive A
    Press any key to reset the system
    ```

24. Because you already formatted your DOS partition, you can now reboot from Drive C, instead of Drive A. To do this, remove the supplemental diskette from Drive A, and leave the drive lever open. Then, press the space bar.

    Rebooting the system causes MS-DOS to execute the new configuration file so that it can recognize the DOS2 partition. The screen displays a message like this:

    ```
    Tandy MLPART version xx.xx.xx split disk
      drive
    Installing additional drive on C: as Drive
      D:
          --INSTALLED
    ```

    This screen tells you that the system is making your DOS2 partition into a *logical* drive, and assigning it the letter D. From now on, you need to specify D: to access that part of the hard disk.

25. Press [ENTER] at the date prompt and again at the time prompt.

26. At the C> prompt, format your DOS2 partition by typing:

    ```
    mlformat d: [ENTER]
    ```

    The screen displays:

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

27. Type Y [ENTER] to begin formatting. A series of dashes appears on the screen. The dashes that refer to the DOS2 partition change to periods as each track formats.

    If a track is flawed, a question mark appears instead of a period. It is common for a few of the hard disk tracks to be flawed. MS-DOS locks out flawed tracks, and the system does not use them.

    After informing you that the formatting is complete, the screen displays information about your disk space in a format like this:

    ```
    9375744 bytes total disk space
    9375744 bytes available on disk
    ```

    The numbers apply to the space on your DOS2 partition.

28. Follow the steps outlined in the next section, "Copying MS-DOS to Hard Disk."

Copying MS-DOS to Hard Disk

Now that you have formatted your hard disk, you need to transfer MS-DOS to hard disk. Follow these steps:

1. Place your MS-DOS system diskette in Drive A, and close the drive lever.

2. Type:

    ```
    copy  a:*.*  c: [ENTER]
    ```

    COPY transfers the files from the diskette to the hard disk, one at a time, displaying each filename. When finished, COPY displays the number of files copied, and the system prompt returns.

3. Replace the system diskette in Drive A with the Supplemental Programs Diskette, and type [F3] [ENTER].

    COPY transfers the files from the second diskette in the same manner as from the first.

4. When the system prompt appears on the screen, you can select your hard disk, Drive C, as the current disk by typing:

    ```
    c: [ENTER]
    ```

Booting From Hard Disk

After your hard disk system is formatted and contains MS-DOS, booting your computer is easy. All you do is turn on the computer and answer the time and date prompts.

When you boot from hard disk, you see the system prompt C>, instead of A>, to indicate that your hard disk is the current drive.

Your system boots from the hard disk only if:

● Drive C is formatted.

● Drive C contains the MS-DOS system files.

● The MS-DOS partition on Drive C is the active partition. (Whenever you specify that you want the entire hard disk for MS-DOS, FDISK automatically makes the MS-DOS partition active.)

- You did not boot the system with a system diskette in Drive A.

Hard Disk Commands

After you copy MS-DOS on a hard disk, you seldom need to use your floppy drives except for copying files and making backups of hard disk files. If you purchase an application program, you can copy it to hard disk.

All of the commands that operate on floppy diskette systems also operate on systems with both floppy and hard disk drives. Also, there are several commands designed especially for hard disk systems.

If you have a hard disk initialized as the active drive, MS-DOS assumes it is Drive C. You can also have a second internal or an external hard disk, Drive D.

Copying to Hard Disk

You can transfer programs, or any files, from floppy diskettes to hard disk using the COPY command. For instance, if you have a program named Datapro that you want to place on your hard disk, you place the floppy diskette in Drive A, and type:

```
copy  a:datapro  c: ENTER
```

If you wish to copy all the programs and files from a diskette to hard disk, use this command:

```
copy  a:*.*  c: ENTER
```

To execute the programs, be sure you are operating from hard disk. Type the proper filename, and press ENTER. For instance, to execute Datapro you would type:

```
datapro ENTER
```

Many application programs have specific instructions for their installation on hard disk and their execution. Refer to each program's instruction manual for any special steps you must follow.

Backing Up Hard Disks

Making backups of hard disk files is even more important than making backups of floppy diskette files. Because the storage capacity of a hard disk is so much greater, lost data can represent thousands of hours of work.

You can use the BACKUP command to make copies of one or more directories or of an entire hard disk. For example, if you have a subdirectory named MYSTUFF in the ROOT directory of your Drive C hard disk, you can use BACKUP to copy it to a floppy diskette. With a formatted diskette in Drive A, type:

```
backup  c:mystuff  a:  /s ENTER
```

Note: Unless you specify otherwise, using this method causes MS-DOS to erase any files currently on the floppy diskette used for the backup. Be sure you are using a newly formatted diskette or a diskette with files you do not want to keep.

To accomplish the same backup without erasing files currently on the floppy diskette, add the /A switch to the command. This switch causes the COPY command to append the new backup files to any existing files on the diskette. The same command, with the /A switch, is:

```
backup  c:mystuff  a:  /s/a ENTER
```

The preceding BACKUP commands include the /S switch. This switch tells MS-DOS to back up all the files in a specific directory and all the directories and files that branch from that directory. You can also use BACKUP with /S to back up the **entire hard disk** to floppy diskettes. Before using the command that follows, use FORMAT to prepare several floppy diskettes for use during the backup procedure. Then, to back up everything on Drive C, type:

```
backup  c:\*.*  a:  /s ENTER
```

The backward slash (\) is an abbreviation for the ROOT directory of any disk. Therefore, this command line tells MS-DOS to copy all files from the ROOT directory of Drive C to the diskette in Drive A. The /S switch tells MS-DOS to copy all directories, and their files, that branch from that designated directory. Because all directories branch from the ROOT directory, BACKUP copies all the files in all the disk directories.

For more information on BACKUP and its switches, see BACKUP in the *MS-DOS Reference Manual*.

Restoring Backups to Hard Disk

You use the RESTORE command to copy one or more directories from diskette to hard disk. Use RESTORE **only** on those directories that you copied to floppy diskette using BACKUP.

To restore the directory MYSTUFF from the diskette in Drive A back to the hard disk (Drive C), type:

```
restore  a:  c:\ /s [ENTER]
```

To restore all the files that were backed up from all directories on Drive C, insert the first backup diskette into Drive A, and use the same command:

```
restore  a:  c:\ /s [ENTER]
```

The /S switch tells MS-DOS to copy all files and directories that were saved to floppy diskettes using the BACKUP command. If the backup required more than one diskette, you are prompted when to swap diskettes during the restore process.

For more information on RESTORE and its options, see the *MS-DOS Reference Manual*.

Part 2
More Ways To
Use MS-DOS

COMMANDS AND KEYS

You have already put MS-DOS to work with commands such as DISKCOPY and FORMAT. In these cases the handbook told you exactly what to do to accomplish a very specific task. If you want to strike out on your own, you need additional background information.

> **Note:** To avoid confusion, Part 2 of this manual assumes you are operating with floppy diskettes. Therefore, if you are instructed to insert your system diskette in a floppy drive and are operating from a hard drive that contains MS-DOS, you do not need to insert the system diskette. For instance, if you are instructed to access a file from the system diskette in Drive A, leave off the drive name, because the file is already on your current drive (Drive C), and you don't have a system diskette in Drive A.

Typing Commands

- You can enter a command whenever the screen displays the system prompt.

- A command consists of one word, the command name. A *command line* consists of one or more command names and their associated parameters and switches. Parameters and switches are means by which you include special information with a command. They provide data needed by a command, or they change a command's operation.

- A command line can have a maximum of 125 characters, including any combination of upper- or lowercase letters. To execute a command, press [ENTER]. For example, to clear the screen, type:

        cls [ENTER]

Understanding Commands

As described in Part 1, MS-DOS acts in much the same manner as an office manager. It looks after the operation of your computer and equipment. Because MS-DOS is only a manager, it expects you to make the necessary decisions.
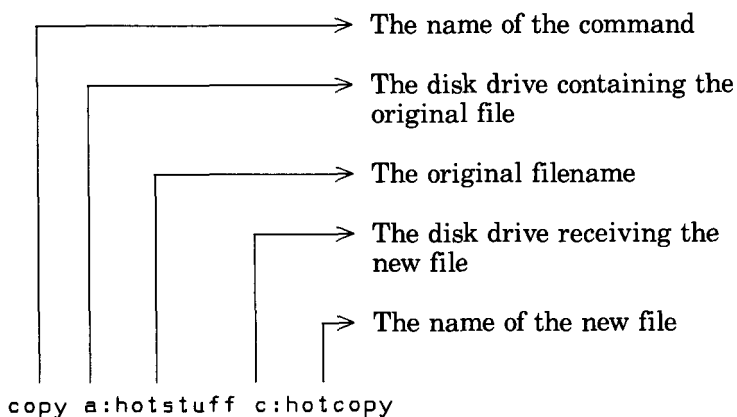
For example, suppose you have an important document named Hotstuff that you want to copy. Before giving it to your office manager (MS-DOS), you must make executive decisions, such as:

- Do you want the copy on disk, paper, or the computer screen?

- If you want the copy on disk, which disk?

You make the decisions; MS-DOS manages the job. For instance, if your decision is to copy Hotstuff from a diskette to a hard disk, you might type the following command line:

```
copy  a:hotstuff  c:hotcopy ENTER
```

This is how MS-DOS sees your command:

> The name of the command

> The disk drive containing the original file

> The original filename

> The disk drive receiving the new file

> The name of the new file

```
copy a:hotstuff c:hotcopy
```

This command line tells MS-DOS to copy a file named Hotstuff from your floppy disk Drive A to your hard disk Drive C. The Drive C file is named Hotcopy.

You only need to know the name of the file you want to copy, on which disk drive it is located, and on which disk drive you want the new file. MS-DOS manages the operation for you.

Types of Commands

MS-DOS has two kinds of commands. One kind are the commands it keeps "in its head"—you might say it has them "memorized." A second kind are those it keeps in files. The former commands are called *internal* commands, and the latter are called *external* commands.

When you give MS-DOS an external command, it must find the command in a disk file before it can perform the assigned task. (Usually, the external commands are in a file in the ROOT directory of the MS-DOS system disk.) If you are not operating on the same disk and in the same directory that contains the command file, you must use a complete command *pathname* to locate the file. A pathname is a route to the proper disk, then through the directory or directories, and finally to the file.

For instance, suppose you are in a directory called SALES on Drive C, and want to access the FORMAT command from the ROOT directory of Drive A. To do so, you need to type the complete pathname a:\format, instead of format, when entering the command.

Editing Commands

MS-DOS is very particular about the commands you type. If you make any typing mistakes, and then press [ENTER], MS-DOS either does not understand (and tells you so with an error message) or does the wrong thing.

- If you see that you made a mistake before you press [ENTER], you have two choices: (1) use [←] to move the cursor back to the mistake, and retype to the end of the line, or (2) press [CTRL] [C] or [ESC] to exit the line you are typing, and start over.

- If you use [ESC] to end a line, the system prompt does not reappear. Retype the command line, and press [ENTER] to execute it.

Special Keys

The following keys and key sequences have special significance to MS-DOS.

[→] display template	Displays the contents of the keyboard *template* (a storage place for the last line you typed) one character at a time. For more information on the template, see "EDLIN Command Reference" in the *MS-DOS Reference Manual*.
[CTRL] special commands	Lets you give complex commands to your computer by pressing only two or three keys. While holding down [CTRL], press another key.
[CTRL] [C] terminate process	Stops the execution of a program if the program uses MS-DOS functions. If the program does not access MS-DOS, this key sequence is not recognized. While holding down [CTRL], press [C]. The computer might take a few moments before it recognizes the key sequence.
[CTRL] [H] correct typing error	Moves the *cursor* (the blinking underline character displayed on the screen) left one character. Erases the character beneath the cursor.
[CTRL] [J] end line	Causes the current line to end and performs a carriage return, but does not cause the line to process. You can continue to add to the command line before pressing [ENTER].
[CTRL] [NUMLOCK] or [CTRL] [S] stop scroll	Stops the screen display from *scrolling* to let you view displays before they leave the screen. If you use [CTRL] [NUMLOCK], press [ENTER] to continue scrolling. If you use [CTRL] [S], press [CTRL] [S] to continue.

CTRL P or CTRL PRTSC print output	Causes all computer output to print on your printer if the printer is connected and ready. Press this sequence again to stop the function.
CTRL ALT DEL	Resets your computer.
DEL	Erases the character under the cursor. DEL erases a character each time you press it until you erase all characters originally to the right of the cursor. If you are at the end of the line, this key does nothing.
ENTER process command carriage return	Starts the processing of a command line you typed. ENTER also causes a carriage return; the cursor drops one line and returns to the left margin.
ESC terminate line	Terminates the current line but does not process it. ESC clears the line buffer, and outputs a backslash, carriage return, and line feed. The template is not affected. Although the system prompt does not display, the system is ready for a command.
F1 display character	Displays the next character in the template until you reach the end of the line. Serves the same function as →.
F2 *char* copy to char	Copies all characters up to the specified character and displays them. Type F2 and then the character.
F3 display template	Redisplays the last typed command line on the screen. Execute the line again by pressing ENTER, or edit the line before re-executing it.
F4 *char* delete to char	Deletes from the template all characters up the specified character. The deleted characters are skipped, and are not copied to the command line. Type F4 and then the character.

[F5] replace template	Makes the line you type the new template, but does not execute the command.
[INS]	Lets you insert characters in a line. Press [INS] to begin inserting. Press [INS] again to end the insertion. Use the arrow keys to position the cursor where you wish the insertion to begin.
space bar	Moves the cursor one space to the right, and adds a space to a line.
[SHIFT] [PRTSC] print screen	Causes the current screen display to print if your printer is connected and ready.

MS-DOS TOOLKIT

You have learned about a number of MS-DOS commands that help you set up and use your computer system. There are many more commands available. This chapter contains information about a few of the most helpful commands. Becoming acquainted with these commands makes it easy for you to look up other commands and functions in the *MS-DOS Reference Manual*.

Among other things, this chapter discusses how to create and use subdirectories. If you have a floppy disk-only system, you probably don't need subdirectories. Subdirectories are intended mainly for hard disk use, to help users organize vast amounts of data for easy access. If you use only floppy diskettes, you can organize your data simply by storing it on multiple diskettes. If, however, you want to learn about subdirectories, read the "MS-DOS Disk Organization" section in Chapter 4 before reading this chapter.

Floppy disk users should also read the section "About File and Directory Names" in Chapter 4 to learn the restrictions MS-DOS puts on filenames.

The examples in this chapter make use of the sample directory structures shown in Chapter 4.

Viewing Directories

To look at the directory (a list of files and subdirectories) of a disk, use the DIR command. For example, to view the contents of the current directory, type:

    dir [ENTER]

If a disk contains more filenames than can appear on the screen at once, all but the last 22 scroll off the top of the screen.

MS-DOS has three ways to overcome this problem:

- Press [CTRL] [S] to stop the screen from scrolling. Press [CTRL] [S] again to restart the scrolling.

- Use the /P switch with the DIR command. In this case, /P causes the directory listing to pause when the screen is filled. To resume the listing, press the space bar. To use the /P switch, type:

  ```
  dir /p [ENTER]
  ```

- Use the /W switch to display the disk files in five columns. This format usually allows all filenames to appear on the screen at once. The format for this command line is:

  ```
  dir /w [ENTER]
  ```

Use DIR to view any directory on a disk. For instance to see which directories and files are in the SALES directory, you must specify the directory name, such as:

```
dir sales [ENTER]
```

If you want to look at a directory on a disk drive other than the current drive, you must specify a complete pathname for MS-DOS to follow. As mentioned in Chapter 5, a pathname is the route through the drive and directories to the file. For example:

```
dir b:\sales [ENTER]
```

In this case, the backslash is used to indicate the ROOT directory of Drive B. It can also be used to separate directory names. Always use a backslash to separate directory names and filenames in pathnames you type.

Creating Directories

Before you can store data in a directory other than the ROOT directory, first create a directory with MKDIR. For instance, to create a SALES directory on Drive B, type:

```
mkdir b:sales [ENTER]
```

Changing the Current Directory

You can change the current directory (the default directory) by using CHDIR. If you are in the ROOT directory of the current drive and want to operate from the SALES directory, you can type:

```
chdir sales [ENTER]
```

To change to a directory *deeper* in the directory structure, such as REGION1 within the SALES directory, you type:

```
chdir  sales\region1 [ENTER]
```

Finding Files and Directories

Because of the multiple levels of directories possible with MS-DOS, it is easy to forget exactly which directories and files are on a disk. You can use the external command, TREE, to display a complete list of all directories and subdirectories on a disk.

```
tree [ENTER]
```

If there are more directories than you can display on one screen, press [CTRL] [S] to stop the display. Press [CTRL] [S] again to restart the display.

Make a note of any paths in which you are interested. Then use the pathname to access the file you want.

Copying Files and Directories

It is easy to copy a file from one disk to another, using the COPY command. This command requires the following information:

- The name of the file you want to copy.

- The disk and directory where it resides.

- The name you want to give to the copy.

- The disk and directory where you want the new copy to reside.

For instance, to copy the Joesales file from the SALES directory of Drive A to the ROOT directory of Drive C, using the same name for the new copy, type:

```
copy  a:sales\joesales  c:joesales [ENTER]
```

It is also easy to copy **all** files in a directory to another directory, using the XCOPY command. For instance, to copy all files in the SALES directory of Drive A to the ROOT directory of Drive C, type:

```
xcopy  a:sales  c: [ENTER]
```

To copy all files in a directory and its subdirectories, use XCOPY with the /S and /E switches. For example, to copy all files on Drive A to Drive C, type:

```
xcopy a: c: /s /e
```

The /S switch tells XCOPY to copy all subdirectories that contain at least one file. The /E switch tells the command to also copy empty subdirectories.

> **Note:** COPY has other functions, as well as the simple copying of files. You can also use it to append and combine files. See the COPY command in the *MS-DOS Reference Manual* for more information on this versatile command.

Home Directories

MS-DOS remembers which directory is the current directory for any disk, even if you change the current drive. For instance, assume that Drive B is the current drive and REGION1 is the current directory. If you then set Drive A as the current drive, REGION1 becomes the *home directory* of Drive B. This means that you can access REGION1 without specifying the full path-name, b:\sales\regions1. Instead, you can type:

```
dir  b:\region1 [ENTER]
```

This feature is equally convenient for other commands, such as COPY. To place a file from your current directory into the REGION1 directory on Drive B, type:

```
copy  thisfile  b:thatfile [ENTER]
```

COPY reproduces the data in Thisfile in a new REGION1 file named Thatfile.

Renaming Files

MS-DOS also lets you change the names of files. Suppose you have a staff change in your company. Use RENAME to give your old file a new name. For example, to change Joesales to Samsales, type:

```
rename  sales\joesales  sales\samsales [ENTER]
```

Establishing Paths

If you expect to use a particular pathname frequently but want to remain in your current directory, you can use the PATH command to expand the scope of MS-DOS's search for files. For instance, if you are in Drive B but want to easily access the commands in the ROOT of Drive A, type:

```
path  a:\ [ENTER]
```

Now, to access a command in the ROOT directory of Drive A, you only need to specify the command name, such as:

```
copy  hotstuff  hotcopy [ENTER]
```

Looking Inside Files

TYPE is a command that lets you examine files that consist of text characters. For instance, to view the Joesales file from the SALES directory, type:

```
type  sales\joesales [ENTER]
```

The contents of the file appear on the screen. If there are too many lines in the file to fit on the screen, use [CTRL] [S] to stop and start display scrolling.

If you use TYPE to display a file that is not a text file, it produces a meaningless display.

Deleting Directories

To delete a directory, follow these steps. Note that MS-DOS does not allow you to delete a directory until it is empty.

1. Use DIR to view the contents of the target directory.

2. Copy any files you want to keep into another directory.

3. Use DEL to delete all files from the directory. For example to delete all files from the SALES directory, type:

```
del  sales\*.* [ENTER]
```

4. Use RMDIR to remove (delete) the directory. For example to remove the SALES directory, type:

```
rmdir  sales [ENTER]
```

Using Other Commands

MS-DOS has more than 50 commands and functions. The guidelines you have learned from this handbook provide the background you need to make use of any or all of MS-DOS's capabilities.

By referring to the *MS-DOS Reference Manual,* you can learn how to create and edit data files, create command files to accomplish numerous tasks in sequence, create directories, send information to a printer, and much more.

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