

User's Guide

Microsoft®
WINDOWS™

Microsoft® Windows™

Version 3.1

User's Guide

For the Microsoft Windows Operating System

Microsoft Corporation

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Welcome

Welcome to the Microsoft® Windows™ operating system, the software that transforms the way you use your personal computer. The ability to run more than one application at a time with Windows and transfer information between applications, the superior way Windows uses the full power of your computer, and the rich Windows graphical interface provide a more intuitive, more efficient work environment for your personal computer.

This introductory section of the *Microsoft Windows User's Guide* provides a guide to the documentation—so you know where to find information about working with Windows. This section also defines typographic conventions used in the Windows documentation.

If You Have a Previous Version of Windows

Updates are available for some of the Windows applications you may have used with previous versions of Windows. The updated versions take full advantage of the new features and power of Windows version 3.1.

If you have not received information about updates for your Windows applications, check with the manufacturers. Most applications developed for versions of Windows earlier than 3.0 do not run correctly with Windows version 3.1.

About Your Windows Documentation

The Windows version 3.1 documentation set consists of the *Getting Started with Microsoft Windows* book, this book, an online Tutorial, an extensive online Help system, and several online documents (formatted for use with Windows Write) that are copied to your hard disk when you set up Windows. The following pages outline the contents of the *Microsoft Windows User's Guide* and define terminology that is important to your understanding of Windows.

The way you like to learn and how much you already know about Windows and about computers will determine how you use the different pieces of the documentation.

- *Getting Started with Microsoft Windows* is a guide to setting up Windows on your system, and a brief visual introduction to Windows. The book also includes a “Troubleshooting” chapter that deals with situations you might encounter while setting up or running Windows.
- The *Microsoft Windows User's Guide* provides a comprehensive description of Windows and the ways you can work with it. It includes explanations and procedures for first-time users, in addition to topics for advanced users.
- The Microsoft Windows Tutorial provides online instructions for using a mouse and for performing some basic Windows tasks. To use the Tutorial, you need a mouse and a VGA (or better) monitor.
- Help provides a quick online reference to procedures and commands you need when using Windows. *Context-sensitive* help is now available in the main Windows applications—to obtain specific information about how to complete a dialog box, just press F1 or choose the Help button while using the dialog box.
- Several online documents are copied to your hard disk when you set up Windows. You can read (and print) the files by using Write. These files include:
 - SETUP.TXT—Information specific to setting up Windows. Contains information about software or hardware configurations that require special handling to successfully set up and start Windows. (This file can be viewed by using any text editor.)
 - README.WRI—Information updated after the user's guide was printed.
 - PRINTERS.WRI—Information about configuring particular printers and fonts for the Windows environment.
 - NETWORKS.WRI—Information about operating Windows with specific network configurations.
 - SYSINI.WRI—Procedures for modifying settings in the SYSTEM.INI file (for advanced users only).
 - WININI.WRI—Procedures for modifying settings in the WIN.INI file (for advanced users only).

What's Included in Your Windows User's Guide

You'll probably find yourself using some Windows applications, such as Program Manager, more often than others, such as PIF Editor. The *Microsoft Windows User's Guide* is organized with this in mind. Those features you are likely to use most often are described in the early chapters; those you'll probably use less frequently appear later.

To use the procedures in this guide, you must have Windows set up on your system. For setup information, see Chapter 1, "Setting Up Windows," in *Getting Started with Microsoft Windows*.

Using a mouse is the easiest way to work with Windows. If you have not used a mouse before, it is recommended that you run the online Windows Tutorial to learn basic mouse techniques. For information about starting this program, see "Running the Microsoft Windows Tutorial" in Chapter 2, "Application Basics."

This book is divided into the following parts:

Part 1, "Windows Fundamentals"—Chapters in this part explain the basic structure of Windows and the skills you need to work with Windows. One chapter describes how to run non-Windows applications with Windows. Other chapters show you how to use the important system-management applications you received with Windows. These applications are:

- Program Manager, which helps you organize your applications.
- File Manager, which helps you organize and manage the files and directories on your disks.
- Control Panel, which you use to change Windows settings such as screen colors and fonts; set up printers, multimedia hardware, and modems; and change the appearance of your desktop.
- Print Manager, which schedules and fills all print requests you send from Windows and non-Windows applications.
- PIF Editor, which you use to create or change program information files (PIFs) for non-Windows applications.
- Task List, which you use at any time to switch quickly between applications on your desktop.
- The Clipboard, which you use to move and copy information from one window to another, across applications.

Part 2, “Windows Accessories”—Chapters in this part describe the accessory applications that are included with the Windows package. You received three full-featured accessory applications:

- Write, a word processor
- Windows Paintbrush™, a color painting and drawing application
- Terminal, a communications application

You also received two new multimedia applications, Media Player and Sound Recorder, in addition to several applications that add convenient capabilities to your Windows desktop, including Calculator, Calendar, Cardfile, Character Map, Clock, Notepad, Object Packager, and Recorder.

Part 3, “Getting the Most Out of Windows”—This part contains three chapters of information for advanced users. It explains how to integrate information in your Windows applications, how to modify Windows to run most efficiently with your computer and the applications you want to use, and how to reconfigure Windows by using the Setup program.

Appendixes—The appendixes provide reference material on the following topics:

- Instructions for using Windows with a network
- Specifications for terminal emulations
- Keyboard shortcuts for performing various Windows tasks

The *Microsoft Windows User's Guide* also includes a glossary and a comprehensive index.

Conventions

To help you locate and interpret information easily, the *Microsoft Windows User's Guide* uses consistent visual cues and a few standard text formats. These conventions are explained as follows.

Visual Cues

You will find the following typographic conventions throughout this guide.

This	Represents
bold	Anything that you must type exactly as it appears. For example, if you are asked to type dir \windows , you would type all the bold characters exactly as they are printed.
<i>italic</i>	Placeholders for information you must provide. For example, if you are asked to type <i>filename</i> , you would type the actual name for a file instead of the word shown in italic type. Italic type also signals a new term. An explanation immediately follows the italicized term.
ALL CAPITALS	Directory names, filenames, and acronyms.
386	Information that is specific to running Windows in 386 enhanced mode.

Keyboard Formats

Key combinations and key sequences appear in the following formats.

Format	Meaning
KEY1+KEY2	A plus sign (+) between key names means to press and hold down the first key while you press the second key. For example, "press ALT+ESC" means to press and hold down the ALT key and press the ESC key. Then release both keys.
KEY1, KEY2	A comma (,) between key names means to press and release the keys one after the other. For example, "press ALT, F" means to press and release the ALT key, and then press and release the F key.

Microsoft Product Support Services

Microsoft offers a variety of support options to help you get the most from your Microsoft product. This section summarizes these options.

If you have a question about your Microsoft product, first look in the printed product documentation or consult Help. If you cannot find the answer, contact Microsoft Product Support.

Outside the United States, contact Microsoft Product Support at the Microsoft subsidiary office that serves your area. For information about Microsoft subsidiary offices, see the following section, "Product Support Worldwide." For information about additional support options, you can refer to a card enclosed in your Microsoft Windows package.

Getting Product Support in the United States

The following means of support are available in the United States. These services are provided using the English language.

■ Call the Interactive Voice Support Service

You can hear recorded responses to common Microsoft Windows questions, and order application notes by fax. This automated service is always available and requires a touch-tone telephone. For assistance with Microsoft Windows, dial (206) 635-7245.

You can use the following keys on your touch-tone telephone after you reach the Interactive Voice Support Service:

- To advance to the next message, press *.
- To repeat the current message, press 7.
- To return to the beginning of the Interactive Voice Support Service, press #.

■ Call Microsoft Product Support Staff

Call (206) 637-7098 Monday through Friday, between 6:00 A.M. and 6:00 P.M. Pacific time.

When you call, you should be at your computer and have the Microsoft Windows documentation at hand. Be prepared to give the following information:

- Your product's serial number. Your serial number label is on the inside back cover of *Getting Started with Microsoft Windows*.
- The version numbers of Windows and MS-DOS that you are using.
- The type of hardware you are using.

- The exact wording of any messages that appeared on your screen.
- What happened and what you were doing when the problem occurred.
- How you tried to solve the problem.

Microsoft's support services are subject to Microsoft's prices, terms, and conditions in place at the time the service is used.

Product Support Worldwide

Microsoft provides product support services throughout the world. To receive product support or for information about how to receive product support, contact the Microsoft subsidiary office that serves your country. Microsoft subsidiary offices and the countries they serve are listed in the following table.

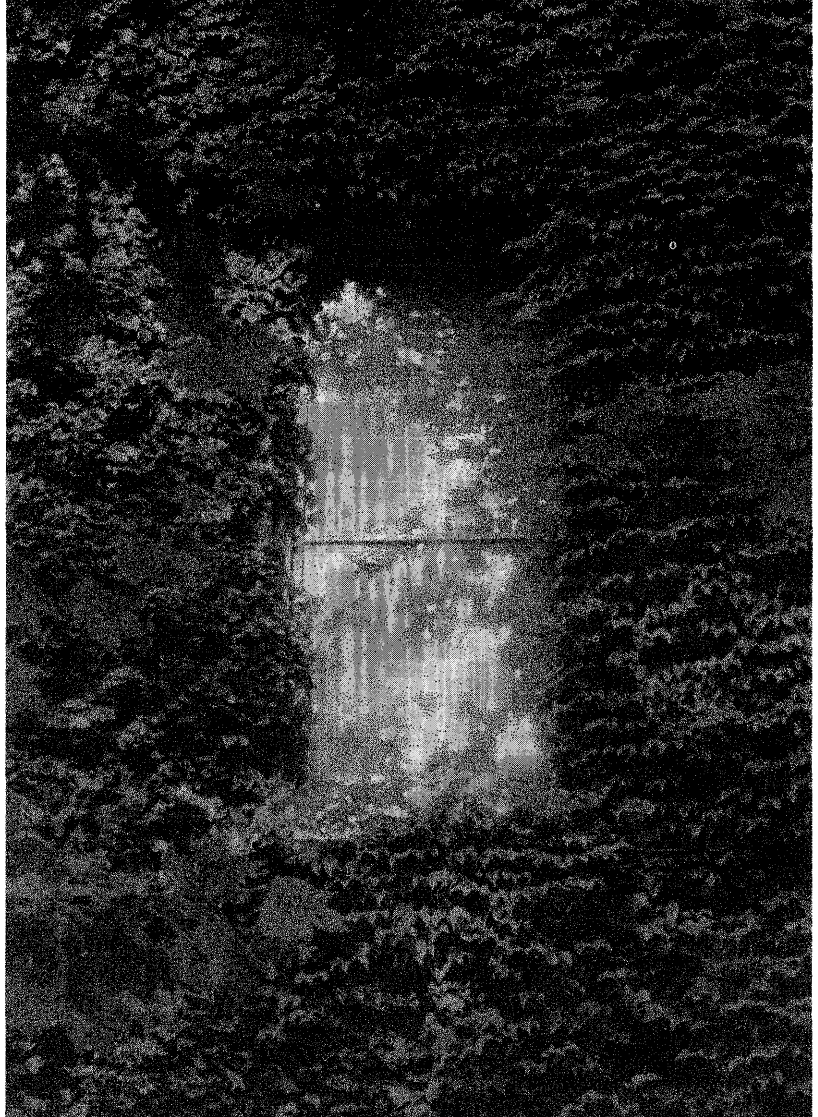
For this country	Contact this office	Using this number
Australia	Australia	(02) 870-2131
Austria	Austria	0660/65-10
Argentina	Argentina	(54-1) 814-0356
Baltic republics	Germany	(0049) 089/3176-1110
Belgium	Belgium	02-5133274 (Dutch) 02-5023432 (English) 02-5132268 (French)
Bermuda	Venezuela	0058.2.914739
Bolivia	Argentina	(54-1) 814-0356
Brazil	Brazil	011-533-2922
Canada	Canada	1 (416) 568-3503
Caribbean countries	Venezuela	0058.2.914739
Central America	Venezuela	0058.2.914739
Chile	Argentina	(54-1) 814-0356
Colombia	Venezuela	0058.2.914739
Commonwealth of Independent States	Germany	(0049) 089/3176-1110
Denmark	Sweden	(46) (8) 752 68 50 (applications) (46) (8) 752 60 50 (systems)
Eastern Europe	Germany	(0049) 089/3176-1110
Ecuador	Venezuela	0058.2.914739
England	United Kingdom	(734) 271000
Finland	Sweden	(46) (8) 752 68 50 (applications) (46) (8) 752 60 50 (systems)
France	France	(33) (1) 69-86-10-20
French Polynesia	France	(33) (1) 69-86-10-20

For this country	Contact this office	Using this number
Germany	Germany	(0049) 089/3176-1110
Iceland	Sweden	(46) (8) 752 68 50 (applications) (46) (8) 752 60 50 (systems)
Italy	Italy	(39) (02) 26901363 (applications) (39) (02) 26901354 (SDK)
Japan	Japan	(81) (3) 3363-0160, 3363-0170
Korea	Korea	(82) (2) 563-9230
Liechtenstein	Switzerland	(0041) 1/ 342-4085 (German) (0041) 22/ 738 96 88 (French)
Luxembourg	Netherlands	(0031) 2503-77877 (Dutch) (0031) 2503-77853 (English)
Mexico	Mexico	(52) (5) 325-0912
Netherlands	Netherlands	02503-77877 (Dutch) 02503-77853 (English)
New Zealand	Australia	(02) 870-2131
Northern Ireland	United Kingdom	(734) 271000
Norway	Norway	(47) (2) 18 35 00
Papua New Guinea	Australia	(02) 870-2131
Paraguay	Argentina	(54-1) 814-0356
Peru	Argentina	(54-1) 814-0356
Portugal	Portugal	351 1 4412205
Puerto Rico	Venezuela	0058.2.914739
Republic of Ireland	United Kingdom	(734) 271000
Scotland	United Kingdom	(734) 271000
Spain	Spain	(91) 803 99 60
Sweden	Sweden	(46) (8) 752 68 50 (applications) (46) (8) 752 60 50 (systems)
Switzerland	Switzerland	1/ 342-4085 (German) (41-22) 738 96 88 (French)
Uruguay	Argentina	(54-1) 814-0356
Venezuela	Venezuela	0058.2.914739
Wales	United Kingdom	(734) 271000

Note For product-support information for countries not listed, contact the United States office at (206) 936-8661.

Windows Fundamentals

Part 1



Windows Fundamentals

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Windows Basics

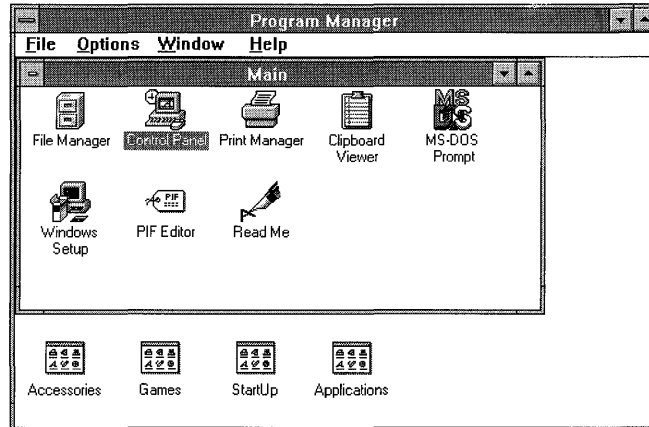


Chapter 1

Basic Elements of Windows

If you are new to the Microsoft Windows operating system, this chapter may be the most important one to read. It explains the basic skills you need to work with Windows. You may want to return to this chapter often as a reference.

Windows provides everything you need to manage your applications and files easily and efficiently. The following illustration shows the rich graphical environment of Windows.



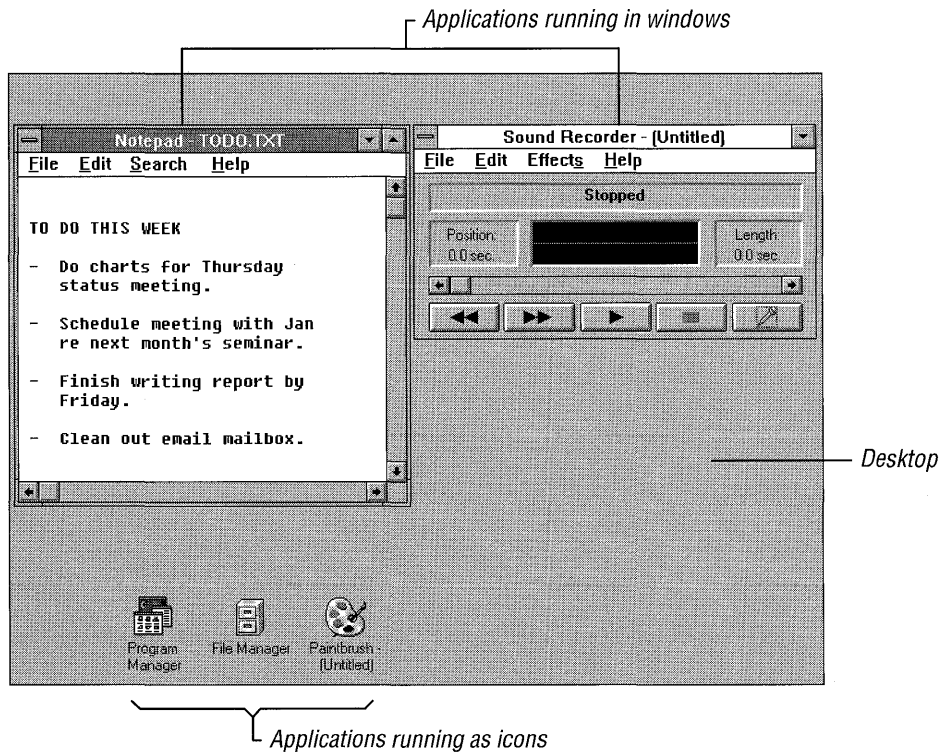
Note You can learn basic mouse techniques, in addition to some basic Windows techniques, by using the online Windows Tutorial. For information about running this program, see “Running the Microsoft Windows Tutorial” in Chapter 2, “Application Basics.” To use the Windows Tutorial, you need a mouse and a VGA (or better) monitor.

When you are running Windows, your work takes place on the *desktop*, the screen space Windows occupies. Think of this area as resembling the surface of a desk. You can move work items around on the Windows desktop, bring new ones onto it, and remove those you don't need.

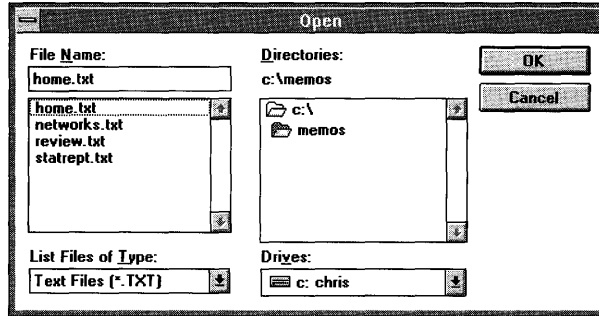
The first time you start Windows, Program Manager appears on your screen. You can use Program Manager to organize your applications and start them.

After you start an application, it runs in an *application window* on the desktop. You can reduce any open application window to an *application icon*. An application icon is a small picture representing an application. By reducing application windows to icons, you can free space on your desktop without quitting the applications. For more information about icons, see "Types of Icons" later in this chapter.

The following illustration shows applications running in windows and applications running as icons on the desktop. For more information about how to start, run, switch between, and quit applications, see Chapter 2, "Application Basics."



Another element of Windows is the *dialog box*, a rectangular box that supplies or requests information about the task you are performing. The following illustration is an example of a dialog box commonly used in Windows. For more information, see “Using a Dialog Box” later in this chapter.



Windows Modes

Windows can run in one of two modes: standard or 386 enhanced. The mode you use depends on the hardware you have. When you start Windows by typing **win**, Windows examines your system's configuration and starts in the most appropriate mode for your system.

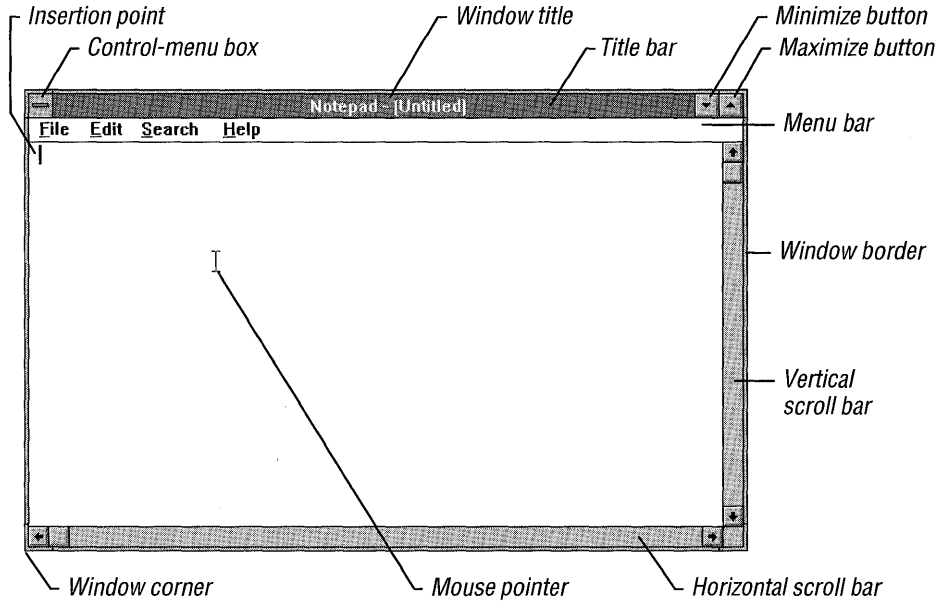
Standard mode is the basic operating mode for Windows. This mode provides access to extended memory and enables you to switch between applications, including those not specifically designed to run with Windows (non-Windows applications).

386 enhanced mode provides access to the virtual memory capabilities of the 80386 processor. If Windows is running in 386 enhanced mode, applications have access to more memory than is physically available on your system, and you can still switch between applications.

For more information about Windows modes, see *Getting Started with Microsoft Windows*.

The Parts of a Window

This section describes the elements of a window that are your tools for working with the window and the application or document within the window. Most windows have certain elements in common, such as a title bar and menus. Not all windows, however, have every element.



You'll learn more about how to use window elements throughout this chapter.

- The *Control-menu box* is in the upper-left corner of each window. The Control menu is most useful if you use your keyboard to work with Windows. By using Control-menu commands, you can resize, move, maximize, minimize, and close windows, and switch to other applications. (If you use a mouse, you can perform these tasks by clicking and dragging.)
- The *title bar* shows the name of the application or document. If more than one window is open, the title bar for the *active* window (the one in which you are working) is a different color or intensity than other title bars.
- The *window title*, depending on the type of window it appears in, can be the name of an application and the name of a document, or the name of a group, directory, or file. If a document has not been saved, a placeholder such as "(Untitled)" usually appears as part of the window title.

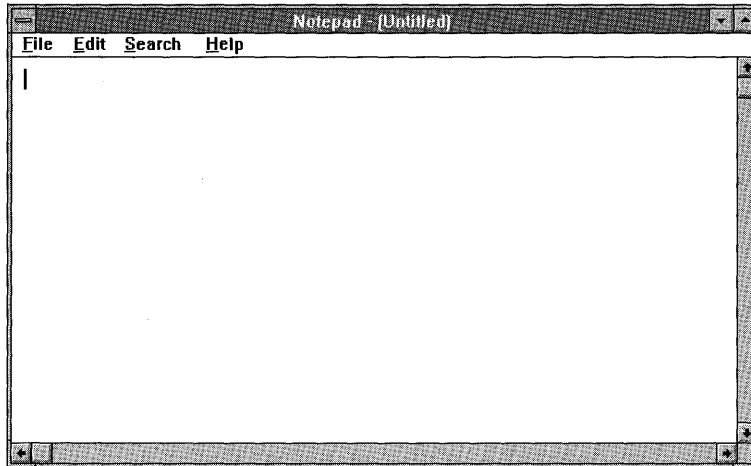
- The *menu bar* lists the available menus. A menu contains a list of commands, or actions, you can carry out with Windows. Most applications have a File menu, an Edit menu, and a Help menu, in addition to menus unique to the application.
- By using *scroll bars*, you can move parts of a document into view when the entire document doesn't fit in the window. You can also use scroll bars to view unseen portions of lists and other information that cannot fit in the allotted space.
- Using a mouse, you can click the *Maximize button* to enlarge the active application window so that it fills the entire desktop, or you can click the *Minimize button* to reduce the window to an icon.
- After you enlarge a window, the Maximize button is replaced by the *Restore button*, which contains both an up arrow and a down arrow. You can click the Restore button to return the window to its previous size. If you are using the keyboard rather than a mouse, you can use the Restore command on the Control menu.
- The *window border* is the outside edge of a window. You can lengthen or shorten the border on each side of a window.
- The *window corner* can be used to shorten or lengthen two adjoining sides of a window border at the same time.
- The *insertion point* shows where you are in a document. It marks the place where text and graphics appear when you begin typing or drawing. (Some applications have insertion points that look different from the one shown in the previous illustration.)
- The *mouse pointer* appears if you have a mouse installed. When you move the mouse, the position of the pointer changes on the screen. (Some applications have different mouse pointers from the one shown in the previous illustration.)

Types of Windows

As you work with applications, two kinds of windows appear on your desktop: application windows, and windows contained within the application window.

As mentioned earlier, an *application window* contains a running application. The name of the application and any associated document, and the application's menu bar, appear at the top of the application window.

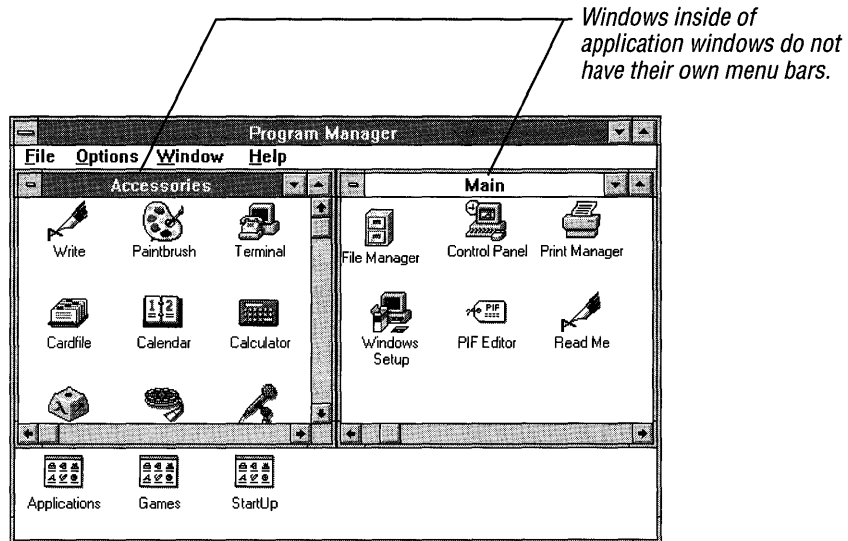
The following is an example of an application window.



Another window may appear inside an application window. These types of windows are sometimes called *document windows*, because they often contain your document or other data files. In Program Manager, they contain groups. In File Manager, they contain directories. In many applications, more than one of these windows can be open at a time. For example, with Windows File Manager (one of the main applications included with Windows), you can open several directories at a time. Each directory appears inside its own window.

These windows share the application window's menu bar. When a document window is opened, commands that you choose from the application's menu bar affect the document window or the information or items contained in it.

Windows inside of application windows have their own title bar unless they are *maximized* (expanded to their maximum size within the application window). When maximized, they share the application window's title bar.



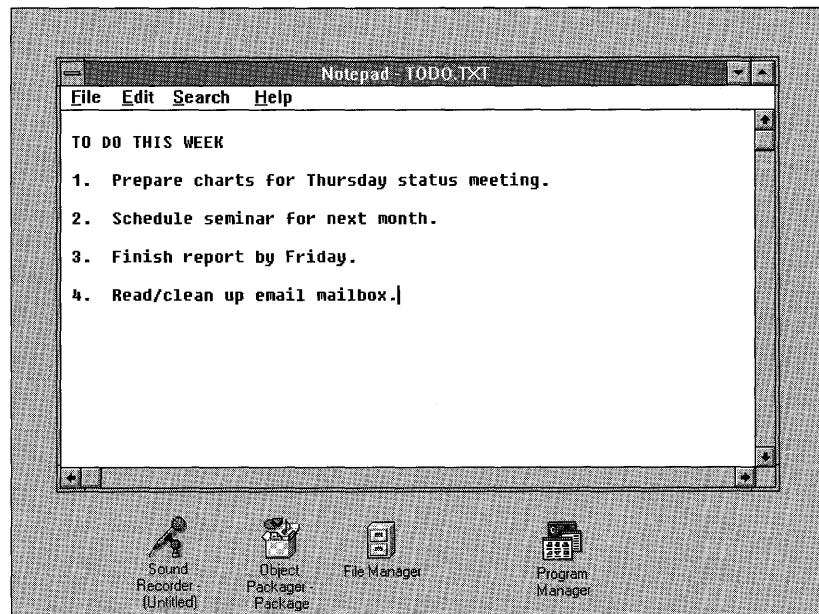
If you use a mouse, there's no difference between the way you manipulate application windows and the windows inside them. If you use the keyboard, however, you use different keystrokes to manipulate each type of window. For more information, see “Working with a Window” later in this chapter.

Types of Icons

Icons are small pictures that represent various types of applications and files. In Program Manager, there are a number of different types of icons.

- An *application icon* represents an application that is running, but whose window is not open. The application window has been reduced to an icon at the lower edge of your Windows desktop.

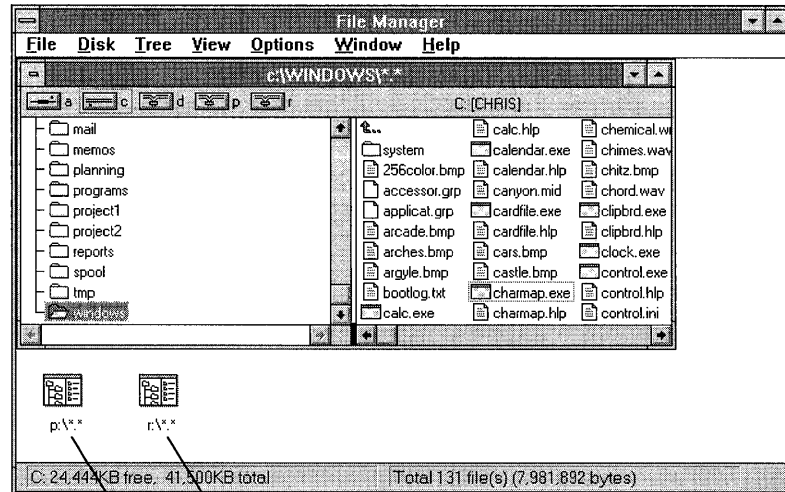
You can move an application icon (that is, the icon for a running application) anywhere on the desktop except into an open window. This is because the icon represents an open application, and applications run only on the desktop, not inside of documents or other applications.



Application icons

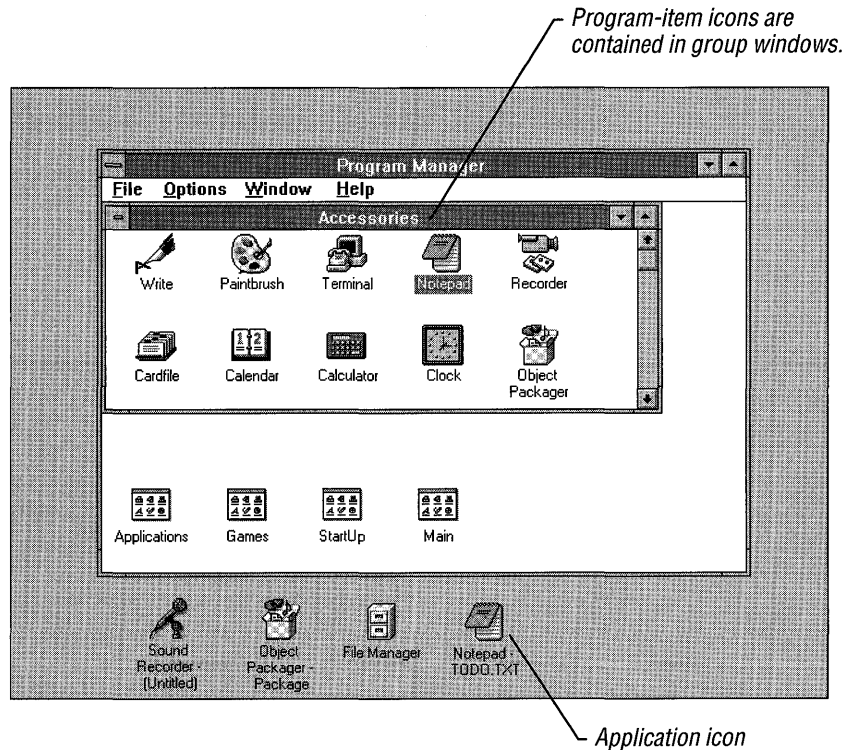
- Another type of icon represents a document window that is minimized. These icons generally appear along the lower edge of the application window and can be moved anywhere within the application window. In Program Manager, these icons are called *group icons*.

Notice in the following illustration that the icons that represent document windows look the same. Only the labels that identify them are different.



These icons are distinguished only by their labels.

- *Program-item icons* represent the applications you can start from Windows. They are contained in Program Manager group windows. You can move or copy program-item icons from one group window to another; for example, if you want to be able to start an application from a different group. (For more information, see “Moving an Icon” later in this chapter.)



Most program-item icons look unique. However, icons for many non-Windows applications are identical. Also, for many applications, you can run more than one copy of the application. Program-item icons for multiple copies of applications are identical. Thus, a group window might contain several identical program-item icons distinguished only by their labels.

Basic Mouse and Keyboard Techniques

This section explains some of the basic terminology and techniques that are referred to throughout this guide. Other terms are explained as they are introduced in the text. (For more information about specific terms, see the Glossary at the back of this guide.)

Term	Meaning
Click	To quickly press and release the mouse button.
Double-click	To click the mouse button twice in rapid succession.
Drag	To hold down the mouse button while you move the mouse.
Point	To move the mouse until the mouse pointer on the screen rests on the item of choice.

Choosing and Selecting Items

In Windows, the terms *choose* and *select* have different, and specific, meanings. Selecting an item usually means marking it with the selection cursor, which can appear as a highlight, a dotted rectangle, or both. You also select *check boxes* in dialog boxes. Selecting alone does not initiate an action.

You choose an item to carry out an action. For example, choosing an icon might start an application, open a window, or carry out a command. You can also choose an item from a menu, or choose a command button in a dialog box. (Menus and dialog boxes are discussed in more detail later in this chapter.) You often need to select an item before you can choose it.

You can use a combination of mouse and keyboard techniques. For example, you could click an item to select it, and then press `ENTER` to choose it. When a procedure in this guide says to choose an item, generally you can use whichever method you prefer. Alternative procedures are often provided as well.

Keyboard Shortcuts

Shortcut keys can be used to carry out some menu commands. Shortcut-key combinations are listed to the right of a menu item. Instead of opening the menu and choosing a command, you simply press the key combination.

Using a Menu

Windows commands are listed on *menus*. Each application has its own menus, which are listed on the menu bar along the upper edge of the application window. In addition, each application window has a Control menu. The Control menu opens from the small box in the upper-left corner of each window. For more information, see “Using the Control Menu” later in this chapter.

Selecting and Closing a Menu

In Windows, you select (highlight) a menu and then choose a command from that menu. Choosing the command carries out the action.

► To select a menu

Mouse

- Using the mouse pointer, point to the name of the menu on the menu bar, and click the left mouse button. This opens the menu. (To move directly to a menu item, you can drag the selection cursor down the menu until the menu item is highlighted, and then release the mouse button.)

Keyboard

1. Press ALT or F10 to select (highlight) the menu bar.
2. Press the LEFT ARROW or RIGHT ARROW key to select the menu you want.
3. Press ENTER to open the selected menu.

Tip If a name in the menu bar has an underlined letter, you can press ALT to move to the menu bar, and then type the letter that's underlined to open the menu. For example, to open the File menu in Program Manager, press ALT, F.

If more than one menu name has the same underlined letter, the first name listed is selected. To select the next menu name, press ALT, and then the letter again.

The following are typical Windows menus.

File	
New...	
O <u>pen</u>	Enter
M <u>ove</u> ...	F7
C <u>o</u> py...	F8
D <u>e</u> lete	Del
P <u>r</u> operties...	Alt+Enter
R <u>u</u> n...	
E <u>x</u> it Windows...	

Edit	
Undo	Ctrl+Z
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Delete	Del
Select All	
Time/Date	F5
Word Wrap	

Effects	
Increase Volume (by 25%)	
Decrease Volume	
Increase Speed (by 100%)	
Decrease Speed	
Add Echo	
Reverse	

► **To close a menu**

- Click the menu name or anywhere outside the menu.
Or press ALT or F10 to cancel the menu and move back to the application workspace.
Or press ESC to close the menu but remain on the menu bar so that you can select another menu.

Choosing a Menu Command

Menu items are most often commands. However, they can also be characteristics you assign to graphics or text (such as bold or centered), a list of open windows or files, or the names of *cascading* menus, which list additional commands.

► **To choose an item from a selected menu**

- Click the item.
Or type the letter that is underlined in the item name.
Or use the UP ARROW and DOWN ARROW keys until you reach the item you want to select, and then press ENTER.

There are a number of menu conventions used in Windows. For example, some menu items may have a check mark, an ellipsis (...), or a key combination next to them. Other menu items may be dimmed.

The following menu conventions are used in Windows.

Menu convention	Meaning
Dimmed (or not visible) command	You may not be able to use the command with your application at the current time. (For example, you may need to select another item before using this command.)
An ellipsis (...) following a command	A dialog box appears when you choose the command. The dialog box contains options you need to select before the command can be carried out.
A check mark (✓) next to a command	The command is in effect. When you remove the check mark (by selecting the command), the command is no longer in effect.
A key combination next to a command	The key combination is a <i>shortcut</i> for this command. You can use this key combination to choose the command.
A triangle (▶) next to a command	When you choose this command, a cascading menu appears, listing additional commands.

Using the Control Menu

Application windows, application icons, document windows and their icons, and some dialog boxes have a Control menu.

You open the Control menu for windows and dialog boxes by selecting the Control-menu box in the upper-left corner of the window or dialog box. You open the Control menu for an icon by selecting the icon.

The Control menu for an application window, a document window, and a dialog box are somewhat different from each other, as are the Control menus for non-Windows applications. The following section describes how to use the Control menu in these environments.

Opening the Control Menu

How you open the Control menu depends on whether you are working with an application window, a document window, a dialog box, or an icon.

Note In applications that can contain document windows, you may see more than one Control-menu box. The one in the far upper-left corner controls the application. The others control the windows inside the application window.

► To open the Control menu for an application window or application icon

Mouse

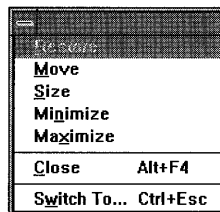
- Click the Control-menu box in the upper-left corner of the window.

Or click the application icon.

Do not double-click; if you do, the window closes or the icon is restored to a window.

Keyboard

1. Press ALT+ESC repeatedly to cycle through the open application windows and icons until you reach the one you want.
2. Press ALT, SPACEBAR to open the Control menu. (Press ALT if you want to close the menu without choosing a menu item.)



► **To open the Control menu for a document window or its icon**

Mouse

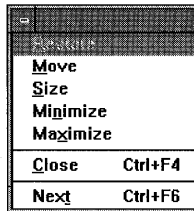
- Click the Control-menu box in the document window.

Or click the icon.

Do not double-click; if you do, the window closes or the icon is restored to a window.

Keyboard

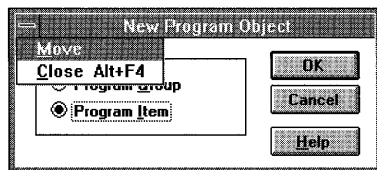
1. Press CTRL+F6 or CTRL+TAB repeatedly to cycle through the open windows and icons in an application until you reach the one you want.
2. Press ALT, HYPHEN (-) to open the Control menu. (Press ALT if you want to close the menu without choosing a menu item.)



► **To open the Control menu for a dialog box**

- Click the Control-menu box in the upper-left corner of the dialog box.

Or press ALT, SPACEBAR. (Press ALT to close the menu without choosing a menu item.)



The Control Menu in a Non-Windows Application

A non-Windows application is one that was designed for the Microsoft MS-DOS® environment, rather than for Windows. You can use most non-Windows applications with Windows.

A non-Windows application running in standard mode does not have an application window; it occupies the entire screen. Before you can open the Control menu, you must switch back to Windows so that the application is reduced to an icon.

To find out which mode Windows is running in, choose the About command on the Help menu in applications included with Windows (Main or Accessories group applications).

► **To open the Control menu for a non-Windows application running in standard mode**

1. Press ALT+ESC to switch from the application to Windows.

The application is reduced to an application icon at the bottom of the screen.

2. Click the icon.

Or press ALT+ESC to select the icon you want, and then press ALT+SPACEBAR to open the Control menu.

386

► **To open the Control menu for a non-Windows application running in 386 enhanced mode**

Mouse

- Click the Control-menu box in the upper-left corner of the application window.

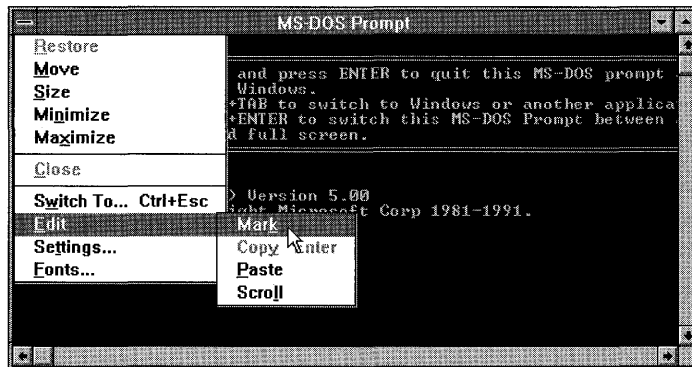
Or, if the application window has been reduced to an icon, click the icon.

Do not double-click; if you do, the window closes or the icon is restored to a window.

Keyboard

1. Press ALT+ESC repeatedly to cycle through the open application windows and icons until you reach the one you want.
2. Press ALT+SPACEBAR. (Press ALT to close the menu without choosing a menu item.)

Note The Control menu for a non-Windows application running in 386 enhanced mode includes a cascading menu. Using a mouse, you open the cascading menu by clicking the Edit command. Using a keyboard, you open the cascading menu by choosing Edit and then pressing the RIGHT ARROW key or ENTER. To use the commands on a cascading menu, you must be running the application in a window. For more information about running a non-Windows application in a window, see Chapter 7, “Non-Windows Applications.”



Control-Menu Commands

The following table describes the commands on the Control menu. Some applications do not have all these commands.

Use	To
Restore	Restore the window to its former size after you have enlarged it (by using the Maximize command) or reduced it to an icon (by using the Minimize command).
Move	Use the keyboard to move the window to another position.
Size	Use the keyboard to change the size of the window.
Minimize	Reduce the window to an icon.
Maximize	Enlarge the window to its maximum size.
Close	Close the window or dialog box. (From an application window, you can use this command to quit the application.)

Use	To
Switch To	Open Task List, which enables you to switch between running applications and rearrange windows and icons on your desktop.
Next	Switch between open document windows and icons (available for document windows only).
Edit	Display a cascading menu with additional commands (available for non-Windows applications running in 386 enhanced mode only).
Settings	Display a dialog box that requests information about multitasking options (available for non-Windows applications running in 386 enhanced mode only).
Fonts	Display a dialog box that you can use to specify font information (available for non-Windows applications running in 386 enhanced mode only).

Choosing the Edit command opens a menu that has four additional commands, as follows.

Use	To
Mark	Use your keyboard to select text and move it onto the Clipboard.
Copy	Copy the selected text onto the Clipboard.
Paste	Copy text from the Clipboard to the active window.
Scroll	View information not currently visible in the window.

Working with a Window

When you work with applications and documents, you often have a number of windows open. This section explains how to move and resize windows, scroll through their contents, and arrange them on the desktop.

Moving a Window

You can move any window to a different location on your desktop.

► To move a window

Mouse

1. Drag the title bar of the window to the new location.

As you move the mouse pointer, an outline of the window moves with it.

2. Release the mouse button.

To cancel the move, press ESC before you release the mouse button.

Keyboard

1. Select the window you want to move. (Be sure NUM LOCK is turned off.)
To cycle through the application windows until you reach the one you want, press ALT+ESC.
To cycle through the windows inside an application window, press CTRL+F6 or CTRL+TAB.
2. If you are moving an application window, press ALT, SPACEBAR to open the Control menu.
If you are moving a document window, press ALT, HYPHEN (-) to open the Control menu.
3. From the Control menu, choose Move.
The pointer changes to a four-headed arrow.
4. Use the arrow keys to move the window to the new location.
An outline of the window moves as you use the arrow keys.
5. Press ENTER.
To cancel the move, press ESC before you press ENTER.

Changing the Size of a Window

You might want to change the size and shape of windows on your desktop. For example, to compare the contents of two documents, you can reduce the size of both document windows so that they fit side by side. If you are using a mouse, you can drag the window's border or corners to adjust the size. If you are using the keyboard, you can modify the window's size and shape by using commands on the Control menu.

Note The minimum size for all windows is about 2 inches by 1 inch. Some application windows cannot be resized.

► To change the size of a window

Mouse

1. Select the window you want to resize.
2. Point to a border or corner.
The pointer changes to a two-headed arrow.

3. Drag the corner or border until the window is the size you want.
If you drag a border, the window size changes only on the side of the border you drag. If you drag a corner, the two adjoining sides that form the corner are moved at the same time.
An outline shows the size and shape you are creating.
4. Release the mouse button.
To cancel the resizing, press ESC before you release the mouse button.

Keyboard

1. Select the window you want to resize. (Be sure NUM LOCK is turned off.)
To cycle through application windows until you reach the one you want to resize, press ALT+ESC.
To cycle through the windows inside an application window, press CTRL+F6 or CTRL+TAB.
2. If you are resizing an application window, press ALT, SPACEBAR to open the Control menu.
If you are resizing a document window, press ALT, HYPHEN (-) to open the Control menu.
3. From the Control menu, choose Size.
The pointer changes to a four-headed arrow.
4. Use an arrow key to move the pointer to the border you want.
If you want to change the size both horizontally and vertically, press two arrow keys simultaneously to select a corner of the window. Press UP ARROW+RIGHT ARROW, for example, to select the upper-right corner of the window.
5. Use an arrow key to move the border.
If you are changing the size both horizontally and vertically, press the RIGHT ARROW key to stretch the window to the right, and the UP ARROW key to stretch the window toward the top of the desktop, until the window is the size you want.
An outline shows the size and shape as you make changes.
6. Press ENTER when the window is the size you want.
To cancel the resizing, press ESC before you press ENTER.

Reducing a Window to an Icon

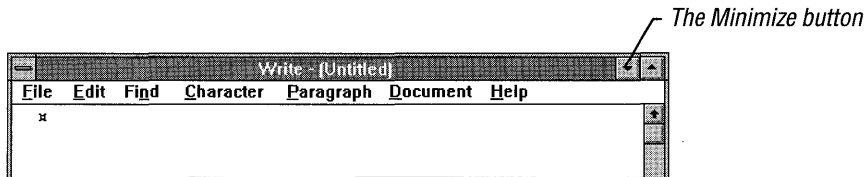
When you finish working with an application, you may want to reduce the application window to an icon if you want the application available for later use. When you reduce an application window to an icon, the application continues to run but its window does not take up space on the desktop. You may also be able to reduce a document window to an icon.

You can select and move icons on your desktop in the same way you select and move windows.

► **To reduce a window to an icon**

Mouse

1. Select the window you want to reduce.
2. Click the Minimize button (the box with a down arrow to the right of the title bar) in the upper-right corner of the window.



Keyboard

1. Select the window you want to reduce.
To cycle through application windows until you reach the one you want, press ALT+ESC.
To cycle through document windows, press CTRL+F6 or CTRL+TAB.
2. If you are reducing an application window, press ALT, SPACEBAR to open the Control menu.
If you are reducing a document window, press ALT, HYPHEN (-) to open the Control menu.
3. From the Control menu, choose Minimize.

If a document window (for example, the Main group window) has been maximized, you must restore it to its original size before you can use the Minimize button to reduce it to an icon. (The Minimize button does not appear in a maximized document window.) Or you can reduce the window by choosing Minimize from the window's Control menu.

Enlarging a Window

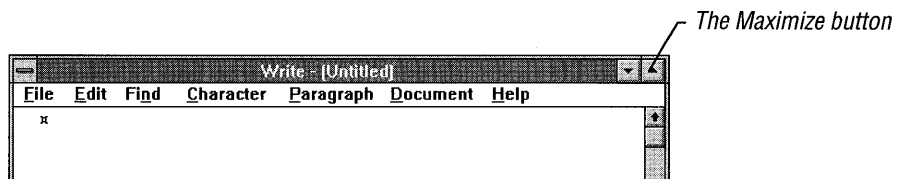
In most cases, you can enlarge an application window to fill a larger portion of the desktop or even the entire desktop. A document window can be enlarged to fill an entire application window except the menu-bar area.

► **To enlarge a window to its maximum size**

Mouse

1. Select the window you want to enlarge.
2. Click the Maximize button in the upper-right corner of the window.

Note You can also maximize a window by double-clicking its title bar. To restore an application window to its previous size, double-click the title bar again. To restore a document window, click the Restore button in the upper-right corner of the window.



Keyboard

1. Select the window you want to enlarge.
 - To cycle through application windows and icons until you reach the one you want, press ALT+ESC.
 - To cycle through document windows and icons, press CTRL+F6 or CTRL+TAB.
2. If you are enlarging an application window, press ALT, SPACEBAR to open the Control menu.
 - If you are enlarging a document window, press ALT, HYPHEN (-) to open the Control menu.
3. From the Control menu, choose Maximize.
 - The window enlarges to its maximum size, and the Maximize button is replaced by the Restore button.

A maximized document window no longer has its own title bar. The Minimize and Maximize buttons affect the application window, not any windows inside it. Only the Restore button affects the document window alone.

Tip When two or more windows are open inside an application window and you enlarge one of them, all the others are covered up by the enlarged window. To display the other windows, choose the Restore button to return the enlarged window to its previous size or choose Minimize from the document's Control menu to reduce the window to an icon.

Restoring an Icon or Window

You can restore an icon or window to its original size by using the Restore command.

► To restore an icon to a window

Mouse

- Double-click the icon.
Or choose the Restore command from the Control menu.

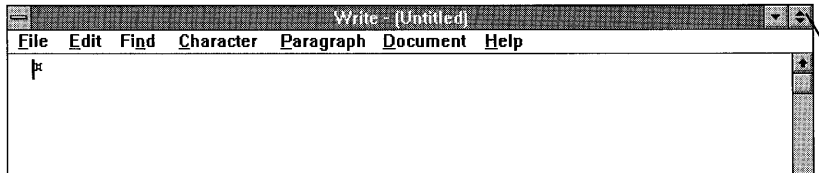
Keyboard

1. Select the icon you want to restore.
To cycle through application icons until you reach the one you want to restore, press ALT+ESC.
To cycle through document icons until you reach the one you want to restore, press CTRL+F6 or CTRL+TAB.
2. Press ENTER.

► To restore an enlarged window to its previous size

Mouse

- Click the Restore button in the upper-right corner of the window.



The Restore button restores a window to its previous size.

Keyboard

1. If you are restoring an application window, press ALT, SPACEBAR to open the Control menu.
If you are restoring a document window, press ALT, HYPHEN (-) to open the Control menu.
2. From the Control menu, choose Restore.

Moving an Icon

You can move an application icon or document icon to a different location on your desktop.

You can move an application icon anywhere on your desktop except into another application window. (The application icon may appear to be in the other application's window, but if you close the window, the icon remains on the desktop. This is because applications cannot run within other applications.)

You can move a document icon to a different location in its application window, but not outside of the application window.

► To move an icon

Mouse

1. Drag the icon to a new location.

The mouse pointer changes to an outline of the icon, which moves as you move the mouse.

2. Release the mouse button.

To cancel the move, press ESC before you release the mouse button.

Keyboard

1. Select the icon you want to move. (Be sure NUM LOCK is turned off.)

To cycle through the application icons until you reach the one you want to move, press ALT+ESC.

To cycle through the document icons until you reach the one you want to move, press CTRL+F6 or CTRL+TAB.

2. If you are moving an application icon, press ALT, SPACEBAR to open the Control menu.

If you are moving a document icon, press ALT, HYPHEN (-) to open the Control menu.

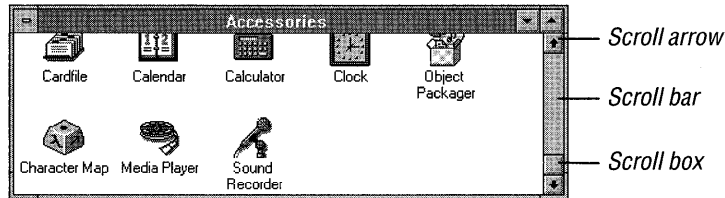
3. From the Control menu, choose Move.
 4. Use the arrow keys to move the icon to a new location.
- An outline of the icon moves as you use the arrow keys.

5. Press ENTER.

To cancel the move, press ESC before you press ENTER.

Using Scroll Bars

Some windows and dialog boxes have scroll bars you can use to view information that exists beyond the borders of the window. When you can view all the contents of a window or dialog box without scrolling, scroll bars may be absent, or dimmed, to indicate they cannot be used.



► To scroll through information displayed in a window or dialog box

Mouse

- Drag the scroll box to scroll through all the information in a list or document.

You can also use the following techniques to scroll.

To scroll	Do this
One line up or down	Click the up or down scroll arrow.
One screen	Click the scroll bar above or below the scroll box on vertical scroll bars, and to the left or right of the scroll box on horizontal scroll bars.
Continuously	Point to one of the scroll arrows, and hold down the mouse button until the information you want comes into view.
To any position	Drag the scroll box in the scroll bar to the position you want. The section of the document or list that moves into view depends on where you position the scroll box. For example, if you position the scroll box halfway down the vertical scroll bar, the text halfway through the document or list appears.

Keyboard

- Press the arrow key that points in the direction you want to scroll. (Be sure NUM LOCK is off.)

Depending on the application, you may also be able to use the following techniques to scroll.

To scroll	Press
One line up or down	UP ARROW or DOWN ARROW
One screen up or down	PAGE UP or PAGE DOWN

To scroll	Press
One screen left or right	CTRL+PAGE UP or CTRL+PAGE DOWN
To the beginning of a line	HOME
To the end of a line	END
To the beginning of the document	CTRL+HOME
To the end of the document	CTRL+END

Closing a Window

One way to quit an application is to close the application window. Similarly, you can close a document by closing the document window. If you made changes to your document since you last saved it, a message prompts you to save the document before closing the window.

► To close a window

- From the File menu, choose Exit.

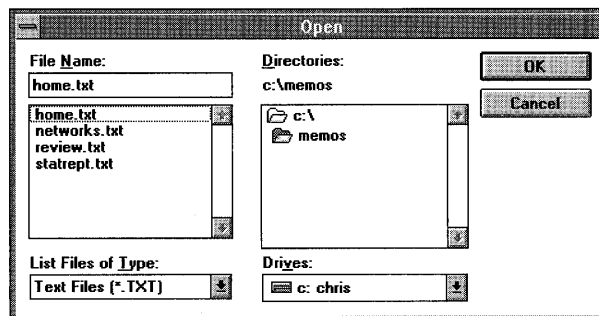
Or choose Close from the Control menu.

As a shortcut, you can double-click the Control-menu box.

Using a Dialog Box

Windows displays a *dialog box* to request information about a task you are performing or to supply information you might need.

An ellipsis (...) after a menu command indicates a dialog box will appear when you choose that command. For example, if you choose the Open command on the File menu in Windows Notepad, the Open dialog box appears. In this dialog box, you specify the name of the file you want to open.



Most dialog boxes contain options you can select. After you specify options, you can choose a command button to carry out a command. Other dialog boxes may display additional information, warnings, or messages indicating why a requested task cannot be accomplished.

Moving a Dialog Box

If a dialog box has a title bar, you can move the dialog box to another location on your desktop.

► To move a dialog box

Mouse

1. Drag the title bar of the dialog box to the new location.
As you move the mouse pointer, an outline of the dialog box moves with it.
2. Release the mouse button.
To cancel the move, press ESC before you release the mouse button.

Keyboard

1. Select the dialog box you want to move. (Be sure NUM LOCK is turned off.)
2. Press ALT, SPACEBAR to open the Control menu.
3. From the Control menu, choose Move.
The pointer changes to a four-headed arrow.
4. Use the arrow keys to move the dialog box to the new location.
5. Press ENTER.
To cancel the move, press ESC before you press ENTER.

Moving Within a Dialog Box

Often you need to move within a dialog box to select one or more options. The currently selected option is marked by the selection cursor, which appears as a dotted rectangle, a highlight, or both.

► To move within a dialog box

Mouse

- Click the option or area you want to move to.

Keyboard

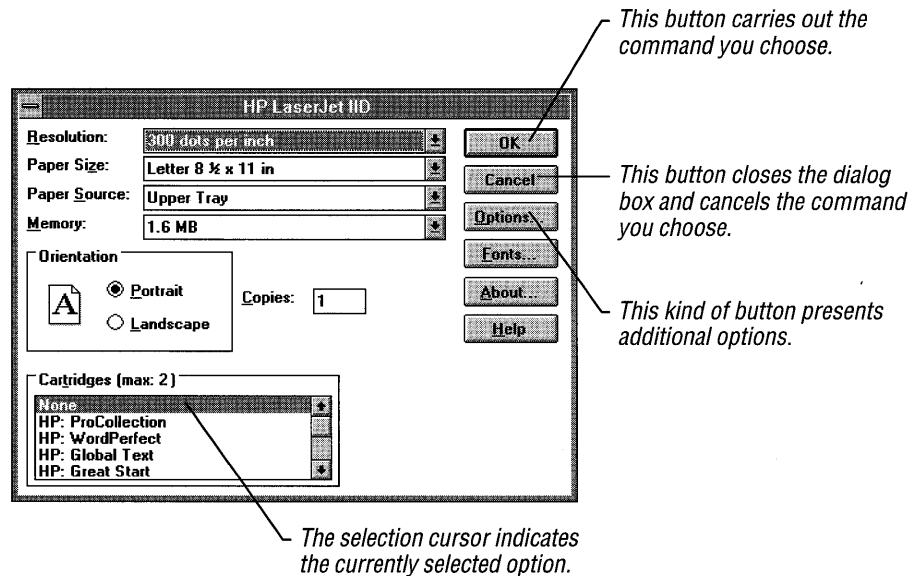
1. Press TAB to move forward (generally from left to right and top to bottom), or press SHIFT+TAB to move in the opposite direction.
Or, while you press and hold down ALT, type the letter that is underlined in the option name or group name.
2. Within an area, use the arrow keys to move from one option to another.
(Be sure NUM LOCK is turned off.)

Types of Options

There are several types of dialog box options, which are described in the following sections.

Command Buttons

You choose a *command button* to initiate an immediate action, such as carrying out or canceling a command. The OK, Cancel, and Help buttons are common command buttons. They are often located along the bottom or on the right side of the dialog box.



A command button followed by an ellipsis (...) opens another dialog box. A command button marked with greater-than signs (>>) expands the active dialog box.

For example, the Color dialog box in Control Panel has a button labeled Color Palette>> that expands the Color dialog box to display more options.

Unavailable buttons are dimmed. The currently selected button has a darker border than other buttons. You can choose the selected button simply by pressing ENTER.

To close a dialog box without completing a command, choose the Cancel button.

► To choose a command button

Mouse

- Click the command button.

Keyboard

1. Press TAB to move to the button you want.

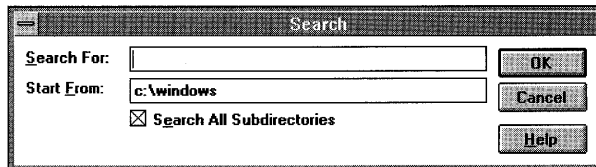
A dark border marks the selected button.

2. Press the SPACEBAR or ENTER.

Tip If the button has an underlined letter in its name, you can choose the command button in one step. Press and hold down ALT while typing the underlined letter.

Text Boxes

You type information into a *text box*.



When you move to an empty text box, an *insertion point* (flashing vertical bar) appears at the far left side of the box. The text you type starts at the insertion point.

If the box you move to already contains text, this text is selected, and any text you type replaces it. You can also delete the existing text by pressing DEL or BACKSPACE. For information about editing text, see “Working with Text” in Chapter 2, “Application Basics.”

► To select text in a text box

Mouse

- Drag the pointer across the text you want to select.
Or double-click on a word to select one word at a time.

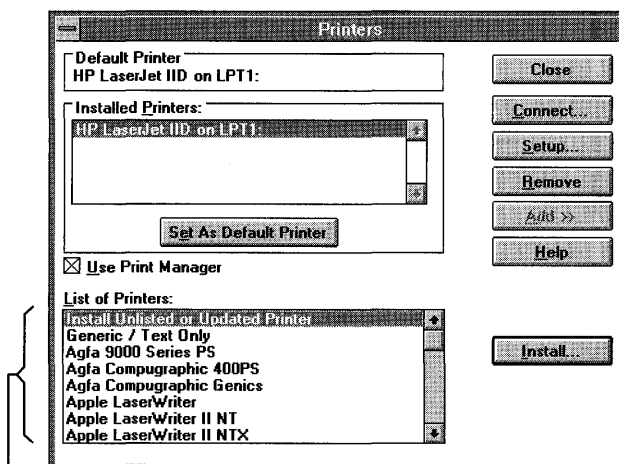
Keyboard

1. Use the arrow keys to move to the first character you want to select in the box. (Be sure NUM LOCK is turned off.)
2. To extend the selection, press and hold down SHIFT while pressing the appropriate arrow key. (Press SHIFT+HOME to extend the selection to the first character in the box. Press SHIFT+END to extend the selection to the last character in the box.)

For more information about selection methods, see “Selecting Text” in Chapter 2, “Application Basics.”

List Boxes

A *list box* displays a list of choices. If there are more choices than can fit in the box, scroll bars are provided so you can move quickly through the list. For information about scrolling, see “Using Scroll Bars” earlier in this chapter.



List boxes present available choices.

Usually, you can select only one item in a list box. There are some cases when you can select more than one item, as in Windows Setup when you select various applications to install.

► **To select a single item from a list box**

Mouse

1. Click the scroll arrows until the item you want to select appears in the list box.
2. Click the item, and then choose the appropriate command button.

Or double-click the item to select it and complete the command all in one step.

Keyboard

1. Use the arrow keys to scroll to the item you want. (Be sure NUM LOCK is turned off.)

Or type the first letter of the item you want to select. The selection cursor moves to the first item that starts with that letter.

2. Press ENTER.

Sometimes you can select more than one item in a list box, whether or not those items are sequential. In these cases, you can select or cancel as many items as you want.

► **To select multiple sequential items in a list**

Mouse

- Click the first item you want to select, and then drag the cursor to the last item you want to select.

To cancel the selection, click any item in the list.

Or click the first item you want to select, press and hold down SHIFT, and click the last item you want to select. Both items, and all items in between, are selected.

To cancel the selections, release SHIFT and click any item.

Keyboard

1. Use the UP ARROW or DOWN ARROW key to move the cursor to the first item you want to select. (Be sure NUM LOCK is turned off.)
2. Press and hold down SHIFT.
3. Continue to press the arrow key repeatedly until all the items you want are selected.

To cancel the selections, release the SHIFT key and press the UP ARROW or DOWN ARROW key.

► **To select multiple nonsequential items in a list**

- Press and hold down CTRL, and click each item you want to select.

To cancel a selection, press and hold down CTRL, and click the item again.

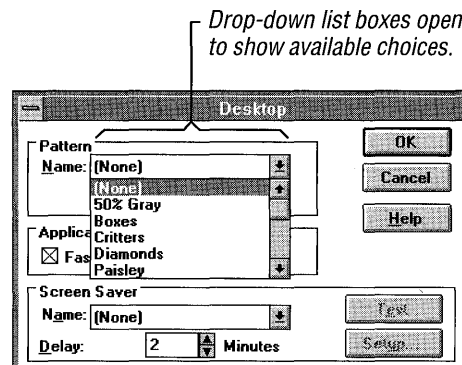
There are no keyboard equivalents for this procedure.

Note With some applications, you can use other key combinations to extend a selection to items that follow sequentially. For information, see the user's guide for the application. You may also want to see Appendix C, "Keyboard Shortcuts."

Drop-Down List Boxes

A *drop-down list box* appears initially as a rectangular box with the current selection marked by the selection cursor. When you select the arrow in the square box at the right, a list of available choices appears. If there are more items than can fit in the box, scroll bars are provided.

This type of list box is often found in small or crowded dialog boxes.



► **To open a drop-down list box and select an item**

Mouse

1. Click the arrow at the right of the box to open the box.
2. Click the up or down scroll arrow.
Or drag the scroll box to move to the item you want to select.
3. Click the item.

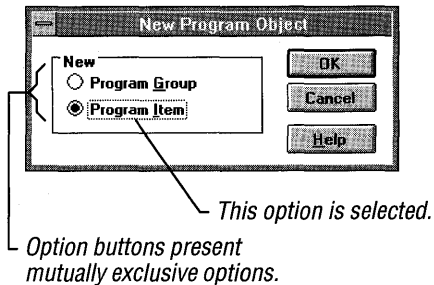
Keyboard

1. Press ALT+DOWN ARROW to open the box. (Be sure NUM LOCK is turned off.)
2. Press the UP ARROW or DOWN ARROW key to move the selection cursor to the item you want.
3. Press ALT+UP ARROW or ALT+DOWN ARROW to select it.

Option Buttons

Option buttons represent mutually exclusive options. You can select only one option at a time.

The selected option button contains a black dot. Unavailable options are dimmed.



► To select an option button

Mouse

- Click the option button.

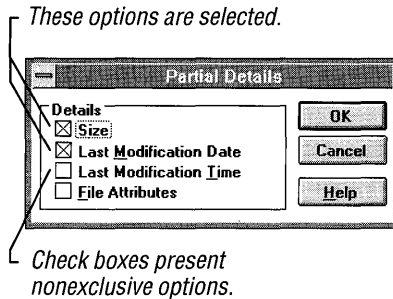
Keyboard

1. Press TAB to move to the group of options you want.
2. Use the arrow keys to select the option button you want.

Tip If the option has an underlined letter, you can select the option button by pressing and holding down ALT while typing the underlined letter.

Check Boxes

A *check box* next to an option means you can select or clear the option. You can select as many check-box options as needed. When a check box is selected, it contains an X. Names of unavailable options are dimmed.



Note In some cases, a check box may be shaded. A shaded box often signifies that additional choices relate to the option, though the meaning varies with the application. For example, in the Add/Remove Windows Components dialog box in Windows Setup, you can choose to add only selected README files. When you do this, the Readme Files check box is shaded.

► To select or clear check boxes

Mouse

- Click each blank check box you want to select.
Click a selected box to clear it.

Keyboard

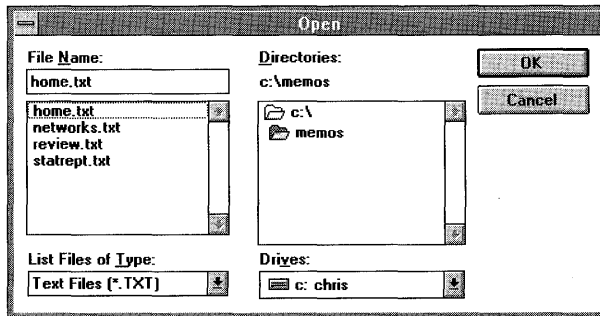
1. Press **TAB** to move to the check box you want to select or clear.
2. Press the **SPACEBAR** to select the box.
Press the **SPACEBAR** again to clear the selection.

Tip If the option name has an underlined letter, press and hold down **ALT** while typing the underlined letter to select or clear the check box.

Common Dialog Boxes

Some menu commands are common to several applications included with Windows. An example is the Open command in the File menu. Choosing one of these commands opens a dialog box that is the same, regardless of which application you are using. These dialog boxes are designed to save you time because you can select the drive, directory, file, and file type from the ones displayed in the list boxes, instead of having to remember and type the names.

Common dialog boxes all contain the same basic areas, as shown in the following example. Instructions for each area follow.



File Name

The currently selected file, if any, is listed in the box at the top of this area. Additional files you can select are shown in the list box.

► To select a file

Mouse

- Click the filename in the list box. To view more filenames, click the scroll arrow at the right of the list box.

Keyboard

1. Press TAB to move to the list box.
2. Press the DOWN ARROW key to move the selection cursor to the filename.
3. Press the SPACEBAR to select the filename.

Press the SPACEBAR again if you want to clear the selection.

Directories

The open directory is the one with the “open” file-folder icon to the left of the directory name.

► To open a different directory

Mouse

- Double-click the directory name. To view more directory names, click the scroll arrow at the right of the list box.

Keyboard

1. Press **TAB** to move to the list box.
2. Press the **UP ARROW** or **DOWN ARROW** key to move the selection cursor to the directory name.
3. Press **ENTER**.

List Files of Type

This section specifies which files are listed in the File Name area. The current type of file and its extension are displayed.

Note In the Save As dialog box, this area is called Save File As Type. Procedures are the same in both cases.

► To select a different file type

Mouse

1. Click the arrow at the right of the drop-down list box to display more file types.
2. Click the type of files you want to display.

Keyboard

1. Press **TAB** to move to the list box.
2. Press the **DOWN ARROW** or **RIGHT ARROW** key to display more file types.
3. Press the **UP ARROW** or **DOWN ARROW** key to move the selection cursor to the file type.
4. Press **ENTER** to complete your selection.

Drives

This section shows your system's current drive.

► To select a different drive

Mouse

1. Click the arrow at the right of the drop-down list box to display more drives.
2. Click the drive you want.

Keyboard

1. Press **TAB** to move to the list box.
2. Press the **DOWN ARROW** or **RIGHT ARROW** key to display more drives.
3. Press the **UP ARROW** or **DOWN ARROW** key to move the selection cursor to the drive you want.
4. Press **ENTER** to complete your selection.

Closing a Dialog Box

When you choose a command button, the dialog box closes and the command is carried out. You can also close the dialog box to cancel a command.

► To close a dialog box without completing the command

- Choose the **Cancel** button.

Or double-click the **Control-menu** box.

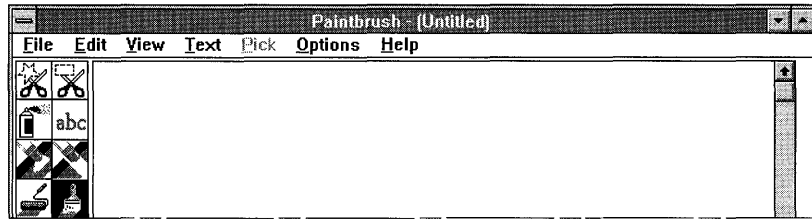
Or press **ESC**.

If a dialog box does not have a **Cancel** button, choose the **Close** command (or press **ALT+F4**) on the **Control** menu. If a dialog box does not have a **Cancel** button or **Control** menu, choose the appropriate button.

Using Windows Help

Windows online Help is a convenient, quick way to look up information about a task you are performing, a feature you would like to know more about, or a command you want to use.

Windows Help is available whenever you see a **Help** command button, or **Help** as an item on a menu bar.



The applications and accessories (except Clock) you received with Windows include online Help, as described in this section. Other Windows applications and non-Windows applications might also have online Help. For information, see the documentation for your application.

Tip You can keep Help readily available by resizing the Help window and moving it next to the running application. For information about sizing windows, see “Changing the Size of a Window” earlier in this chapter.

Starting Help

Because Help might be displayed differently, depending on which application you are using and what kind of information you need, you can request Windows Help in several ways. Not all methods can be used with every application.

► To request Help, use one of the following methods

- From the Help menu, choose a Help category.
- Press F1. Then choose a topic from the Help Contents for the application you are using, or search for a topic by using the Search button.
- Choose the Help command button that’s available in many dialog boxes. This method gives you quick access to specific information about the dialog box.
- Use the keyboard to select an item on a menu, and then press F1 to see a description of the item (available in certain applications).
- Select a dialog box option or command, and then press F1 or the Help button to move directly to an explanation of the option (available in Windows PIF Editor).

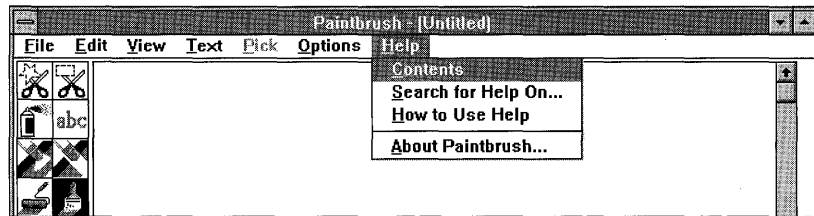
Using the Help Menu

The Help menu is generally the last menu on the menu bar, as shown in the following illustration. When you select Help from the menu bar, a list of Help menu items appears.

Mouse

► To get Help from a menu

1. Click the Help menu.



2. Click the menu item you want.

Keyboard

1. Press ALT, H.
2. Press the underlined letter for the menu item you want.

Or press the UP ARROW or DOWN ARROW key to move the selection cursor to the item you want, and then press ENTER.

If this is the first time you've used online Help, you might want to choose How To Use Help from the Help menu.

You can find the following standard items on most Help menus in Windows.

Menu item	Description
Contents	An alphabetic list of all Help topics available for the active application.
Search For Help On	A dialog box for locating information about a specific topic.
How To Use Help	Information about how to use Windows Help.
About (Application)	Information about the active application, such as copyright, version, and application name. Generally, also includes a user name and company name; the mode Windows is running in; and the amount of memory available on your computer.

Note The Help menu in Program Manager also contains an item named Windows Tutorial. Choose this item to start an online tutorial that teaches basic mouse and Windows techniques. To use the Windows Tutorial, you need a mouse and a VGA (or better) monitor. For information about how to use the Tutorial, see “Running the Microsoft Windows Tutorial” in Chapter 2, “Application Basics.”

Finding Information in Help

To view a list of all the Help topics related to the application you are working with, choose Contents from the Help menu, or press F1. To search for specific information, choose Search For Help On from the Help menu, or choose the Search button in the Help window.

Finding Information by Using Search

The Search feature is an efficient way to find the information you need. When you have a topic you want help with, you can select or type it in the Search dialog box so that Help can find the information for you.

► To search for a Help topic

1. From the Help menu in your application, choose Search For Help On.
Or press F1 to open Help, and then choose the Search button.
The Search dialog box appears.
2. Select the word or phrase you want to search for. If you start typing, the list box scrolls to those keywords that most closely match what you type.
3. Choose the Show Topics button.
A list of topics is displayed at the bottom of the dialog box.
4. Select the topic you want to view, and then choose the Go To button.
Information about the topic you selected appears on your screen.

Note You do not have to type an entire word in the Search For box. Help matches the characters you type as closely as possible with the available keywords.

Finding Information by Using Help Contents

If you are using an application that has a Help item on the menu bar, you can display all the available Help topics by choosing Contents from the Help menu. The Help topics refer to the application you are currently using.

You can also get to Help Contents by choosing the Contents button in the Help window. In most cases, you can display Help Contents by pressing F1 while using an application.

► **To display Help Contents and choose a topic**

1. From the Help menu, choose Contents.
Or press F1.
The Contents window appears.
2. Scroll to the topic you want information about.
3. Click the topic.
Or press TAB until you reach the topic you want, and then press ENTER.

Note There may be an additional list of related topics (under “See Also”) in the Contents window. When you select a related topic, information about that topic appears.

Getting Help for a Dialog Box

Many dialog boxes contain a Help button. If you press this button (or press F1 while using the dialog box), a window appears that lists each area of the dialog box.






► **To request Help on a dialog box**

1. While using the dialog box, choose the Help button or press F1.
The window describing the dialog box appears. If the dialog box contains only a few areas, procedural information for the whole dialog box is included. More complex dialog boxes have a list of areas to select from.
2. Select the area you want information about.
A pop-up window displaying procedural information appears. (If the window has no Control menu, you can close it by pressing any key or clicking anywhere on your screen.)



Tip It may be helpful to resize and arrange the Help window so that it does not overlap the dialog box. For more information, see “Working with a Window” earlier in this chapter. In some cases, resizing the Help window affects the size of pop-up windows as well. If you cannot read all the information in a pop-up window, enlarge the Help window.

Additional Methods

When you finish reading about a topic, you have several choices. If a list of related topics follows the information, you can choose from the list. Or you can choose one of the buttons along the top of the Help window.

Use this button	To
	View the Help Contents for your application.
	Locate information about a topic (keyword or phrase) you select from a list or that you type in the Search For box.
	Return to previously viewed information. When you choose the Back button, you retrace your path through the Help topics you've already viewed.
	View a complete, sequential list of every Help topic you have viewed during the current Windows session.
	View an alphabetic listing of terms used in Windows online Help.

The following buttons may appear in Help for some applications.

Use this button	To
	View the previous topic in a series of related topics. When you reach the first topic in the series, the button is dimmed.
	View the next topic in a series of related topics. When you reach the last topic in the series, the button is dimmed.

Displaying Glossary Definitions

In Help, glossary terms have a dotted underline. If you select a glossary term, a definition of that term appears.

► To display a glossary definition

Mouse

- Click the term.
A definition appears.

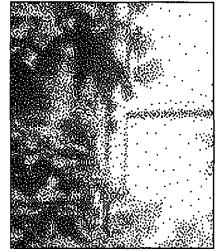
To remove the definition from your screen, click anywhere.

Keyboard

1. Press TAB to move to the term.
2. Press ENTER.
A definition appears.

To remove the definition from your screen, press ESC.

Application Basics



Chapter 2

Working with Applications

A major advantage of the Microsoft Windows operating system is that it can run two or more applications at the same time. For example, you can have a spreadsheet calculating complex formulas while you are using a word-processing application to prepare an annual report. And at the same time, your computer can be receiving the latest information about industry sales trends for you to use in the introduction of your report.

Using Windows, you can:

- Quickly start the applications you use every day.
- Organize your applications into groups that make sense to you.
- Run more than one application at the same time and easily switch between them.
- Cut and paste information between applications by using the Clipboard.

Types of Applications

Various types of applications run with the Windows operating system. Some are specifically designed to run with Windows, whereas others are designed to run with MS-DOS rather than Windows. This section describes the following four types of applications:

- Windows applications—designed for Windows versions 3.0 and later
- Older Windows applications—designed for versions earlier than 3.0
- Non-Windows applications—designed for MS-DOS (most will run with Windows)
- Memory-resident programs

Windows Applications

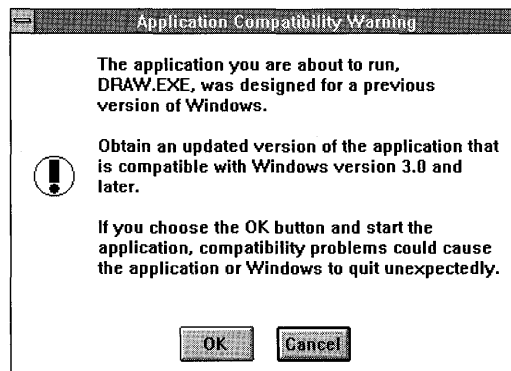
Windows applications require Windows version 3.0 or later in order to run. They are designed to take advantage of Windows features. Windows applications use memory cooperatively, which means that Windows distributes your computer's memory among applications as efficiently as possible. Windows applications generally are highly graphical, and their menus, commands, and dialog boxes are visually the same as those in Windows.

Several Windows applications are included with Windows—applications in the Main group (such as File Manager and Control Panel) and Accessories-group applications (such as Write, Paintbrush, and Notepad).

Older Windows Applications

Some Windows applications were designed for previous versions of Windows and do not work correctly with Windows version 3.0 and later. If you have an older Windows application, it is best to obtain an updated version of it.

If your application was designed to be used with versions of Windows earlier than 3.0, a dialog box similar to the following appears.



If you choose the OK button, the application starts running even though it is not compatible with this version of Windows.

Caution Though running, these applications may not perform reliably.

Non-Windows Applications

A *non-Windows application* is designed to run with the MS-DOS operating system but not specifically with Windows. It does not take advantage of the Windows graphical interface and may not have menus or dialog boxes, or make use of the

mouse. However, you can still use most non-Windows applications with Windows. For more information, see Chapter 7, “Non-Windows Applications.”

Memory-Resident Programs

A *memory-resident program* is a type of non-Windows application; however, it runs differently than other applications do. When started from MS-DOS, it is loaded into memory and is available even when another application is running. A common type of memory-resident program is a *pop-up program*, which is loaded into memory but is not visible until you type a certain key combination. Memory-resident programs are sometimes referred to as *terminate-and-stay-resident programs*, or *TSRs*.

For information about using memory-resident programs with Windows, see Chapter 7, “Non-Windows Applications.”

Starting an Application

With Windows, you can start an application in a number of ways:

- Choose an application icon from a group in Program Manager.
- Choose a program file or a program information file (PIF) from a directory window in File Manager. (For information about starting an application from its PIF, see Chapter 8, “PIF Editor.”)
- Choose the Run command from the File menu in Program Manager or File Manager.
- Use the MS-DOS command prompt (for non-Windows applications only).

Remember that when using a mouse, you click to choose menu commands and command buttons. When choosing icons, you double-click.

You can also set up an application to start when Windows starts. For more information, see “Starting an Application When You Start Windows” in Chapter 3, “Program Manager.”

Starting an Application from Program Manager

If an application is in a group, the easiest way to start it is to choose its icon from the group window. If a document is associated with the application, it is loaded into the application workspace. For information about organizing applications into groups and setting up a document so that it starts with an application, see Chapter 3, “Program Manager.”

► **To start an application from a group**

Mouse

1. Open the Program Manager window, if it is not already open.
2. If the group window that contains the application you want to start is not already open, open it by double-clicking the group icon.
3. Double-click the icon for the application.

Keyboard

1. Open the Program Manager window.
2. Open the group window that contains the application you want to start by pressing CTRL+TAB to move to the group, and then pressing ENTER.
3. Use the arrow keys to move the selection cursor to the icon representing the application, or type the first letter of the application's name (for example, "N" for Notepad).
4. From the File menu, choose Open.
Or press ENTER.

Tip You can choose the Minimize On Use command from the Options menu in Program Manager if you want to reduce Program Manager to an icon whenever you start an application.

Starting an Application from File Manager

You can start an application from File Manager by choosing the application's program file from a directory window. A program file has a .COM, .EXE, .PIF, or .BAT filename extension. If you start an application that can run in a window, the window appears in front of the File Manager window. If the application is a full-screen application, such as MS-DOS Prompt, it replaces the File Manager window.

Tip If you use an application frequently, you might find it more convenient to add it to a group in Program Manager than to start it from File Manager. For information about how to add an application to a group, see Chapter 3, "Program Manager."

► **To start an application from File Manager**

Mouse

1. In the Main group, double-click the File Manager icon.
2. Click the drive icon for the drive you want.
3. Click the directory icon for the directory you want.
4. Double-click the filename.

Keyboard

1. In the Main group, use the arrow keys to move the selection cursor to the File Manager icon, and then press ENTER.
2. Press CTRL plus the drive letter to move to the drive.
3. Press the UP ARROW or DOWN ARROW key to open the directory you want.
4. Press TAB to move the selection cursor to the right half of the directory window.
5. Press the UP ARROW or DOWN ARROW key to select the filename.
6. From the File menu, choose Open.
Or press ENTER.

You can use the Minimize On Use command on the Options menu in File Manager if you want File Manager reduced to an icon whenever you start an application.

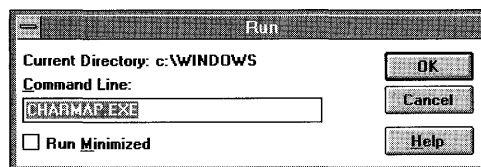
Tip With File Manager, you can quickly print files and perform various other file operations by using a mouse to drag a file's icon onto an application window or icon. For example, to print a data file, you can drag the file's icon from File Manager to the Print Manager window (or onto Print Manager running as an icon), and then release the mouse button. For more information, see "Dragging Icons to Perform Tasks" later in this chapter.

Starting an Application by Using the Run Command

You can use the Run command to start an application that you run only occasionally or have not yet added to a group. You can also specify that a particular document open when you start the application.

► To start an application by using the Run command

1. From the File menu in Program Manager or File Manager, choose Run.
The Run dialog box appears.



2. Type the path and name of the program file, including the extension, if there is one. (In File Manager, you don't need to type the path if the program file is in

3. the current directory. In Program Manager, you can choose the Browse button to display a list of program files to select from.)

For example, if you want to start Aldus PageMaker and it is in the directory C:\PAGEMKR, you would type the following in the Command Line box:

c:\pagemkr\pm.exe

In most cases, you can open a document at the same time you start an application by typing a space and the document filename (including the path where the document is located) after the name of the program file.

For example, to open a document named NEWSLTR.PM3 in the AUGUST subdirectory of C:\PAGEMKR, you would type the following in the Command Line box:

c:\pagemkr\pm.exe c:\pagemkr\august\nwsltr.pm3

4. If you want the application to be reduced to an icon as soon as it starts, select the Run Minimized check box.
5. Choose the OK button.
Or press ENTER.

Starting an Application by Using the MS-DOS Command Prompt

Generally, you can set up your non-Windows applications to run from Program Manager. (For more information, see Chapter 7, "Non-Windows Applications.") For non-Windows applications that aren't set up, you can start them by using File Manager or by using MS-DOS commands.

MS-DOS Prompt appears as a program item in the Main group in Program Manager. You can use it to access the MS-DOS command prompt without leaving Windows.

► To start MS-DOS Prompt

1. In Program Manager, choose the Main group icon.
2. In the Main group, choose the MS-DOS Prompt icon.

Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.

When the MS-DOS command prompt appears, you can type the necessary MS-DOS commands to start your non-Windows application.

► To quit MS-DOS Prompt

1. At the MS-DOS command prompt, type the following:
exit
2. Press ENTER.

You can also leave MS-DOS running and switch back to Windows to work with applications. For more information, see “Switching Between Applications” later in this chapter.

Caution Some MS-DOS commands do not work properly when Windows is running. For example, when you use the **chkdsk** command with the **/f** option, **chkdsk** tries to modify part of the operating system that cannot be modified while Windows is running. Other operations you should avoid running from Windows include the **undelete** command and disk-compaction or optimization programs, such as the Norton SD.EXE program. If you need to run such operations, quit Windows first.

Running Two or More Applications

With Windows, you can start an application and then keep it running while you start one or more additional applications.

When applications run at the same time, they share your computer’s resources. The way they share resources depends on the type of computer you have, the type and amount of available memory, whether the applications are Windows or non-Windows, and which mode Windows is running in.

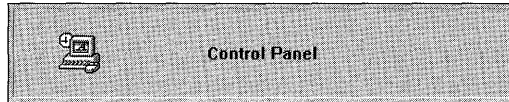
Note When Windows is running in 386 enhanced mode rather than in standard mode, more applications can run simultaneously. To find out which mode Windows is running in, choose the About command from the Help menu in any of the applications in the Main or Accessories group (except Windows Setup).

Switching Between Applications

When you have more than one application window open at once, the window you are currently working with is the *active window*. The active window always appears in the foreground, so it might overlap or completely obscure other windows. To work with another application, you must select its window to make it active.

► **To switch to an application, use one of the following methods**

- If the application is visible, click anywhere in the application's window. If the application is running as an icon, choose the icon.
- To return to the application you last used, press ALT+TAB.
- To switch quickly to another application, press and hold down ALT, and then press TAB repeatedly. As you continue to press TAB, you see the title of each open application.



When the title of the application you want appears in the center of your screen, release ALT. The application appears in the foreground.

- Press ALT+ESC repeatedly to cycle through open application windows and application icons until you reach the application you want.
- Display Task List, and use it to switch to the application you want. (You can display and use Task List in several ways. For more information, see “Arranging Application Windows and Icons,” later in this chapter.)

Note If you use an application frequently, you may want to create a shortcut key to use when switching to it. You can define a shortcut key in the Program Item Properties dialog box in Program Manager. For more information, see Chapter 3, “Program Manager.”

Using Task List to Switch Between Applications

Task List is a window that displays a list of all the applications you are currently running. You can use Task List to switch to another application.

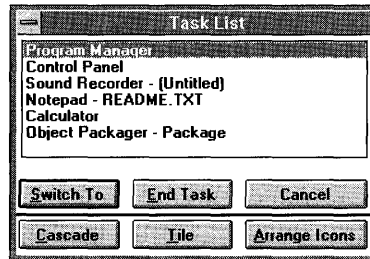
► **To switch to an application by using Task List**

Mouse

1. Double-click anywhere on the desktop (that is, not inside an open window) to display Task List.

Or choose Switch To from the Control menu in Program Manager.

- In Task List, double-click the name of the application you want to switch to.
Or select the name of the application you want, and then choose the Switch To button.



Keyboard

- Press CTRL+ESC to display Task List.
Or choose Switch To from any Control menu.
- Press the UP ARROW or DOWN ARROW key to move the selection cursor to the application you want.
Or type the first letter of the application name.
- Press ENTER.

Note You can close Task List at any time by pressing ESC or by choosing the Cancel button.

Arranging Application Windows and Icons

You can use the Cascade and Tile buttons in Task List to rearrange application windows so that all running applications are visible on your desktop. The Cascade command causes the windows to overlap so that each title bar is visible. The Tile command arranges the open windows in smaller sizes to fit next to each other on the desktop.

► To arrange application windows on your desktop

- Double-click anywhere on the desktop to open Task List.
Or press CTRL+ESC.
- Choose the Cascade or Tile button.

If you have a number of applications running as icons and they are scattered across your desktop, follow the next procedure to rearrange them evenly.

► **To rearrange application icons**

1. Double-click anywhere on the desktop to open Task List.

Or press CTRL+ESC.

2. Choose the Arrange Icons button.

The icons are arranged along the lower edge of the desktop.

Tip You can also open Task List by choosing Switch To from an application's Control menu.

Dragging Icons to Perform Tasks

When using File Manager, Program Manager, Print Manager, and certain other Windows applications, you can perform some essential tasks by dragging File Manager file icons from one place to another with the mouse. This is known as “dragging and dropping.”

For example, you can print a file on your default printer by dragging a File Manager file icon onto the Print Manager icon (the minimized Print Manager window) and then releasing the mouse button. Or you can set up an application to run with Windows by dragging a File Manager file icon onto a group window or icon in Program Manager.

For more information about using File Manager, see Chapter 4, “File Manager.” For more information about using Program Manager, see Chapter 3, “Program Manager.”

Note Dragging File Manager icons can only be done by using a mouse. There is no keyboard equivalent.

► **To drag and drop an icon**

1. In the Main group, double-click the File Manager icon to start File Manager.

2. Open the directory containing the file you want to drag.

3. Make sure the application where you want to drag the icon is running either as a window or an icon.

4. Arrange the windows on your screen so that both the File Manager file you want to drag and the application window or icon you want to move the file onto are visible.

Tip Display Task List, then choose the Tile button.

5. Select the file you want.
6. Press and hold down the left mouse button, drag the file onto the application window or icon, and then release the mouse button.

You can perform the following tasks by dragging File Manager file icons.

To	Drag the icon onto
Print a file on your default printer	The minimized Print Manager window (Print Manager running as an icon)
Create a Program Manager group item	A Program Manager group window or icon
Move or copy a file to a File Manager directory	A File Manager directory window or directory icon
Move or copy a file to a different drive	A File Manager drive icon
Open a file in an application	The application's icon or title bar

Note The ability to print and open files by dragging and dropping icons depends on the application. Some applications may not support these processes.

Transferring Information Between Applications by Using the Clipboard

The Clipboard provides temporary storage for information you want to transfer. You can cut or copy information from an application onto the Clipboard and then transfer that information from the Clipboard into other applications. You can also use the Clipboard to share information between files in a powerful new way called object linking and embedding. For more information, see Chapter 13, “Integrating Your Windows Applications.”

Information you cut or copy onto the Clipboard remains there until you clear the Clipboard, cut or copy another piece of information onto it, or quit Windows. Because the information remains on the Clipboard, you can paste the information into a file as often as you like.

Cutting or Copying Information onto the Clipboard

The method you use to transfer information onto the Clipboard depends on whether you are using a Windows or non-Windows application and whether it is running in a window or a full screen. For information about cutting or copying information onto the Clipboard from a non-Windows application, see Chapter 7, “Non-Windows Applications.”

If you are using a Windows application, you can cut or copy selected information onto the Clipboard. You can also copy an image of the entire desktop or of a single window for any application running in a window.

► **To cut or copy information onto the Clipboard**

1. Select the information you want to cut or copy. (For information about selecting text in Windows, see “Selecting Text” later in this chapter.)

You can cut or copy text, graphics, or a combination of text and graphics.

2. From the application's Edit menu, choose Cut or Copy.

Use the Cut command to remove information from a file and place it onto the Clipboard.

Use the Copy command to place a copy of the information onto the Clipboard, leaving the information in its original location as well.

Copying an Entire Screen You can copy the contents of an entire screen onto the Clipboard from applications that support this feature.

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► **To copy the contents of an entire screen onto the Clipboard**

1. Make sure the information you want to copy is on the screen.
2. Press PRINT SCREEN.

A “snapshot” (bitmap) of the screen is placed onto the Clipboard.

Tip If this procedure doesn't work, press ALT+PRINT SCREEN or SHIFT+PRINT SCREEN. Some keyboards might not recognize PRINT SCREEN alone.

Copying an Entire Window To use the following procedure, the application you want to copy information from must be running in the active window.

► **To copy the contents of the active window onto the Clipboard**

1. Make sure the information you want to copy is in the active window.
2. Press ALT+PRINT SCREEN.

A “snapshot” (bitmap) of the active window is placed onto the Clipboard. Not all applications can read bitmaps (.BMP files). Make sure the application you want to paste the information into accepts the bitmap format.

Tip If this procedure doesn't work, press SHIFT+PRINT SCREEN. Some keyboards might not recognize ALT+PRINT SCREEN.

Pasting Information from the Clipboard

You can paste information from the Clipboard into an application at any time. Make sure the application you want to paste the information into accepts the bitmap format if you copied an entire screen or window onto the Clipboard.

Information you cut or copy onto the Clipboard remains there until you change it, clear it, or quit Windows. The method you use to paste information depends on whether you are pasting into a Windows or a non-Windows application. For information about pasting information into a non-Windows application, see Chapter 7, “Non-Windows Applications.”

► **To paste information into a Windows application**

1. Make sure the information you want to paste is on the Clipboard. (For information about viewing the Clipboard’s contents, see the following section.)
2. Start the application.
3. Place the insertion point at the place you want the information from the Clipboard to appear.
4. From the application’s Edit menu, choose Paste.

Using Clipboard Viewer

By using Clipboard Viewer, you can view, save, retrieve, and delete the contents of the Clipboard.

► **To view the contents of the Clipboard**

1. Switch to Program Manager.
2. Open the Main group.
3. Choose the Clipboard Viewer icon.

Note Sometimes Windows changes the line length of the information you copy or cut so that all of it is included in the Clipboard Viewer window. When you paste the information from the Clipboard into the destination application, however, the information is intact.

The Clipboard accepts a number of text and graphics formats. When you transfer information from one application to another, the original application places the information onto the Clipboard in formats the Clipboard recognizes. The application you paste the information into then selects the format that is most compatible (the application’s default format).

You can view the information on the Clipboard in any of the formats that were supplied by the original application.

► **To view another format**

- From the Display menu, choose a different format.

► **To return to the first format that was displayed**

- From the Display menu, choose Auto.

You can save the contents of the Clipboard in a file. You can later retrieve the file and paste its contents into an application. You can view the file you save by using Clipboard Viewer.

► **To save the contents of the Clipboard to a file**

1. Switch to Program Manager.
2. Open the Main group.
3. Choose the Clipboard Viewer icon.
4. From the File menu, choose Save As.
The Save As dialog box appears.
5. Type a filename for the contents of the Clipboard. The default extension for a Clipboard file is .CLP.

You can also type a path if you want to store the Clipboard file in a different directory.

6. Choose the OK button.

You can open a Clipboard file and then paste it into any application. Only files with a .CLP extension can be opened in Clipboard Viewer.

► **To retrieve a Clipboard file**

1. Switch to Program Manager.
2. Open the Main group.
3. Choose the Clipboard Viewer icon.
4. From the File menu, choose Open.
The Open dialog box appears.
5. Select the .CLP file you want to retrieve. (For information about using the Open dialog box, see Chapter 1, "Windows Basics.")
6. Choose the OK button.

Note If the Clipboard already contains information, you are prompted to clear it. If you choose the OK button, the current contents of the Clipboard are replaced by the contents of the file you specified.

If you need more memory to run an application, you can clear the Clipboard. Since the Clipboard stores information in multiple formats, clearing it might free some memory.

► **To clear the Clipboard**

1. Switch to Program Manager.
2. Open the Main group.
3. Choose the Clipboard Viewer icon.
4. From the Edit menu, choose Delete.
Or press DEL.
5. Choose the OK button.

Receiving a Message from an Inactive Application

When an inactive application issues a status or error message, the application's title bar or icon flashes, and you may hear a beep.

► **To receive a status or error message**

- Select the application window or icon.

The message appears as soon as you select the window or icon.

Quitting an Application

There are various ways to quit an application.

► **To quit a Windows application**

- From the application's File menu, choose Exit.
Or choose Close from the Control menu.
Or press ALT+F4.
Or double-click the Control-menu box.

If you are working on a document and you haven't yet saved your changes, you are prompted to save them.

► **To quit a non-Windows application**

- Choose the application's exit or quit command.

Or, if you are using MS-DOS Prompt, type **exit** at the command prompt.

The application closes, and you return to Windows.

Note When you quit a non-Windows application that is running in a full screen, you usually return to the Windows desktop just as you left it. However, you can change a setting in the application's program information file (PIF) so that you return to what's called an *inactive window*.

The inactive window captures information from the application that was displayed as you quit the application. Sometimes that type of information stays on the screen too briefly to be read, making the inactive window a convenient feature. For information about creating and modifying a PIF, see Chapter 8, "PIF Editor."

Working with Documents

This section explains some basic tasks, such as opening, editing, and saving files, that are common to many Windows applications. For information about organizing your applications and documents, see Chapter 3, "Program Manager," and Chapter 4, "File Manager."

Note The procedures in this section apply to the applications supplied with Windows. Other applications might work differently.

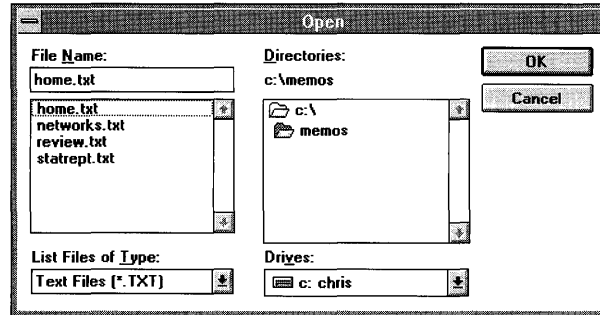
Opening Files

Choosing the Open command from an application's File menu opens a dialog box that is often the same regardless of which application you are using. This dialog box is designed to save you time because you can select the drive, directory, file, and file type from the ones displayed in the list boxes.

► **To open a file**

1. From the application's File menu, choose Open.

The Open dialog box appears.



2. If the file you want to open is on a different drive, select the drive you want from the Drives box.
3. In the Directories box, choose the directory you want to open. (Double-click the directory, or press the UP ARROW or DOWN ARROW key to select the directory, and then press ENTER.)

Windows displays the names of all files in that directory that are the type selected in the List Files Of Type box. To display a different type of file, select the type you want from the List Files Of Type box.

4. From the list of files, select the file you want to open.

Some applications provide a check box to specify that the file be *read-only* (which means changes cannot be made to the file). If you want the file to be read-only, select this check box.

5. Double-click the filename.

Or choose the OK button.

Saving Files

In many applications, the File menu contains two commands for saving files: Save and Save As. You use the Save command to save changes to an existing file. You use the Save As command to name and save a new file or to save an existing file under a new name. For example, you might want to make changes to a file, yet keep a copy of the file as it existed before you began working on it. By using the Save As command, you can save another copy of the original file by giving it a different name.

► **To save an existing file**

- From the application's File menu, choose Save.

► **To save a new file or an existing file under a new name**

1. From the application's File menu, choose Save As.
The Save As dialog box appears.
2. If you want to save the file on a different drive, select the drive you want from the Drives box.
3. In the Directories box, choose the directory in which you want to save the file. (Double-click the directory, or press the UP ARROW or DOWN ARROW key to select the directory, and then press ENTER.)
4. In the File Name box, type a name for the file.
If you don't specify a filename extension, the application may add one. For example, Windows Notepad adds the extension .TXT to a filename.
The default extension is shown in the Save File As Type box. To use a different extension, select the extension from the Save File As Type list, or type an extension.
5. Choose the OK button.

Switching Between Documents

With some applications, you can open more than one document at a time, each in its own window. If you have more than one document window open, you can easily switch between them.

► **To switch to another document window in an application**

- Click anywhere in the document window you want to switch to.
Or open the application's Window menu, and choose the document you want.

Tip Press CTRL+F6 or CTRL+TAB repeatedly until the document you want is selected. This is a shortcut for using the Next command on the Control menu.

Working with Text

With many applications, you type text from time to time. The procedures for typing text, correcting errors, and editing text are the same for most Windows applications.

Typing Text

When you start typing text, an insertion point (flashing vertical bar) marks the place where the text will appear.

► To type text in a new document

- Begin typing the text.

Press **ENTER** to move the insertion point to the next line. Press the **SPACEBAR** to move the insertion point one space to the right.

► To type text in an existing document

- Move the mouse pointer to where you want text to appear, click once, and then start typing.

Or use the arrow keys to move the insertion point to the place you want text to appear.

Note To create a blank line, and move the insertion point along that line, you need to use **ENTER** and the **SPACEBAR**. For example, to type a report title 10 lines from the top of a new page and 20 spaces from the left margin, you press **ENTER** 10 times and then press the **SPACEBAR** 20 times before you type the title.

Moving Within Text

You can easily move the insertion point wherever you want within text.

Press	To move to
DOWN ARROW	The next line
UP ARROW	The previous line
END	The end of the line
HOME	The beginning of the line
PAGE DOWN	The next screen
PAGE UP	The previous screen
CTRL+RIGHT ARROW	The next word
CTRL+LEFT ARROW	The previous word
CTRL+END	The end of the document
CTRL+HOME	The beginning of the document

Correcting Typing Mistakes

If you make a mistake while typing, you can correct it by using one of the methods in the following table. Or, if you need to change more than a few characters, you can select the text and edit it.

Do this	To
Press BACKSPACE	Delete the character (or selected text) to the left of the insertion point.
Press DEL	Delete the character (or selected text) to the right of the insertion point.
Type the characters	Insert characters at the insertion point.

Selecting Text

You can make changes to blocks of text by selecting (highlighting) the text you want to change, and then choosing one of the commands from the application's Edit menu.

► To select text

Mouse

1. Point to the first character you want to select.
2. Drag the insertion point to the last character you want to select.
3. Release the mouse button.

To cancel the selection, click again anywhere in the document.

Tip With some applications, you can select a single word by double-clicking it.

Keyboard

1. Use the arrow keys to move the insertion point to the first character you want to select.
2. Press and hold down SHIFT while you use the arrow keys to move the insertion point to the last character you want to select.
3. Release the keys.

To cancel the selection, press an arrow key.

Tip With some applications, you can select all the text in your file. From the Edit menu, choose Select All.

The following table shows other ways to select text by using the keyboard. Not all applications offer all options. In most cases, you can select an area of text by pressing and holding down **SHIFT** while you use the standard movement keystrokes. For information about valid key combinations, see the documentation about your application.

Press	To
SHIFT+DOWN ARROW	Extend the selection to the next line. Or, if the next line is already selected, use these keys to cancel the selection.
SHIFT+UP ARROW	Extend the selection to the previous line. Or, if the previous line is already selected, use these keys to cancel the selection.
SHIFT+END	Extend the selection to the end of the line.
SHIFT+HOME	Extend the selection to the beginning of the line.
SHIFT+PAGE DOWN	Extend the selection down one screen. Or, if the next screen is already selected, use these keys to cancel the selection.
SHIFT+PAGE UP	Extend the selection up one screen. Or, if the previous screen is already selected, use these keys to cancel the selection.
CTRL+SHIFT+RIGHT ARROW	Extend the selection to the next word. Or, if the next word is already selected, use these keys to cancel the selection.
CTRL+SHIFT+LEFT ARROW	Extend the selection to the previous word. Or, if the previous word is already selected, use these keys to cancel the selection.
CTRL+SHIFT+END	Extend the selection to the end of the document.
CTRL+SHIFT+HOME	Extend the selection to the beginning of the document.

Editing Selected Text

The following table describes ways you can edit text that has been selected. For more information, see “Transferring Information Between Applications by Using the Clipboard” earlier in this chapter.

Do this	To
Choose Cut from the Edit menu	Delete the selected text and place it onto the Clipboard.
Choose Copy from the Edit menu	Make a copy of the selected text and place it onto the Clipboard.
Type the new text	Replace the text with new text.
Press DEL or BACKSPACE	Delete the text. (It is not placed onto the Clipboard.)

Do this	To
Choose Undo from the Edit menu	Cancel the previous editing operation.
Place the insertion point where you want the text to appear, and choose Paste from the Edit menu	Paste text from the Clipboard into the active window.

Practicing Basic Skills

If you are new to Windows or you want to explore some of the newest features in Windows, you may want to play Solitaire or Minesweeper to practice some of the skills described in this chapter and in Chapter 1, “Windows Basics.” These games were copied to your hard disk when you set up Windows.

Both games provide a rich graphical environment that utilizes many of the most powerful features in Windows. Play while you learn to use online Help, open menus and select items, move and resize application windows, work with dialog boxes, and switch between applications.

You start Solitaire or Minesweeper just as you start any other application. For information, see “Starting an Application” earlier in this chapter.

Running the Microsoft Windows Tutorial

The Windows Tutorial is an interactive, online program that teaches you the basics of using a mouse and Windows. To use the Tutorial, you need a mouse and a VGA (or better) monitor.

► To run the Tutorial from Windows

Mouse

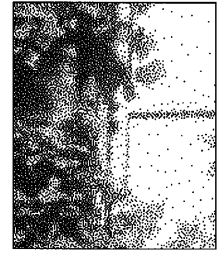
1. Switch to the Program Manager window.
2. Click the Help menu, and then click the Windows Tutorial command.

Keyboard

1. Switch to the Program Manager window: Press and hold down ALT, and then press TAB repeatedly until “Program Manager” appears in the small window in the middle of your screen. Then release both keys.
2. Press ALT, H to display the Help menu.
3. Press W.

Or press the DOWN ARROW key to select Windows Tutorial, and then press ENTER.

Program Manager



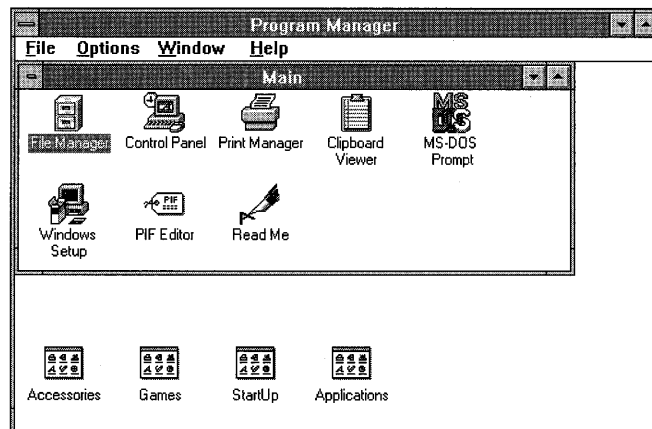
Chapter 3

What Is Program Manager?

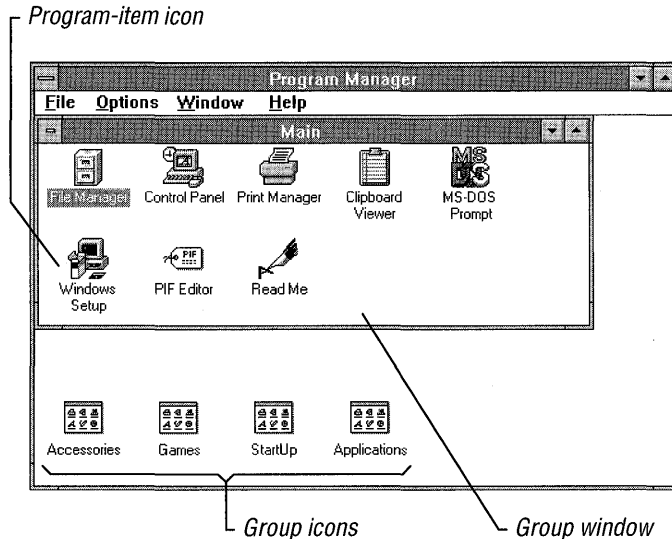
Windows Program Manager is an application that is central to the Microsoft Windows operating system. It starts whenever you start Windows and continues to run as long as you are working with Windows. You can use Program Manager to start other applications and organize applications and files into groups that make sense to you.

Starting an application from Program Manager is easy: You choose the icon for the application you want to use, and Program Manager does the rest. When you run other applications, Program Manager runs either in the background, or as an icon on your desktop.

The first time you start Windows, Program Manager opens on your desktop with the *Main group window* open inside the Program Manager window.



The StartUp group, the Applications group, the Accessories group, and the Games group are represented as *group icons* along the lower edge of the Program Manager window. (If you chose the Custom Setup option and chose not to have Windows set up applications from your hard disk, the Applications group icon does not appear.) All of these groups contain icons that represent applications, or *program-item icons*.



The following elements are part of the Program Manager window:

- A *group window* is a separate window inside the Program Manager window. It contains icons that start applications, or *program-item icons*. There can be more than one group window, each with its own Control menu but no menu bar. Group windows are affected by commands from the Program Manager menu bar. These windows cannot be moved outside the Program Manager workspace.
- A *group icon* is a minimized group window. Group icons are located along the lower edge of the Program Manager window and all look alike. However, there is a unique label below each icon so that it can be distinguished from the others. Like group windows, they cannot be moved outside the Program Manager workspace.
- *Program-item icons* appear inside a group window and represent the applications, accessories, and documents you can start from Windows. Choosing a program-item icon starts the application that icon represents. Program-item icons can be moved between groups but not outside them.

Most program-item icons have a unique appearance, making them easy to identify at a glance. However, some applications use identical program-item icons.

Also, when you create several program items for one application, the icons look the same.

For example, suppose you want a group to include several documents to be loaded whenever you start a particular application. You can add a program item for each document. The resulting group contains several program-item icons that look like the original icon for the application, but their labels distinguish them. For more information, see “Creating a Program Item” later in this chapter.

Working with Groups

A group contains program items, which are icons that represent an application, an accessory, or a document. Choosing a program-item icon from a group can start an application or accessory, or start an application and open a related document at the same time. When adding a program item to a group, you can specify how you want the application to start.

Windows has several predefined groups, each containing program-item icons, as described here:

- The *Main group* contains the Windows system applications: File Manager, Control Panel, Print Manager, Clipboard Viewer, MS-DOS Prompt, Windows Setup, and PIF Editor (a tool for editing program information files). This group also contains an item named Read Me, which contains information you should know before you start working with Windows.

Note If you upgraded from Windows version 3.0, PIF Editor remains in the Accessories group.

- The *Applications group* contains applications found on your hard disk during Setup. (If you chose the Custom Setup option and chose not to have Windows set up applications from your hard disk, your Program Manager window will not contain an Applications group.)
- The *Accessories group* includes Windows applications for word processing, drawing, and communications, plus several other useful applications, such as a clock and a calculator.
- The *Games group* offers games you can use to practice the basic skills you learn as you operate Windows, or to give yourself a relaxing break from work.
- The *StartUp group* contains applications that start when you start Windows. You can add any applications you want to this group. This group is empty until you add applications to it.

You start an application from a group by opening the group window and choosing the program-item icon for the application you want to run.

Program Manager also provides a way to organize groups visually. You can control how the groups of applications are arranged on your desktop.

If you remove any of the predefined groups, you can recreate them by running the Setup program from Program Manager.

Opening Group Windows and Reducing Them to Icons

To start an application from a group, you must first open the group window that contains the program-item icon for that application. Once you have started the application, you can then reduce the group window to an icon to make room on your desktop.

► To open a group window

- Double-click the group icon.

Or press CTRL+F6 or CTRL+TAB until the group icon you want is selected. (You can also select the group name from the list at the bottom of the Window menu.) Then press ENTER.

► To reduce a group window to an icon

- Click the Minimize button.

Or press ALT, HYPHEN (-) to open the Control menu for the group, and then choose Minimize.

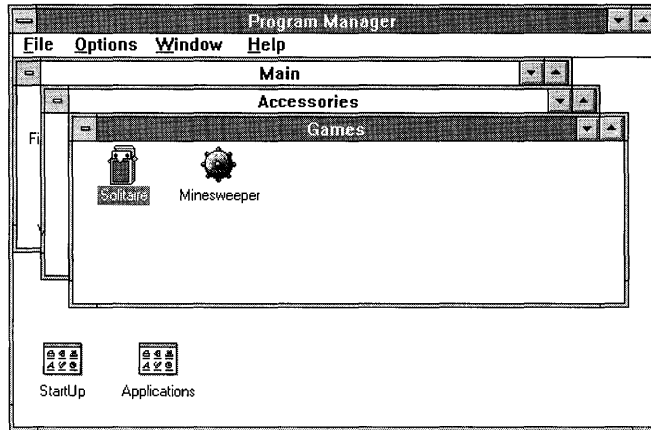
Or double-click the Control-menu box for the group.

Or choose Close from the Control menu for the group.

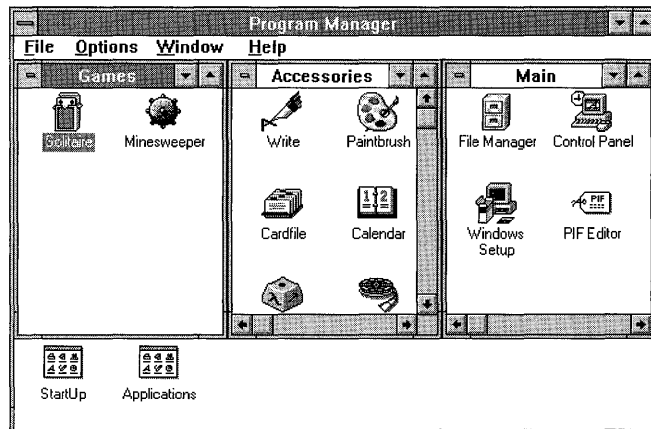
Rearranging Group Windows

When you open several group windows at a time, some windows are hidden beneath others. You can use the Cascade and Tile commands on the Window menu to rearrange all the group windows so that some part of each window is visible.

The Cascade command resizes and layers the open group windows within the Program Manager workspace so that each title bar is visible, as shown in the following illustration.



The Tile command resizes and arranges the open group windows side by side in the Program Manager workspace. Not all the program-item icons may be visible in the allotted space for each group. The following illustration shows tiled windows.



If you open another group window after you use the Cascade or Tile command, it overlaps the rearranged windows. To include it among the rearranged windows, choose the Cascade or Tile command again.

- ▶ **To rearrange all the open group windows**
 - From the Window menu, choose Cascade or Tile.
 - Or press **SHIFT+F5** for Cascade or **SHIFT+F4** for Tile.

Arranging Group Icons

You can move any group icon within the Program Manager workspace by dragging it with the mouse or by using the Move command on the Control menu for the group.

You can also move program-item icons between group windows or onto group icons. For information about copying and moving program-item icons, see “Working with Program Items” later in this chapter.

► To rearrange group icons

1. Select any group icon.
2. From the Window menu, choose Arrange Icons to distribute the group icons evenly along the lower edge of the Program Manager window.

Using the mouse, you can drag individual icons to a new location. Using the keyboard, press ALT, HYPHEN (-) to open the Control menu for the group icon. Choose the Move command and use the arrow keys to move the icon to the location you want, and then press ENTER.

► To rearrange program-item icons

1. Select the group window that contains the program-item icons you want to rearrange.
2. From the Window menu, choose Arrange Icons to distribute the program-item icons evenly within the selected group window.

Or, using the mouse, drag the individual icons to a new location.

You can also have Windows automatically rearrange program-item icons whenever you change the window size, add new items, or move items from place to place.

► To have Windows automatically rearrange icons

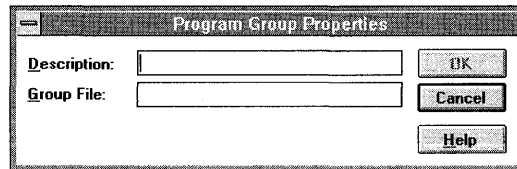
- From the Options menu, choose Auto Arrange. A check mark beside the command means it is in effect.

Creating and Deleting Groups

You can add any number of groups to Program Manager to organize your applications and documents in a way that makes sense to you. If you no longer need a group, you can delete it and free some space on your desktop.

► **To create a new group**

1. From the File menu, choose New.
The New Program Object dialog box appears.
2. Select the Program Group option, and then choose the OK button.
The Program Group Properties dialog box appears.



3. In the Description box, type a description for the group you want to create. This description will appear in the title bar of the group window and below the group icon.
4. Choose the OK button.
Because Program Manager creates a .GRP file for the new group, you can leave the Group File box blank.

After creating a group, you can add program items to it. For more information, see “Creating a Program Item” later in this chapter.

► **To delete a group**

1. Make sure the group you want to delete is reduced to an icon.
2. Click the icon for the group you want to delete.
Or press CTRL+F6 or CTRL+TAB repeatedly until you reach the group icon you want to delete.
3. From the File menu, choose Delete.
Or press DEL.
A dialog box appears, prompting you to confirm that you want to delete the group.
4. To remove the group, choose the Yes button.
Program Manager deletes the group you selected and any program-item icons in it. However, program and data files for the deleted program items are not removed from your hard disk.

You can also delete a group by first deleting all of the program items contained in it, and then deleting the group. When you use this method, the group doesn't have to be reduced to an icon before you delete it. Deleting program items is discussed later in this chapter.

Changing the Description of a Group

You can change the description of any group. The description is the label for the group icon and appears in the title bar of the group window.

► To change the description of a group

1. Make sure the group whose description you want to change is reduced to an icon.
 2. Click the icon for the group whose description you want to change.
Or press CTRL+F6 or CTRL+TAB repeatedly until you reach the group icon.
 3. From the File menu, choose Properties.
The Program Group Properties dialog box appears.
 4. In the Description box, type a new description, and then choose the OK button.

Note It is possible to make a group a *read-only* group. When a group is read-only, you cannot make changes to it. For example, you cannot change its description or properties, and you cannot delete or add icons. You can make a group read-only by switching to File Manager, selecting the group's file (a file with a .GRP extension, usually located in your Windows directory), and then choosing Properties from the File menu.

Working with Program Items

As described earlier, a program item represents an application, accessory, or document in a Windows group. By choosing the icon for a program item, you start the application or accessory, or open the document. You can create new program items, copy or move program items from one group to another, or delete program items.

Creating a Program Item

When you create a program item for an application, you specify the program item's properties. Properties include such things as a description for the item, a working directory where any files the application creates are stored, and the icon that Windows uses to represent the application. After you create a program item, you can go back and change any of its properties.

Note The Working Directory, Shortcut Key, and Run Minimized properties are new to Windows version 3.1. If you create program items with these properties and then use the applications with an earlier version of Windows, these properties will be lost.

You can create a program item by using any of the following methods:

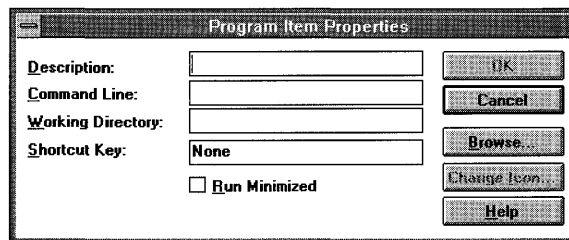
- Choose the New command from the File menu in Program Manager.
- Drag files from File Manager.
- Use Windows Setup.

Note You cannot include more than 40 program items per group.

► **To create a program item for an application by using Program Manager**

1. Open the group that you want to add an item to.
2. From the File menu in Program Manager, choose New.
The New Program Object dialog box appears.
3. Select the Program Item option, and then choose the OK button.
The Program Item Properties dialog box appears.

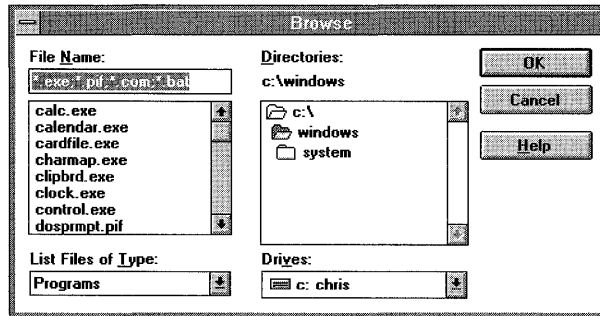
Tip When creating a program item, you can quickly open the Program Item Properties dialog box by pressing and holding down ALT while double-clicking in a blank area of the group window.



4. In the Description box, type a description that uniquely identifies the application. The description becomes the label that appears under the icon in the group window.
The description is optional. If you leave this box blank, Program Manager labels the icon for you. However, a description of your own can be very useful, especially if you set up multiple program items for the same application.
5. In the Command Line box, type the name of the program file, including the path (if there is one) and extension.

For example, to add Microsoft Excel, located in a directory named C:\EXCEL, type `c:\excel\excel.exe` in the Command Line box.

If you don't know the name of the program file, choose the Browse button to display a list of files and directories. Select the appropriate filename from the list. Then choose the OK button to place that filename in the Command Line box. (You can use the directory listing to change to a different directory, if necessary.)



6. In the Working Directory box, type the name of the directory where the program files for this application are located and where new files will be placed. The directory you specify here becomes the current directory while the application is running.
7. To reserve a shortcut key for use with the application, type the key combination in the Shortcut Key box. You use a shortcut key to switch to the application when it is running.

Valid shortcut-key sequences are *CTRL+ALT+character*, *CTRL+SHIFT+character*, *CTRL+SHIFT+ALT+character*, and *CTRL+ALT+SHIFT+character*. *Character* can be any letter, number, or special character. When you simply type a character in the Shortcut Key box, Program Manager adds CTRL+ALT in front of it. To specify a different control-key sequence, you must type the sequence.

Note You can reserve shortcut keys for a non-Windows application by using Program Manager or PIF Editor. Shortcut-key settings made in Program Manager override settings made in PIF Editor.

8. If you want this application to run as an icon when it starts, select the Run Minimized check box. When this box is selected, the application is reduced to an icon when it starts.

You may want to use this option for applications you have added to the StartUp group. If you use this method, the application starts and is reduced to an icon whenever you start Windows.

9. Choose the Change Icon button to see the default icon for this program item. You can scroll through other available icons by clicking the scroll arrows or by using the LEFT ARROW and RIGHT ARROW keys. To change the icon, select the icon you want to use and then choose the OK button.

For more information about changing an icon for a program item, see “Changing an Icon” later in this chapter.

10. Choose the OK button. The dialog box closes, and the new program item appears in the group.

You can also create a program item for a document. When you choose the program item, Windows starts the specified application and opens the specified document.

► **To create a program item for a document by using Program Manager**

1. Follow the same first five steps as you would to create a program item for an application by using Program Manager.
2. After the program’s filename in the Command Line box, press the SPACEBAR, and type the filename of the document. Include the path required to locate the document.

For example, to specify a spreadsheet named 92BUDGET.XLS, located in the C:\ADMIN\FY92 directory, as the document to be opened when you start Microsoft Excel, you would type the following:

```
c:\excel\excel.exe c:\admin\fy92\92budget.xls
```

Note If the document is in the same directory as the application, you do not have to repeat the path when you type the filename for the document. If you have specified a working directory that is different from the application directory, you must still specify a path with the document filename.

3. Complete the dialog box, and then choose the OK button.

You can also use File Manager to create program-item icons in Program Manager groups. You can move applications and associated documents from File Manager directories to Program Manager group windows or group icons.

The following procedure requires a mouse and has no keyboard equivalent.

► **To create a program item by using File Manager**

1. Arrange your desktop so that you can see both File Manager and the group where you want to place the new program item. The destination group can be either a window or an icon.
2. Open the File Manager window, and, if necessary, position and resize it.

Tip If no other application windows are open, press CTRL+ESC to open Task List, and then choose the Tile button to arrange the File Manager and Program Manager windows.

3. Locate and select the program or document file in File Manager that you want to add. (You can also select multiple items and add them all to a group at the same time.)
4. Drag the file icon from File Manager to Program Manager, and drop it in the group window or on the group icon. As you drag the file icon, the mouse pointer turns into a replica of a file icon. If you have more than one file or document selected, you see a multiple-file icon.

By using Windows Setup, you can create a program item for an application that is already on your hard disk. When you use this method, the program item is added to the Applications group. (If you do not have an Applications group, you must first create one. For more information, see “Creating and Deleting Groups” earlier in this chapter.)

► **To create a program item for an application by using Windows Setup**

1. In the Main group, choose the Windows Setup icon.
The Windows Setup dialog box appears.
2. From the Options menu in the dialog box, choose Set Up Applications.
The Set Up Applications dialog box appears.
3. If you want Windows Setup to search the hard disk for applications, select the Search For Applications option. To specify a particular application, select the Ask You To Specify An Application option.
4. If you selected the Search For Applications option, another dialog box appears. From the Setup Will Search list, select the drive or path you want Setup to search.

5. Choose the Search Now button.
Windows Setup searches for applications and lists the ones it recognizes in the Applications Found On Hard Disk(s) box.
6. Select as many applications as you want to add from the Applications Found On Hard Disk(s) box.
Click to select each application. (To clear the selection, click the application again.)
Or use the arrow keys to move to the next application you want, and press the SPACEBAR to select it. (To clear the selection, press the SPACEBAR again.)
7. After you select all the applications you want, choose the Add button to move them from the box on the left to the box on the right.
If you change your mind about setting up an application after you add it, select it again, and choose the Remove button to return it to the box on the left.
8. Choose the OK button.

For each application you selected, Windows Setup adds a program-item icon to the Applications group.

Deleting a Program Item from a Group

Using Program Manager, you can easily delete a program item from a group. When you delete a program-item icon from a group, the application is not removed from your disk.

► To delete a program item from a group

1. Open the group window that contains the item you want to delete.
2. Select the program-item icon for the item.
3. From the File menu, choose Delete.
A confirmation message appears.
4. Choose the Yes button.

Copying Program Items from One Group to Another

The easiest way to copy a program item from one group to another is to use the mouse to drag the program-item icon onto the other group icon or into the other group window. If you don't have a mouse, you can use the Copy command on the File menu.

► **To copy a program item to another group**

Mouse

1. If you're not concerned with where the new program-item icon is placed in the group window, open the group window containing the program-item icon you want to copy, and leave the destination group reduced to an icon.

If you want to place the new program-item icon in a particular location in a group window, open the group windows for both the source and the destination.

2. Press and hold down CTRL while you drag the program-item icon from its current location to the destination group's icon or window.

The mouse pointer becomes a replica of the program-item icon you are copying.

3. When the copied icon is on top of the destination group's icon or inside the destination group's window, release the mouse button and the CTRL key.

Tip You can create a duplicate program item within a group by pressing CTRL while dragging the icon to another place in the window.

Keyboard

1. Open the group window that contains the program item you want to copy.
2. Use the arrow keys to select the program-item icon.
3. From the File menu, choose Copy.
4. In the To Group box, select the name of the group you want to copy the program item to.
5. Choose the OK button.

Moving a Program Item to Another Group

Moving a program item is easiest if you have a mouse. You can simply drag the program-item icon onto the other group icon or into a group window. If you don't have a mouse, you can use the Move command on the File menu.

► **To move a program item to another group**

Mouse

1. Open the group window that contains the program item you want to move.
2. Drag the program-item icon to the destination group's icon or window.

The mouse pointer becomes a replica of the program-item icon you are moving.

3. When the program-item icon is on top of the destination group's icon or inside the destination group's window, release the mouse button.

Keyboard

1. Open the group window that contains the program item you want to move.
2. Use the arrow keys to select the program-item icon.
3. From the File menu, choose Move.
4. In the To Group box, select the name of the group you want to move the program item to.
5. Choose the OK button.

Changing an Icon

When you add a program item to a group, Program Manager selects an icon for that item. You can change an icon in Program Manager by using the following methods:

- If more than one icon is available for a program item, you can select a different icon by choosing Properties from the File menu and then choosing Change Icon in the Program Item Properties dialog box. You can scroll through the available icons by clicking the scroll arrows or by pressing the LEFT ARROW or RIGHT ARROW key.
- You can use one of the many icons provided with Program Manager. First, select the program-item icon that you want to change. Choose Properties from the File menu, and then choose Change Icon in the Program Item Properties dialog box. In the File Name box, type the path for the PROGMAN.EXE file. You can now select any of the Program Manager icons to use with the selected program item. (If there are no icons available for the program item you selected, Windows displays the Change Icon dialog box with PROGMAN.EXE already specified.)
- You can use one of the many icons designed especially for non-Windows applications. These are located in the MORICONS.DLL file. First, select the program-item icon that you want to change. Choose Properties from the File menu, and then choose Change Icon in the Program Item Properties dialog box. In the File Name box, type the path for the MORICONS.DLL file (this file is in your Windows directory). You can now select from these icons by scrolling through the Current Icon area.
- You can adjust the spacing between icons by choosing the Desktop icon from Control Panel and then typing a number in the Icon Spacing box. For more information, see Chapter 5, “Control Panel.”

Starting an Application from Program Manager

By using Program Manager, you can easily find and start an application. You can also start an application from File Manager. For more information, see “Starting an Application from File Manager” in Chapter 4, “File Manager.”

Starting an Application from a Group

If an application is represented by a program-item icon in a group, the easiest way to start the application is to choose the program-item icon from the group window. If you included a document with the program item, it appears in the application workspace. For more information, see “Creating a Program Item” earlier in this chapter.

► **To start an application from a group**

1. Open the group window that contains the program-item icon for the application.
2. Double-click the icon.

Or use the arrow keys to select the icon, and then press ENTER.

When you start an application, Program Manager changes the current directory to the directory you specified in the Working Directory box when you added the program item to the group. If you are using a non-Windows application, you can specify a working directory in either Program Manager or PIF Editor. Settings made in Program Manager override PIF Editor settings. For information about the working directory setting in Program Manager, see “Creating a Program Item” earlier in this chapter. For information about PIF Editor, see Chapter 8, “PIF Editor.”

You can use the following procedure to have an application run as an icon when you start the application.

► **To run an application as an icon**

1. Open the group window that contains the program-item icon for the application.
2. Press and hold down SHIFT while double-clicking the icon.

Or use the arrow keys to select the icon, and then press SHIFT+ENTER.

You can have Windows reduce Program Manager to an icon whenever you start an application. This is useful because the icon remains visible on the lower edge of the desktop when most applications are running, making it easy to find when you want to switch to Program Manager.

► **To reduce Program Manager to an icon whenever you run an application**

- From the Options menu, choose Minimize On Use.

A check mark (✓) appears beside the command when it is in effect. To cancel the command, choose it again.

Starting an Application When You Start Windows

When you install Windows by using the Setup program, Windows creates a StartUp group. When you set up a program item for an application in the StartUp group, Windows starts the application each time you start Windows.

For example, if you want Windows to start File Manager whenever you start Windows, move the File Manager icon from the Main group to the StartUp group. Program items in the StartUp group run in the order their icons appear in the window (starting with the top row, and moving left to right).

You can also have Windows automatically reduce an application in the StartUp group to an icon. You do this by selecting the Run Minimized check box when you are creating the program item, or by using the Properties command on the File menu.

Returning to Program Manager from an Application

When you are working with an application or document and you want to start a different application, you can do so by returning to Program Manager or by using File Manager. For information about using File Manager, see “Starting an Application from File Manager” in Chapter 4, “File Manager.”

► **To return to Program Manager, use one of the following methods**

Mouse

- Click the Program Manager window, or double-click the Program Manager icon.

If the Program Manager window is not visible, press ALT+ESC repeatedly until you reach it.

- Double-click anywhere on the Windows desktop to display Task List, and then choose Program Manager from list of running applications.

Keyboard

- Press CTRL+ESC to display Task List, and then choose Program Manager from the list of running applications. For more information about using Task List to switch between applications, see Chapter 2, “Application Basics.”
- Press and hold down ALT, and then press TAB repeatedly. As you continue to press TAB, you see the title of each open application. When Program Manager appears in the center of your screen, release ALT. The Program Manager window appears in the foreground.
- If Program Manager appears as an icon, you can press ALT, SPACEBAR to open the Control menu. Then press ENTER to restore Program Manager to a window. Or first select the icon, and then press ENTER.

Quitting Program Manager

Even when you run applications, Program Manager remains running in the background. You must return to Program Manager before you end your Windows session. You cannot quit Program Manager without also quitting Windows.

Before you quit Windows, you can choose to save any changes you made to the layout of Program Manager during your Windows session. If you do, Windows starts your next session with the Program Manager windows and icons arranged as they were at the end of the previous session.

If you want to save the arrangement of Program Manager group windows and icons, you need to specify this before you quit Program Manager. You can save settings at any time, without quitting Program Manager.

► To save settings without quitting Program Manager

- Press and hold down SHIFT, and then choose Exit Windows from the File menu.

► To save settings when you quit Program Manager

- From the Options menu, choose Save Settings On Exit.

A check mark appears next to the command. The next time you start Windows, the Program Manager workspace appears as it did when you last used it.

► **To quit Program Manager (and Windows)**

1. Quit all applications that are running.
2. From the File menu, choose Exit Windows.

A confirmation dialog box appears, prompting you to confirm that you want to end your Windows session.

3. Choose the OK button.

Or from the Control menu, choose Close.

Or double-click the Control-menu box.



File Manager



Chapter 4

What Is File Manager?

Windows File Manager is a powerful tool that can help you organize your files and directories. You can use File Manager to view all your files and directories and then build a directory structure that makes sense to you.

You can use File Manager to move and copy files, start applications, connect to networks, print documents, and maintain disks. You can also associate a file with an application so that you can easily start the application and open the file at the same time.

When you use File Manager, you work with *directory windows*. A directory window graphically displays the directory structure of your disk and the files and directories on the disk.

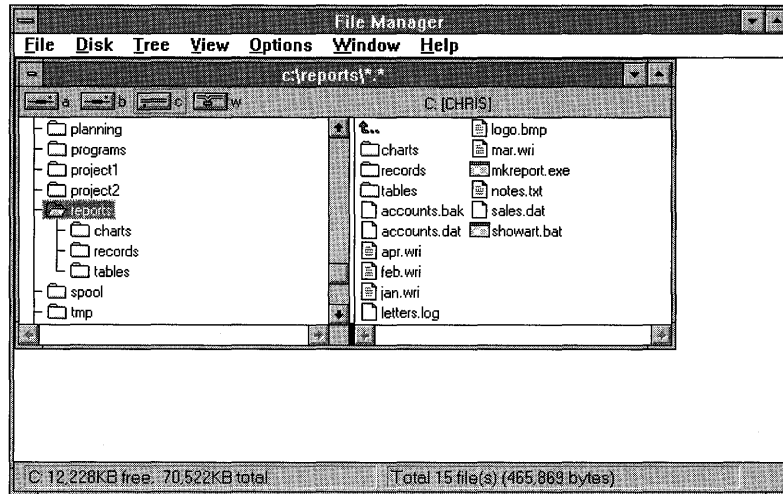
► To start File Manager

- In the Main group, choose the File Manager icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the File Manager icon, and then press ENTER.)

Note If you find that you run applications from File Manager most of the time, you can change the **shell** setting in your Windows system initialization file to read **shell=winfile.exe**. Then File Manager, instead of Program Manager, appears whenever you start the Microsoft Windows operating system. For information about changing the system initialization file, start Write (in the Accessories group), and open the SYSINI.WRI file.

Working with a Directory Window

When you first start File Manager, a directory window appears, displaying the contents of the current drive. This directory window is split: The left half displays the *directory tree*, and the right half lists the contents of the current directory.



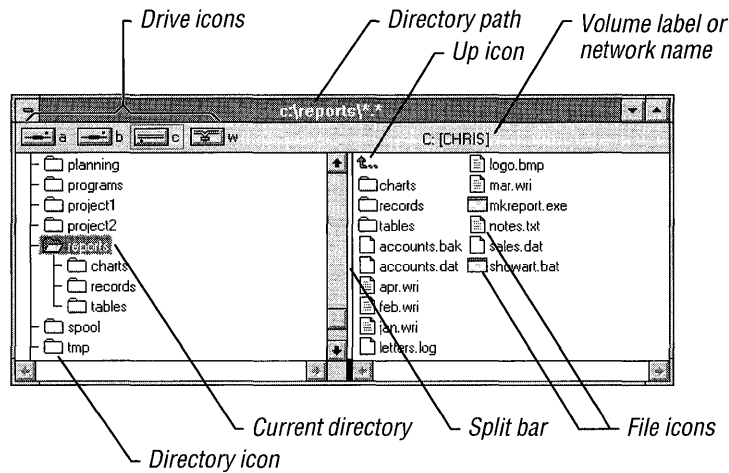
The directory tree shows the structure of the directories on a disk. The directory structure begins at the upper left with the *root directory*, the first directory on a disk. Other directories branch below the root directory. (The directory tree takes its name from this branching structure.)

The root directory is created when you format a disk. It is represented by a backslash (\). For example, C:\ is the root directory for drive C.

The contents list in the right half of the directory window shows the names of files and directories within the current directory. Directories within a directory are known as *subdirectories*.

Note The split window is the default view for a directory window. For information about displaying only the directory tree or only the contents of the current directory, see “Changing Views” later in this chapter.

The parts of a directory window are shown in the following illustration.



The following table describes the elements in a directory window.

Element	Description
Directory path	The location of the current directory; it appears in the title bar of a directory window.
Drive icons	Icons that represent the drives on your computer. A drive letter follows each icon. Different icons are used to represent the hard and floppy disk drives on your computer, network drives you are connected to, RAM drives you may have set up in your computer's memory, and CD-ROM drives.
Volume label	The name that identifies your disk; it appears in brackets ([]) to the right of the drive icons. You see this information only if you have assigned a label to your disk.
Network name	The name assigned to your network-drive connection. If a network drive is selected, the network name is displayed instead of the volume label.
Directory icon	An icon that represents a directory on your disk. In the directory tree, directory icons are connected by a vertical line to the directory level above them. In the contents list, directory icons represent directories in the current directory.
Current directory	The directory you are currently using; represented by an icon that looks like an open directory folder in the directory tree. File Manager commands affect the current directory or files within it.
File icons	Icons that are next to filenames; they indicate file type. There are icons to represent program files, document files, and other types of files. For more information, see "Working with Files and Directories" later in this chapter.

Element	Description
Up icon	The icon (shaped like an arrow) that takes you up one level in the directory tree. For more information, see “Changing Directories” later in this chapter.
Split bar	The bar that divides the window so that you can view both the directory tree and the contents list. For information about moving this bar to the left or right, see “Moving the Split Bar” later in this chapter.

You can resize and move a directory window in the File Manager workspace. You can enlarge it to fill the entire workspace, or you can reduce it to an icon. For more information about working with windows, see Chapter 1, “Windows Basics.”

Selecting Files or Directories

Before you can work with a file or a directory, you must select it. You can select a single file or directory, or several. Selecting more than one item is called *extending a selection*. When a file or directory is selected, its name and icon are highlighted in the directory window.

Selecting a Single File or Directory

In the contents list, you can select a single file or directory and then use File Manager commands to work with it.

► To select a file or directory

Mouse

- In the contents list, click the filename or directory name you want to select.

Keyboard

1. Press TAB to move the selection cursor to the contents list.
2. Use the following keys to select files and directories.

Press	To select
UP ARROW or DOWN ARROW	A file or directory above or below the current selection.
END	The last file or directory in the list.
HOME	The first file or directory in the list.
PAGE UP	The file or directory at the top of the previous screen.
PAGE DOWN	The file or directory at the bottom of the next screen.
A letter or number	The next file or directory that begins with that letter or number.

Extending a Selection

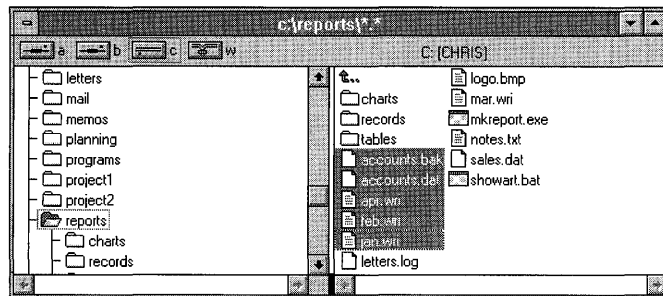
In the contents list, you can select more than one file or directory at a time in order to perform a task with several files at once. For example, you may want to select several files and move them to another directory. You can select a group of files or directories that appear in consecutive order, or you can select items that are not in sequence.

You can use the mouse or keyboard to select a group of files or directories visible in the contents list, or you can use the Select Files command to select any group of files.

► To select two or more items in sequence

Mouse

1. Click the first file or directory you want to select.
2. Press and hold down **SHIFT** while you click the last item in the group.



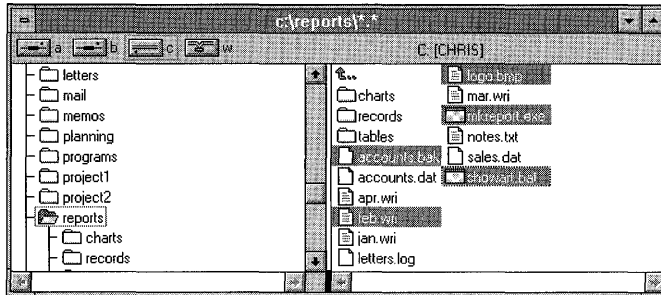
Keyboard

1. Press **TAB** to move the selection cursor to the contents list, and then use the arrow keys to move to the first item you want to select.
2. Press and hold down **SHIFT** while you use the arrow keys to select the remaining items in the group.

► **To select two or more items out of sequence**

Mouse

- Press and hold down CTRL while you click each item.



Keyboard

1. Press TAB to move the selection cursor to the contents list, and then use the arrow keys to move to the first item you want to select.
2. Press and release SHIFT+F8.
The selection cursor begins to blink.
3. Use the arrow keys to move to each remaining item you want to select.
4. Press the SPACEBAR to select each item.
5. Press SHIFT+F8 again when you finish extending the selection.

► **To select more than one group of items**

Mouse

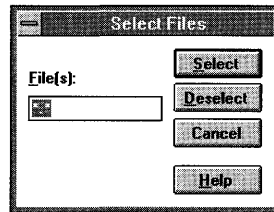
1. To select the first group of sequential items, click the first item and then press and hold down SHIFT while you click the last item in the group.
2. To select the next group of items, press and hold down CTRL while you click the first item. Then press and hold down CTRL+SHIFT while you click the last item in the group.

Keyboard

1. Press **TAB** to move the selection cursor to the contents list.
2. To select the first group of sequential items, press and hold down **SHIFT** while you use the arrow keys to move from the first to the last item in the group.
3. Press and release **SHIFT+F8**.
The selection cursor begins to blink.
4. Use the arrow keys to move to the first item in the next group of items.
5. Press the **SPACEBAR** to select the first item.
6. Press **SHIFT+** an arrow key to select the remaining items in the group.
7. Press **SHIFT+F8** again when you finish extending the selection.

► To select a group of items by using the Select Files command

1. From the File menu, choose Select Files.
The Select Files dialog box appears.



2. In the Files box, type the name of the file you want to select. Use wildcards to specify a group of files. For example, to select all files with a .TXT extension, type ***.txt**. Or, to select all files in a directory, leave the default ***.*** in the Files box.
3. Choose the Select button.
The Cancel button changes to the Close button.
4. Repeat steps 2 and 3 until you have selected all the files you want.
You can choose the Deselect button at any time to cancel a selection. The Deselect button cancels the selected files that you specify in the Files box.
5. Choose the Close button.

Tip You can select all files in a directory by pressing **CTRL+SLASH (/)**.

Canceling a Selection

To cancel a selection, you can use mouse or keyboard techniques, or the Select Files command. You can cancel one selected file or a group of selected files.

► To cancel a selection

Mouse

- Press and hold down CTRL while you click the item.

Keyboard

1. If you have not already done so, press and release SHIFT+F8.
The selection cursor begins to blink.
2. Use the arrow keys to move to the selection you want to cancel.
3. Press the SPACEBAR.
4. Press SHIFT+F8.

► To cancel a group of selected files

1. From the File menu, choose Select Files.
The Select Files dialog box appears.
2. In the Files box, type the name of one of the selected files you want to cancel.
You can use wildcards to specify a group of files or all files that are selected in a directory.
3. Choose the Deselect button.
4. Repeat steps 2 and 3 until you finish canceling selections.
5. Choose the Close button.

Tip You can cancel all selections by pressing CTRL+BACKSLASH (\).

Changing Views

When you first start File Manager, the directory window displays both the directory tree for the current drive and the contents of the current directory. By using commands on the View menu, you can choose to display only the directory tree or only the contents of the current directory.

- ▶ **To display only the directory tree**
 - From the View menu, choose Tree Only.
The active directory window displays the directory tree for the current drive.
- ▶ **To display only the directory contents**
 - From the View menu, choose Directory Only.
The active directory window displays the filenames and directories in the current directory.
- ▶ **To display both the directory tree and the directory contents**
 - From the View menu, choose Tree And Directory.
The active directory window displays the directory tree for the current drive and the filenames and directories in the current directory.

Changing Drives

A directory window shows the directory structure of the current drive. The icon for the current drive is surrounded by a rectangle.

You can change drives by selecting another drive icon in the directory window or by using the Select Drive command on the Disk menu. When you change to a different drive, the names of the files and directories on that drive are displayed in the directory window.

- ▶ **To select another drive in a directory window**

Mouse

- Click the drive icon representing the drive you want to use.

Keyboard

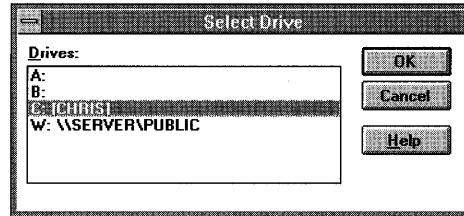
1. Press TAB or F6 to move to the drive icons.
If you want to move back to the directory tree or contents area without changing drives, press TAB or F6 again.
2. Use the arrow keys to select the drive icon you want, and then press the SPACEBAR.

Tip You can change drives by pressing and holding down CTRL while typing the letter of the drive you want to select.

► **To change drives by using the Select Drive command**

1. From the Disk menu, choose Select Drive.

Or double-click the background of the area where the drive icons are located.
The Select Drive dialog box appears.



2. Select the drive you want to change to.
3. Choose the OK button.

Note When you change drives, File Manager searches the drive to display its contents. You can press ESC at any time to stop the search. If you stop the search, only a partial directory tree is displayed, as indicated by the status bar at the bottom of the File Manager window.

Changing Directories

In the directory tree, the current directory is marked by the *selection cursor*, a dotted rectangle around the highlighted icon and text. You can select only one directory at a time in the directory tree. To change to a different directory, you move the selection cursor.

► **To change to another directory in the directory tree**

Mouse

- Click the directory name you want to change to.

Keyboard

- Use the following keys to change to a different directory.

Press	To change to
UP ARROW or DOWN ARROW	A directory above or below the current directory.
HOME or BACKSLASH (\)	The root directory.
END	The last directory in the list.

Press	To change to
RIGHT ARROW	The first subdirectory of the current directory, if one exists and is displayed in the directory tree.
LEFT ARROW or BACKSPACE	The next directory level up from the current directory, if one exists.
PAGE UP	The directory one screen up from the current directory.
PAGE DOWN	The directory one screen down from the current directory.
CTRL+UP ARROW	The previous directory at the same level, if one exists.
CTRL+DOWN ARROW	The next directory at the same level, if one exists.
A character key	The next directory that begins with the specified letter or number.

In the contents list, you can move up or down one level in the directory structure. You can go up one level by using the Up icon, and you can change to a subdirectory (go down one level) by using the directory icons in the list.

► **To change directories by using the contents list**

Mouse

- Double-click the directory icon next to the name of the subdirectory you want to change to.
Or double-click the Up icon if you want to move up one level.

Keyboard

- Use the arrow keys to select the appropriate directory icon or the Up icon, and then press ENTER.
Or press BACKSPACE to go up one level.

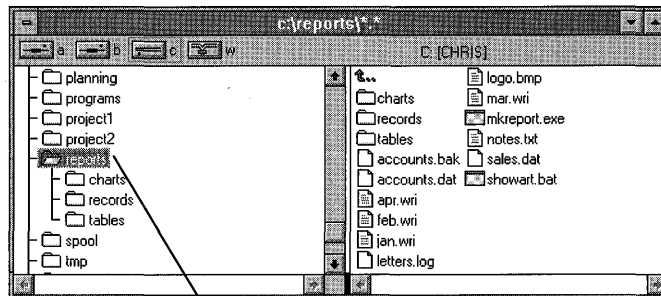
Expanding and Collapsing Directory Levels

You can control the level of directory information shown in a directory window. When you first start File Manager, the directory tree shows the first level of directories on the current drive. You can use the commands on the Tree menu to expand and collapse the directory information shown.

Expanding Directory Levels

When you *expand* a directory, the names of the subdirectories in that directory are displayed in the directory tree. You can expand an entire branch, a single level of the branch, or all branches.

The following illustration shows a directory tree with the REPORTS directory expanded.



Expanded directory

► **To expand one level of a directory**

- In the directory tree, choose the directory icon or the name of the directory you want to expand by double-clicking it or by selecting it and pressing ENTER.
Or select the directory, and then choose Expand One Level from the Tree menu.

► **To expand an entire branch**

1. In the directory tree, select the directory you want to expand.
2. From the Tree menu, choose Expand Branch.
Or press the ASTERISK (*) key.

► **To expand all branches in the directory tree**

- From the Tree menu, choose Expand All.
Or press CTRL+ASTERISK (*).

Collapsing Directory Levels

You can *collapse* a directory so that subdirectories are not listed in the directory tree. All directories, except the root directory, are collapsed when you first start File Manager.

► **To collapse a directory**

Mouse

- In the directory tree, double-click the directory icon or the name of the directory you want to collapse.

Keyboard

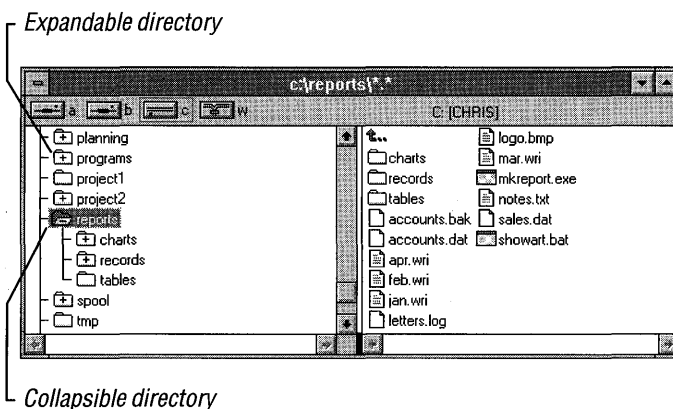
1. In the directory tree, use the arrow keys to select the name of the directory you want to collapse.
2. From the Tree menu, choose Collapse Branch.

Or press the HYPHEN (-) key.

Displaying Expandable Directories

If you want to know which directories have subdirectories, you can use the Indicate Expandable Branches command on the Tree menu. When you use this command, a plus sign (+) marks each directory that has subdirectories. The plus sign means you can expand the directory to display its subdirectories in the directory tree. After you expand a directory, the plus sign changes to a minus sign (-), indicating that the directory is expanded and can be collapsed.

The following illustration shows a directory tree with the expandable directories marked.



► To mark expandable directories in the directory tree

- From the Tree menu, choose Indicate Expandable Branches.

File Manager displays the directory tree, marking each expandable directory with a plus sign. A check mark appears next to the command in the Tree menu.

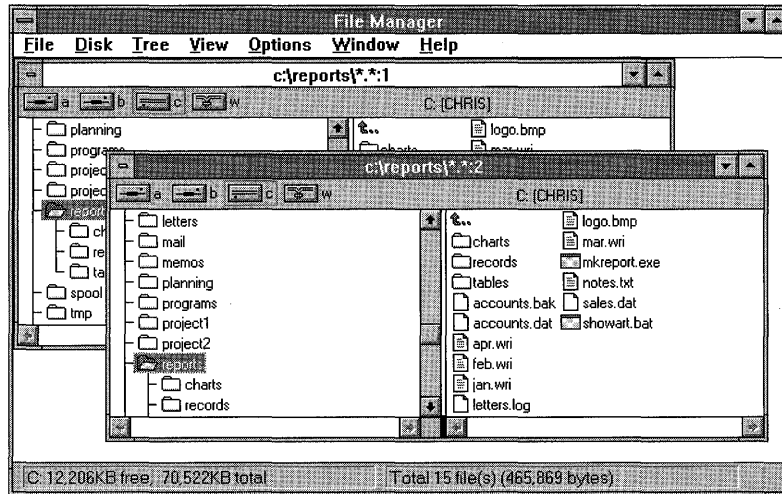
To turn off this feature, choose Indicate Expandable Branches again.

Note If you choose the Indicate Expandable Branches command, File Manager may take longer to create the directory tree.

Opening More Than One Directory Window

You can open additional directory windows that display the contents of the same drive or a different drive. It's useful to have more than one directory window displayed if you want to copy or move files from one drive to another.

The following illustration shows File Manager with two directory windows open.



You can open a new directory window by choosing a drive icon in the directory window, by using the New Window command on the Window menu, or by choosing a directory icon in the directory tree.

If you have two or more windows displaying the same drive and directory information, a number appears in the title bar of each window, indicating there is more than one window displaying that directory.

Note The new directory window has the same display options as the one you opened it from. For example, if you are working with a directory window that shows only the directory tree, and you open a new directory window, the new window displays only the directory tree.

► **To open a new directory window by using a drive icon**

Mouse

- Double-click a drive icon.

A new directory window appears, displaying the names of the files and directories on the drive you selected.

Keyboard

1. Press **TAB** to move to the drive icons.
2. Use the arrow keys to select the drive icon you want, and then press **ENTER** or choose **Open** from the **File** menu.

A new directory window appears, displaying the names of the files and directories on the drive you selected.

► **To open a new directory window by using the New Window command**

- From the **Window** menu, choose **New Window**.

A new directory window appears, displaying the same directory information as the previous active window.

► **To open a new directory window by using the directory tree**

- Press and hold down **SHIFT** while you double-click a directory icon in the directory tree.

Or select a directory icon in the directory tree, and then press **SHIFT+ENTER**. For information about selecting directories, see “Changing Directories” earlier in this chapter.

The new directory window displays only the contents of the directory you selected; the directory tree is not displayed.

Selecting an Open Directory Window

Although many directory windows can be open at the same time, only one of them is *active*. A directory window must be active before you can work in that directory. To make an inactive window active, you select it. When the window is selected, the title bar changes color or intensity and the window moves in front of the other open windows.

► To select an open directory window

Mouse

- Click anywhere in the window.

Or choose a window name from the list at the bottom of the Window menu.

Keyboard

1. Press ALT, HYPHEN (-) to open the Control menu.
2. Type **t** to choose Next.
3. Repeat steps 1 and 2 until the window you want is selected.

Or select the name of the window you want from the list at the bottom of the Window menu. Then press ENTER to open the window.

To cycle quickly through the open directory windows, press CTRL+F6 (or CTRL+TAB) until the window you want is selected.

Tip If the window you want to select is hidden by another window, you can use the Cascade or Tile command (on the Window menu) to rearrange the open directory windows so that all of them are visible. You can also move or resize windows that cover the window you want. For more information, see “Arranging Directory Windows” later in this chapter.

Closing a Directory Window

When you finish working with a directory window, you may want to close the window to clear space on your screen and free some of your computer's memory. If you have only one directory window open, you cannot close it.

► **To close the active directory window**

Mouse

- Double-click the Control-menu box, located in the upper-left corner of the directory window.

Keyboard

1. Press ALT, HYPHEN (-) to open the Control menu.
2. From the Control menu, choose Close.

Changing the Information Displayed in a Directory Window

When you first start File Manager, the names of directories and files are listed alphabetically. You can change the order of the directories and files and also list details about them by using commands on the View and Options menus.

The changes you make by using commands on the View menu affect the active directory window and any new windows you open from that window. Other open windows are not affected.

Note To save the new settings, make sure the Save Settings On Exit command on the Options menu has a check mark next to it. For more information, see “Saving Your Settings” later in this chapter.

Displaying Different Types of File Information

You can use the commands on the View menu to indicate what kind of file information you want displayed in a directory window. File Manager can display the name, size, last modification date and time, and attributes of files.

When you first start File Manager, the Name command on the View menu has a check mark next to it, indicating it is in effect. This means that only the names of files and directories appear in a directory window.

► **To display only names of files and directories**

- From the View menu, choose Name.

Only the names of files and directories are displayed in the active directory window.

► **To display complete information about each file**

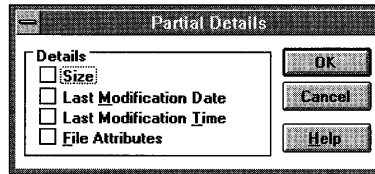
- From the View menu, choose All File Details.

The file size, last modification date and time, and file attributes are displayed next to each filename and directory name in the active directory window.

► **To display specific information about each file**

1. From the View menu, choose Partial Details.

The Partial Details dialog box appears.



2. Select the check boxes of options you want to display, and clear the check boxes of options you don't want to display. The table that follows describes each option.
3. Choose the OK button.

You can select the following options in the Partial Details dialog box.

Select	To
Size	Display the size (in bytes) of each file.
Last Modification Date	Display the date each file was last modified, according to the system clock.
Last Modification Time	Display the time of day each file was last modified, according to the system clock.
File Attributes	Indicate whether files are hidden, system, archive, or read-only. (For more information, see "Setting File Attributes" later in this chapter.)

Note The Name, All File Details, and Partial Details commands affect only the contents list in the active directory window. If the directory window is displaying only the directory tree, the window is not affected by these commands.

Sorting the Contents of a Directory

By default, the contents of a directory are listed alphabetically, with directories listed first, followed by filenames. You can sort the files and directories by name, type, size, or the date the file was last modified. The Sort commands do not affect the directory tree.

► To sort files and directories alphabetically

- From the View menu, choose Sort By Name.

In the active directory window, first directories are sorted alphabetically, then files.

► To sort files and directories by type

- From the View menu, choose Sort By Type.

Directories and then files are listed alphabetically by extension in the active directory window. For example, files ending with .COM appear before files ending with .EXE.

► To sort files by size

- From the View menu, choose Sort By Size.

In the active directory window, directories are listed first; then files are listed by size, with the largest files listed first.

► To sort files and directories by last modification date

- From the View menu, choose Sort By Date.

In the active directory window, directories are listed first, sorted by date. Then files are listed by date, with the most recently modified file listed first.

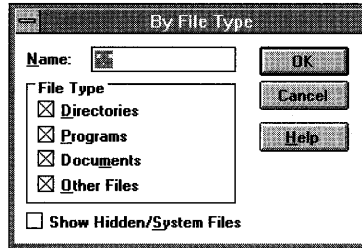
Choosing the Type of File to Display

When you first start File Manager, the contents list (the right side of the directory window) displays the names of all the files and directories in the current directory, except hidden and system files. (For information about hidden and system files, see “Setting File Attributes” later in this chapter.) You can specify whether File Manager displays only certain types of files, or groups of files with similar filenames or extensions.

► **To specify which types of files are displayed in a directory window**

1. From the View menu, choose By File Type.

The By File Type dialog box appears.



2. To display files with similar names, you can use wildcards in the Name box. For example, to display only those files with the extension .TXT, you can type *.txt. The default is *.* , meaning all files in the directory are listed. (For more information about using wildcards, see your MS-DOS documentation.)
3. Under File Type, select the types of files you want to display. The table that follows describes each option.
4. To display hidden and system files, select the Show Hidden/System Files check box.
5. Choose the OK button.

The active directory window displays the types of files you selected.

Under File Type in the By File Type dialog box, you can select the following options.

Select	To
Directories	Display the names of directories that are in the current directory.
Programs	Display all filenames that have an .EXE, .COM, .PIF, or .BAT extension.
Documents	Display the names of text or graphics files associated with an application. For information about associating files, see "Associating Files with an Application" later in this chapter.
Other Files	Display all filenames not included in the preceding three options.

Caution If you choose to display your hidden and system files, be careful not to rename or delete any of them. Your computer may not start or work properly without them.

Updating a Directory Window

In most cases, File Manager updates open directory windows automatically. For example, if you save a file by using Write, its filename shows up immediately in the appropriate directory window. Sometimes, however, File Manager cannot complete an automatic update, especially if you are using network directories or if you change floppy disks. In this case, use the Refresh command to update the active directory window.

► **To update a directory window**

- Click the drive icon for the current drive, or choose Refresh from the Window menu.

Customizing and Arranging Directory Windows

You can customize directory windows so that they are easy to find and use. You may want to arrange them so that you can see each one, or change fonts to make it easier to read the names of files and directories. You can also turn on or off the status bar displayed at the bottom of your File Manager window.

Moving the Split Bar

In the default view, the directory window has a bar that splits the window into two sections. The split bar is located to the right of the directory-tree scroll bar. You can move this bar so that you have more room for the contents list or the directory tree.

► **To move the split bar**

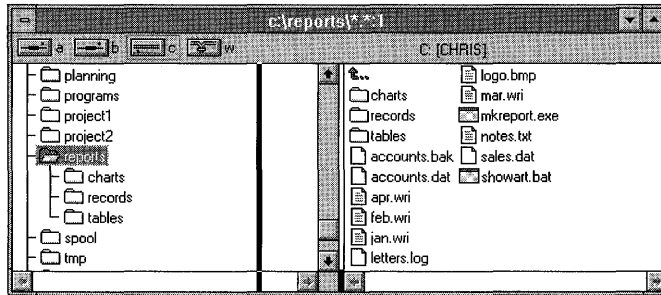
Mouse

1. Move the mouse pointer to the split bar.
The pointer turns into a double bar with two arrows.
2. Press and hold down the mouse button, and move the pointer left or right to position the split bar.
3. Release the mouse button.

Keyboard

1. From the View menu, choose Split.

A vertical bar appears.



2. Use the arrow keys to move the selection bar to where you want to place the split bar, and then press ENTER.

If you decide you do not want to move the split bar, press ESC to cancel the command.

Arranging Directory Windows

The Window menu includes the Cascade and Tile commands, which help you organize the way directory windows appear on your screen. These commands affect all open directory windows.

► To arrange open directory windows

- From the Window menu, choose Cascade.

Directory windows overlap, starting in the upper-left corner of the File Manager workspace. Each window's title remains visible, making it easy for you to select any of the directory windows.

- Or from the Window menu, choose Tile.

The windows are resized and arranged vertically (on top of each other) so that no windows overlap and each window's contents are visible.

- Or press and hold down SHIFT while choosing Tile from the Window menu.

The windows are resized and arranged horizontally (side-by-side) so that no windows overlap.

Arranging Icons

When you minimize a directory window, it becomes an icon. You can move these icons around in the File Manager workspace by dragging them with a mouse. If you have many of these icons in your File Manager window, you can arrange them so that they are evenly spaced and don't overlap. For information about minimizing a window, see Chapter 1, "Windows Basics."

File Manager uses an invisible grid to line up icons. For information about changing the size of this grid, see Chapter 5, "Control Panel."

► To arrange icons

- From the Window menu, choose Arrange Icons.

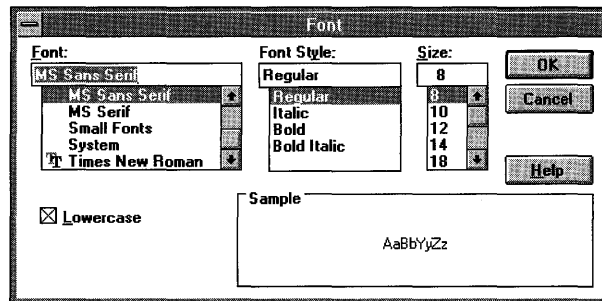
Changing the Font in File Manager

You can change the font that File Manager uses to display the names of files and directories. When you change the font, all directory windows are affected.

► To change the font

1. From the Options menu, choose Font.

The Font dialog box appears.



2. In the Font box, select the font you want to use.

The text in the Sample box changes to reflect the font you select.

3. In the Font Style box, select any style options you want to use (for example, bold or italic).

The text in the Sample box changes to reflect the style you select.

4. In the Size box, select the point size you want to use: the larger the point size, the larger the character appears on your screen.

The text in the Sample box changes to reflect the point size you select.

5. If you want text to appear all uppercase, clear the Lowercase check box.
6. Choose the OK button.

The text in all directory windows is displayed in the new font.

Displaying the Status Bar

The *status bar* at the bottom of the File Manager window supplies information about the active directory window or the selected directory-window icon. This information includes the number of bytes available on the disk, the number of files in the current directory and how much disk space they occupy, and the number and size of the currently selected files.

You can turn the status bar on or off by using the Status Bar command. When the status bar is on, a check mark appears next to the command on the Options menu.

- ▶ **To turn the status bar on or off**
 - From the Options menu, choose Status Bar.

Saving Your Settings

Any changes you make by using commands on the Options menu are saved automatically. For example, if you change the font and then quit File Manager, text appears in the new font the next time you start File Manager.

By default, the positions of the open directory windows and icons, and any changes you've made by using commands on the View menu, are also saved when you quit File Manager. You can turn this option on or off by using the Save Settings On Exit command.

► **To turn the save settings option on or off**

- From the Options menu, choose Save Settings On Exit.

When the Save Settings On Exit option is in effect, a check mark appears next to the command on the Options menu.

Using a Network Drive

When using a network, you can work with any network drive if you know its location (and password, if there is one). With some networks, you can browse through all the network drives. You should always start the network before you start Windows.

When you start Windows, it recognizes network connections you have made and shows the network drives in File Manager as icons different from other drive icons. Windows saves any new network connections you make, and if you don't disconnect them, sets up the same network connections the next time you start Windows.

With some networks, you can change settings so that your connections are not reestablished each time you restart Windows. To change network settings, choose the Network icon in Control Panel. For more information, see Chapter 5, "Control Panel."

Connecting to and Disconnecting from a Network Drive

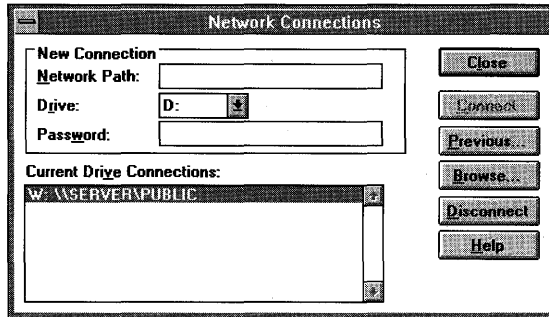
You can use File Manager to connect to network drives or to disconnect from them. If you are not using a network, the network commands are not available.

Note Depending on your network, you may have different commands and dialog boxes available to connect and disconnect your network drives. The following procedures are based on your having the Network Connections command available. If you have different network commands, such as Connect Network Drive and Disconnect Network Drive, substitute those commands for Network Connections in the following procedures. If the dialog box for connecting to a network drive is different from the one shown in this procedure, choose the Help button in the dialog box for more information.

► **To connect to a network drive**

1. From the Disk menu, choose Network Connections.

The Network Connections dialog box appears. The next available letter to assign to a drive appears in the Drive box.



2. In the Network Path box, type the path required to locate the network drive.

With some networks, you can use the Browse button to browse through a list of drives until you find the one you want. If your network does not provide this capability, the Browse button in the Network Connections dialog box appears dimmed.

3. To assign a different drive, open the Drive list and select the letter you want.

Or type the drive letter in the Drive box.

4. In the Password box, type the password, if one is required.

5. Choose the Connect button.

Or, if you do not want this connection to be made when you restart Windows, press and hold down **SHIFT** while you choose the Connect button.

6. Repeat steps 2 through 5 if you want to connect to another network drive.

When you finish setting up your network connections, choose the Close button.

File Manager maintains a list of previous network drives you have used so that you can easily reconnect to them.

► **To connect to a network drive you have used previously**

1. From the Disk menu, choose Network Connections.
The Network Connections dialog box appears.
2. Choose the Previous button.
The Previous Network Connections dialog box appears.
3. Select the network path you want, and then choose the Select button.
The network path you select appears in the Network Path box.
4. In the Password box, type the password, if one is required.
5. Choose the Connect button.
6. When you finish setting up your network connections, choose the Close button.

You can connect to network drives while running some applications. If you do this, you may need to update the directory windows in File Manager to see the drive icon representing the connection. For more information, see “Updating a Directory Window” earlier in this chapter.

► **To disconnect from a network drive**






1. From the Disk menu, choose Network Connections.
The Network Connections dialog box appears.
2. In the Current Drive Connections box, select the network drive you want to disconnect.
3. Choose the Disconnect button.
4. Choose the Close button.

Note If Windows is running in 386 enhanced mode, you might not be able to disconnect from network drives that were active before you started Windows.

Working with Files and Directories

You can use File Manager commands to work with files and directories individually or in groups.

To the left of each filename or directory name in the contents list is an icon to help you identify its type. The following table describes the icons.

Icon	Represents
	Directories. These are listed first, in alphabetical order.
	Program files and batch files. Their default filename extensions are .EXE, .COM, .PIF, and .BAT. These files start applications.
	Document files. These files are associated with applications. When you open one of these files, the associated application starts automatically. For more information, see "Associating Files with an Application" later in this chapter.
	System or hidden files. These files have system or hidden attributes. For more information, see "Setting File Attributes" later in this chapter.
	All other files.

Naming a File or Directory

Many File Manager tasks involve naming or renaming files and directories. Windows follows MS-DOS conventions for naming files:

- The name of a file or directory can have two parts: a name and an optional extension. The two parts are separated by a period. For example, MYFILE.NEW is a valid filename; MYFILE is the name of the file, and .NEW is the filename extension.
- The name can contain up to eight characters, and the extension can contain up to three characters.
- The name must start with either a letter or number. It can contain any uppercase or lowercase characters except the following:

period (.)	quotation mark (")
slash (/)	backslash (\)
brackets ([])	colon (:)
semicolon (;)	vertical bar ()
equal sign (=)	comma (,)

If you use these characters in a filename, you may get unexpected results.

- The name cannot contain any spaces.
- The following names are reserved and cannot be used for files or directories: CON, AUX, COM1, COM2, COM3, COM4, LPT1, LPT2, LPT3, PRN, and NUL.

Examples of valid filenames are LETTER.DOC, MEMO.TXT, BUDGET.92, and 2NDTRY.RPT. For more information about naming files, see your MS-DOS documentation.

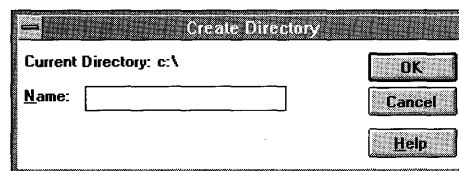
Creating a Directory

You can create a directory by using the Create Directory command. After you create a directory, you can copy files and directories to it from other locations by using the Move and Copy commands. For more information, see “Moving and Copying Files and Directories” later in this chapter.

► To create a directory

1. In the directory tree, select the directory in which you want the new directory to appear.
2. From the File menu, choose Create Directory.

The Create Directory dialog box appears.



3. In the Name box, type a name for the new directory.

Use the same conventions for naming directories as you do for naming files. For information, see the previous section, “Naming a File or Directory.”

If you want to create the directory somewhere other than in the current directory, type the full path of the new directory.

4. Choose the OK button.

Searching for a File or Directory

When you want to find a file or directory, you can use the Search command. By using wildcards, you can search for a group of files or directories that have related filenames or extensions. For example, suppose you gave each of your correspondence files an .LTR extension. To find all of them, you can search for *.LTR. File Manager finds all correspondence (.LTR) files in the specified directories on the current drive and lists them in the Search Results window.

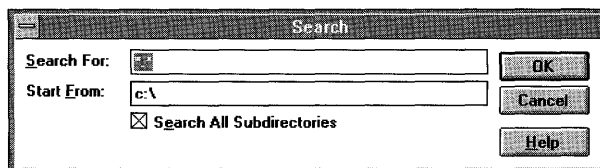
You can select files and directories in the Search Results window and use File menu commands to print, copy, move, delete, and rename them. You can view file details by using commands on the View menu. However, although you can move or copy files from the Search Results window, you cannot copy or move files into it.

The Search Results window remains open until you close it or reduce it to an icon. The contents of the Search Results window are replaced when you use the Search command again.

► To search for a file or directory

1. Select the directory that you want to start the search from.
2. From the File menu, choose Search.

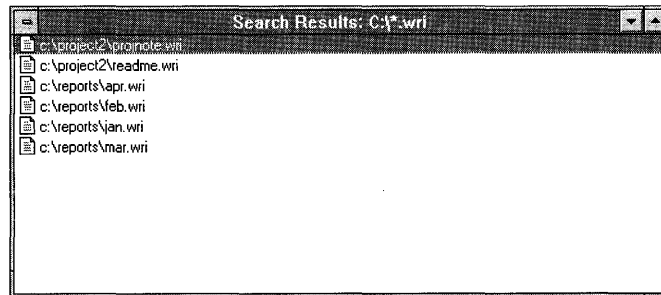
The Search dialog box appears.



3. In the Search For box, type the name of the file or directory. You can use wildcards to search for a group of files or directories with similar names or extensions. For example, to search for all files with the extension .WRI, you would type *.wri in the Search For box.
4. In the Start From box, the current directory is listed. If you want to start the search from a different directory, type the directory name in the Start From box.
5. By default, File Manager searches the directory listed in the Start From box, and all its subdirectories. If you do not want File Manager to search the subdirectories, clear the Search All Subdirectories check box.
6. Choose the OK button.

To cancel the search, press ESC.

File Manager searches the directory and subdirectories you specified. The Search Results window appears, displaying all the filenames and directories found.



Note If you modify the drive on which the search was performed and the Search Results window is active (or is made active), a dialog box appears, asking whether you want to update the Search Results window. If you choose the Yes button, the search is performed again on the modified drive.

Moving and Copying Files and Directories

You can move and copy files and directories from one File Manager location (called the *source*) to another (called the *destination*) by dragging them with the mouse or by using the Copy or Move command. You can copy and move items between directories and between drives.

By extending your selection, you can move or copy more than one file or directory at a time. For information about extending a selection in a directory window, see “Extending a Selection” earlier in this chapter.

► To move files or directories

Mouse

1. Make sure the source and destination are visible. (You can use the Cascade or Tile command on the Window menu to rearrange directory windows.) The destination can be a directory icon, directory window, or drive icon. If the destination is a drive icon, the file will be placed in the current directory of that drive.
2. Press and hold down SHIFT while you use the mouse to drag the source file or directory icon to the destination.

The mouse pointer replicates a file icon.

3. Release the mouse button, and then release SHIFT.

A confirmation message appears. (You can choose not to receive confirmation messages. For more information, see “Turning Off Confirmation Messages” later in this chapter.)

4. To complete the move, choose the Yes button.

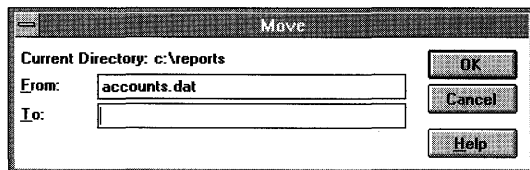
If the destination directory contains a file with the same name as the file you are moving, a dialog box appears, prompting you to verify that you want to replace the existing file. Choose the Yes button to replace the existing file, or if you are moving more than one file, choose the Yes To All button. If you choose the Yes To All button, File Manager does not prompt you for each file that is replaced.

Tip If you are moving files or directories to a destination on the same drive, you can simply drag them with your mouse. You do not have to use SHIFT.

Keyboard

1. Select the file or directory you want to move.
2. From the File menu, choose Move.

The Move dialog box appears.



3. The name of the selected file or directory appears in the From box. To move a different file or directory, type its name in the From box. If the file or directory is not in the current directory, include the path.
4. In the To box, type the destination directory. (If you type a filename, the original file or directory is renamed.)
5. Choose the OK button.

If the destination directory contains a file with the same name as the file you are moving, a dialog box appears, prompting you to verify that you want to replace the existing file. Choose the Yes button to replace the existing file, or if you are moving more than one file, choose the Yes To All button. If you choose the Yes To All button, File Manager does not prompt you for each file that is replaced.

The file or directory disappears from its original location and appears in the destination directory you specified. If you move a directory, all the files and subdirectories in it move also.

► To copy files or directories

Mouse

1. Make sure the source and destination are visible. (You can use the Cascade or Tile command on the Window menu to rearrange directory windows.) The destination can be a directory window, directory icon, or drive icon. If the destination is a drive icon, the file will be placed in the current directory of that drive.
2. Press and hold down CTRL while you use the mouse to drag the source file or directory icon to the destination.

The mouse pointer changes to a file icon with a plus sign to indicate you are copying, not moving, files or directories.

3. Release the mouse button, and then release CTRL.

A confirmation message appears. (You can choose not to receive confirmation messages. For more information, see “Turning Off Confirmation Messages” later in this chapter.)

4. Choose the Yes button.

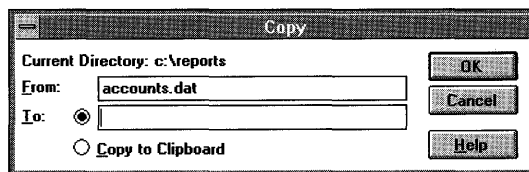
If the destination directory contains a file with the same name as the file you are copying, a dialog box appears, prompting you to verify that you want to replace the existing file. Choose the Yes button to replace the existing file, or if you are copying more than one file, choose the Yes To All button. If you choose the Yes To All button, File Manager does not prompt you for each file that is replaced.

Tip If you are copying files or directories to a different drive, you can simply drag them with the mouse. You do not have to use CTRL.

Keyboard

1. In the contents list, select the file or directory you want to copy.
2. From the File menu, choose Copy.

The Copy dialog box appears.



3. The name of the selected file or directory appears in the From box. To copy a different file or directory, type its name in the From box. If the file is not in the current directory, include the path.

4. In the To box, type the destination path.
5. Choose the OK button.

If the destination directory contains a file with the same name as the file you are copying, a dialog box appears, prompting you to verify that you want to replace the existing file. Choose the Yes button to replace the existing file, or if you are copying more than one file, choose the Yes To All button. If you choose the Yes To All button, File Manager does not prompt you for each file that is replaced.

The file or directory is copied to the destination directory and remains in the location from which you copied it. If you copy a directory, all the files and subdirectories in it are copied also.

Note You can copy files from a directory window in File Manager to a group window or group icon in Program Manager by dragging the files with a mouse. For more information, see “Creating a Program Item” in Chapter 3, “Program Manager.”

Copying a File onto the Clipboard

You can use File Manager to copy a file onto the Clipboard so that you can link or embed the file into a different document. For more information about object linking and embedding, see Chapter 13, “Integrating Your Windows Applications.”

► To copy a file onto the Clipboard

1. Select the file you want to copy.
2. From the File menu, choose Copy.
The Copy dialog box appears.
3. Select the Copy To Clipboard option button.
4. Choose the OK button.

Deleting a File or Directory

You can use File Manager to delete files and directories. When you delete a directory, all files and subdirectories in the directory are deleted. You can extend the selection of files or directories to delete more than one. For information about extending a selection, see “Extending a Selection” earlier in this chapter.

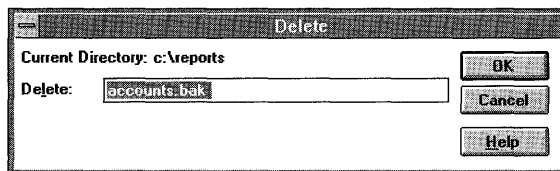
Caution Be careful when you delete files and directories. Unless you are running MS-DOS version 5.0 or have a file-recovery program, you cannot recover files or directories deleted accidentally. For more information, see your MS-DOS documentation.

► To delete a file or directory

1. Select the file or directory you want to delete.
2. From the File menu, choose Delete.

Or press DEL.

The Delete dialog box appears.



3. Choose the OK button to delete the selected file or directory, or type the name of a different file or directory you want to remove.

File Manager prompts you to confirm the deletion. (You can choose not to receive confirmation messages. For more information, see the following section, “Turning Off Confirmation Messages.”)

4. If you are deleting a single file or directory and are sure you want to delete it, choose the Yes button. If you are deleting more than one file or directory and you do not want to confirm each deletion, choose the Yes To All button.

Turning Off Confirmation Messages

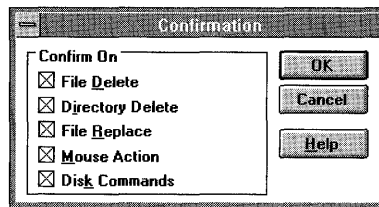
If you do not want a confirmation message to appear each time you delete or replace files and directories, you can change the confirmation settings. You can also turn off messages that appear when you perform certain mouse actions, such as moving and copying.

If you turn off confirmation messages, File Manager carries out commands as soon as they are issued.

► To turn off confirmation messages

1. From the Options menu, choose Confirmation.

The Confirmation dialog box appears.



2. Clear the check box for each confirmation option you want to cancel.
3. Choose the OK button.

The confirmation options are described in the following table.

Clear this option	If you don't want
File Delete	A warning message before deleting files.
Directory Delete	A warning message before deleting directories.
File Replace	A warning message before writing over existing files.
Mouse Action	A warning message before moving or copying when you drag files with a mouse.
Disk Commands	A warning message before formatting or copying a disk.

Caution If you clear the Directory Delete check box, remember that when you delete a directory, all files and subdirectories in that directory are deleted. Also, to avoid accidentally writing over files you want to keep, do not clear the File Replace check box.

Renaming a File or Directory

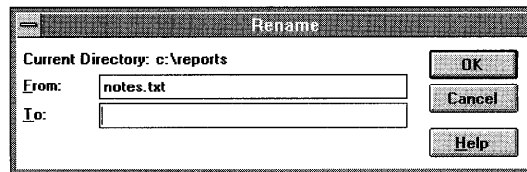
You can rename any file or directory by choosing the Rename command on the File menu.

Caution Be careful when you rename files. If you rename a file that your system requires (for example, any file that has a .SYS extension), your system may not start or run correctly.

► To rename a file or directory

1. Select the file or directory you want to rename.
2. From the File menu, choose Rename.

The Rename dialog box appears.



3. The name of the selected file or directory appears in the From box. To rename a different file, type the name in the From box. To rename a group of files, use wildcards (for example, *.BAK).
4. In the To box, type the new name. Use a file or directory name that does not already exist in the destination directory. You can specify only one filename in the To box. If you want to rename a group of files, use wildcards (for example, *.TXT).
5. Choose the OK button.

Inserting a File into Another File

If you have applications that support object linking and embedding, you can use File Manager to embed a file into another file or link a file to another file. Some applications developed prior to this version of Windows may not support embedding and linking through File Manager.

For information about object linking and embedding, see Chapter 13, “Integrating Your Windows Applications.”

► **To embed a file into another file**

- Drag the file icon into the application window where the other file is open.

► **To link a file to another file**

- Press and hold down **SHIFT+CTRL** while you use the mouse to drag the file icon to the application window where the other file is open.

You can also embed or link a file into another file by copying the file onto the Clipboard and then pasting it into the destination file. For more information, see “Copying a File onto the Clipboard” earlier in this chapter.

Setting File Attributes

File attributes are part of the directory information MS-DOS maintains for each file. This information helps MS-DOS identify a file and controls the kinds of tasks you can perform with the file. The four file attributes are described in the following table.

Abbreviation	Attribute
R	Read-only. Prevents a file from being changed.
A	Archive. Identifies a file that has been modified since it was last backed up. When you use some MS-DOS commands, such as backup and xcopy , the archive attribute is turned off.
H	Hidden. Prevents a file from appearing in a directory listing at the MS-DOS command prompt. Files that have a hidden attribute appear in directory windows only if you select the Show Hidden/System Files check box by using the By File Type command on the View menu.
S	System. Identifies the file as an MS-DOS system file. Files that have a system attribute appear in a directory window only if you select the Show Hidden/System Files check box by using the By File Type command on the View menu.

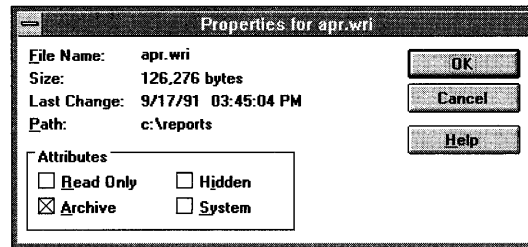
You can see file attributes in a directory window by choosing the All File Details command on the View menu. This command displays all the information about a file.

You can change file attributes by using the Properties command on the File menu.

► **To change file attributes for a single file**

1. Select the file for which you want to set or cancel attributes.
2. From the File menu, choose Properties.

The Properties dialog box appears.



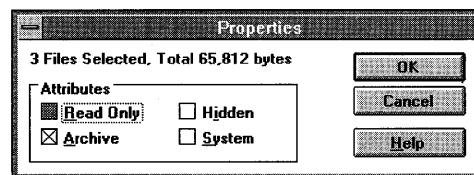
If you are using a network, more options may be available in the Properties dialog box.

3. Select or clear the check boxes for the attribute settings you want.
4. Choose the OK button.

► **To change file attributes for a group of files**

1. Select the files for which you want to set or cancel attributes.
2. From the File menu, choose Properties.

The Properties dialog box appears.



If you are using a network, more options may be available in the Properties dialog box.

3. Select or clear the check boxes, as needed. If a check box is solid gray, it means that some of the files you selected have different settings for that particular attribute.
4. Choose the OK button.

Associating Files with an Application

You can use File Manager to help you save time when you want to work with a file. Instead of starting your application and then loading a file, you can simply choose the file in the directory window; the application starts automatically. To do this, a file must be associated with an application. For example, if you associate the .ACC extension with your accounting application, you can open any file that has an .ACC extension and your accounting application will start with that file loaded.

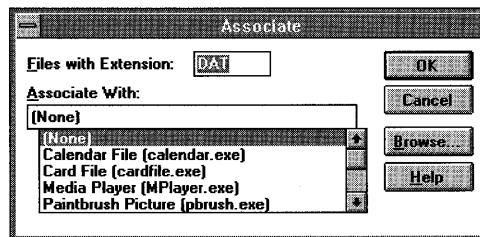
Some applications, including most Windows applications, are associated with a filename extension when you install them. If a file is associated with an application, it has a document-file icon next to it. If your application does not automatically set up an association, you can associate files with the application by using the Associate command.

► To associate a file with an application

1. In a directory window, select a file that has the extension you want to associate. For example, to associate files that have a .DAT extension with an application, select any file that has a .DAT extension.

2. From the File menu, choose Associate.

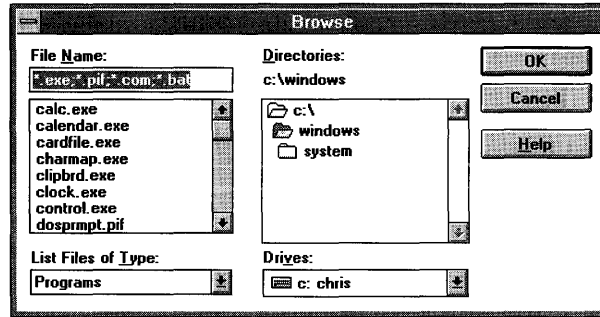
The Associate dialog box appears.



3. The filename extension of the file you selected appears in the Files With Extension box. To associate a different filename extension, or if no file was selected when you chose the Associate command, type the extension in the Files With Extension box.
4. In the Associate With box, select the application you want to associate with the extension. The Associate With box lists all the applications that registered information when they were set up. A description of the type of file that the application uses is listed first, followed by the name of the program file.

5. If the application is not listed in the Associate With box, you can either type the name of a program file or choose the Browse button to select a file from a list of program files. You can type only the name of a program file in this box; you cannot specify a description of the type of file.

If you choose the Browse button, the following dialog box appears.



Select the program file you want, and then choose the OK button.

The name of the program file then appears in the Associate With box in the Associate dialog box.

6. Choose the OK button.

In the directory window, the file icon changes to a document-file icon, indicating the file is associated with an application. The next time you open that file, the application will start also.

Changing an Association

You may want to change an association if you have two applications that could be associated with the same filename extension. For example, suppose you install a word-processing application that is associated with the .DOC extension, and then you install another word processor that is also associated with the .DOC extension. Because a filename extension can only be associated with one application at a time, the most recently installed application is associated with the filename extension; in this example, .DOC is associated with the second word processor you installed. If you want to be able to use the first word processor when you open a .DOC file, you need to change the association back to the first word processor.

► **To change an association**

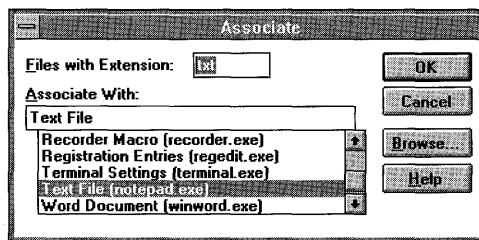
1. In a directory window, select a file that has the extension for which you want to change the association.
2. From the File menu, choose Associate.
The Associate dialog box appears.
3. The extension of the selected file appears in the Files With Extension box. To change the association for a different filename extension, or if no file was selected when you chose the Associate command, type the extension in the Files With Extension box.
4. In the Associate With box, select the new application you want to associate with the filename extension.
5. Choose the OK button.

Removing an Association

If you no longer want files associated with an application (for example, if you remove the application from your system), you can remove the association by using the Associate command.

► **To remove an association between files and an application**

1. In a directory window, select a file that has the extension for which you want to remove the association.
2. From the File menu, choose Associate.
The Associate dialog box appears.



3. The filename extension of the file you selected appears in the Files With Extension box. To remove the association for a different extension, or if no file was selected when you chose the Associate command, type the extension in the Files With Extension box.
4. In the Associate With box, select None.
5. Choose the OK button.

Printing a File

Using File Manager, you can print files that are associated with applications. You can use the Print command, or, if you are using a mouse, you can simply drag the file icon onto the minimized Print Manager icon.

Note Some applications do not support printing through File Manager. If this is the case, or if a file is not associated with an application, you must open the application and print the file from there.

► **To print a file by dragging the file icon**

1. Make sure Print Manager is started and reduced to an application icon on the desktop.
2. Drag the document-file icon onto the Print Manager icon.

► **To print a file by using the Print command**

1. In the directory window, select the file you want to print.
2. From the File menu, choose Print.
The Print dialog box appears.
3. Choose the OK button.

Starting an Application from File Manager

You can use File Manager to start your applications. You start an application by opening a program file or document file from a directory window. Program files almost always have a .COM, .EXE, .PIF, or .BAT filename extension. Document files are associated with applications and are represented by document-file icons in directory windows. For information about the types of file icons, see “Working with Files and Directories” earlier in this chapter.

When you start an application that runs in a window, the window appears in front of any open File Manager windows. When you start an application that uses the entire screen, the application replaces the File Manager window. If you want to reduce File Manager to an icon each time you start an application, you can choose the Minimize On Use command from the Options menu.

Tip If you use an application frequently, you might find it more convenient to add it to a Program Manager group than to start it from File Manager. You can copy program and document files from File Manager to Program Manager by dragging them with a mouse. For information about how to add items to a Program Manager group, see Chapter 3, “Program Manager.”

► **To start an application from a program file or document file**

Mouse

- In the directory window, double-click the filename.

Keyboard

1. Select the filename in the directory window.
2. From the File menu, choose Open.
Or press ENTER.

► **To start an application and open a file**

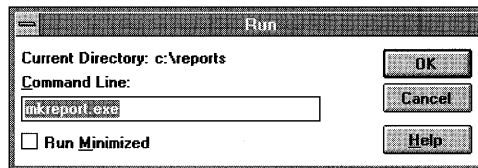
Mouse

- Drag the icon for the data file onto the icon for the program file.

Keyboard

1. Select the program file for the application you want to use.
2. From the File menu, choose Run.

The Run dialog box appears.



3. The name of the program file appears in the Command Line box. If you did not select a program file, or if you want to run a different application, type the name (and path, if necessary) of the program file in the Command Line box.
Then, in the Command Line box, add the name of the data file you want to open. Include the path if the data file is not in the same directory as the program file.
4. If you want the application to start minimized, select the Run Minimized check box.
5. Choose the OK button.

► **To reduce File Manager to an icon when you start an application**

- From the Options menu, choose Minimize On Use.

Maintaining Floppy Disks

You can use commands on the Disk menu to prepare floppy disks, copy the contents of one disk to another, or label a disk.

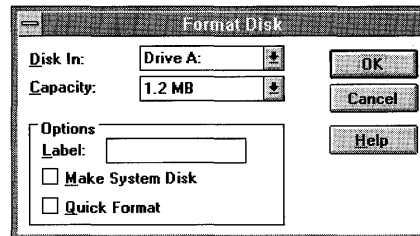
Formatting a Disk

Formatting prepares a floppy disk so that information can be stored on it and retrieved from it. When you format a disk, File Manager removes all the information from it, writes new directory information to it, and checks for unusable portions (bad sectors).

► To format a floppy disk

1. Insert a disk into a drive.
2. From the Disk menu, choose Format Disk.

The Format Disk dialog box appears.



3. In the Disk In box, select the letter for the drive you want to use.
4. In the Capacity box, select the size of the disk you want to format.
5. Under Options, select any options you want.

If you want to give the disk a volume label, type a name in the Label box.

If you want to include system files on the disk you are formatting, select the Make System Disk check box. (For information about system disks, see the next section, “Making a System Disk.”)

If you want to format a disk quickly, select the Quick Format check box. The directory information (the file allocation table and root directory of the disk) is deleted, but the disk is not scanned for bad sectors. You can use the Quick Format option only for disks that have been previously formatted.

6. Choose the OK button.

A confirmation dialog box appears, in which you can verify that you want to format the disk. Formatting deletes all information on a disk. Therefore, make sure the disk in the drive you selected is the one you want to format.

You can choose not to receive confirmation messages by using the Confirmation command on the Options menu, as explained earlier in this chapter.

7. Choose the Yes button.

After your disk is formatted, a dialog box appears, prompting you to indicate whether you want to format another disk.

Caution Be careful when you format a disk. Unless you are running MS-DOS version 5.0 or have a disk-recovery program, you cannot recover information on a disk that is accidentally formatted. For more information, see your MS-DOS documentation.

Making a System Disk

You can use File Manager to copy MS-DOS operating-system files onto a floppy disk. This disk is called a system disk, and you can use it to start your computer.

► To copy system files onto a floppy disk

1. Insert a formatted floppy disk into a drive.
2. From the Disk menu, choose Make System Disk.
3. If your computer has two floppy disk drives, a dialog box appears. Select the letter for the drive that contains the disk, and then choose the OK button.

If your computer has only one floppy disk drive, this dialog box does not appear.

Note Not all disks can accept system files. A message notifies you if this is the case.

Copying a Floppy Disk

You can make a copy of a floppy disk by using the Copy Disk command on the Disk menu. When you copy a floppy disk, both disks must have the same storage capacity. For example, if the source disk (the disk you are copying from) has a capacity of 720K, the destination disk (the disk you are copying to) must also.

► **To copy an entire disk**

1. Insert the source disk in the drive you want to copy from. If you have two floppy disk drives of the same size, insert the destination disk in the drive you want to copy to.
2. From the Disk menu, choose Copy Disk.
3. If your computer has two floppy disk drives, a dialog box appears. Select the letter of the source drive and the destination drive, and then choose the OK button.

If your computer has only one floppy disk drive, this dialog box does not appear.

4. A confirmation dialog box appears, in which you can verify that you want to copy the disk. When you copy an entire disk, there is no way to recover information previously stored on the destination disk. Make sure the disk in the destination drive is the one you want to copy to.

Choose the Yes button. A message appears, informing you of the percentage of your disk that has been copied.

If you have only one floppy disk drive, follow the instructions to switch source and destination disks as needed.

Labeling a Disk

You can assign or change a label for a disk by selecting the Label Disk command on the Disk menu.

► **To assign or change a volume label**

1. Click the drive icon for the disk you want to label.
Or press `TAB` to move the selection cursor to the drive icons, use the arrow keys to select the icon for the disk you want to label, and then press the `SPACEBAR`.
2. From the Disk menu, choose Label Disk.
The Label Disk dialog box appears.
3. In the Label box, type the label for the disk.
The label can contain up to 11 characters.
4. Choose the OK button.

Quitting File Manager

You can quit File Manager by using the Exit command on the File menu. To save the positions and views of your open directory windows, make sure the Save Settings On Exit command on the Options menu has a check mark next to it. For more information, see “Saving Your Settings” earlier in this chapter.

► To quit File Manager

- From the File menu, choose Exit.
Or double-click the Control-menu box.
Or press ALT, SPACEBAR to open the Control menu, and then choose Close.

Control Panel



Chapter 5

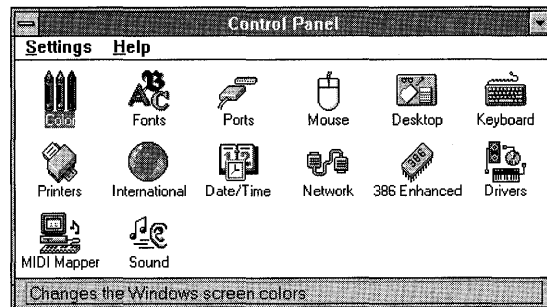
What Is Control Panel?

Windows Control Panel provides you with a visual way of changing the configuration of your system while you're using the Microsoft Windows operating system.

When you change an option by using Control Panel, the change is stored in the WIN.INI file so that it will be in effect the next time you run Windows.










► **To start Control Panel**






- In the Main group, choose the Control Panel icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.)



The icons in this window represent the settings you can change by using Control Panel. For each icon, there is a corresponding command on the Settings menu. These icons represent the options that appear when you are running Windows on an 80386 computer using a network, sound, and Musical Instrument Digital Interface (MIDI) capabilities. Your Control Panel window may look different, depending on the devices you have installed (for example, an extra pointing device) and the software that manages them.

The following table describes the Control Panel options.

Choose	To
 Color	Set the color of the desktop and most of the elements on it.
 Fonts	Add or remove TrueType fonts, in addition to screen and plotter fonts for the Windows screen display. (Some printer fonts must be set up by using a font-installation program provided by the font manufacturer.)
 Ports	Set the communications options for your serial communications ports.
 Mouse	Customize the way you use your pointing device. For example, if you are using a mouse, you may want to adjust how fast the pointer moves across the screen, set the double-click speed, swap functions of the left and right mouse buttons, and set any options specific to the type of mouse you are using.
 Desktop	Select patterns or images to decorate the desktop, specify a screen saver to run when Windows is running but is not being used, set an invisible grid to help you align objects on the desktop, specify icon spacing and title wrapping, and set the cursor blink rate.
 Keyboard	Adjust the keyboard repeat rate and delay.
 Printers	Install and configure printers. This may include assigning output ports, choosing paper sizes and orientation, specifying graphics resolution, connecting to network printers, choosing the default printer, installing soft and cartridge fonts, and using Print Manager.
 International	Specify international settings, such as country and language, number and currency formats, and date and time formats. This option does not change the language of the Windows product itself, only the way applications sort and manage information that includes these formats.
 Date/Time	Change the system date and time.

Choose	To
 Network	Control your connection to the network. Depending on your network, this may include signing on and off the network, restoring your network connections when you start Windows, or changing your user identification or password. This icon appears only if you have a network installed and started.
 386 Enhanced	Specify settings for swap files, and the use of 32-bit disk access, and specify how applications running concurrently in 386 enhanced mode compete for use of peripheral devices, and how much of the computer's resources are allocated to Windows applications running in the foreground and background. This option is available only on systems that can run Windows in 386 enhanced mode.
 Drivers	Install and configure drivers for optional devices, such as sound cards and pen tablets.
 MIDI Mapper	Select, change, or create MIDI setups for playing MIDI information on a synthesizer connected to your computer.
 Sound	Assign sounds to system and application events. You can also use this option to turn on or off the warning beep and system sounds.

► **To choose a Control Panel option**

- In the Control Panel window, double-click the icon for the option you want.
 - Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.
 - Or choose the corresponding command from the Settings menu.

Customizing Desktop Colors

In Control Panel, you can customize the colors used for your *desktop*, the area of the screen on which elements such as windows, icons, and dialog boxes appear. You can use a color scheme that Windows provides, create a new scheme, and define custom colors.

Choosing a Color Scheme

Windows provides several predefined *color schemes*. A color scheme is a collection of complementary colors. Some color schemes include only solid colors, whereas others include nonsolid colors as well.

A *solid color* is directly supported by your display adapter. Video graphics adapters (VGAs) support 16 solid colors, and 256-color adapters support 20 solid colors. Both types of adapters support hundreds of nonsolid colors. A *nonsolid color* is produced by a pattern of colored dots that simulate a color or pattern. Depending on the detail of the screen resolution, nonsolid colors can look almost exactly like solid colors.

When selecting a color scheme, note the following:

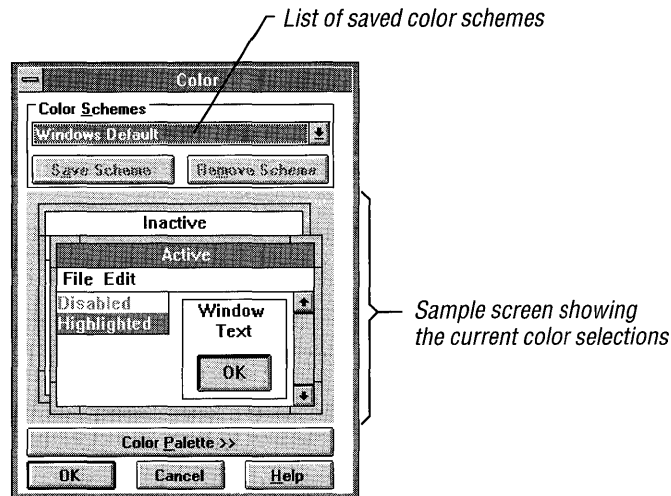
- Selecting a color scheme that has all solid colors may increase the speed at which Windows updates your screen. The Windows Default scheme and several others use only solid colors.
- If you are using a plasma display adapter, you might want to use the Plasma Power Saver color scheme. This scheme uses darker colors, which require less power than brighter colors.
- If you are using an LCD display adapter, the colors may appear in reverse video. In this case, you might want to use an LCD color scheme. The names of these schemes start with LCD.
- Control Panel uses only the solid color closest to the selected nonsolid color for the following screen elements: Window Frame, Window Text, Window Background, Menu Bar, Menu Text, Active and Inactive Title Bar Text, Button Face, Button Text, Disabled Text, Highlight, and Highlighted Text.

Note Some LCD monitors have switches you can use to set the screen display so that it does not appear in reverse video. On other computers with LCD monitors, you need to press a key to change the screen display. In this case, you may need to quit Windows before you can change the display.

► **To choose a color scheme**

1. In the Control Panel window, choose the Color icon.

The Color dialog box appears. The Color Schemes box shows the name of the current color scheme, and the sample screen shows the colors for the current scheme.



2. Open the Color Schemes list, and then select the color scheme you want.

Click the arrow next to the box to open the list. Or press TAB to move to the box, and then press ALT+DOWN ARROW.

The sample screen changes to reflect your selection.

3. Choose the OK button at the lower left of the Color dialog box.

Tip You can select a scheme without opening the Color Schemes list by using the UP ARROW and DOWN ARROW keys. Each scheme appears in the Color Schemes box and sample screen as you cycle through the schemes.

Changing a Color Scheme

You can change the color assigned to many parts of the Windows screen (also referred to as *screen elements*). The color change is effective until you change colors again, and you can save the change for future sessions.

► To change the colors of a color scheme

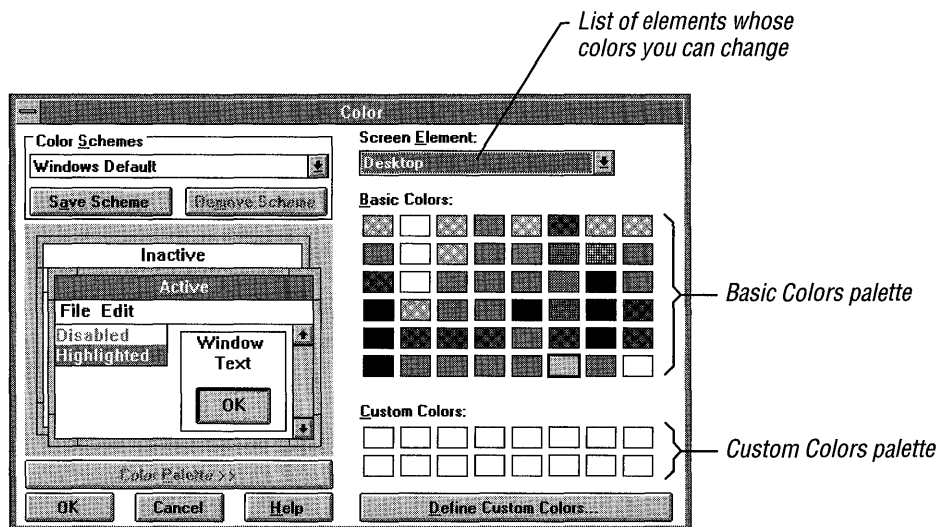
1. In the Control Panel window, choose the Color icon.

The Color dialog box appears.

2. Open the Color Schemes list, and then select the color scheme you want to change.

3. Choose the Color Palette button.

The Color dialog box expands to include a list of screen elements, a palette of basic colors, and a palette titled Custom Colors.



4. In the sample screen, click the part of the screen whose color you want to change.

Or open the Screen Element list, and then select the part of the screen from the list.

Clicking “Highlighted” in the sample screen alternately selects the “Highlight” and “Highlighted Text” elements. Similarly, clicking the OK button in the sample screen alternately selects the “Button Face,” “Button Shadow,” “Button Highlight,” and “Button Text” elements. You can see which element is selected in the Screen Element list.

5. In the Basic Colors palette, click the color you want.

Or press `TAB` to move to the palette, and then use the arrow keys to move the selection cursor to the color you want. Press the `SPACEBAR` to select the color.

The color is displayed in the sample screen.

6. Change the color of any other screen elements.

7. To save the new color selections, choose the Save Scheme button, and then type a name for the scheme in the text box.

If you don’t save the scheme, Windows still uses the new color selections until you change them again, even if you quit Windows and restart it. However, when you make another change or choose an existing scheme, the color selections are lost.

8. Choose the OK button.

Tip You can increase the speed at which Windows updates your screen by selecting only solid colors and by selecting the same color for the Active Border and Inactive Border.

If you find that you use only one or two color schemes, you can shorten the list of selections by deleting schemes. The only color scheme that cannot be deleted is Windows Default, the scheme you see the first time you start Windows.

► To remove a color scheme

1. In the Control Panel window, choose the Color icon.

The Color dialog box appears.

2. Open the Color Schemes list, and then select the color scheme you want to delete.

3. Choose the Remove Scheme button.

A dialog box appears, asking you to confirm the deletion.

4. Choose the Yes button.

The Color dialog box appears.

5. Choose the OK button.

Defining Custom Colors

You can specify up to 16 additional colors at a time and use them in your color schemes. Control Panel offers two methods of defining custom colors:

- You can select colors from a *color refiner box* that shows the full range of possible colors.
- You can specify numbers for hue, saturation, and luminosity, or for relative amounts of red, green, and blue.

Hue is the position of the color along the color spectrum. *Saturation* is the purity of the hue, moving from gray to the pure color. *Luminosity* is the brightness of the color on a scale from black to white.

► To define a custom color

1. In the Control Panel window, choose the Color icon.

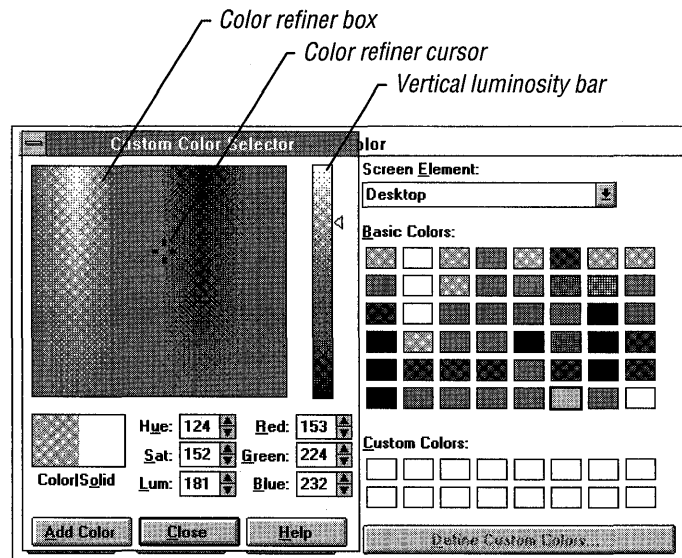
The Color dialog box appears.

2. Choose the Color Palette button.

The Color dialog box expands to include a palette titled Custom Colors.

3. Choose the Define Custom Colors button.

The Custom Color Selector dialog box appears.



4. Drag the color refiner cursor to the area of the color refiner box that shows the color you want. Then drag the arrow next to the vertical luminosity bar up or down to adjust the luminosity.

Or type values in the Red, Green, and Blue or the Hue, Sat, and Lum boxes. You can type values into the boxes or click the arrows to the right of the appropriate box to increase or decrease the number.

As you change the color, the new color is displayed on the left side of the Color/Solid box. The right side of the box displays the solid color closest to your choice. If you want to select the solid color, double-click the right side of the box, or press **ALT+O**. For more information about solid and nonsolid colors, see “Choosing a Color Scheme” earlier in this chapter.

5. When you are satisfied with the color, select a box in the Custom Colors palette for the new color. You can select an empty box or one that contains a color you want to change.
6. Choose the Add Color button to add the new color to the Custom Colors palette.
7. Define any other custom colors you want to add to the palette.
8. To close the Custom Color Selector dialog box and return to the Color dialog box, choose the Close button.

Or, to return to the Color dialog box without closing the Custom Color Selector dialog box, move the Custom Color Selector dialog box.

You can now choose the custom colors the same way you would choose a color from the Basic Colors palette.

9. To close the Color dialog box, choose the OK button.

Changing Desktop Options

In addition to changing your color scheme, you can customize your desktop in the following ways:

- Specify a pattern or wallpaper for the desktop.
- Specify a screen saver to display when Windows is running but not being used.
- Adjust icon spacing.
- Wrap icon titles.
- Set an invisible grid to easily align windows and icons.
- Change window border width.
- Adjust the cursor blink rate.

Displaying Desktop Patterns

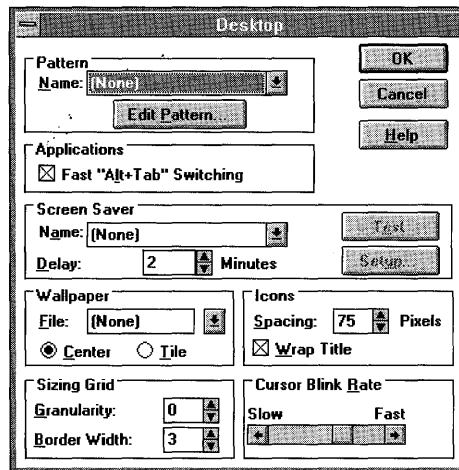
When you set up Windows, the desktop is a solid color. You can replace the solid color with a pattern by using the Pattern option. You can choose a predefined desktop pattern or create one of your own.

The background color for the pattern is the same as the Desktop color. The foreground color (the lines that make up the pattern) is the same as the color of the Window Text screen element. For more information, see “Customizing Desktop Colors” earlier in this chapter.

► To choose a pattern

1. In the Control Panel window, choose the Desktop icon.

The Desktop dialog box appears.



2. In the Pattern area, open the Name list, and then select a pattern.

Click the arrow next to the box to open the list. Or press **TAB** to move to the box, and then press **ALT+DOWN ARROW**.

3. Choose the OK button.

Tip You can select a pattern without opening the Name list by using the **UP ARROW** and **DOWN ARROW** keys.

If you are using a mouse, you can change an existing desktop pattern or create one and save it with a new name. You cannot change a pattern by using the keyboard.

► **To change an existing pattern**

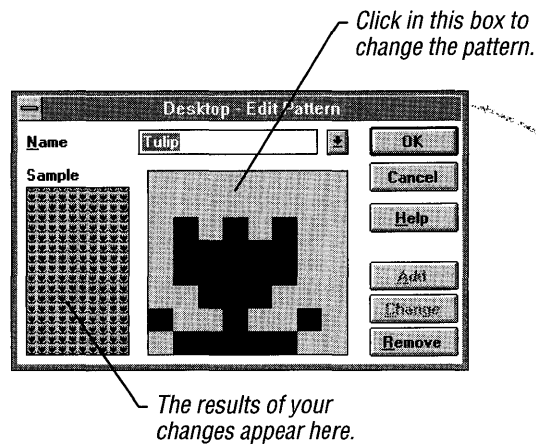
1. In the Control Panel window, choose the Desktop icon.

The Desktop dialog box appears.

2. Choose the Edit Pattern button.

The Edit Pattern dialog box appears, displaying a sample of the current pattern in the Sample box and a cell in which you can make changes to the pattern. (The cell shows an enlarged version of the pattern.)

3. Open the Name list, and then select a pattern.



4. In the cell, click locations where you want to reverse the colors in the pattern.
5. When the Sample box shows the pattern you want, choose the Change button.
6. Choose the OK button.

The Desktop dialog box appears.

7. Choose the OK button.

► To create a pattern

1. In the Control Panel window, choose the Desktop icon.
The Desktop dialog box appears.
2. Choose the Edit Pattern button.
The Edit Pattern dialog box appears, displaying a sample of the current pattern in the Sample box, and a cell in which you can make changes to the pattern.
3. In the Name box, type a name for the new pattern.
4. Click locations in the cell where you want to reverse the colors in the pattern.
5. When the cell shows the pattern you want, choose the Add button.
6. Choose the OK button.
The Desktop dialog box appears. The new pattern's name appears in the Name box.
7. Choose the OK button.
The new pattern appears on the desktop.

The pattern you define is repeated as many times as necessary to completely fill the background. Remember, the colors of the pattern are determined by the Desktop and Window Text colors you choose.

If you find that you use only one or two patterns, you can shorten the list of selections by removing patterns you no longer use.

► To remove a pattern

1. In the Control Panel window, choose the Desktop icon.
The Desktop dialog box appears.
2. Choose the Edit Pattern button.
The Edit Pattern dialog box appears.
3. Open the Name list, and then select the pattern you want to remove.
4. Choose the Remove button.
A dialog box appears, asking you to confirm the removal.
5. Choose the Yes button.
6. Choose the OK button.
The Desktop dialog box appears.
7. Choose the OK button.

Displaying Custom Wallpaper

You can alter the appearance of your desktop by displaying a bitmap graphic as *wallpaper* instead of the desktop color or pattern. You can display any bitmap (any file with a .BMP extension), even an elaborate one such as a scanned color photograph.

You can use Windows Paintbrush or another paint application that produces .BMP files to create a bitmap to use as wallpaper. After you create the bitmap, copy the .BMP file into the Windows directory. If you put the file into a different directory, be sure to specify the full path.

Not all bitmaps cover the entire desktop when the wallpaper is displayed. You can have small bitmaps repeated on your screen by selecting the Tile option.

► To choose a bitmap to display as wallpaper

1. In the Control Panel window, choose the Desktop icon.

The Desktop dialog box appears.

2. In the Wallpaper area, open the File list.

Click the arrow next to the box to open the list. Or press TAB to move to the box, and then press ALT+DOWN ARROW.

3. Select a bitmap from the list.

Or type a full path for the bitmap.

4. Select the Center or Tile option button.

The Center option positions the bitmap in the center of the desktop. The Tile option repeats the bitmap as many times as necessary to cover the desktop.

5. Choose the OK button.

If you select both a pattern and custom wallpaper in the Desktop dialog box, the wallpaper overlays the pattern. If you select the Center option for the wallpaper and the bitmap doesn't cover the entire desktop, you'll see the pattern around the edges of the bitmap. If the original bitmap is too large to fit on the screen or takes up too much memory, Windows does not display it.

If you want to remove a wallpaper from the list, delete the bitmap file from the Windows directory.

Note Windows uses more memory when displaying wallpaper than when displaying a solid color or a pattern on the desktop. If you run out of memory when running an application, you can change to a color or pattern to free some memory.

Using Fast Application Switching

You can use fast application switching to switch quickly between applications. When fast application switching is active, you can press and hold down the ALT key while pressing TAB repeatedly to display the name of each application Windows can switch to.

When you reach the name of the application you want to use, releasing ALT switches you to that application. If the application is running as an icon, it is restored to a window.

► To use fast application switching

1. In the Control Panel window, choose the Desktop icon.
The Desktop dialog box appears.
2. In the Desktop dialog box, select the Fast “Alt+Tab” Switching check box.
3. Choose the OK button.

If, while using ALT+TAB, you want to return to your original application, continue to press and hold down ALT, and then press ESC.

Using a Screen Saver

You can select and customize a *screen saver* to appear on your screen while Windows is running. A screen saver is a moving pattern or bitmap that appears after you have not used your computer for an amount of time you specify. Screen savers can reduce the wear on your screen and provide security for your system.

You can use one of the several screen savers that Windows provides, or you can use the IdleWild screen savers included in the Microsoft Entertainment Pack for Windows. If you want to customize your screen saver, see “Customizing a Screen Saver” later in this chapter.

Note To use the IdleWild screen savers, the IWLIB.DLL file and the screen-saver files (these have the extension .IW) must be in the same directory. You can place these files in any directory you want. If these files are not in your Windows directory or in the SYSTEM directory, the directory where they are located must be included in your path. For more information about modifying your path, see your MS-DOS documentation.

► **To select a screen saver**

1. In the Control Panel window, choose the Desktop icon.
The Desktop dialog box appears.
2. In the Screen Saver area, open the Name list.
Click the arrow next to the box to open the list. Or press TAB to move to the box, and then press ALT+DOWN ARROW.
3. Select a screen saver from the list.
4. In the Delay box, click the up arrow to increase or the down arrow to decrease the number of minutes of inactivity you want to elapse before the screen saver appears.
Or type the number of minutes (larger than zero) you want to elapse.
5. Choose the OK button.

► **To return to Windows when the screen saver is on your screen**

- Move the mouse.
Or press any key.

Note If a non-Windows application is the active application, the screen saver does not appear on your screen, regardless of whether the application is running in a window, from the MS-DOS command line, or as an icon.

Testing a Screen Saver

After you've selected a screen saver, you can test it to see how it looks on your screen.

► **To test a screen saver**

1. In the Control Panel window, choose the Desktop icon.
The Desktop dialog box appears.
2. In the Screen Saver area, select the screen saver you want to use from the Name list.
3. Choose the Test button.
The screen saver appears.
4. To return to Windows, move the mouse.
Or press any key.

Customizing a Screen Saver

Some screen savers can be customized. For example, you can change the colors of the object displayed, the number of lines the object contains, or any text that is displayed. The settings that you can change depend on the screen saver you are using.

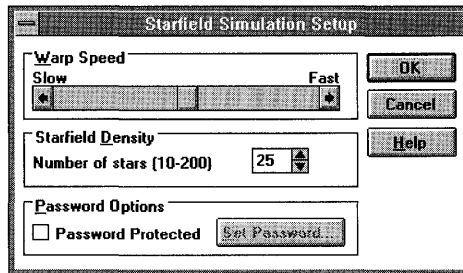
► To customize a screen saver

1. In the Control Panel window, choose the Desktop icon.

The Desktop dialog box appears.

2. In the Screen Saver area, select the screen saver you want to use from the Name list.
3. Choose the Setup button.

The Setup dialog box appears, with options specific to the screen saver you selected. (If the screen saver cannot be customized, a message appears, notifying you that the screen saver has no options to set.) The following is a sample Setup dialog box for a screen saver.



4. Change any settings you want.

For information about these settings, choose the Help button or press F1 while using the dialog box.

5. Choose the OK button.

The Desktop dialog box appears.

6. Choose the OK button.

Specifying or Changing a Password for a Screen Saver

When you use a screen saver provided by Windows, you can specify a password. If you have specified a password, you must type the password before you can return to Windows from the screen saver. This ensures that unauthorized users do not have access to your work.

► **To specify or change a password**

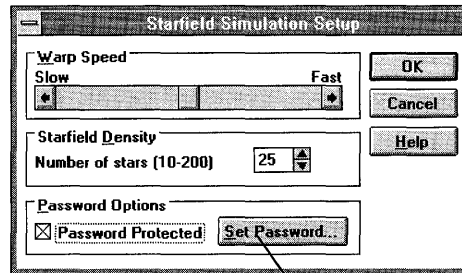
1. In the Control Panel window, choose the Desktop icon.

The Desktop dialog box appears.

2. In the Screen Saver area, select the screen saver you want to use from the Name list.

3. Choose the Setup button.

The Setup dialog box appears. The following is a sample Setup dialog box for a screen saver.

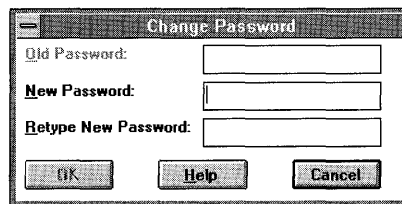


You can set passwords for Windows screen savers.

4. Select the Password Protected check box.

5. Choose the Set Password button.

The Change Password dialog box appears.



If you are specifying a password for the first time, skip the following step.

6. If you are changing your password, type the old password in the Old Password box.

7. In the New Password box, type your new password.

The password for a screen saver provided by Windows can contain up to 20 characters.

8. In the Retype New Password box, type your new password again.

9. Choose the OK button.
The Setup dialog box appears.
10. Choose the OK button.
The Desktop dialog box appears.
11. Choose the OK button.

► **To turn off the password option**

1. In the Control Panel window, choose the Desktop icon.
The Desktop dialog box appears.
2. In the Screen Saver area, select the screen saver you want to turn off from the Name list.
3. Choose the Setup button.
The Setup dialog box appears.
4. Clear the Password Protected check box.
5. Choose the OK button.
The Desktop dialog box appears.
6. Choose the OK button.

Changing the Spacing Between Icons

Windows calculates the standard spacing for application, document, and program-item icons based on the size of the widest icon. Usually this spacing is adequate. However, sometimes the title of an icon exceeds the icon's width, causing it to overlap adjacent icons. You can prevent icon titles from overlapping by increasing the space between icons, by wrapping the title of an icon so that it occupies more than one line, or by doing both.

Icon spacing is measured in *pixels* (or *pels*), the smallest unit of measurement on the screen. Increments of 10 pixels result in noticeable increases in spacing between icons.

► **To increase icon spacing and wrap the icon title**

1. In the Control Panel window, choose the Desktop icon.
The Desktop dialog box appears.
2. In the Icons area, click the up or down arrow next to the Spacing box to increase or decrease the spacing between icons.
Or type a number.

3. Select the Wrap Title check box.
4. Choose the OK button.

If you select the Wrap Title check box, the icon titles wrap immediately after you close the Desktop dialog box. The change in spacing for application icons occurs when you choose the Arrange Icons button in Task List. The change in spacing for document and program-item icons occurs when you use the Arrange Icons command in Windows File Manager or Program Manager. For more information about arranging icons in File Manager and Program Manager, see Chapter 3, “Program Manager,” and Chapter 4, “File Manager.”

Changing the Sizing Grid

The sizing grid affects both the position and size of windows you manipulate. Until you set the granularity of the invisible sizing grid to a number greater than zero, the grid is off. When the grid is set to zero, Windows leaves icons and windows wherever you place them on the desktop. With the grid set to a number greater than zero, all items on your desktop align in an orderly fashion and “snap” to the nearest invisible grid line whenever you move any of them.

Note The sizing grid has no effect on document windows and icons. This option only affects application windows and the application icons that appear at the bottom of your screen.

► To set the grid spacing

1. In the Control Panel window, choose the Desktop icon.

The Desktop dialog box appears.

2. In the Sizing Grid area, click the up or down arrow next to the Granularity box to increase or decrease the size of the grid.

Or type a number from 0 to 49.

The grid changes in multiples of 8 pixels. A value of 1 creates a grid with “magnetic” points every 8 pixels, 2 places points every 16 pixels, and so forth. A value of 0 cancels the grid.

You may need to experiment with the value you specify. Specifying a value that is too high may make it difficult to move windows and icons around on the desktop.

3. Choose the OK button.

Changing Border Width

You can change the border width of all the windows on your desktop, except those that have a fixed size (such as most dialog boxes).

► **To change the border width**

1. In the Control Panel window, choose the Desktop icon.
The Desktop dialog box appears.
2. In the Sizing Grid area, click the up or down arrow next to the Border Width box to increase or decrease the border width.
Or type a number from 1 to 50, with 1 being the narrowest border.
You may need to experiment with the value you specify. Specifying a value that is too low may make it difficult to size windows by using the mouse.
3. Choose the OK button.

Setting the Cursor Blink Rate

If the cursor blinks faster or slower than you prefer, you can change the rate.

► **To change the cursor blink rate**

1. In the Control Panel window, choose the Desktop icon.
The Desktop dialog box appears.
2. Move to the Cursor Blink Rate area.
Or press ALT+R.
3. Drag the scroll box toward Fast or Slow to change the blink rate.
Or click the right or left scroll arrow to speed up or slow down the rate.
Or press the RIGHT ARROW or LEFT ARROW key to move the box.
4. Choose the OK button.

Installing and Configuring a Printer

You can use the Printers option to install a printer or change printer settings. The Printers option in Control Panel and the Printer Setup command in Windows Print Manager provide the same method for installing and configuring a printer. Both display the Printers dialog box, in which you select the printer you want to install and then choose other command buttons to connect the printer to a port, connect the port to a network printer, and specify printing options.

However, if Print Manager is not active, you cannot use it to install and configure a printer. In this case, you can use the Printers option in Control Panel either to install and configure a printer or to activate Print Manager. For instructions on how to complete the Printers dialog box, activate Print Manager, and install and configure a printer, see Chapter 6, “Print Manager.”

Configuring Communications Ports

You can specify the communications settings for each serial port your system uses by using the Ports option. You use serial ports (the ports named COM1 through COM4) to connect serial pointing devices, printers, or other serial devices to your computer. Most computers include at least two serial ports: COM1 and COM2. Some devices, such as serial-port adapters, modems, and fax cards, use COM3 and COM4. The settings you specify determine how information is transferred between your computer and the device.

The communications settings you can specify include standard settings, such as those for baud rate, parity, and flow control, and more advanced settings, such as those that specify the base port address and interrupt request line (IRQ) that Windows uses to send information to a serial port. If you plan on using serial ports COM1 and COM2 only, you may only need to change the standard settings. If you plan on using COM3 and COM4, you may also need to change the advanced settings.

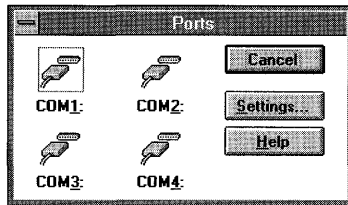
Note Most communications applications that you use to exchange information between computers, such as Windows Terminal, require that you specify standard port settings within the application. These settings, such as baud rate, parity, and data bits, override the settings you specify by using the Ports option in Control Panel.

For details about the standard settings, see the list at the end of the following procedure. For details about the advanced settings, see the next section, “Setting Advanced Options.”

► **To specify standard communications settings**

1. In the Control Panel window, choose the Ports icon.

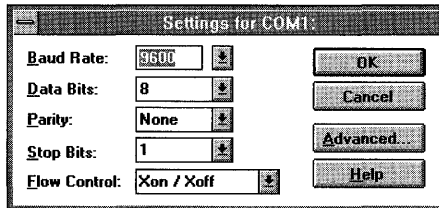
The Ports dialog box appears, showing icons for the four possible serial ports.



2. Double-click the icon for the port whose communications settings you want to specify.

Or press TAB to select the icon for the port you want, and then press ALT+S to choose the Settings button.

The Settings dialog box appears.



3. To display the options for each setting, click the arrow to the right of each box.
Or press TAB to move to each box, and then press ALT+DOWN ARROW.
4. Set the options to match the device connected to the port. A description of each option follows this procedure. For information about the correct settings, see the documentation supplied with the device.
5. When you finish specifying the settings, choose the OK button.
The Ports dialog box appears.
6. Choose the Close button.

The following table describes the Settings options.

Use	To
Baud Rate	Specify the data-transfer rate of your device.
Data Bits	Specify the number of data bits you want to use for each character. Most characters are transmitted in 7 or 8 data bits.
Parity	Specify the type of error-checking you want to use.
Stop Bits	Specify the time between transmitted characters. Stop bits are not actually bits; they are the timing units between characters.
Flow Control	Specify the method for controlling the flow of data. Xon/Xoff (also known as <i>software handshaking</i>) is the standard software method. Select Hardware (or <i>hardware handshaking</i>) if your device controls the flow of data.

Setting Advanced Options

Control Panel provides advanced options for specifying the base port address and the interrupt request line (IRQ) for each serial port. In most cases, Windows can detect the base port address and IRQs used by the serial ports on your computer (usually COM1 and COM2).

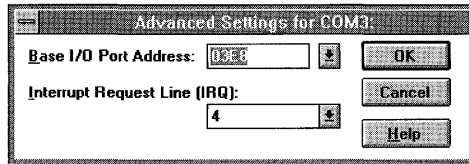
If you plan on using only COM1 and COM2, you probably do not need to change the base port address or IRQ settings. However, if you install additional serial ports, or if a device connected to a serial port does not use the values that Windows detects, you can use the Advanced Options dialog box to change the settings so that they match those required by your device.

Note If you want to use serial ports 1 and 3 or 2 and 4 simultaneously and your computer cannot simultaneously access ports that use the same interrupt, you need to specify a unique IRQ number for each serial port. First, identify which interrupts are not being used by other cards or boards installed in your computer. After you have determined this, you may need to adjust your communications card in order to use the interrupts. For more information, see the documentation supplied with your communications card.

► **To specify advanced port settings for a serial port**

1. In the Settings dialog box, choose the Advanced button.

The Advanced Settings dialog box appears.



2. Open the Base I/O Port Address list, and then select an address value from the list.

Or type a value in the box.

Click the arrow next to the box to open the list. Or press TAB to move to the box, and then press ALT+DOWN ARROW.

3. Open the Interrupt Request Line (IRQ) list, and then select an IRQ number from the list.

Or type a number between 2 and 15 in the box.

The table following this procedure lists common port address and IRQ settings. See the manual that came with your device for information about the interrupt and base port address that your device uses. If you are not sure which settings to use, select Default.

4. Choose the OK button.

Any change you make to the Base I/O Port Address option does not take effect until you restart Windows. If you change this option, a dialog box appears, asking you whether you want to restart Windows.

5. To restart Windows, choose the Restart Now button.

The following table lists common port address and IRQ settings you can use if Windows does not provide settings.

Port	Address	IRQ
COM1	03F8	4
COM2	03E8	3
COM3	02F8	4
COM4	02E8	3

Setting Network Options

If you installed a network when setting up Windows, the Control Panel window includes a Network icon. You can choose this icon to view information about your network or to specify settings available for your particular network.

When you choose the Network icon, a dialog box specific to your network appears. The following are some of the tasks you might be able to perform by using this dialog box:

- Sign on and off the network.
- Change user ID and password.
- Send messages to other network users.
- Restore network connections when you start Windows.

For information about the tasks you can perform by using your network, see your network documentation and online Help (if available) in the dialog box.

Using Fonts

A *font*, or typeface, is a collection of letters, numerals, symbols, and punctuation marks that have common characteristics. Fonts come in different sizes and styles. Font sizes indicate the height of a character and are measured in points—a point equals 1/72 of an inch. Font styles include bold and italic.

Choosing the right font, font size, and font style can help you create whatever look you want for a document—professional, highly visual, draft quality, and so on. The right fonts can also make a document easier to read. The font size and type determine how much text can fit on one page of a document.

Windows Fonts and Printer Fonts

Windows supplies several fonts that are installed when you set up Windows on your computer. These fonts include:

- Screen fonts, which are used by Windows to display information such as the text that appears in application windows and in dialog boxes. Screen fonts come in predefined point sizes. Screen fonts also print on some printers (for example, on dot-matrix printers).
- Plotter fonts, which are scalable to any point size and are most often used for displaying information on the screen and for plotting graphics with pen plotters. Plotter fonts can also be used with some dot-matrix printers. However, the print quality may not be as high.
- TrueType fonts, which are scalable to any point size and look exactly the same on the screen as they do printed. For information about TrueType fonts, see “Using TrueType Fonts” later in this chapter.

Printers also include built-in fonts for printing. These fonts are referred to as *printer fonts*. The number of printer fonts a printer supports varies according to the capabilities of the printer. Dot-matrix and some laser printers include one or two printer fonts, whereas PostScript-compatible printers include several printer fonts. When you install a printer, the printer fonts appear in your Windows applications in the Font list of the Fonts dialog box.

Cartridge Fonts and Soft Fonts

In addition to printer fonts, you can also use soft fonts and cartridge fonts. To use soft fonts, you need to install them by using the installation program that comes with your fonts package. If an installation program was not provided with your fonts package and you are using a Hewlett-Packard LaserJet or DeskJet (PCL) printer, you can use the Font Installer program provided by Windows.

To use cartridge fonts, you need to insert one or more font cartridges into the cartridge slots on your printer. You might also need to install them if the support for the fonts is not built in to the printer driver for your printer. If you need to use Font Installer, you can do so while setting printing options. For more information about setting printing options and using Font Installer, see Chapter 6, “Print Manager.”

Viewing Printer, Soft, and Cartridge Fonts on the Screen

Because various printers and screens display information at different resolutions, many printer drivers and cartridge- and soft-font packages include matching screen fonts so that the fonts look the same on your screen as they do printed. If matching screen fonts are not included with your fonts cartridge or soft-fonts package, check with your printer or font manufacturer to see if they are available.

If you format text using a cartridge, soft, or printer font, and no matching screen font is available, then one of the screen, plotter, or TrueType fonts supplied by Windows is used to display text on the screen. Though the font you see on the screen may not look exactly like the font you see in the printed document, the substitute font creates line lengths and page breaks on the screen similar to those in the printed file.

Using TrueType Fonts

If you use TrueType fonts in your documents, Windows and all Windows applications display the fonts on the screen exactly as they appear when printed: There is no need to install matching screen fonts. In addition, by using TrueType fonts, your documents become more portable: They look the same printed on different printers, as long as you use the same application and print at the same resolution.

Note If you print at a different resolution, or are printing a document from an older application, line and page breaks might change.

Because several TrueType fonts are installed automatically when you set up Windows, they are available to your printer and your Windows applications immediately. In the applications that come with Windows (such as Write and Paintbrush), TrueType fonts appear in the Font list of the Fonts dialog box with a TT symbol next to them. If you purchase additional TrueType fonts, you can add them to Windows and your Windows applications by using the Fonts option in Control Panel.

Adding Screen and TrueType Fonts

When you install a printer driver, any screen fonts that match the printer fonts your printer supports are also installed. If you are using cartridge or soft fonts, your font manufacturer usually supplies an installation program for installing screen fonts; or the installation program that installs the cartridge or soft fonts may install the screen fonts automatically.

If no installation program is provided for installing screen fonts, you can use the Fonts option to install them. You can also use the Fonts option to install any additional TrueType fonts that you purchase.

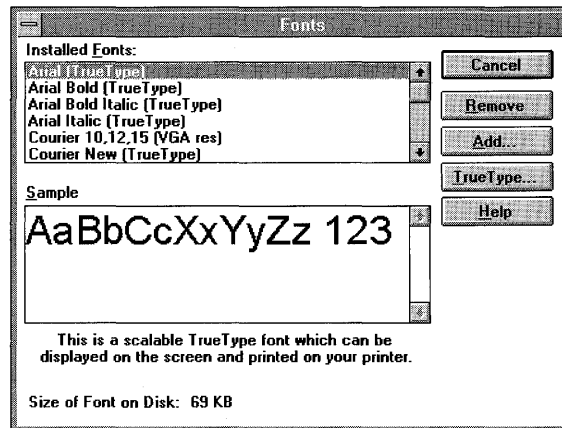
All installed fonts are listed in the Fonts dialog box, with the type (for example, TrueType or Plotter) displayed in parentheses. Screen fonts are designated by the resolution of your screen. For example, (VGA res) screen fonts are used on VGA screens, (EGA res) screen fonts are used on EGA screens, and (8514 res) screen fonts are used on 8514 screens.

► **To add a font**

1. In the Control Panel window, choose the Fonts icon.

The Fonts dialog box appears.

The Sample box displays the selected font in all available sizes unless the font is a plotter font or a TrueType font. Plotter fonts can be scaled to any height, so the only size displayed is the size used to design the font. TrueType fonts can also be scaled to any height and are displayed in about 24-point size.



2. Choose the Add button.
The Add Fonts dialog box appears.
3. Open the Drives list, and then select the drive that contains the fonts you want to add.
Click the arrow next to the box to open the list. Or press TAB to move to the box, and then press ALT+DOWN ARROW.
4. Select the directory where the fonts you want to add are located.
The fonts on the selected drive and in the selected directory appear in the List Of Fonts box.

5. From the List Of Fonts box, select the fonts you want to add.

You can extend the selection to include all the fonts you want to add at once. (For information about how to extend the selection, see Chapter 2, “Application Basics.”)

To add every font in the list, choose the Select All button.

6. If you have limited disk space, you can clear the Copy Fonts To Windows Directory check box. You can then use the fonts directly from the directory in which they are located, without copying them to your Windows directory. For example, this is useful if you are using a CD-ROM that contains hundreds of TrueType fonts.

If you want to use fonts that are located on a network or on a removable disk drive, it is recommended that you select the Copy Fonts To Windows Directory check box, if you have enough disk space to store the fonts. This ensures that the fonts will always be available, even if the source drive is removed or the fonts are removed from the network.

If you select the Copy Fonts To Windows Directory check box and are running Windows from a network, the fonts will be copied to your Windows SYSTEM directory.

7. Choose the OK button to add the font.

The Fonts dialog box appears.

8. Choose the Close button.

Turning TrueType Font Options On or Off

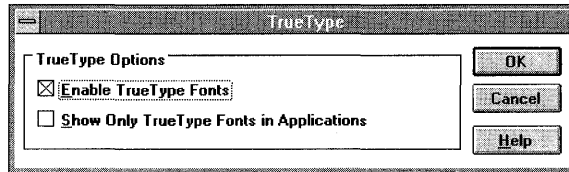
TrueType fonts require additional memory. If you have a limited amount of memory, you may want to turn them off when you are not using them in your applications. TrueType fonts are on by default.

If you find you use only TrueType fonts in your documents, you can prevent all other fonts from appearing in the fonts lists of your Windows applications. These fonts include screen, plotter, and printer fonts.

Note Selecting the Show Only TrueType Fonts In Applications check box does not turn off non-TrueType fonts. It only prevents them from appearing in the fonts lists of your Windows applications. You can still use your Windows applications to view and print documents that contain other fonts. Some applications do not support listing TrueType fonts exclusively. If you select the Show Only TrueType Fonts In Applications check box, and no TrueType fonts appear in your application, then do not use this option.

► **To set TrueType options**

1. In the Control Panel window, choose the Fonts icon.
The Fonts dialog box appears.
2. Choose the TrueType button.
The TrueType dialog box appears.



3. Clear the Enable TrueType Fonts check box to turn off TrueType fonts, or select the Show Only TrueType Fonts In Applications check box to use TrueType fonts exclusively.
If you turn off TrueType fonts, then the Show Only TrueType Fonts In Applications option is unavailable.
4. Choose the OK button.
Any change you make to the Enable TrueType Fonts option does not take effect until you restart Windows. If you change this option, a dialog box appears, asking you if you want to restart Windows.
5. To restart Windows, choose the Restart Now button.

Removing a Font

You can remove fonts you do not use from the Installed Fonts list. Because fonts occupy memory, removing them frees this memory for use by your applications.

Caution The MS® Sans Serif font set is used for most Windows dialog boxes. Do not remove this font; if you do, the text in the dialog boxes will be difficult to read.

► **To remove a font**

1. In the Control Panel window, choose the Fonts icon.
The Fonts dialog box appears.
2. In the Installed Fonts list, select the font you want to remove.
You can extend the selection to include all the fonts you want to remove at once. (For information about how to extend the selection, see Chapter 2, “Application Basics.”)

3. Choose the Remove button.

A dialog box appears, asking you to confirm the removal.

4. If you want to delete the font files from your disk in addition to removing the fonts from memory, select the Delete Font File From Disk check box.

Caution It is recommended that you do not delete fonts from the disk if you chose not to copy the fonts to your Windows directory. In this case, you may be deleting the original font files, and you may not be able to re-add the fonts if you decide to use them later.

5. Choose the Yes button or, if you are removing several fonts at the same time, the Yes To All button.

The Fonts dialog box appears.

6. Choose the Close button.

Specifying International Settings

By using the International option, you can specify settings for Windows and all the Windows applications that use international settings. You can also specify the format Windows uses to display the date and time in your applications. If you are using Windows in English within the United States, you do not need to make any changes to the international settings unless you want to change the date and time format.

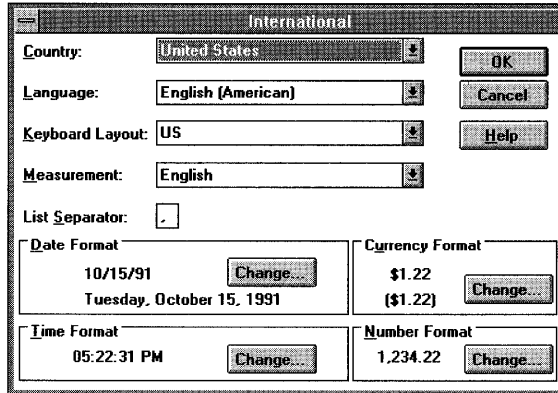
Note Changing the International settings does not change the language of Windows itself. Additional language versions of Windows can be obtained separately.

Basic Settings

Using with the International option, you can specify basic international settings such as the country, language, keyboard layout, system of measurement, and the list separator you want to use. When you select a country, Windows adjusts the date, time, currency, and number formats to reflect those used by the selected country. You can also adjust these settings yourself to customize them for your particular situation.

► **To select international settings**

1. In the Control Panel window, choose the International icon.
The International dialog box appears.



2. Specify the settings for Country, Language, Keyboard Layout, Measurement, and List Separator.
A description of each option follows this procedure.
3. Specify the settings for Date, Time, Currency, and Number formats.
For information about these options, see the procedures that follow.
4. Choose the OK button.

Use	To
Country	Specify the country whose standard settings you want to use. When you select the country, Windows adjusts the settings for the date, time, number, and currency formats, in addition to the Paper Size option in the Print Setup dialog box, to match the standard formats used by that country.
Language	Specify the language you want to work in. The language you select affects the way applications sort information. For example, if the language you are working in includes accented characters, setting this option to that language ensures that your applications will correctly sort words or phrases that include these characters.
Keyboard Layout	Specify the keyboard layout of your computer. Keyboard layouts vary to accommodate the special characters and symbols used in different languages. Windows uses this setting to interpret the keys you press.
Measurement	Select the metric or English system of measurement.

Use	To
List Separator	Specify a symbol to separate elements in a list. In English, the list separator is typically a comma and is used to separate words or numbers that appear in a series.

Date Format

You can change the way the date is displayed in applications that have a date function. For example, you can vary the order of month, day, and year, or change the punctuation used to separate parts of the date.

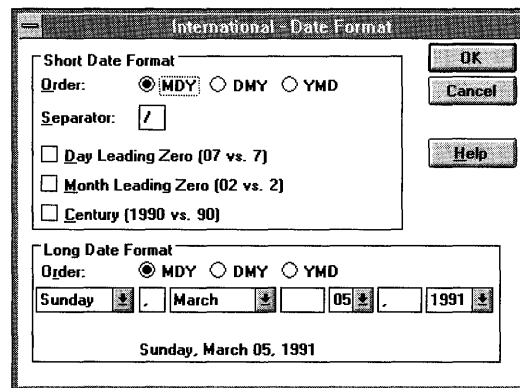
► To change the date format

1. In the Control Panel window, choose the International icon.

The International dialog box appears.

2. In the Date Format area, choose the Change button.

The Date Format dialog box appears.



3. Set the options you want for both the Short Date Format and Long Date Format. A description of each option follows this procedure.
4. Choose the OK button. The International dialog box appears.
5. Choose the OK button.

The Short Date Format displays the date as three numbers, representing the month, day, and year. You specify the order and number of digits for each part of the date. The Long Date Format displays the date as a combination of words and numbers (for example, Monday, October 19, 1992) or a variation you specify. Descriptions of the options for both formats follow.

Use	To
Order	Specify the order of the month (M), day (D), and year (Y). This option works the same for Short and Long Date Formats.
Separator	Specify a symbol to separate the month, day, and year. You can specify any character as the separator, though the most common are the slash (/) and the hyphen (-).
Day/Month Leading Zero	Specify that the day or month appear as two digits. For example, February 7 appears as 02-07.
Century	Specify that the year be displayed as four digits. For example, December 10, 1992, appears as 12-10-1992.
Long Date Format options	Specify alternative choices for the Long Date Format, including abbreviations for the day and month and different separators.

Time Format

You can select either the 12-hour or 24-hour format and a number of related options. For example, you can add suffixes to the date, such as AM for morning or PST for Pacific Standard Time.

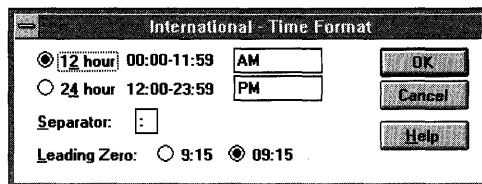
► To change the time format

1. In the Control Panel window, choose the International icon.

The International dialog box appears.

2. In the Time Format area, choose the Change button.

The Time Format dialog box appears.



3. Set the options you want.

A description of each option follows this procedure.

4. Choose the OK button.

The International dialog box appears.

5. Choose the OK button.

The following table describes the Time Format options.

Use	To
12-Hour/24-Hour	<p>Display time in numbers representing the hours between 1 and 12 or between 0 and 23.</p> <p>If you use the 12-hour format, specify your country's notation for <i>before</i> noon in the upper box next to 00:00–11:59.</p> <p>If you use the 12-hour format, specify your country's notation for <i>after</i> noon in the lower box next to 12:00–23:59.</p> <p>If you use the 24-hour format, you can only use the lower box to specify a special suffix, such as PST.</p>
Separator	<p>Select a character to separate the hours, minutes, and seconds. Any character is acceptable, but the most common is the colon (:).</p>
Leading Zero	<p>Display the hours before ten o'clock as a two-digit number, with the first digit being a zero. For example, nine o'clock appears as 09:00.</p>

Currency Format

You can control the way currency is represented in Windows applications.

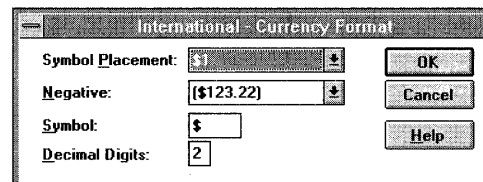
► To change the currency format

1. In the Control Panel window, choose the International icon.

The International dialog box appears.

2. In the Currency Format area, choose the Change button.

The Currency Format dialog box appears.



3. Set the options you want.

A description of each option follows this procedure.

4. Choose the OK button.

The International dialog box appears.

5. Choose the OK button.

The following table describes the Currency Format options.

Use	To
Symbol Placement	Specify the placement and spacing of the currency symbol relative to the amount.
Negative Symbol	Select the way you want negative numbers to appear.
Symbol	Specify a different currency symbol for your country.
Decimal Digits	Specify the number of digits you want to appear after the decimal separator.

Number Format

You can control the way numbers are displayed in Windows and many Windows applications.

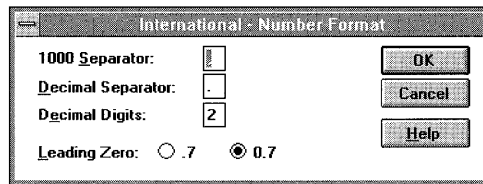
► To change the number format

1. In the Control Panel window, choose the International icon.

The International dialog box appears.

2. In the Number Format area, choose the Change button.

The Number Format dialog box appears.



3. Set the options you want.

A description of each option follows this procedure.

4. Choose the OK button.

The International dialog box appears.

5. Choose the OK button.

The following table describes the Number Format options.

Use	To
1000 Separator	Change the punctuation that separates thousands.
Decimal Separator	Change the punctuation that separates the fractional part of a decimal number from the whole number part.
Decimal Digits	Specify the number of digits to appear after the decimal separator.
Leading Zero	Specify whether the decimal is preceded by a zero.

Customizing the Mouse and Other Pointing Devices

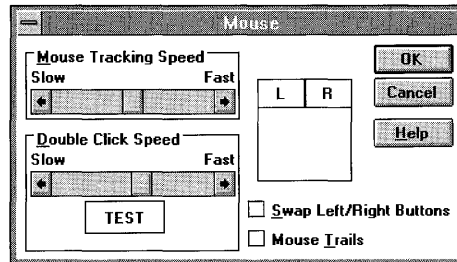
You can make several adjustments to the way Windows works with your pointing devices, depending on the type of pointing device you are using. For example, if you are using a mouse, you may be able to switch the functions of the left and right buttons and change the speed of the mouse pointer.

Before customizing your pointing device, you need to install it and its driver. For more information, see the documentation for your pointing device.

► To customize your pointing device

1. In the Control Panel window, choose the icon for your pointing device.

A dialog box appears for the device you are using. The following is the Mouse dialog box supplied by Windows.



2. Set the options you want, and then choose the OK button.

The options vary, depending on the pointing device you are using. For details about the options and their settings, see the documentation for your pointing device and online Help, if available.

If you are using a Microsoft Mouse or compatible, Windows provides a standard Mouse dialog box. The dialog box has the following options.

Use	To
Mouse Tracking Speed	Change the speed at which the pointer moves across the screen.
Double Click Speed	Change the speed at which Windows registers a double-click when you press your mouse button. If you increase the speed, double-click the Test button to make sure you're clicking fast enough for the new setting. The Test box blinks if your double-click is fast enough.
Swap Left/Right Buttons	Switch the functions of the left and right mouse buttons. With many applications, you use the left button as the primary tool for selecting text and choosing items. If you are left-handed, you might find it more convenient to use the right button.
Mouse Trails	Leave a trail of pointer icons as you move the pointer across the monitor. If you are using an LCD monitor, this option makes the mouse pointer easier to see.

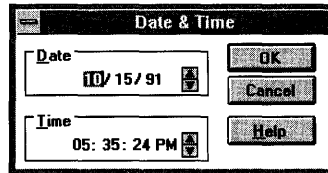
Note The changes you make to the Swap Left/Right Buttons and Mouse Trails options take effect immediately, before you close the dialog box. If you switch the buttons, you either need to click the right button to choose the OK or Cancel button, or switch the mouse buttons again. If the display driver you are using does not support mouse trails, this option is unavailable.

Setting the System Date and Time

You can change the system date and time by using the Date/Time option. The system date and time are reflected in Clock and Calendar (two Windows applications in the Accessories group), and in the information kept by File Manager for each file you save on your disk. The format of the date and time depends on the international settings you choose (for information, see "Specifying International Settings" earlier in this chapter).

► **To change the date**

1. In the Control Panel window, choose the Date/Time icon.
The Date & Time dialog box appears.



2. Select the part of the date (day, month, or year) you want to change.
3. Type the new value, or click the up or down arrow at the right of the Date box to change one date element at a time.
4. Choose the OK button.

► **To change the time**

1. In the Control Panel window, choose the Date/Time icon.
The Date & Time dialog box appears.
2. Select the part of the time (hour, minute, second, suffix) you want to change.
3. Type the new value, or click the up or down arrow at the right of the Time box to change the selected part one unit at a time.
4. Choose the OK button.

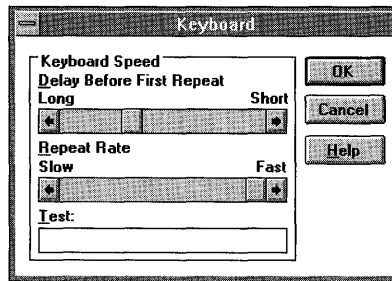
Adjusting Keyboard Speed

By using the Keyboard option, you can specify the keyboard delay (how long your computer waits after you hold down a key before it repeats that key) and how fast a key repeats when you press it and hold it down.

► **To change the keyboard delay and repeat rate**

1. In the Control Panel window, choose the Keyboard icon.

The Keyboard dialog box appears.



2. Drag the Delay Before First Repeat scroll box toward Long or Short to increase or decrease the delay, or click the appropriate scroll arrow.
Or press the LEFT ARROW or RIGHT ARROW key to increase or decrease the delay time.
3. Drag the Repeat Rate scroll box toward Fast or Slow to increase or decrease the repeat rate, or click the appropriate scroll arrow.
Or press the RIGHT ARROW or LEFT ARROW key to increase or decrease the rate.
4. To test the speed, move to the Test box and type or hold down any key on the keyboard.
Adjust the box positions until you reach a delay speed or repeat rate you are comfortable with.
5. Choose the OK button.

Installing and Configuring Drivers

When you add new devices to your system, you need to install the driver that controls the device. A device driver is a program that allows a specific piece of hardware (or *device*) to communicate with Windows. Although the device may be installed in or connected to your computer, Windows will not recognize the device until after you install and configure the driver.

You can use the Drivers option in Control Panel to install certain device drivers. These drivers most often include those for multimedia devices, such as sound cards or videodisc players. They may also include other drivers, such as those for pens or for pointing devices other than a mouse. Generally your device package includes a disk containing the appropriate Windows device driver. Windows also provides drivers for some sound cards. If you do not have a driver for your device, contact your device manufacturer about providing one.

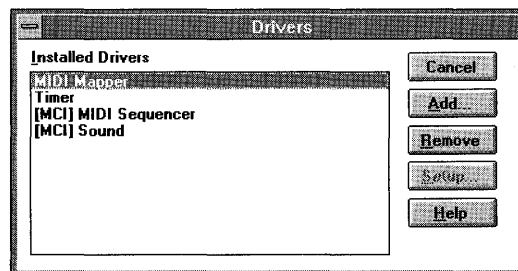
To install device drivers for your mouse, keyboard, and printer, and international drivers, you need to run the Setup program or use the appropriate option in Control Panel. For information about the International option in Control Panel, see “Specifying International Settings” earlier in this chapter. For more information about using Setup to install display (monitor), keyboard, and mouse drivers, see Chapter 15, “Maintaining Windows with Setup.” For information about installing a printer driver, see Chapter 6, “Print Manager.”

Note You cannot install an updated version of a device driver that is already installed on your system until you remove the old driver. If you do not remove the old driver, you will receive a message while attempting to install the new one. For more information about how to remove a device driver, see “Removing a Driver” later in this chapter.

► To install a new device driver supplied by Windows

1. In the Control Panel window, choose the Drivers icon.

The Drivers dialog box appears, displaying a list of the drivers already installed.



2. Choose the Add button.

The Add dialog box appears, listing devices that Windows provides drivers for.

If your device is not listed, see “Installing a Driver Not Supplied with Windows” following this procedure.

3. Select the driver you want to install from the list, and then choose the OK button.

A dialog box may appear, prompting you to insert the disk that contains the driver.

4. Insert the disk containing the device driver you want to install into drive A. Or, if the driver is located on your hard disk, type the drive and directory where it is located. Do not type the filename for the driver.

If you do not know where the driver is located, you can choose the Browse button. This displays the Browse dialog box, in which you can locate and select the drive and directory where the driver is located. When you are finished using the Browse dialog box, choose the OK button.

5. In the Install Driver dialog box, choose the OK button.

If the driver requires additional settings (for example, you might need to change the port address and interrupts used by your sound card), a setup dialog box appears for the driver.

6. Select the settings required by the driver.

It is important that the settings you specify do not conflict with the settings used by other devices installed on your system, such as a mouse or network card. For example, the interrupts used by each device must be unique. See the manuals for your devices to determine the settings they are using. Then see the manual that came with the device you are configuring for information about its settings.

7. When you are finished selecting the settings, choose the OK button.

When you install a device driver, Windows installs additional related drivers. These drivers may also require specific settings. In this case, other setup dialog boxes may appear.

8. Repeat steps 6 and 7 until all related drivers have been configured.

Any new driver and any changed driver settings do not take effect until you restart Windows. A dialog box may appear, asking if you want to restart Windows.

9. To have your changes take effect immediately, choose the Restart Now button.

Installing a Driver Not Supplied with Windows

When you purchase a new device, such as a sound card, the associated driver should be included with the device. If you do not have a driver for your device, contact the device manufacturer to get one. Follow any instructions the manufacturer provides for installing the driver.

If there are no instructions, complete the following steps to install the device driver.

► To install a driver provided by the device manufacturer

1. In the Control Panel window, choose the Drivers icon.

The Drivers dialog box appears, displaying a list of the drivers already installed.

2. Choose the Add button.

The Add dialog box appears.

3. In the List Of Drivers box, select Add Unlisted Or Updated Driver, and then choose the OK button.

A dialog box appears, instructing you to insert the disk that contains setup information for the driver (this may be the same disk that contains the driver file).

4. Insert the disk containing the setup information into drive A. Or, if the setup information is located on your hard disk, type the drive and directory where the information is located. Do not type the driver filename.

If you do not know where the setup information is located, you can choose the Browse button. This displays the Browse dialog box, in which you can locate and select the drive and directory where the information is located. When you are finished using the Browse dialog box, choose the OK button.

5. In the Install Driver dialog box, choose the OK button.

Another dialog box appears, listing the drivers you can install.

6. Select the driver you want to install.

7. Choose the OK button.

If the driver is located on a different disk, another dialog box appears asking you to insert the disk that contains the driver. If this dialog box does not appear, go to step 10.

8. Insert the disk that contains the driver, or specify the drive and directory where the driver is located. You can also use the Browse button.

9. Choose the OK button.

If the driver requires additional settings, a setup dialog box appears for the driver.

10. Select the settings required by the driver.

It is important that the settings you specify do not conflict with the settings used by other devices installed on your system, such as a mouse or network card. For example, the interrupts used by each device must be unique. See the manuals for your devices to determine the settings they are using. Then see the manual that came with the device you are configuring for information about its settings.

11. When you are finished selecting the settings, choose the OK button.

When you install a device driver, Windows installs additional related drivers. These drivers may also require additional settings. In this case, other setup dialog boxes may appear.

12. Repeat steps 10 and 11 until all related drivers have been configured.

Any new driver and any changed driver settings do not take effect until you restart Windows. A dialog box may appear, asking if you want to restart Windows.

13. To have your changes take effect immediately, choose the Restart Now button.

Specifying Driver Settings

After a device driver is installed, you can change any of its settings. For instructions on how to install a driver, see “Installing and Configuring Drivers” earlier in this chapter.

► To adjust device-driver settings

1. In the Control Panel window, choose the Drivers icon.

The Drivers dialog box appears.

2. In the Installed Drivers list, select the driver you want to configure.

3. Choose the Setup button.

Some drivers do not require specific settings. If you select such a driver, the Setup button is unavailable.

The Setup dialog box appears. The options in this dialog box vary according to the driver you are configuring.

4. Set the options as described in your device's manual.

5. Choose the OK button.

The changes you make may not take effect until you restart Windows. If this is the case, a dialog box may appear, asking if you want to restart Windows.

6. To have the new settings take effect immediately, choose the Restart Now button.

Removing a Driver

If you are no longer using a device, you can remove its driver from the Installed Drivers list. Removing a driver from the Installed Drivers list does not remove the driver file from your hard disk. If you need to use the same device later, you can add its driver again.

Caution The device drivers that are automatically installed during Setup are required by your system (these are the drivers that are displayed when you first opened the Drivers dialog box). If you remove one of these drivers, your system may not work properly.

► To remove a device driver

1. In the Control Panel window, choose the Drivers icon.
The Drivers dialog box appears.
2. In the Installed Drivers list, select the driver you want to remove.
3. Choose the Remove button.
A dialog box appears, asking you to confirm your decision to remove the driver.
4. Choose the Yes button.
A dialog box appears, asking you if you want to restart Windows.
5. To have the removal take effect immediately, choose the Restart Now button.

Using Sound

Control Panel provides several options to control how sound works in Windows. With these options, you can perform simple sound tasks, such as assigning different sounds to system and application events. If you are using a sound device that has Musical Instrument Digital Interface (MIDI) capabilities, you can specify MIDI settings for your device. For more information about assigning sounds to system and application events and specifying MIDI settings for synthesizers, see the following sections, “Assigning Sounds to Events” and “Changing MIDI Settings.”

To use basic sound in Windows, you should have a sound card installed in your computer that conforms to the Multimedia Personal Computer (MPC) specifications. To use both basic and MIDI sound capabilities, you also need to install the sound drivers that control your sound card and other sound devices, such as synthesizers. For information about installing and configuring drivers for your sound devices, see “Installing and Configuring Drivers” earlier in this chapter.

Assigning Sounds to Events

Control Panel provides a Sound option that you can use to assign sounds to different application and system events. For example, you can select a sound to play whenever you start Windows. The other sounds play as specified by the application you are using.

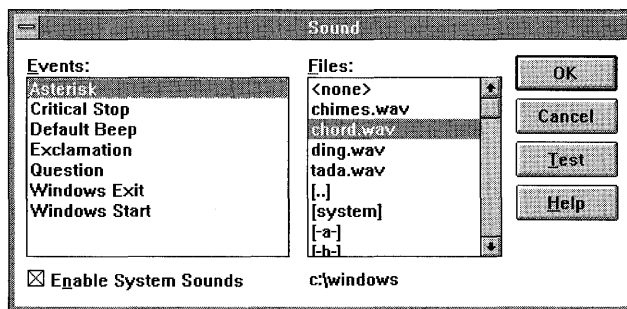
For example, some applications play the sound assigned to the Default Beep whenever you click the mouse button outside of an open dialog box. Other applications may play the sound assigned to Exclamation or Asterisk whenever you encounter a warning message. The sounds you can assign to these events are stored in files that have the .WAV extension.

To use sound in Windows, the sound driver that controls your sound card must be installed and configured for your system. If you do not have a sound card or if the sound driver is not configured properly, Windows will use a warning beep when it encounters an error or you attempt to do something your computer does not recognize. For more information about installing and configuring sound drivers, see “Installing and Configuring Drivers” earlier in this chapter.

► To assign sounds to events

1. In the Control Panel window, choose the Sound icon.

The Sound dialog box appears.



2. In the Events list, select the event that you want to assign a sound to.
If a sound file is assigned to that event, it is selected in the Files list.
Otherwise, None is selected.
3. In the Files list, select the sound file you want to use. If the file you want is not listed, select the drive and directory where the file is located, and then select the file. If you don't want to assign a sound to the selected event, select None.

4. To hear the sound, choose the Test button or double-click the event or filename.
5. Repeat steps 2 through 4 until you have assigned a sound to each event you want.
6. When you are finished, choose the OK button.

Turning Sounds and the Warning Beep On or Off

If no sounds have been assigned to events or if you do not have a sound driver installed, Windows uses a warning beep when it encounters an error or you attempt to do something your computer does not recognize.

You can turn the warning beep and all other sounds, except those assigned to Windows Exit and Windows Start, on or off. (If you do not want to play a sound when starting or quitting Windows, you must assign None to Windows Start or Windows Exit.)

► To turn sounds and the warning beep on or off

1. In the Control Panel window, choose the Sound icon.

The Sound dialog box appears.

2. Select or clear the Enable System Sounds check box.

(If you want to turn off sound for a specific event, select the event from the Events list, and then select None from the Files list.)

3. Choose the OK button.

Changing MIDI Settings

If you are using a sound device, such as a synthesizer, that has Musical Instrument Digital Interface (MIDI) capabilities, you can specify MIDI settings for your device.

Windows supports two different standards for playing MIDI information generated by an application or stored in a MIDI file. These standards, the General MIDI guidelines and the Microsoft authoring guidelines for MIDI files, both include certain instrument patch settings and key assignments, as defined by the General MIDI specification, but differ in the channel settings they require.

When you set up Windows, the Setup program installs MIDI setups that support both standards for playing MIDI information on common sound-card and synthesizer combinations. These setups include key maps, patch maps, and channel settings that ensure that the MIDI information plays accurately on your

synthesizer. You can use MIDI Mapper to select a different MIDI setup, create a new setup, edit key assignments, or edit patch or channel mappings for an existing setup.

Caution To use MIDI Mapper, you should have a basic understanding of MIDI concepts and terminology. It is recommended that you not use MIDI Mapper to edit or create MIDI setups unless you are experienced with MIDI and understand the results of the changes you make.

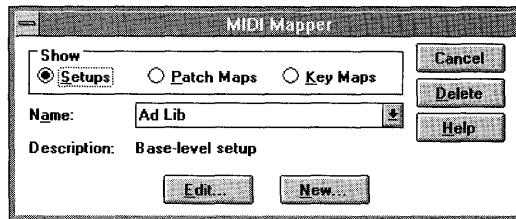
Selecting a MIDI Setup

If you are using an application, such as Windows Media Player, that uses MIDI setups to play MIDI files, you need to select the MIDI setup for the synthesizer that will be playing the file.

► To select a MIDI setup

1. In the Control Panel window, choose the MIDI Mapper icon.

The MIDI Mapper dialog box appears.



2. In the Show area, select the Setup option button (this button is selected by default).
3. Open the Name list, and then select the setup you want to use. A description of the setups provided by Windows follows this procedure.
4. Choose the Close button.

The following table lists the MIDI setups provided by Windows, and describes the setups you should use with your synthesizer and MIDI output port.

Use	With
Ad Lib	The Ad Lib or Ad Lib-compatible synthesizer included on your sound card. This setup uses channels 12–16 (base-level channels).
Ad Lib General	The Ad Lib or Ad Lib-compatible synthesizer included on your sound card. This setup uses all 16 channels.
LAPC1	The Roland synthesizer included on your LAPC1 sound card. This setup uses all available LAPC1 channels.
MT32	The Roland MT-32 synthesizer connected to the Sound Blaster MIDI output port. This setup uses all available MT32 channels.
Proteus/1	The E-mu Systems Proteus/1 synthesizer connected to the Sound Blaster MIDI output port. This setup uses channels 1–10 (extended-level channels).
Proteus General	The E-mu Systems Proteus/1 synthesizer connected to the Sound Blaster MIDI output port. This setup uses all 16 channels.
Extended MIDI	Any General MIDI synthesizer, such as the Roland Sound Canvas (SC-55), connected to the Sound Blaster MIDI output port. This setup uses channels 1–10 (extended-level channels). Use this setup to play MIDI files authored according to Microsoft guidelines.
General MIDI	Any General MIDI synthesizer, such as the Roland Sound Canvas (SC-55), connected to the Sound Blaster MIDI output port. This setup uses all 16 channels. Use this setup to play MIDI files authored according to General MIDI guidelines.

If you plan on playing MIDI files that are authored according to General MIDI guidelines, use a “general” setup for your synthesizer. If you plan on playing MIDI files that are authored according to Microsoft guidelines, use the other setup.

If you are using a synthesizer that is connected to a MIDI output port other than Sound Blaster or a Sound Blaster compatible port, you will need to edit the setup to change the port assignments. For information about editing MIDI setups, see “Editing Key Maps, Patch Maps, and Setups” later in this chapter. If you are using a synthesizer that is not included in the list, you may need to create a MIDI setup for it.

Creating a New MIDI Setup

You may need to create a MIDI setup if:

- You connect your computer to a MIDI synthesizer that does not support General MIDI and you want to play MIDI files authored according to General MIDI guidelines.
- You connect your computer to a MIDI synthesizer and Windows does not supply a setup for it.
- You are using a MIDI synthesizer or sound card that includes a built-in synthesizer and Windows does not supply a MIDI setup for it.

In this case, check with your MIDI- or sound-card manufacturer to see if an updated MIDIMAP.CFG file that includes a MIDI setup for your sound card is available. If you are able to obtain this file, quit MIDI Mapper, make a backup copy of the original MIDIMAP.CFG file, and then copy the MIDIMAP.CFG file you received from the manufacturer into your Windows SYSTEM directory. For information about copying files, see Chapter 4, "File Manager."

There are several steps involved in creating a new MIDI setup. You need to perform these steps in the following order:

1. Set up the synthesizer to receive MIDI messages on multiple MIDI channels. Refer to the manual that came with your synthesizer for information about how to do this.
2. Determine whether your synthesizer is a base-level synthesizer, an extended-level synthesizer, or a synthesizer that has enough voices to play General MIDI files.

Base-level synthesizers meet these minimum requirements: the ability to play six notes on three melodic instruments and three notes on three percussion instruments simultaneously. Extended-level synthesizers meet these minimum requirements: the ability to play 16 notes on nine melodic instruments and 16 notes on eight percussion instruments simultaneously. Synthesizers that can play General MIDI files have 24 voices or can play 16 notes on 15 melodic channels and eight notes of percussion.

3. Create a key map for percussion instruments. Depending on your synthesizer, you might also need to create a key map to specify key-registration changes for melodic instruments. For example, if your synthesizer plays a certain patch one octave higher than General MIDI specifies, you can create a key map to correct the octave registration. For information about creating key maps, see the next topic, "Creating a Key Map."

4. Create two patch maps: one for the melodic instruments and one for the percussion instruments. For information about creating patch maps, see “Creating a Patch Map” later in this chapter.
5. Specify the channel mapping for your synthesizer.

Caution For the settings you specify in a MIDI setup to take effect, the application you are using to play MIDI files or send MIDI information must use MIDI Mapper. Also, the application must send patch-select and volume-change messages, or a MIDI file must include them. MIDI files authored for Windows meet these requirements. If you are not sure whether your application supports MIDI Mapper, see your documentation or contact the application vendor.

Creating a Key Map

General MIDI specifies that certain keys, when played on a percussive channel, correspond to certain percussion instruments. General MIDI also specifies that each key, when played on a melodic channel, generates sounds within a certain octave. If your synthesizer does not support these specifications, you need to create a new key map for the percussion instruments. If your synthesizer plays certain sounds at registrations that differ from General MIDI definitions (for example, playing a patch a fifth higher than General MIDI specifies), you may also need to create a melodic key map for registration changes.

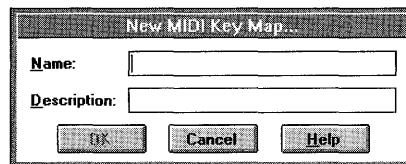
► To create a key map

1. In the Control Panel window, choose the MIDI Mapper icon.

The MIDI Mapper dialog box appears.

2. In the Show area, select the Key Maps option button.
3. Choose the New button.

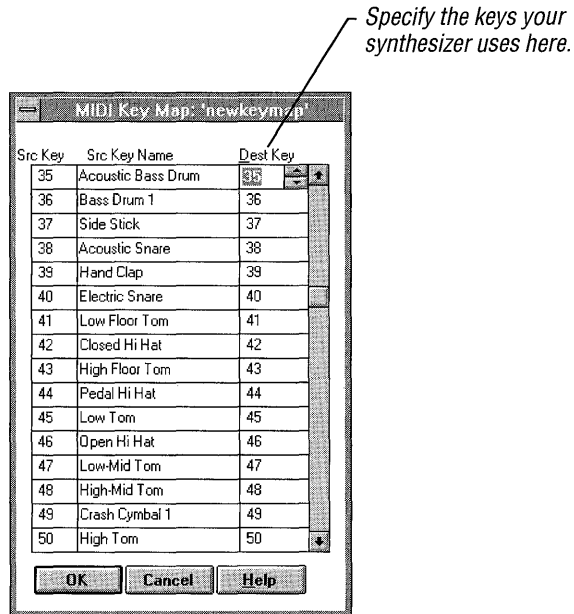
The New MIDI Key Map dialog box appears.



4. In the Name and Description boxes, type a name and description for the new key map.

5. Choose the OK button.

A dialog box for the new key map appears, listing the percussive sounds for source keys 35 through 81 as defined by General MIDI.



6. Specify the destination keys required by your synthesizer.

A detailed description of the options in the MIDI Key Map dialog box follows this procedure.

7. When you are finished, choose the OK button.

A dialog box appears, asking if you want to save your changes.

8. Choose the Yes button to confirm the changes.

9. In the MIDI Mapper dialog box, choose the Close button.

The following list describes the options in the MIDI Key Map dialog box.

Option	Description
Src Key	Lists the MIDI keys that can occur within MIDI messages in a MIDI file. You cannot change these values.
Src Key Name	Displays the names of the percussion instruments associated with the source keys, as defined by the General MIDI specification. Use these names as a reference when creating a key map for percussion instruments. If you are creating a key map to correct registration changes for melodic instruments, you can ignore these names.
Dest Key	Specifies the key that is played on your synthesizer when the source key number is sent by an application or encountered in a MIDI file. To change the destination key, select the Dest Key box, and then click the up or down arrow until the destination key number you want is displayed. Or select the key number, and then type a new number.

Creating a Patch Map

If your synthesizer's patch list differs from the General MIDI patch definitions, you need to create two patch maps: one for melodic instruments and one for percussion instruments.

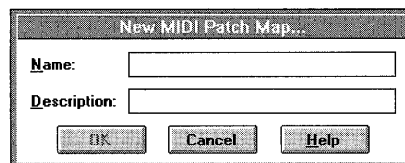
► To create a patch map

1. In the Control Panel window, choose the MIDI Mapper icon.

The MIDI Mapper dialog box appears.

2. In the Show area, select the Patch Maps option button.
3. Choose the New button.

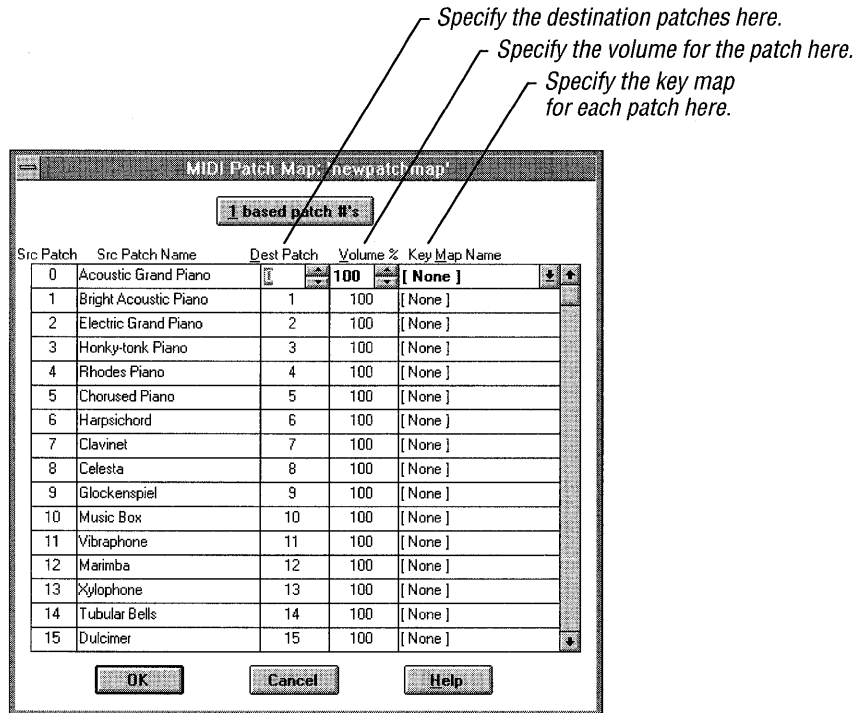
The New MIDI Patch Map dialog box appears.



4. In the Name and Description boxes, type a name and description for the new patch map.

- Choose the OK button.

A dialog box for the new patch map appears, listing the sounds for source patches 0 through 127 as defined by General MIDI.



- If the patch numbers for your synthesizer start at 1 rather than at 0, choose the "1 based patch #'s" button.
Or press ALT+1.
- Assign a destination patch, volume level, and key map to the source patches.
A detailed description of the options in the MIDI Patch Map dialog box follow this procedure.
- When you are finished, choose the OK button.
A dialog box appears, asking if you want to save your changes.
- Choose the Yes button to confirm the changes.
- In the MIDI Mapper dialog box, choose the Close button.

The following list describes the options in the MIDI Patch Map dialog box.

Option	Description
Src Patch	Lists the MIDI patch numbers that can occur within MIDI messages in a MIDI file. Some synthesizers define patch numbers from 0 through 127; others define patch numbers from 1 through 128. You cannot change these values.
Src Patch Name	Displays the names of the standard sounds or instruments associated with the source patch numbers for melodic channels, as defined by the General MIDI specification. Use these names as a reference when creating a patch map for melodic instruments. If you are creating a patch map for percussion instruments, you can ignore these names.
Dest Patch	<p>Specifies the patch numbers your synthesizer uses that match the sounds or instruments listed in the Src Patch Name box. For synthesizers that support General MIDI, this number is the same as the Src Patch number.</p> <p>To change the destination patch, select the Dest Patch box, and then click the up or down arrow until the destination patch number you want is displayed. Or select the number, and then type a new number.</p> <p>If you are creating the patch map for percussion instruments, change all the destination patch numbers to match the patch number that your synthesizer uses for percussion.</p>
Volume %	<p>Specifies the volume for the destination patch. This value is measured as a percentage of the volume specified by a MIDI volume message in the MIDI file. The default value is 100, which specifies that the patch will play at the volume indicated in the MIDI file.</p> <p>To change the volume setting, select the Volume % box, and then click the up or down arrow until the volume percentage you want is displayed. Or select the number, and then type a new number. To increase the volume, use a number greater than 100. To decrease the volume, use a number less than 100.</p>
Key Map Name	<p>Specifies the key map used with the patch.</p> <p>To specify a key map, open the Key Map Name list, and then select the key map you want.</p> <p>If you are creating the patch map for percussion instruments, specify the key-map name you created for percussion for all the source patches.</p> <p>If you are creating the patch map for melodic instruments and your synthesizer produces certain sounds using a registration that differs from General MIDI definitions, select a key map that maps the keys to play at the appropriate registration for the patch corresponding to that sound. For example, if your synthesizer plays Chorused Piano one octave higher than defined by General MIDI, select the -1 octave key map for the patch that corresponds to Chorused Piano.</p>

Specifying Channel Mapping

Once you have created the patch maps and key maps required by your synthesizer, you can specify the channel mapping for the new MIDI setup.

The MIDI Mapper lists 16 channels. Files authored using the Microsoft authoring guidelines for General MIDI use source channels 13 through 16 for base-level synthesizers and channels 1 through 10 for extended-level synthesizers. On base-level synthesizers, channels 13 through 15 are the melodic channels and 16 is the percussive channel. On extended-level synthesizers, channels 1 through 9 are the melodic channels and channel 10 is the percussive channel.

► To specify the channel mapping

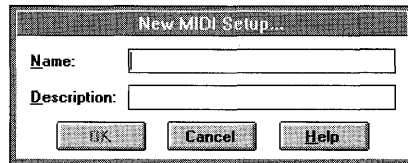
1. In the Control Panel window, choose the MIDI Mapper icon.

The MIDI Mapper dialog box appears.

2. In the Show area, select the Setups option button.

3. Choose the New button.

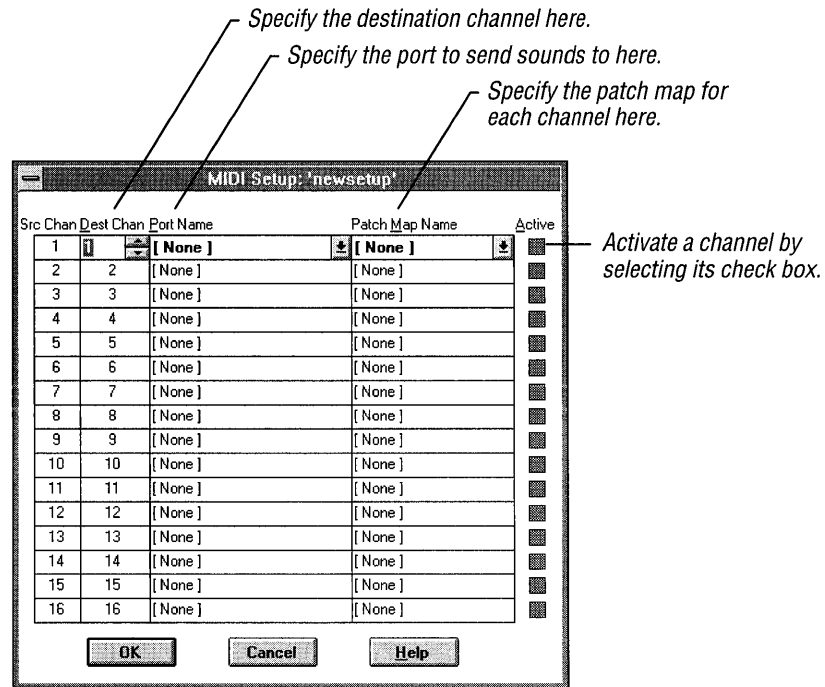
The New MIDI Setup dialog box appears.



4. In the Name and Description boxes, type a name and description for the new setup.

5. Choose the OK button.

A dialog box for the new setup appears.



- For each source channel used by your synthesizer, specify a destination channel, a port name, and a patch map.

A detailed description of the options in the MIDI Setup dialog box follows this procedure.

- When you are finished, choose the OK button.

A dialog box appears, asking if you want to save your changes.

- Choose the Yes button to confirm the changes.
- In the MIDI Mapper dialog box, choose the Close button.

The following list describes the options in the MIDI Setup dialog box.

Option	Description
Src Chan	Lists the MIDI source channels that can occur within a MIDI message in an application or MIDI file. You cannot change these values.
Dest Chan	<p>Specifies the channel that your synthesizer will use to play the sounds on the source channel. The default value is the same as the value for the source channel. If your synthesizer supports General MIDI, use the default values.</p> <p>To change the value, select the Dest Chan box, and then click the up or down arrow until the destination channel number you want is displayed. Or select the number, and then type a new number.</p>
Port Name	<p>Specifies the name of the MIDI output port that the sounds on the source channel are sent to. You do not need to use the same port for each channel. For example, if you are using two synthesizers, such as an Ad Lib and a synthesizer connected to the MIDI output port of your computer, you could send some sounds on certain channels to the Ad Lib port, and other sounds on other channels to the MIDI output port.</p> <p>To specify the port name, open the Port Name list, and then select the port you want.</p>
Patch Map Name	<p>Specifies the patch map used with a particular channel. To specify a patch map, open the Patch Map Name list, and then select the patch map you want.</p> <p>Which patch map you select depends on whether the source channel is melodic or percussive. For melodic source channels, select the patch map you created for melodic instruments. For percussive source channels, select the patch map you created for percussion instruments. On base-level synthesizers, melodic channels are 13–15 and the percussive channel is 16. On extended-level synthesizers, melodic channels are 1–9 and the percussive channel is 10.</p>
Active	<p>Specifies whether MIDI information for a particular channel is sent to the selected port. When you select a port name, this box is selected automatically, indicating that MIDI information will be sent to the port.</p> <p>To change the setting, select the Active check box.</p>

Editing Key Maps, Patch Maps, and Setups

You can edit the key maps, patch maps, and channel mapping for an existing MIDI setup. Generally you should not need to do this, unless you are not getting the sounds you expect, or you want to use a setup provided by Windows and the setup specifies port assignments that differ from those used by your synthesizer.

► To edit key maps, patch maps, or setups

1. In the Control Panel window, choose the MIDI Mapper icon.

The MIDI Mapper dialog box appears.

2. In the Show area, select the option button (Key Maps, Patch Maps, or Setups) that corresponds to the type of map (key map, patch map, or channel map) that you want to edit.
3. Open the Name list, and then select the name of the map you want to edit.
4. Choose the Edit button.

The Edit dialog box for the specified key map, patch map, or setup appears.

5. Make any changes you want.

For information about how to edit the settings in the dialog box, see the procedures for creating a key map or patch map and for specifying channel mapping, earlier in this chapter.

6. When you are finished, choose the OK button.

A dialog box appears, asking if you want to save your changes.

7. To save the changes, choose the Yes button.
8. In the MIDI Mapper dialog box, choose the Close button.

Deleting a Key Map, Patch Map, or Setup

If you are not using a particular key map, patch map, or setup, you can delete it. Keep in mind that you cannot delete the current MIDI setup (the setup that is displayed in the Name box when the MIDI Mapper dialog box first appears). In addition, you cannot delete a key map that is used in a patch map or a patch map that is used in a MIDI setup. Before deleting key maps and patch maps, make sure that an existing patch map or setup does not reference the key map or patch map you want to delete.

► **To delete a key map, patch map, or setup**

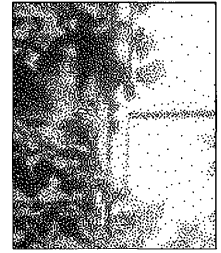
1. In the Control Panel window, choose the MIDI Mapper icon.
The MIDI Mapper dialog box appears.
2. In the Show area, select the option button (Key Maps, Patch Maps, or Setups) that corresponds to the type of map (key map, patch map, or channel mapping) that you want to delete.
3. Open the Name list, and then select the name of the map you want to delete.
4. Choose the Delete button.
A dialog box appears, asking you to confirm the deletion.
5. To delete the map, choose the Yes button.
6. In the MIDI Mapper dialog box, choose the Close button.

Setting Options for Running Windows in 386 Enhanced Mode

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If Windows is running in 386 enhanced mode, the Control Panel window includes a 386 Enhanced icon. When you choose this icon, you can specify how applications compete for peripheral devices and how much of the computer's resources are allocated to Windows and non-Windows applications. For detailed instructions on how to specify these options, see Chapter 14, "Optimizing Windows."

Print Manager



Chapter 6

What Is Print Manager?

Print Manager is an important part of the Microsoft Windows operating system. You use Windows Print Manager to install and configure printers, connect to network printers, and control the printing of your files.

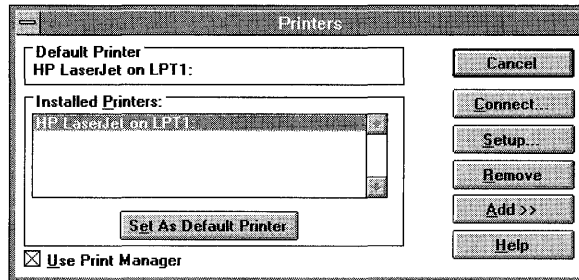
If you print from a Windows application when Print Manager is active, the application creates a print file and sends it to Print Manager. Print Manager works in the background, sending your files to the printer while you continue working. You can check the status of a file in the print queue at any time, and change the status of the file until it starts printing.

Print Manager also works together with your network to provide information about network print queues and files you have sent to a particular network printer.

Before you can use Print Manager to perform printing tasks, you must activate it.

► **To activate Print Manager**

1. In the Main group, choose the Control Panel icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.)
2. In the Control Panel window, choose the Printers icon.
The Printers dialog box appears.



3. Select the Use Print Manager check box, if it is not already selected.
4. Choose the Close button.

Installing and Configuring a Printer

Before you can print in Windows, you need to connect your printer to your computer, and then install it. If you did not install a printer when you set up Windows, or if you want to add another one, use the procedures described in this section.

The PRINTERS.WRI file supplied with Windows provides specific information about many printers that Windows supports. By using Windows Write, you can view this file to determine whether it includes information about your printer. It is recommended that you read this file before installing a printer. For additional information about your printer, see your printer manual.

To use a printer with Windows applications, you must first do the following:

- Install a printer-driver file for the printer you want to use.
- Select the port you want to assign the printer to.

After you install a printer-driver file and assign the printer to a port, you may be able to print, but you may not get the results you want. If this is the case, you may want to perform some or all of the following procedures:

- Set the print options that the printer driver will use while printing your documents.
- Specify how much time should elapse before you receive messages about printer problems.
- Select the default printer.

The following sections explain how to perform each of these tasks.

Note You can also use the Printers option in Control Panel to perform these tasks. The Printers option provides the same method for installing and configuring a printer as the method described in the following sections.

Installing a Printer-Driver File

A *printer-driver file* gives Windows important information about your printer, including details about printer features and the printing interface, descriptions of fonts (such as sizes and styles), character translations, and control sequences the printer uses to produce various formats. Windows comes with printer-driver files for most of the commonly used printers.

When you want to install a printer, Windows displays a list of printers to choose from. If your printer isn't listed or if you are prompted to insert an unlisted, updated, or vendor-provided printer-driver disk, it means Windows does not have a printer-driver file for your specific printer. Your printer might be supported, however, through a printer-driver file for another printer, or a driver might have been developed after this version of Windows. For more information, see "If Your Printer Is Not Listed" later in this chapter.

► To install a printer-driver file

1. In the Main group, choose the Print Manager icon.

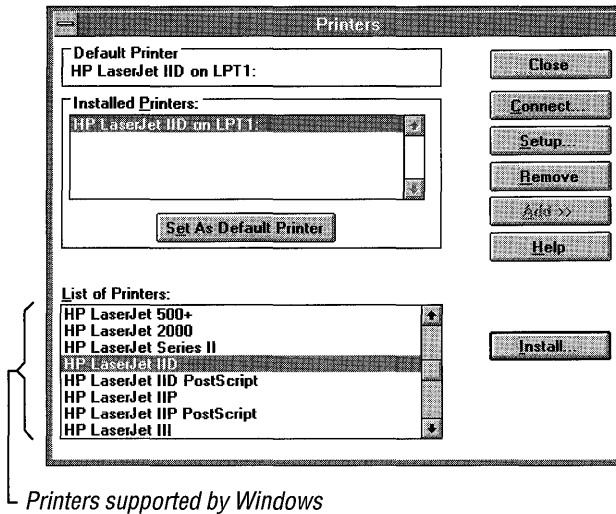
The Print Manager window appears.

2. From the Options menu, choose Printer Setup.

The Printers dialog box appears. If you did not install a printer during Setup, the dialog box expands and the Add button is dimmed. Continue to step 4.

3. Choose the Add button.

The dialog box expands to display a list of printers supported by the printer-driver files supplied by Windows.



4. In the List Of Printers box, select the printer you want to install.

Note If you are installing a PostScript printer, do not select PostScript Printer. If you do, your documents may not print correctly. Select the name of the printer model instead. If you are installing a laser printer that supports PostScript cartridges or has built-in PostScript capabilities, see the following section, “If You Are Using a Laser Printer with a PostScript Cartridge.”

5. Choose the Install button.

If the printer-driver file for the printer you selected is not already installed, a dialog box appears, prompting you to insert the disk that contains the printer-driver file. This disk may be one of the disks included with Windows or, if the message prompts you to “Insert unlisted, updated, or vendor-provided printer driver disk,” it is the printer-driver disk provided by your printer manufacturer.

6. If necessary, insert the disk that contains the printer-driver file, and then choose the OK button.

Or, if you know where the file is on your hard disk, type the drive letter and directory name where the file is located, and then choose the OK button.

If you do not know where the printer-driver file is, you can choose the Browse button. This displays the Browse dialog box, in which you can locate and select the drive and directory that contain the printer-driver file. When you finish using the Browse dialog box, choose the OK button to return to the Printers dialog box.

Another dialog box may appear, prompting you for the disk that contains the font files or other files associated with the printer.

7. If you are prompted for other files, insert the appropriate disk, and then choose the OK button.

Or specify the drive and directory where the additional files are located, using one of the methods described under step 6.

Windows copies the file(s) to your hard disk, and the Printers dialog box reappears.

The name of the printer model you selected appears in the Installed Printers box. If it is the first printer you installed, it is assigned as the default printer. "LPT1" appears next to the name indicating the default port assignment.

Note If this printer is not connected to LPT1, you need to change the port assignment. For information about how to change the port assignment, see "Selecting a Printer Port" later in this chapter. If you want to change the default printer, see "Choosing the Default Printer" later in this chapter.

8. Choose the Close button.

If You Are Using a Laser Printer with a PostScript Cartridge

Some laser printers support PostScript cartridges that can emulate a specific PostScript-printer model. If you are installing a laser printer with such a PostScript cartridge, select the PostScript printer that your cartridge emulates from the List Of Printers box in the Printers dialog box. For example, if you were installing a Hewlett-Packard LaserJet IID with a PostScript cartridge that can emulate an Apple Laserwriter, you would select the Apple LaserWriter printer and not the HP LaserJet IID printer.

If you are installing a laser printer with a PostScript cartridge that does not emulate a specific PostScript-printer model, select the PostScript version of the printer model from the List Of Printers box. For example, if you are installing a Hewlett-Packard LaserJet IID with a PostScript cartridge, you would select the HP LaserJet IID PostScript printer from the List Of Printers box. This also applies if you want to print in PostScript mode to a laser printer that has built-in PostScript capabilities.

For information about how to install your printer, see the previous section, "Installing a Printer-Driver File."

If Your Printer Is Not Listed

If your printer is not listed in the Printers dialog box, you may still be able to use your printer with Windows.

First, check the Hardware Compatibility List provided in the Windows package. If your printer is not on this list, check the printer manual. It might indicate whether your printer is 100-percent compatible or has an emulation mode that is compatible with a printer in the List Of Printers box. Look for DIP-switch settings or modes in the index of the printer manual.

For example, you can change DIP-switch settings on many dot-matrix printers so that they emulate an Epson printer. Also, you can change DIP-switch settings or use menu commands on many laser printers so that they emulate an HP LaserJet printer. However, when you use your printer in emulation mode, you might not be able to use all the printer's features.

If your printer is not 100-percent compatible and does not have an emulation mode that is compatible with a printer in the List Of Printers box, you have three options:

- Contact your printer manufacturer for a printer driver that works with Windows.
- Request information about additional drivers included on the Microsoft Windows Driver Library Disk. Microsoft adds drivers as they become available. For more information, see "Installing a Device Driver Not Supplied with Windows Version 3.1" in Chapter 15, "Maintaining Windows with Setup."
- For non-U.S. customers, use the Additional Non-USA Printer Drivers disk that comes in your Windows package. This disk contains printer-driver files that support printers used in countries outside the United States.

For information about installing an unlisted printer-driver file, see the following section.

If none of these suggestions works for you, select Generic/Text Only in the List Of Printers box. The Generic/Text Only printer driver works with most printers and should be selected for daisy-wheel printers. Using this printer driver, you can print text, but not graphics.

Installing a Printer Driver Not Supplied with Windows

If you receive a new printer driver from a printer manufacturer, you should follow any instructions the manufacturer provides for installing the printer driver.

If there are no instructions, carry out the following procedure to install the printer driver.

► To install a printer driver not supplied with Windows

1. In the Main group, choose the Print Manager icon.
2. From the Options menu, choose Printer Setup.
The Printers dialog box appears.
3. Choose the Add button.
The List Of Printers box appears.
4. In the List Of Printers box, select Install Unlisted Or Updated Printer.
5. Choose the Install button.
A dialog box appears, instructing you to insert the disk that has the printer-driver file on it.
6. Insert the disk that contains the printer-driver file. If you are a non-U.S. customer, insert the the Additional Non-USA Printer Drivers disk that comes in your Windows package.
7. Choose the OK button.
Another dialog box appears, listing several printers.
8. In the List Of Printers box, select the printer you want. If your printer still does not appear in this list, you need to contact your printer manufacturer for the correct printer driver.
9. Choose the OK button.
The Printers dialog box appears.
The new printer is added to the Installed Printers list.
10. Choose the Close button.

Selecting a Printer Port

When you install a printer-driver file, the printer is assigned to LPT1. If your printer is connected to a different port, you need to change the port assignment.

Note Do not change the port assignment for a printer you are currently printing documents to. If you do so, your documents will disappear from the Print Manager queue. Your documents will still print, but you will not be able to perform Print Manager tasks on them, such as pausing and resuming printing or viewing status information.

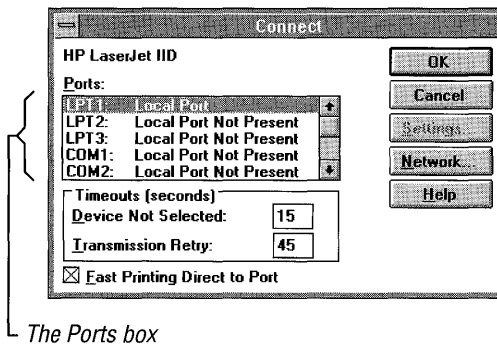
► To select the printer port

1. If you are not already using the Printers dialog box, choose Printer Setup from the Options menu.

The Printers dialog box appears.

2. In the Installed Printers box, select the printer whose port assignment you want to change.
3. Choose the Connect button.

The Connect dialog box appears.



4. Select the port you want to assign the printer to. A description of each port follows this procedure.

If you select a serial (COM) port, you may need to change the port's communications settings to match those required by your printer. Windows uses the most common communications settings for serial printers; these settings should work with most printers.

5. If you need to change the communications settings, choose the Settings button, and then make any changes you need in the Settings dialog box. (The Settings button is unavailable if your printer is assigned to a parallel [LPT] port.) For information about the communications settings, see Chapter 5, “Control Panel.” For information about the settings that your printer requires, see your printer manual.

If you are installing a network printer, you can connect to it by choosing the Network button. For more information about connecting to a network printer, see “Connecting to a Network Printer” later in this chapter.

When you are finished, choose the OK button.

6. In the Connect dialog box, choose the OK button.

The Printers dialog box appears, with the selected port next to the highlighted printer name in the Installed Printers box.

7. Choose the Close button.

You can connect your printer to one of the following ports.

Port	Description
LPT	A parallel port.
COM	A serial port.
EPT	Used for the IBM Personal Pageprinter. This port requires that a special card be installed in your computer.
FILE	Prints to a file instead of to a printer. If the application you are working with supports this feature, you can print to a file even if you don't select this option.

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If you are using non-Windows applications in 386 enhanced mode, you can specify what happens when several applications compete for access to a printer port. For more information, see Chapter 14, “Optimizing Windows.”

Setting the Printing Options

Printing options are printer-specific settings, such as resolution, color, and text quality. These options vary, depending on the capabilities of your printer.

Windows assigns settings that should work for your printer in most situations. You can change these settings to specify different options.

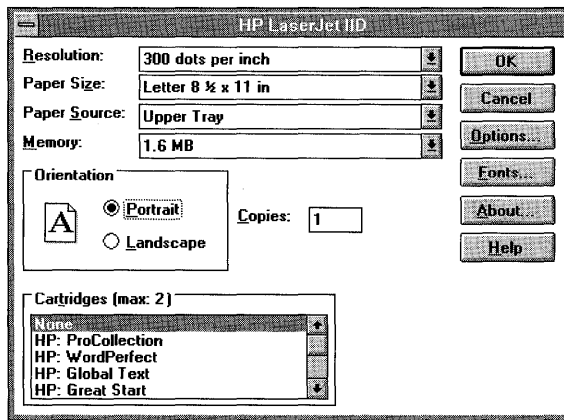
► **To change printer settings**

1. If you are not already in the Printers dialog box, choose Printer Setup from the Options menu.

The Printers dialog box appears.

2. In the Installed Printers box, select your printer.
3. Choose the Setup button.

A printer setup dialog box appears, displaying the options for the selected printer. The following is a sample printer setup dialog box. The options displayed in these dialog boxes vary, depending on the printer you are using.



4. Make any necessary changes to the options, and then choose the OK button.

The Printers dialog box appears.

5. Choose the Close button.

The following table describes some of the common printing options found in a printer setup dialog box. The printer setup dialog box is different for each printer, so some options may not be included here. For a description of the options specific to your printer, choose the Help button or press F1 while using the printer setup dialog box.

Use	To
Paper Source	Specify the tray or bin feeder option if your printer uses single sheets of paper. Select Tractor if your printer prints on paper that feeds into it through a tractor feeder. On some printers, you can choose to feed paper manually.
Paper Size	Specify the paper size you are using. The default paper size depends on the country that is currently selected in the Control Panel International dialog box. If United States is selected, the default paper size for most printers is letter (8.5 by 11 inches). If a European country is selected, the default paper size is A4. If you are using a different paper size, you must change this setting. For information about customizing Windows for international use, see Chapter 5, "Control Panel."
Memory	Specify the amount of printer memory. To find out how much memory your printer has, see your printer manual or contact the manufacturer. If you cannot find the information, use the default setting.
Orientation	Specify <i>portrait</i> or <i>landscape</i> orientation. Portrait means the page is taller than it is wide when you view the printed text upright. Landscape means the page is wider than it is tall when you view the printed text upright.
Resolution	Specify the resolution you want to use for printing graphics. Resolution settings may be listed as High, Medium, or Low, but are most often listed in dots per inch (DPI). The more dots per inch, the higher the resolution. Higher resolutions print more slowly but produce higher-quality graphics, whereas lower resolutions print faster but produce lower-quality graphics.
Cartridges	Select the font cartridges you want to use from the list. You can select up to the maximum number of cartridges that can be physically plugged into your printer.
Fonts	Run the Font Installer program to install additional cartridge or downloadable soft fonts for your printer. These fonts are supplied by printer or font manufacturers, not by Windows. For more information about installing these fonts, see the next section, "Installing Additional Fonts for Your Printer."
Options	Display the Options dialog box, which lists additional printing options specific to your printer. For more information about these options, choose the Help button in the Options dialog box.
Help	Display information about how to use the printer setup dialog box.

Note If you change the port assignment for a printer, you should also check the print settings to make sure they are still correct. With some printers, certain settings no longer apply when you change the port assignment.

Installing Additional Fonts for Your Printer

When setting printing options, you may be able to install additional cartridge or soft fonts, or scalable typefaces supplied by a printer or font manufacturer. If your printer supports these fonts, the Fonts button and/or the Cartridge list appears in the printer setup dialog box. Cartridge fonts are stored in cartridges that must be inserted into the cartridge slots on your printer before you can use the fonts. Soft fonts and scalable typefaces are stored in font files on disks. Soft fonts have predefined point sizes, whereas scalable typefaces can be scaled to any size.

Some printer drivers supplied by Windows include information about cartridge fonts. If you are setting printing options for a printer that uses such a printer driver, there is no need to install the fonts. The supported cartridge fonts appear in the Cartridges list in the printer setup dialog box.

► To use supported cartridge fonts

1. If you are not already using the Printers dialog box, choose Printer Setup from the Options menu.

The Printers dialog box appears.

2. Select the printer you want to use, and then choose the Setup button.

The printer setup dialog box appears.

3. From the Cartridges list, select the font cartridges you want to use.

4. Set any other printing options you want.

5. Choose the OK button.

The Printers dialog box appears.

6. Choose the Close button.

If you want to use scalable typefaces or soft fonts, or if the cartridge fonts do not appear in the Cartridges list, you need to install them.

To install scalable typefaces, or soft or cartridge fonts, use the installation program that comes with the fonts package. If no installation program was provided and you are using a Hewlett-Packard DeskJet or LaserJet (PCL) printer, you can use the Font Installer program provided with Windows.

After you install cartridge fonts by using Font Installer, the fonts appear in the Cartridge list in the printer setup dialog box. If you use another method to install cartridge fonts, they do not appear in the Cartridge list, but they are still available to your Windows applications.

► **To run Font Installer**

1. If you are not already using the Printers dialog box, choose Printer Setup from the Options menu.

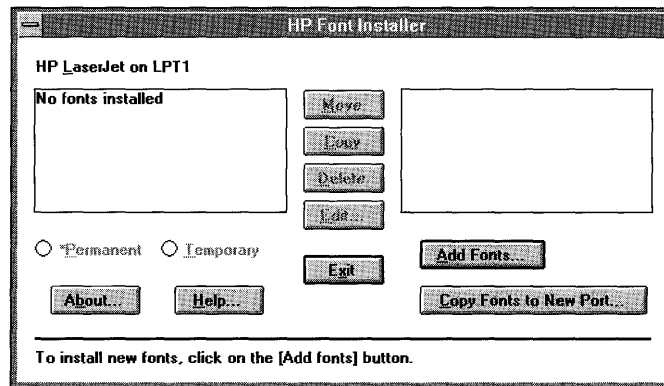
The Printers dialog box appears.

2. Select the printer for which you want to install fonts, and then choose the Setup button.

The printer setup dialog box appears.

3. Choose the Fonts button. (If you're not using a PCL printer, the Fonts button does not appear in the dialog box.)

The Font Installer dialog box appears.



There may be additional tasks you need to perform prior to installing your fonts. For information about this and other topics, choose the Help button in the Font Installer dialog box.

Note If you change the port a printer is connected to, you need to copy any cartridge or soft fonts you have installed to the new port. To do this, use the Copy Fonts To New Port button in the Font Installer dialog box.

Selecting Timeouts Options

Timeouts options control the amount of time that elapses before a message appears to notify you of printer problems.

The default settings for the Timeouts options work with all printers, and you should use these settings unless you have a specific problem. For example, if you are configuring a PostScript printer, you may want to increase the value for Transmission Retry significantly, especially if you plan on printing documents that contain complicated graphics or several types of fonts. If you print to a network printer and network traffic is heavy, you might also need to increase the Transmission Retry setting.

► To change the Timeouts options

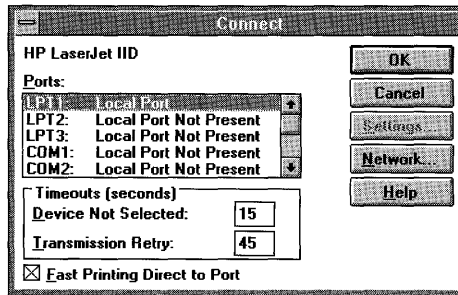
1. If you are not already using the Printers dialog box, choose Printer Setup from the Options menu.

The Printers dialog box appears.

2. In the Installed Printers box, select the printer whose Timeouts settings you want to change.

3. Choose the Connect button.

The Connect dialog box appears.



4. Change Timeouts options as needed. The Timeouts options are described in the table following this procedure.

5. Choose the OK button.
The Printers dialog box appears.
6. Choose the Close button.

Use	To
Device Not Selected	Control the amount of time that Print Manager continues to check the printer to determine whether it is online and ready to print. If the printer is not ready to print after the amount of time specified for this setting has elapsed, a message appears, notifying you that the printer is offline. The default setting is 15 seconds.
Transmission Retry	Control the amount of time that elapses before a message appears to notify you that your printer cannot accept any more information. After the printer finishes processing the information it currently has, it clears its memory and is ready to accept more information. The default setting is 45 seconds for non-PostScript printers and 90 seconds for PostScript printers.

Choosing the Default Printer

Many Windows applications use the default printer when you choose the Print command. Only one default printer can be selected at a time. If you have several printers installed, you can use the Printer Setup command whenever you want to change the default printer.

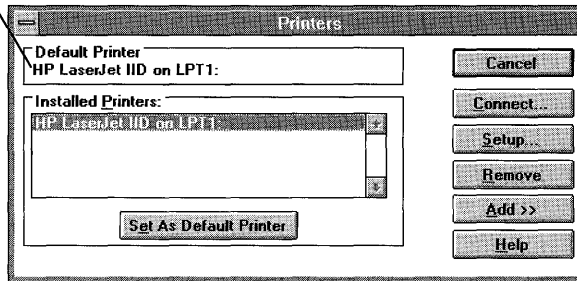
► To select a default printer

1. If you are not already using the Printers dialog box, choose Printer Setup from the Options menu.
The Printers dialog box appears.
2. In the Installed Printers box, select the printer you want to use as the default printer.

3. Choose the Set As Default Printer button.

The printer name appears in the Default Printer area of the Printers dialog box.

The name of the default printer appears here.



4. Choose the Close button.

Other Windows applications may have a print setup command that you can use to print to any installed printer. In most cases, selecting a different printer does not make it the default printer. However, some applications do change the setting for the default printer. For information about the print setup command in an application, see the documentation for the application.

Removing an Installed Printer

If you are no longer using an installed printer, you can remove it from the Installed Printers list in the Printers dialog box.

► To remove an installed printer

1. In the Main group, choose the Print Manager icon.
The Print Manager window appears.
2. From the Options menu, choose Printer Setup.
The Printers dialog box appears.
3. In the Installed Printers box, select the printer you want to remove.
4. Choose the Remove button.
A message appears, asking you to confirm the removal.
5. Choose the Yes button to remove the printer.
6. Choose the Close button.

Removing a printer from the Installed Printers list does not remove the printer-driver file from your hard disk, because another printer may use the same driver. In addition, removing the printer-driver file does not remove any associated fonts from memory, because another printer-driver file might use the fonts. For information about removing fonts from memory, see “Removing a Font” in Chapter 5, “Control Panel.”

Printing Documents

The way you print documents depends on the application you are using. Most Windows applications include a Print command on the File menu that you can use to print the current document. You can also use File Manager to print documents that are associated with a particular application. (For information about printing from File Manager, see Chapter 4, “File Manager.”) When you print from a Windows application, the application uses the printer drivers for your printer, and Print Manager, if Print Manager is active.

You might find slight differences in the way various Windows applications print. To make sure you understand these differences, read the documentation on printing that comes with the application.

Printers differ in their abilities to use fonts, graphics, spacing, alignment, and character formats. The appearance of your printed document is affected by three factors: whether you can specify fonts and formats in your application, the font and format choices you make, and the fonts and formats your printer can print.

Some applications attempt to display fonts on the screen as you would see them on the printed page. However, unless you use TrueType fonts, you may need to experiment to get the printed results you want. If you use TrueType fonts, your document looks the same when it is printed as it does when it is displayed on the screen. For more information about using TrueType fonts, see “Using Fonts” in Chapter 5, “Control Panel.”

Printing from Non-Windows Applications

Non-Windows applications that you start from Windows print the same way they would if you started them from MS-DOS. The applications do not use Windows printer drivers and do not route print files through Print Manager.

If you want to use Windows printer drivers and Print Manager when printing from a non-Windows application, you must transfer the information to be printed into a Windows application. For example, if you are using Microsoft Word for the Personal Computer, you need to transfer your documents to Microsoft Word for

Windows to take full advantage of the Windows printing features. For more information about using non-Windows applications, see Chapter 7, “Non-Windows Applications.”

Looking at the Print Queue

As you send files to Print Manager, a *print queue* forms. A print queue lists the installed printers that have had files sent to them and shows the status of those files. There are two types of print queues: local and network. The *local queue* shows all files sent from a Windows application to a printer connected locally to your computer (that is, the computer and the printer are directly connected by a cable).

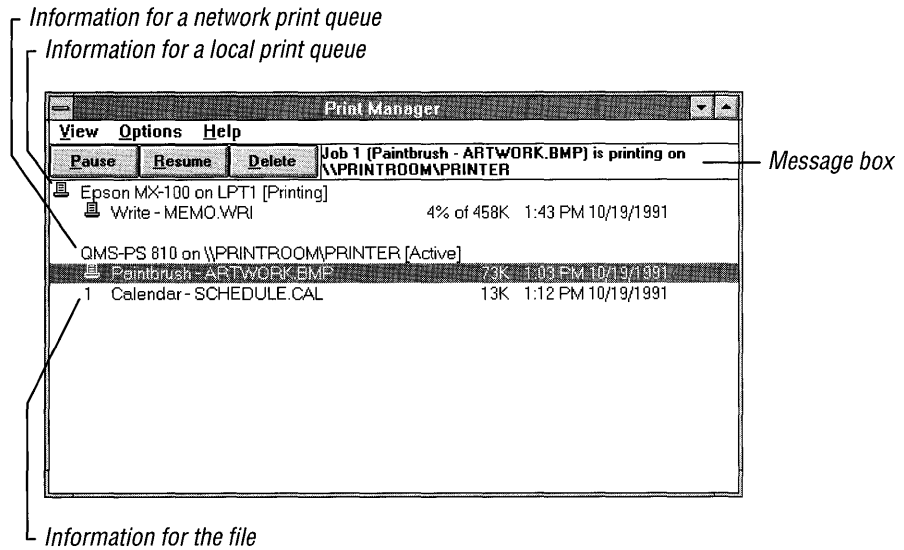
When Print Manager starts printing to a local printer, the Print Manager icon appears at the bottom of your screen. If you enlarge the icon to a window, you can view the print queue for any printer connected to your computer. You can use the Print Manager window to check the status of files in the print queue or to interrupt or cancel the printing of files.

The *network queue* refers to the print queue on the network server. This queue is generally managed by a network print manager, instead of Windows Print Manager. When you print files to a network printer, Print Manager requests status information from the network print manager and then displays this information in the Print Manager window. For more information about how Print Manager handles network printing, see “Managing Network Printing” later in this chapter.

The Print Manager icon does not appear at the bottom of your screen when you print to a network printer. To view the status of your network print job, you must start Print Manager from the Main group.

► To look at the print queue

- In the Main group, choose the Print Manager icon.
 - Or, if you are printing to a local printer, restore the Print Manager icon.



The print queue displays the following printer information:

- The name of the printer.
- The port your printer is connected to, and, if it is a network printer, the network path.
- The current status of the printer (such as active or idle).

Beneath the printer information, the print queue displays the following file information:

- The title of the print job (some network software may not support this option).
- The file's position in the queue, or a printer icon if the file is printing.
- The size of the file in kilobytes (if the Print File Size command has a check mark next to it).
- The time and date you sent the file to Print Manager (if the Time/Date Sent has a command check mark next to it). If you are connected to a network printer, the network time and date are shown, which may differ from your computer's time and date.
- If a file is currently printing, the amount (as a percentage) of the file printed so far.

If you are connected to a network printer, any information the network can provide appears in the message box at the upper-right corner of the Print Manager window.

Print Manager only reports the status of files that you have sent to the network printer from your Windows applications. For information about viewing every file in a network queue, see “Viewing the Entire Network Queue” later in this chapter.

Changing the Order of the Queue

You can change the position of a file in a local queue if it is not the first file in the queue or if it has not yet begun to print. However, you cannot change the position of files in a network queue.

► To change the order of files in the queue

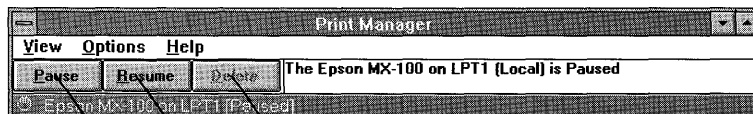
- Select the file whose position you want to change, drag it to its new position in the print queue, and then release the mouse button.

Or select the file, press and hold down CTRL, and press the UP ARROW or DOWN ARROW key to move the file to its new position. Then release CTRL and the arrow key.

The file information in the print queue changes to reflect the new positions of the files.

Pausing and Resuming Printing

You can interrupt printing on a local print queue by selecting the printer (to interrupt the entire queue), or by selecting an individual file, and then using buttons in the Print Manager window. Most networks support the ability to interrupt the printing of an individual file. However, your ability to interrupt the entire network queue depends on the features the network supports.



Use these buttons to interrupt, resume, and cancel printing.

► **To temporarily interrupt printing**

1. Select the printer for the print queue, or select the individual file you want to pause.
2. Choose the Pause button.
Or press ALT+P.

The information displayed for the printer or file now indicates that printing has paused.

► **To resume printing**

1. Select the printer for the print queue, or select the individual file you want to continue printing.
2. Choose the Resume button.
Or press ALT+R.

The information displayed for the printer or file changes to indicate that printing has resumed.

Deleting a File from a Print Queue

You can use the Delete button in the Print Manager window to delete a file from a local print queue at any time. Whether you can delete a file from a network print queue depends on the capabilities of the network.

► **To delete a file from a print queue**

1. From the print queue, select the file you want to delete.
2. Choose the Delete button.
Or press ALT+D.
A message appears, asking you to confirm the deletion.
3. Choose the OK button.

► **To delete all files from all print queues**

1. From the View menu, choose Exit.

A message appears, asking you to confirm that you want to cancel printing.

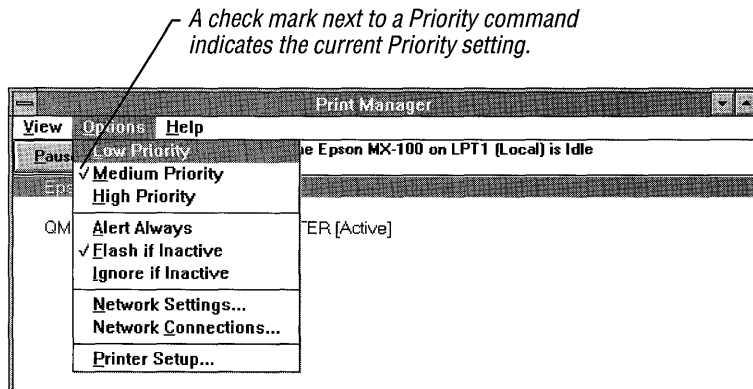
2. Choose the OK button.

If you do not choose the OK button, Print Manager continues to operate and the files continue to print.

Caution If you delete a file currently printing in graphics mode, you might need to reset your printer to ensure that the printer's buffer is clear. (Turn your printer off and on again, or select the Reset option, if available. It is most important to do this with laser-type printers.)

Changing the Printing Speed

You can specify the rate at which information passes from Print Manager to the printer by using the Low Priority, Medium Priority, or High Priority command on the Options menu. Specifying a priority for Print Manager determines how your computer's processor time is divided between Print Manager and your other applications. For example, if you specify Low Priority, Print Manager receives less processor time than your other applications, causing those applications to run faster.



► **To set a priority for Print Manager**

- From the Options menu, choose High, Medium, or Low Priority.

Each command is described here.

Use	To
High Priority	Assign more of your computer's processor time to Print Manager. This causes other applications to run more slowly.
Medium Priority	Distribute your computer's processor time as equally as possible between Print Manager and other applications that are running. This is the default setting.
Low Priority	Give more of your computer's processor time to your other applications. This causes Print Manager to slow down.

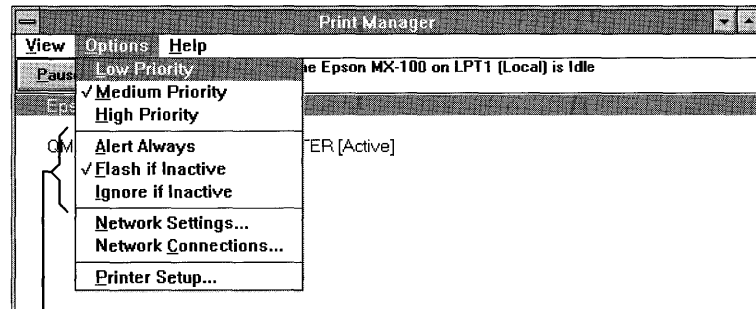
The command you choose remains in effect until you choose a different command from the Options menu.

Displaying Print Manager Messages

Occasionally, Print Manager displays a message. For example, if your printer is set up for manual paper feed, Print Manager requests that you feed in a new sheet of paper.

► To control how Print Manager displays messages

- From the Options menu, choose Alert Always, Flash If Inactive, or Ignore If Inactive.



These commands determine how Print Manager displays messages.

Each command is described here.

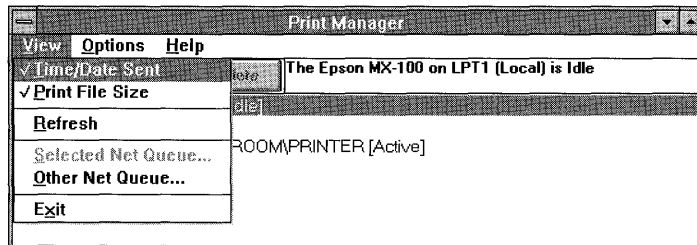
Use	To
Alert Always	Display a message when a condition occurs that requires user interaction.
Flash If Inactive	Cause the Print Manager icon or the title bar of the inactive Print Manager window to flash until you enlarge the icon or make the window active. Then Print Manager displays its message. This is the default setting.
Ignore If Inactive	Ignore the condition requiring user interaction when Print Manager is an icon or the Print Manager window is inactive.

The command you choose remains in effect until you use the Options menu to change it.

Note These commands do not control the display of system messages, such as a notification that your printer is offline.

Displaying the Time/Date and File Size

In the Print Manager window, a print queue displays the time, date, and size of any files you sent to Print Manager. You can turn off these options by choosing the appropriate command from the View menu.



► To turn off the time and date or file-size display

- From the View menu, choose Time/Date Sent or choose Print File Size.

The check mark next to the command on the View menu disappears, and the information no longer appears in the Print Manager window. If you want to display the time and date or file size, choose the appropriate command again from the View menu.

Printing to a File

There may be times when you want to format a spreadsheet, report, or other document and print it to a file rather than directly to a printer. You might do this when merging two files or when planning to print a file at a later time or different location.

Some applications have an area in their Print dialog box where you can specify to print to a file. If your application supports this feature, select the appropriate option in the application's Print dialog box.

If your application does not support this feature, you can print your document to a file by specifying FILE as the printer port. You do this by using the Printer Setup command.

► To print to a file

1. From the Options menu, choose Printer Setup.

The Printers dialog box appears.

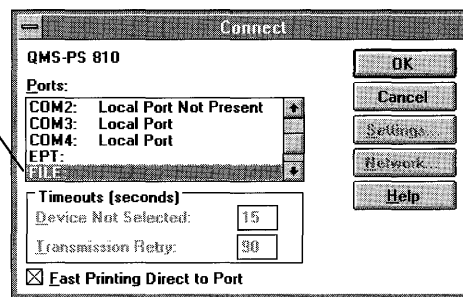
2. In the Installed Printers box, select the name of the printer you want to print the file to.

3. Choose the Connect button.

The Connect dialog box appears.

4. In the Ports box, select FILE as your port.

Use this port setting to print to a file.

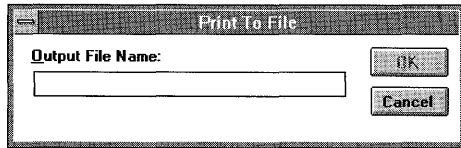


5. Choose the OK button.

The Printers dialog box appears.

6. Choose the Close button.

If you choose to print to a file either from your application or by specifying FILE as the port your printer is connected to, the Print To File dialog box appears when you print.



In the dialog box, you can specify the name of the file you want to print to, and a drive and directory where you want the file to be located.

Note When you print a document to a file, the document does not appear in the Print Manager window.

Printing Through MS-DOS

When you print in Windows, print files are sent directly to the port your printer is connected to, bypassing MS-DOS printing interrupts. This speeds up printing and is the recommended method to use.

However, in the following situations you may want to print by using MS-DOS interrupts:

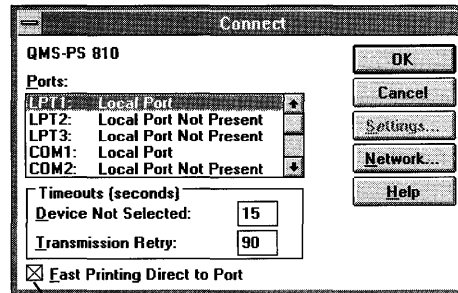
- You are using additional printer software that relies on MS-DOS interrupts (such as software that accompanies switch boxes).
- You are trying to print on a network not supported by Windows.
- You are trying to print to a serial printer and are using a terminate-and-stay-resident (TSR) program that takes direct control of the COM port.

► To print through MS-DOS

1. From the Options menu, choose Printer Setup.
The Printers dialog box appears.

2. Choose the Connect button.

The Connect dialog box appears.



This check box controls printing through MS-DOS.

3. Clear the Fast Printing Direct To Port check box.
4. Choose the OK button to return to the Printers dialog box.
5. Choose the Close button.

Printing through MS-DOS may slow down printing, but it ensures that your files print correctly.

Managing Network Printing

If you want to print to a network printer, Windows must be installed for use with a network, and a network must currently be running. If you do not have network software installed, you need to run the Setup program from Windows to install it. For more information, see Chapter 15, “Maintaining Windows with Setup.”

Print Manager offers several options to assist you when printing to a network printer. For example, you can:

- Connect to and disconnect from a network printer.
- View all the files in a network printer’s queue, not just the files you have sent to the printer.
- View a network queue you are not currently connected to.
- Route files through Print Manager, instead of printing directly to the network printer.
- Turn off automatic updating of network print queue status.

The level of support for these options depends on the capabilities of your network software and the support provided by your Windows network driver. Before you print to a network printer, it is recommended that you view the NETWORKS.WRI online document. This document contains information about how specific networks handle printing in Windows. For more information, open the NETWORKS.WRI file by using Windows Write.

Connecting to a Network Printer

You can connect to a network printer either while installing the printer, or afterward by using the Network Connections command.

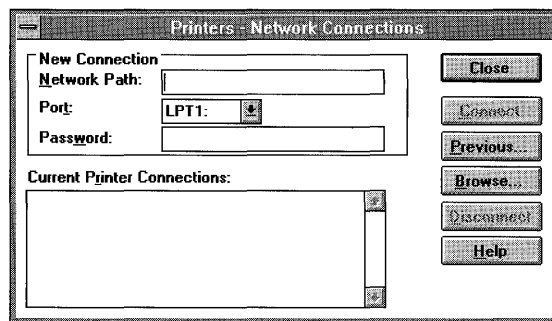
► To connect to a network printer

1. From the Options menu, choose Network Connections, or if you are currently installing a printer from the Printers dialog box, choose the Connect button.

If you chose the Network Connections command, go to step 3. If you chose the Connect button, the Connect dialog box appears.

2. Choose the Network button.

The Network Connections dialog box appears, listing any network printer connections that have already been made. (The contents of this dialog box may vary, depending on the type of network you are using.)



3. In the Network Path box, type the network name.

For information about the path or password for your network printer, see the network documentation.

4. Click the down arrow to open the Port list.

Or select the Port box, and then press ALT+DOWN ARROW.

5. Select the port you want to use.

If a network printer is already connected to the port you want to use, disconnect the other printer first. For more information, see “Disconnecting from a Network Printer” later in this chapter.

6. In the Password box, type the password, if one is required.
An asterisk (*) appears for each character you type.
7. Choose the Connect button.
The printer connection is added to the list in the dialog box.
8. Choose the Close button.
9. The Connect dialog box appears, with the path for the network printer displayed next to the port.
10. Choose the OK button.
The Printers dialog box appears.
11. Choose the Close button.

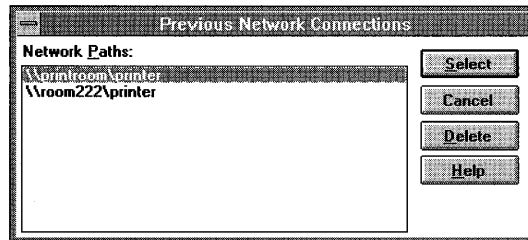
Note If your network supports the Browse button, you can choose it to look at the list of available network printers. For information about the Browse dialog box for networks, see Chapter 4, “File Manager.”

Reconnecting to a Network Printer

You can reconnect to a network printer that was previously installed but is no longer connected if your network supports this option. This saves you having to specify the path information again.

► To reconnect to a network printer

1. From the Options menu, choose Network Connections.
The Network Connections dialog box appears.
2. Choose the Previous button.
A dialog box appears, listing your previous network printer connections.



3. Select the network path for the printer you want to reconnect to.

4. Choose the Select button.

The Network Connection dialog box appears, displaying the network path and port.

5. Select the port you want to use.
6. In the Password box, type a password, if one is required.
7. Choose the Connect button.
8. Choose the Close button.

Note If your network does not support reconnecting to a printer directly, you may be able to browse the network to locate the printer you want to reconnect to. For more information, see your network manual or use the network's Help feature.

Viewing the Entire Network Queue

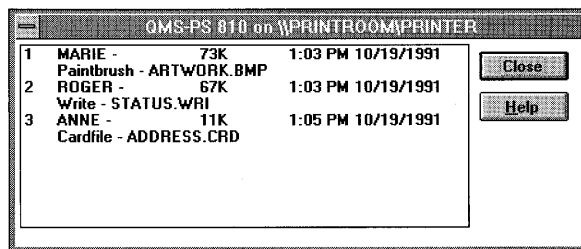
When you print a file on a network printer, Print Manager displays a print queue that shows only the files you have sent to that printer. By using the Selected Net Queue command, you can view every file sent to that printer.

► To view the entire queue for a network printer

1. In the Print Manager window, select the network printer whose queue you want to view.
2. From the View menu, choose Selected Net Queue.

A dialog box appears, displaying the entire queue for the selected printer.

(The options available in this dialog box may vary, depending on the network you are using. If this is the case, see your network manual or the network's Help feature for more information.)



3. To close the dialog box, choose the Close button.

You can choose Selected Net Queue from the View menu at any time to display an updated queue for a network printer you are connected to.

Viewing Other Network Queues

In addition to viewing queues for network printers you are connected to, you can view queues for other network printers. Using the Other Net Queue command, you can compare how many files are in the queues for different network printers before deciding which one you want to print to.

Before you can print to a network printer, you must connect to it. For more information, see “Connecting to a Network Printer” earlier in this chapter.

► To view the queue for a network printer you are not connected to

1. From the View menu, choose Other Net Queue.

The Other Net Queue dialog box appears, prompting you for the location and name of the network queue you want to view.

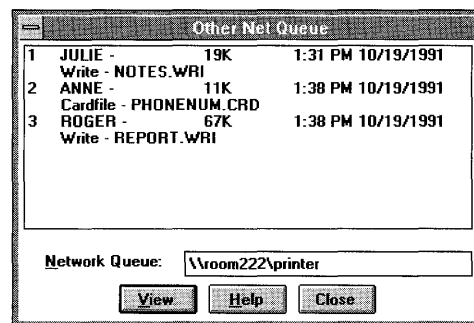
2. In the Network Queue box, type the network path to the network printer.

For information about how to specify the network path, see your network software documentation.

3. Choose the View button.

Print Manager displays the status information for the queue in the area above the Network Queue box.

(The options available in the Other Net Queue dialog box may vary, depending on the network you are using. If this is the case, see your network manual or the network’s Help feature for more information.)



Status information for the specified network queue appears here.

4. In the Network Queue box, type the name of another queue you want to view.

Or, to close the Other Net Queue dialog box, choose the Close button.

Note Viewing a queue for a network printer you are not connected to does not connect you to that network printer for printing. You must use the Network Connections command to connect to the network printer before you can print to it.

Manual Updating of the Network Queue Status

The network queue status is updated on a periodic basis or when a change has occurred on the network. The frequency of the updates depends on your network software. In some cases, you may want to update the network queue status manually.

- ▶ **To update the network queue status manually**
 - From the View menu, choose Refresh.

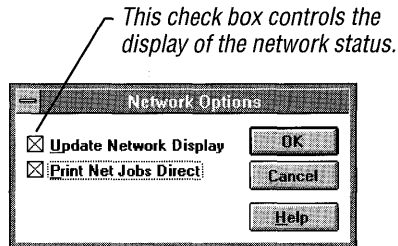
Ignoring the Status of the Network Queue

When running as an icon, Print Manager does not update the status of the files in the network print queue. If the Print Manager window is open, Print Manager periodically requests updates to the status of the network queue. This can cause additional traffic for the network printer, which can slow down printing.

If you are concerned about network traffic, or you do not need to view the status of the network queue, you can turn off automatic updating of the status.

- ▶ **To turn off automatic updating of the network-queue status**
 1. From the Options menu, choose Network Settings.

The Network Options dialog box appears.



2. Clear the Update Network Display check box.
3. Choose the OK button.

The print queue status is not updated until you select this check box again.

Routing Files Through Print Manager

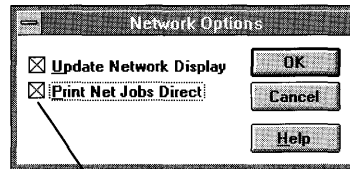
Because routing files through Print Manager adds an extra step that can delay printing over a network, Windows is set up to bypass Print Manager and print files directly to the network. In most cases, this is the fastest way to print to a network.

However, sometimes you might prefer to route files through Print Manager; for example, you may want to use the error-checking features offered by Print Manager. When you route network files through Print Manager, Print Manager manages your files as if they were being printed on a local printer instead of a network printer.

► To route files through Print Manager when using a network printer

1. From the Options menu, choose Network Settings.

The Network Options dialog box appears.



This check box specifies whether to route files through Print Manager.

2. Clear the Print Net Jobs Direct check box.
3. Choose the OK button.

Now all the print jobs on your computer are tracked as if they were on a local queue.

► To bypass Print Manager

- In the Network Options dialog box, select the Print Net Jobs Direct check box.

The fine points of how Print Manager controls printing to a network depend on the network you are using. You may want to experiment with both methods to determine which is best for you.

When you bypass Print Manager, Print Manager still reports on the status of the network print queue, unless you clear the Update Network Display check box. For more information, see “Ignoring the Status of the Network Queue” earlier in this chapter.

Disconnecting from a Network Printer

When you finish using a network printer, you can disconnect from it.

► To disconnect from a network printer

1. From the Options menu, choose the Network Connections command.
The Network Connections dialog box appears. (Contents of this dialog box vary, depending on the type of network you are using.)
2. In the Current Printer Connections list, select the network printer you want to disconnect from.
3. Choose the Disconnect button.
4. Choose the Close button.

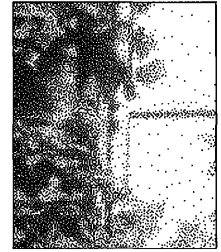
Quitting Print Manager

When running as an icon, Print Manager quits (and frees the memory it was using) as soon as it finishes printing. If the Print Manager window is open, Print Manager does not quit automatically.

► To quit Print Manager

1. From the Options menu, choose Exit.
If there are still files in the print queue, a message appears, asking whether you want to cancel printing these files.
2. Choose the OK button to cancel printing and quit Print Manager.

Non-Windows Applications



Chapter 7

Working with Non-Windows Applications

Non-Windows applications are applications that are designed to run with MS-DOS but not specifically with the Microsoft Windows operating system. Most non-Windows applications can run with Windows nonetheless.

To run a non-Windows application with Windows in the most efficient way, you may need to give Windows more information about the application. You do this by using a *program information file* (PIF). A PIF contains information about a non-Windows application, such as how much memory it needs and how it uses various system components.

Windows provides PIFs for many common non-Windows applications. Windows also provides a default PIF with settings that work for most applications. If Windows does not provide a PIF and the settings in the default file do not work for your application, you need to create a PIF. You do this by using PIF Editor, a tool included with Windows.

This chapter explains what you need to know about setting up and running non-Windows applications, describes how to use PIFs, and introduces Windows PIF Editor. For more information about PIF Editor and all of its options, see Chapter 8, “PIF Editor.”

Setting Up a Non-Windows Application

You can set up a non-Windows application just as you would other applications, by using the Windows Setup program, Program Manager, or File Manager. Regardless of which method you use, Windows sets up a PIF for the application.

Note If you set up a non-Windows application and it doesn't run properly, you might need to modify the PIF. See “Using PIF Editor” later in this chapter.

Using the Setup Program

When you use the Setup program to install Windows, Setup searches your hard disk for applications you have installed and creates a PIF and icon for each. Setup gets the information it needs for a particular application's PIF by looking at a table provided by Windows.

The following procedure describes how to use the Setup program to set up an application after Windows has been installed. You can follow this procedure at any time, and you can use it to create a PIF or to set up an application that already has a PIF. You can also use this procedure to assign a custom icon to a program item, depending on whether one has been provided for your application.

► **To set up a non-Windows application after Windows is installed**

1. In the Main group, choose the Windows Setup icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.)

Setup begins.

2. From the Options menu, choose Set Up Applications.

The Set Up Applications dialog box appears.

3. Select one of the two option buttons, depending on whether you want the Setup program to search your hard disk for applications or whether you want to specify an application. Then choose the OK button.

4. If you selected Search For Applications, a dialog box appears, prompting you to select the MS-DOS path or individual drives. Make your selection, and then choose the OK button.

If you chose to specify an application, a dialog box appears, prompting you to type the application's path and filename. Specify your application, and then choose the OK button.

For each application you select, Setup adds a program-item icon to the Applications group. If there is no Application group, Setup creates one.

5. Follow the instructions on the screen to complete the process.

The Setup program searches for a PIF to use with the application. If it finds one, it sets up the application and the PIF to work together.

If Setup doesn't find a PIF, it searches for the information it needs to create one. If it finds the information, a dialog box appears, asking whether you want Windows to use the information. When you choose the Yes button, a PIF is created for the application.

If there is no information available, Windows uses the default PIF, named `_DEFAULT.PIF`, when you start the application.

Using Program Manager

You can also set up a non-Windows application by using Program Manager.

► To set up a non-Windows application by using Program Manager

1. Open the group in which you want to set up the application.
2. From the File menu, choose New.

The New Program Object dialog box appears.

3. Select the Program Item option button, and then choose the OK button.

The Program Item Properties dialog box appears.

4. In the Description box, type the label you want to appear below the program-item icon for the application.
5. In the Command Line box, type the path and filename for the application you are adding.
6. If you like, you can specify a working directory. If you do not specify a working directory, Program Manager adds the directory that was specified as a start-up directory (if there was one specified) in the application's PIF.
7. If you want the application to start as an icon, select the Run Minimized check box.
8. Choose the OK button.

Program Manager searches for a PIF to use with the application. If it finds one, it sets up the application and the PIF to work together. When you start this application from Program Manager, you are now running the application from its PIF rather than from its program file.

If Program Manager doesn't find a PIF, it searches for information it needs to create one. If it finds the information, a dialog box appears, asking whether you want Windows to use the information. When you choose the Yes button, Program Manager creates a PIF for the application.

If there is no information available, Windows uses the default PIF, named `_DEFAULT.PIF`, when you start the application.

A program-item icon for the application appears in the group you selected.

Note Program Manager does not set up an application's custom icon. To use an application's custom icon, you must use the Setup program to set up the application. For more information about custom icons, see "Changing an Icon" in Chapter 3, "Program Manager."

Using File Manager

You can also set up a non-Windows application by using File Manager. (The following procedure requires a mouse and has no keyboard equivalent.)

► **To set up a non-Windows application by using File Manager**

1. Arrange your desktop so that you can see both File Manager and the group where you want to place the non-Windows application icon. The destination group can be either a window or an icon.
2. In File Manager, select the program or document file you want to add.
3. Drag the file icon from File Manager to Program Manager, and drop it in the group window or on the group icon. As you drag the icon, the mouse pointer replicates a file icon.

The non-Windows application is added to the group. If there was no PIF for the application, Windows creates one.

Note When you use File Manager to set up a non-Windows application in a Program Manager group, Program Manager does not set up the application's custom icon. To set up an application's custom icon, you must use the Setup program.

Using PIF Editor

After you set up your application, you can start using it with Windows. If the application doesn't perform properly, you probably need to modify the application's PIF. Make sure you modify the PIF that Windows is using with your application. If a PIF has been created for the application, Windows uses it. Otherwise, it uses the default PIF.

You can usually find out which PIF Windows is using with your application by using the Properties command on the File menu in Program Manager. The PIF is specified in the Command Line box in the Program Item Properties dialog box.

Caution Changing the PIF settings can affect how, and even whether, the application runs.

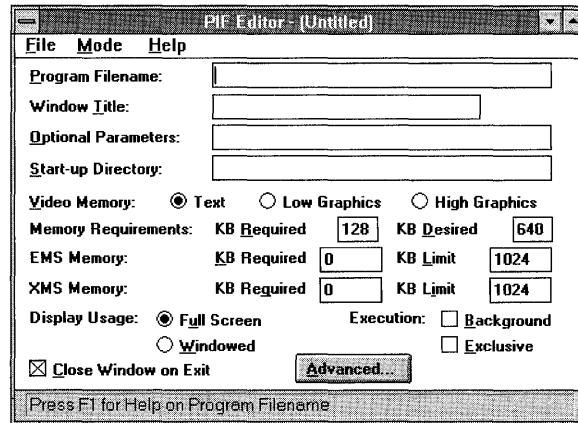
► **To modify or create a PIF**

1. In the Main group, choose the PIF Editor icon.

If you upgraded from Windows version 3.0, PIF Editor remains in the Accessories group.

Depending on which mode Windows is running in, PIF Editor displays an untitled PIF that contains either standard-mode or enhanced-mode settings.

If Windows is running in 386 enhanced mode, the following dialog box appears.



You can change these settings and name the new file, or continue with the next step to modify an existing PIF.

2. From the File menu, choose Open.

The Open dialog box appears.

3. In the File Name box, type the name of the PIF you want to open, or select a PIF from the list. Then choose the OK button, or press ENTER.

The PIF's settings appear.

4. Change any options that are appropriate for your application.

You can press the F1 key while using PIF Editor to receive Help for a selected option.

5. From the File menu, choose Save. Use the same base filename as the application.

For example, if the application filename (program file) is WP.EXE, the PIF should be named WP.PIF.

6. From the File menu, choose Exit.

All PIF Editor options are described in Chapter 8, "PIF Editor."

Using a Manufacturer-Supplied PIF

Some software manufacturers provide a PIF for an application so that you can run the application with Windows. To determine whether a PIF has been supplied, contact the software manufacturer or search the Windows Setup disks for a file that uses the same base filename as the application and has a .PIF extension. If you have PIFs from both Windows and the software manufacturer, use the PIF supplied by the manufacturer.

To use a PIF supplied with an application, copy the file to the directory where the application's files are located or the directory where you set up Windows. Then set up a program item so that you can run the application from its PIF. For information about setting up a program item, see "Using Program Manager" earlier in this chapter.

Using the Default PIF

The _DEFAULT.PIF file is located in the Windows SYSTEM directory. This PIF contains settings that work with most non-Windows applications. Windows uses the _DEFAULT.PIF file when there is no other PIF available for your application.

Because Windows might use the default PIF with more than one non-Windows application, you should not modify it. You can use the default PIF as a starting point for creating a new PIF.

► To create a PIF, using the default PIF as a starting point

1. In the Main group, choose the PIF Editor icon.
If you upgraded from Windows version 3.0, PIF Editor remains in the Accessories group.
2. From the File menu, choose Open.
3. Select the _DEFAULT.PIF file.
4. Make any changes you need for your application.
For example, you can start your application in a window by setting the Display Usage option to Windowed.
5. From the File menu, choose Save As.
6. In the File Name box, type a new name for the file. Use the application filename with .PIF as the extension. For example, if the application filename (program file) is SPECIAL.EXE, use SPECIAL.PIF as the PIF filename.

For more information about PIF Editor, see Chapter 8, "PIF Editor."

Using Multiple PIFs for an Application

You can create more than one PIF for an application. You may find it useful to do this if you run an application differently under different circumstances.

For example, you can specify in a PIF how much EMS (expanded) memory an application has access to. By using two PIFs, you could give an application access to a large amount of EMS memory when you are using large data files but limit its use of memory when you are working with smaller files.

► To set up two PIFs for an application

1. Create two PIFs. For more information, see “Using PIF Editor” earlier in this section.
2. For each PIF, indicate the appropriate settings. In this example, you would set the EMS Memory: KB Limit setting to -1 for one PIF. For the other PIF, you would set the EMS Memory: KB Limit setting to 1024K. (These options are available only in 386 enhanced mode.)
3. Save each PIF with a unique filename.
4. Create program-item icons for both PIFs in Program Manager, giving each a distinct label. Because you want to start the application from its PIF in this case, be sure to specify the PIF filename, not the program file, in the Command Line box.

You can choose either icon to start the application.

Starting a Non-Windows Application

You can start a non-Windows application from Program Manager or File Manager by choosing the application’s program-item icon, its program file, a document associated with a program file, or the application’s program information file (PIF). This section describes each of these methods.

Note When you start an application from Program Manager or File Manager by choosing the filename for the program file, Windows searches for a PIF with the same filename. It searches directories for the PIF in the following order: the directory where the application’s files are located, the current working directory, the Windows directory, the SYSTEM subdirectory of the Windows directory, and then the directories specified by the **path** command in the AUTOEXEC.BAT file. Make sure the PIF for the application is located in one of these directories and that the PIF has the same base filename as the application. For example, if the program file is QBASIC.EXE, the PIF should be named QBASIC.PIF.

Starting an Application from Program Manager

If an application is set up as a program item in Program Manager, the easiest way to start that application is to double-click its icon. For information about using Program Manager to organize your applications into groups and to set up applications as program-item icons, see Chapter 3, "Program Manager."

► To start an application from its program-item icon

1. Open the group that contains the program-item icon for the application.
2. Choose the icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.)

The application appears on your screen.

You can also start an application from Program Manager by using the Run command.

► To start an application by using the Run command

1. From the File menu in Program Manager, choose Run.
The Run dialog box appears.
2. In the Command Line box, type the name of the file that starts the application. Include the filename extension.
You can specify the application's PIF, the name of the program file (.EXE, .BAT, or .COM extension), or the name of a document associated with the program file.
3. Choose the OK button.

Starting an Application from File Manager

Using File Manager, you can start an application by choosing its program file or PIF from a directory window.

► To start an application from File Manager

1. In the Main group, choose the File Manager icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.)
2. In the File Manager directory window, make sure you have selected the drive and directory where the application's PIF is located.

3. Double-click the filename for the PIF, program file, or document file associated with the application. Or use the arrow keys to select one of these files, and then press ENTER.

You can also use the Run command from the File menu in File Manager.

Working with Non-Windows Applications in 386 Enhanced Mode

This section describes features of Windows that you use only when you are running non-Windows applications in 386 enhanced mode.

Giving an Application Exclusive Use of Resources

You can give an application exclusive use of system resources when it is the active application. For example, you might want to do this to ensure an application runs as quickly as possible, without being slowed down by applications running in the background. Also, some applications use hardware in such a way that they cannot run at the same time as other applications.

There are two ways to give an application exclusive use of resources:

- Use PIF Editor to open the application's PIF, and then select the Exclusive check box. When you use this setting, no other applications can run when that application is active. This setting takes effect every time you start the application.
- If the application is running in a window or is reduced to an icon, you can use the Settings command on the application's Control menu. When you use this setting, the application gets exclusive use of resources only until you quit the application. The next time you start the application, the setting is not in effect.

For more information about PIF Editor options, see Chapter 8, "PIF Editor." For more information about using the Control menu, see Chapter 1, "Windows Basics."

Running an Application in the Background

If you want an application to continue running when it is not the active application, select the Background check box in the application's PIF. If you select this option, the application runs in the background (calculating numbers or reading a large file, for example) while another application is in the foreground. If the application is running in a window or reduced to an icon, you can also select the

Background option (under Tasking Options) by using the Settings command on the application's Control menu.

When you change this setting in the PIF, the application runs in the background whenever you start it. When you change the setting by using the Control menu, the application runs in the background only until you quit the application.

Note If an application is running in the background and the Exclusive check box is selected in its PIF, other applications do not run in the background (even if the Background check box is selected in their PIFs).

Running a Non-Windows Application in a Window

You can run most non-Windows applications in a window when Windows is running in 386 enhanced mode. You can move and size the window, reduce the window to an icon, and share information with other applications by using the Clipboard. However, you cannot run a non-Windows application in a window if you are running Windows in standard mode.

► To make sure Windows is running in 386 enhanced mode

- From any Help menu in Windows, choose About.

A dialog box appears. The mode is displayed near the bottom of the dialog box.

► To switch a non-Windows application between a window and a full screen

- While working with a non-Windows application, press ALT+ENTER.

If the application was running in a full screen, it now appears in a window. If the application was running in a window, it now appears in a full screen.

You can have an application run in a window every time you start it. You do this by using PIF Editor.

► To start a non-Windows application in a window

1. Use PIF Editor to open the application's PIF, if it has one. If there is no PIF, you need to create one. For information about creating and editing a PIF, see "Using PIF Editor" earlier in this chapter.
2. Set the Display Usage option to Windowed rather than Full Screen. For information about the Display Usage options, see Chapter 8, "PIF Editor," or press F1 when this option is selected.

3. Make sure the Display options are set correctly in the Advanced dialog box. For information about the Advanced options, see Chapter 8, “PIF Editor,” or press F1 when one of the Display options is selected.
4. Save the changes you made to the PIF, and quit PIF Editor.
When you start the application, it appears in a window.

Using a Mouse with a Non-Windows Application

With Windows version 3.1, you can use a mouse with a non-Windows application that is running in a window.

► To use a mouse with a non-Windows application running in a window

- If you are using a Microsoft mouse, you must set up the mouse driver before starting Windows. You need to use either the MOUSE.SYS or MOUSE.COM driver, usually located in the Windows directory. You specify MOUSE.SYS in the CONFIG.SYS file, or you specify MOUSE.COM in the AUTOEXEC.BAT file. For example, to specify the MOUSE.SYS device driver located in the Windows directory on drive C, add the following command line to your CONFIG.SYS file:

```
device = c:\windows\mouse.sys
```

If these mouse drivers are not in the Windows directory, you can copy them from the Windows Setup disks. To do this, you need to use the **expand** command. For more information, see Chapter 4, “Troubleshooting,” in *Getting Started with Microsoft Windows*.

- If you are using a Logitech mouse, follow the procedure in the README.WRI file. You can view this file by using Write, an application in the Accessories group.
- If you are using a mouse from another manufacturer, you must get an updated mouse driver. Contact the mouse manufacturer.

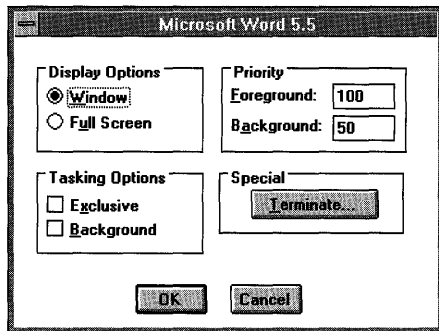
Changing Settings for a Running Application

When Windows is running in 386 enhanced mode, you can make temporary changes to the way a non-Windows application runs. To do so, use the Settings command on the application’s Control menu. (If your application is running in a full screen, reduce it to an icon to access the Control menu.) Your changes stay in effect until you quit the application.

► To change settings for a running application

1. From the application's Control menu, choose Settings.

The following dialog box appears. The title bar reflects the particular application you are using.



2. Change the appropriate setting, and then choose the OK button. The options are Display, Tasking, Priority, and Terminate, and are described in the following sections.

Display Options

Use the Display options to change whether an application appears in a window or in a full screen. You can select only one of the following options.

Use	To
Window	Run the application in a window.
Full Screen	Run the application in a full screen.

You can also switch a running application from a window to a full screen, or vice versa, by pressing ALT+ENTER.

Tasking Options

Use the Tasking options to control how an application shares system resources with other applications. You can select one or both of the following options.

Use	To
Exclusive	Suspend other applications while the application is the active one. (If this application is running in a window, Windows applications continue to run, but other non-Windows applications are suspended.)
Background	Run the application in the background while you work with other applications. (However, this application is suspended when you run an application that has the Exclusive option set.)

Priority Options

Use the Priority options to specify how much processor time the application should receive, relative to other applications. Giving the application a high priority makes it run faster than applications with lower priorities; conversely, giving it a lower priority slows it down.

You can specify the following options.

Use	To
Foreground	Control how fast the application runs, relative to other applications, when it is the active application.
Background	Control how fast the application runs, relative to other applications, when it is not the active application. For this option to take effect, you must also select the Background check box in the Tasking Options box.

You can also set these options in the application's PIF by using PIF Editor. For more information about these and other PIF Editor options, see Chapter 8, "PIF Editor."

Terminate Option

Use the Terminate button to quit a non-Windows application when you cannot use the usual methods from within the application—for example, when the application does not respond to the commands you type. Ordinarily, when you

run a non-Windows application in a window and the application does not respond to your commands, you have to restart your computer to quit the application. When you use the Terminate button, you can quit the application and then save any open files in other applications before restarting your computer.

Caution Use the Terminate button only as a last resort, since it can result in lost data. If you don't restart your computer after using the Terminate button to quit an application, Windows and MS-DOS may become unstable.

If you cannot open the Control menu in your non-Windows application, you can press CTRL+ALT+DEL to quit the application. Windows displays a message confirming the action. Press ENTER to quit the application.

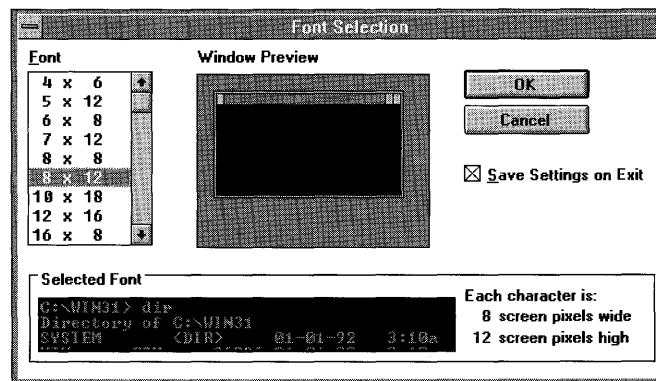
Changing the Size of the Font

When Windows is running in 386 enhanced mode, and you are running a non-Windows application in a window, you can change the size of the font by using the Fonts command on the Control menu.

► To change the size of the font

1. From the Control menu in your non-Windows application, choose Fonts.

The Font Selection dialog box appears.



2. Select a font size.
The Window Preview and Selected Font areas display the font size.
3. If you want to use this font whenever you run this non-Windows application in a window, select the Save Settings On Exit check box.
4. Choose the OK button.

Handling Device Contention

When more than one application is running in 386 enhanced mode, the applications sometimes request the use of a device (such as a printer or modem) at the same time. This is called *device contention*. By using the device-contention options, you can specify how Windows should handle those requests.

These options apply only when a non-Windows application is one of the applications requesting access to the device. When two Windows applications request access to a device, Windows handles their use of the device without these options.

► **To specify how to handle contention for a device**

1. In the Main group, choose the Control Panel icon.
2. Choose the 386 Enhanced icon.

The 386 Enhanced dialog box appears.

3. Select the port that is connected to the device you want to control.
4. Set the options you want, and then choose the OK button.

The device-contention options are described in the following list. Examples of when you would change these options are included in the descriptions.

Use	To
Always Warn	Specify that a message appear every time an application tries to use a device that is already in use. The message prompts you to specify which application should be given control of the device. In most cases, you should select this option.
Never Warn	Specify that any application can use a device any time, without a message. If you select this option, two applications may try to use the same device at the same time, which may cause problems.
Idle	<p>Specify the number of seconds after an application stops using a device before another application can use the device, without causing a message to appear. The range is from 1 to 999 seconds.</p> <p>It is a good idea to specify idle time when the device is capable of switching between two applications. For example, you might use Cardfile to dial an online service and then switch to another application to communicate with the service. In this case, you should specify a short delay, such as 2 seconds.</p>

Transferring Information Between Applications

The method you use to transfer information onto the Clipboard depends on whether you are running a Windows or non-Windows application. This section describes how to use the Clipboard with non-Windows applications. For information about using the Clipboard with Windows applications, see Chapter 2, "Application Basics." You can view the contents of the Clipboard by opening Clipboard Viewer in the Main group.

When a non-Windows application is running in a window or is minimized to an icon, its Control menu contains additional commands. You use these commands to transfer information to and from non-Windows applications. For information about using the Control menu, see Chapter 1, "Windows Basics."

Note To quickly switch a running non-Windows application between a full screen and a window, press ALT+ENTER.

Copying Information onto the Clipboard

When you are running a non-Windows application in a window, you can copy selected information, the entire desktop, or a single window onto the Clipboard. When you are running a non-Windows application in a full screen, you can copy the entire screen onto the Clipboard.

To use the following procedures, the application you want to copy information from must be running in a window.

Copying Selected Information

When Windows is running in 386 enhanced mode, you can select information from a non-Windows application running in a window and copy it onto the Clipboard.

► To copy selected information from a non-Windows application

Mouse

1. If the application you want to copy from is running in a full screen, press ALT+ENTER to run it in a window.
2. Click the Control-menu box to open the Control menu.
3. From the Control menu, choose Edit.

4. From the Edit menu, choose Mark.
5. In the non-Windows application, select the information you want to copy.
6. Press the right mouse button to transfer the selected information onto the Clipboard.

Keyboard

1. If the application you want to copy from is running in a full screen, press ALT+ENTER to run it in a window.
2. Press ALT+SPACEBAR to open the Control menu for the application.
3. From the Control menu, choose Edit.
4. From the Edit menu, choose Mark.
A flashing rectangular cursor appears at the upper-left corner of the window.
5. Move the cursor to the first character you want to select.
6. Press SHIFT and an arrow key to mark the information you want to copy.
7. Press ENTER to transfer the selected information onto the Clipboard.

Note If your application uses ALT+SPACEBAR for another function, you cannot access the Control menu by pressing ALT+SPACEBAR.

Copying an Entire Screen

Whether Windows is running in 386 enhanced mode or in standard mode, you can copy the contents of an entire screen onto the Clipboard by pressing PRINT SCREEN. When Windows is running in standard mode, however, you cannot copy graphics from a non-Windows application onto the Clipboard.

► To copy the contents of an entire screen onto the Clipboard

1. Make sure the information you want to copy is on the screen.
2. Press PRINT SCREEN.

The contents of the screen is copied onto the Clipboard.

Note If the preceding procedure does not copy the screen onto the Clipboard, you may have an unenhanced keyboard. Try pressing ALT+PRINT SCREEN or SHIFT+PRINT SCREEN to copy the screen.

The screen contents may be a bitmap or text. To determine which it is, open the Display menu in Clipboard Viewer. If the screen contents is a bitmap, the application you want to transfer the information to must be able to read bitmap (.BMP) files. See the documentation supplied with your application to determine whether your application can read bitmap files.

Copying a Window and Its Contents

To use the following procedure, you must be running Windows in 386 enhanced mode, and the application you are copying from must be running in a window.

► To copy a window and its contents onto the Clipboard

1. Make sure the window you want to copy is the active window.
2. Press ALT+PRINT SCREEN.

A bitmap of the active window is created and placed onto the Clipboard. The application you want to transfer the information to must be able to read bitmap (.BMP) files. See the documentation supplied with your application to determine whether your application can read bitmap files.

Pasting Information from the Clipboard into a Non-Windows Application

To paste information from the Clipboard into a non-Windows application, you use the Paste command on the destination application's Control menu. Some non-Windows applications accept only unformatted text, others accept formatted text and graphics images as well. For more information, see the documentation supplied with your application.

The method you use to paste information depends on whether the non-Windows application is running in a window or a full screen.

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To use the following procedure, you must be running Windows in 386 enhanced mode.

► To paste information into an application running in a window

1. Make sure the information you want to paste is on the Clipboard. Choose the Clipboard Viewer icon in the Main group to view the contents of the Clipboard.
2. Switch to the destination application.

3. Place the insertion point where you want the information from the Clipboard to appear.
4. From the application's Control menu, choose Edit.
5. From the Edit menu, choose Paste.

The following procedure can be used in either standard or 386 enhanced mode.

► **To paste information into an application running in a full screen**

1. Make sure the information you want to paste is on the Clipboard. Choose the Clipboard Viewer icon in the Main group to view the contents of the Clipboard.
2. Switch to the destination application.
3. Place the insertion point where you want the information from the Clipboard to appear.
4. Press ALT+SPACEBAR to open the the application's Control menu.
5. From the Control menu, choose Paste.

If Windows is running in 386 enhanced mode, choose Edit from the Control menu, and then choose Paste.

Note If your application uses ALT+SPACEBAR for another function, you cannot open the Control menu by pressing ALT+SPACEBAR. Press CTRL+ESC to switch to Task List without quitting the application. The application appears as an icon near the bottom of the Windows desktop. Click the icon to open the application's Control menu.

Changing an Application's Default Directory

A default directory is the directory an application uses while it is running. For example, the application searches the default directory for files it needs to access, and it also saves files to the default directory.

You can specify any directory as the application's default directory by using Program Manager. For a non-Windows application, you can also use PIF Editor. Because settings made in Program Manager override settings made in PIF Editor, the recommended method is to use Program Manager. However, if you plan to start this application other than through Program Manager, set the default directory in the application's PIF.

► **To specify a default directory by using Program Manager**

1. Select the application's program-item icon.
2. From the File menu, choose Properties.
The Program Item Properties dialog box appears.
3. In the Working Directory box, type the name of the directory where you want the application to look for existing files and place new files. The directory you specify becomes the default directory, which is the current directory while this application is running.
4. Choose the OK button.

Note If you do not specify a working directory, Program Manager changes the directory to that which was specified as a start-up directory in the application's PIF.

► **To specify a default directory by using PIF Editor**

1. In the Main group, choose the PIF Editor icon.
If you upgraded from Windows version 3.0, PIF Editor remains in the Accessories group.
2. From the File menu, choose Open.
The Open dialog box appears.
3. In the File Name box, select the application's PIF, and then choose the OK button or press ENTER.
PIF Editor appears.
4. In the Start-up Directory box, type the path of the default directory.
5. From the File menu, choose Save.
6. From the File menu, choose Exit.

Managing Memory for Non-Windows Applications

If you have an 80286 system and you use applications that need expanded memory, you must have an expanded memory board. Also, your CONFIG.SYS file must contain a command line for the expanded memory manager supplied with the memory board.

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If you have an 80386 or 80486 system and Windows is running in 386 enhanced mode, Windows can simulate expanded memory for applications that require it, even if your system does not have expanded memory.

You can use an application's PIF to specify how much expanded memory a particular application needs. You also use the PIF to make sure the application never runs with insufficient memory and to prevent it from using all available expanded memory (and leaving none for other applications). For information about PIF Editor options, see Chapter 8, "PIF Editor."

Note If you have an 80386 or 80486 system, you can install the expanded-memory emulator EMM386. This memory manager provides expanded memory for applications even when Windows is not running in 386 enhanced mode. For information about using EMM386, see Chapter 14, "Optimizing Windows."

"Out of Memory" Message

Windows applications use memory cooperatively, but non-Windows applications often do not. Some non-Windows applications require a certain amount of memory when they start, and they keep that memory until you quit the application. When there is not enough conventional memory to start or continue running an application, you may receive an "out-of-memory" message.

If you get the "out of memory" message when attempting to run an application, try the following:

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- Close any applications you aren't working with.

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- If Windows is running in 386 enhanced mode, try running the non-Windows application in a full screen instead of a window.
- If Windows is running in 386 enhanced mode and you don't need your application running when it's in the background, you can set it to run only when it's in the foreground. To do this, edit the application's PIF and make sure the Execution setting is not set to Background. If the application is running in a window or reduced to an icon, you can make this change by using the Settings command on the Control menu.
- Clear or save the contents of the Clipboard. For information about using the Clipboard, see Chapter 2, "Application Basics."
- In Control Panel, choose the Desktop icon. Set the Wallpaper option to None, or use a pattern. The Pattern feature uses less memory.
- Minimize Windows applications (reduce them to icons at the bottom of your screen).
- Free some disk space. Windows and some applications use free disk space to temporarily store information that doesn't fit into memory.

Using Application Swap Files

Each time you start a non-Windows application in standard mode, Windows creates a temporary *application swap file* for that application. When you switch from the application, Windows moves the application from memory to the application swap file. The memory is then available to other applications. To create a swap file, there needs to be at least as much free disk space as the amount of memory required to start and run the application.

When you quit Windows, application swap files created during that session are deleted. If Windows quits unexpectedly, these files remain on your hard disk but are deleted the next time you start Windows. To free disk space, you can delete these files by using the MS-DOS command prompt before you restart Windows.

The amount of available disk space determines how many application swap files Windows can create; this, in turn, determines how many non-Windows applications you can start before running out of memory. For more information about using application swap files, see Chapter 14, "Optimizing Windows."

Using Memory-Resident Programs

Many applications require memory-resident programs in order to work properly. For example, some electronic-mail applications require a memory-resident network driver.

If you want a memory-resident program to be available to all Windows and non-Windows applications, start it before you run Windows. The program is then available to all applications you run with Windows; however, the memory it uses is not available to other applications. In general, most memory-resident programs are started from your CONFIG.SYS or AUTOEXEC.BAT file. (These files are located in the root directory of your startup drive.) They indicate to MS-DOS which commands and programs to run when you start your computer.

If only one application requires a memory-resident program, you might not want to start the program from the CONFIG.SYS or AUTOEXEC.BAT file. Instead, you can use one of the following methods so that the program doesn't take up memory unless an application is using it.

- Create an MS-DOS batch program that starts the memory-resident program and then the application. You can run that batch program from Windows. For more information about using batch programs with Windows, see "Using a Batch Program to Run Memory-Resident Programs" later in this chapter.

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- If Windows is running in 386 enhanced mode, you can start the program from the batch program WINSTART.BAT. The program is then available to Windows applications but not to non-Windows applications. This prevents the program from taking up memory that non-Windows applications could use. For more information about using WINSTART.BAT, see Chapter 14, “Optimizing Windows.”

Running Pop-up Programs

A pop-up program is a memory-resident program that is loaded into memory but isn't visible until you press a certain key combination. You should start pop-up programs, such as Borland SideKick, only after starting Windows. By doing so, you can switch to and from that program as you would any non-Windows application (rather than using its “pop-up” hot key), and the pop-up program can share memory with Windows and other applications.

► To use a pop-up program with Windows

1. If necessary, create a PIF for the pop-up program. For information, see “Using PIF Editor” earlier in this chapter.
2. Start the pop-up program as you would any application—for example, by setting it up as an item in Program Manager and then double-clicking its icon. For information about setting up and starting applications, see Chapter 3, “Program Manager.”

When you start the pop-up program, Windows displays a message confirming that the program has been loaded.

3. Press the appropriate key combination to make the program appear on your screen.

A few pop-up programs require a key combination that is usually reserved for Windows (for example, ALT+ESC). In this case, you can edit the PIF for the pop-up program and select the Reserve Shortcut Keys option for that key combination. Then, when you press that key combination, the pop-up program appears instead of the usual Windows function being performed.

You can switch to and from a pop-up program by using Task List (CTRL+ESC) rather than by pressing the key combination that usually displays the program.

Using a Batch Program to Run Memory-Resident Programs

Sometimes it may be useful to load a pop-up program only when you use another application. For example, you might want to load Borland SideKick in conjunction with the Framework II application. SideKick is then available from Framework II and does not take up memory that other applications could use. To load a pop-up program in conjunction with another application, create a batch program that starts first the pop-up program and then the application.

You can do this by creating an MS-DOS batch program and a PIF for it. An MS-DOS batch program is a data file (text file) that contains MS-DOS commands. When you run the batch program, MS-DOS carries out each command as if you had typed it at the MS-DOS prompt. If you wanted to use SideKick with Framework II, for example, the batch program could first load the pop-up program, SideKick, and then run the application, Framework II. The following is a sample batch program, named SKFWLOAD.BAT, which you could create by using Notepad:

```
SK.COM  
FW.EXE
```

The first command in the batch program loads the pop-up program SideKick (SK.COM). The second command starts the application Framework II (FW.EXE).

To run the batch program with Windows, you create a PIF for it.

► To create a PIF for a batch program

1. In the Main group, choose the PIF Editor icon.

If you upgraded from Windows version 3.0, PIF Editor remains in the Accessories group.

2. In the Program Filename box, type the filename of the batch program. Include the .BAT extension.

For example, to use the sample batch program just discussed, type **skfwload.bat**.

3. Set other PIF options as appropriate. In this example, the options you set affect both applications.
4. From the File menu, choose Save As.
5. In the File Name box, type a filename for the PIF. Include the .PIF extension.

If you give the PIF the same base filename as the batch file (in this case, SKFWLOAD.PIF), you can run the batch program by choosing the batch file or by choosing its PIF.

You can also add the batch file or PIF to a Program Manager group and then choose it from that group. Or you can start File Manager and then double-click the batch file or the PIF's filename.

Using MS-DOS Prompt

You can also run non-Windows applications, such as memory-resident programs, by using MS-DOS Prompt. However, when you start a non-Windows application from the MS-DOS command prompt, the DOSPRMPT.PIF file is used instead of the application's PIF. If you have an application that requires unique PIF settings and has its own PIF, start that application from Program Manager or File Manager. For more information, see "Starting a Non-Windows Application" earlier in this chapter.

► To start MS-DOS Prompt

1. In Program Manager, choose the Main group.
2. Choose the MS-DOS Prompt icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.)

When the MS-DOS command prompt appears, you can type the commands necessary to run your non-Windows applications.

If Windows is running in 386 enhanced mode, you can also run MS-DOS Prompt in a window.

► To run MS-DOS Prompt in a window

- Press ALT+ENTER.

MS-DOS Prompt appears in a window, so you can use the commands on the Control menu.

If you want MS-DOS Prompt to always start in a window, you can change the DOSPRMPT.PIF file located in the Windows directory. Using PIF Editor, open the file and select the Windowed option under Display Usage.

To return to a full screen, press ALT+ENTER again.

► To quit MS-DOS Prompt

- Type **exit**, and then press ENTER.

Caution Some MS-DOS commands do not work properly with Windows. For example, when you use the **chkdsk** command with the **/f** option, **chkdsk** tries to modify part of the operating system that cannot be modified while Windows is running. Also avoid using the **undelete** command, the **chcp** (**change codepage**) command, and disk-compaction and optimization programs when running Windows. You should quit Windows before using such commands and programs.



Working with PIFs and PIF Editor

Whenever you start a non-Windows application, Windows looks for a *program information file* (PIF). A PIF contains information about a non-Windows application, including how much memory the application needs and how it uses components of your computer, such as the communications ports. Windows uses this information to run the application in the most efficient way. When you set up Windows, PIFs are placed in your Windows directory.

Note A non-Windows application is designed to run with the MS-DOS operating system but not specifically with the Microsoft Windows operating system. Most non-Windows applications can, however, run with Windows.

When a non-Windows application doesn't run properly in Windows, you may need to modify its PIF. You do this by using Windows PIF Editor. This chapter tells you how to start PIF Editor and describes the PIF Editor options. It first describes the options you use for applications running in 386 enhanced mode, and then describes the options you use for applications running in standard mode.

Starting PIF Editor

You create, modify, and save a PIF just as you would any Windows file. For example, to create a new PIF, you start PIF Editor, choose New from the File menu, modify the PIF options, and then save the PIF with a new filename. You could also create a new PIF by opening an existing PIF, modifying it, and saving the changed PIF with a new filename.

Typically, a PIF has the same filename as the associated application's main program file, except that a PIF has a .PIF filename extension.

► **To start PIF Editor**

1. In the Main group, choose the PIF Editor icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.)

Note If you upgraded from Windows version 3.0, PIF Editor remains in the Accessories group.

PIF Editor displays a new, untitled window that displays the default settings for the mode Windows is currently running in.

2. To edit an existing PIF, choose Open from the File menu, and then specify the PIF you want.

Caution Changing the PIF settings can affect how, and even whether, the application runs.

Changing PIF Modes

There are two categories of options in PIF Editor:

- The standard-mode options apply when you run the application with Windows in standard mode.
- The 386-enhanced-mode options apply when you run the application with Windows in 386 enhanced mode.

When you start PIF Editor, it displays the correct options for the mode Windows is currently running in.

Occasionally, you might want to specify PIF options for an application that runs in a mode other than the one Windows is currently running in. For example, if Windows is running in 386 enhanced mode, you can set PIF options for an application that runs in standard mode. You do this by using commands on the Mode menu.

Note Most options have effect only in the mode for which they are specified. For example, you can specify two different values for the Optional Parameters option: one for use with standard mode and one for use with 386 enhanced mode. However, a few options, such as Program Filename and Window Title, are common to both modes.

► **To change the PIF mode**

- From the Mode menu, choose the mode you want (Standard or 386 Enhanced).

If you choose the mode you are not currently running in, PIF Editor displays a message, reminding you that options you specify won't have any effect in the current mode. If you are sure you want to set options for the selected mode, choose the OK button.

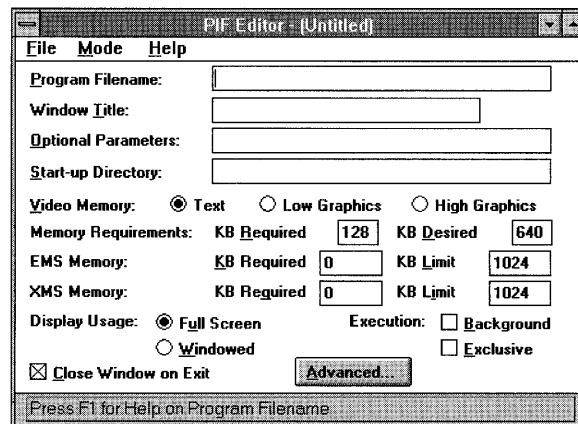
PIF Editor displays the options for the mode you chose.

Specifying Basic PIF Options for 386 Enhanced Mode

386

There are two types of 386 Enhanced options: basic and advanced. The basic options are similar to the PIF options for standard mode. The advanced options fine-tune the way the application runs in 386 enhanced mode. This section explains each of the basic options for running an application in 386 enhanced mode.

If Windows is running in 386 enhanced mode, PIF Editor displays the 386 Enhanced options. (If you are running Windows in standard mode, you can display the 386 Enhanced options by choosing 386 Enhanced from the Mode menu.) The basic options for 386 enhanced mode appear as follows.



Program Filename

In the Program Filename box, type the name of the file that starts the application. Include the path if necessary. If you start the application from a batch program, type its path, including the filename extension (usually .BAT).

For most applications, you can type the path of the main program file, which usually has the extension .EXE or .COM. For example, if the file you use to start Microsoft Word is named WORD.EXE and is located in the WORD directory, you would type **c:\word\word.exe**.

You can also specify an environment variable in this box. By using an environment variable, you can place a variable name in the PIF and assign it a value by using the **set** command in the AUTOEXEC.BAT file. When you type the variable name, enclose it in percent signs (%). For example, in your AUTOEXEC.BAT file you could assign the value "c:\word\word.exe" to an environment variable named WORDDIR. Then, in PIF Editor, you would specify the environment variable **%worddir%** as the program filename.

Window Title

You can type a descriptive name in the Window Title box. For example, you could type **Lotus 1-2-3** if you are creating a PIF for that application. When the application is minimized, the name appears under its icon, and it appears in the title bar when the application is running in a window.

This entry is optional. If you leave the Window Title box blank, the application's title bar displays the name of the application without the extension if you start the application from the PIF.

You can also specify an environment variable in this box. By using an environment variable, you can place a variable name in the PIF and assign it a value by using the **set** command in the AUTOEXEC.BAT file. When you type the variable name, enclose it in percent signs (%).

You can also use Program Manager to specify a title. You do this by choosing the Properties command from the File menu in Program Manager, and then specifying a name in the Description box. Program Manager settings override PIF Editor settings.

Optional Parameters

You can type application parameters in the Optional Parameters box. These are the same parameters you type after the application's filename when starting the program from MS-DOS. For example, if you type **word /c** when you start

Microsoft Word from the MS-DOS command prompt, type `/c` in the Optional Parameters box.

Parameters can be filenames, letters, numbers, or any type of information up to 62 characters in length. For information about valid parameters, see the application's documentation.

If you want Windows to prompt you for parameters whenever you start the application, type a question mark (?) in this box. You can also specify an environment variable in this field. By using an environment variable, you can place a variable name in the PIF and assign it a value by using the **set** command in the AUTOEXEC.BAT file. When you type the variable name, enclose it in percent signs (%).

This entry is optional. If the application does not require parameters, or if you do not want to use any parameters when you start your application, leave this box blank.

The optional parameters you specify when PIF Editor is displaying the 386 Enhanced options apply to 386 enhanced mode only. If you want to specify different ones for your application to use in standard mode, choose the Standard command from the Mode menu.

Note When you start the application by using the Run command in File Manager or Program Manager, any optional parameters you specify override the optional parameters specified in PIF Editor.

Start-up Directory

Some applications require access to files in a particular directory before they can run. You can type a path in the Start-up Directory box to specify the directory you want to be the current directory when the application starts (usually the directory where the application's program file is located). This entry is optional.

You can also specify an environment variable in this box. By using an environment variable, you can place a variable name in the PIF and assign it a value by using the **set** command in the AUTOEXEC.BAT file. When you type the variable name, enclose it in percent signs (%).

You can also use Program Manager to specify a start-up directory. You do this by choosing the Properties command from the File menu in Program Manager, and then specifying a directory in the Working Directory box. Program Manager settings override PIF Editor settings.

Video Memory

Use the Video Memory options to specify how the application appears on the screen when you start it. The video mode determines how much memory Windows allocates to initially display the application.

You can select from three video modes: Text, Low Graphics, and High Graphics. The following table describes the options.

Use	To
Text	Reserve enough memory to display the application initially in text mode. Text mode requires the least amount of memory (usually less than 16K).
Low Graphics	Reserve enough memory to display the application initially in low-resolution graphics mode. With most display adapters, this mode corresponds to CGA-resolution graphics, and requires about 32K of memory.
High Graphics	Reserve enough memory to display the application initially in high-resolution graphics mode. Enhanced graphics adapters (EGAs) and video graphics adapters (VGAs) use high-resolution graphics mode, which usually requires about 128K of memory. Selecting both this check box and the Retain Video Memory check box (in the Advanced dialog box) ensures that there's always enough memory to run the application; however, less memory is then available for other applications.

After the application is running, Windows can adjust the application's display memory, depending on the application's current video mode. For example, if you start the application in graphics mode and later change it to text mode (which requires less memory), Windows frees the extra memory for other applications. If you change to a video mode that requires more memory, Windows attempts to provide the additional memory.

If you switch to a higher-resolution video mode and there is not enough additional memory available, the application could partially or completely disappear from the screen. You can prevent this by ensuring that there is always enough display memory available for the application. To do this, select the highest-resolution video mode that the application can run in. Then, select the Retain Video Memory check box in the Advanced dialog box so that extra video memory is not available to other applications. For more information about this option, see "Retain Video Memory" later in this chapter.

Note The effects of the Video Memory options depend on the display adapter used with your system. For example, some display adapters, such as Hercules and color graphics adapters (CGAs), have only one graphics mode. With these adapters, there is no difference between the Low Graphics and High Graphics options.

Memory Requirements

Use the Memory Requirements options to allocate conventional memory to the application. Conventional memory is the first 640K of memory that MS-DOS uses to run applications. Most computers have at least 256K of conventional memory, and can accommodate up to 640K.

Note The Memory Requirements options pertain to the amount of free memory the application needs in order to run. When setting these options, do not use the memory requirements listed in the application's documentation. Such "requirements" usually are an estimate of the total amount of memory your system should have, not the amount of memory that must be free for the application to run. Application manufacturers usually specify more memory than the application needs; this ensures that your system has enough memory to run MS-DOS, the utilities in your CONFIG.SYS and AUTOEXEC.BAT files, and the application. When specifying memory requirements, use the following guidelines.

Use	To
KB Required	<p>Specify how many kilobytes of conventional memory are needed to start the application. In general, you should leave this setting at 128. Windows starts the application only if there is at least as much free memory as the KB Required option specifies. Otherwise, a message appears, indicating there is not enough memory to run the application. If other applications are running, you can quit one or more of them and try running the application again. For information about making more memory available, see Chapter 14, "Optimizing Windows."</p> <p>The KB Required option does not limit how much memory the application receives; Windows gives it at least as much as is specified by KB Required, plus any available expanded memory up to the amount specified by the KB Desired option.</p> <p>To start the application using the total amount of conventional memory, set the KB Required option to -1. If Windows cannot use the total amount of conventional memory, it will not start the application.</p>
KB Desired	<p>Limit the amount of conventional memory the application gets. Windows allocates an application up to, but no more than, the amount of memory you specify in this box. The maximum amount of conventional memory any application can use is 640K.</p> <p>You can set KB Desired to an amount less than 640K to reserve more memory for other applications.</p> <p>A setting of -1 gives this application as much memory as possible up to 640K.</p>

EMS Memory

Although Windows doesn't use expanded memory when running in 386 enhanced mode, it simulates expanded memory for applications that use it. Use the EMS Memory options to specify how much expanded memory Windows should provide to an application. Although few applications actually require expanded memory, many run better if they can use it. (For more information about the different types of memory, see Chapter 14, "Optimizing Windows.") The following table describes the options.

Use	To
KB Required	<p>Specify how many kilobytes of expanded memory are needed to start the application. In general, you can leave this option at the standard setting of 0, indicating that the application does not require expanded memory. The KB Required option does not limit how much expanded memory the application receives; Windows gives it at least as much as is specified by KB Required, plus any available expanded memory up to the amount specified by the KB Limit option.</p> <p>Windows starts the application only if it can provide at least as much expanded memory as the KB Required option specifies. Otherwise, Windows displays a message indicating there is not enough expanded memory to run the application. If other applications are running, you can quit one or more of them and then try running the application again. For information about making more memory available to the application, see Chapter 14, "Optimizing Windows."</p>
KB Limit	<p>Limit the amount of expanded memory provided to the application. Windows gives an application as much expanded memory as it requests, up to the amount you type in this box (or until no more memory is available).</p> <p>Some applications take all available expanded memory whether they need it or not. This option is useful for limiting an application's access to expanded memory.</p> <p>The default setting of 1024 provides the application with as much expanded memory as it requests, up to a limit of 1024K, or until no more memory is available.</p> <p>A setting of -1 allocates as much expanded memory to an application as it requests, up to the limit of system memory. This can slow down the rest of your system.</p>

To prevent Windows from providing any expanded memory to the application, set both KB Required and KB Limit to 0.

XMS Memory

Use the XMS Memory options to allocate extended memory to an application that uses memory according to the Lotus/Intel/Microsoft/AST eXtended Memory Specification (XMS) standard. Because few applications require extended memory, you can usually leave these options at their default settings. The following table describes the options.

Use	To
KB Required	<p>Specify how many kilobytes of extended memory are needed to start the application. In general, you can leave this option at the default setting of 0, indicating that this application does not require extended memory.</p> <p>The KB Required option does not limit how much extended memory the application receives; Windows gives it as much extended memory as the application requests, up to the limit set by the KB Limit option (or until no more memory is available).</p> <p>Windows starts the application only if it can provide at least as much extended memory as the KB Required option specifies. Otherwise, Windows displays a message indicating there is not enough memory to run the application. If other applications are running, you can quit one or more of them and try running the application again. For information about making more memory available to the application, see Chapter 14, "Optimizing Windows."</p>
KB Limit	<p>Limit the amount of extended memory provided to the application. Windows gives an application as much extended memory as it requests, up to the amount you type in this box (or until no more memory is available).</p> <p>Some applications take all available extended memory whether they need it or not. This option is useful for limiting an application's access to extended memory.</p> <p>The default setting of 1024 provides the application with as much extended memory as it requests, up to a limit of 1024K, or until there is no more memory available.</p> <p>A setting of -1 allocates as much extended memory to an application as it requests, up to the limit of system memory. This can slow down the rest of your system.</p>

To prevent Windows from providing any extended memory to the application, set both KB Required and KB Limit to 0.

Display Usage

Use the Display Usage options to indicate whether you want the application to start in a window or in a full screen. The following table describes the options.

Use	To
Full Screen	Start the application in a full screen.
Windowed	Start the application in a window. Running an application in a window requires more memory than running it in a full screen. However, you gain the advantages of running in a window, including the ability to easily share information between applications.

When the application is running, you can switch between a window and a full screen by pressing **ALT+ENTER**.

Execution

Use the Execution options to control when the application can run and how it shares resources with other applications. The following table describes the options.

Use	To
Background	Specify that the application run while you are using another application. For example, a communications program can run in the background, accepting information from another computer, while you work with a word-processing application. If you do not select this option, the application is suspended when you switch to another application.
Exclusive	<p>Suspend other applications while this application is the active application (even if the other applications have the Background option selected). Selecting this option can give the active application more memory and processor time.</p> <p>You can set this option both for applications that run in a window and for those that run in a full screen. It is best to run exclusive applications in a full screen because this gives them the full benefit of the Exclusive option. When you run an exclusive application in a window, Windows reserves some resources for itself and for running Windows applications.</p>

Close Window on Exit

Clear the Close Window On Exit check box if you want Windows to leave the window on the screen after you quit the application. This is especially useful if you are running a command or application that displays output on the screen. If the window closes too quickly, you won't see the output.

If you are running the application in a window, the title bar changes to read “Inactive.” You can close the application window (quit the application) by choosing the Close command from the Control menu.

Specifying Advanced PIF Options for 386 Enhanced Mode

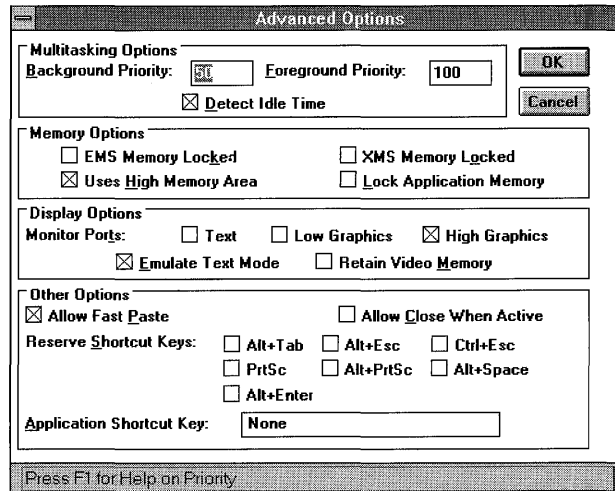
386

You can use the advanced PIF options to fine-tune how the application runs in 386 enhanced mode and how it uses memory and other system resources. In most cases, you do not need to change the advanced options; you can use the default settings. If you plan to change these options, it is best to be familiar with memory issues, Windows, and the applications you use. For more information about the technical concepts discussed in this section, see Chapter 14, “Optimizing Windows.”

► To display the advanced PIF options for 386 enhanced mode

1. If PIF Editor is not currently displaying the options for 386 enhanced mode, choose 386 Enhanced from the Mode menu.
2. Choose the Advanced button.

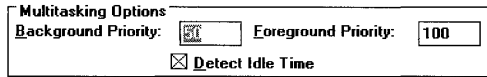
The Advanced Options dialog box appears.



The advanced options are divided into four groups: Multitasking Options, Memory Options, Display Options, and Other Options.

Multitasking Options

Use the Multitasking options to determine how the application runs in relationship to other applications. The Multitasking options appear as follows.



Multitasking Options

Background Priority: Foreground Priority:

Detect Idle Time

Background Priority

Use the Background Priority option to specify how much processor time the application should receive when it is running in the background. The application receives this priority only when its Background check box is selected and the foreground application's Exclusive check box is not selected. You can type a value from 0 to 10000; the default background priority is 50. The figure you type is meaningful only when compared with other applications' background and foreground priorities; it refers to the amount of computer processor time the applications use.

For example, suppose you have four applications running. One application is running in the foreground with a foreground priority of 200. The other three applications are running in the background with a background priority of 50 each. The total priority of all four applications is 3 times 50 (the background priorities), plus 200 (the foreground priority), or 350. Of this total, the foreground application gets 200 out of 350, or 58 percent of the processor time. Each of the three background applications gets 50 out of the total of 350, or 14 percent of the processor time.

When a non-Windows application is running in a window or when it is minimized, you can also change its priorities by using commands on the Control menu.

Note You set priorities for Windows by using Control Panel. If you have set priorities in a PIF that do not give Windows enough priority to perform efficiently, Windows changes the settings in Control Panel.

Foreground Priority

Use the Foreground Priority option to specify how much processor time you want the application to receive when it is the active application. You can type a value from 0 to 10000; the default foreground priority is 100. For example, you can ensure that an application receives all of the processing time it needs without interruption by setting Foreground Priority to 10000. At this setting, no background applications can run unless the foreground application is idle—that is, waiting for input from you.

The figure you type is meaningful only when compared with other applications' background and foreground priorities; it refers to the amount of computer processor time the applications use. For information about how Windows interprets application priorities, see the preceding section, "Background Priority."

Detect Idle Time

Select the Detect Idle Time check box to give resources to other applications while your application is idle. Leave this option selected except in rare cases; this enhances the performance of the entire system.

Try clearing this option to speed up an application that is running slowly or not working properly.

Memory Options

The advanced PIF options include options that control how the application uses the computer's available memory when running in 386 enhanced mode. The Memory options appear as follows.

Memory Options	
<input type="checkbox"/> EMS Memory Locked	<input type="checkbox"/> XMS Memory Locked
<input checked="" type="checkbox"/> Uses High Memory Area	<input type="checkbox"/> Lock Application Memory

EMS Memory Locked

Use the EMS Memory Locked check box if you don't want the application's expanded memory swapped to the hard disk. Locking an application's expanded memory can improve that application's performance, but it slows down the rest of your system and reduces the amount of available memory.

XMS Memory Locked

Use the XMS Memory Locked check box if you don't want the application's extended memory swapped to the hard disk. Locking an application's extended memory can improve that application's performance, but it slows down the rest of your system and reduces the amount of available memory.

Uses High Memory Area

Select the Uses High Memory Area check box if you want your application to use the high memory area (HMA) of RAM. The high memory area is the first 64K of extended memory.

If the HMA is available when Windows starts, each application can allocate its own HMA. However, the HMA is used by some memory-resident programs, such as network software. If such a program is using the HMA when you start Windows in 386 enhanced mode, no other application can use the HMA.

Keep this option selected for most applications. If the HMA is available and the application uses it, more memory is available to the application. If the application does not use the HMA, no memory is wasted.

Clear this check box if you want to prevent the application from using the HMA even when the HMA is available.

Lock Application Memory

Select the Lock Application Memory check box to speed up some applications. If this option is selected, the application stays in memory and is not swapped to the hard disk. Although selecting this option can speed up the application, it slows down the rest of your system and reduces the amount of available memory.

Note This option affects how the application's conventional memory is handled. The use of its expanded and extended memory is controlled separately by the Locked options in the EMS Memory and XMS Memory sections of the Advanced Options dialog box. For more information about memory, see Chapter 14, "Optimizing Windows."

Display Options

Use the Display options to determine how the application appears on the screen and how Windows handles memory when it displays the application. The Display options appear as follows.

Display Options			
Monitor Ports:	<input type="checkbox"/> Text	<input type="checkbox"/> Low Graphics	<input checked="" type="checkbox"/> High Graphics
	<input checked="" type="checkbox"/> Emulate Text Mode	<input type="checkbox"/> Retain Video Memory	

Monitor Ports

Some applications interact directly with input and output ports in order to control the display adapter. When one of these applications is running with Windows, Windows needs to monitor those interactions. This ensures that when you switch from and return to the application, Windows displays the application correctly.

For most applications, you can leave these options at their default settings. You should change these options only if the application is not displayed properly when you switch to it.

Note If you are running a non-Windows application in 386 enhanced mode, and Windows updates the screen too slowly, make sure none of the Monitor Ports options are selected in the application's PIF. Clearing these options speeds up the screen update. However, you may be unable to switch to and from the application. In this case, you must quit the application to return to Windows with a correctly restored screen.

If an application is not displayed properly, open the application's PIF, and then select the Monitor Ports option for the mode the application was running in when the problem occurred. Then try running the application again. If the application is still not displayed correctly, try selecting the other Monitor Ports options. The following table describes the options.

Use	To
Text	Monitor all video operations when the application is running in text mode. Few applications require this option.
Low Graphics	Monitor all video operations when the application is running in low-resolution graphics mode. Few applications require this option.
High Graphics	Monitor all video operations when the application is running in high-resolution graphics mode.

Emulate Text Mode

You can use the Emulate Text Mode option to increase the rate at which the application displays text. For most applications, you can leave this check box selected.

Try clearing this check box if the application's text is garbled, the cursor appears in the wrong place, or the application will not run.

Retain Video Memory

Select the Retain Video Memory check box if you don't want Windows to release the application's extra video memory for use by other applications.

Some applications can use several video modes. Usually, you can change the video mode from within the application itself. For example, in Microsoft Word, you can switch between Text and Graphics modes. If you are using such an application and the Retain Video Memory check box is not selected, Windows adjusts the application's video memory to accommodate the application's current video mode. If you change to a video mode that requires less memory, Windows frees the extra memory for use by other applications. If you later change back to a mode that requires more memory, Windows attempts to provide additional memory to the application.

This dynamic allocation of video memory works well as long as you do not run out of memory. However, if you are running low on memory and then change the application to a more memory-intensive video mode, Windows might not be able to support that mode, and the application could partially or completely disappear from the screen. (At this point the application is still running. You can make the application visible again by freeing some memory.)

Selecting both this check box and the appropriate Video Memory option (in the basic PIF options for 386 enhanced mode) ensures that there is always enough memory available for Windows to correctly display the application. The Video Memory option ensures that there is enough video memory to display the application when it starts; the Retain Video Memory option ensures that Windows does not release any of the application's video memory to other applications. Note that if you select both options, the memory is not available for other applications even when the memory is not being used by this application.

Other Options

The advanced PIF options include several additional options you can use to customize the way the application runs with Windows in 386 enhanced mode. The Other options appear as follows.

Other Options	
<input checked="" type="checkbox"/> Allow Fast Paste	<input type="checkbox"/> Allow Close When Active
Reserve Shortcut Keys:	<input type="checkbox"/> Alt+Tab <input type="checkbox"/> Alt+Esc <input type="checkbox"/> Ctrl+Esc <input type="checkbox"/> PrtSc <input type="checkbox"/> Alt+PrtSc <input type="checkbox"/> Alt+Space <input type="checkbox"/> Alt+Enter
Application Shortcut Key:	None

Allow Fast Paste

Select this option if the application is capable of accepting information pasted from the Clipboard by using the fastest method. Most applications can use the fastest pasting method.

Clear this check box only if you cannot paste information into the application. Windows can detect most applications that cannot handle fast pasting and, for them, will use the slower pasting method instead. Occasionally, Windows is unable to detect an application that cannot accommodate the fastest pasting method; in this case, when you choose the Paste command from the application's Control menu, nothing happens. To fix this problem, cancel the paste operation by pressing ESC, and then quit the application. In the application's PIF, clear the Allow Fast Paste check box, save the PIF, and then restart the application.

Allow Close When Active

Select this check box if you want to be able to quit an application without choosing the application's exit command. If this option is selected, you can quit Windows without having to quit every application separately.

Use this option only if you are sure the application uses standard MS-DOS file handles. If you are unsure, do not select this check box.

Caution Selecting this option could result in data loss or damage to your files. Windows might quit an application before the application closes its open files; as a result, you could lose any changes you made to those files. Do not use this option for such applications as databases and word processors.

Reserve Shortcut Keys

If you select one or more of the shortcut-key check boxes, Windows ignores the specified key combination when the application is running in the foreground. Instead, the application responds to the key combination. The following table describes the shortcut-key combinations.

Use	To
ALT+TAB	Reserve the ALT+TAB shortcut key for the application. Otherwise, Windows switches between applications when you press this key combination.
ALT+ESC	Reserve the ALT+ESC shortcut key for the application. Otherwise, when you press this key combination, Windows cycles you through the applications in the order each was started.
CTRL+ESC	Reserve the CTRL+ESC shortcut key for the application. Otherwise, Windows displays Task List when you press this key combination.
PRTSC	Reserve the PRINT SCREEN shortcut key for the application. Otherwise, Windows copies an image of the screen onto the Clipboard when you press this key.
ALT+PRTSC	Reserve the ALT+PRINT SCREEN shortcut key for the application. Otherwise, Windows copies an image of the active window onto the Clipboard when you press this key combination.
ALT+SPACE	Reserve the ALT+SPACEBAR shortcut key for the application. Otherwise, Windows displays the application's Control menu when you press this key combination.
ALT+ENTER	Reserve the ALT+ENTER shortcut key for the application. Otherwise, when you press this key combination, Windows switches the application between a window (if it can run in one) and a full screen.

The Reserve Shortcut Keys options for 386 enhanced mode are similar to the corresponding options for standard mode. For more information, see "Specifying PIF Options for Standard Mode" later in this chapter.

Application Shortcut Key

When running in 386 enhanced mode, Windows provides a special feature called an *application shortcut key*. When an application is running in the background and you press its application shortcut key, it immediately becomes the foreground (active) application. By using an application shortcut key, you can switch to a particular application quickly, no matter where you are in Windows or which application you are using.

To assign an application shortcut key to an application, you can use the Properties command on the File menu in Program Manager, or you can use the Application Shortcut Key option in the application's PIF. Shortcut-key settings made in Program Manager override settings made in PIF Editor.

After you assign an application shortcut key, the key combination works as a shortcut key only when that application is loaded. No application (including Windows, Windows applications, and the application that uses the shortcut key) can use that key combination for any other purpose. For this reason, you should select application shortcut keys carefully. Avoid assigning the same shortcut key to more than one application.

For example, suppose you specify ALT+F as the application shortcut key for PFS: First Choice. In many Windows applications, ALT+F is a shortcut key: It displays the File menu. However, if PFS: First Choice is loaded when you are using Windows Notepad, pressing ALT+F makes PFS: First Choice the active application, rather than displaying the File menu in Notepad.

► To specify a shortcut key by using Program Manager

1. Switch to Program Manager.
2. Select the icon of the application for which you want to specify a shortcut key.
3. From the File menu, choose Properties.
4. Select the Shortcut Key box, and then press the key combination you want to use for this application.

Valid key sequences are CTRL+ALT+*character*, CTRL+SHIFT+*character*, CTRL+SHIFT+ALT+*character*, and CTRL+ALT+SHIFT+*character*. The *character* can be any letter, number, or special character. When you type a character in the Shortcut Key box, Program Manager adds CTRL+ALT in front of it. To specify a different control-key sequence, you must type the sequence.

5. Choose the OK button.

If you press an invalid key combination, a message appears and Windows resets the key definition to its previous value.

► **To delete a shortcut-key definition by using Program Manager**

1. Switch to Program Manager.
2. Select the application's icon.
3. From the File menu, choose Properties.
4. Select the Shortcut Key box, and then press BACKSPACE.
The shortcut key is set to None.
5. Choose the OK button.

► **To specify a shortcut key by using PIF Editor**

1. From the File menu, choose Open.
2. Select the PIF for the application you want to specify a shortcut key for, and then choose the OK button.
3. Choose the Advanced button.
The Advanced dialog box opens.
4. Select the Application Shortcut Key box.
5. Press the key combination you want.

The key combination you specify must include either the ALT or CTRL key. For example, the key combinations CTRL+Y, ALT+F4, CTRL+SHIFT+F11, and CTRL+ALT+7 are all valid application shortcut keys. You cannot specify a key combination that includes the ESC, ENTER, TAB, SPACEBAR, PRINT SCREEN, or BACKSPACE key. Windows interprets any key combination you press as an application shortcut key unless you press keys that move you to another area in the dialog box (such as TAB) or keys that are Windows keys not yet reserved for the application (such as CTRL+ESC or ALT+TAB).

6. Choose the OK button.

If you press an invalid key combination, a message appears, and Windows resets the key definition to its previous value.

Unlike shortcut keys defined by using Program Manager, shortcut keys defined by using PIF Editor cannot be used to start an application but only to switch to the application while it is running.

► **To delete a shortcut-key definition by using PIF Editor**

1. Open the PIF for the application whose shortcut key you want to delete.
2. Choose the Advanced button.
3. Select the Application Shortcut Key box.
4. Press SHIFT+BACKSPACE to set the shortcut key to None.

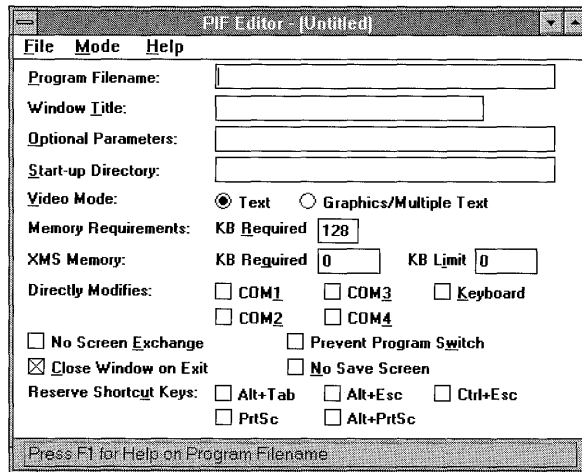
Or, while pressing a key combination, press BACKSPACE to reset the shortcut-key definition to its previous value.

Specifying PIF Options for Standard Mode

A PIF contains two sets of options: 386 Enhanced and Standard. This section explains how to specify the Standard options. You can use these options for running an application in standard mode.

If you are currently running Windows in standard mode, PIF Editor displays the Standard options. (If you are running Windows in 386 enhanced mode, you can display the Standard options by choosing Standard from the Mode menu.) For more information about modes and PIF options, see “Changing PIF Modes” earlier in this chapter.

The Standard options appear as follows.



Program Filename

In the Program Filename box, type the name of the file that starts the application (including the path, if necessary). If you start the application from a batch program, type its path, including the filename extension (usually .BAT).

For most applications, you can type the path of the main program file, which usually has the extension .EXE or .COM. For example, when creating a PIF for Microsoft Word, you would type `c:\word\word.exe`.

You can also specify an environment variable in this box. By using an environment variable, you can place a variable name in the PIF and assign it a value by using the **set** command in the AUTOEXEC.BAT file. When you type the variable name, enclose it in percent signs (%). For example, in your AUTOEXEC.BAT file you could assign the value “c:\word\word.exe” to an environment variable named WORDDIR. Then, in PIF Editor, you would specify the environment variable `%worddir%` as the program filename.

Window Title

You can type a descriptive name in the Window Title box. For example, you could type **Lotus 1-2-3** if you are creating a PIF for that application. When the application is minimized, the name you type appears under its icon, and appears in the title bar if the application is running in a window.

This entry is optional. If you leave the Window Title box blank, the application’s title bar displays the name of the PIF without the extension.

You can also specify an environment variable in this box. By using an environment variable, you can place a variable name in the PIF and assign it a value by using the **set** command in the AUTOEXEC.BAT file. When you type the variable name, enclose it in percent signs (%).

Note You can also specify a window title for a non-Windows application by using the Properties command on the File menu in Program Manager. Settings made in Program Manager override settings made in PIF Editor.

Optional Parameters

You can type application parameters in the Optional Parameters box. These are the same parameters you type after the application’s filename when starting the program from MS-DOS. For example, if you type `word /c` when you start Microsoft Word from the MS-DOS command prompt, type `/c` in the Optional Parameters box.

Parameters can be filenames, letters, numbers, or any type of information up to 62 characters in length. For information about valid parameters, see the application's documentation.

If you want Windows to prompt you for parameters whenever you start the application, type a question mark (?) in this box. You can also specify an environment variable in this field. By using an environment variable, you can place a variable name in the PIF and assign it a value by using the **set** command in the AUTOEXEC.BAT file. When you type the variable name, enclose it in percent signs (%).

This entry is optional. If the application does not require parameters, or if you do not want to use any parameters when you start your application, leave this box blank.

The optional parameters you specify when PIF Editor is displaying Standard options apply to standard mode only. If you want to specify different ones for your application to use in 386 enhanced mode, use the 386 Enhanced command on the Mode menu.

Note When you start the application by using the Run command in File Manager or Program Manager, any optional parameters you specify override the optional parameters specified in PIF Editor.

Start-up Directory

Some applications require access to files in a particular directory before they can run. You can type a path in the Start-up Directory box to specify the directory you want to be the current directory when the application starts (usually the directory where the application's program file is located). This entry is optional.

You can also specify an environment variable in this box. By using an environment variable, you can place a variable name in the PIF and assign it a value by using the **set** command in the AUTOEXEC.BAT file. When you type the variable name, enclose it in percent signs (%).

You can also use Program Manager to specify a start-up directory. You do this by choosing the Properties command from the File menu in Program Manager, and then specifying a directory in the Working Directory box. Program Manager settings override PIF Editor settings.

Video Mode

Use the Video Mode options to indicate how much memory is needed to save and restore your application's screen contents and to copy the screen contents onto the Clipboard.

The memory that Windows reserves for the application's screen contents is part of the memory allocated to the application. Therefore, the more memory required to display the application's screen contents, the less memory there is available for the application itself.

You can select from two video modes: Text mode and Graphics/Multiple Text mode. Text mode requires less memory than Graphics/Multiple Text. The following table describes the options.

Use	To
Text	Indicate that the application is to run only in text mode. Text mode uses the least memory. Therefore, you could select this option to make the most memory available to the application.
Graphics/ Multiple Text	Indicate that the application is to run in graphics mode, or that it is to use more display memory than one text screen requires. The Graphics/Multiple Text video mode uses more memory than the Text video mode. However, selecting this option ensures that enough video memory is available when you switch between modes. Multiple text refers to text-mode applications that use more than one video page to display text, and therefore need more video memory than typical text-mode applications. Some Microsoft Basic programs use this mode.

You can make more memory available to the application by selecting the Text option button. However, if you are not sure which video mode to use, select the Graphics/Multiple Text option button. If the application needs the Graphics mode but the Text option button is selected, you cannot switch from the application; the only way to return to Windows is to quit the application.

Memory Requirements

Use the Memory Requirements: KB Required box to indicate how many kilobytes of conventional memory must be free to start the application. In general, you should leave this setting at 128.

When you start an application, Windows gives it all available conventional memory regardless of what you type in the KB Required box. The number in this box simply determines how much memory must be available before Windows tries to start the application; it does not limit how much conventional memory the application receives.

If Windows cannot provide as much memory as you specify and you try to start the application, a message appears, telling you there is not enough memory to run

the application. For more information about specifying memory options and fine-tuning memory requirements, see Chapter 14, "Optimizing Windows."

Note The Memory Requirements option pertains to the amount of free memory the application needs in order to run. When setting this option, do not use the memory requirements listed in the application's documentation. Such "requirements" usually are an estimate of the total amount of memory your system should have, not the amount of memory that must be free for the application to run. Application manufacturers usually specify more memory than the application needs; this ensures that your system has enough memory to run MS-DOS, the utilities in your CONFIG.SYS and AUTOEXEC.BAT files, and the application.

XMS Memory

Use the XMS Memory options to allocate extended memory to an application that uses memory according to the Lotus/Intel/Microsoft/AST eXtended Memory Specification (XMS) standard. Because few applications require extended memory, you can usually leave these options at their default settings. Lotus 1-2-3 version 3.1 is an example of a non-Windows application that does use extended memory. (For more information about extended memory, see Chapter 14, "Optimizing Windows.") The following table describes the options.

Use	To
KB Required	<p>Specify how many kilobytes of extended memory must be free in order to start the application.</p> <p>Leave this setting as it is for most applications. Specifying a value other than 0 dramatically increases the time it takes to switch to and from the application. You should specify a value only if the application requires a certain amount of extended memory in order to run.</p>
KB Limit	<p>Limit how many kilobytes of extended memory the application can use.</p> <p>Some applications take all available extended memory whether they need it or not. This option is useful for limiting an application's access to extended memory.</p> <p>Leave this setting at 0 to prevent the application from gaining access to any extended memory (except in the high memory area or HMA).</p> <p>Setting this option to -1 provides the application with all the extended memory it requests (up to the maximum amount available). Set this option to -1 only if the application requires large amounts of extended memory. In general, it is not a good idea to set this option to -1, because it dramatically slows down your system.</p>

To prevent the application from using any extended memory, leave both XMS Memory options at a setting of 0.

Directly Modifies

Use the Directly Modifies options to indicate that the application uses certain system resources in a way that prevents sharing those resources with other applications. For example, some communications applications take control of the communications port they are using, to the exclusion of other applications. The following table describes the options.

Use	To
COM1, COM2, COM3, COM4	Specify which communications ports the application uses. This prevents two applications from trying to use the same communications port at once (which can result in garbled or lost data).
Keyboard	<p>Indicate that the keyboard will be used with the application, rather than with Windows or other applications.</p> <p>Selecting this check box can make more memory available to the application, since Windows does not need to save the application's current state or its display settings.</p> <p>Selecting the Keyboard check box is similar to selecting the Prevent Program Switch check box; you have to quit the application in order to return to Windows or other applications. If you are uncertain, do not select these options.</p>

With either the COM or Keyboard option, Windows cannot respond to any shortcut keys you press while you're using the application, and you cannot switch from the application or copy its screen contents onto the Clipboard.

No Screen Exchange

You can conserve memory (thereby making more memory available to the application) by selecting the No Screen Exchange check box. If you select this option, you cannot copy information from the application's window onto the Clipboard by using ALT+PRINT SCREEN or PRINT SCREEN. If you are uncertain, do not select this option.

Selecting this check box has an effect similar to selecting both the PRtSc and ALT+PRtSc check boxes in the Reserve Shortcut Keys options.

Prevent Program Switch

Selecting the Prevent Program Switch check box keeps Windows from allocating memory for program switching, which leaves the memory available to the application. If you select this option, you cannot switch to another application. To use Windows or other applications, you have to first quit the application. If you are uncertain, do not select this option.

To conserve memory, select this option if your application does not support switching, or when the application is a Microsoft Basic application that uses the serial communications port.

Close Window on Exit

Clear this check box if you want Windows to leave the window displayed after you quit the application. This is especially useful if you are running a command or application that displays output on the screen. If the window closes too quickly, you won't see the output.

If you clear the Close Window On Exit check box and are running the application in text mode, a message reminds you to press any key to return to the Windows desktop. If you are running the application in graphics mode, this message does not appear; however, you can press any key to clear the screen and continue your Windows session.

No Save Screen

When you switch between applications in standard mode, Windows saves in memory the information displayed on the screen. By doing this, Windows ensures information is displayed correctly when you switch back to an application.

When you select the No Save Screen check box, Windows no longer retains the screen information for that application, and the memory becomes available to the application. When the application uses this additional memory, it performs faster. However, when you switch to the application, the screen is not restored correctly, unless the application has the capability of retaining its own screen information.

Use this option only when the application you are using can retain its own screen information and has a "redraw screen" command. To find out if your application has this capability, see the application's documentation.

Reserve Shortcut Keys

Use the Reserve Shortcut Keys options to specify the key combinations you want to be used with your application, rather than with Windows.

Normally, when you type a Windows shortcut-key combination, Windows carries out that shortcut key's assigned action; the application never registers that you pressed those keys.

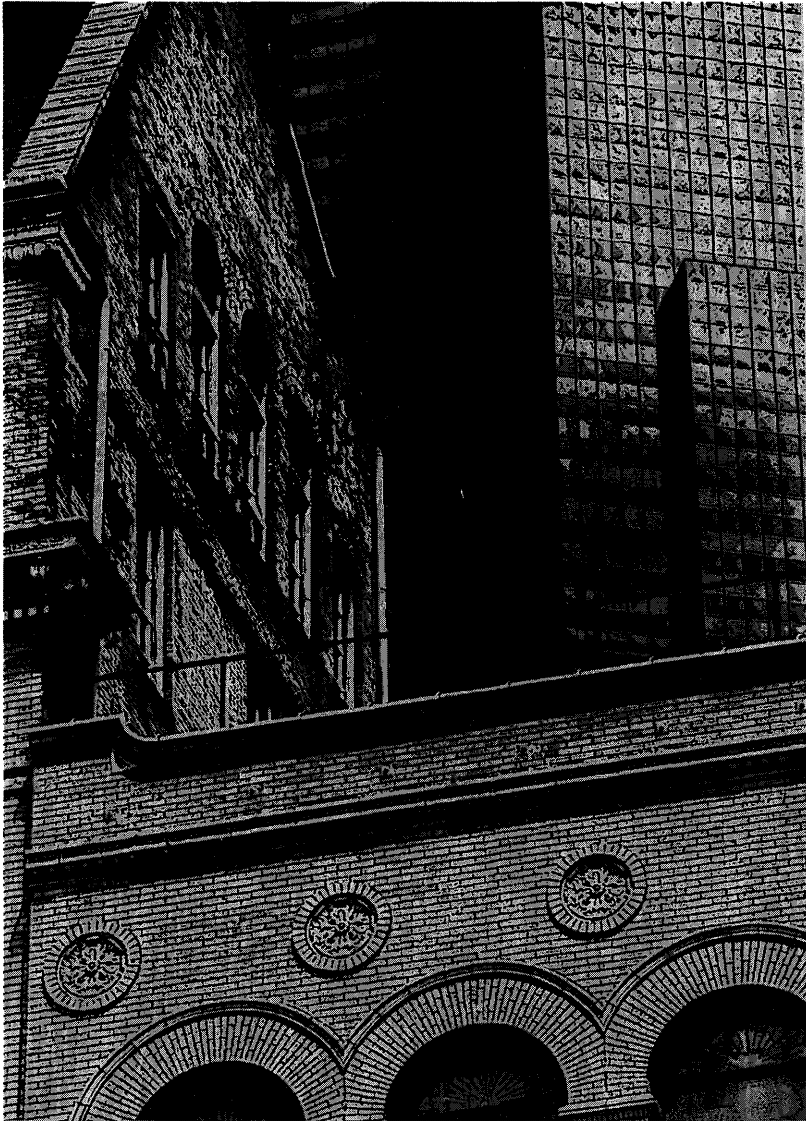
Selecting one or more of the Reserve Shortcut Keys check boxes indicates that Windows should ignore the specified key combination when the application is active. Instead, the application responds to the key combination.

For example, suppose your word-processing application uses the key combination ALT+TAB to insert a special character into a document. But when you run the word processor with Windows, pressing ALT+TAB switches you to another application. For ALT+TAB to work in the word processor, you edit the word processor's PIF and select the Reserve Shortcut Keys option for the ALT+TAB shortcut key. Thereafter, when you use the word processor with Windows, pressing ALT+TAB inserts the special character rather than switching you to a different application. (When you use other applications, the key combination acts as a Windows shortcut key.) The following table describes the shortcut-key combinations.

Use	To
ALT+TAB	Reserve the ALT+TAB shortcut key for the application. Otherwise, Windows switches between applications when you press this key combination.
ALT+ESC	Reserve the ALT+ESC shortcut key for the application. Otherwise, when you press this key combination, Windows cycles you through the applications in the order each was started.
CTRL+ESC	Reserve the CTRL+ESC shortcut key for the application. Otherwise, Windows displays Task List when you press this key combination.
PRTSC	Reserve the PRINT SCREEN shortcut key for the application. Otherwise, Windows copies an image of the screen onto the Clipboard when you press this key.
ALT+PRTSC	Reserve the ALT+PRINT SCREEN shortcut key for the application. Otherwise, Windows copies an image of the active window onto the Clipboard when you press this key combination.



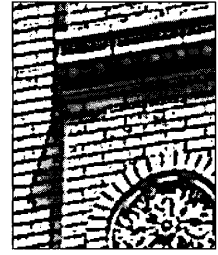
Windows Accessories



Windows Accessories

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Write



Chapter 9

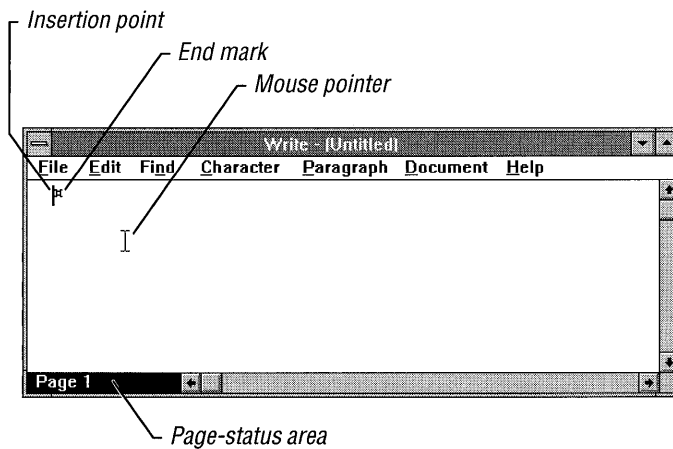
Working with Write

Microsoft Windows Write is a word-processing application that you can use to create and print documents for day-to-day business and personal use. To create Write documents, you need to know how to type, edit, and format text in the Write window; save the text to a file; and print your documents on your printer. The following sections explain each of these tasks.

► To start Write

- In the Accessories group, choose the Write icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.)

The Write window appears, ready for you to begin typing.



In the Write window, you see the following items:

- The *insertion point* indicates where text appears when you start typing. When you start Write or open an existing document, the insertion point appears in the upper-left corner of the Write window.
- The *end mark* indicates the end of a document. When there is no text in a Write window, the end mark is directly to the right of the insertion point.
- The *page-status area* indicates which page of your text is currently on the screen. Until you break a document into pages, you see only “Page 1” in the page-status area.
- The *mouse pointer* appears only if you have a mouse connected to your computer. It indicates where the mouse is pointing inside the window and where the insertion point will move to if you click a location in a document.

Typing Text

When you are ready, just start typing. The text that you type starts filling the Write window at the insertion point. When you reach the end of the line, Write automatically *wraps* your text to the beginning of the next line. To start a new paragraph, press ENTER. If you want to leave a blank line between paragraphs, press ENTER twice.

If you make a mistake while typing, press BACKSPACE to back up the insertion point and undo the mistake. For information about editing techniques specific to Write, see the following section, “Editing a Document.”

Editing a Document

Editing is much the same in Write as in any other Windows application (for more information, see Chapter 2, “Application Basics”). However, in addition to providing the same editing features used throughout the Microsoft Windows operating system, Write offers various special editing techniques. The following sections explain each of these techniques.

Moving Around in a Document

You can use the scroll bars to move around in your Write document (for more information, see Chapter 2, “Application Basics”). To move the insertion point, use the mouse to point to a location in the document, and then click. Or you can use the keyboard.

Write includes a number of special keys and key combinations for moving quickly around a document. These are in addition to the arrow keys, the SPACEBAR, and ENTER. The 5 key referred to in the following table is 5 on the numeric keypad. Make sure that the NUM LOCK key is off.

Press	To move the insertion point to the
CTRL+RIGHT ARROW	Next word
CTRL+LEFT ARROW	Previous word
5+RIGHT ARROW	Next sentence
5+LEFT ARROW	Previous sentence
HOME	Beginning of a line
END	End of a line
5+DOWN ARROW	Next paragraph
5+UP ARROW	Previous paragraph
PAGE DOWN	Next screen down
PAGE UP	Next screen up
CTRL+PAGE DOWN	Bottom of the window
CTRL+PAGE UP	Top of the window
5+PAGE DOWN	Next page
5+PAGE UP	Previous page
CTRL+HOME	Beginning of the document
CTRL+END	End of the document

You can move the insertion point continuously by holding down any of the key combinations except for the keys that move you to the beginning or end of a line or document.

You can use 5+PAGE DOWN and 5+PAGE UP to move to the next or previous page only after you either print your document or use the Repaginate command to divide your document into pages. Write stores page breaks with a document and remembers them each time you use the document. For more information, see “Breaking a Document into Pages” later in this chapter.

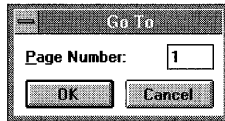
If you have divided a document into pages, you can move to a specific page by choosing the Go To Page command from the Find menu.

► **To move to a specific page**

1. From the Find menu, choose Go To Page.

Or press F4.

The Go To dialog box appears.



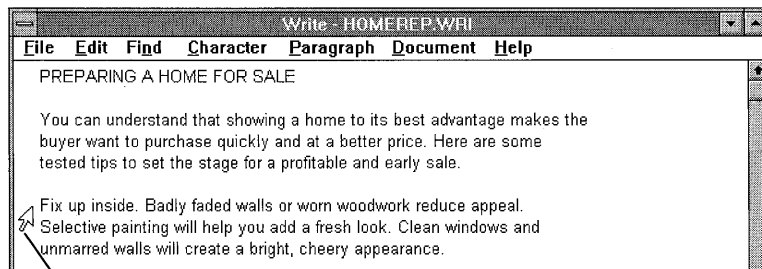
2. In the Page Number box, type the number of the page you want to move to.
3. Choose the OK button.

The dialog box disappears, and the insertion point moves to the beginning of the selected page.

Selecting Text

Before you edit or format text in a Write document, you need to *select* it. The easiest way to select text is to press and hold down the mouse button, and then move the pointer over the text. For information about the general selecting techniques used throughout Windows, see Chapter 2, "Application Basics."

In addition to these general techniques, Write also features a technique for selecting by using the *selection area* and your mouse. The selection area is at the far left edge of the Write window, as shown in the following illustration.



The mouse pointer in the selection area

In the selection area, the pointer changes to an arrow that slants to the right. You can use the selection area to select text in the following ways.

To select	Do this
By the line	Move the pointer to the selection area and point to a line. Click the mouse button once to select the line. To select more than one line, drag the pointer.
By the paragraph	Move the pointer to the selection area and point to any line in the paragraph. Double-click to select the paragraph. To extend the selection one paragraph at a time, hold the mouse button down after the second click, and then drag the pointer.
Between points	Move the pointer to the selection area and select a line or paragraph. Move along the selection area to another line or paragraph, press and hold down SHIFT, and then click. Write selects all lines or paragraphs between the two points.
The entire document	Move the pointer to the selection area, press and hold down CTRL, and then click.

► **To cancel a selection**

- Move the pointer to the selected text, and then click.

Finding and Changing Text

You can easily search for and edit text in your Write documents by using the Find and Replace commands on the Find menu. These commands allow you to:

- Search for text up to 255 characters in length.
- Change all occurrences of the text in the document.
- Change only certain occurrences of text.

The following sections explain how to use the Find and Replace commands.

Finding Text

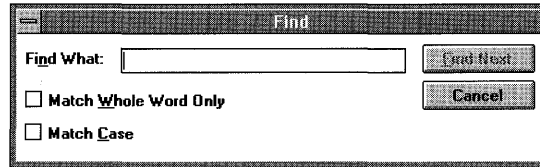
By using the Find command on the Find menu, you can look for a character, word, or group of characters or words in a Write document.

When you choose the Find command, Write starts a search at the insertion point or at the end of any text that is selected. When it reaches the end of the document, Write continues searching from the beginning of the document to the point at which the search started.

► **To find text**

1. Position the insertion point where you want to start your search.
2. From the Find menu, choose Find.

The Find dialog box appears.



3. In the Find What box, type the text you want to find.
4. To find only entire words, select the Match Whole Word Only check box. Otherwise, Write finds, for example, *main* in *remainder*.
5. To match capitalization exactly, select the Match Case check box.
6. To start the search, choose the Find Next button.

Write searches for the text and selects the first occurrence. If you want to edit the text, point to it and click to switch from the dialog box to the document. (If you are using the keyboard, press ALT+F6 to switch between the dialog box and the document.)

If there are no occurrences of the text in the document, Write displays a message, telling you that it could not find the text. Choose the OK button.

7. To find the next occurrence of the text, choose the Find Next button again. When Write finds the last occurrence of the text, it displays a message, telling you that the search is complete. Choose the OK button.
8. To close the Find dialog box, choose the Cancel button.

When searching for text that includes spaces, tabs, paragraph marks, and page breaks, type the following characters (where ^ means the caret symbol) in the Find What box.

Type	To represent
?	Any character in a file (? is called a <i>wildcard</i>). For example, if the search text is <i>hea?</i> , Write finds every word with <i>hea</i> followed by at least one character, such as <i>headstrong</i> , <i>figurehead</i> , <i>heal</i> , or <i>theater</i> .
^w	A space anywhere in your document—between words, for example.
^t	A tab character.
^p	A paragraph mark.
^d	A manual page break. For more information, see “Breaking Pages Manually” later in this chapter.

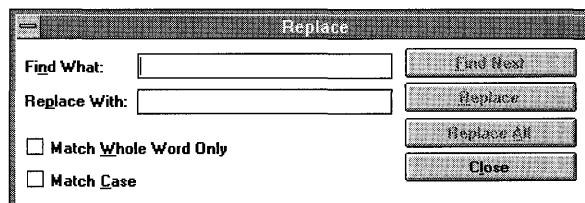
Changing Text

The Replace command on the Find menu allows you to find text and replace it with new text. You can find and change all occurrences of the specified text automatically, or you can decide whether to change each occurrence as Write finds it.

When you choose the Replace command, Write searches forward from the location of the insertion point. When it reaches the end of the document, Write continues searching from the beginning of the document to the insertion point. If you select a section of your document before choosing Replace, however, the command searches only within that selection.

► To find and change text

1. Position the insertion point where you want to start your search.
If you want to make changes to only part of your document, select that part.
2. From the Find menu, choose Replace.
The Replace dialog box appears.



3. In the Find What box, type the text you want to find, and in the Replace With box, type the text you want to replace it with.
For information about how to search for text that includes spaces, tabs, paragraph marks, and page breaks, see the preceding section, “Finding Text.”

4. To find only entire words, select the Match Whole Word Only check box.
5. To match capitalization exactly, select the Match Case check box.
6. Choose one of the following buttons to start the search: Find Next, Replace, or Replace All. If you selected a section of your document to make changes in, choose the Replace Selection button. For more information about these options, see the table that follows this procedure.

Write displays a message, telling you when a search is complete. Or, if there are no occurrences of the text in the document, Write displays a message, telling you that it could not find the text. Choose the OK button to close either dialog box.

7. To close the Replace dialog box, choose the Close button.

The following options are available when you choose the Replace command.

Use	To
Find Next	Find the next occurrence of the search text. If you want to edit the text, click the text (or press ALT+F6) to switch to the document.
Replace	Replace the selected text. Write then waits for further instructions.
Replace All	Automatically change all occurrences of the specified text in the document.
Replace Selection	Automatically change all occurrences of the specified text in the selected section of the document. The Replace All button changes to Replace Selection when you select a section of text.

Using the Repeat Last Find Command

You do not have to keep the Find or Replace dialog box on the screen throughout the entire search. You can use the Repeat Last Find command on the Find menu to continue a search after finding the first occurrence of search text. You cannot, however, make automatic changes to text if you use Repeat Last Find to find text.

► To repeat the last find

1. Use the Find or Replace dialog box to find the first occurrence of the search text.
2. Choose the Cancel or Close button to close the Find or Replace dialog box.
3. From the Find menu, choose Repeat Last Find to find the next occurrence of the search text.

Or press F3 to choose Repeat Last Find quickly.

Inserting Optional Hyphens

As you look over the text in your document, you may occasionally see a large gap at the end of a line where a long word has been wrapped to the beginning of the next line. You can eliminate such gaps by inserting optional hyphens in long words to specify correct hyphenation points. If such a word occurs at the end of a line when you print your document, Write breaks it at one of these hyphenation points. Optional hyphens are invisible unless they appear at the end of a line.

► To insert optional hyphens in a word

- Press CTRL+SHIFT+HYPHEN (-) at each desired hyphenation point.

Note If you type a normal hyphen at the end of a line of text, Write will always break the line at that hyphen.

Inserting Pictures in Write

There are three methods you can use to insert a drawing into a file. You can copy, embed, or link a drawing into a Write document. You can link and embed information only if the application used to create it supports object linking and embedding. Check the application's documentation to find out.

Method	Description
Copy	You use this method to copy a drawing to a different application, by using the Clipboard. Once the drawing is in the new file, you can change it only by deleting it and copying a new one in its place. To insert a Windows Paintbrush drawing already on the Clipboard, you use the Paste Special command on the Edit menu.
Embed	Embedding is similar to copying but with one important difference: You can edit an embedded drawing (or <i>object</i>), because you can open Paintbrush from within Write. To embed a Paintbrush drawing already on the Clipboard, you use the Paste command on the Edit menu.
Link	Linking dynamically connects two files so that information in one file automatically updates when information in the other file changes. To link a Paintbrush drawing already on the Clipboard, you use the Paste Link command on the Edit menu. Linked drawings are also easily edited from within Write.

When you paste a picture or graph into Write, it always appears at the left margin. You can select the picture and move it horizontally or change its size. You can also select the picture and cut, copy, or paste it just as you would the text in the document.

Write displays pictures in a screen resolution appropriate for the printer you have selected. Because of differences in screen and printer resolutions, pictures may

seem slightly distorted on the screen. However, when you print a picture in a Write document, the resolution will be correct.

For more information about object linking and embedding, see Chapter 13, “Integrating Your Windows Applications.”

► **To embed a drawing into a Write file**

1. Open the Write document into which you want to embed the drawing.
2. Place the insertion point at the location you want the drawing to appear.
3. Switch to Paintbrush.
4. Create a drawing, or open the file that contains the drawing you want to embed.
5. If you want to save the drawing, choose Save from the File menu.
6. Select the drawing using the Pick or Scissors tool.
7. From the Edit menu, choose Copy.

A copy of the drawing is placed onto the Clipboard.

8. Switch to the Write document.
9. From the Edit menu, choose Paste.
10. The drawing appears in the Write document.

For more information about selecting a drawing in Paintbrush, see Chapter 10, “Paintbrush.”

► **To link a drawing to a Write document**

1. Open the Write file that you want to link the drawing to.
2. Place the insertion point at the location you want the drawing to appear.
3. Switch to Paintbrush.
4. Open the file containing the drawing you want to link, or create a new drawing.
5. If you make any changes to the existing drawing, or create a new one, you need to choose Save from the File menu.
6. Select the drawing using the Pick or Scissors tool.
7. From the Edit menu, choose Copy.

A copy of the drawing is placed onto the Clipboard.

8. Switch to the Write document.

9. From the Edit menu, choose Paste Link.

You now have the original Paintbrush file containing the drawing, and a link to it in the Write document. A presentation of the linked drawing appears in the Write document.

10. From the File menu, choose Save.

Editing Pictures in Write

To make changes to an embedded or linked drawing, you can start Paintbrush from within Write, make your changes, and continue working in your Write document.

For more information about object linking and embedding, see Chapter 13, “Integrating Your Windows Applications.”

► To edit an embedded drawing

Mouse

1. In Write, double-click anywhere in the embedded drawing.
Paintbrush opens, displaying the drawing.
2. Edit the drawing as needed.
3. From the File menu, choose Update.
The embedded drawing is updated to reflect your changes.
4. From the File menu, choose Exit & Return To (name of document).
Paintbrush closes. If you forget to update, a dialog box appears, asking if you want to update your changes. Choose the Yes button to update.

Keyboard

1. In Write, use the arrow keys to move the insertion point to select the embedded drawing.
2. From the Edit menu, choose Edit Paintbrush Picture Object.
(The Object command changes to reflect the type of object selected.)
Paintbrush opens, displaying the drawing.
3. Edit the drawing as needed.
4. From the File menu, choose Update.
The embedded drawing is updated to reflect your changes.
5. From the File menu, choose Exit & Return To (name of document).
Paintbrush closes. If you forget to update, a dialog box appears, asking if you want to update your changes. Choose the Yes button to update.

You edit a linked drawing the same way you edit an embedded drawing. Remember, though, that any changes you make to a linked drawing appear in all the drawings associated with it through links.

► **To edit a linked drawing**

Mouse

1. In Write, double-click anywhere in the presentation of the linked drawing.
Paintbrush opens, displaying the drawing.

2. Edit the drawing as needed.

The presentation of the linked drawing is automatically updated to reflect your changes if the Update option is set to Automatic.

3. From the File menu, choose Save.
4. From the File menu, choose Exit & Return To (name of document).

Note If you have set the link to update manually, you must update it by choosing the Links command on the Edit menu in Write, choosing the Update Now button in the Links dialog box, and then choosing the OK button.

Keyboard

1. In Write, use the arrow keys to move the insertion point to select the presentation of the linked drawing.

2. From the Edit menu, choose Edit Paintbrush Picture Object.

(The Object command changes to reflect the type of object selected.)

Paintbrush opens, displaying the drawing.

3. Edit the drawing as needed.

The presentation of the linked drawing is updated to reflect your changes automatically if the Update option is set to Automatic.

4. From the File menu, choose Save.
5. From the File menu, choose Exit & Return To (name of document).

Note If you have set the link to update manually, you must update it by choosing the Links command on the Edit menu in Write, and then choosing the Update Now button in the Links dialog box and the OK button.

Moving a Picture

You can move a picture horizontally in a document by using the Move Picture command on the Edit menu.

► To move a picture

1. Click the embedded picture to select it.
Or use the arrow keys to move the insertion point to select the picture.
2. From the Edit menu, choose Move Picture.
A square cursor appears in the center of the picture, and a dotted frame surrounds the picture.
3. Without pressing the mouse button, move the mouse right or left to move the dotted frame.
Or press the RIGHT ARROW or LEFT ARROW key to move the dotted frame.
To cancel the move, press ESC.
4. When the frame is where you want it, click the mouse button.
Or press ENTER.

If you are not satisfied with the position of your picture, you can choose Undo from the Edit menu to return the picture to its original position.

Tip You can also use the formatting commands (Left, Centered, or Right) on the Paragraph menu to move a picture.

Changing the Size of a Picture

You can enlarge or reduce a picture in Write by using the Size Picture command on the Edit menu.

► To change the size of a picture

1. Click the embedded picture to select it.
Or use the arrow keys to move the insertion point to select the picture.
2. From the Edit menu, choose Size Picture.
A square cursor appears in the center of the picture, and a dotted frame surrounds the picture.

3. Without pressing the mouse button, move the cursor until it rests halfway across the left side, right side, or lower edge of the frame.

Or press the LEFT ARROW, RIGHT ARROW, or DOWN ARROW key to move the cursor.

To change the length and width of the picture at the same time, move the cursor halfway across a lower corner of the frame.

4. Move the cursor in the direction you want to enlarge or reduce the picture.

Or press an arrow key to move the cursor.

To cancel sizing of your picture, press ESC.

5. When the frame is the size you want, click the mouse button.

Or press ENTER.

If you are not satisfied with the size of your picture, you can choose Undo from the Edit menu to return the picture to its original size.

Tip The lower-left corner of the Write window displays sizing information in the form of x and y location values. It is best to keep these values as whole numbers (for example, 5 rather than 5.5). This will prevent distortion of the picture.

Breaking a Document into Pages

When you finish editing your document, you can see where Write proposes to break the document into pages for printing. You can have Write break a document into pages at any time.

Breaking Pages Automatically

When Write automatically breaks your document into pages, it prevents the first or last line of a paragraph from being separated from the rest of the paragraph by a page break. By breaking a document into pages before printing, you can see where automatic page breaks will occur and decide where you might want to insert *manual page breaks*. When you use manual page breaks, Write starts new pages at places you designate.

By breaking a document into pages before printing, you can also make sure that any manual page breaks you have inserted are still in the right place after you edit a document. You can choose to confirm or change each page break as Write creates it.

► **To break a document into pages automatically**

1. From the File menu, choose Repaginate.

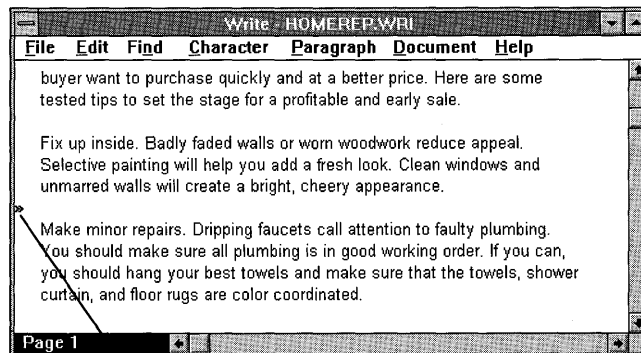
The Repaginate Document dialog box appears.



2. If you want to approve each page break as Write creates it, select the Confirm Page Breaks check box. For more information, see “Confirming Page Breaks” later in this chapter.
3. Choose the OK button.

As Write breaks the document into pages, the page numbers appear in the page-status area at the lower-left corner of the window.

The page breaks that Write automatically assigns to the document look like the arrows in the following illustration.



These arrows indicate the first new line of each page.

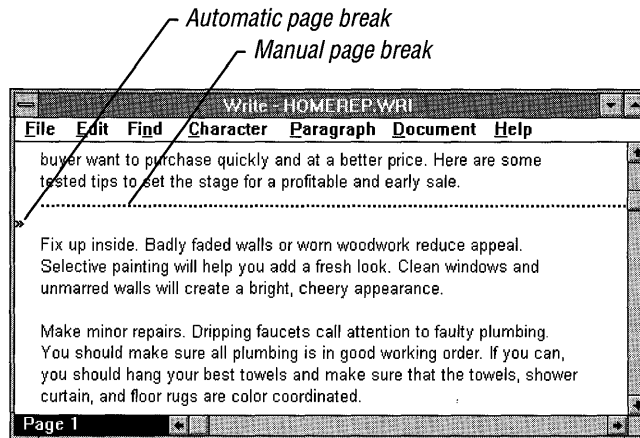
Breaking Pages Manually

If you know you want a page to end or begin at a certain place, you can insert a manual page break at any time.

► To insert a manual page break

1. Position the insertion point where you want the page break to occur.
2. Press CTRL+ENTER.

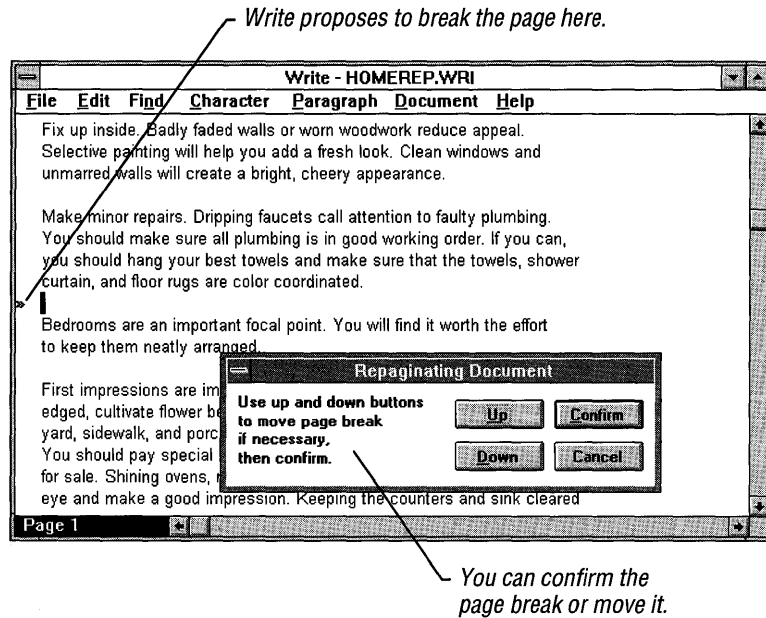
A dotted line appears in the document to show where you inserted the page break.



Manual page breaks can be selected, deleted, or copied like any other character in a document.

Confirming Page Breaks

If you select the Confirm Page Breaks check box in the Repaginate Document dialog box, Write pauses at each page break that it proposes to insert and at any page breaks that you inserted manually. The following dialog box appears every time Write pauses at a page break that it proposes to insert.



You can move an automatic page break up from where Write proposes to put it, but you cannot move it down. The Down button in the dialog box allows you to move the page break down only if you previously moved it up. You move to the next page break by choosing the Confirm button.

Each time Write pauses at a manual page break, it displays another dialog box so that you can confirm or remove the manual break.

Formatting Your Document

When you format your Write document, you determine how you want the document to look. You can determine the appearance of characters throughout the document, the spacing and alignment of lines in each paragraph, and the page layout for the entire document. Most of the formats you choose look the same on your screen as in the printed document.

Formatting Characters

The commands on the Character menu control how you format the characters in your document. You can format characters by:

- Using different character styles, such as bold, italic, and underline.
- Creating superscripts and subscripts.
- Using different fonts and point sizes.

Choosing a command from the Character menu affects text that is currently selected or text that you are about to type. A new paragraph will have the same character formatting as the previous paragraph.

If possible, Write displays the same fonts and sizes on the screen that you will see when you print your document. If Write cannot match the selected font, it substitutes a font that resembles the selected font as closely as possible. Whenever Write uses a substitute screen font, it still uses the correct line and page breaks.

Write saves character formats when you save your document. Write also transfers character formats when you move or copy formatted text to other parts of the same document or to another Write document.

Applying Character Styles

Character styles add emphasis to text by making it bold, italic, or underlined. You can apply more than one style to the same characters.

► **To format existing text in bold, italic, or underline**

1. Select the text you want to format.
2. From the Character menu, choose the style you want to use.
 - A check mark appears next to the style on the menu.
 - The selected text changes to the style you chose.

► **To format text that you are about to type in bold, italic, or underline**

1. From the Character menu, choose the style you want to use.
 - A check mark appears next to the style on the menu.
2. Type your text.
 - The text appears in the style you chose.

► **To cancel a character style**

1. Select the text for which you want to cancel the character style.
2. From the Character menu, choose the style (except for Regular).
The check mark next to the style on the menu disappears.
The style is removed from the selected text.

► **To cancel all character styles**

1. Select the text whose styles you want to cancel.
2. From the Character menu, choose Regular.
A check mark appears next to the Regular command.
All styles are removed from the selected text.

► **To format an entire document with a single character style**

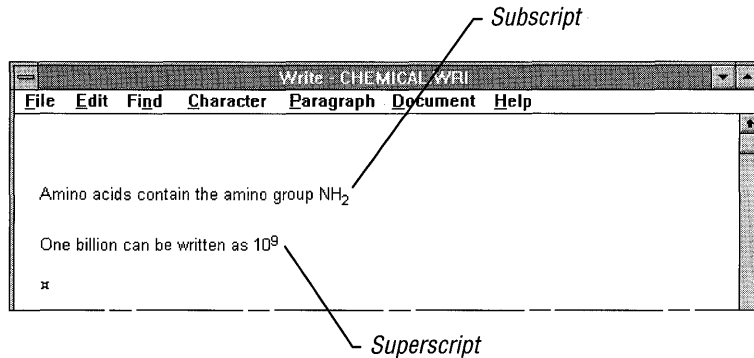
1. Select the entire document.
2. In the Character menu, choose Fonts.
The Fonts dialog box opens.
3. In the Font Style box, select the style you want or type the name of the style.
If there is more than one style included in the selected text, then the text box is left blank.
If you select Regular, all existing styles are removed.

Note If you have selected text before choosing the Fonts command and if there are any formats already in this text, the existing formats and fonts are replaced by the selections you make in the Font Style box. If you don't change a selection, then this format remains unchanged. For example, if you change the font style but not the size, then the current size remains but all font styles in the selected text are overwritten.

4. Choose the OK button.

Creating Superscripts and Subscripts

Superscript and subscript characters appear slightly above or below other text. They are also scaled to a smaller size.



► To format text as superscript or subscript

1. Select the text you want to format as superscript or subscript.
2. From the Character menu, choose Superscript or Subscript.

Write resizes and repositions the text you selected.

Using Fonts

A *font*, or typeface, is a graphic design applied to all text, numerals, and other characters. If possible, Write displays the same fonts and sizes on the screen that you will see when you print your document. If Write cannot, it substitutes a font that resembles the selected font as closely as possible. Whenever Write uses a substitute screen font, it still uses the correct line and page breaks.

The currently selected printer determines the fonts that are available. If you plan to print the document on a printer other than the selected one, you must set up the other printer by using either Windows Control Panel or the Print Setup command on the File menu. Then you can use that printer's fonts for text in your document. For more information about fonts and the default printer, see Chapter 6, "Print Manager."

Changing Fonts and Font Sizes

When you start typing text in a new document, Write uses the standard font for the default printer. If you want to use a different font, you can choose one of the font names displayed in the Fonts dialog box.

► **To change a font or font size by using the Fonts command**

1. From the Character menu, choose Fonts.
The Fonts dialog box appears.
2. In the Fonts box, select the name of the font you want to use.
Or type the name of the font in the Font Name box.
3. In the Font Style box, choose whether you want the text to appear as regular, bold, bold italic, or italic.
Or type the new font style in the Font Style box.

Note If you have selected text before choosing the Fonts command and if there are any formats already in this text, the existing formats and fonts are replaced by the selections you make in the Font Style box. If you don't change a selection, then this format remains unchanged. For example, if you change the font style but not the size, then the current size remains but all font styles in the selected text are overwritten.

4. In the Size box, select a size for the font.
Or type the new size.
5. Choose the OK button.
If you choose a font size that cannot be printed on the default printer, Write does not change the size of text on the screen.

As you select a new font, a sample of that font appears in the Sample box. When certain fonts are selected, the phrase "This is a scalable TrueType font" appears below the box. This means that the font you have selected is scalable to any point size and that what you see on the screen is exactly what the printer will print.

► **To change the font size by using the Character menu**

- From the Character menu, choose Reduce Font or Enlarge Font.

When you choose the Reduce Font or Enlarge Font command, Write changes the font size to the next smaller or larger size. The sizes are determined by Write, independent of the default printer. If you choose Reduce Font or Enlarge Font and the default printer does not support the next smaller or larger size, the text you type does not change size on the screen.

If you want to change the font or font size for text that is already typed, you must select the text before you choose the new font or size.

TrueType fonts scale more smoothly than other fonts across the entire range of sizes available in Write.

Formatting Paragraphs

The format of a paragraph includes the alignment, spacing, and indentation of the lines in the paragraph. A new paragraph starts out with the same format as the previous paragraph. For example, if you are typing a paragraph that is double-spaced and you press ENTER to start a new paragraph, the text you type in the new paragraph will also be double-spaced.

You can use either the Ruler or the commands on the Paragraph menu to change the format in each paragraph of a document. Before choosing a command from the Paragraph menu, position the insertion point inside the paragraph you want to format. If you want to format more than one paragraph at the same time, select a portion of all the paragraphs you want to format.

When you copy or move a paragraph, include the paragraph mark in the selection to keep the paragraph formats with the paragraph.

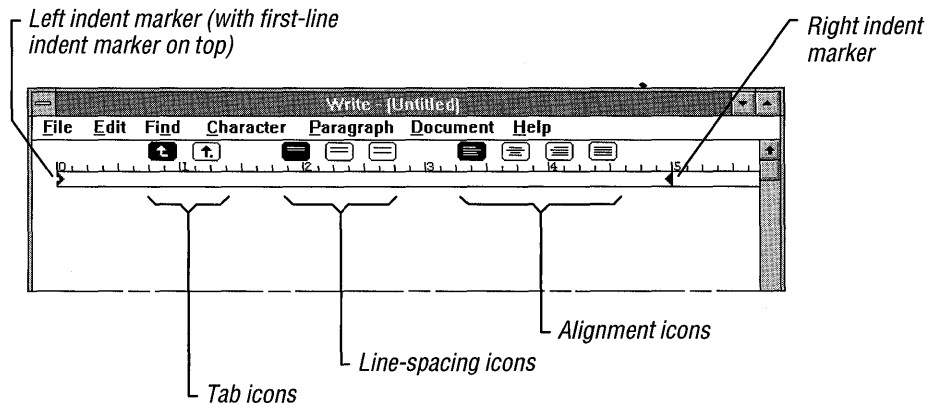
Displaying the Ruler

If you have a mouse, you can change paragraph formats by using the Ruler.

► To display the Ruler

- From the Document menu, choose Ruler On.

The Ruler appears at the top of the Write window.



You can set a different unit of measure on the Ruler by choosing the Page Layout command from the Document menu in Write. For more information, see "Changing the Page Layout" later in this chapter.

► **To hide the Ruler**

- From the Document menu, choose Ruler Off.

The following sections explain the different ways in which you can format your paragraphs. They also explain how to use the Ruler to create each format.

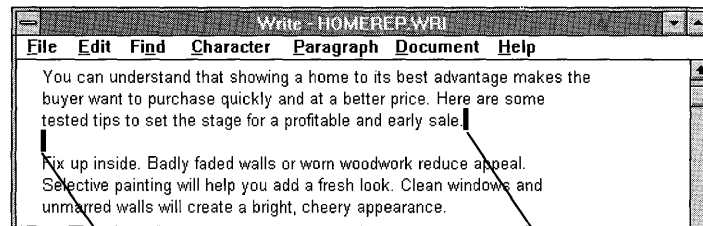
Adding and Removing Paragraph Marks

A paragraph mark is not a visible character in a document, but it marks the end of a paragraph or a blank line.

► **To add a paragraph mark**

1. Press ENTER after typing the last character in a paragraph.
2. If you want a blank line between paragraphs, press ENTER again.

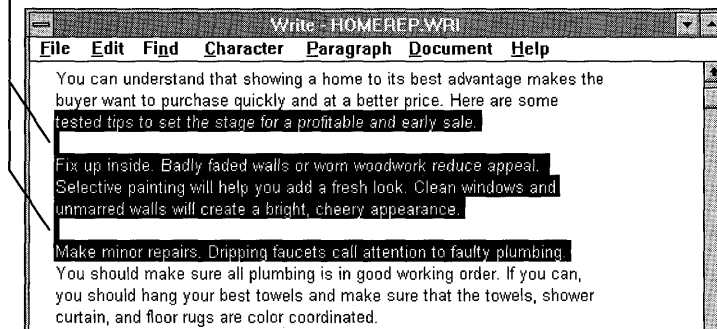
Although there is no visible character for the paragraph mark, you can select, delete, copy, and move a paragraph mark just as you do other characters. You can select individual paragraph marks, as shown in the following illustration.



Paragraph marks selected

Or you can select both text and paragraph marks.

Paragraph marks included in selection



► **To remove a paragraph mark**

1. Place the insertion point at the beginning of the paragraph that follows the mark you want to remove.
2. Press BACKSPACE.

If your paragraphs have a blank line between them, press BACKSPACE twice.

Changing Paragraph Alignment

You can align a paragraph in any of the following ways:

- At the left margin
- At the right margin
- Justified between both margins
- Centered between both margins

► **To change paragraph alignment**

1. Place the insertion point inside the paragraph you want to change.
2. From the Paragraph menu, choose the alignment command you want to use.

Write realigns the paragraph according to the command you chose.

► **To change paragraph alignment by using the Ruler**

1. Place the insertion point inside the paragraph you want to change.
2. To the right above the Ruler, click the appropriate paragraph-alignment icon.

Changing Paragraph Line Spacing

You can change the line spacing in a paragraph to single-spacing, one-and-one-half-line spacing, or double-spacing.

► **To change line spacing**

1. Place the insertion point inside the paragraph you want to change.
2. From the Paragraph menu, choose a line-spacing command.

The line spacing in the selected paragraph changes to reflect your choice.

► **To change line spacing by using the Ruler**

1. Place the insertion point inside the paragraph you want to change.
2. In the center above the Ruler, click the appropriate line-spacing icon.

Changing the Indentation of a Paragraph

When you first type a paragraph into Write, the text fills the area between the left and right margins. You can indent an entire paragraph from the left or right margin, or you can indent just the first line of a paragraph from the left margin.

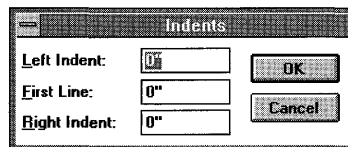
Indenting the lines of a paragraph differs from changing the left or right margins for a paragraph. Write indents paragraph lines from the current margin setting. You should set the margins that you want to use for your paper size first (or use the standard settings provided by Write), and then indent the paragraphs of your document. For more information about margins, see “Changing the Page Layout” later in this chapter.

Note You can also indent pictures or any other embedded information in a Write file.

► **To change the indentation of a paragraph**

1. Place the insertion point inside the paragraph you want to change.
2. From the Paragraph menu, choose Indents.

The Indents dialog box appears.



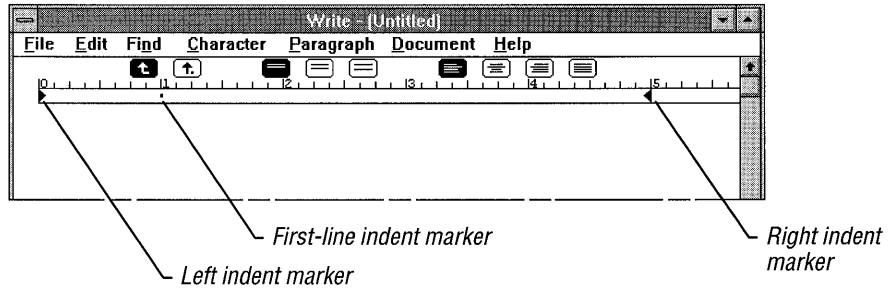
3. Type a measurement for any indentation you want to change.

The measurement can be in inches or centimeters, depending on the Measurements setting in the Page Layout dialog box. For more information, see “Changing the Page Layout” later in this chapter.

4. Choose the OK button.

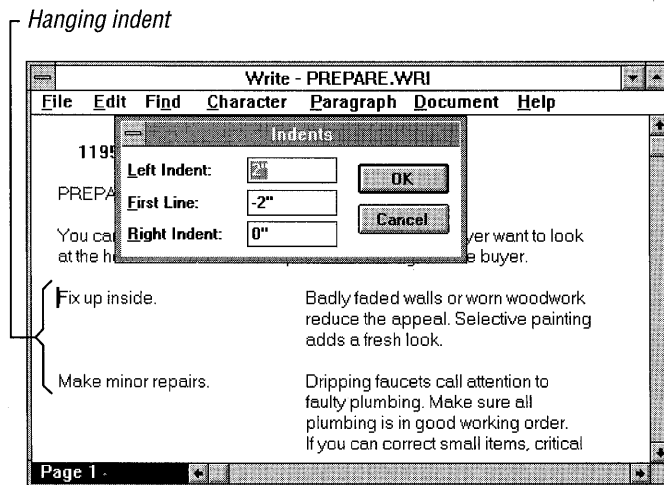
► **To change the indentation of a paragraph by using the Ruler**

1. Place the insertion point inside the paragraph you want to change.
2. On the Ruler, drag the appropriate indent marker to a new position.



The indents you create by using the Ruler are reflected in the Indents dialog box.

Creating a Hanging Indent You can also use the Indents command to create a *hanging indent*. In a paragraph with a hanging indent, the first line extends farther to the left than the rest of the paragraph, as in a numbered or bulleted list. Another example of a hanging indent appears in the following illustration.



► **To create a hanging indent**

1. Place the insertion point inside the paragraph you want to format.
2. From the Paragraph menu, choose Indents.
3. In the Left Indent box, type a positive number to set the indentation for the entire paragraph.
4. In the First Line box, type a negative number to set the indentation for the first line. The amount you are indenting must be less than or equal to the amount of the left indent. For example, if your left indent is 10, your first-line indent should be between -1 and -10.

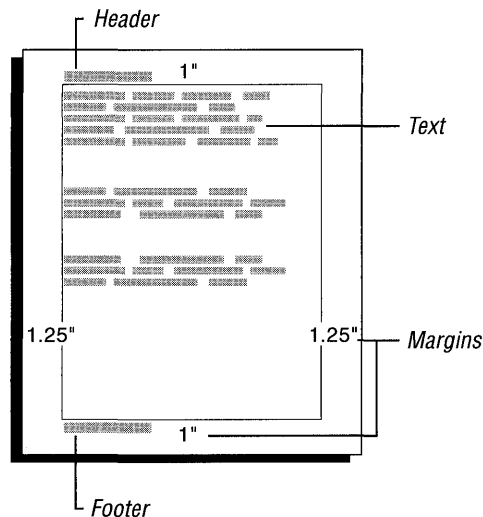
Both measurements can be in inches or centimeters, depending on the Measurements setting in the Page Layout dialog box. For more information, see “Changing the Page Layout” later in this chapter.

5. Choose the OK button.

The selected paragraph is reformatted according to the measurements you typed.

Formatting a Whole Document

When you start a new document, it is automatically formatted to look like the document in the following illustration.



You can change these settings at any time as you work in your document. The commands on the Document menu affect the document as a whole and apply to the following parts of a document:

- A *header* is text that appears at the top of every page. The default position of the header is .75 inch from the top of the page at the left margin.
- A *footer* is text that appears at the bottom of every page. The default position of the footer is .75 inch from the bottom of the page at the left margin.
- *Text* is single-spaced by default, and aligned at the left margin without any indentations.
- The *standard margins* are preset at 1 inch of space at the top and bottom of the document and 1.25 inches at the left and right edges.

For information about changing page-layout settings, see “Changing the Page Layout” later in this chapter.

Using Headers and Footers

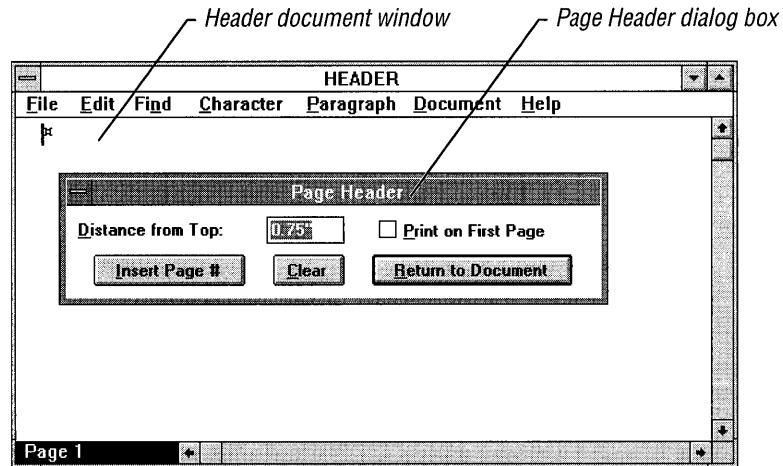
You can have one header and one footer in each Write document. Using the Header or Footer commands, you can:

- Type the text you want to use as a header or footer.
- Include page numbers in the printed document.
- Start the header or footer on the first or second page of the document.
- Change the distance between the header or footer and the top or bottom of the page.

► To add a header or footer

1. From the Document menu, choose Header or Footer.

A blank Header or Footer document window and the Page Header or Page Footer dialog box appear.



2. In the blank Header or Footer window, type the text you want.
 You can format the text as you would any other text. For example, if you want to center the text, choose Centered from the Paragraph menu before or after you type the text.
 If you make a mistake, you can press BACKSPACE to correct the last few characters typed, or you can choose the Clear button in the Page Header or Page Footer dialog box to delete all the text in the Header or Footer window and start over.
3. Click the Page Header or Page Footer dialog box.
 Or press ALT+F6 to select the dialog box.
4. If you want to change the distance between the header or footer and the edge of the page, type a measurement in the Distance From Top or Distance From Bottom box.
 The measurement can be in inches or centimeters, depending on the Measurements setting in the Page Layout dialog box. For more information, see “Changing the Page Layout” later in this chapter.
5. If you want the header or footer to appear on the first page of the printed document, select the Print On First Page check box.
 Otherwise, the header or footer starts on the second page.

6. Choose the Insert Page # button to print page numbers in the document. For more information about using page numbers, see the procedure that follows.
7. When you finish setting up your header or footer, choose the Return To Document button.
Or press ESC to return to your document.

When you print your document, you will see the headers and footers. They do not appear on the screen.

Note If the header, footer, or margins are too close to the edge of the page, the printer may not print them. If this happens, try moving them farther away from the edge.

► **To use page numbers in headers or footers**

1. From the Document menu, choose Header or Footer, depending on where you want your page numbers to appear.
2. In the Header or Footer window, type any text that you want included with the page number.
3. Move the insertion point to where you want the page number to appear on the line. (Choose the Centered or Right command from the Paragraph menu to quickly center or right-align the header or footer.)
4. Click the Page Header or Page Footer dialog box.
Or press ALT+F6 to select the dialog box.
5. Choose the Insert Page # button.
Choosing this button inserts (*page*) in the Header or Footer window at the location of the insertion point.
6. If you want a page number to appear on the first page of the printed document, select the Print On First Page check box.
If you want your first page to be a cover page without a number, do not select the Print On First Page check box.
7. Choose the Return To Document button.
Or press ESC.

When you print your document, consecutive page numbers appear on the printed pages.

Setting Tabs

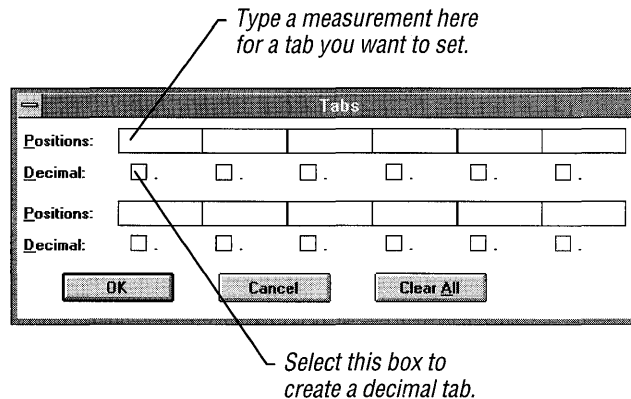
Write has tabs preset at every half inch. You can use these preset tabs to create a column of items aligned to the left. Preset tabs do not appear in the Tabs dialog box or on the Ruler.

You can easily set your own tabs for lists or tables by using the Tabs command on the Document menu or by using the Ruler. Tabs that you set override the preset tabs. You can set up to 12 tabs—either left-aligned tabs or *decimal tabs*. Decimal tabs let you create a column of numbers that line up on their decimal points.

► **To set tabs**

1. From the Document menu, choose Tabs.

The Tabs dialog box appears.



2. Click a position box.

Or press TAB to move to a position box.

3. Type a measurement.

This will be the location of the tab stop from the left margin. The number can be in inches or centimeters, depending on the Measurements setting in the Page Layout dialog box. For more information about the Measurements setting, see “Changing the Page Layout” later in this chapter.

4. If you want a decimal tab, select the Decimal check box below the measurement you type.
5. Choose the OK button.

The tabs you set in the Tabs dialog box also appear on the Ruler.

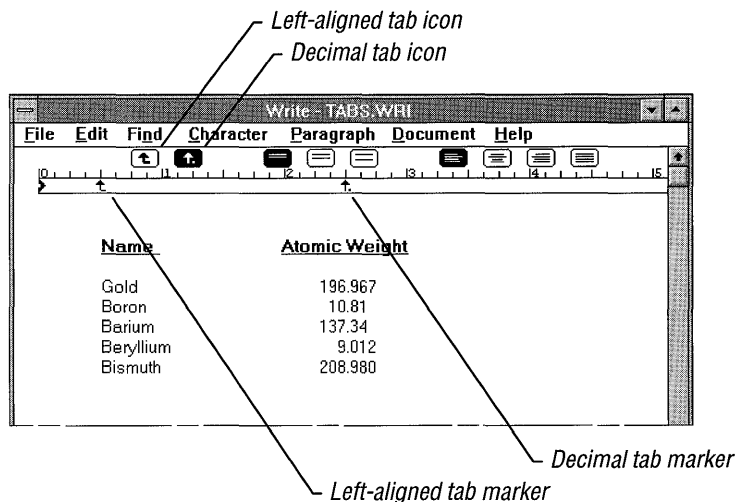
Tip When you type text at a decimal tab stop, the characters you type are inserted to the left of the tab stop until you type a decimal point. The decimal point is inserted at the tab stop, and any additional characters you type are inserted to the right of the decimal point. You can use a decimal tab to line up text to the right, as long as you do not use more than one period in the text.

► **To delete a tab**

1. From the Document menu, choose Tabs.
The Tabs dialog box appears.
2. Select the position box for the tab you want to delete.
3. Press DEL or BACKSPACE.
To delete all tabs at once, choose the Clear All button.

► **To set tabs by using the Ruler**

1. To the left above the Ruler, click the appropriate tab icon.



2. Click the Ruler where you want to set the tab.
You can also drag an existing tab marker to a new position.
The tabs you set by using the Ruler appear in the Tabs dialog box.

► **To delete a tab by using the Ruler**

- Drag the tab marker off the Ruler.

Changing the Page Layout

When printing a document, Write is preset to:

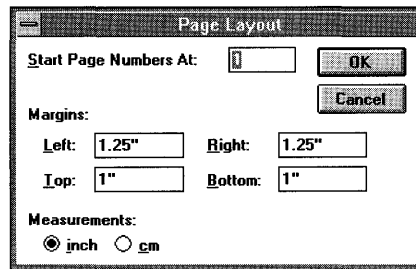
- Use inches in measurements.
- Use 1-inch top and bottom margins.
- Use 1.25-inch side margins.
- Number the first page as page 1.

You can use the Page Layout command on the Document menu to change these settings.

► To change the page-layout settings for a document

1. From the Document menu, choose Page Layout.

The Page Layout dialog box appears.



2. If you want to start numbering your document with a page number other than 1, type the number you want in the Start Page Numbers At box.

This number appears on the first page of your document if you have a page number in your header or footer. For information, see “Using Headers and Footers” earlier in this chapter.

3. In the Margins boxes, type the measurements you want for the margins.
4. If you want to use metric measurements, select the Cm option button.

You can also change this setting by using Control Panel. For more information, see Chapter 5, “Control Panel.”

5. Choose the OK button.

If you enter a starting page number, Write adjusts the page numbers displayed in the lower-left corner of the window. Write also uses the adjusted page numbers for the Go To Page command on the Find menu.

Managing Write Files

Working with Write files is much the same as working with any other Windows file. For information about opening and saving Windows files, see Chapter 2, “Application Basics.” For information about managing Windows files, see Chapter 4, “File Manager.”

The maximum size of a Write file is limited only by the amount of memory in your computer. Windows assigns the extension .WRI to a document you create by using Write and saves the document as a Write file. If you prefer, you can choose to save your document in one of several other formats. You can also open and work with files that were not created by using Write. The following sections discuss these topics.

Opening a Microsoft Word Document

If you want to use Write to work with a Microsoft Word document, you must first convert the Word document to the Write format.

When you open a Word document from Write, the Write dialog box appears, asking whether you want to convert the text to the Microsoft Write format.

Caution Be sure you back up a file before you convert it.

- ▶ **To convert a Word document to Write format**
 - In the Write dialog box, choose the Convert button.

Opening a Windows Data File

Most data files (also called *text files*) created by using Windows applications are in the same format used for Write files. When you choose to open a Windows data file in Write, the Write dialog box appears, but you do not need to convert Windows data files.

- ▶ **To avoid converting a Windows data file**
 - In the Write dialog box, choose the No Conversion button.

Tip If you make a mistake in selecting Convert or No Conversion, choose New from the File menu and choose the No button when asked if you want to save any changes. Your file will be left in its original state. Then reopen the file.

Opening a Non-Windows Data File

Most data files (text files) created outside Windows are not created using the Windows character format. You must convert these files to Write format.

When you choose to open a non-Windows data file from Write, the Write dialog box appears.

► **To convert a non-Windows data file to Write format**

- In the Write dialog box, choose the Convert button.

Caution Be sure you back up a file before you convert it to the Write format. Write cannot convert certain MS-DOS or Windows application files.

In addition, do not convert any files that are not purely text files. In binary files, ASCII characters above 127 might be related to the program that created the file and, therefore, may or may not be converted. Other files may contain control characters that should not be converted.

Saving a Document

When you are working with a Write document—especially a large document—you should save your document often. Doing so helps Write perform faster and minimizes lost work if there is a power failure.

You have five possible formatting choices when you save a Write document.

Use	To save your document as
Write Files (.WRI)	A Write-formatted document. When you first save the file, Write assigns the extension .WRI to the filename.
3.0 Write (.WRI)	A file that is compatible with Windows version 3.0. This option appears only if you have an embedded or linked object in the Write file you are saving. This option deletes any embedded or linked objects in the file. Static objects remain unchanged.
Word for MS-DOS (.DOC)	A Microsoft Word document. Do not use this format if you have any pictures in your document, because they will disappear. This format does not work for Microsoft Word for Windows documents.
Word for MS-DOS/Text Only Text Files (.TXT)	An unformatted Microsoft Word data file. A Windows-format data file. You might want to use this option if your document is a program or will be telecommunicated. For more information, see Chapter 11, “Terminal.”

Making a Backup Copy

You can specify that Write automatically make a backup copy of a file when you save the file.

► **To make a backup copy**

- In the Save As dialog box, select the Backup check box.

Thereafter, Write makes a backup copy each time you save an edited document.

If you save your document as a Write file, Write assigns the backup copy the filename extension .BKP. If you save your document as a Microsoft Word file, Write assigns the backup copy the extension .BAK.

If, before making a backup, you delete the extension from the filename of a Write document and save the document in Microsoft Word format, the document and its backup are given the extensions .DOC for the document now in Word format and .WRI for the backup copy. The backup is the original version of the document in Write format.

Similarly, if you delete the extension of the filename from an existing Word document and save it in Write format, the document and its backup are given the extensions .WRI for the document now in Write format and .DOC for the backup copy. The backup is the original version of the document in Word format.

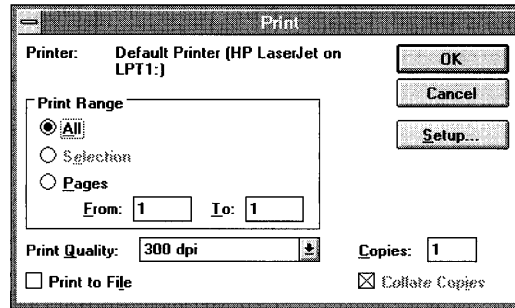
Printing a Document

If you have connected and installed a printer, you can print your Write documents. For information about installing a printer, see Chapter 6, “Print Manager.”

► **To print a document**

1. Make sure the document is displayed in the Write window.
2. From the File menu, choose Print.

The Print dialog box appears.



3. Select the options you want to use. (For more information about these options, see the table following this procedure.)
4. Choose the OK button.

A dialog box appears, telling you that Write is printing your document.

You can use the options in the Print dialog box to perform the following tasks.

Use	To
All	Print all the pages in your document. This is the default setting.
Selection	Print only the selected text in the document.
Pages: From/To	Print a range of pages. After you select this option, type page numbers in the From and To boxes.
Print Quality	Change the quality of graphic images in the file. The change varies from printer to printer. If Print Quality is dimmed, this option is not available for the selected printer.
Print To File	Save the file to another file containing commands that can be sent to the printer from MS-DOS. You will be prompted for a filename after you choose the OK button to close the Print dialog box.
Copies	Specify the number of copies you want to print. The default setting is 1.
Collate Copies	Separate each document page when printing more than one copy (if your printer supports this feature).

When printing, Write uses the margins specified in the Page Layout dialog box. If you want to position your document differently on the page, you can use the Page Layout command on the Document menu to change these settings. For more information, see “Changing the Page Layout” earlier in this chapter.

Changing Printers and Printer Option Settings

Write prints your documents on the default printer. If you want to use another installed printer, choose the Print Setup command from the File menu.

► To change printers

1. From the File menu, choose Print Setup.

The Print Setup dialog box appears.

2. In the Printer box, select the Default Printer or Specific Printer option.

If you select Specific Printer, select the printer you want to use from the list.

3. Change the Orientation and Paper specifications as needed.

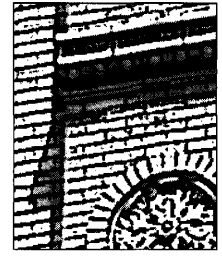
To display options specific to your printer driver, choose the Options button. (For more information about setting printer options, see Chapter 6, "Print Manager.")

4. Choose the OK button.

Write now prints to the newly selected printer unless you specify otherwise.

Note When you change printers, the appearance of your document may change on the screen. This is because Write applies the fonts and character formats available with the default printer. These changes may affect the line breaks and page breaks in the document. Use the Repaginate command to see the new page breaks. For more information, see "Breaking a Document into Pages" earlier in this chapter.

Paintbrush



Chapter 10

Working with Paintbrush

By using Windows Paintbrush, you can create simple or elaborate color drawings.

Unlike the other accessories for the Microsoft Windows operating system, Paintbrush makes use of both mouse buttons. When you need to use the right mouse button, the instructions in this chapter specify that button. If no button is specified, you should use the left mouse button—the one most commonly used.

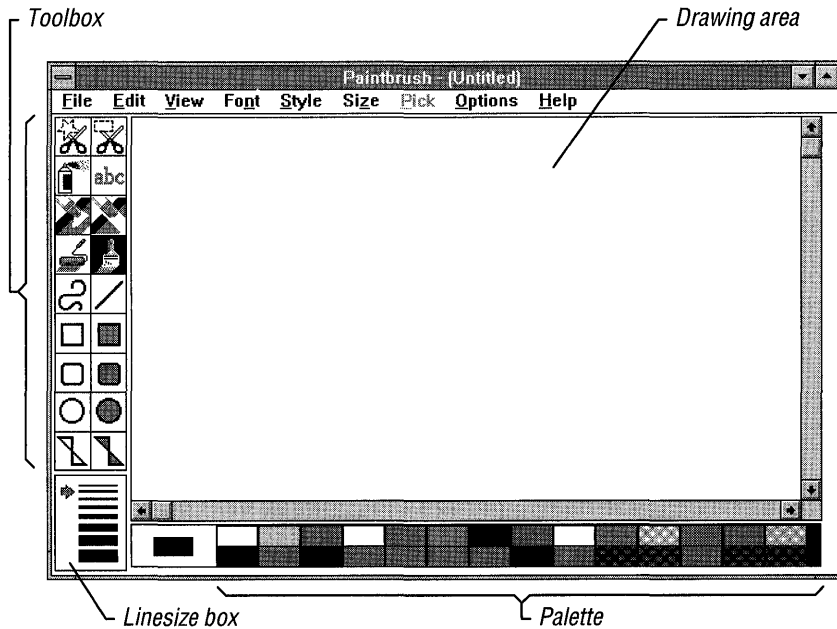
In Paintbrush, you will probably find that it is much easier to create your drawings by using a mouse. For this reason, the instructions in this chapter are directed toward mouse users. If you do not have a mouse or prefer using the keyboard, use the following keys when the instructions tell you to click, double-click, or press a mouse button.

Press	If instructions say to
INS	Click or press the left mouse button.
DEL	Click or press the right mouse button.
F9+INS	Double-click using the left mouse button.
F9+DEL	Double-click using the right mouse button.
INS + an arrow key	Drag the cursor.

For more information about using the keyboard, see “Moving Around in a Large Drawing” later in this chapter.

► **To start Paintbrush**

- In the Accessories group, choose the Paintbrush icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.)



In the Paintbrush window, you see the following items:

- The *drawing area* is where you create your Paintbrush drawings. The size of the drawing area varies depending on your display adapter. If you do not have enough memory available to create a drawing equal to the size of this drawing area, a small drawing area appears in the upper-left corner of the Paintbrush window. You need to free some of your computer's memory before Paintbrush can create the larger drawing area.

You can also override this default drawing-area size by using the Image Attributes command on the Options menu. For more information, see the following section, "Determining the Size of Your Drawing Area."

- The *cursor* indicates where a line or other object appears when you start drawing in the drawing area, or what you are pointing to outside the drawing area. The cursor moves as you move your mouse (or press TAB or an arrow key). Inside the drawing area, the cursor's shape changes depending on which tool you are using. Outside the drawing area, the cursor always appears as an arrow.
- The *Toolbox* contains the tools that you use to create your drawing. The tools allow you to draw, fill, airbrush, erase, type text, and select the items in the drawing area.
- The *Palette* contains the colors and patterns available for use in the background of the drawing area and with the drawing tools.
- The *Linesize box* contains the available drawing widths.

Tip If you are using the keyboard, use TAB and SHIFT+TAB to move between the different areas of the Paintbrush window.

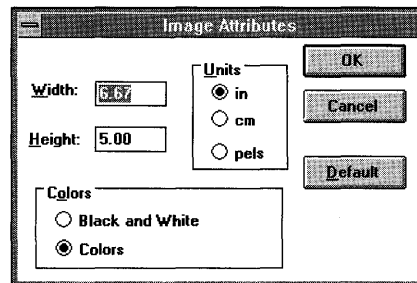
Determining the Size of Your Drawing Area

The first time you start Paintbrush, it establishes a default size for a drawing area based on your type of display adapter and the amount of memory available. If you want to create a drawing that is larger or smaller than the size established by Paintbrush, you can change the default drawing size.

► To change the default drawing size

1. From the Options menu, choose Image Attributes.

The Image Attributes dialog box appears.



2. In the Width and Height boxes, type the new measurements you want to use for your drawing.

If necessary, make changes to the other options in the dialog box. For information about these options, see the table that follows this procedure.

3. Choose the OK button.
4. Paintbrush displays a message asking if you want to start a new drawing using the new settings. Choose the Yes button to do so.

Each time you start Paintbrush now, it uses the new settings.

Tip To start a new Paintbrush drawing quickly, double-click the Eraser tool in the Toolbox. (Or move the cursor to the Eraser tool, and then press F9+INS.) For more information about using the Eraser tool, see “The Eraser” later in this chapter.

The settings in the Image Attributes dialog box are used in the following ways.

Use	To
Width	Change the width of the drawing you want to create.
Height	Change the height of the drawing you want to create.
Units	Select the unit of measurement you want to use when you specify the width and height of your drawing. The default setting is inches (in). You can also choose to work with centimeters (cm) or picture elements (pels, also known as pixels)—the smallest unit on the screen.
Colors	Choose whether you want to work in color or black and white.
Default button	Return the drawing area to the original size established by Paintbrush to accommodate your display adapter. The Default button does not affect the colors or units you have specified.

Note You should keep in mind that the larger the drawing and the more colors you use, the more memory is required. If you plan to print your drawing at printer resolution, be sure that you specify the correct dimensions (in pels) for the printed drawing in the Image Attributes dialog box. Also, be sure that the dimensions you specify are in proportion to the current screen dimensions of the drawing. Because printing at printer resolution requires more memory, you cannot print as large a drawing as you can at screen resolution. For more information about printing, see “Printing a Drawing” later in this chapter.

Enlarging the Drawing Area

You can remove the Toolbox, Linesize box, and Palette from the Paintbrush window to increase the size of the drawing area. You will still be able to use the selected tool, drawing width, and color, in addition to the menu commands.

► **To remove the Toolbox and Linesize box from the drawing area**

- From the View menu, choose Tools And Linesize.

The Toolbox and Linesize box disappear from the Paintbrush window, and the check mark next to the Tools And Linesize command also disappears.

To return the Toolbox and Linesize box to the window, choose the command again.

► **To remove the Palette from the drawing area**

- From the View menu, choose Palette.

The Palette disappears from the Paintbrush window, and the check mark next to the Palette command also disappears.

To return the Palette to the window, choose the command again.

Moving Around in a Large Drawing

If you create a drawing that is larger than the size of the drawing area, you can use the scroll bars to move around in the drawing. If you are using the keyboard, the following keys are available for moving around in the drawing.

Press	To move
TAB	Among the Toolbox, Linesize box, Palette, and drawing area, counterclockwise.
SHIFT+TAB	Among the Toolbox, Linesize box, Palette, and drawing area, clockwise.
An arrow key	Around the drawing area.
HOME	To the top of the drawing area.
END	To the bottom of the drawing area.
PAGE UP	Up one screen.
PAGE DOWN	Down one screen.
SHIFT+UP ARROW	Up one line (about 10 pels).
SHIFT+DOWN ARROW	Down one line (about 10 pels).
SHIFT+HOME	To the left edge of the drawing area.
SHIFT+END	To the right edge of the drawing area.
SHIFT+PAGE UP	Left one screen.
SHIFT+PAGE DOWN	Right one screen.
SHIFT+LEFT ARROW	To the left one space (about 10 pels).
SHIFT+RIGHT ARROW	To the right one space (about 10 pels).

Viewing Your Drawing

To see more of your drawing, you can remove everything from the screen except your drawing. You can also compact a large drawing so that all of it fits inside the drawing area.

Viewing a Picture in a Full Screen

The View Picture command on the View menu displays as much of your drawing as fits on the entire screen, by removing everything but your drawing from the screen. Because the menus, Toolbox, Palette, Linesize box, and even the cursor disappear when you choose View Picture, you cannot edit your drawing in any way.

► **To use the entire screen to display your drawing**

- From the View menu, choose View Picture.

Or press CTRL+P.

Tip To clear the entire screen quickly of everything except your drawing, double-click the Pick cutout tool in the Toolbox. Or move the cursor to the Pick tool, and then press F9+INS.

► **To cancel the View Picture command**

- Click anywhere on the screen.

Or press any key.

The screen returns to its previous state.

Zooming Out

If you create a drawing that is larger than the drawing area and the entire screen, it is still possible to see all of the drawing on the screen at one time.

► **To display all of a drawing that is larger than the drawing area**

- From the View menu, choose Zoom Out.

Or press CTRL+O.

The drawing shrinks to fit into the drawing area.

While using the Zoom Out command, you can cut, copy, and paste parts of your drawing called cutouts. You create a cutout by using either the Pick or Scissors tool (for more information, see “The Cutout Tools” and “Editing Your Drawing” later in this chapter). You cannot, however, add anything new to a drawing in zoom-out mode by using the drawing tools.

► **To cancel the Zoom Out command**

- From the View menu, choose Zoom In.
Or press ESC.
The drawing returns to normal resolution size.

When you use Zoom Out to view a drawing, you might lose some of the line detail in the drawing. Generally, the larger the size of your original, the greater the amount of line detail you lose when Paintbrush shrinks the drawing. You see this loss of detail only in the compacted version of the drawing. It does not affect your full-size drawing.

For more information about the Zoom In command, see “Editing by Using the Zoom In Command” later in this chapter.

Creating a Simple Drawing

The procedure for creating a simple drawing involves the following steps:

- Selecting a background color
- Selecting a foreground color
- Selecting a drawing width
- Selecting a drawing tool
- Drawing your picture
- Editing your picture

The following topics describe each of these steps.

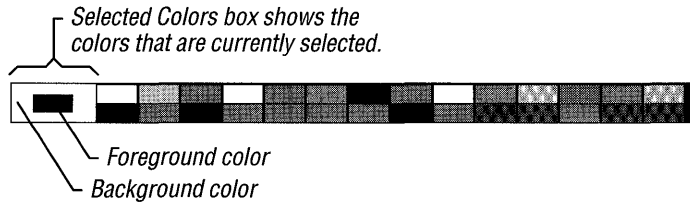
Selecting Background and Foreground Colors

One of the first things to decide when you create a drawing is what color you want to use for the background and what color you want to start drawing with (the foreground color). You select your colors from the Palette.

Note You can change from color to black-and-white patterns by choosing the Image Attributes command from the Options menu. Once you have begun a drawing in color or in black and white, however, you must stay with that selection.

You can change the foreground and background colors at any time while creating a drawing and, by doing so, create special effects with tools and commands that use the background color to draw. For example, you can create shadows around different pieces of text in a drawing.

You can change the background color for an entire drawing only by choosing the color, and then choosing the New command from the File menu to start a new drawing.



When you start Paintbrush, the selected background color is white and the selected foreground color is black.

► **To select a different background color or pattern**

- In the Palette, point to the color or pattern you want, and then click it using the right mouse button.

Or press TAB to move to the Palette, use the arrow keys to move the cursor to the color, and then press DEL.

The Selected Colors box shows the color you selected.

If you now choose New from the File menu, Paintbrush opens a new document with the newly selected background color or pattern in the drawing area.

► **To select a different foreground color or pattern**

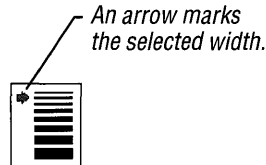
- In the Palette, point to the color or pattern you want, and then click it using the left mouse button.

Or press TAB to move to the Palette, use the arrow keys to move the cursor to the color, and then press INS.

The Selected Colors box shows the color you selected.

Selecting a Drawing Width

The Linesize box in the lower-left corner of the Paintbrush window displays the available drawing widths. The top line represents a width of one pel (pixel).



The drawing width determines either the width of a line you draw or the width of the border around an object you draw, such as a filled box. You might want to experiment with the way different drawing widths work with different tools so that you can use the tools most effectively.

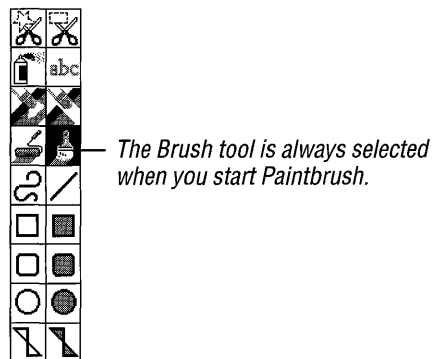
► To change the width of the drawing line

- In the Linesize box, point to the width you want, and then click it.
Or press **TAB** to move to the Linesize box, use the arrow keys to move the cursor to the drawing width, and then press **INS**.

An arrow appears next to the drawing width you selected.

Selecting and Using a Drawing Tool

Before you begin working in the drawing area, you need to select the tool you want to work with from the Toolbox at the left of the Paintbrush window.



► **To select a drawing tool**

- In the Toolbox, point to the tool you want to use, and then click it.
Or press **TAB** to move to the Toolbox, use the arrow keys to move the cursor to the tool, and then press **INS**.

► **To draw with the selected tool**

1. Move the cursor to the place you want to start drawing, and then press and hold down the mouse button.
Or press **TAB** to move to the drawing area, and use the arrow keys to position the cursor.
2. Drag the cursor around the drawing area.
Or press and hold down **INS**, and use the arrow keys to move the cursor.
If you are drawing an item such as a box or circle, a flexible box or circle expands and contracts, following the cursor's movements.
3. When you are satisfied with the item, release the mouse button.

For more information about each of the available tools, see “Working with the Paintbrush Tools” later in this chapter.

Undoing Your Changes

If you make a mistake while drawing, you can use the Undo command on the Edit menu or the **BACKSPACE** key to make simple corrections.

You can use the Undo command and **BACKSPACE** to make corrections until you do any of the following:

- Select a tool.
- Use a scroll bar.
- Switch to another application.
- Resize the window.

Once you take any of these actions, the items currently in the drawing area are set (*pasted down*), and the Undo command and **BACKSPACE** no longer delete those items. You must now use an eraser tool, or select and edit a portion of your drawing called a cutout. For more information about erasing and editing cutouts, see “The Color Eraser,” “The Eraser,” and “Editing Your Drawing” later in this chapter. For more information about defining a cutout, see “The Cutout Tools” later in this chapter.

Note To prevent undoing work that you are satisfied with, protect that section of your drawing from Undo and **BACKSPACE** by reselecting the tool you

are currently working with or by taking one of the other actions in the preceding list. Then Undo and BACKSPACE can delete only your most recent work.

► **To edit a drawing by using the Undo command**

- From the Edit menu, choose Undo.

Or press CTRL+Z.

Everything you have drawn since selecting the tool you are currently working with is deleted.

Using just BACKSPACE lets you delete a portion or all of what you have drawn since selecting the tool you are currently working with. BACKSPACE is particularly handy for small cleanup jobs, such as deleting stray dots made by the Airbrush tool.

► **To edit a drawing by using the BACKSPACE key**

1. Press BACKSPACE.

The cursor turns into a square with an X inside. The size of the square depends on the drawing width selected.

2. Drag the cursor over the parts of the item you want to delete.
3. When you finish, release the mouse button.
4. Drag the cursor again to continue drawing with the selected tool.

Typing Text

The procedure for using text in your drawing involves the following steps:

- Selecting the foreground color you want to use for the text
- Selecting the Text tool from the Toolbox
- Choosing the font you want to use
- Choosing a size for the font
- Choosing a style for the font
- Positioning and typing your text
- Editing your text

For information about selecting a foreground color, see “Selecting Background and Foreground Colors” earlier in this chapter. The following sections explain the remaining steps.

Selecting the Text Tool

When you select the Text tool, you can type text in the drawing area.



► To select the Text tool

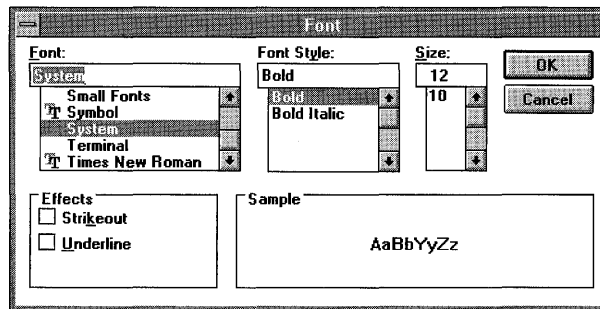
- In the Toolbox, point to the Text tool, and then click it.
Or press TAB to move to the Toolbox, use the arrow keys to move to the Text tool, and then press INS.

Selecting a Font and Font Size

You select a font and font size (also known as point size) to modify the appearance of your text. The availability of point sizes depends on your display adapter and the fonts you have installed.

► To select a font for text

1. From the Text menu, choose Fonts.



2. In the Font dialog box, select a font.
3. Choose the OK button.

The font that you select affects any text that is not pasted down in the drawing area, in addition to the text that you are about to type. For information about pasting down text, see “Basic Text Editing” later in this chapter.

► **To select a point size for a font**

1. From the Text menu, choose Fonts.
2. In the Font dialog box, select a point size.
3. Choose the OK button.

Setting Style Options

In addition to selecting different sizes for fonts, you can select different styles for emphasizing text. You can use bold, italic, and underline formats for the text you type. You can also outline text and create a shadow around it in a background color you specify.

► **To change the style of text**

- From the Text menu, choose a style.
A check mark appears next to the style on the Text menu.

You can also select or cancel a style by using the Font dialog box.

You can have more than one style for the same text. The styles affect text that is not pasted down in the drawing area, in addition to text that you are about to type. For information about pasting down text, see “Basic Text Editing” later in this chapter.

► **To cancel a style selection**

- From the Text menu, choose the style (except for Regular) you want to cancel.
The check mark next to the style on the Text menu disappears.

► **To cancel all the current style selections**

- From the Text menu, choose Regular.
A check mark appears next to the Regular command.
All other check marks on the Text menu disappear.

Typing and Positioning Text

Typing text in the Paintbrush drawing area is similar to typing text in a word-processing application, except that text does not automatically wrap from line to line in Paintbrush. Also, the cursor does not realign itself with previously typed text if you switch to a different tool and then switch back to the Text tool.

► **To type text in the Paintbrush drawing area**

1. Point to the place you want your text to appear, and then click to position the cursor.

Or press **TAB** to move to the drawing area, and then use the arrow keys to position the cursor.

The Text cursor appears as a vertical line.

2. Start typing.

The text you type appears in the drawing area at the position of the text cursor, while the cursor moves to the right.

If you continue typing on the same line, Paintbrush stops entering text when you reach the right edge of the drawing area.

3. Press **ENTER** when you want to start a new line of text.

Or reposition the Text cursor by clicking the appropriate location.

If the size of your drawing is larger than the size of the drawing area, you can use the scroll bars or the appropriate arrow keys to move to other parts of your drawing, and then type text there. For more information about using the keyboard to move around in a drawing, see “Moving Around in a Large Drawing” earlier in this chapter.

Basic Text Editing

You can correct simple text errors by pressing the **BACKSPACE** key. **BACKSPACE** works the same with Paintbrush text as it works in any other Windows application. For more information, see Chapter 2, “Application Basics.”

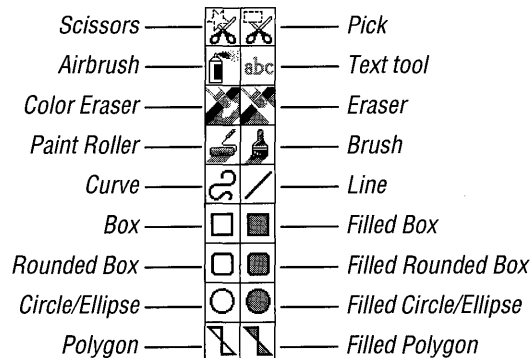
You can also select a new foreground color, font, point size, or text style for text in the drawing area. You can use **BACKSPACE** or make other changes to your text until you do any of the following:

- Select a tool.
- Use a scroll bar.
- Switch to another application.
- Reposition the text cursor.
- Resize the window.

Once you take any of these actions, Paintbrush pastes down the text currently in the drawing area. BACKSPACE no longer deletes that text, and you cannot change the color, font, point size, or style of the text. If you want to change or delete the text, you must erase or cut the text out of the drawing and then retype it. For more information, see “The Color Eraser,” “The Eraser,” and “Editing Your Drawing” later in this chapter.

Working with the Paintbrush Tools

The Toolbox appears at the left of the Paintbrush window.



You use the tools in the Toolbox to create your drawings.

► To select a tool from the Toolbox

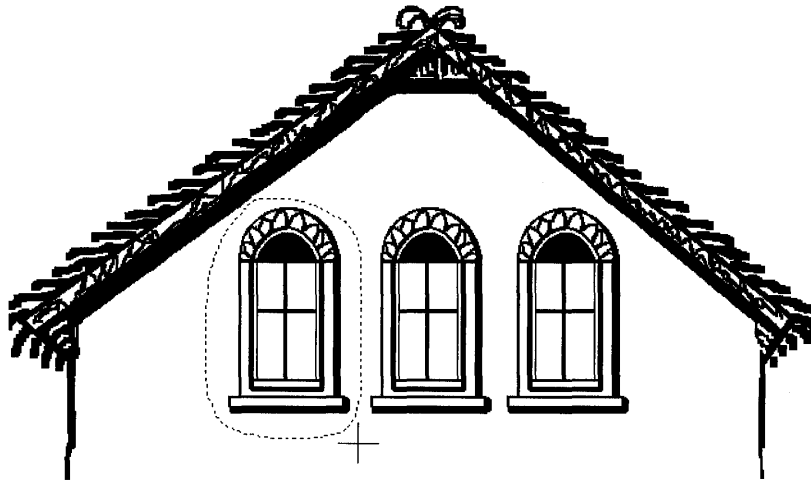
- Point to the tool, and then click it.

Or press TAB to move to the Toolbox, use the arrow keys to select a tool, and then press INS.

Paintbrush highlights the selected tool in the Toolbox.

The following sections explain the tools in the order that they appear in the Toolbox.

The Cutout Tools



You can *define*, or select, an area of your picture called a *cutout* by using the cutout tools. When you define a cutout, you outline an area with a dotted line. You can then cut, copy, and manipulate that area.

You can define a free-form cutout with the Scissors tool, or a rectangular cutout with the Pick tool. The cutout can be very small or as large as the drawing area.

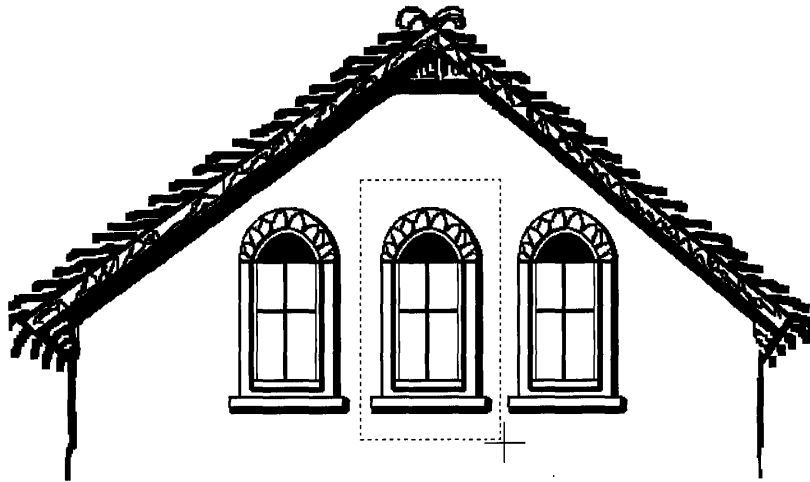
Define a free-form cutout when you want the cutout area to closely follow the contours of an object in the drawing.

► To define a free-form cutout

1. From the top left of the Toolbox, select the Scissors tool, and then move the cursor into the drawing area.
2. Holding down the mouse button, move the mouse to draw a line around the part of your picture you want to define as a cutout.
3. When you have completely outlined the area, release the mouse button.

If you make a mistake, click anywhere on the screen to start over.

Define a rectangular cutout with the Pick tool when the size and shape of the cutout area don't need to conform closely to the object's contours.



► **To define a rectangular cutout**

1. From the top right of the Toolbox, select the Pick tool, and then move the cursor into the drawing area.
2. Drag the cursor until the flexible box encloses the area you want to define.
3. Release the mouse button.

If you make a mistake, click anywhere on the screen to start over.

After you define a cutout, you can use commands from the Edit menu to cut, copy, paste, and save the cutout, and commands from the Pick menu to manipulate it in various other ways.

Once you manipulate a cutout, there are three ways you can paste it down (*anchor* it) in its new position.

► **To paste down a cutout**

- Click outside the cutout.
Or define a new cutout.
Or select any tool.

For more information about ways of working with cutouts, see “Editing Your Drawing” and “Advanced Paintbrush Features” later in this chapter.

The Airbrush



The Airbrush tool produces a circular spray of dots. The color of the spray is the foreground color.



► To use the Airbrush tool

1. Select a foreground color.
2. Select a drawing width.

The drawing width determines the size of the circle of spray.

3. From the Toolbox, select the Airbrush tool, and then move the cursor into the drawing area.
4. At the location where you want to start the Airbrush spray, press and hold down the mouse button and drag the cursor.

The speed at which you drag the cursor determines the density of the spray.

5. Release the mouse button to stop the spray.

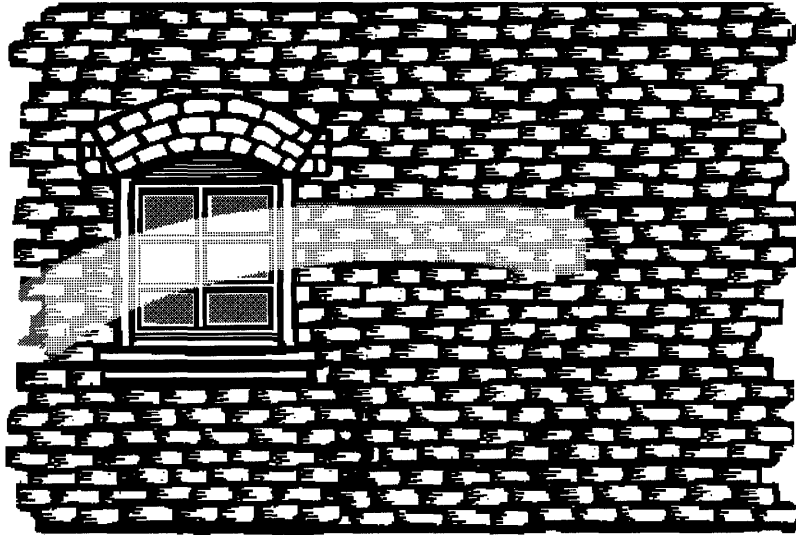
The Airbrush tool is particularly useful for shading “3-D” objects.

The Text Tool



You can add text to your Paintbrush drawings with the Text tool. The text appears in the selected foreground color, font, point size, and font style. For more information about working with the Text tool, see “Typing Text” earlier in this chapter.

The Color Eraser



You can use the Color Eraser in two ways to change colors in all or part of your drawing. You can:

- Drag the Color Eraser cursor over an area of a drawing, changing the selected foreground color under the cursor to the selected background color.
- Change every occurrence of one color in the drawing area to another color.

► **To change a color by using the Color Eraser**

1. Select the foreground and background colors you want to use the Color Eraser with.

The background color will replace the foreground color.

2. Select a drawing width.

The larger the drawing width, the larger the Color Eraser cursor. You can erase small or large areas easily by changing drawing widths.

3. From the Toolbox, select the Color Eraser tool, and then move the cursor into the drawing area.

4. Drag the cursor to change any areas of the selected foreground color under the cursor. (The other colors remain the same.)

To make the Color Eraser move in a straight horizontal or vertical line, press and hold down SHIFT as you drag the cursor.

5. Release the mouse button to stop erasing.

The selected foreground color remains the same in all areas not touched by the Color Eraser cursor.

► **To change every occurrence of one color to another color**

1. Make sure that every place that has the colors you want to change is displayed in the drawing area.

If the drawing is larger than the drawing area, you can use the scroll bars or arrow keys to move to other parts of the drawing.

2. Select the foreground and background colors you want to use the Color Eraser with.

The background color will replace the foreground color.

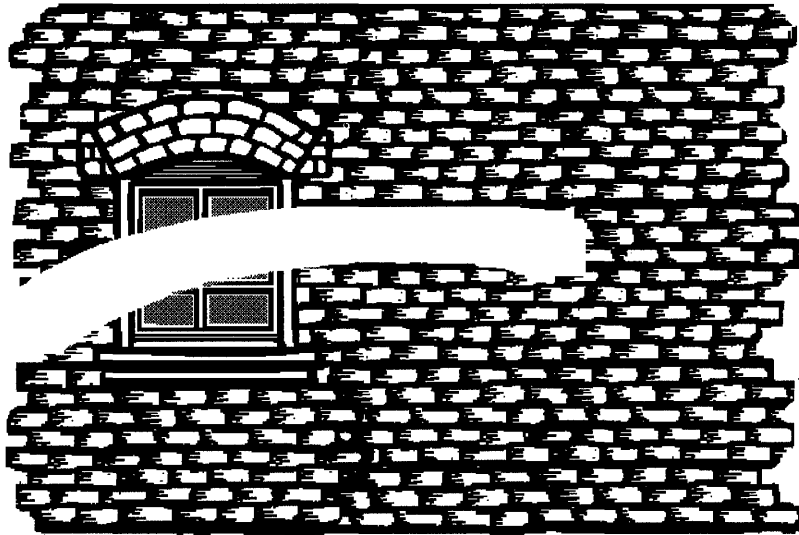
3. In the Toolbox, double-click the Color Eraser tool.

Every section of the selected foreground color in the drawing area changes to the selected background color.

The Eraser



The Eraser changes all the foreground colors that it touches to the selected background color.



► To erase portions of the drawing by using the Eraser

1. Make sure the selected background color is the same as the background color in the area you want to erase.

If the colors don't match, you will draw with the currently selected background color rather than erase to the original background color.

2. Select a drawing width.

The larger the drawing width, the larger the Eraser cursor. You can erase small or large areas easily by changing drawing widths.

3. From the Toolbox, select the Eraser tool, and then move the cursor into the drawing area.

4. Drag the cursor to erase the part of the drawing under the cursor.

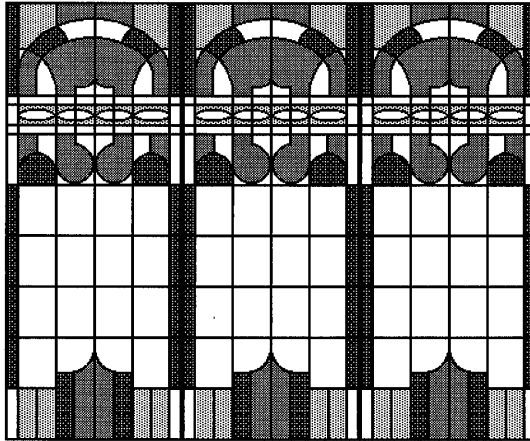
To make the Eraser move in a straight horizontal or vertical line, press and hold down **SHIFT** as you drag the cursor.

5. Release the mouse button to stop erasing.

The Paint Roller



Using the Paint Roller, you can fill any closed shape or area with the selected foreground color. You can fill a hollow area enclosed by a border or fill a solid object with a different color or pattern.



► To fill an area by using the Paint Roller

1. Select the foreground color you want to use for the fill.
If you fill an object with a pattern or nonsolid color rather than a solid color, you will not be able to refill the object using the Paint Roller. However, you can use the Color Eraser to change the pattern used to fill an object.
2. From the Toolbox, select the Paint Roller tool, and then move the cursor into the drawing area.
3. Place the cursor inside the area you want to fill, and then click using the left mouse button.

The area fills with the selected foreground color.

If the shape being filled has any breaks in its border, the filling color leaks through to the rest of the drawing area. If this should happen, wait for the color to stop leaking, and then choose Undo from the Edit menu (or press CTRL+Z) to clean it up. Note that the drawing area itself defines a border, so color fills will stop at the edges of the drawing area.

You can use the Zoom In command on the View menu to close the opening in your object where the color leaked out. For more information, see “Editing by Using the Zoom In Command” later in this chapter.

Tip To prevent undoing work that you are satisfied with, reselect the Paint Roller tool each time you perform a fill.

The Brush



You can use the Brush tool like a standard bristle paintbrush to draw freehand shapes and lines in the selected foreground color and drawing width.



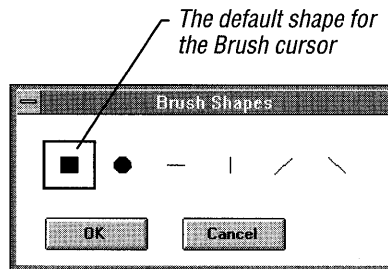
► **To draw freehand lines by using the Brush tool**

1. Select a foreground color.
2. Select a drawing width.
3. From the Toolbox, select the Brush tool, and then move the cursor to the place you want in the drawing area.
4. Drag the cursor to draw freehand shapes.
To draw straight horizontal or vertical lines, press and hold down **SHIFT** as you drag the cursor.
5. Release the mouse button to stop drawing.

You can change the shape of the Brush cursor to create different effects as you paint.

► **To change the shape of the Brush cursor**

1. From the Options menu, choose Brush Shapes.
The Brush Shapes dialog box appears.



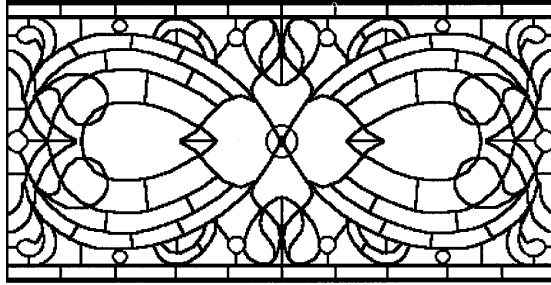
2. Choose a cursor shape by double-clicking it.
Or use an arrow key to select a shape, and then choose the **OK** button.
The Brush Shapes dialog box disappears, and the Brush cursor appears in the drawing area in the selected shape.

Tip To open the Brush Shapes dialog box quickly, double-click the Brush tool in the Toolbox. Or move the cursor to the Brush tool in the Toolbox, and then press **F9+INS**.

The Curve



Using the Curve tool, you can draw curved lines in the selected foreground color and drawing width.

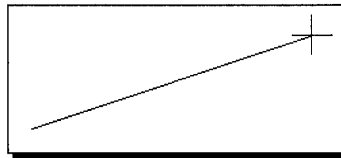


► **To draw a curved line by using the Curve tool**

1. Select a foreground color.
2. Select a drawing width.
3. From the Toolbox, select the Curve tool, and then move the cursor into the drawing area.
4. Press the mouse button at the place you want to anchor one end of the curve, and then drag the cursor.

A flexible line stretches from the anchored end of the line to the current cursor position.

5. When the line is the length you want, release the mouse button to anchor the second end of your curve.

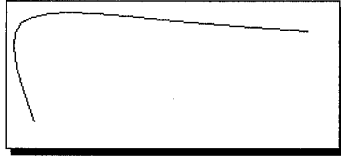


6. Drag the cursor.

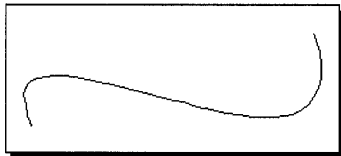
The line curves in the direction you move the mouse.

7. When you are satisfied with the angle of this first curve, release the mouse button.

If you want to curve the line in only one direction, click the second end point of the line. Otherwise, go on to the next step.



8. Press the mouse button again, and drag the cursor away from the first curve to bend your line in another direction.
9. When you are satisfied with the angle of this curve, release the mouse button.



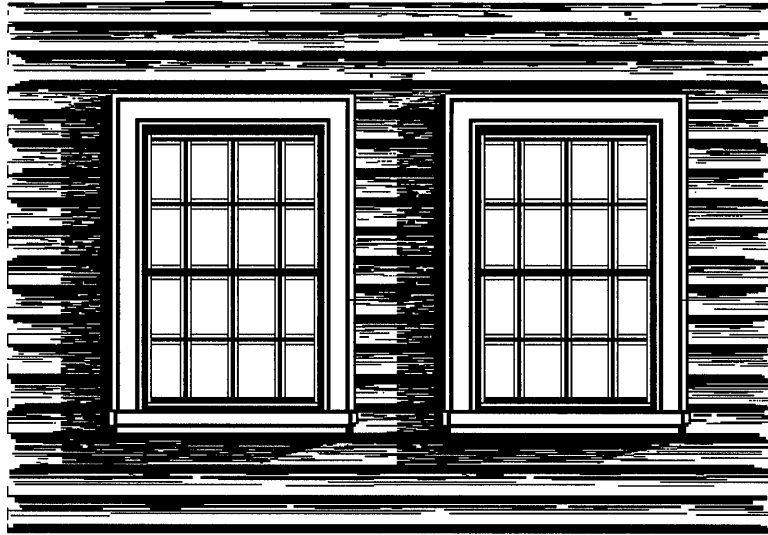
Until you click the second end point or release the left mouse button the second time, you can click using the right button to undo the curve and start over.

When you finish your curved line, Paintbrush colors the curve with the foreground color.

The Line



You can easily draw straight lines in the selected foreground color and drawing width by using the Line tool.



► To draw a straight line by using the Line tool

1. Select a foreground color.
2. Select a drawing width.
3. From the Toolbox, select the Line tool, and then move the cursor into the drawing area.
4. Press the mouse button at the place you want to anchor one end of the line, and then drag the cursor.

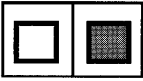
A flexible line stretches from the anchored end of the line to the cursor, changing length and position as you move the mouse.

5. When you are satisfied with the length and position of the flexible line, release the mouse button to paste the line onto the drawing area.

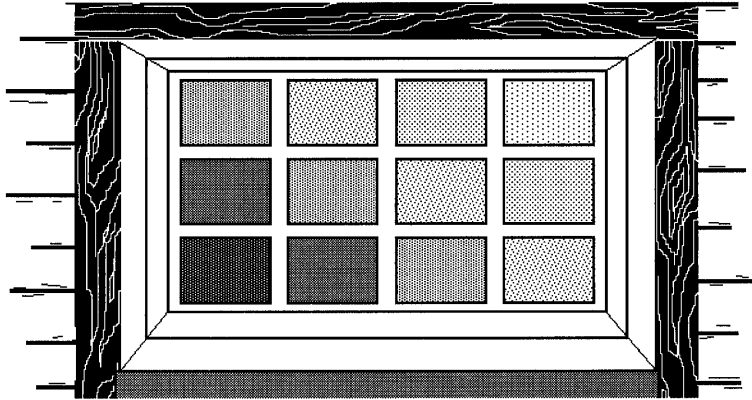
Until you release the left mouse button, you can click using the right button to undo the line and start over.

Tip To draw a perfectly horizontal, vertical, or 45-degree diagonal line, press and hold down **SHIFT** as you drag the cursor.

The Box and the Filled Box



You can use the Box tool to draw hollow squares or rectangles in the selected foreground color and drawing width. The Filled Box tool produces squares and rectangles that are filled with the selected foreground color and bordered by the selected background color.



► To draw a box or filled box

1. Select a foreground color.
2. If you are drawing a filled box, select a background color for the border.
If you want a filled box with no border, make the foreground and background colors the same.
3. Select a drawing width.
If you are drawing a filled box, the drawing width determines the thickness of the box's border.
4. From the Toolbox, select the Box or Filled Box tool, and then move the cursor into the drawing area.
5. Press the mouse button at the place you want to anchor the box, and then drag the cursor.
A flexible box stretches from the anchored end of the line to the position of the mouse, expanding and contracting as you move the mouse.

- When you are satisfied with the size of the flexible box, release the mouse button to paste the box onto the drawing area.

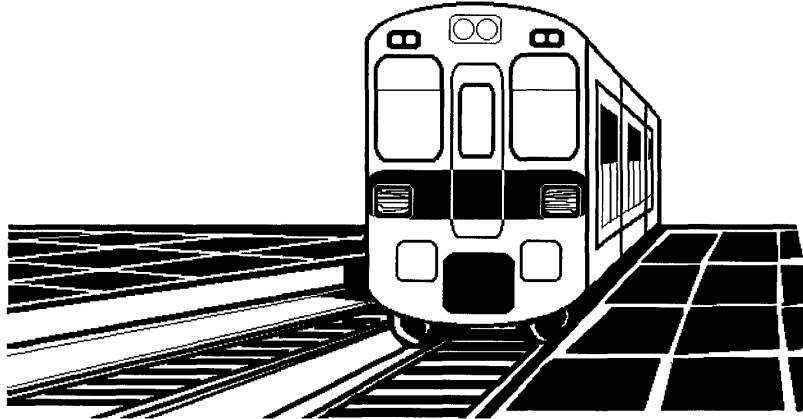
Until you release the left mouse button, you can click using the right button to undo the box and start over.

Tip If you want to draw a perfect hollow or filled square, press and hold down **SHIFT** as you drag the cursor.

The Rounded Box and the Filled Rounded Box



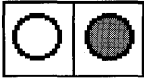
The Rounded Box tool and the Filled Rounded Box tool work exactly the same as the Box tool and the Filled Box tool. The only difference is that rounded and filled rounded boxes have round corners.



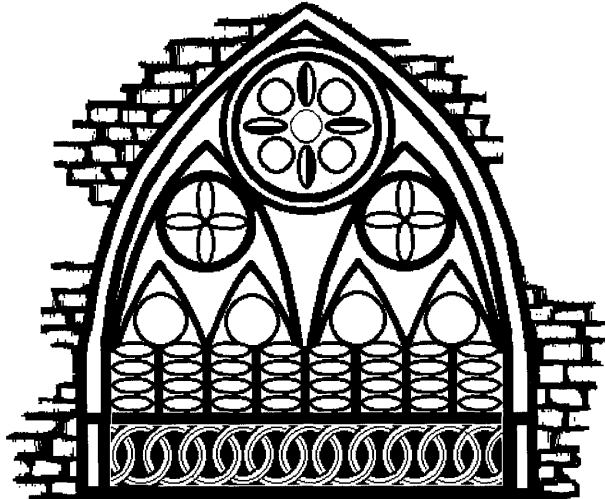
For information about drawing a box or a filled box, see the preceding section, “The Box and the Filled Box.”

Tip If you want to draw a perfect hollow or filled rounded square, press and hold down **SHIFT** as you drag the cursor.

The Circle/Ellipse and the Filled Circle/Ellipse



By using the Circle/Ellipse tool, you can draw hollow circles or ellipses in the selected foreground color and drawing width. The Filled Circle/Ellipse tool produces circles and ellipses filled with the selected foreground color and bordered by the selected background color.



► To draw a hollow or filled circle or ellipse

1. Select a foreground color.
2. If you are drawing a filled circle or ellipse, select a background color for the border.

If you want no border, make the foreground and background colors the same.

3. Select a drawing width.

If you are drawing a filled circle or ellipse, the drawing width determines the thickness of the border around the circle or ellipse.

4. From the Toolbox, select the Circle/Ellipse or Filled Circle/Ellipse tool, and then move the cursor into the drawing area.
5. Press the mouse button at the place you want to anchor the circle, and then drag the cursor.

A flexible circle or ellipse stretches from the anchored end of the line to the position of the cursor, expanding and contracting as you move the mouse.

6. When you are satisfied with the size and shape of the flexible circle/ellipse, release the mouse button to paste it onto the drawing area.

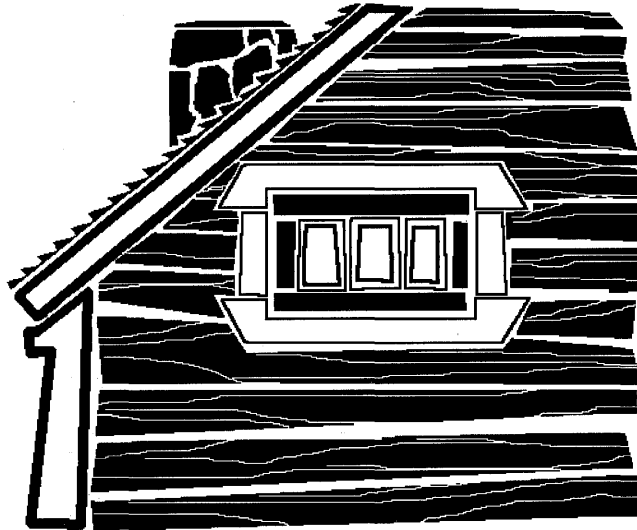
Until you release the left mouse button, you can click using the right button to undo the circle or ellipse and start over.

Tip If you want to draw a perfect circle or filled circle, press and hold down **SHIFT** as you drag the cursor.

The Polygon and the Filled Polygon



Using the Polygon tool, you can draw polygons from connected straight-line segments in the selected foreground color and drawing width. The Filled Polygon tool produces polygons filled with the selected foreground color and bordered by the selected background color.



► To draw a polygon or filled polygon

1. Select a foreground color.
2. If you are drawing a filled polygon, select a background color for the border.
If you want no border, make the foreground and background colors the same.
3. Select a drawing width.

If you are drawing a filled polygon, the drawing width determines the thickness of the polygon's border.

4. From the Toolbox, select the Polygon or Filled Polygon tool, and then move the cursor into the drawing area.
5. Press the mouse button at the place you want to anchor the starting point of the polygon, and then drag the cursor.
A flexible line stretches from the anchored starting point to the position of the cursor, expanding and contracting as you move the mouse.
6. When you reach the point where you want the first side of the polygon to end, release the mouse button.
A line appears from the starting point to the point where you released the mouse button. The end of the first line segment then becomes the starting point for the next segment.
7. Continue adding sides until you are ready to add the last side.
At any time before you add the last side, you can click using the right mouse button to undo the polygon and start over.
8. To add the last side, double-click.
The polygon is automatically closed.

Tip To draw a perfectly horizontal, vertical, or 45-degree diagonal line, press and hold down **SHIFT** as you drag the cursor.

If you prefer, you can draw the lines for your polygon without dragging flexible lines. Just move the cursor, without pressing the mouse button, to the position where you want the next line to end, and then press the mouse button. A line appears between the two points. Before you release the mouse button, you can adjust the position of this line.

Editing Your Drawing

As you create a Paintbrush drawing, there are a variety of tools and functions to help you make changes to your drawing. The **BACKSPACE** key and the Undo command on the Edit menu allow you to delete those parts of a drawing that are not pasted down yet. For information about **BACKSPACE** and Undo, see “Undoing Your Changes” earlier in this chapter.

After you paste down part or all of a drawing, you can use the Eraser tool to erase and the Color Eraser tool to change colors. You can also define, or select, an area called a cutout, and then cut, copy, move, sweep, or paste that cutout. You can save a cutout in a disk file, and then retrieve it to use as part of another drawing. The following sections discuss using the two erasers and working with cutouts. For information about defining cutouts, see “The Cutout Tools” earlier in this chapter.

Using the Erasers

By dragging the Eraser over parts of your drawing, you can change all the foreground colors that the Eraser touches to the selected background color. You can use the Color Eraser to change particular colors in part or all of your drawing. For more information about using the erasers, see “The Eraser” and “The Color Eraser” earlier in this chapter.

Cutting and Pasting Cutouts

You can use the Copy, Cut, and Paste commands on the Edit menu to transfer a defined cutout to and from the Clipboard, just as you use the Clipboard in other Windows applications. When you paste a cutout into Paintbrush, the cutout appears in a flexible box in the upper-left corner of the drawing area. (The Pick tool at the top right of the Toolbox is automatically selected.) You need to move the cutout to the location in the drawing area where you want it to appear permanently.

It is important to remember while cutting and pasting cutouts that you cannot paste a cutout larger than the current drawing area unless you have zoomed out to display your entire drawing. If you try, Paintbrush pastes only the part of the cutout showing in the drawing area. For more information about using the Clipboard, see Chapter 2, “Application Basics.” For information about defining a cutout, see “The Cutout Tools” earlier in this chapter.

Once you manipulate a cutout, there are three ways you can paste it down (“anchor” it) in its new position.

- ▶ **To paste down a cutout**
 - Click outside the cutout.
Or define a new cutout.
 - Or select any tool.

Linking and Embedding Cutouts

You can insert Paintbrush drawings into other files by copying, linking, or embedding them. The method you use to insert the drawing determines how you make changes to it. You can link and embed information only if the application you are transferring the drawing to supports object linking and embedding. Check the application’s documentation to find out.

Method	Description
Copy	You copy a drawing to a document in a different application. Once the drawing is in the new document, you can change it only by deleting it and copying a new drawing in its place. To copy a drawing, use the Copy command on the Edit menu to copy the drawing onto the Clipboard.
Embed	Embedding is similar to copying but with one important difference: You can edit embedded drawings from within the other application's document. To embed a drawing, use the Copy command on the Edit menu to copy the drawing onto the Clipboard.
Link	Linking dynamically connects two files so that information in one file automatically updates when information in the other file changes. To link an object, use the Copy command on the Edit menu to copy the drawing onto the Clipboard.

The commands you use to insert, or paste, the drawing or object from the Clipboard into the application depend on whether you want the drawing copied, embedded, or linked. Check your application's documentation to find out how to complete these procedures.

For more information about linking and embedding Paintbrush drawings, see Chapter 13, "Integrating Your Windows Applications."

Using the Omit Picture Format Command

When Paintbrush copies a drawing onto the Clipboard, it copies it in various formats to ensure that other applications will be able to display the drawing.

Some applications cannot read all these formats. Before copying a drawing between Paintbrush and these applications, you must limit the formats that get copied onto the Clipboard.

Check the documentation of the other applications you are using to see if you need to use this option.

► **To limit the formats that are copied onto the Clipboard**

1. From the Options menu, choose Omit Picture Format.
A check mark appears next to the command on the menu.
2. Select the drawing, and then copy it onto the Clipboard.

Moving a Cutout

After you define a cutout, you can move it anywhere in the drawing area. For information about defining a cutout, see “The Cutout Tools” earlier in this chapter.

► **To move a cutout**

1. Move the cursor inside the cutout.
2. Using either mouse button, drag the cutout to where you want it.
If you want the cutout to appear transparently in its new location, use the left mouse button. If you want the cutout to appear opaquely, use the right mouse button. For more information, see “Transparent and Opaque Pasting and Sweeping” later in this chapter.
3. When the cutout is where you want to leave it, release the mouse button.
4. Click outside the cutout to set it in its new position. Or select a tool.

Copying a Cutout

When you move a cutout, you can choose to leave a copy of the cutout in its original position.

► **To move a cutout and leave a copy behind**

1. Move the cursor inside the cutout.
2. Press and hold down CTRL and, using either mouse button, drag the cutout away from the copy.
3. Release CTRL once you have moved the cutout away from the copy.
4. When the cutout is where you want to leave it, release the mouse button.
5. Click outside the cutout to set it in its new position. Or select a tool.

Sweeping a Cutout

When you sweep a cutout, you move it across the drawing area, leaving a trail of copies behind.



► To sweep a cutout

1. Move the cursor inside the cutout.
2. Press and hold down **SHIFT** and, using either mouse button, drag the cutout across the drawing area.

If you want the cutout to appear transparently in its new location, use the left mouse button. If you want the cutout to appear opaquely, use the right mouse button. For more information, see “Transparent and Opaque Pasting and Sweeping” later in this chapter.

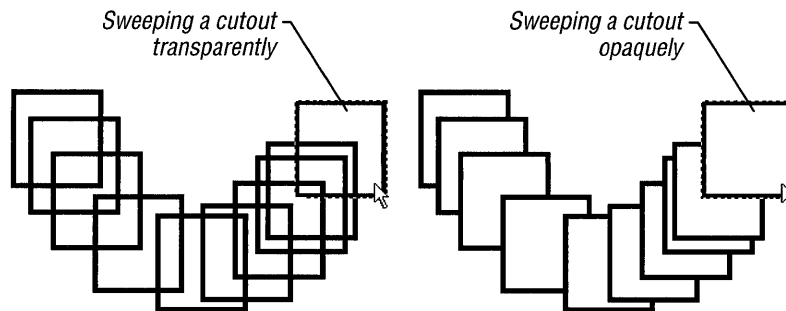
3. When you finish sweeping the cutout, release **SHIFT** and the mouse button.
4. Click outside the cutout to paste it in the drawing area. Or select a tool.

Moving, Sweeping, and Copying a Cutout in Zoom-Out Mode

When you perform a cutout operation in zoom-out mode, you can only paste the cutout opaquely. After you choose the Paste or Paste From command from the Edit menu, a shaded box representing the cutout appears in the upper-left corner of the drawing area. You can then move the cursor inside the box and drag the box to the position you want. To paste it down, click outside the box. You will have to click outside the drawing if the cutout is as large as the drawing itself. Any part of the box outside the drawing area will be cropped.

Transparent and Opaque Pasting and Sweeping

You have the choice of pasting or sweeping transparently or opaquely. If you paste or sweep transparently, any part of your drawing covered by the cutout shows through. If you paste or sweep opaquely, the entire cutout area covers whatever part of the drawing is underneath it. The following illustrates both transparent and opaque sweeping.



If you want to paste or sweep transparently, the background color for the cutout and the currently selected background color must be the same. Otherwise, the object you paste or sweep won't be transparent.

Tip If you want to sweep a cutout opaquely across the screen, you might want to define a free-form cutout with the Scissors tool. By creating a cutout that closely outlines the object you want to sweep, the shape that you sweep is only the defined object. If you define a rectangular cutout, the object appears in a box of background color.

Saving a Cutout

You can save a cutout as a .PCX file or as a bitmap (.BMP) file. Unless you have changed the setting in the Save As dialog box, Windows assigns the extension .BMP to save your cutout as a Windows bitmap.

► To save a cutout

1. Define the cutout.
2. From the Edit menu, choose Copy To.
3. In the File Name box, type a name for your cutout.
4. Choose the OK button.

If you want to save your cutout in a different format, select from the options in the Save File As Type list.

For more information about opening and saving files, see Chapter 2, “Application Basics.”

If you are concerned about the amount of disk space needed to store a cutout, you can choose the Info button in the Copy To dialog box to see the cutout's size and number of colors and planes before you save it. The larger the size of the cutout and the more colors used, the more disk space it requires.

Retrieving a Cutout from a File

You can use the Paste From command on the Edit menu to retrieve a previously saved cutout from a file and place it in the drawing area. The Paste From command works much like the Open command on the File menu. For more information about opening files, see Chapter 2, “Application Basics.”

If you want to see the cutout's height, width, number of colors, and number of planes before pasting it, choose the Info button in the Paste From dialog box.

You can use the same techniques as when pasting from the Clipboard. When you paste a cutout into Paintbrush, the cutout appears in a flexible box in the upper-left corner of the drawing area. (The Pick tool at the top right of the Toolbox is automatically selected.) You need to move the cutout to the location in the drawing area where you want it to appear permanently.

Note If you paste a previously saved color drawing into a black-and-white drawing, Paintbrush translates the colors into black and white.

► **To place a cutout where you want it to appear permanently**

1. Move the cursor inside the flexible box.
2. Using either mouse button, drag the cutout to the place you want it to appear in your drawing, and then release the mouse button.

If you want to paste the cutout transparently in its new location, use the left mouse button. If you want to paste the cutout opaquely, use the right mouse button. For more information, see “Transparent and Opaque Pasting and Sweeping” earlier in this chapter.

3. Click outside the cutout to paste it onto the drawing area. Or select a tool.

Advanced Paintbrush Features

Paintbrush has a number of other features that allow you to:

- Shrink, enlarge, flip, and tilt defined cutouts.
- Invert colors in a cutout.
- Create drawings containing greater detail.
- Do detailed editing.
- Use custom colors in your drawings.

The following topics explain each of these features.

Shrinking and Enlarging a Cutout

After you define a cutout, you can use the Shrink + Grow command on the Pick menu to change the size of the cutout.

► **To change the size of a cutout**

1. From the Pick menu, choose Shrink + Grow.
2. If you want the original area erased after shrinking or enlarging the cutout, choose Clear from the Pick menu.

Be sure that the current background color matches the background color of the area you want to clear.

3. Move the cursor to the place you want to anchor the upper-left corner of the flexible box that you use to change the dimensions of your cutout. Then press and hold down the mouse button.

4. Drag the cursor until you are satisfied with the box's dimensions.
To keep the dimensions of the flexible box in proportion to those of the cutout, press and hold down **SHIFT** while dragging the cursor.
5. When you are satisfied with the dimensions of the flexible box, release the mouse button.
The cutout shrinks or enlarges to fit the dimensions of the box.
6. Click outside the cutout to paste it onto the drawing area. Or select a tool.

If you shrink a defined cutout, you can remove what remains of the larger cutout by using any of the various ways of editing a drawing.

Flipping a Cutout

You can use the **Flip Horizontal** command on the **Pick** menu to flip a defined cutout from side to side. The **Flip Vertical** command flips a defined cutout from top to bottom.

► To flip a cutout horizontally or vertically

1. From the **Pick** menu, choose **Flip Horizontal** or **Flip Vertical**.
Paintbrush flips the cutout at the current cutout position.
2. Click outside the cutout to paste it onto the drawing area. Or select a tool.

Inverting Colors in a Cutout

The **Inverse** command on the **Pick** menu inverts the colors in a defined cutout. For example, in a black-and-white drawing, black becomes white and white becomes black.

► To invert the colors in a cutout

1. From the **Pick** menu, choose **Inverse**.
The colors in the cutout are inverted.
2. Click outside the cutout to paste the inverted colors onto the drawing area.
Or select a tool.

Tilting a Cutout

You can use the Tilt command on the Pick menu to tilt a defined cutout on an angle that you determine.

► To tilt a cutout

1. From the Pick menu, choose Tilt.
2. If you want the original area erased after tilting the cutout, choose Clear from the Pick menu.
3. Move the cursor to the place you want to anchor the upper-left corner of the flexible box that you use to determine the angle of tilt. Then press and hold down the mouse button.
4. Move the mouse left or right. The bottom of the flexible box shifts with the mouse, tilting the sides of the box and changing the corner angles.
5. When the angle of the box is correct, release the mouse button.
You can tilt the same cutout as many times as you like.
6. To paste the tilted cutout onto the drawing area, select any tool.

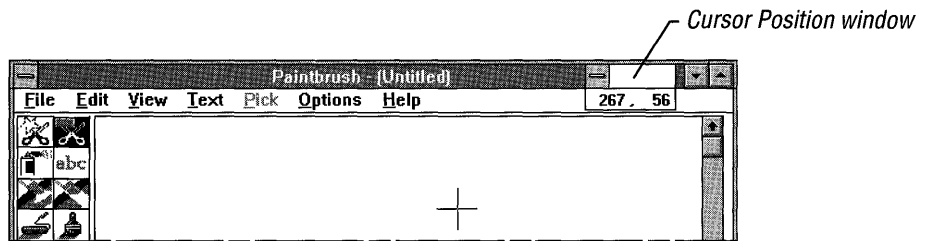
Working with Detail

The Cursor Position command on the View menu displays the current cursor position as x - y coordinates. You can use these width and height coordinates to accurately align text or lines in your drawings. This is particularly helpful when you create charts and tables.

► To use the cursor position coordinates

1. From the View menu, choose Cursor Position.

The Cursor Position window appears on the right side of the title bar above the drawing area. You can move it to any position outside the drawing area, even outside the Paintbrush window. For information about moving windows, see Chapter 1, “Windows Basics.”



2. Move the cursor around the drawing area.

The coordinates inside the Cursor Position window change to indicate the position of the cursor. The coordinates change only while the cursor is inside the drawing area. If you move the cursor outside the drawing area, the last valid coordinates remain showing in the window until you move back inside the drawing area.

3. When you finish using the coordinates, choose Cursor Position again to remove the window from the screen.

Editing by Using the Zoom In Command

You can use the Zoom In command on the View menu to magnify a portion of a drawing so that you can make changes one pel (pixel) at a time.

► To edit a drawing by using the Zoom In command

1. From the View menu, choose Zoom In.

Or press CTRL+N.

2. Move the cursor into the drawing area.

The cursor changes to a movable rectangle.

3. Move the mouse to place the rectangle over the area you want to magnify.

4. Click to magnify the portion of your drawing enclosed by the rectangle.

In the small box that appears in the upper-left corner of the drawing area, you can see how changes you make to the magnified area look at normal resolution.

5. Edit the magnified area in any of the following ways:

- Click using the left mouse button to change a single pel to the selected foreground color.
- Click using the right mouse button to change a single pel to the selected background color.
- Using either mouse button, drag the cursor to change a wide area of pels.
- Use the Paint Roller tool to change whole areas of solid color within the magnified area. The Paint Roller works the same whether you are working with a full-size drawing or a magnified portion of a drawing. For more information, see “The Paint Roller” earlier in this chapter.

6. If you make a mistake, choose Undo from the Edit menu to return to the normal resolution and cancel any changes made to your drawing.

Or press CTRL+Z.

7. When you are satisfied with your changes, choose Zoom Out from the View menu.

Tip If you use the Paint Roller tool with a full-size drawing and the paint leaks, Zoom In is very useful for patching the areas where the paint has leaked through.

Creating Custom Colors

Every color and pattern in Paintbrush is made by varying the amount of each of the three primary colors—red, green, and blue—present in the color. This is true even in monochrome (black-and-white) mode. For instance, white is made by mixing together 255 parts of red, 255 parts of green, and 255 parts of blue. Black, on the other hand, is 0 red, 0 green, and 0 blue.

You can create custom colors and patterns for your drawings by varying the amounts of red, green, and blue (or RGB components) present in the colors provided by Paintbrush. You can change colors and patterns at any time. Changing colors and patterns while you are working on a drawing does not affect your drawing in any way other than to provide you with more color options.

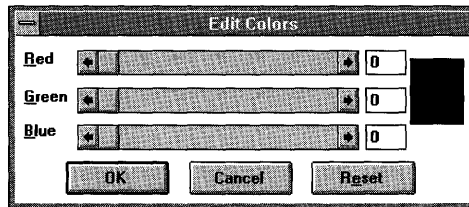
You edit colors by using the Edit Colors command on the Options menu. Imagine that each scroll bar in the Edit Colors dialog box controls the brightness of a red, green, and blue flashlight. Moving the scroll box to the right increases the amount of that RGB component present in the color, lightening the color. Moving the scroll box to the left decreases the amount of that RGB component, darkening the color.

If you shine the three flashlights on the same point of a piece of paper, the color where the beams of light meet is the composite color, which you see in the large rectangle to the right of the scroll bars.

► **To create a custom color**

1. Select the color you want to modify as the foreground color.
2. From the Options menu, choose Edit Colors.

The Edit Colors dialog box appears.



3. Use the scroll bars to increase or decrease the amount of the primary color used, or type a number from 0 to 255 in the Red, Green, and Blue boxes.
4. When you are satisfied with your new color, choose the OK button.

If you are not satisfied with your new color, choose the Cancel button to cancel your changes and return to the drawing.

Or, if you have edited a color several times, you can choose the Reset button to return the color to the one provided by Paintbrush at the beginning of a session.

When you choose the OK button, the new color replaces the original color in the Palette.

Tip To move quickly to the Edit Colors dialog box, double-click the color or pattern in the Palette that you want to edit. Or move the cursor to the color in the Palette, and then press F9+INS.

If you like the new colors and patterns you create, you might want to save them so that they are available the next time you use Paintbrush. Use the Save Colors and Get Colors commands on the Options menu to save or retrieve your color palettes. You save and retrieve custom color files the same way you save and open any other Windows file. Windows assigns the extension .PAL to custom color files. You can also save the default palette so that you can easily retrieve it if you are currently using a custom palette. For more information about opening and saving Windows files, see Chapter 2, "Application Basics." For more information about working with Windows files, see Chapter 4, "File Manager."

Working with Paintbrush Files

You can save your Paintbrush drawings as PCX (.PCX) files, or as bitmap (.BMP) files in four formats. Unless you change the setting in the Save As dialog box, Windows saves a new drawing as a Windows bitmap file. It saves a drawing that you open and edit in the same format that it was opened in. Except for selecting what kind of a file to save, you save and open Paintbrush files the same way you save and open any other Windows file. For more information about opening and saving files, see Chapter 2, “Application Basics.”

When you save in the PCX format, you can use Paintbrush with files created using some non-Windows applications. Not all PCX files are supported by Paintbrush.

You should save images in one of the Windows bitmap formats whenever possible, in order to maintain the highest possible level of compatibility across hardware and future versions of Windows. If you want to save your Paintbrush drawing in other than the standard Windows bitmap format for your display adapter, open the Save As File Type list in the Save As dialog box, and then select from the following options:

- PCX file
- Monochrome bitmap
- 16-color bitmap
- 256-color bitmap
- 24-bit bitmap

Note To avoid using up more memory and disk space than is required, you should always use the bitmap format that is closest in size to the number of colors used in the picture.

Converting Microsoft Paint Files

You can easily convert a Microsoft Paint file to a Paintbrush file. However, you cannot use Paintbrush to work with a Paint file and then resave it as a Paint file.

► To convert a Microsoft Paint file

1. From the File menu, choose Open.

The Open dialog box appears.

2. In the File Name box, type the name of the Paint file.

Or, if you do not know the name of the Paint file you want to convert, select MSP Files from the List Files Of Type box, select the directory that contains the .MSP file, and then select the correct file in the File Name list.

3. Choose the OK button.

A dialog box appears, asking you to confirm that the file should be converted to a Paintbrush file.

4. Choose the OK button.

The drawing appears on the screen.

5. Edit the drawing as needed.

6. When you are finished working with the drawing, choose Save from the File menu.

Paintbrush assigns the extension .BMP to the old filename and saves the drawing.

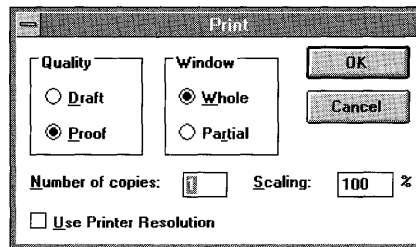
Printing a Drawing

If you have connected and installed a printer, you can print your Paintbrush drawings. For information about installing a printer, see Chapter 6, "Print Manager."

► To print the current drawing

1. From the File menu, choose Print.

The Print dialog box appears, containing the different print options available.



2. Make any necessary changes to the options.

For information about the different options, see the table that follows this procedure.

3. Choose the OK button.

A dialog box appears, displaying the status of the print job.

If you want to cancel printing, choose the Cancel button.

Using the different options available in the Print dialog box, you can perform the following tasks.

Use	To
Draft	Produce an unenhanced copy of your drawing by using the fastest speed of your printer. A few printers support only one setting for printing, in which case you will not notice any difference between Draft and Proof.
Proof	Produce a copy of your drawing that makes use of as many of your printer's advanced features as possible. This is the default setting.
Whole	Print your entire drawing, including those parts not showing in the drawing area. This is the default setting.
Partial	Print part of your drawing. For more information, see the following section, "Printing Part of a Drawing."
Number Of Copies	Specify the number of copies that you want to print.
Scaling	Specify how much to scale the image before sending it to the printer. Specify 100 percent to indicate no scaling.
Use Printer Resolution	Print your drawing at printer resolution rather than at screen resolution. Since the dimensions of a pel (pixel) on a printer may be different from those for a pel on the screen, Paintbrush may stretch a drawing to produce the same dimensions on the printed page as you see on the screen. Selecting this option avoids this stretching process. In some cases, the image on the printer will be much smaller than the image on the screen because of the differences in resolution.

Printing Part of a Drawing

When you select the Partial option button in the Print dialog box, you must determine which part of your drawing you want to print.

► To print part of a drawing

1. From the File menu, choose Print.

The Print dialog box appears.

2. In the Print dialog box, select the Partial option button.
3. Choose the OK button.

Paintbrush adjusts the size of your drawing so that the entire image is displayed on the screen.

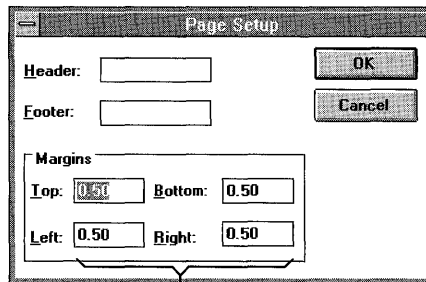
4. Move the cursor to the place you want to anchor one corner of the flexible box you will use to define your printing area. Then press and hold down the mouse button.
5. Drag the cursor until the box contains the portion of the drawing that you want to print.
6. Release the mouse button.
Paintbrush prints the selected portion of the drawing.

Setting Margins

Paintbrush prints your drawing by using the margin settings in the Page Setup dialog box. If you want to position your drawing differently on the page, you can adjust the margins.

► To set the margins you want to use for printing

1. From the File menu, choose Page Setup.
The Page Setup dialog box appears.



*The standard settings
for margins*

2. In the Margins area, type the measurements for the margin settings you want to use.

Paintbrush displays a message if your margin settings are too small for the size of your drawing. If your margin settings are larger than the size of your drawing, Paintbrush positions the upper-left corner of the drawing according to the settings in the Top and Left margin boxes.

3. Choose the OK button.

When you print, Paintbrush uses the new margin settings to position your drawing on the page.

Printing Headers and Footers

When you print a drawing, you can add explanatory text, the date, a page number, or the filename as a header or footer on the printed page. You can also choose whether you want a header or footer to be left-aligned, right-aligned, or centered on the page.

► To print a header or footer on a drawing

1. From the File menu, choose Page Setup.
The Page Setup dialog box appears.
2. In the Header and/or Footer box, type the text you want to use as a header or footer, along with any of the codes that can be used in these boxes. For information about these codes, see the table that follows this procedure.
The Header and Footer boxes will scroll as you type in text.
3. Choose the OK button.

You can type the following codes in the Header and Footer boxes.

Type	For
&d	The current date.
&p	Page numbers.
&f	The current filename.
&l	Text that follows the code to be aligned at the left margin.
&r	Text that follows the code to be aligned at the right margin.
&c	Text that follows the code to be centered between left and right margins. This is the default setting.
&t	The current time.

You can include these codes in a single header or footer. For example, if you specify a header as **&lPage &p&cFile &f&rDate &d**, the header will print as follows:

Page 1 File FILENAME.BMP Date 12/9/91

When you print, any assigned headers or footers appear in their designated places on the printed pages. Headers always appear in the top margin and footers appear in the bottom margin, regardless of how your margins are set.

Changing the Printer and Printer Options

Paintbrush prints your drawings on the default printer. If you want to use another printer or change any printer options, choose the Print Setup command on the File menu.

The printer you change to does not need to be physically connected to your computer. You can change to another printer just to format a drawing for that printer.

► To change printers or printer options

1. From the File menu, choose Print Setup.
The Print Setup dialog box appears.
2. In the Printer box, select the Default Printer or Specific Printer option button.
If you select the Specific Printer option button, select the printer you want to use from the list.
3. Change the Orientation and Paper specifications as needed.
4. To set options specific to your printer driver, choose the Options button, set the options as needed, and then choose the OK button.
5. In the Print Setup dialog box, choose the OK button.

Terminal



Chapter 11

Working with Terminal

This chapter describes how to use Windows Terminal, an application that enables you to connect your computer to other computers and exchange information. For example, with Terminal you can hook up to online information services, such as Dow Jones News/Retrieval, and to online bulletin boards, such as CompuServe.

Before using Terminal, you should be familiar with basic telecommunications concepts and terms, such as *modem*, *baud*, and *protocol*. If exchanging information between computers is new to you, it might be helpful to consult an introductory book on the subject.

Hardware Requirements

Besides the basic hardware requirements for the Microsoft Windows operating system, you need additional hardware to make full use of Terminal. By using the correct hardware with Terminal, you can connect and transfer files to another computer in the same room or to computers in different offices or buildings.

To connect two computers in the same room, a special serial cable, called a *null modem cable*, must be attached to the serial port of each computer. Each computer must have its own communications application as well—either Terminal or another application.

To communicate with computers in different locations, you need the following hardware:

- An available serial port
- A modem and a cable to connect to a serial port
- A telephone line to connect to the modem

For more information about these components, see your hardware manual or computer dealer.

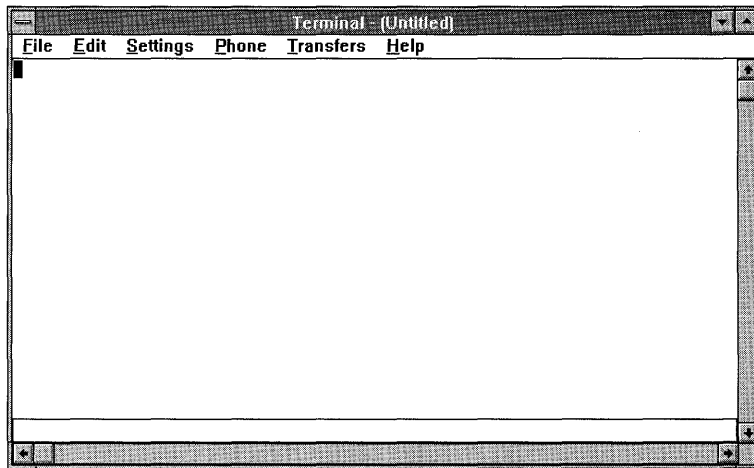
Preparing to Connect

Once you have started Terminal, you can familiarize yourself with the application before you actually connect your computer to another computer.

► **To start Terminal**

- In the Accessories group, choose the Terminal icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.)

The Terminal window appears.



To use Terminal to exchange information with another computer, you need to know the settings required by the remote computer with which you want to communicate.

For example, you need to know the remote computer's basic communications settings for baud rate, data bits, stop bits, parity, and flow-control method. If the remote machine is an online service, such as CompuServe, you can find information about these settings in the package you received when you joined the service.

Once you know what the required settings are for the remote computer, you can modify the default settings in Terminal so that they match those required by the remote computer. You can also specify additional settings or preferences to make your sessions more convenient.

You can save these settings into a unique *settings file* at any time during your Terminal session. Then, you do not have to modify Terminal's default settings each time you connect to the same remote computer. Settings files are identified by the .TRM extension in the filename. You can open and, if you need to, modify an existing settings file whenever you are ready to begin a Terminal session. Instructions for opening a settings file you have saved and for specifying new settings follow.

Opening a Settings File

You can use the New and Open commands on the File menu to create a new settings (.TRM) file or to open an existing one.

► To create a new settings file

- From the File menu, choose New.

The default settings remain in effect, unless you change them to match the remote system you are connecting to.

► To open a settings file that has already been created and saved

1. From the File menu, choose Open.

The Open dialog box appears.

2. Select the drive or directory where the .TRM file is located, if it is not on the current drive or directory.
3. In the File Name box, select the .TRM file you want to use for this session.
4. Choose the OK button.

Specifying Communications Settings

Before connecting to and exchanging information with another computer, you must specify basic communications settings, such as the parity and baud rate, by using the Communications command in Terminal. For information about the correct settings, see your modem documentation and the remote service package, or call the remote system's information number (not the data transmission number) and request the settings.

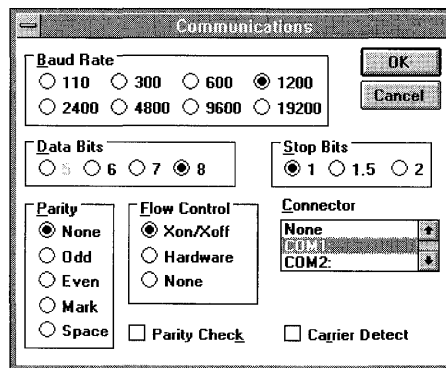
The serial port that your modem is connected to also uses communications settings for the base port address and the interrupt request line (IRQ). Windows detects these settings and displays the values in the Advanced Settings dialog box of the Ports option in Control Panel. If your port requires different values than those detected by Windows, you can use the Advanced Settings dialog box to change these values. For more information about changing advanced port settings, see Chapter 5, "Control Panel."

Note You cannot use Control Panel to change basic communications settings for use with Terminal. You must use the Communications command in Terminal to do this.

► **To specify the communications settings**

1. From the Settings menu, choose Communications.

The Communications dialog box appears.



2. Select the options appropriate to your system and the remote computer. Then choose the OK button.

A description of each option follows.

Use	To
Baud Rate	Specify the data-transfer rate of your modem. Communicating systems must use the same baud rate. The most common settings are 1200 and 2400. Some modems can automatically drop back to the rate of the remote modem and signal Terminal of the change. For information about this feature, see your modem manual.
Data Bits	Specify the number of data bits in each data packet sent between the two computers. Most characters are transmitted in 7 or 8 data bits, though some computers require a setting of 5 or 6 data bits.

Use	To
Parity	Specify the type of parity. If you select 8 data bits (see the previous option), select None (no parity).
Flow Control	<p>Specify the action to be taken if the buffer becomes too full to receive more data from the remote system.</p> <p>Selecting Xon/Xoff (also known as <i>software handshaking</i>) causes Terminal to pause when the buffer fills. Then, when Terminal is ready for more data, it sends a signal to the remote computer. Selecting Hardware (or <i>hardware handshaking</i>) causes the remote system to control the flow of data. With None, neither system uses any method to control the flow of data.</p> <p>Select Xon/Xoff if you do not know what type of flow-control method to use. However, although Xon/Xoff is the standard method for most systems, it cannot be used with a remote system that is configured for hardware handshaking.</p>
Parity Check	Display the byte in which a parity error was encountered. Otherwise, you see a question mark (?) where the modem detected an error. A question mark appears at every character that was not transferred correctly.
Carrier Detect	Specify that Terminal use the modem signal for detecting a carrier signal. If your modem does not connect after you have correctly set the other options, turn off this option to use the carrier-detection method in Terminal, and then try connecting again.
Connector	Select the communications port that your modem uses. If you select None, Terminal uses COM1 if it is available and then checks COM2, and so forth.
Stop Bits	Specify the time between transmitted characters. Stop bits are not actually bits; they are the timing units between characters.

Changing the Modem Command Settings

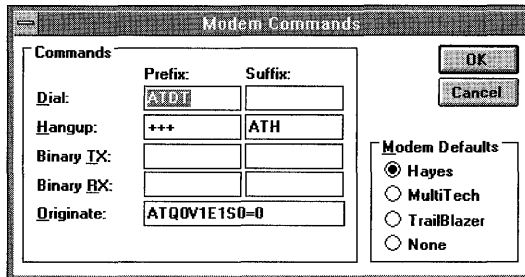
Before connecting to a remote computer, you need to specify the modem you are using and accept or modify its default commands. You do this by choosing Modem Commands from the Settings menu.

When you choose Modem Commands, Terminal displays several popular modem types and their commands. If your modem is not one of these types, you can select None, or you can select the modem whose commands most closely match the ones for the modem you are using. If you need to, you can then modify the default commands for the selected modem so that they are appropriate for your modem. For more information about the commands your modem uses, see your modem manual.

► **To change modem command settings**

1. From the Settings menu, choose Modem Commands.

The Modem Commands dialog box appears.



2. In the Modem Defaults area, select the modem you are using, or the modem whose commands most closely match those for your modem. If none of the modem commands closely match those for your modem, then select None.
3. In the Commands area, make any needed adjustments to the commands or, if you selected None, enter the commands for your modem. For example, if the Hayes commands are the same ones used by your modem, yet you want to pulse dial instead of tone dial, change the Hayes Dial Prefix command from ATDT to ATDP.

For more information about these commands, see your modem manual.

4. Choose the OK button.

If you modify the commands incorrectly, you can reset them to the standard commands by selecting the appropriate modem type again.

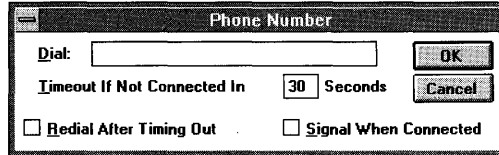
Entering a Phone Number

When you choose the Dial command from the Phone menu, Terminal dials a phone number to connect to the remote computer. You can specify the number for Terminal to dial by choosing the Phone Number command from the Settings menu.

► **To specify the phone number you want Terminal to dial**

1. From the Settings menu, choose Phone Number.

The Phone Number dialog box appears.



2. In the Dial box, type the phone number you want Terminal to dial. You can type parentheses and dashes, but they are not required. Type commas to provide any delays required before the number is processed by the telephone system. If you are using a Hayes-compatible modem with the default settings, each comma inserts a delay of approximately 2 seconds. If you are not using a Hayes-compatible modem, the delays or the character that creates delays may be different.

For Hayes-compatible modems, the following string first dials a 9, then pauses for 4 seconds before dialing the number:

9,,1-800-555-1212

3. Set the options you want.
4. Choose the OK button.

A description of each option follows.

Use	To
Timeout If Not Connected In	Increase the number of seconds Terminal waits for a connect signal from the remote computer (30 seconds is the minimum waiting time). If a remote modem is busy with other calls or is being serviced, it may not answer immediately.
Redial After Timing Out	Dial the phone number again if the previous attempt did not result in a connection.
Signal When Connected	Ring the system bell (beep) when a successful connection to the remote computer has been made. If you are likely to be away from the computer, the bell can be a helpful reminder.

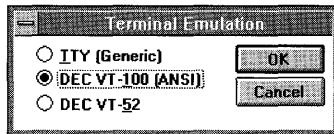
If you want to save phone number settings for a future communications session, you must save them in a settings file. For information, see “Saving a Settings File” later in this chapter.

Setting Terminal Emulation

Using Terminal, your computer can emulate the terminal type required by the remote computer. You specify the terminal type by using the Terminal Emulation command.

► **To specify the terminal-emulation type**

1. From the Settings menu, choose Terminal Emulation.
The Terminal Emulation dialog box appears.



The terminal types displayed are the most common ones used by the large, mainframe computers that host online services. If you are not sure which terminal to use, select the DEC VT-100 (ANSI) option button.

2. Select a terminal type, and then choose the OK button.

Note To use the function keys for DEC VT-100 (ANSI) terminal emulation, SCROLL LOCK must be turned on. If SCROLL LOCK is turned off, the function keys and arrow keys have normal Windows (not VT-100) functionality.

After you confirm your selection, Terminal adjusts your system so that your computer, keyboard, and terminal perform just as the specified terminal does. For example, if you selected TTY, the remote system receives formatting codes for the carriage return, backspace, and tab characters only.

For information about how the various configurations compare with the behavior of the IBM PC keyboard, see the “VT-52 Terminal—Keyboard” and “VT-100 Terminal—Keyboard” tables in Appendix B, “Terminal Emulation Tables.”

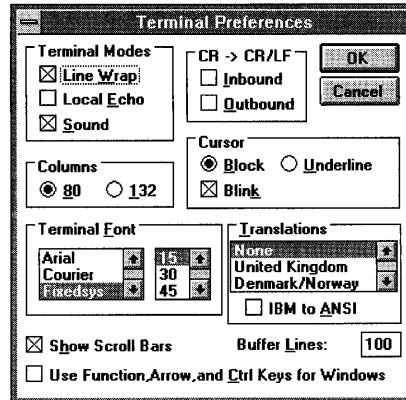
Specifying Terminal Preferences

You can specify how your terminal performs during a communications session by using the Terminal Preferences command. You do not have to specify Terminal Preference settings for Terminal to work properly with the remote computer, but the settings can improve the format of the data you receive and send.

► **To specify terminal preferences**

1. From the Settings menu, choose Terminal Preferences.

The Terminal Preferences dialog box appears.



2. Select the options you want, and then choose the OK button.

A description of each option follows.

Use	To
Line Wrap	Wrap incoming characters that exceed the column width of your monitor onto the next line. For example, if the host computer uses 132-column lines and you have an 80-column monitor, select this option. When Line Wrap is not selected, you can view incoming characters to the right of your monitor's column by using the scroll bars.
Local Echo	Display the data that you are sending to the remote computer on your screen as you type. The remote system may operate in <i>half</i> or <i>full duplex</i> . Half-duplex systems cannot echo your keystrokes to your screen. Full-duplex systems can echo your typing. If the remote system can echo your typing (known as <i>remote echo</i>), do not select this option. If the remote system is not configured for remote echo, select this option to display the outgoing characters as you type them.
Sound	Turn on your computer's bell (or beep) so that it makes a sound when instructed to by the remote computer.
Columns	Specify your monitor type—the common 80-column monitor or the wide 132-column monitor. You can specify 132 if you want an 80-column monitor to work as though it were a wide monitor, and vice versa. If you specify 132, Terminal reserves 132 columns for text even if 132 columns are not entered or received.

Use	To
Terminal Font	Select the font and font size (point size) to use for displaying both the outgoing characters you type and the incoming data on your screen.
Show Scroll Bars	Display the scroll bars. Scroll bars are useful for reviewing information you have typed or received that does not fit on your screen.
CR → CR/LF	Specify each carriage return as a <i>carriage return</i> plus a <i>linefeed</i> . Linefeeds move text on a printer or monitor down one line, whereas carriage returns may only move the print head or cursor to the left margin (depending on the computer type). Before selecting this option, you need to know whether the remote computer already sends linefeeds. You can select Inbound, Outbound, both, or neither. If you select Inbound, carriage returns coming from the remote computer are interpreted as carriage returns followed by linefeeds. If you select Outbound, carriage returns are sent to the remote computer as carriage returns followed by linefeeds.
Cursor	Specify the shape, block or underline, of the cursor and whether or not it blinks.
Translations	Specify a country for sending and receiving data in another language. By selecting a country name, you specify which International Standards Organization (ISO) character set to use. Make sure that the host computer recognizes the character set for the country you select.
IBM to ANSI	Receive information that includes accented or extended characters so that they are correctly displayed on your screen.
Buffer Lines	Specify how much incoming data is saved in the buffer. You can set the buffer to store from 25 to 399 lines of information if you are using Terminal in 80-column mode, or from 25 to 244 lines of information if you are using Terminal in 132-column mode. If you specify more lines than will fit in the available memory, Terminal sets the buffer to the largest number of lines that the memory can accept. If you type fewer than 25 lines, Terminal reserves 25 lines.
Use Function, Arrow, and CTRL Keys for Windows	Specify whether the function, arrow, and CTRL keys are recognized by Windows or by the host computer. If this option is selected, these keys are recognized by Windows. If this option is not selected, these keys are passed to the host computer and will perform the tasks that they are designed to perform by the software you are using on the host. If you use CTRL+C frequently on a host system, you should clear this option.

Assigning Commands to Function Keys

In Terminal, you can assign frequently used commands to function keys. For example, instead of typing a command that performs a common task—such as dialing a remote computer, or specifying your logon name and password each time you use Terminal—you can assign the command to a function key and then just press `CTRL+ALT+function key` to quickly carry out the command.

To assign commands to function keys, you first assign a name to the key that describes the task the key will perform. This step is optional, but it helps you keep track of the tasks you assign to the function keys. Then you assign the command(s) to the key. You assign commands to a function key by entering control codes that carry out specific Terminal commands, or by typing numbers or text to specify time delays or passwords. Each command can contain up to 41 characters.

For example, you may regularly type a logon command sequence that connects you to a remote computer. You can assign the command sequence to a function key, and name the function key “Logon.” A sample logon command sequence might be:

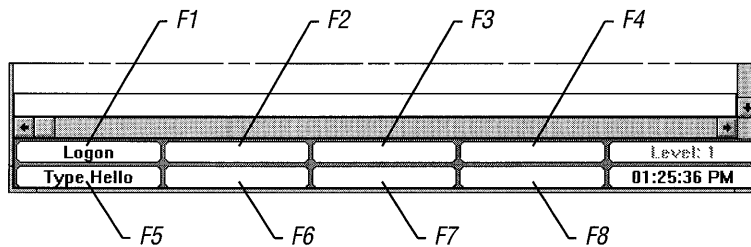
```
^$C^$D03^M^$D02myname^M^$D04password^M
```

where *myname* represents your logon name or user ID, and *password* represents your password to the remote computer. The commands would perform these actions in the following order:

1. Dial the number that you specified from the Settings menu (^\$C).
2. Wait 3 seconds (^\$D03).
3. Send a carriage return (^M).
4. Wait 2 seconds (^\$D02).
5. Send your logon name to the remote computer (*myname*).
6. Send a carriage return (^M).
7. Wait 4 seconds (^\$D04).
8. Send your password (*password*).
9. Send a carriage return (^M).

The delays are required to give the remote computer enough time to respond with prompts. For example, an online service would prompt you to enter your logon name.

To keep track of the commands you have assigned to different function keys, you can display the function-key names along the bottom of the Terminal window.



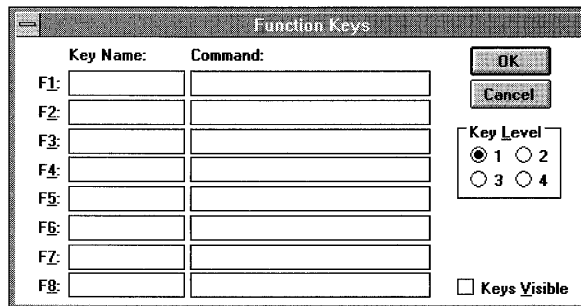
If you are using a mouse, you can quickly choose the command or sequence of commands that you want to carry out by simply clicking the appropriate function-key name.

Function-key assignments are organized into four different levels. You can assign up to eight function keys per level. This means that each function key can be assigned up to four different functions, and the function that is carried out depends on which key level you have selected. You might want to group the eight function keys you use most often in Level 1, the ones you use less often in Level 2, and so on.

► **To assign commands to function keys and specify key levels**

1. From the Settings menu, choose Function Keys.

The Function Keys dialog box appears.



2. In the Key Level area of the Function Keys dialog box, select the key level.
3. In the respective Key Name box, type a name for each function key you want to specify.

For example, you could enter **type hello** as the name of a prompt command.

Names are optional.

4. In the corresponding Command box, type the code(s) or text such as a password that you want included in the command.
For example, you could type **hello** in the Command box that corresponds to the Type Hello key name. A list of the control codes you can enter follows this procedure.
5. Repeat steps 2 through 4 to define another level.
6. To display the function-key pad along the bottom of the Terminal window, select the Keys Visible check box.
7. When you are finished defining all the key levels you want, choose the OK button.

You can assign these control codes to function keys to perform the following tasks.

Control code	Action
^A to ^Z	Sends control code A through control code Z to the remote computer.
^\$Dnn	Causes Terminal to delay for <i>nn</i> seconds before continuing.
^\$B	Causes Terminal to transmit a break code of 117 milliseconds in duration.
^\$C	Causes the same action as choosing Dial from the Phone menu.
^\$H	Causes the same action as choosing Hangup from the Phone menu.
^\$L1 to ^\$L4	Changes to another key level or group of assigned function keys.
^^	Sends a caret (^) to the remote computer.
^@	Sends a NULL character to the remote computer.
^[n	Sends one or more escape-code sequences to the remote computer, where <i>n</i> is a variable representing one or more codes.

Carrying Out Commands Assigned to Function Keys

Once you have assigned commands to function keys, you can carry them out quickly.

► To carry out commands assigned to function keys

Mouse

1. If you have assigned commands to several key levels, click the Level button at the bottom of the Terminal window until the name for the command you want to carry out is displayed on the function-key pad.
2. Click the name of the command displayed on the function-key pad.

Keyboard

- Press CTRL+ALT+*function key*.

For example, if the command you want to carry out is assigned to F4, press CTRL+ALT+F4.

Showing and Hiding Function Keys

You can keep the function-key pad from appearing at the bottom of the Terminal window, even if you have selected the Keys Visible check box.

► To hide the function-key pad

- From the Settings menu, choose Hide Function Keys.

The command changes to Show Function Keys.

To show the function keys, select the command again.

Timing Sessions with Timer Mode

When the function-key pad is displayed (by using the Show Function Keys command), a timer box in the lower-right corner of the Terminal window also displays the system time. You can use this timer box to time your Terminal sessions.

When you choose the Timer Mode command from the Settings menu, the timer is set to 00:00:00. Terminal then tracks how long you have been connected to the remote computer. That way, you can monitor the length of your hook-up time and avoid charges you did not anticipate.

► **To time your communications sessions**

- From the Settings menu, choose Timer Mode.

When the timer function is active, the Timer Mode command is preceded by a check mark.

► **To reset the timer**

- From the Settings menu, choose Timer Mode again.

For more information about these commands, see your hardware manual.

Connecting to the Remote Computer

Once you specify the settings for a session or open a Settings file, you can use Terminal to call the remote system. Terminal uses the phone number and dialing information specified with the Phone Number command on the Settings menu, or prompts you to supply the information.

► **To connect to the remote computer**

- From the Phone menu, choose Dial.

Terminal begins dialing the number. If you did not specify a number by using the Phone Number command on the Settings menu, the Phone Number dialog box appears. For more information, see “Entering a Phone Number” earlier in this chapter.

Note If your modem is dialing but you cannot get through to the remote computer, you might not have specified the correct communications settings for the remote computer. For more information, see “Specifying Communications Settings” earlier in this chapter.

Transferring Files

Once you have called another computer and the communications link is established, you can send or receive text or binary files. Before transferring files, make sure that both your modem and the remote modem are using the same settings for the following:

- Data bits
- Parity type (none, odd, even, mark, and space)
- Stop bits
- Flow control

For more information about the communications settings, see “Specifying Communication Settings” earlier in this chapter.

Setting Up a File Transfer

Before you send or receive files by using commands on the Transfers menu, you can specify the transfer rules. You should do so only if you plan to send or receive binary files. It is not necessary to specify these rules for reading or sending electronic mail or text files.

Text files are prepared with a text editor or word-processing application (such as Notepad or Write) and saved unformatted. This type of file is also known as an ASCII file and contains only the printable ASCII characters and the few control codes needed for minimal formatting, such as carriage returns and linefeeds.

Binary files can be any kind of files, including executable program files, formatted document files, or ASCII files. These files are not converted or translated during the transfer process. If you intend to transfer program files, you must use a binary transfer.

The two methods of transfer—text and binary—differ in a number of ways. In general, it is preferable to send both text and binary files by using the binary transfer method. This method checks more rigorously for errors and loss of data. However, if you do not need to send formatting codes and you are not worried about the loss of data, the text transfer method can be faster. Other significant differences between text and binary transfers are summarized here.

Binary transfers

Automatic retransmission if an error is detected.

Suitable for use with any type of file.

Protocol (XModem/CRC or Kermit) on each system makes system type irrelevant.

Parity is usually not used for error-checking.

Transfer of entire file contents only.

Text transfers

Possible suspension of transmission if an error is detected.

Suitable for use with ASCII text files only.

Lack of protocol makes system specifics important.

Parity can be used to detect character-transmission errors.

Transfer of entire or partial file contents.

Note When communicating with a system that does not recognize either of the binary protocols supported by Terminal (XModem/CRC or Kermit), you cannot transfer binary files. In this case, only text transfers are supported.

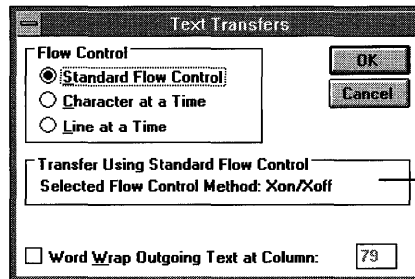
Preparing to Transfer a Text File

Text files contain ASCII text, with font, style, and size specifications stripped out. Because most applications can work with text alone, this format is useful for transfers between vastly different systems.

► To prepare for text-file transfers

1. From the Settings menu, choose Text Transfers.

The Text Transfers dialog box appears.



Use the Communications command to specify the flow-control method.

2. Select the options you want to specify, and then choose the OK button.

A description of each option follows.

Use	To
Standard Flow Control	Use the flow-control method you chose with the Communications command. For more information, see "Specifying Communications Settings" earlier in this chapter.
Character At A Time	<p>Specify that text files be sent one character at a time. Choosing this option displays these additional options in the center of the dialog box:</p> <p><u>Delay Between Characters</u></p> <p>Transmits characters evenly and slowly enough to prevent errors. However, there is no true verification of the transmitted data, and no feedback comes from the remote system. You can set the delay by typing a value in the /10 Sec box.</p> <p><u>Wait For Character Echo</u></p> <p>Sends one character (8 bits) at a time and then waits for the remote computer to echo the character back. Terminal verifies that the two characters are the same before sending the next character. The transfer continues in this manner until every character in the file has been sent. This method is extremely slow and should be used only with a system that echoes characters reliably.</p>
Line At A Time	<p>Specify that text be sent one line at a time. If you select this option, these additional options appear:</p> <p><u>Delay Between Lines</u></p> <p>Transmits lines evenly and slowly enough to prevent errors. However, there is no true verification of the transmitted data, and no feedback comes from the remote system. You can set the delay by typing a value in the /10 Sec box.</p> <p><u>Wait For Prompt String</u></p> <p>Sends one line, and then waits until the remote system sends a verification string (a message) back to Terminal before sending the next line.</p> <p>Terminal can automate this process if you specify what string of characters you want the remote system to send before Terminal sends the next line.</p> <p>This method is faster than character echoing and works better if your remote character echo is unreliable. You can find this out by experimenting or by contacting the administrator of the remote system.</p>

Use	To
Word Wrap Outgoing Text At Column	Use this option if the files you want to send were created with a text editor or word-processing application. You can specify a column up to 132 characters wide, regardless of the size of your terminal. If this option is not selected, outgoing text will be sent as it is currently formatted. To send a file to a 132-column terminal, type 131 after selecting the check box. Reducing the column size by 1 leaves one character space for the end-of-line code (usually ^M).

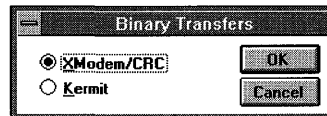
Preparing to Transfer a Binary File

Whereas text transfers require you to know the appropriate settings for the remote computer, binary transfers rely on standard *protocols* (sets of rules) for data transmission. You must specify only the protocol the remote computer uses. Terminal gives you the choice of two common protocols—XModem/CRC and Kermit.

► To prepare for a binary transfer

1. From the Settings menu, choose Binary Transfers.

The Binary Transfers dialog box appears.



2. Select the protocol you want to use, and then choose the OK button.

You can use these options to perform the following tasks.

Use	To
XModem/CRC	Specify the XModem/CRC binary protocol, which uses all 8 bits as data bits, and thus requires the Parity option to be set to None. If the Parity option is not set to None, Terminal will set it to None automatically. If you specify 7 bits as data bits and the remote computer can reconfigure a 7-bit path to 8 bits, Terminal will automatically convert the number of data bits and the parity during the transfer. Terminal initially uses the cyclic redundancy check (CRC) scheme for error-checking. If the remote system does not support CRC, Terminal automatically switches to the checksum scheme.
Kermit	Specify the Kermit protocol, which can use either 7 or 8 bits as data bits; thus, Parity can be specified as Even, Odd, or None.

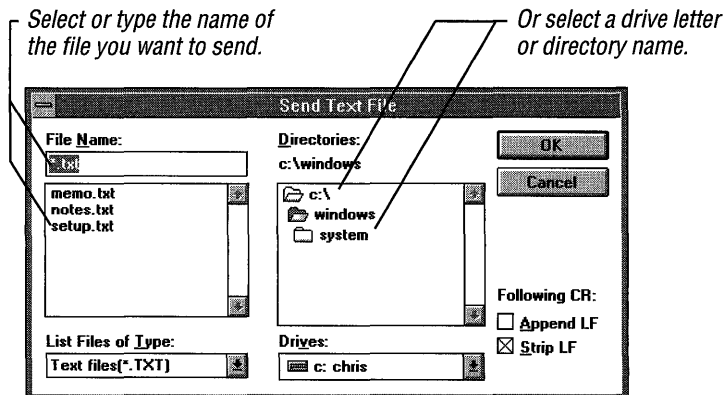
Sending a Text File

If you specified the settings for text transfers by using the Settings menu, you are ready to send your file. You can use the Send Text File command on the Transfers menu to send files you have saved in ASCII (text) format.

► To send a text file

1. From the Transfers menu, choose Send Text File.

The Send Text File dialog box appears.



2. In the Directories area, select the drive and directory where the file you want to send is located, if it is not in the current drive or directory.
3. From the File Name list, select the file you want to send, or type the name in the text box.
4. To attach a linefeed to the end of each line of the text you send, select the Append LF check box. To strip out linefeeds in the text you send, select the Strip LF check box.

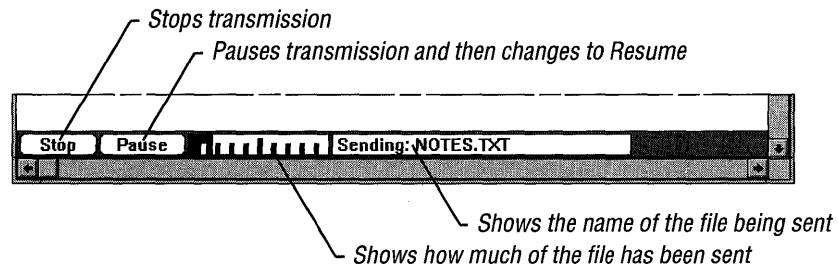
If the remote system adds linefeeds to incoming text, you may need to strip them out. For more information about linefeeds, see the CR To CR/LF option under “Specifying Terminal Preferences” earlier in this chapter.

5. Choose the OK button to begin sending the file.

You will see the file contents scroll in the Terminal window.

► **To control transmission of your file**

- Choose from the Pause, Resume, or Stop buttons at the lower edge of the Terminal window, or choose a command from the Transfers menu.



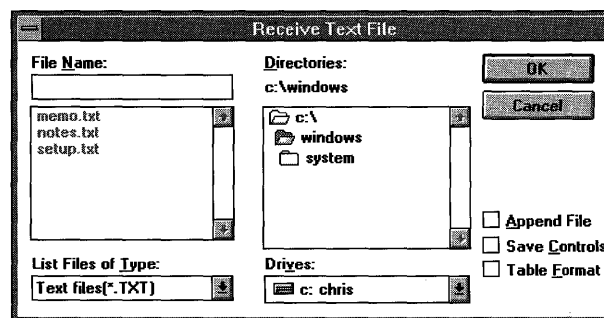
Receiving a Text File

If you specified the settings for text transfers by using the Settings menu, you are ready to receive a text file. If you want to save the incoming information to a file, use the Receive Text File command on the Transfers menu. You can create a new text file, append incoming information to an existing file, or replace an existing file with the incoming information. Be sure to choose the Receive Text File command before actually receiving the information.

► **To receive a text file**

1. From the Transfers menu, choose Receive Text File.

The Receive Text File dialog box appears.



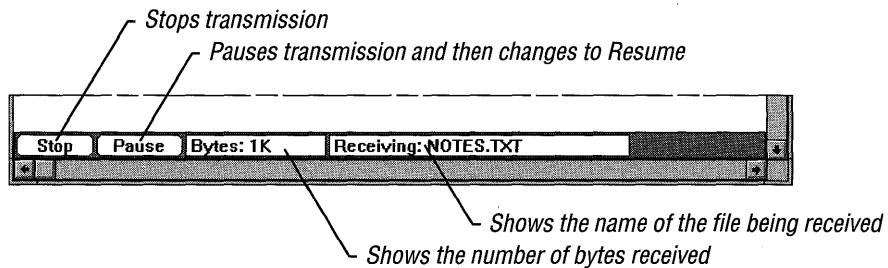
Select the drive and directory where you want to store the file or where the file you want to append to or replace is located.

2. To append to or replace an existing file, select the file from the File Name list. To create a new file, type a filename in the text box.
3. Select any or all of the boxes at the lower-right corner of the dialog box. Then choose the OK button. The following table describes the options.

Use	To
Append File	Add incoming information to the end of the specified file instead of replacing it. In the File Name box, specify the file you want to append the incoming information to.
Save Controls	Save all of the formatting codes in an incoming text file. Many applications, such as word-processing or spreadsheet programs, provide you (or the sender) with an option to save files as text. This means most of the formatting codes are stripped out of the file, enabling it to be sent as a text file. (However, a file may retain some formatting codes.) If you select this option, those formatting codes are received by your system.
Table Format	Receive the incoming text in a tabular format. Terminal puts tab characters between incoming text that is separated by two or more consecutive spaces.

► **To control transmission of the incoming file**

- Choose from the Pause, Resume, or Stop buttons at the lower edge of the Terminal window, or choose a command from the Transfers menu.



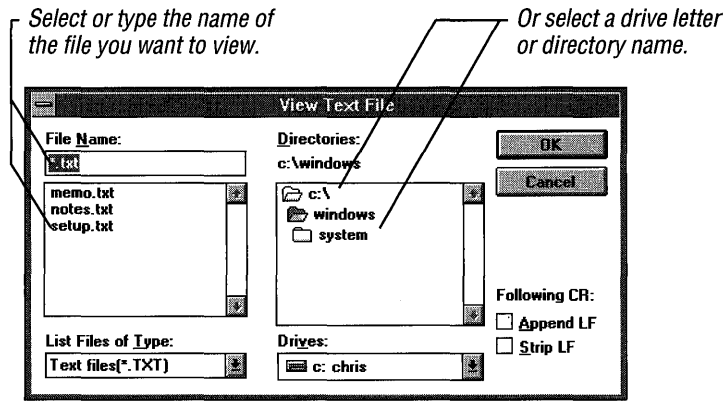
Viewing a Text File

If you want to look at a text file before sending it or after receiving it, use the View Text File command.

► **To view a text file**

1. From the Transfers menu, choose View Text File.

The View Text File dialog box appears.



2. In the Directories area, select the drive and directory where the file you want to view is located, if it is not in the current drive or directory.
3. From the File Name list, select the file you want to view, or type the name.
4. To attach a linefeed to the end of each line of the text you send, select the Append LF check box. To strip out linefeeds in the text you send, select the Strip LF check box.

If you already specified linefeeds when you received the file, you might want to ignore these options. For more information about linefeeds, see the CR To CR/LF option under “Specifying Terminal Preferences” earlier in this chapter.

5. Choose the OK button to view the specified file.

The file contents scroll in the Terminal window. The same buttons appear along the lower edge of the window as when you send a text file.

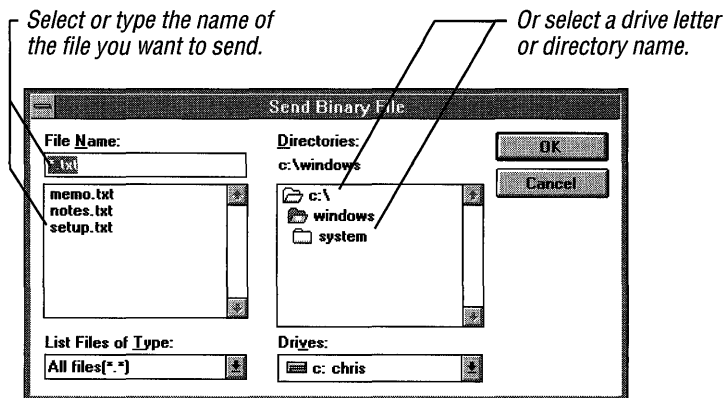
- ▶ **To control how the file is displayed**
 - Choose the Pause, Resume, or Stop button.

Sending a Binary File

You can use the Send Binary File command on the Transfers menu to send a file in binary format. The file is sent according to the protocol specified by using the Binary Transfers command on the Settings menu.

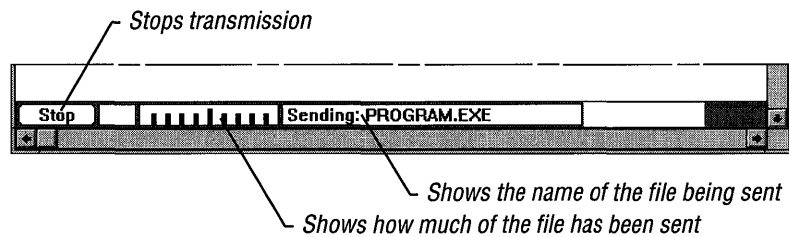
- ▶ **To send a binary file**
 1. Signal the remote computer to prepare to receive a binary file, and then indicate the type of protocol to use (XModem/CRC or Kermit).
 2. From the Transfers menu, choose Send Binary File.

The Send Binary File dialog box appears.



3. In the Directories area, select the drive and directory where the file you want to send is located, if it is not in the current drive or directory.
4. From the File Name list, select the file you want to send or type the name in the text box.
5. Choose the OK button.

The file transfer begins, and the name of the file being transferred appears along the lower edge of the Terminal window. A Stop button also appears.



► To end the file transfer

- Choose the Stop button.

You cannot pause or resume a binary-file transfer, so these buttons and commands are not available.

If Terminal is running as an icon during a binary send, the icon flashes when the transfer is either completed or fails. To continue your communications session, restore Terminal to a window.

Note If you are having trouble sending a binary file, you might have specified a transfer protocol that the remote system does not use. To change the protocol, use the Binary Transfers command. For more information, see “Setting Up a File Transfer” earlier in this chapter.

Receiving Binary Files

The Receive Binary File command on the Transfers menu prepares Terminal to receive a file in binary-file format, according to the protocol specified with the Binary Transfers command on the Settings menu.

► To receive a binary file

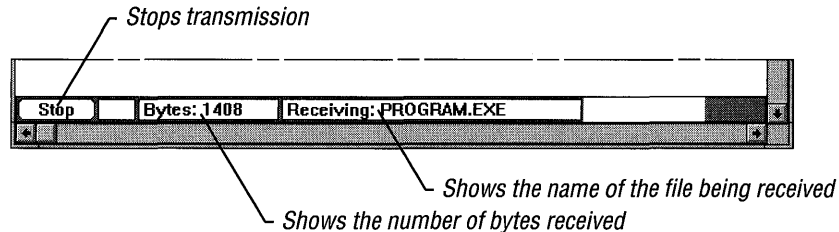
1. Signal the remote computer to send a binary file, and then indicate the type of protocol to use (XModem/CRC or Kermit).
2. From the Transfers menu, choose Receive Binary File.
The Receive Binary File dialog box appears.
3. Select the drive and directory where you want to store the file or where the file you want to replace is located.

4. To replace an existing file, select the file from the File Name list. To create a new file, type a filename in the text box.

If you select an existing file from the File Name list, Terminal requests verification that you want to replace the existing file with the incoming one.

5. Choose the OK button.

The file transmission begins. Terminal displays the name of the binary file being received, the amount of the file already received, and a Stop button.



► To stop the file transfer

- Choose the Stop button.

You cannot pause or resume a binary-file transfer, so those buttons and commands are not available.

Occasionally, a communications error prevents the successful transfer of data. When this occurs, the remote system will try again. The Retries box at the bottom of the Terminal window displays the number of times the remote system has tried to send the data. The maximum number of retries for the XModem/CRC protocol is 20. The maximum number of retries for the Kermit protocol is 5. When the maximum number of retries has been reached, Terminal cancels the file transfer.

If Terminal is running as an icon during a binary receive, the icon flashes when the transfer is complete (or if the transfer fails). To continue your communications session, restore Terminal to a window.

Note If you are having trouble receiving a binary file, you might have specified a transfer protocol that the remote system does not use. To change the protocol, use the Binary Transfers command. For more information, see “Setting Up a File Transfer” earlier in this chapter.

Working with Text in the Terminal Window

Using commands on the Edit menu, you can modify the contents of the Terminal window. You can also send, save, append, or clear the text in the Terminal window. Descriptions of the tasks you can perform by using the Edit menu follow.

Copying Text onto the Clipboard

► **To copy text onto the Clipboard**

1. Select the text you want to copy.
2. From the Edit menu, choose Copy.

Once a selection is copied, you can insert it by using the Paste command.

Sending Clipboard Contents

When you paste text from the Clipboard, Terminal sends a copy of the Clipboard contents to the remote system. The contents of the Clipboard remain unchanged.

► **To send the contents of the Clipboard to a remote system**

- From the Edit menu, choose Paste.

Sending Selected Text

You can use the Send command to send selected text to the remote system. This command is equivalent to choosing the Copy and Paste commands.

► **To send selected text to a remote system**

1. Select the text you want to send.
2. From the Edit menu, choose Send.

Selecting All Text

Using the Select All command has the same result as selecting the entire contents of the Terminal buffer by using the mouse or keyboard. After selecting the text, you can copy or send it.

► **To select all the text in the Terminal window and scroll buffer**

- From the Edit menu, choose Select All.

Clearing the Buffer

When you type or receive more text than can fit in the window, Terminal places that text into a buffer. By using the scroll bars, you can scroll forward and backward to see text you've already typed or received. You might want to clear the buffer to free memory.

► **To clear the contents of the scroll buffer and the window**

- From the Edit menu, choose Clear Buffer.

Terminal removes the contents of the Terminal window and any text in the buffer.

Printing

You can print text (either incoming files or a communications session) in two ways: You can save the text currently in the scroll buffer to a file and print it from another application such as Write; or you can turn on Printer Echo to have incoming text go directly to a printer in addition to your screen.

Setting Up the Printer

If you have connected and installed a printer, you can print text from Terminal. For information about installing a printer, see Chapter 6, "Print Manager."

Printing Incoming Text

You can use the Printer Echo command on the Settings menu to specify whether or not to send incoming information to the printer. When Printer Echo is on, all information received by Terminal is sent to the printer. If you want to print incoming text while you are receiving it, choose this command before receiving the information.

► **To print incoming text**

- From the Settings menu, choose Printer Echo.

A check mark appears next to the Printer Echo command, indicating that all incoming text is being sent directly to the printer.

If the incoming text is less than a page long, you can eject the partial page from the printer.

- ▶ **To eject a page from the printer**
 - From the Settings menu, choose Printer Echo again.

Printing Selected Text

If you want to print selected text from the Terminal window or scroll buffer, it is best to wait until you are ready to end your communications session.

- ▶ **To print text you have received or entered**
 1. Select the text you want to print.
 - If you want to select the entire contents of the window and scroll buffer, choose Select All from the Edit menu.
 2. From the Edit menu, choose Copy to place the selected text on the Clipboard.
 3. Start a word-processing or text-editor application—preferably a Windows-based application such as Write or Notepad.
 4. Paste the contents of the Clipboard into a text file.
 5. Use the application's Print command to print your selection.

Ending Your Communications Session

To end a communications session, you save the settings file (if you want to use these settings again), disconnect from the remote computer, and quit Terminal.

Saving a Settings File

You can save Terminal settings so that you can use them again for the next communications session.

- ▶ **To save the settings file**
 - From the File menu, choose Save.
 - If you have not saved the settings before, a dialog box appears in which you can specify the drive, directory, and filename where you want to store your settings file. Terminal assigns the extension .TRM to the file if you do not specify an extension. You can choose Save As to save the settings under a new filename or to replace an existing file.

Disconnecting from the Remote Computer

Disconnecting from the remote computer is an important step in ending your Terminal session.

► To disconnect from the remote computer

1. Type the exit command specified by the remote system—typically, **bye**.
This command hangs up the remote modem.
2. From the Phone menu, choose Hangup to hang up your modem.

Caution It is important to signal the remote computer with an exit command before choosing Hangup. If you do not know the exit command assigned for the service you are using, see the manual that came with your service package. If you choose Hangup first, you disconnect from the remote computer, but its phone connection remains off the hook. Your account might continue to be charged for connect time until the remote system detects that the connection has been dropped.

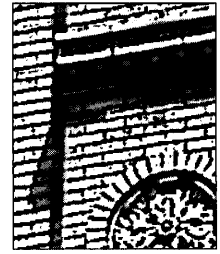
Quitting Terminal

You can end a communications session by quitting Terminal and returning to the Program Manager window.

► To quit Terminal

1. From the File menu, choose Exit.
2. If you made changes to the current settings file without saving, Terminal will ask if you want to save the changes, abandon the changes, or cancel your request to quit Terminal.
3. Choose the appropriate button.

Additional Accessories



Chapter 12

Calculator

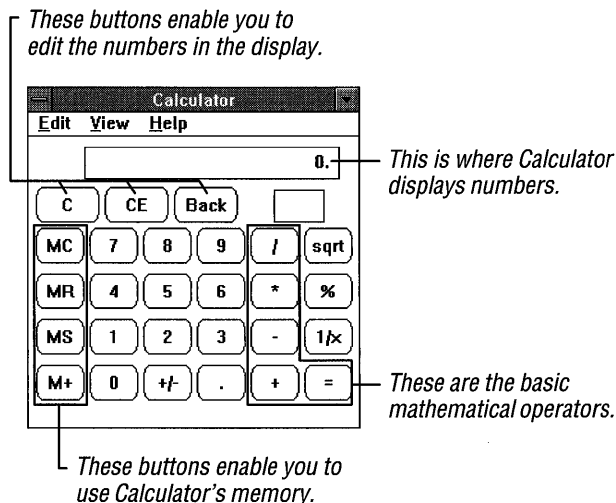
Windows Calculator includes both a standard calculator and a scientific calculator. The standard calculator allows you to do simple calculations and store them in memory. The scientific calculator allows you to do advanced scientific and statistical calculations.

Both calculators work the same way, so you might want to skim the standard calculator section even if you plan to use only the scientific calculator.

► To start Calculator

- In the Accessories group, choose the Calculator icon.

If you are starting Calculator for the first time, the standard calculator appears.



The next time you start Calculator, the last calculator that you used—standard or scientific—appears.

You cannot resize the Calculator window. However, you can reduce Calculator to an icon so that it is readily available when you want to perform calculations.

Performing Calculations

Calculator is easiest to use with the mouse—just point to a Calculator button and click it. You can also use the keyboard, using corresponding keys for each Calculator button. (For information about the keyboard equivalent for each Calculator function, see “Standard Calculator Functions” or “Advanced Calculator Functions” later in this chapter.) For simple calculations, you can use the numbers and basic operators (such as +, −, *, /, =) on your keyboard or numeric keypad. (The NUM LOCK key must be active before you can use the numeric keypad.)

► To perform a simple calculation

1. Enter the first number in the calculation.

The number appears in the Calculator display area.

2. Choose the operator you want to use in the calculation.

For information about which operator to use, see “Standard Calculator Functions” later in this chapter.

3. Enter the next number in the calculation.

If you make a mistake, choose the BACK button (or press the BACKSPACE key) to correct a few digits, or choose the CE button (or press DEL) to clear the entire number.

4. Enter any remaining numbers and operators.

5. Choose the equal sign (=) button.

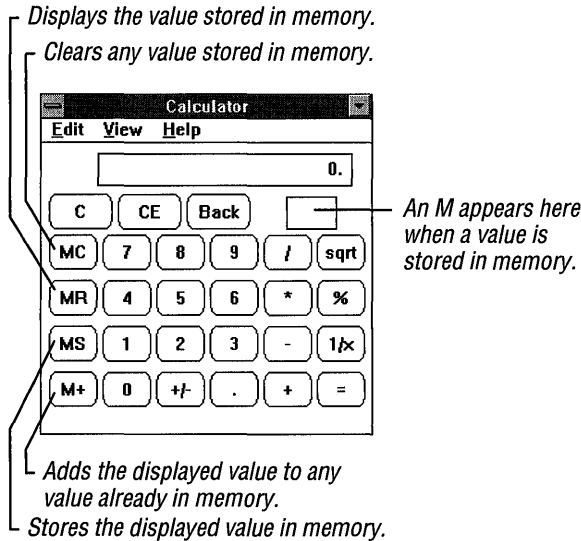
Or press = (equal sign) or ENTER.

The result appears in the Calculator display area.

If you make a mistake and want to restart a calculation, choose the C button (or press ESC) to clear the entire calculation from Calculator.

Using Calculator Memory

Calculator has its own memory, where you can store a value for future use. The following illustration shows the buttons that work with Calculator memory.



When you store a value in memory, the letter *M* appears in the box below the Calculator display area.

If you store a zero in memory or if a value that you add to memory causes the value there to equal zero, *M* disappears from the box below the Calculator display area. If you store another value in memory by using the MS button, that value replaces any value currently in memory.

If you don't have a mouse, you can use the memory functions by using the keyboard. For information, see "Standard Calculator Functions" later in this chapter.

Using Calculator with the Clipboard

Using the Clipboard, Calculator can supply calculated results to other applications and perform calculations on values supplied by other applications. You can use Calculator with any application with which you can use the Clipboard.

► **To copy the value in the display area onto the Clipboard**

- From the Edit menu, choose Copy.

You can now paste the value into any application with which you can use the Clipboard.

► **To paste a number from the Clipboard into the display area**

1. If you're using the scientific calculator, select a number system.
2. From the Edit menu, choose Paste.

Calculator interprets most characters on the Clipboard as if they were typed on the keyboard. When you paste from the Clipboard, however, Calculator interprets some characters as key sequences or function keys. The following table describes the meaning of these characters.

Characters	Meaning in pasted text
:c	Clears any value stored in memory. Equivalent to CTRL+L.
:e	Allows entry of numbers in scientific notation in decimal mode. This character can optionally be followed by a plus (+) or minus (-) sign to indicate the sign of the exponent. The plus sign will not work if the character is preceded by a colon (:). If no sign is present, then + is assumed. Also specifies the number "E" in hexadecimal mode.
:m	Stores the displayed value in memory. Equivalent to CTRL+M.
:p	Adds the displayed value to any value in memory. Equivalent to CTRL+P.
:q	Clears the current calculation. Equivalent to the ESC key and the C button.
:r	Displays the value stored in memory. The value also remains in memory. Equivalent to CTRL+R.
\	Same as the Dat button, which is normally assigned to the INS key. You must activate the Statistics Box before using this key.

Standard Calculator Functions

The following table describes each key on the standard calculator, its keyboard equivalent, and its function.

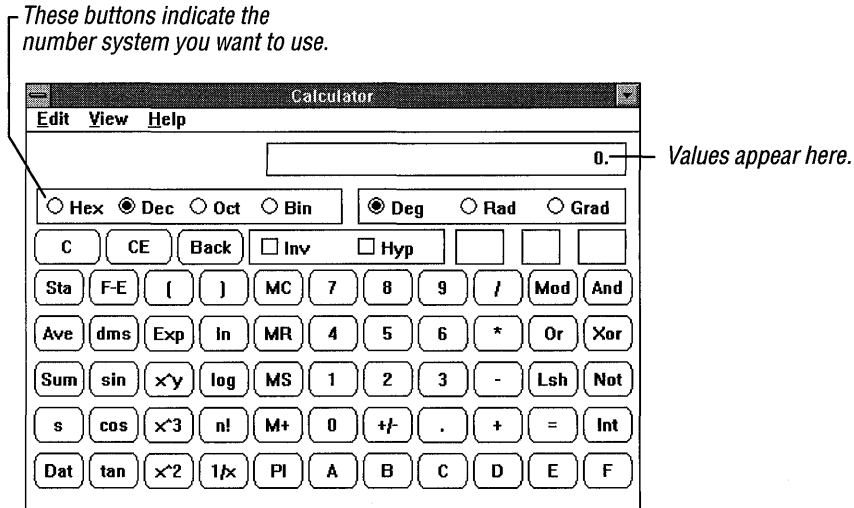
Button	Key	Function
+	+	Adds.
-	-	Subtracts.
*	*	Multiplies.
/	/	Divides.
sqrt	@	Calculates the square root of the displayed value.
%	%	Calculates percentages.
1/x	r	Calculates the reciprocal of the displayed number.
=	= or ENTER	Performs any operation between the previous two numbers. Choose again to repeat the last operation. (For example, $4 + 2 = 6$. Pressing = again calculates 8; again calculates 10; and so on.)
+/-	F9	Changes the sign of the displayed number.
.	. or ,	Inserts a decimal point in the displayed number. The period is the standard setting for a decimal separator. You can change the decimal separator setting by using Windows Control Panel.
Back	BACKSPACE or LEFT ARROW	Deletes the rightmost digit of the displayed number.
CE	DEL	Clears the displayed number.
C	ESC	Clears the current calculation.
MC	CTRL+L	Clears any value stored in memory.
MR	CTRL+R	Displays the value stored in memory. The value also remains in memory.
MS	CTRL+M	Stores the displayed value in memory.
M+	CTRL+P	Adds the value that is displayed to any value in memory.

Using the Scientific Calculator

The scientific calculator can perform simple, standard mathematical calculations or scientific and statistical calculations. This calculator can also calculate in the binary, octal, and hexadecimal number systems in addition to the decimal system that we ordinarily use.

► **To use the scientific calculator**

- From the View menu, choose Scientific.
The scientific calculator appears.



You perform a simple calculation on the scientific calculator the same way you perform a simple calculation on the standard calculator. For information, see “Performing Calculations” earlier in this chapter. The following topics provide information that applies only to the scientific calculator.

Working with Different Number Systems

When you start the scientific calculator, it is set to work in the decimal number system—the base 10 system that we are accustomed to. This calculator can also work in the binary, octal, and hexadecimal number systems.

When you enter values into the scientific calculator, it accepts only values that are valid for the number system you have selected to work in. For example, if you are working in the hexadecimal number system, B is a valid entry, but if you are working in the decimal number system, B is not.

Converting a Value to Another Number System

The scientific calculator can convert most values that you are currently working with to any of the other available number systems. The following table lists the valid ranges for converting numbers.

Number system	Range
Hexadecimal	$-2^{31}-1$ to $2^{31}-1$
Decimal	$-9.9999999999999999e-307$ to $9.9999999999999999e+307$
Octal	$-2^{31}-1$ to $2^{31}-1$
Binary	$-2^{31}-1$ to $2^{31}-1$

► To convert a value to another number system

1. Enter the value you want to convert.
2. Select the option button for the number system you want to convert to—Hex, Dec, Oct, or Bin.
3. Select the unit of measurement you want Calculator to use to display the result.

When converting to hexadecimal, octal, or binary numbers, you can select the Dword, Word, or Byte option button. For more information about these settings, see “Advanced Calculator Functions” later in this chapter.

The value resulting from the conversion appears in the display area.

If you convert a decimal number containing decimal places to another number system, Calculator shortens the number to its integer. Numbers converted from the hexadecimal, octal, or binary number systems to the decimal system also appear as integers.

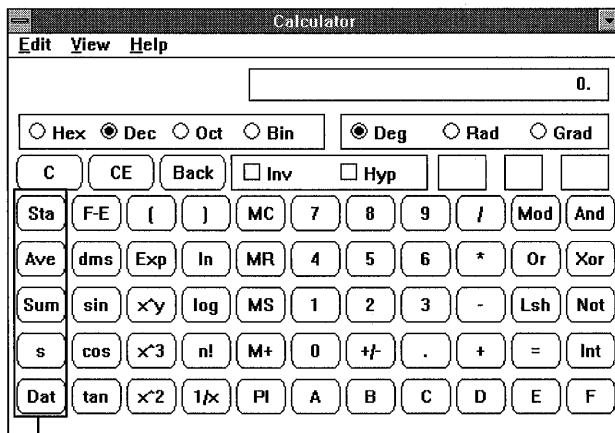
Copying and Pasting in Different Number Systems

When you use the Copy command on the Edit menu to copy a value from Calculator onto the Clipboard, the Clipboard regards the value as a piece of text. It does not distinguish between text and numbers. You can use the Copy command to transfer a number in any number system from the scientific calculator into another Windows application or accessory.

You can also paste a value in any number system into the scientific calculator from the Clipboard, provided that the number is in the number system that is currently active.

Using the Calculator Statistical Functions

In addition to doing simple and programming calculations, the scientific calculator does statistical calculations, such as averages and standard deviations.

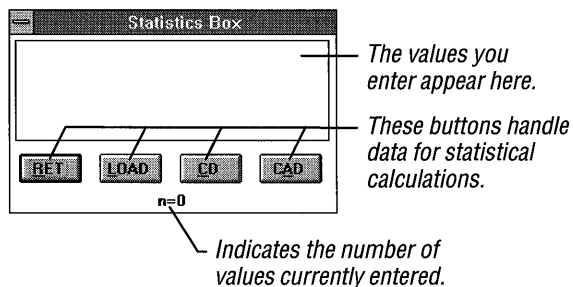


These buttons indicate statistical calculations.

► To perform a statistical calculation

1. Choose the Sta button.

The Statistics Box appears.



2. Move the Statistics Box to a position where you can easily work with the numbers and statistical functions you want to use.
3. Enter the first value.
If you are using the keyboard, choose the RET button in the Statistics Box by pressing ALT+R, and then type the number.
4. Choose the Dat button to enter the value in the Statistics Box.
5. Enter any other numbers in the calculation, choosing the Dat button each time to place the number in the Statistics Box.
You can enter as many numbers as your computer's memory allows.
6. Choose the button for the statistical function you want to use in your calculation—Ave (average), Sum (total), or s (standard deviation). For more information about these functions, see the following section, "Advanced Calculator Functions."
Choose the Dat button to include the results in the Statistics Box.
7. When you complete your statistical calculations, choose Close from the Control menu in the Statistics Box.

You can use the Statistics Box buttons in the following ways.

Use	To
RET	Switch to the main calculator and retain the Statistics Box entries. (To return to the Statistics Box, choose the Sta button.)
LOAD	Change the number in the Calculator display area to the number selected in the Statistics Box.
CD	Delete the selected number from the Statistics Box.
CAD	Delete all numbers from the Statistics Box.

Advanced Calculator Functions

The following tables describe each button specific to the scientific calculator and its functions. They do not describe buttons that also appear on the standard calculator. For information about those buttons, see "Standard Calculator Functions" earlier in this chapter. The tables also provide the keyboard equivalent for each function.

Operators

Button	Key	Function
((Starts a new level of parentheses. The current number of levels appears below the display area. The maximum number is 25.
))	Closes the current level of parentheses.
And	&	Calculates bitwise AND.
Int	;	Displays the integer portion of a decimal value. Inv+Int displays the fractional portion of a decimal value. For example, if the current value is 47.5, Int displays 47 and Inv+Int displays .5.
Lsh	<	Shifts left. Inv+Lsh shifts right. After you select this button, you must specify how many positions (in binary) to the left or right you want to shift the number in the display area, and then press = (equal sign).
Mod	%	Displays the modulus, or remainder, of x/y. For example, 10 Mod 3 displays 1.
Not	~	Calculates bitwise inverse.
Or		Calculates bitwise OR.
Xor	^	Calculates bitwise exclusive OR.

Number-Base Functions

Button	Key	Function
Bin	F8	Converts to the binary number system.
Byte	F4	Displays the lower 8 bits of the displayed number, but does not change the value.
Dec	F6	Converts to the decimal number system. This is the standard setting. Uses Deg, Rad, or Grad in trigonometric functions. Dword, Word, and Byte do not apply here.
Dword	F2	Displays the full 32-bit representation of the displayed number.
Hex	F5	Converts to the hexadecimal number system.
Oct	F7	Converts to the octal number system.
Word	F3	Displays the lower 16 bits of the displayed number, but does not change the value.

Advanced Statistical Functions

Button	Key	Function
Ave	CTRL+A	Calculates the mean of the values displayed in the Statistics Box. Inv+Ave calculates the mean of the squares.
Dat	INS	Enters the displayed number in the Statistics Box.
s	CTRL+D	Calculates standard deviation with the population parameter as $n-1$. Inv+s calculates standard deviation with the population parameter as n .
Sta	CTRL+S	Opens the Statistics Box and activates the Ave, Sum, s, and Dat buttons.
Sum	CTRL+T	Calculates the sum of values in the Statistics Box. Inv+Sum calculates the sum of the squares.

Other Advanced Functions

Button	Key	Function
cos	o	Calculates the cosine of the displayed number. Inv+cos calculates the arc cosine. Hyp+cos calculates the hyperbolic cosine. Inv+Hyp+cos calculates the arc hyperbolic cosine.
Deg	F2	Sets trigonometric input for degrees. This function is available in decimal mode only. (For example, to calculate the cosine of 35 degrees, change to Deg, enter 35, and choose the cos button.)
dms	m	Converts the displayed number to degree-minute-second format (assuming the number is in degrees). Inv+dms converts the displayed number to degrees (assuming the number is in degree-minute-second format).
Exp	x	Allows entry of scientific notation numbers. The exponent has an upper limit of +307. You can continue to enter numbers as long as you only use keys 0–9. You can use Exp only with the decimal number system.
F-E	v	Switches between scientific notation and normal notation. Calculator always displays numbers larger than 10^{15} exponentially. You can use F-E only with the decimal number system.
Grad	F4	Sets trigonometric input for gradients in decimal mode.
Hyp	h	Sets the hyperbolic function for sin, cos, and tan. The different functions automatically turn off the hyperbolic function after a calculation is completed. (For more information, see the individual functions.)

Button	Key	Function
Inv	i	Sets the inverse function for sin, cos, tan, PI, x^y , x^2 , x^3 , ln, log, Ave, Sum, and s. The different functions automatically turn off the inverse function after a calculation is completed. (For more information, see the individual functions.)
ln	n	Calculates natural (base e) logarithm. Inv+ln calculates e raised to the x th power, where x is the current number.
log	l	Calculates common (base 10) logarithm. Inv+log calculates 10 raised to the x th power.
n!	!	Calculates factorial of the displayed number.
PI	p	Displays the value of π . Inv+PI displays 6.28... (or $2*\pi$).
Rad	F3	Sets trigonometric input for radians in decimal mode. Input can be from $0-2*\pi$.
sin	s	Calculates the sine of the displayed number. Inv+sin calculates the arc sine. Hyp+sin calculates the hyperbolic sine. Inv+Hyp+sin calculates the arc hyperbolic sine.
tan	t	Calculates the tangent of the displayed number. Inv+tan calculates the arc tangent. Hyp+tan calculates the hyperbolic tangent. Inv+Hyp+tan calculates the arc hyperbolic tangent.
x^y	y	Computes x raised to the y th power. Inv+ x^y calculates the y th root of x .
x^2	@	Squares the displayed number. Inv+ x^2 calculates the square root.
x^3	#	Cubes the displayed number. Inv+ x^3 calculates the cube root.

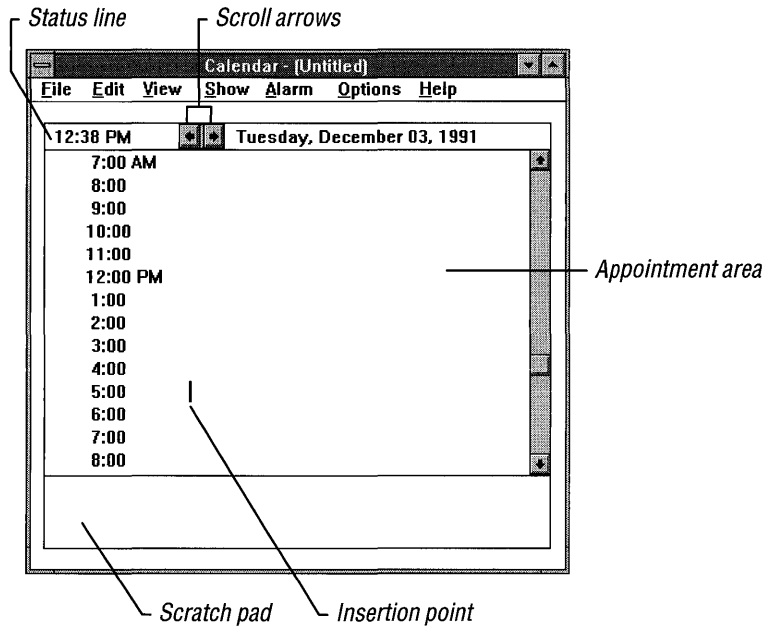
Calendar

Windows Calendar combines a month-at-a-glance calendar and a daily appointment book.

► To start Calendar

- In the Accessories group, choose the Calendar icon.

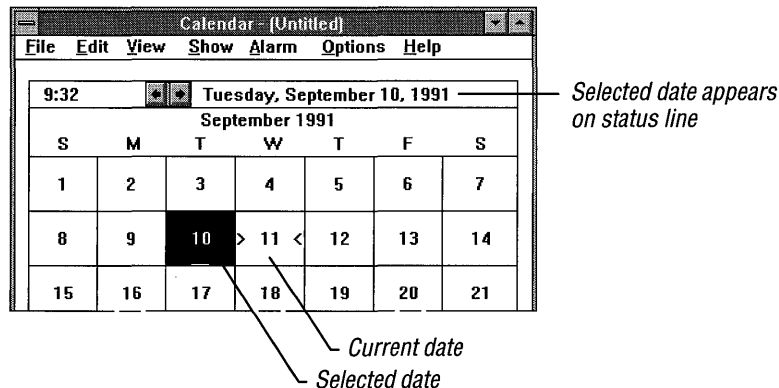
An untitled Calendar window appears, displaying one-hour time intervals for the current date. The first hour that appears at the top of the window is 7:00 A.M.



Calendar displays the system time and date in the status line. If the time or date is wrong or you would like to change the format, you can reset it by using Windows Control Panel. For more information, see Chapter 5, “Control Panel.”

Changing Views in Calendar

Calendar gives you two views of the calendar. When you start Calendar, you see one full day (the Day view). You can change to the Month view to see the whole month at one time.



► **To switch between the Day view and the Month view**

- From the View menu, choose Month or Day.

Tip If you have a mouse, you can quickly switch between the Day view and the Month view by double-clicking the date in the status line. You can also change back to the Day view by double-clicking a specific date in the Month view (or by using the arrow keys to move to the date and then pressing ENTER).

Entering Appointments

When you enter an appointment, you move the insertion point to a time in the Day view, and then type text that describes the appointment. You can also set an alarm, and type notes and reminders in the Calendar scratch pad.

The Day view contains a list of times that are initially set at one-hour intervals, beginning with 12 A.M. The insertion point initially appears at 7 A.M. (the starting time).

► **To enter an appointment**

1. Move the insertion point to the appointment time.

If the time is not visible, use the scroll bar or arrow keys to move the time onto the screen.

2. Type any information you want.

You can type up to 80 characters of text describing an appointment. The appointment line scrolls horizontally if you continue typing past the end of the line initially shown in Calendar.

If you are using the keyboard, you can use the following keys to move the insertion point.

Press	To move to
UP ARROW	The time above.
DOWN ARROW or ENTER	The time below.
PAGE UP	The previous screen.
PAGE DOWN	The next screen.
CTRL+HOME	The starting time (set for 7 A.M. the first time you start Calendar).
CTRL+END	Twelve entries below the starting time (this is not 12 hours below if special times are added).

If you want to schedule an appointment for a time not displayed, you need to add a special time. For more information, see “Customizing Your Calendar” later in this chapter.

Editing an Appointment

You can edit the text that describes an appointment in much the same way that you edit text in other Windows applications. For more information, see Chapter 2, “Application Basics.” When you select Calendar text for editing, however, you can select only one appointment line at a time.

Adding a Note or Reminder

The daily appointment window has a scratch pad at the bottom in which you can type notes and reminders.

► To write notes on the scratch pad

1. Point to the scratch pad and click it.

Or press **TAB** to move to the scratch pad.

2. Type your notes and reminders.

You can type up to three lines of text in the scratch pad. When your text reaches the right border of the scratch pad, Calendar wraps the text to the next line.

3. To return to the appointment area, press **TAB**.

Displaying a Different Appointment Day

You can move to different appointment days by using commands on the Show menu. You can also use this menu to return quickly to the current day's appointments.

► To display the previous or next appointment day

- From the Show menu, choose Previous or Next.

► To return to the current appointment day

- From the Show menu, choose Today.

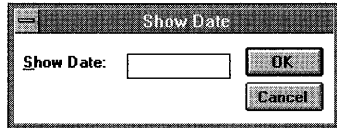
The Previous, Next, and Today commands also apply to months when you are using the Month view.

Tip To move quickly to the previous day, click the left arrow in the Calendar status line (or press **CTRL+PAGE UP**). To move quickly to the next day, click the right arrow in the Calendar status line (or press **CTRL+PAGE DOWN**).

► **To change the appointment day to a specific date**

1. From the Show menu, choose Date.

The Show Date dialog box appears.



2. In the Show Date box, type the date you want Calendar to display.
3. Choose the OK button.

You can type any date between January 1, 1980, and December 31, 2099. If you have not used Control Panel to change the date format, you can type dates in either the mm/dd/yy or mm-dd-yy format. You do not need to type leading zeros for days or months. If you are referring to a year in the twentieth century, you need to type only a two-digit number. The following examples show some acceptable date formats.

You can type	For this date
3/9/92	March 9, 1992
3-9-92	March 9, 1992
1/1/2010	January 1, 2010

Using the Month View

In the Month view, you see at a glance all the dates in the current month. The current date is marked by brackets (for example, >15<).

► **To move to another date in the Month view**

- Point to the date and click it.
Or use the arrow keys.

► **To view the previous or next month**

- From the Show menu, choose Previous or Next.

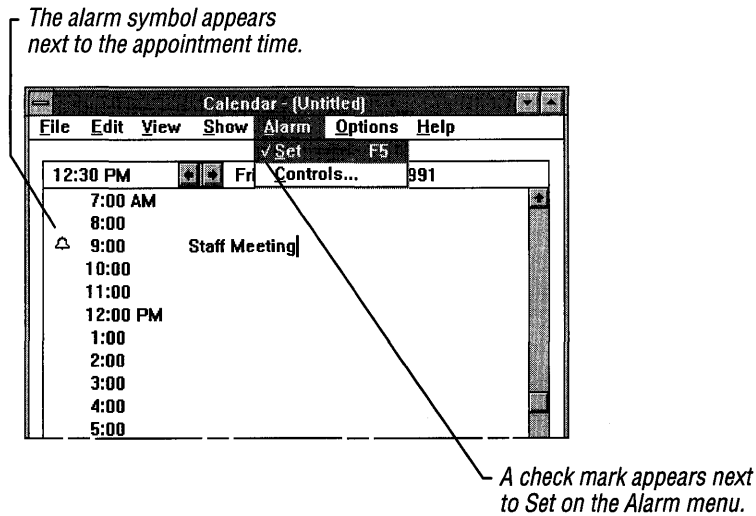
Tip To move quickly to the previous month, click the left arrow in the Calendar status line (or press PAGE UP). To move quickly to the next month, click the right arrow in the Calendar status line (or press PAGE DOWN).

- ▶ **To move quickly to an appointment day from the Month view**
 - Double-click the date in the Month view.
Or use the arrow keys to move to the date, and then press ENTER.

Setting an Alarm

Calendar has an alarm you can set to remind you of appointments. You can set the alarm for as many appointments as you want.

- ▶ **To set the alarm for an appointment time**
 1. Select the appointment time.
 2. From the Alarm menu, choose Set.



When the alarm goes off, Calendar alerts you in one of the following ways.

If Calendar is	This happens
The active window	A dialog box reminds you of the appointment.
An inactive window	The title bar and borders of the Calendar window flash.
An icon	The icon flashes.

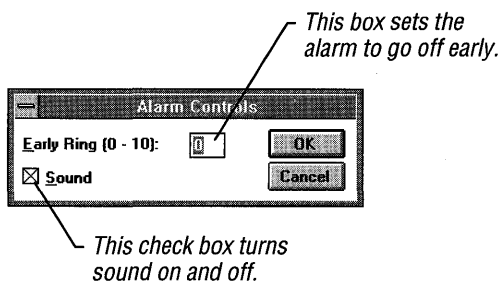
Changing the Sound Option

In addition to visually alerting you about your appointments, the alarm also makes a sound. If you do not want to hear the alarm, you can turn off its sound.

Note If you have turned off the system sounds for Windows by using the Sound option in Control Panel, the Calendar alarm will not beep.

► To use a silent alarm

1. From the Alarm menu, choose Controls.
The Alarm Controls dialog box appears.



2. Clear the Sound check box.
3. Choose the OK button.

Setting the Calendar Alarm to Go Off Early

Once the alarm is set, you can set it to go off up to 10 minutes before the appointment time.

► To set the alarm to go off early

1. From the Alarm menu, choose Controls.
The Alarm Controls dialog box appears.
2. In the Early Ring box, type a number from 0 to 10.
3. Choose the OK button.

Alarms continue to go off early until you change the Early Ring setting.

Turning Off the Alarm

When an alarm goes off, it continues to flash until you turn it off. How you turn off an alarm depends on whether Calendar is an icon, or whether the Calendar window is active or inactive.

► To turn off the alarm

1. If the Alarm dialog box is not already visible, switch to the Calendar window or restore the Calendar icon.
2. In the Alarm dialog box, choose the OK button.

Removing an Alarm

You can remove an alarm before it goes off.

► To remove an alarm

1. Select the time the alarm is set for.
2. From the Alarm menu, choose Set.

When you remove an alarm, the check mark next to the Set command disappears.

Customizing Your Calendar

You can customize the Day view of your calendar so that it shows other than 60-minute time intervals, uses a 24-hour clock rather than a 12-hour clock, or uses a starting time other than 7 A.M. You can also add special times in the Day view and mark special dates in the Month view.

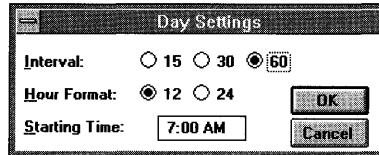
Changing Settings in the Day View

The day settings determine the time interval, hour format, and starting time used in the Day view.

► **To change the settings in the Day view**

1. From the Options menu, choose Day Settings.

The Day Settings dialog box appears.



2. Select the options you want to use. For more information, see the table of options following this procedure.
3. Choose the OK button.

You can set the following options in the Day Settings dialog box.

Use	To
Interval	Determine the intervals between daily appointments. You can select intervals of 15, 30, or 60 minutes.
Hour Format	Select either a standard 12-hour clock or a 24-hour clock.
Starting Time	Specify the time that appears at the upper left of the Calendar window when you first view an appointment day.

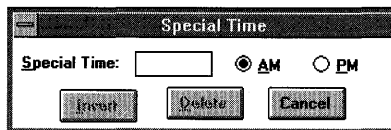
Adding a Special Time

A special time is any time that falls between the 15-, 30-, or 60-minute intervals you set in the Day Settings dialog box. For example, no matter what time interval you set, 11:10 is a special time.

► **To add a special time to an appointment day**

1. From the Options menu, choose Special Time.

The Special Time dialog box appears.



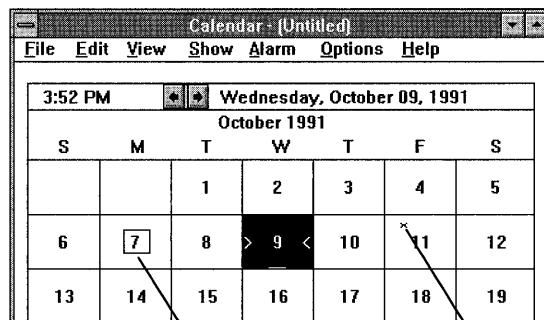
2. In the Special Time box, type the time.
3. Select the AM or PM option button if you are using a 12-hour clock.
You can use the Date/Time option in Control Panel to specify a 24- or 12-hour clock.
4. Choose the Insert button.

► **To delete a special time**

1. Select the time you want to delete.
2. From the Options menu, choose Special Time.
The Special Time dialog box appears with the selected time in the Special Time box.
3. Choose the Delete button.

Marking a Date

You can call attention to special days such as paydays, holidays, birthdays, and anniversaries by marking the days in the Month view. Calendar supplies five different symbols for marking dates. By always marking a specific type of day, such as payday, with the same symbol, you can tell at a glance when that day occurs in the month.



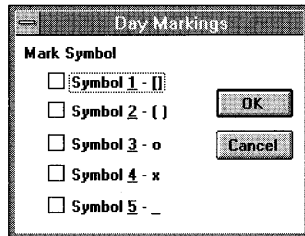
A box marks a holiday.

An x designates a payday on this calendar.

You can mark a special date while in either the Day or Month view, but it is displayed only in the Month view.

► **To mark a date in the Month view**

1. Select the date you want to mark.
2. From the Options menu, choose Mark.
The Day Markings dialog box appears.



3. Select the check box for the symbol or symbols you want to use.
4. Choose the OK button.
Calendar marks the selected date with the symbol you chose.

► **To cancel a mark**

1. Select the marked date.
2. From the Options menu, choose Mark.
The Day Markings dialog box appears.
3. Clear the check box of the symbol that marks the selected date.
4. Choose the OK button.
Calendar removes the mark.

Managing Calendar Files

Windows assigns the extension .CAL to Calendar files. For information about opening and saving Windows files, see Chapter 2, "Application Basics." For information about working with Windows files and directories, see Chapter 4, "File Manager."

Opening Read-Only Appointment Files

If you and your co-workers want to share your daily appointment schedules over a network, you can open appointment files as read-only files. That way, you can view someone else's appointments without accidentally changing or erasing something.

Note Although you can make changes to read-only files, you cannot save those changes.

► To open an appointment file as a read-only file

1. From the File menu, choose Open.
2. Select or type the name of the file you want to open.
3. Select the Read Only check box.
4. Choose the OK button.

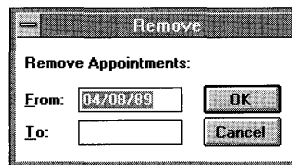
Removing Entries from Appointment Days

You can remove appointments from a single day or a range of days that you don't need anymore from a Calendar file to make room for other appointments.

► To remove entries from appointment days

1. Open the file you want to remove appointments from.
2. From the Edit menu, choose Remove.

The Remove dialog box appears.



3. In the From box, type the first date you want to remove.
4. In the To box, type the last date you want to remove.
To remove only one day's appointments, leave the To box blank.
5. Choose the OK button.

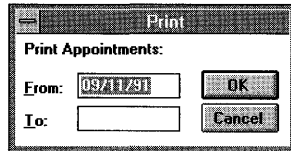
Printing Appointments

If you have connected and installed a printer, you can print your appointments. For information about how to install a printer, see Chapter 5, "Control Panel." Calendar automatically prints to the designated default printer.

► To print appointments

1. From the File menu, choose Print.

The Print dialog box appears.



2. In the From box, type the date of the first appointment day you want to print.
3. In the To box, type the date of the last appointment day you want to print.

To print a single day's appointments, leave the To box blank.

4. Choose the OK button.

Calendar prints your documents on the default printer. If you want to use another printer, choose the Print Setup command from the File menu.

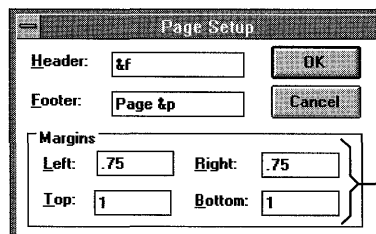
Setting Margins

Calendar automatically prints your appointments using the standard margin settings in the Page Setup dialog box. If you want to position your appointments differently on the page, adjust the margins before you use the Print command.

► To set the margins for printing appointments

1. From the File menu, choose Page Setup.

The Page Setup dialog box appears.



The default settings for margins

2. In the Margins area, type the measurements for the margin settings you want to use.

The increment for this measurement is set using the International option in Control Panel. If you have this setting set to English, you are using inches. For more information, see Chapter 5, "Control Panel."

3. Choose the OK button.

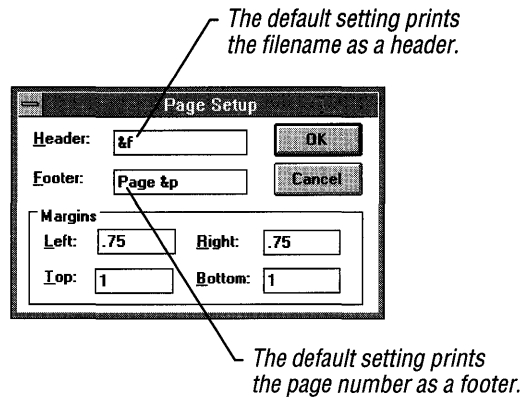
Printing Headers and Footers

When you print your appointments, you can add explanatory text, the date, a page number, or the filename as a header or footer on the printed pages. You can also choose whether you want a header or footer to be left-aligned, right-aligned, or centered on the page.

► To print a header or footer on your appointments

1. From the File menu, choose Page Setup.

The Page Setup dialog box appears.



2. In the Header or Footer box, type the text you want to use as a header or footer, along with any of the codes that Calendar allows in these boxes. For more information, see the table following this procedure.
3. Choose the OK button.

The following table explains the codes that you can type in the Header and Footer boxes.

Type	For
&d	The current date.
&p	Page numbers.
&f	The current filename.
&l	Text that follows the code to be aligned at the left margin.
&r	Text that follows the code to be aligned at the right margin.
&c	Text that follows the code to be centered in the top or bottom margin. This is the default setting.
&t	The current time.

You can include several of these codes in a single header or footer. For example, if you specify a header as **&lPage &p&cFile &f&rDate &d**, the header will print as follows:

Page 1 File FILENAME.CAL Date 12/9/91

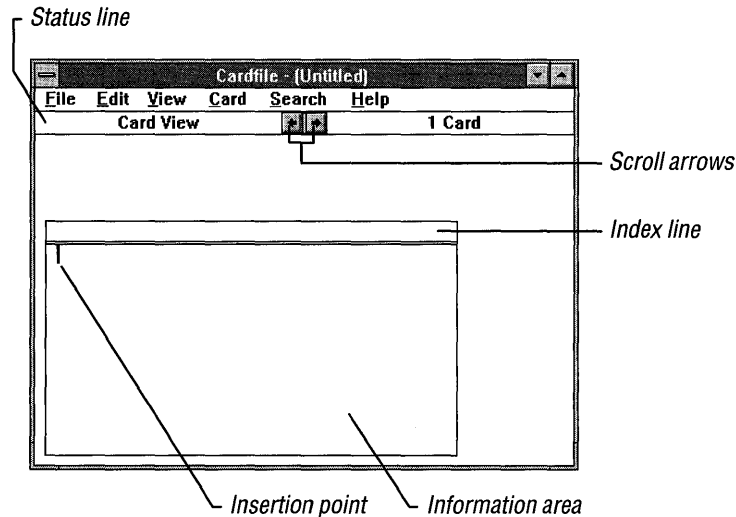
When you print, any assigned headers or footers appear in their designated places on the printed pages. Headers always appear just above the top margin and footers appear just below the bottom margin.

Cardfile

Windows Cardfile is like a set of index cards. You can use it to keep track of names, addresses, phone numbers, directions, or anything else you want quick access to. You then save these index cards in files.

► To start Cardfile

- In the Accessories group, choose the Cardfile icon.



You can change the size of the Cardfile window, but you cannot change the size of the cards.

To create a card file, fill in as many blank cards as you need. This may involve typing text in both the index line and information area of the card. Once the cards are filled out, you can save them in a file and name the file according to the type of information it contains.

Note The number of cards you can create, and how this amount of information affects the speed with which Cardfile loads files and cards, depend on the type of computer you have and how much memory it has.

Filling In and Adding Cards

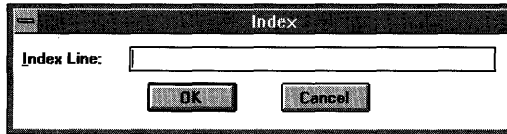
The index line is the bar at the top of each card. Cardfile uses the text you put in the index line to sort the cards. You could also type a name or brief description of the contents of the card on the index line to help you identify the contents.

► **To fill in a blank card**

1. From the Edit menu, choose Index.

You can also double-click the index line or press F6.

The Index dialog box appears.



2. In the Index Line box, type the text you want to use to identify the contents of the card. An index line can hold up to 39 characters.

If you make a mistake while typing, press BACKSPACE to correct the text.

3. Choose the OK button.

The insertion point returns to the information area of the card.

4. Type the text for the card. Each card line can contain up to 40 characters.

The text wraps to the next line.

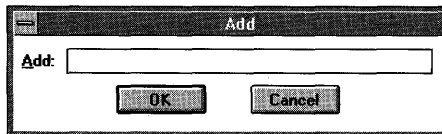
For more information about working with text, see Chapter 2, "Application Basics."

► **To add a new card**

1. From the Card menu, choose Add.

Or press F7.

The Add dialog box appears.



2. In the Add box, type the text for the new card's index line.

3. Choose the OK button.

Cardfile adds the new card to your file in the correct alphabetic order and scrolls the file to display the card at the front.

4. In the card's information area, type the text you want to store.

Viewing Cards as a List

Cardfile has two viewing options—Card view and List view. Card view is active when you start Cardfile, and displays your file as a series of cards. In the List view, Cardfile displays the index line of every card in the file in alphabetic order.

► To display cards as a list

- From the View menu, choose List.

Moving Through Your Cards

You can scroll card by card through a file or bring a specific card directly to the front of a file. Cardfile always keeps the cards in alphabetic order based on your entries in the index lines.

► To scroll through your cards

- Click the right or left arrow in the status bar at the top of the Cardfile window. If you are using the keyboard, use the following keys to move among the cards in your card file.

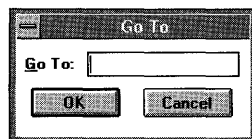
Press	To
PAGE DOWN	Scroll forward one card when you are in Card view. When you are in List view, PAGE DOWN moves forward one page of index lines.
PAGE UP	Scroll backward one card when you are in Card view. When you are in List view, PAGE UP moves back one page of index lines.
CTRL+HOME	Bring the first card in the file to the front.
CTRL+END	Bring the last card in the file to the front.
DOWN ARROW	Scroll one card forward when you are in List view.
UP ARROW	Scroll one card backward when you are in List view.

► To bring a specific card to the front of a file

1. From the Search menu, choose Go To.

Or press F4.

The Go To dialog box appears.



2. Type a portion of the index line text for the card you want to bring to the front; you only need to type enough text to distinguish the card from the other cards.
3. Choose the OK button.

Tip If a card's index line is visible, you can quickly bring the card to the front of the file by pointing to the index line and clicking it.

If you are using the keyboard, you can quickly bring a card to the front of a file if you know the first letter of the index line text. Press and hold down CTRL and SHIFT, and then press the appropriate letter key. Cardfile scrolls to display the first card that has that letter at the beginning of its index line. You can now scroll card by card to find the card you want.

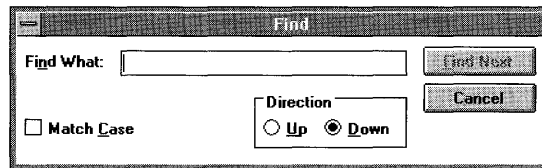
Searching for Text in Cardfile

You can find specific text on cards (not index lines) by using the Find command on the Search menu. You can start a search at any point in the file. Cardfile searches forward from the selected point and, when it reaches the end of the file, automatically continues searching from the beginning of the file. When searching for text, you can specify whether you want Cardfile to ignore capitalization.

► To search for text

1. Select the card from which you want to begin the search.
2. From the Search menu, choose Find.

The Find dialog box appears.



3. In the Find What box, type the text you want to find.
4. Select the Up or Down option button to search forward or backward in the file.
5. Choose the Find Next button.

Cardfile searches for the text and selects the first occurrence. If there are no occurrences of the text in the file, Cardfile displays a message telling you that it could not find the text. Choose the OK button to close the dialog box.

6. To find the next occurrence of the same text, choose the Find Next button again. You can also close the Find dialog box and choose the Find Next command from the Search menu. When you choose the Find Next command (or press F3), Cardfile does not display the Find dialog box but immediately searches for the text.

Editing Text on Cards

You edit text on a card in much the same way that you edit text in other Windows applications. For information about basic editing, see Chapter 2, “Application Basics.” There are a few differences in editing a card file, however, which the following sections explain.

Changing the Index Line

When you edit a card, you edit the index-line text separately from the rest of the card.

► To edit the text in the index line

1. Select the card you want to edit.
2. From the Edit menu, choose Index.

You can also double-click the index line or press F6.

The Index dialog box appears with the current index-line text selected in the Index Line box.

3. If you want to replace all the text in the index line, type the new text. The old text disappears as soon as you type the first character of the new text.
4. If you want to change only a few characters in the index line, click any incorrect character (or press the RIGHT ARROW or LEFT ARROW key to move to the character) and correct it.
5. Choose the OK button.

Cardfile automatically places the card in its correct alphabetic order, and then scrolls the file to display the card at the front.

Moving or Copying Text to Another Card

You can use the Clipboard to move or copy text from one card to another in Cardfile.

► To move or copy text from one card to another

1. Select the text you want to move or copy.
2. To move text, choose Cut from the Edit menu.
Or, to copy text, choose Copy from the Edit menu.
3. Select the card into which you want to insert the text.
4. Move the insertion point to the place you want the text to appear.
Or select the text you want to replace.
5. From the Edit menu, choose Paste.
The text appears in the new location.

You can paste text from the Clipboard to any part of any card. If you paste text to the index line, only the first line appears.

You can continue pasting the text in as many places as you want.

Inserting a Drawing in a Card

One of the most useful features in Windows is the ability to transfer artwork from another application to a card in Cardfile. For example, you could create a small map by using Windows Paintbrush, and then copy it to a card already containing an address. Each card can contain only one picture.

There are three methods you can use to insert a drawing into a card. You can copy, embed, or link the drawing. You can link and embed information only if the application used to create the drawing supports object linking and embedding. Check the application's documentation to find out.

You use the Paste command when you are copying or embedding information. The result of the paste is determined by the application used to create the information on the Clipboard at the time you choose the Paste command. If the information was created using an application that is a server application (one that can supply objects), then information is embedded. If this information was created by an application that does not support object linking and embedding, the information is copied.

For more information about linking and embedding objects, see Chapter 13, "Integrating Your Windows Applications."

Method	Description
Copy	You use this method to copy a drawing to a different application by using the Clipboard. Once the drawing is in the new file, you can change it only by deleting it and copying a new one in its place. To insert a Paintbrush drawing already on the Clipboard, you use the Paste Special command on the Edit menu.
Embed	Embedding is similar to copying but with one important difference: You can edit an embedded drawing (or <i>object</i>) because you can open Paintbrush from within Cardfile. To embed a Paintbrush drawing already on the Clipboard, you use the Paste command on the Edit menu.
Link	Linking dynamically connects two files so that information in one file automatically updates when information in the other file changes. To link a Paintbrush drawing already on the Clipboard, you use the Paste Link command on the Edit menu. Linked drawings are also easily edited from within Cardfile.

► **To embed or link a drawing into a card**

1. Copy the drawing onto the Clipboard. (For more information, see “Editing Your Drawing” in Chapter 10, “Paintbrush.”)

The drawing must be saved in a file if you are going to create a link to it from another document.

2. Switch to Cardfile.
3. Select the card into which you want to insert the drawing.
4. From the Edit menu, choose Picture.

A check mark appears next to the command.

5. To embed the drawing, choose Paste from the Edit menu.
Or, to link the drawing, choose Paste Link.

The drawing appears in the upper-left corner of the card.

6. If text exists on the card, the picture may cover it. Drag the drawing to where you want it to appear.

Or use the arrow keys to move the drawing.

7. To continue working with text, choose Text from the Edit menu.

If the drawing you paste is larger than the area available to paste it in, Cardfile scales the picture down to fit on the card.

Editing a Drawing on a Card

You can easily make changes to drawings you've created in Paintbrush and embedded or linked into cards, because you can open Paintbrush from within Cardfile.

For more information about linking and embedding objects, see Chapter 13, "Integrating Your Windows Applications."

► To edit an embedded drawing

1. From the Edit menu, choose Picture, if it is not already checked on the menu.
2. Double-click anywhere in the embedded drawing.

Or, from the Edit menu, choose Edit Paintbrush Picture Object. (The Object command changes to reflect the type of object selected.)

Paintbrush opens, displaying the drawing.

3. Edit the drawing as needed.
4. From the File menu, choose Update.
This updates the embedded drawing with the changes you just made.
5. From the File menu, choose Exit & Return To (name of document).
Paintbrush closes. If you forget to update, a dialog box appears asking if you want to update your changes. Choose the Yes button to update.

You edit a linked drawing the same way you edit an embedded drawing. Remember, though, that any changes you make to a linked drawing appear in all the drawings associated to it through links.

► To edit a linked drawing

1. From the Edit menu, choose Picture, if it is not already checked on the menu.
2. Double-click in the presentation of the linked drawing.

Or, from the Edit menu, choose Edit Paintbrush Picture Object. (The Object command changes to reflect the type of object selected.)

Paintbrush opens, displaying the drawing.

3. Edit the drawing as needed.
The linked drawing is updated automatically if the Update option is set to Automatic.
4. From the File menu, choose Save.
5. From the File menu, choose Exit & Return To (name of document).
Paintbrush closes. If you forget to save, a dialog box appears asking if you want to save your changes. Choose the Yes button to save.

Note If you have set the link to update manually, you must update it by choosing the Link command on the Edit menu in Cardfile and then choosing the Update Now button in the Link dialog box and the OK button.

Restoring a Card

If you change your mind about changes you just made to a card, you can restore the card to its original condition as long as it is still at the front of the file. However, once you move a card away from the front, the changes become permanent and you cannot restore the card.

- ▶ **To restore a card**
 - From the Edit menu, choose Restore.

Deleting a Card

To delete a single card from a file, use the following procedure.

- ▶ **To delete a card**
 1. Select the card you want to delete.
 2. From the Card menu, choose Delete.
A dialog box appears, asking you to confirm the deletion.
 3. Choose the OK button.
Cardfile deletes the information.

Be sure you have the correct card before you delete it. You can replace a deleted card only by retyping the information.

Duplicating a Card

If the information for several cards is similar, you might want to type the information on one card, duplicate the card, and then edit the copies as necessary.

- ▶ **To duplicate a card**
 1. Select the card you want to duplicate.
 2. From the Card menu, choose Duplicate.
Cardfile adds a copy of the card to the front of the file.

Managing Cardfile Files

Windows assigns the extension .CRD to Cardfile files. For information about opening and saving Windows files, see Chapter 2, "Application Basics." For information about working with Windows files and directories, see Chapter 4, "File Manager."

The following topics provide information specific to working with files in Cardfile.

Saving a File in Windows Version 3.0 Format

You can save a card file so that it can be opened if you are using Cardfile in Windows version 3.0.

When you save a card file to the Windows version 3.0 format, any embedded or linked objects convert to a *static object*, which means that you can no longer edit these objects from within Cardfile. Also, if the embedded or linked object is a color picture, it is converted to a black-and-white picture when the file is closed and opened again, or when a new card is added.

► To save a file in Windows version 3.0 format

1. From the File menu, choose Save.
2. From the Save File As Type list, select 3.0 Card File.
3. In the File Name box, type a filename.
4. Choose the OK button.

Determining File Size

The number of cards you can store in a Cardfile file depends on the amount of memory in your computer and the amount of information on the individual cards. As you work on a file, Cardfile keeps track of how many cards are currently in the file and displays the number on the status line. The number of cards might give you an indication of file size, but it does not tell you the actual size of the file in bytes.

Merging Files

If you want to consolidate two sets of cards, you can do so by merging a second Cardfile file with the file you are currently using.

► To merge two Cardfile files

1. Open one of the files that you want to merge.

2. From the File menu, choose Merge.

The File Merge dialog box appears.

3. In the Files box, select the file you want to merge with the current file.

Or type the name of the file in the File Name box.

4. Choose the OK button.

Cardfile merges the cards from the two files, placing them in correct alphabetic order.

You can now use the Save As command from the File menu to save the combined files under a new name or use the Save command to replace the current file with the combined files.

The file that you selected in step 3 to merge with the current file still exists in its original condition.

Printing a Cardfile File

If you have connected and installed a printer, you can print a single card or an entire file.

► To print a single card

1. Select the card you want to print.

2. From the File menu, choose Print.

A dialog box appears.

If you want to cancel printing, choose the Cancel button.

► To print an entire file

- From the File menu, choose Print All.

A dialog box appears.

If you want to cancel printing, choose the Cancel button.

When printing, Cardfile uses the default margin settings in the Page Setup dialog box. If you want to position your cards differently on the page, you can use the Page Setup command on the File menu to change these settings. You can also use the Page Setup command to have Cardfile print headers and footers. For more information about using this command, see “Setting Margins” and “Printing Headers and Footers” in the Calendar section earlier in this chapter.

Note If you change the standard Cardfile margin settings, be sure to set left and right margins that accommodate the size of the cards.

Cardfile prints your documents on the default printer. If you want to use another printer, choose the Print Setup command from the File menu.

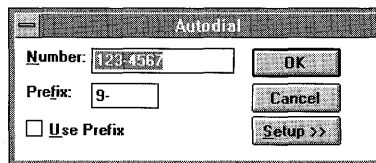
Using Automatic Dialing

If you have a Hayes or Hayes-compatible modem, Cardfile will automatically dial any phone number stored on a card.

► To have Cardfile dial a phone number

1. Select the card containing the phone number you want to dial.
2. From the Card menu, choose Autodial.

The Autodial dialog box appears.

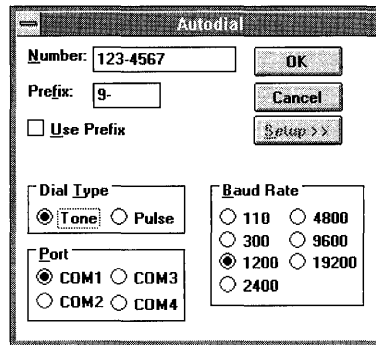


3. If you need to set up your modem for dialing, choose the Setup button, and then select the appropriate options. For more information about options, see the table following this procedure.
4. If you need to use a prefix in front of the number in the Number box, select the Use Prefix check box.

Change the default setting in the Prefix box if necessary.

5. Choose the OK button.

When you choose the Setup button, the Autodial dialog box expands to display the Setup options.



The following table explains the Setup options.

Use	To
Dial Type	Select the dial type of your telephone. If you hear a tone for each number you dial, you have a tone telephone. If you hear a clicking sound, you probably have a pulse telephone.
Port	Select the port to which your modem is connected.
Baud Rate	Specify the correct baud rate for your modem. For information about the correct setting, see your modem manual.

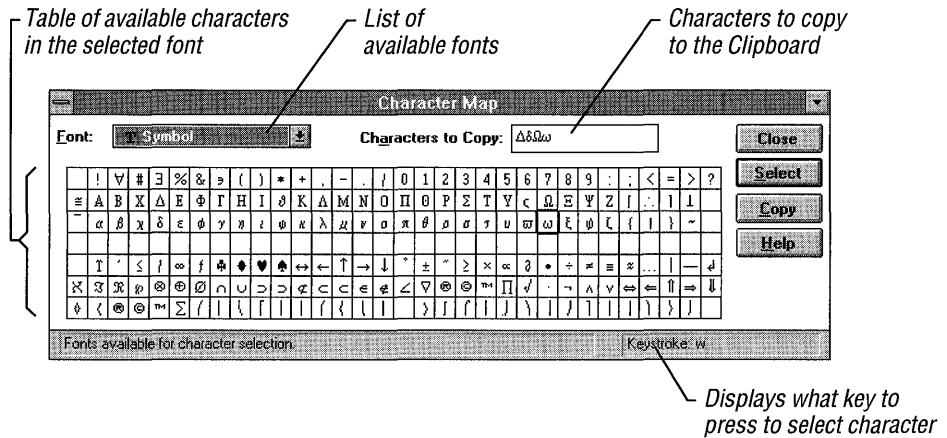
Character Map

Windows Character Map provides you with extended characters and special characters in symbol fonts that you can insert into other applications.

Character Map only works with Windows applications. If you are running non-Windows applications, check the documentation that came with your application to see how to insert special characters.

► To start Character Map

- In the Accessories group, choose the Character Map icon.



Selecting a Font

A font is a design for a set of letters, numbers, and symbols. Character Map comes with a variety of fonts to select from. Each font contains a different set of characters. When you select a font, the character set changes to display the characters in the font.

► To select a font

- Open the Font list, and then select the font you want to use.

Inserting a Character into a Document

You can insert one character or several characters from one font at a time into a document.

► To insert a character into a document

1. Open the Font list, and then select a font.

The character set changes to display the characters in the selected font.

2. Move the pointer to a character, and then press and hold down the mouse button to see an enlarged picture of the character you want.

Or press **TAB** until the cursor is in the character selection area, and then use the arrow keys to see an enlarged picture of the character you want.

3. Double-click the character to select it.
Or choose the Select button.
The character is placed in the Characters To Copy box.
4. Select as many characters as you want.
5. To place the characters in the Characters To Copy box onto the Clipboard, choose the Copy button.
6. Switch to the document into which you want to insert the characters.
7. Select the same font that you previously selected in Character Map.
8. Position the cursor where you want the characters to appear.
9. From the application's Edit menu, choose Paste.

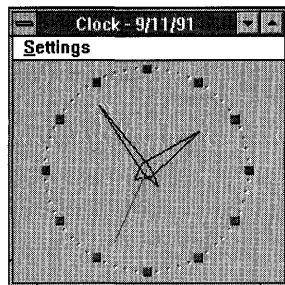
Note Characters may lose the font you selected in Character Map when you paste into some applications. To change the characters to the font you want, select them and format them for the font within the application.

Clock

To help you keep track of the time, Windows provides an accessory called Clock. You can display Windows Clock as an analog or digital clock.

► To start Clock

- In the Accessories group, choose the Clock icon.
If you are starting Clock for the first time, a window with a standard analog clock appears. The clock shows the system time.



The next time you start Clock, the last mode that you used—analogue or digital—appears.

You can change the size of the Clock window and move it wherever you like so that the current time—including seconds, if you want—appears on the screen but uses little work space. Clock even continues to display the time when you reduce it to an icon.

► **To switch between the analogue and digital clocks**

- From the Settings menu in the Clock window, choose Analogue or Digital.

If you need to, you can reset the time by using Control Panel. For more information, see Chapter 5, “Control Panel.”

Customizing Clock

There are various ways you can customize the way Clock appears. You can remove the window title and date, specify that Clock run on top of any other windows, display hours and minutes only, and change the font.

► **To customize Clock**

- From the Settings menu in the Clock window, choose Seconds, Date, or No Title.

If you choose No Title, double-click anywhere in the Clock window to make the Settings menu reappear, or press ESC.

If you want to ensure that Clock is never covered by other open windows, you can specify that the Clock window run on top at all times.

► **To display the Clock window on top of other windows**

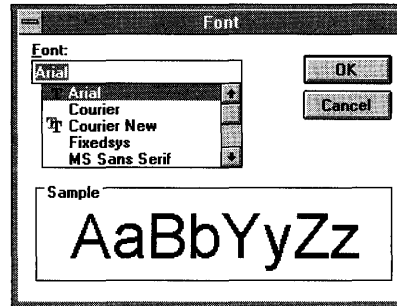
- From the System menu in the Clock window, choose Always On Top. A check mark appears next to the command.

If Clock is running in digital mode, you can change the font of the numerals.

► **To change the font**

1. If Clock is not running in digital mode, choose Digital from the Settings menu.
2. From the Settings menu, choose Set Font.

The Font dialog box opens.



3. From the Font list box, select a font.

If you select a TrueType font, the characters and numbers on the clock face are scaled correctly as you change the size of the Clock window.

4. Choose the OK button.

Media Player

By using Windows Media Player, you can play multimedia files and control hardware devices. Media Player can play sounds and Musical Instrument Digital Interface (MIDI) sounds, and control any Media Control Interface (MCI) multimedia device installed on your system. For example, you can use Media Player to play audio compact discs or videodiscs.

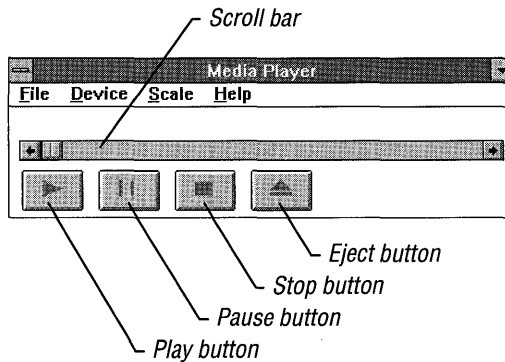
To play a multimedia file (sound or animation) or device (such as a videodisc player), you first choose the type of device you want to use. Use the Drivers option in Control Panel to install drivers for these devices. If the device requires a file to play, you must also open the file. Some devices, like CD audio players, do not require a file.

Before Media Player can play a file, you must have the sound hardware installed and its driver installed and configured. For information about installing drivers, see Chapter 5, "Control Panel."

► To start Media Player

- From the Accessories group, choose the Media Player icon.

You use the buttons in Media Player to control the playing of the media piece. Use the scroll bar to move to a different part of the media piece (change the playback position).



Specifying a Media Device

When you choose a device from the Device menu in Media Player, you specify the Media Control Interface (MCI) device to play. MCI devices include audio compact-disc players, MIDI sequencers, and videodisc players. The Device menu lists the MCI devices installed on your system. Before Media Player can recognize a multimedia device, you must install the hardware and then use Control Panel to install the device drivers necessary for the hardware. For more information about installing device drivers, see Chapter 5, "Control Panel."

Media Player plays two types of multimedia devices: compound and simple. Compound devices play files, so you must specify the name of a file. For example, if you choose the Sound device, you must specify a .WAV file to play.

Simple devices generally control external hardware devices that do not use disk files—for example, an audio compact-disc player. When you choose a simple device from the Device menu, Media Player readies itself to start playing whatever is currently loaded in the hardware device.

The selections that appear on the Device menu vary, depending on what you have installed on your system.

► **To specify a simple device**

- From the Device menu, choose the media device.

The names of simple devices are not followed by an ellipsis (...).

► **To specify a compound device**

1. From the Device menu, choose the media device.

The names of compound devices are followed by an ellipsis (...).

The Open dialog box appears.

2. Select the name of the file you want to play.
3. Choose the OK button.

The first time you specify a compound device (such as Sound), Media Player asks you to identify the file you want played. Once you have specified the device, you can use the Open command to open other files available for use by that device. If you want to use a different device, you can choose that device from the Device menu, or you can choose a different file type to play from the Open dialog box.

Opening a File

After you choose a compound device, you can open and play files appropriate for that device. For example, if you've specified a MIDI Sequencer device, you can open and play MIDI files. If you want to play another type of file, you can change devices from within the Open dialog box.

► **To open a file to play**

1. From the File menu, choose Open.

The Open dialog box opens.

2. Type or select the name of the file you want to play.
3. Choose the OK button.

Playing a Media File

Media Player has controls similar to a VCR or audio compact-disc player. You can choose a button on the screen to play, pause, restart, or stop playing a media file. There is also an Eject button, which works if your media device has an eject function.

► **To control the media playing**

- Click either the Play, Pause, Stop, or Eject button.

Or use the TAB key to move to a button, and press the SPACEBAR to choose the button.

If you choose Pause, to start again choose Pause or Play.

If you choose Stop, to start again choose Play.

The title bar displays the action you choose and the type of device playing the selection (if you are playing a simple device) or the filename (if you are playing a compound device).

Changing and Positioning the Scale

Media Player provides two scales to help you monitor and control how media are played. The Time scale shows time intervals and the Track scale shows tracks.

The scale appears above the scroll bar. The scale displays track locations or time intervals, depending on which you choose. Displaying track locations is useful when playing devices oriented around different tracks, such as audio compact-disc players.

► **To change scales**

- From the Scale menu, choose Time or Tracks.

You can use these scales to select a certain portion of the media to play.

► **To select a certain position**

1. Move to the time or track position you want by dragging the scroll box or by clicking the scroll bar or scroll arrows.

You can also use the LEFT ARROW, RIGHT ARROW, PAGE UP, PAGE DOWN, HOME, and END keys to move around in the file.

2. Choose the Play button.

Quitting Media Player

Simple devices, such as audio compact-disc players and videodisc players, will continue to play even after Media Player is closed.

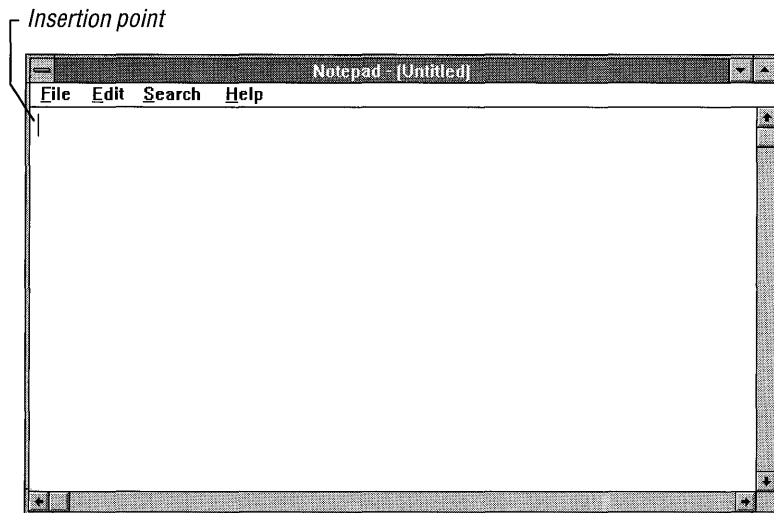
Compound devices, such as MIDI and other sound files, stop playing when you quit the application.

- ▶ **To quit Media Player**
 - From the File menu, choose Exit.

Notepad

Windows Notepad is a text editor. You can use Notepad to jot down notes, write short memos, and create and edit batch files.

- ▶ **To start Notepad**
 - In the Accessories group, choose the Notepad icon.



The insertion point appears in the upper-left corner of the window.

You can move the insertion point either by clicking somewhere else in the document or by using the arrow keys. When you use the scroll bar to move in a document, the insertion point remains where it is until you move it.

Working with Text

Working with text in Notepad is much the same as working with text in any other Windows application. For more information, see Chapter 2, "Application Basics." There are a few differences, however, which the following sections explain.

Setting the Word Wrap Option

Text that you type in the Notepad window can go beyond the right border of the window. If you don't want this to happen, you can specify that Notepad automatically wrap text to the beginning of the next line when it reaches the right edge of the window. This does not affect your text file, which retains the full line of text.

► To set the word wrap option

- From the Edit menu, choose Word Wrap.

A check mark appears next to the Word Wrap command on the menu.

Word wrapping remains in effect until you choose Word Wrap again. If word wrapping is off, you must press ENTER to begin a new line of text.

Moving Around in a Notepad Document

You can use the scroll bars to move around your Notepad document by using a mouse. If you are using the keyboard, you can use the arrow keys, the SPACEBAR, and ENTER in addition to the following keys. For information about using the keyboard and the scroll bars, see Chapter 2, "Application Basics."

Press	To move to
HOME	The beginning of a line
END	The end of a line
CTRL+HOME	The beginning of the document
CTRL+END	The end of the document

Selecting Text in Notepad

In addition to the different ways of selecting text, you can select all the text in a Notepad document. You can use this feature to copy an entire Notepad document onto the Clipboard, and then merge it with another file.

► To select all the text in a Notepad document

- From the Edit menu, choose Select All.

Notepad highlights all the text in your document. If you change your mind, click anywhere in the text area.

Searching for Text in Notepad

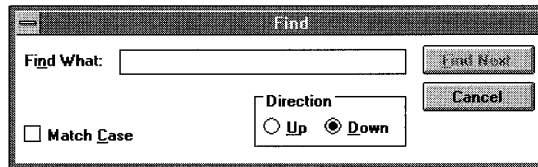
You can find specific text in Notepad by using the Find command on the Search menu. You can start a search at any point in a document and search either forward or backward from that point. You can also specify whether Notepad should match the uppercase and lowercase characters of the text.

When searching for text, Notepad begins the search at the position of the insertion point and ends at the beginning or end of the document, depending on whether you choose the Up or Down option button.

► To search for text in Notepad

1. Move the insertion point to the place you want to start the search.
2. From the Search menu, choose Find.

The Find dialog box appears.



3. In the Find What box, type the text you want to find.
4. To match capitalization exactly, select the Match Case check box.
5. To search from the insertion point to the beginning of the file, select the Up option button.

The default setting is Down. This searches from the insertion point to the end of the file.

6. Choose the Find Next button.

Notepad searches for the specified text and selects the first occurrence. If there are no occurrences of the text in the portion of the document searched, Notepad displays a message telling you that it could not find the text. Choose the OK button.

7. To find the next occurrence of the same text, choose the Find Next button again.

If there are no more occurrences of the text, Notepad displays a message. Choose the OK button.

You can also close the Find dialog box and choose the Find Next command from the Search menu. When you choose the Find Next command, Notepad does not display the Find dialog box but immediately searches for the text.

Managing Notepad Files

Windows assigns the extension .TXT to Notepad files. For information about opening and saving Windows files, see Chapter 2, "Application Basics." For information about working with Windows files and directories, see Chapter 4, "File Manager." The following sections provide information specific to working with Notepad files.

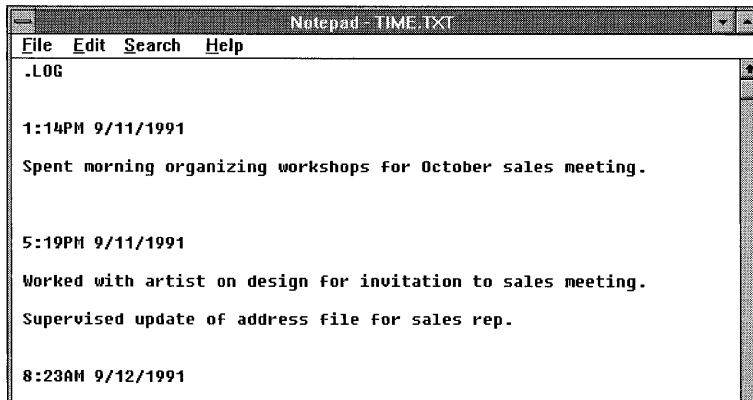
Creating a Time-Log Document

You can use Notepad to create a log to keep track of how you spend your time.

► **To create a time-log document**

1. At the left margin of the first line in a Notepad document, type **.LOG** in capital letters.
2. Save the document.

Every time you open this document, Notepad automatically adds the current time and date to the end of the document. To keep an accurate log of how you spend your day, you can type notes about your daily activities after each time and date.



Note Notepad uses the system time and date. You can reset the time and date by using Control Panel. For more information, see Chapter 5, "Control Panel."

You can also add the current time and date to any Notepad document that you are working with.

► **To add the current time and date to a Notepad document**

1. Move the insertion point to the place you want the time and date to appear.
2. From the Edit menu, choose Time/Date.

Printing a Notepad Document

If you have connected and installed a printer, you can print your Notepad document. Notepad automatically prints to the default printer. For information about how to install a printer, see Chapter 6, “Print Manager.”

► **To print the current document**

- From the File menu, choose Print.

A dialog box appears.

If you want to cancel printing, choose the Cancel button.

When printing, Notepad automatically uses the default margin settings in the Page Setup dialog box. If you want to position your Notepad text differently on the page, you can use the Page Setup command on the File menu to change these settings. You can also use the Page Setup command to have Notepad print headers and footers. For more information about using this command, see “Setting Margins” and “Printing Headers and Footers” in the Calendar section earlier in this chapter.

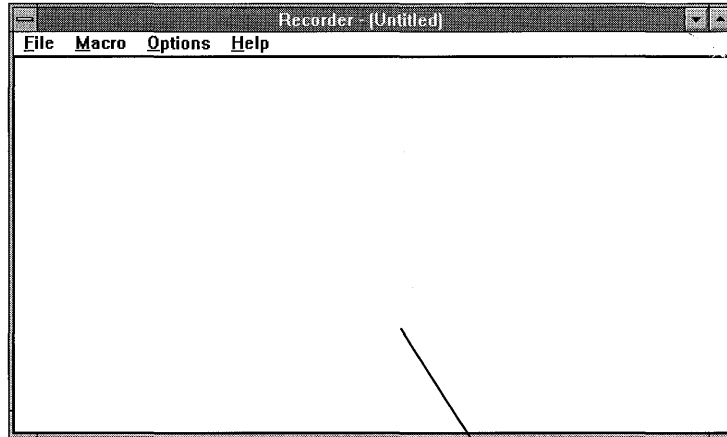
Notepad prints your documents on the default printer. If you want to use another printer, choose the Print Setup command from the File menu.

Recorder

By using Windows Recorder, you can record a sequence of keystrokes and mouse actions—called a *macro*—to play back at a later time. You can use macros to automatically type a special phrase or code that you use frequently or to automate the steps of any routine task.

► **To start Recorder**

- In the Accessories group, choose the Recorder icon.



Macros that you create appear in this window.

Recording a Simple Macro

Recorder provides various options that you can set when recording complex macros. When you are recording a simple macro, however, the default settings for these options should work in most cases.

Recording a simple macro is a straightforward, simple process. However, the Windows environment, which can contain multiple windows and multiple applications, can be a complex one in which to record a macro. For more information about recording macros, see “Using the Record Options” and “Guidelines for Creating Macros” later in this chapter.

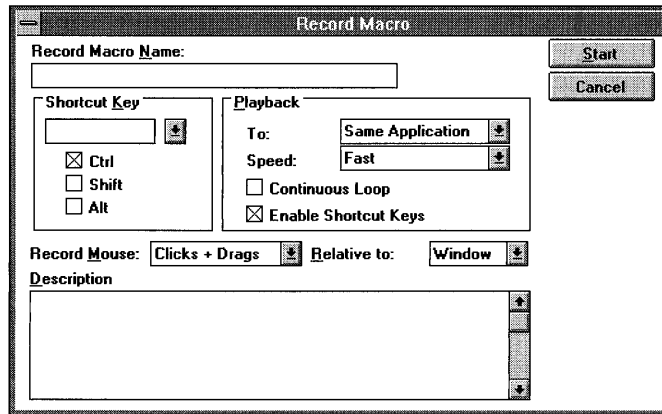
► To record a simple macro

1. In the application where you are recording the macro, move the cursor to the place you want to start recording.

This will also be the position from which you start playing back the macro.

2. Switch to Recorder. From the Macro menu, choose Record.

The Record Macro dialog box appears.



3. In the Record Macro Name box, type a name of up to 40 characters that identifies your macro.

Or, in the Shortcut Key box, specify the *shortcut key* that you want to use to play back the macro. (You can do both if you want.)

Although you do not have to assign a shortcut key to a macro, doing so provides an easy way to play back the macro. You can assign a shortcut key by combining the CTRL, SHIFT, or ALT key with virtually any other keyboard key. CTRL is the default setting. For more information about shortcut keys, see the following section, “Assigning Shortcut Keys.”

4. To begin recording your macro, choose the Start button.

You probably do not need to change the settings for any of the other options when recording a simple macro. For more information about these options, see “Using the Record Options” later in this chapter.

When you choose the Start button, Recorder reduces to a flashing icon. The icon continues flashing until recording stops, although the icon may not be visible if you move another window in front of it.

5. Type the keystrokes and perform the mouse actions that you want to record.

It is best to use few or no mouse actions when recording a macro. For more information, see “Deciding What to Record” and “Guidelines for Creating Macros” later in this chapter.

6. When you want to stop recording, click the Recorder icon.

Or press CTRL+BREAK.

A dialog box appears, asking if you want to save your macro, resume recording, or cancel recording.

7. To save your macro and return to what you were doing before you started recording, select the Save Macro option button.

If you want to resume recording where you left off, select the Resume Recording option button. To cancel recording and discard what you have recorded so far, select the Cancel Recording option button.

8. Choose the OK button.

Assigning Shortcut Keys

It is a good idea to assign a shortcut key to a macro. Doing so provides an easy way of using the macro. You just press the shortcut key, and the macro starts playing back. However, if you prefer not to assign a shortcut key or if you run out of key combinations to use, you can type a name in the Record Macro Name box in the Record Macro dialog box instead. For more information about names and starting a macro by using its name, see “Using Macro Names and Descriptions” and “Playing Back a Macro” later in this chapter.

Virtually any key on the keyboard can be used with the CTRL, SHIFT, or ALT key to create a shortcut key. If you want to use a function or keypad key as a shortcut key instead of a basic keyboard key, select the name for the key from the Shortcut Key list in the Record Macro dialog box.

Caution Although Recorder does not prevent you from using ALT as a shortcut key, it is best to use it sparingly. Shortcut keys using ALT could easily conflict with Windows shortcut keys.

► To create a shortcut key using a regular keyboard key

1. From the Macro menu, choose Record.

The Record Macro dialog box appears.

2. In the Shortcut Key box, type the keyboard key that you want to use.

3. Select the check box for CTRL, SHIFT, or ALT.

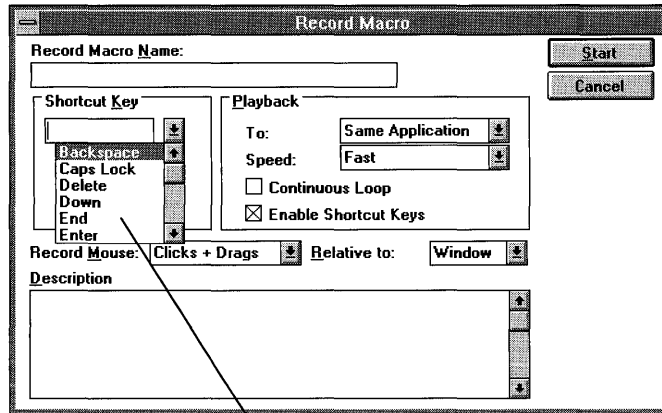
CTRL is the default setting.

► To assign a shortcut key using a function or keypad key

1. From the Macro menu, choose Record.

The Record Macro dialog box appears.

2. Open the Shortcut Key list to display a list of function and keypad key names.



Names of function and keypad keys available for shortcut keys

3. Select the name you want to use from the list.

The selected name appears in the Shortcut Key box at the top of the list.

You can also use combinations of CTRL, SHIFT, and ALT as shortcut keys.

Using Macro Names and Descriptions

You can store many macros in the same Recorder file. To help you remember the purpose of a macro, you can type a descriptive name for the macro in the Record Macro Name box in the Record Macro dialog box. The name then appears with the shortcut key on the list of macros in the main Recorder window. If you do not want to assign a shortcut key to a macro, you *must* type a name in the Record Macro Name box.

A name can contain up to 40 characters. If you want a longer description for your macro, you can use the Description box in the Record Macro dialog box. You can type an unlimited amount of text describing the macro in this box.

Playing Back a Macro

Once you record a macro, you can use it to speed up your work. You must be sure, however, to start the macro when and where it can work properly. For example, if you want to play back a macro that automatically enters and sets an alarm for a standing Wednesday-afternoon appointment, it would not be appropriate to use the macro in any application except Calendar.

► **To play back a macro by using a shortcut key**

1. Open the Recorder window, and then select from the list the macro you want to play back.
2. Switch to the other application. Move the cursor to the place you want to start playing back the macro.
3. Press the shortcut key assigned to the macro.

If you have not assigned a shortcut key to the macro, you must use the Run command on the Macro menu to play back the macro. You can also use this command to play back a macro if you don't remember its shortcut key.

► **To play back a macro by using the Run command**

1. Move the cursor in the application's window to the place you want to start playing back the macro.
2. Switch to Recorder. From the Recorder window, select the macro you want to play back.
3. From the Macro menu, choose Run.
Or double-click the macro name.

► **To stop a macro while it is playing back**

1. Press CTRL+BREAK.
A dialog box appears, confirming the cancellation.
2. Choose the OK button.

Maintaining the Recorder Window at Playback

The Recorder window is preset to reduce to an icon when you start playing back a macro by using the Run command. If you want, you can maintain the Recorder window in its position on the screen while the macro plays.

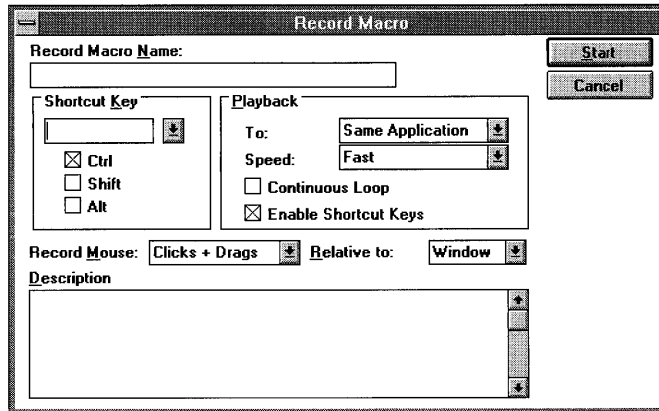
► **To maintain the Recorder window when you use the Run command**

- From the Options menu, choose Minimize On Use.
The check mark is removed from the menu command.

To reduce the Recorder window to an icon during playback, choose the Minimize On Use command again.

Using the Record Options

When you choose the Record command from the Macro menu, the Record Macro dialog box appears.



In addition to providing the boxes where you assign a shortcut key or a descriptive name to a macro, the Record Macro dialog box provides a number of options that you can use when recording a macro. These options allow you to decide such things as whether a macro can:

- Record mouse actions relative to only a window or to the whole screen.
- Record some or all mouse actions as well as keystrokes, or record only keystrokes.
- Play back only in the application in which you record the macro, or play back anywhere.
- Play back quickly, or at the recorded speed.
- Use other macros while it is playing back.

Each time you finish recording a macro, Recorder resets to the default setting any option that you changed before recording. For information about permanently changing the default setting for an option, see “Setting Permanent Preferences” later in this chapter. The following sections explain the options in the Record Macro dialog box.

Deciding What to Record

When you record a macro, Recorder records all keystrokes and only mouse clicks and drags. You can choose, however, to record as much or as little mouse movement as you want.

Although you can record as many mouse actions as you want, it is best to keep the mouse actions to a minimum. Macros that record keystrokes are generally more reliable. This is because mouse actions that you record in one window might not be appropriate for the window in which you later want to replay the macro, particularly if the windows are not the same size or at the same location on the computer screen.

► To specify the mouse actions you want to record

1. From the Macro menu, choose Record.

The Record Macro dialog box appears.

2. Open the Record Mouse list to display its options.

3. Select the option you want to use.

The option then appears as the setting in the Record Mouse box.

4. Choose the OK button.

The following table describes the options available in the Record Mouse box.

Use	To
Clicks + Drags	Record keystrokes and all mouse actions while a mouse button is pressed. This is the default setting. It allows you to record most drawing and editing sequences in a program like Windows Paintbrush.
Ignore Mouse	Record only keystrokes. It is best to use this option when you want to record a macro to be used on more than one computer. Macros containing mouse actions will work properly only on machines using a display adapter identical to the one used when the macro was recorded.
Everything	Record keystrokes and all mouse actions even when a mouse button is not pressed. You should use this option sparingly.

Caution If you use the Everything option to record keystrokes and all mouse actions, you should press CTRL+BREAK when you want to stop recording your macro. If you use the mouse to stop recording, the movement of the mouse to the Recorder icon can cause the macro to perform incorrectly when played back. For example, the Recorder icon could be in a different location, or the Window could be a different size.

Choosing Where to Record

Recorder is preset to record a macro relative to the window you are currently working in. There may be times, however, when you want to record a macro relative to the entire screen. For example, you might be using a full-screen application.

► To record a macro relative to the entire screen

1. From the Macro menu, choose Record.
The Record Macro dialog box appears.
2. Open the Relative To list to display its options.
3. Select the Screen option.

Screen now appears as the setting in the Relative To box.

The Relative To option that you use to record a macro is the same option you use to play back the option. You cannot change this option after the macro is recorded.

Choosing Where a Macro Plays Back

Recorder is preset to play back a macro only in the application in which you recorded it. The To option in the Record Macro dialog box gives you a choice of playing back a macro in any application. Be aware that a macro that makes sense in one application might not make sense in another. For example, a macro that types a long phrase that you use frequently might be appropriate for your word processor, but not for your spreadsheet.

► To record a macro that plays back in any application

1. From the Macro menu, choose Record.
The Record Macro dialog box appears.
2. In the Playback area, open the To list to display its options.
3. Select the Any Application option.

Any Application now appears as the setting in the To box.

Including Macros Within a Macro

You can include—or *nest*—up to five levels of macros within a macro. In other words, Macro 1 can contain a macro called Macro 2, which in turn can contain a macro called Macro 3, and so on. The default setting for Recorder includes nested macros. However, you can also record macros that cannot nest other macros inside themselves.

► **To record a macro that cannot nest other macros**

1. From the Macro menu, choose Record.
The Record Macro dialog box appears.
2. In the Playback area, clear the Enable Shortcut Keys check box.

Caution Because a macro that contains a nested macro records only a shortcut key, not the actual sequence of steps represented by the shortcut key, any nested macros can be changed at any time. When you change a nested macro, you must be sure not to make changes that cause the macro containing the nested macro to stop working properly.

Managing Recorder Files

Recorder files can contain many macros. The macro name and shortcut key (if there is one) identify each macro in the file, as does any description that you typed for the macro. You can create Recorder macros of up to 64K in size. Different Recorder files can contain groups of macros for use at specific times or with a specific application, but you can open only one file at a time.

Windows assigns the extension .REC when you save your Recorder files. For information about saving and opening Windows files, see Chapter 2, “Application Basics.” For information about working with Windows files, see Chapter 4, “File Manager.”

The following sections provide information specific to working with Recorder files.

Changing a Macro's Properties

You can use the Properties command on the Macro menu to change the following properties that you assigned to a macro when you recorded it:

- The shortcut key
- The name
- The description
- Whether the macro plays back in the same application where it was recorded or in any application

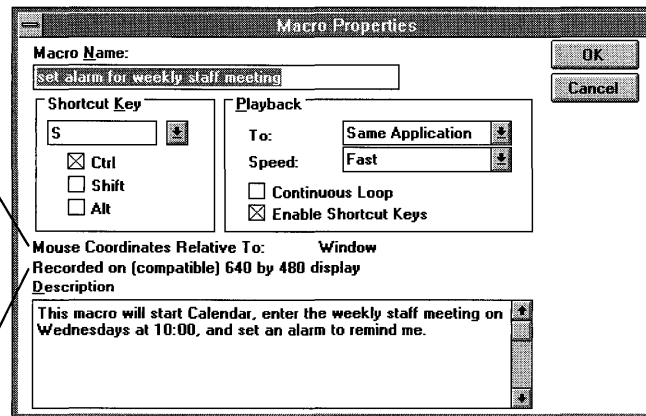
- The speed at which the macro plays back
- Whether the macro plays back continuously
- Whether the macro can contain shortcut keys

► **To change a macro's properties**

1. From the Recorder window, select the macro you want to modify.
2. From the Macro menu, choose Properties.

The Macro Properties dialog box appears.

You cannot change the Relative To setting.



The screen resolution at which the selected macro was recorded.

3. You can change any of the macro settings except Mouse Coordinates Relative To.
4. Choose the OK button.

The screen-resolution information lets you know what kind of screen the macro was recorded on. This is helpful because mouse actions are sensitive to the screen resolution, and macros containing mouse actions seldom work properly when they are played back using a different type of display adapter.

Deleting Macros from a Recorder File

If you are no longer using a macro, you can delete it from a Recorder file.

► To delete a macro

1. From the Recorder window, select the macro you want to delete.
2. From the Macro menu, choose Delete.
A dialog box appears, asking you to confirm the deletion.
3. Choose the OK button to delete the macro.

Merging Recorder Files

If you want to consolidate two Recorder files, you can do so by merging a second Recorder file into the file you are currently using.

► To merge two Recorder files

1. Open or create one of the files that you want to merge.
2. Delete any macros that you know are duplicated in the other file.
3. From the File menu, choose Merge.
Recorder displays the File Merge dialog box.
4. From the File Name list, select the file you want to merge with the current file.
Or type the name of the file in the File Name box.
5. Choose the OK button.
Recorder merges the two files. If Recorder finds duplicate shortcut key assignments in the files, it deletes the duplicate shortcut keys (but not the macros themselves) from the file it is merging with the current file. A dialog box appears to inform you of this. You can use the Properties command on the Macro menu to assign new shortcut keys to the macros.
6. To save the combined files under a new name, choose Save As from the File menu.
Or, to replace the current file with the combined files, choose Save.

Setting Permanent Preferences

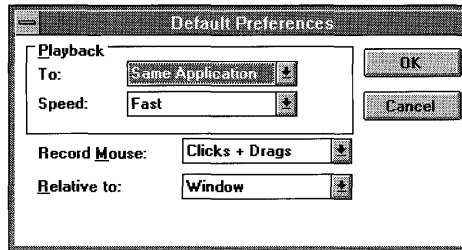
Each time you choose the Record command, the Record Mouse, Relative To, Playback To, and Playback Speed recording options are set to record macros in the following ways.

Use	To specify
Record Mouse	Which mouse actions are recorded.
Relative To	Whether the macro is recorded relative to the window or the screen.
Playback To	Whether the macro will play back in any application or only in the application in which you recorded it.
Playback Speed	Whether the macro plays back at the recorded speed, or faster.

You can change the standard settings for these options if you want to.

► To change the standard settings for recording

1. From the Options menu, choose Preferences.
The Default Preferences dialog box appears.



2. From each option list, select the setting you want Recorder to use as a default setting.
The options are described in the table preceding this procedure.
3. Choose the OK button.

The settings you select in the Default Preferences dialog box become the default settings for the appropriate options in the Record Macro dialog box. Recorder continues to use these default settings until you use the Preferences command to change them again. For more information, see “Changing a Macro’s Properties” earlier in this chapter.

Creating Macros to Use as Demos

Recorder provides certain options for demonstrating features or applications. For example, you can have a macro play back at a speed appropriate for a demonstration and play back continuously. You can also set a demonstration that runs continuously until you turn off the computer.

Choosing How Fast a Macro Plays Back

Recorder is preset to play a macro back quickly. However, if you are going to use a macro as a demonstration, you will want the macro to play back at the same speed at which it was recorded.

► **To play back a macro at the speed at which it was recorded**

1. From the Macro menu, choose Record.
The Record Macro dialog box appears.
2. In the Playback area of the Record Macro dialog box, open the Speed list to display its options.
3. Select the Recorded Speed option.
Recorded Speed now appears as the setting in the Speed Box.

Setting Up for a Continuously Running Demo

If you want to use a macro as a demonstration, you might also want the macro to restart itself each time it reaches the end, so that it plays back continuously.

► **To set a macro to play back continuously**

1. From the Macro menu, choose Record.
The Record Macro dialog box appears.
2. In the Playback area of the Record Macro dialog box, select the Continuous Loop check box.

If you select the Continuous Loop check box, you can still stop a macro by pressing CTRL+BREAK.

Turning Off Control+Break Checking

Pressing CTRL+BREAK usually stops the recording or playing back of a macro. If you want to use a macro as a continuously running demonstration, you might want to turn off Recorder's ability to detect the CTRL+BREAK key combination. This prevents an automated demonstration from being turned off by anyone who uses the keyboard. The macro runs until you turn off the computer.

► To turn off CTRL+BREAK checking

- From the Options menu, choose Control+Break Checking.

The check mark next to the menu command disappears.

After turning off Control+Break Checking, you must restart your computer to stop a continuously running demo.

Tip You might also want to turn off CTRL+BREAK checking if you want to include a CTRL+BREAK key combination in a macro.

The next time you start Recorder after turning off Control+Break Checking, the command is again set to detect CTRL+BREAK.

Turning Off Shortcut-Key Detection

There may be times when you want to temporarily turn off Recorder's ability to detect shortcut keys. For example, you might want to run an application that uses the same shortcut key that one of your macros uses. You can do so without having to quit Recorder.

► To turn off shortcut-key detection

- From the Options menu, choose Shortcut Keys.

The check mark next to the menu command disappears.

If you want to use macros again before you quit Recorder, choose Shortcut Keys again. Otherwise, the next time you start Recorder, the Shortcut Keys command is reset automatically to detect when you press shortcut keys.

Guidelines for Creating Macros

To get the best results, follow these guidelines when recording macros:

- Prepare for recording the macro.

If there are applications on the screen that should not be involved in the macro, quit them or move them out of the way before you start recording.

- Use the mouse sparingly.

An application window might be a different size and in a different place when you play back a macro. This can create problems with recorded mouse actions. For example, the pointer might go outside a window's boundaries when you play back the macro, or it might point at something other than it did when you were recording the macro.

- Use the Windows shortcut keys to choose menus and commands.

If a window is near the bottom of the screen when you play back a macro, a menu might pop up instead of down, making the UP ARROW and DOWN ARROW keys move the cursor inappropriately.

- Be aware of system incompatibility issues.

Recorder is sensitive to the screen resolution of the system that mouse actions were recorded on. Macros that use mouse actions may not work properly when used on a system that does not use the same display adapter as the system on which the macro was recorded.

Recorder is also sensitive to the keyboard that keystrokes were recorded with. Although most keys will play back correctly, it is best not to use a macro recorded using a keyboard set up for one country on a system using a keyboard set up for another country. For more information about keyboard settings, see Chapter 5, "Control Panel."

- Be aware that Recorder is designed for use with Windows applications only.

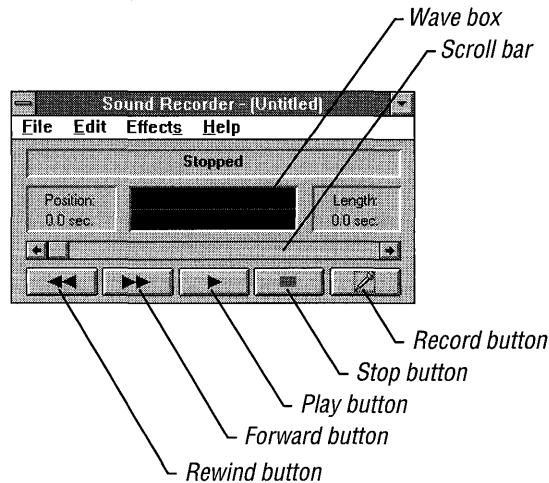
Sound Recorder

You can use Windows Sound Recorder to play, record, and edit sound files. Before Sound Recorder can play, edit, or record a file, you must have the sound hardware installed and its driver installed and configured. For information about installing drivers, see Chapter 5, "Control Panel."

There are five buttons that allow you to record and play back files. These buttons are Rewind, Forward, Play, Stop, and Record. As the sound plays, the wave box graphically displays the sound as if it were being shown on an oscilloscope.

► **To start Sound Recorder**

- From the Accessories group, choose the Sound Recorder icon.



Opening and Playing a Sound File

You open sound files to play or edit them. The files you can play are dependent on the type of hardware you have installed.

► **To open a sound file**

1. From the File menu, choose Open.
The Open dialog box appears.
2. Type or select the file you want to open.
3. Choose the OK button.

After opening a sound file, you can play it.

► **To start and stop playing a sound file**

1. Click the Play button.
Or use TAB to move to the button, and then press SPACEBAR to choose it.
The status bar displays the word "Playing."
2. When you want to stop playing, choose the Stop button.
When playing is stopped, the status bar displays the word "Stopped."
3. To resume playing, choose the Play button again.

Each time you choose the Play button, Sound Recorder plays the file from beginning to end unless you have stopped the file somewhere in the middle or moved to a particular position by using the scroll bar. In this case, choosing the Play button begins playing where the file was stopped.

Moving Around in a Sound File

You can move to any point in a sound file by using the scroll bar.

► To move to any point in a sound file

Mouse

- Move the scroll box by dragging it, clicking a scroll arrow, or clicking the scroll bar.

Clicking a scroll arrow moves the sound back or forward .1 second. Clicking the scroll bar moves the sound 1 second.

Keyboard

1. Use TAB to move to the scroll bar.
2. Use the LEFT ARROW and RIGHT ARROW keys to move the sound file forward or back. Each time you press a key, the sound moves back or forward .1 second.

Moving to the Beginning or End of a Sound File

You can move quickly to the beginning or end of any sound file.

► To move to the end of a sound file

- Choose the Forward button.
Or press the END key.

► To move to the beginning of a sound file

- Choose the Rewind button.
Or press the HOME key.

Creating a Sound File

You can create a sound file in three ways: recording sound, inserting one sound file in another, or mixing one sound file with another. You can also combine the methods.

Recording a Sound File

You can record sound files only if you have a microphone attached to your sound card. See your sound-card documentation for details on configuring the microphone.

You can record a new file, or you can add your recording to an existing file. When you record into an existing file, the new sound records over and erases the original sound. If you start recording the new sound at the end of the file, it will be appended to the file.

► To record a new file

1. From the File menu, choose New.
2. Choose the Record button.
3. Speak into the microphone.
You can record up to one minute of speech.
4. When you finish, choose the Stop button.
5. From the File menu, choose Save As.

► To record into an existing file

1. From the File menu, choose Open.
The Open dialog box appears.
2. Type or select the file you want to open.
You may not be able to record into some sound files. Whether you can record into a file depends on whether the hardware that plays that file supports this feature. The playback and record capabilities differ between sound cards; check the documentation for your sound card to see what its capabilities are.
3. Choose the OK button.
4. Using the Play and Stop buttons or the scroll bar, go to the place in the file where you want to insert your recorded speech.
5. Choose the Record button.
6. Speak into the microphone.
7. When you finish, choose the Stop button.
8. From the File menu, choose Save.

The maximum length of a file is determined by how much memory is available.

Linking and Embedding Sound Files

You can insert sound files into other files by copying, linking, or embedding them. The method you use to insert the sound file determines how you make changes to it. You can link and embed information only if the application you are transferring the sound file to supports object linking and embedding. Check the application's documentation to find out.

Method	Description
Copy	You copy a sound file to a document in a different application. After the sound file is in the new document, you can change it only by deleting it and copying a new sound file in its place. To copy a sound file, use the Copy command on the Edit menu to copy the sound file onto the Clipboard.
Embed	Embedding is similar to copying but with one important difference: You can edit embedded sound files from within the other application's document. To embed a sound file, use the Copy command on the Edit menu to copy the sound file onto the Clipboard.
Link	Linking dynamically connects two files so that information in one file automatically updates when information in the other file changes. To link a sound file, use the Copy command on the Edit menu to copy the sound file onto the Clipboard.

The commands you use to insert, or paste, the sound file or object from the Clipboard into the application depend on whether you want the sound file copied, embedded, or linked. Check your application's documentation to find out how to complete these procedures.

For more information about linking and embedding sound files, see Chapter 13, "Integrating Your Windows Applications."

Changing an Existing Sound File

If you have a microphone attached to your computer, you can record new sound into a sound file. If you don't have a microphone, there are still many ways you can change an existing sound file.

You can:

- Insert one sound file into another.
- Mix together two sound files.
- Make a sound softer or louder.

- Slow down or speed up the sound.
- Reverse the sound.
- Add an echo to the sound.
- Delete part of a sound file.

Inserting Another Sound File

You can insert the contents of another sound file into the current sound file. The maximum length of the new sound file is dependent on how much memory is available.

► To insert a sound file into an existing file

1. Using the Play and Stop buttons or the scroll bar, go to the place in the file where you want to insert the other sound file.
2. From the Edit menu, choose Insert File.
The Insert File dialog box appears.
3. Type or select the file you want to insert.
4. Choose the OK button.

You can continue inserting as many files as you want until you reach the maximum time limit. The maximum length of the file is dependent on how much memory is available.

Mixing In Another Sound File

You can mix the contents of another sound file with the current sound file. The sound files will blend together and play simultaneously. The maximum length of the file is dependent on how much memory is available.

► To mix a sound file into an existing file

1. Using the Play and Stop buttons or the scroll bar, go to the place in the file where you want to mix in the other sound file.
2. From the Edit menu, choose Mix With File.
The Mix With File dialog box appears.
3. Type or select the file you want to mix in.
4. Choose the OK button.

Making a Sound Softer or Louder

You can increase or decrease the volume by 25 percent.

► To decrease the volume of a sound file

1. Open the sound file whose volume you want to decrease.
2. From the Effects menu, choose Decrease Volume.

You can return the file to its previous volume by immediately choosing the Increase Volume command.

► To increase the volume of a sound file

- From the Effects menu, choose Increase Volume.

You can return the file to its previous volume by immediately choosing the Decrease Volume command.

Slowing Down or Speeding Up a Sound

You can either decrease the speed of a sound file by 50 percent or increase the speed by 100 percent.

► To decrease the speed of a sound file

- From the Effects menu, choose Decrease Speed.

You can return the file to its previous speed by immediately choosing the Increase Speed command.

► To increase the speed of a sound file

- From the Effects menu, choose Increase Speed.

You can return the file to the previous speed by immediately choosing the Decrease Speed command.

Reversing the Sound

You can reverse a sound file so that it plays backward.

► **To reverse a sound file**

- From the Effects menu, choose Reverse.
To play the file in the normal direction again, choose the Reverse command again.

Adding Echo to the Sound

You can add an echo to a sound file. Until you save the file, you can undo the echo by using the Revert command on the File menu.

► **To add echo to a sound file**

- From the Effects menu, choose Add Echo.

Deleting Part of a Sound File

You can delete the part of a sound file before or after the current playing position.

Until you save the file, you can undo a deletion by using the Revert command on the File menu.

► **To delete before the current position**

1. Using the Play and Stop buttons or the scroll bar, go to the place in the file before which you want to delete sound.
2. From the Edit menu, choose Delete Before Current Position.
A dialog box appears, requesting you to confirm the deletion.
3. Choose the Yes button to confirm the deletion.

► **To delete after the current position**

1. Using the Play and Stop buttons or the scroll bar, go to the place in the file after which you want to delete sound.
2. From the Edit menu, choose Delete After Current Position.
A dialog box appears, requesting you to confirm the deletion.
3. Choose the Yes button to confirm the deletion.

Saving a Sound File

For information about saving Windows files, see Chapter 2, “Application Basics.”
For information about working with Windows files and directories, see Chapter 4, “File Manager.”

Restoring a Sound File

If you want to undo changes you've made, you can restore a file to its last saved state. After you save a sound file, you cannot undo any of the changes you've made to the file.

► **To restore a sound file to its last saved state**

1. From the File menu, choose Revert.
A dialog box appears, requesting you to confirm the restoration.
2. Choose the Yes button to confirm the restoration.

Getting the Most Out of Windows



Getting the Most Out of Windows

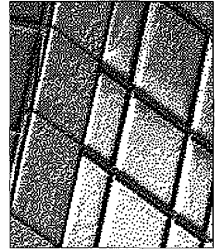
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Integrating Your Windows Applications



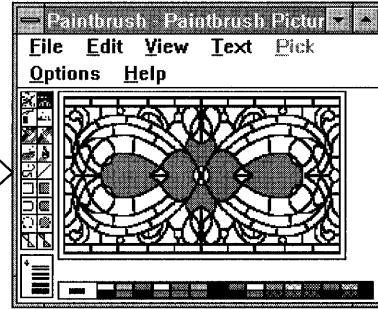
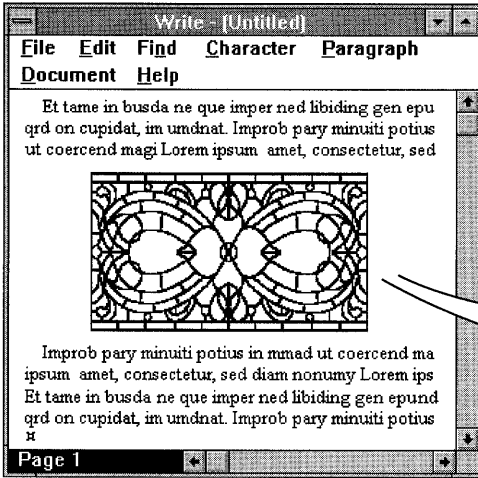
Chapter 13

Moving Information Between Applications

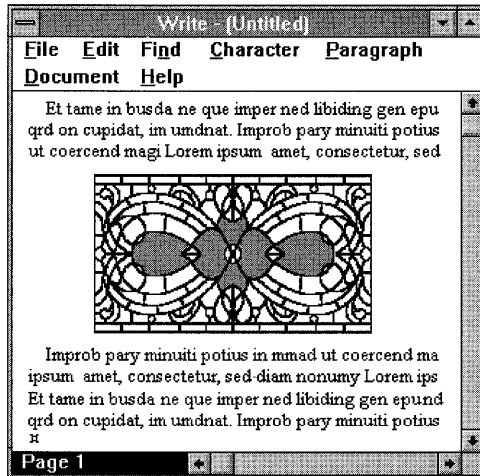
In this version of the Microsoft Windows operating system, you can use Windows Paintbrush, Sound Recorder, Write, Cardfile, and Object Packager to transfer and share information in a powerful new way. This new capability is called *object linking and embedding*. When you embed or link objects, your document can contain information that was created in different applications, and you can edit any of this information from inside your document.

Applications that support object linking and embedding fall into two categories. Applications whose objects can be embedded or linked into other documents are called *servers*. Paintbrush and Sound Recorder are server applications. Applications that can accept embedded or linked objects are called *clients*. Write and Cardfile are client applications. Some applications may be both a server and a client. Others are only one or the other.

To change information that you have linked or embedded, you do not have to delete and copy it again. You can now open one application from within another application, make your changes, and keep on working. For example, suppose you are working on a report in which you have embedded a drawing. To make changes to the drawing, you open it from inside the report. You can make changes to the drawing, and save it in the application used to create it. The drawing closes, and you are returned to your report. The drawing is updated from within the report.



You edit the Paintbrush file by choosing the object in the Write document.



When you update, the changes are reflected in the Write document.

To understand linking and embedding, you should be familiar with the following terms:

- An *object* is any piece of information created by using a Windows application. For example, both a single cell of a spreadsheet and an entire drawing are objects.
- The *source document* is the document from which the object originates.
- The *destination document* is the document into which you place an object.

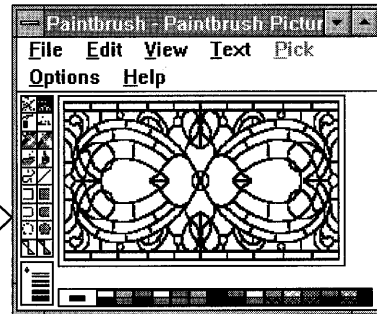
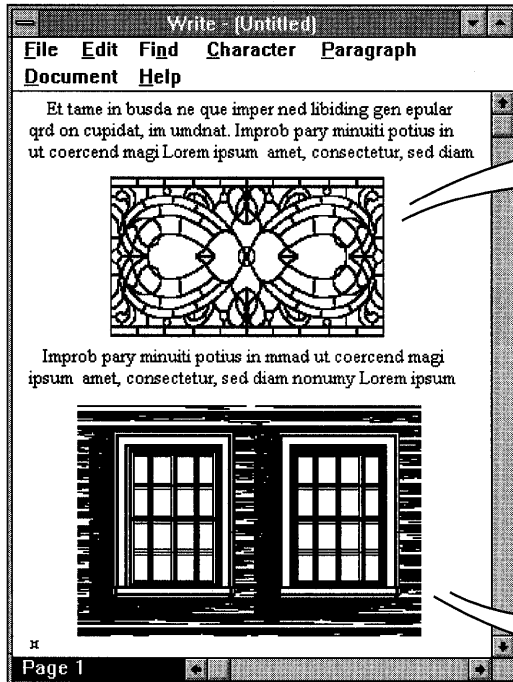
This chapter focuses on embedding and linking objects created by Paintbrush and Sound Recorder into Cardfile cards and Write files. All these applications are included with Windows. You can also embed and link using other applications. Check the documentation of your other Windows applications to determine whether they support object linking and embedding.

What Is Object Linking and Embedding?

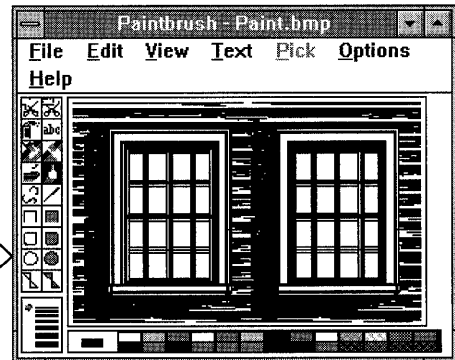
When you embed an object, you are inserting information from one document (the source document) into a document in a different application (the destination document). Embedding is similar to copying using the Clipboard, but with one powerful difference. To make changes to an embedded object, you simply choose the object in the destination document. The application in which the object was created opens, and you can make your changes. You no longer need to switch between applications to view or change different kinds of information—you can now perform all these operations from within one document.

When you embed, you make a copy of the information in the source document and transfer this copy to the destination document. You no longer have any connection to the document from which you transferred the information. So, when you edit an embedded object, the source document is not affected. For example, suppose you embed a drawing into a report. If you change the embedded drawing from inside the report, the drawing in the source document is not affected.

When you link an object, you are not making a copy of the information, you are creating a reference, or link, to the document that contains the information (source document). So, when you edit a linked object, you are actually editing the information in the source document. The destination document only contains a link to where the object exists in the source document.



When you edit an embedded drawing, you are editing a copy of the drawing.



When you edit a linked drawing, you are editing the original file.

Many documents can contain a link to a single source document. For example, if you create a link to a drawing in several documents, any changes you make to the drawing appear in the source document and in any document that contains a link to the drawing.

You have access to the object from any document that contains a link to it, and you can change the object from within any of them. The updated version appears in all the documents that have a link to the object. Linking makes it easy to track information that appears in more than one place and that must be identical.

You can link objects only from saved documents. For example, if you open Paintbrush and create a drawing, you must save it as a document before linking it to another document.

There are two ways an object can be embedded or linked within a document. You can place either the object itself or an iconic representation of the object into the document. This representation is called a package. To create a package, you use Windows Object Packager. For information about Object Packager, see “Working with Object Packager” later in this chapter.

Embedding a Drawing

There are two ways to embed a drawing. The first method is to start from the document where you want the embedded drawing to appear, such as a Write document or Cardfile card. While you work with the application, you open Paintbrush to create a drawing or use an existing one. The second method is to start from Paintbrush.

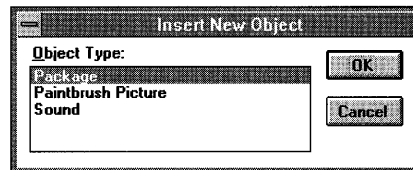
► To embed a drawing, starting from Write or Cardfile

1. Open the Cardfile card or Write document into which you want to embed a drawing.
2. If you are using Write, move the insertion point to the place you want the drawing inserted. If you are using Cardfile, the drawing will be inserted in the upper-left corner of the card.
3. If you are using Cardfile, choose Picture from the Edit menu.

A check mark next to the command means it is in effect.

4. From the Edit menu in Cardfile or Write, choose Insert Object.

A dialog box appears. All applications on your computer that support object linking and embedding are listed.



5. Select Paintbrush Picture.
6. Choose the OK button.
Paintbrush opens.

7. Create a drawing, or use the Paste From command on the Edit menu to open a document that contains the drawing you want to use.
8. From the File menu in Paintbrush, choose Update.
This places the drawing into the Write document or Cardfile card.
9. From the File menu, choose Exit & Return To (name of document).
You are returned to the Write document or Cardfile card so you can continue working.

► **To embed a drawing, starting from Paintbrush**

1. Open Paintbrush.
2. Create a drawing, or open a document that contains the drawing you want to embed.
3. If you want to save the drawing, choose Save from the File menu.
4. Select the drawing.
5. From the Edit menu, choose Copy.
A copy of the drawing is placed onto the Clipboard.
6. Open the Write document or Cardfile card into which you want to embed the drawing.
7. If you are embedding a drawing into a card in Cardfile, choose Picture from the Edit menu.
A check mark next to the Picture command indicates the command is in effect.
8. If you are using Write, place the insertion point at the location you want the drawing to appear. If you are using Cardfile, the drawing will be placed in the upper-left corner of the card.
9. From the Edit menu in Write or Cardfile, choose Paste.
10. The drawing appears in the Write document or Cardfile card.

For more information about selecting a drawing in Paintbrush, see Chapter 10, "Paintbrush."

Editing an Embedded Drawing

You can edit an embedded drawing from inside its destination document. When you choose the drawing, Paintbrush opens and the drawing is displayed inside the Paintbrush window.

► To edit an embedded drawing

Mouse

1. If you are using Cardfile, choose Picture from the Edit menu.
2. In the Write document or Cardfile card, double-click the linked drawing.
Paintbrush opens with the drawing displayed.
3. Edit the drawing as needed.
4. From the File menu in Paintbrush, choose Update.
The embedded drawing in the Write document or Cardfile card is updated to reflect your changes.
5. From the File menu in Paintbrush, choose Exit & Return To (name of document).
Paintbrush closes.

Keyboard

1. If you are using Cardfile, choose Picture from the Edit menu.
2. In the Write document, use the arrow keys to move the selection cursor to the embedded drawing you want to edit.
3. From the Edit menu in Write or Cardfile, choose Edit Paintbrush Picture Object.
Paintbrush opens with the drawing displayed.
4. Edit the drawing as needed.
5. From the File menu in Paintbrush, choose Update.
The embedded drawing in the Write document or Cardfile card is updated to reflect your changes.
6. From the File menu in Paintbrush, choose Exit & Return To (name of document).
Paintbrush closes.

Linking a Drawing

When you create a link to a Paintbrush document, an image of the drawing contained in the Paintbrush document is displayed in the destination document. There is a link between the destination and source documents.

You can link objects only from saved documents. For example, if you open Paintbrush and create a drawing, you must save it as a file before linking it to another document.

When you make changes to the drawing, the changes appear in every document that contains a link to the drawing.

► To link a drawing from Paintbrush

1. Open Paintbrush.
2. Create a drawing, or open the document that contains the drawing you want to link.
3. If necessary, save your drawing.
4. Select the drawing.
5. From the Edit menu, choose Copy.

A copy of the drawing is placed onto the Clipboard.

6. Open the Write document or Cardfile card into which you want to link the drawing.
7. If you are using Cardfile, choose Picture from the Edit menu.
A check mark next to the Picture command indicates the command is in effect.
8. If you are using Write, place the insertion point at the location you want the drawing to appear. If you are using Cardfile, the drawing will appear in the upper-left corner of the card.
9. From the Edit menu in Write or Cardfile, choose Paste Link.
10. Save the Write document or Cardfile card.

You now have the original Paintbrush document containing the drawing, plus a link to that document in the Write document or Cardfile card.

Note For more information about selecting a drawing in Paintbrush, see Chapter 10, "Paintbrush."

Editing a Linked Drawing

You edit a linked drawing the same way you edit an embedded drawing. The difference is that any changes you make to a linked drawing appear in all the drawings associated with it through links, in addition to the original document containing the drawing.

► To edit a linked drawing from a Write document or Cardfile card

Mouse

1. If you are using Cardfile, choose Picture from the Edit menu.
2. In the Write document or Cardfile card, double-click the linked drawing. Paintbrush opens, with the document containing the drawing open.
3. Edit the drawing as necessary.
The linked drawing in the Write document or Cardfile card is updated as you make your changes.
4. From the File menu in Paintbrush, choose Save.
5. From the File menu in Paintbrush, choose Exit.
Paintbrush closes.

Keyboard

1. If you are using Cardfile, choose Picture from the Edit menu.
2. In the Write document, use the arrow keys to move the selection cursor to the linked drawing you want to edit.
3. From the Edit menu in Write or Cardfile, choose Edit Paintbrush Picture Object.
Paintbrush opens, with the document containing the drawing open.
4. Edit the drawing as necessary.
The linked drawing in the Write document or Cardfile card is updated as you make your changes.
5. From the File menu in Paintbrush, choose Save.
6. From the File menu in Paintbrush, choose Exit.
Paintbrush closes.

Note If the Update option is set to Manual, you must update the link by using the Links command to see the changes. For more information, see “Maintaining Links” later in this chapter.

Embedding a Sound Document

Windows Sound Recorder is an application that plays and records sound files. Before you can play, edit, or record a file by using Sound Recorder, you must have the sound hardware installed, and its driver installed and configured. For more information about installing drivers, see Chapter 5, "Control Panel."

Sound Recorder plays existing sound files or sound files you have created (you need a microphone to record your own sound files). Sound files played by Sound Recorder can be embedded and linked. For more information about Sound Recorder, see Chapter 12, "Additional Accessories."

Embedding a Sound Recorder File

There are two ways to embed a Sound Recorder sound file. The first method is to start from the document where you want to embed the sound file, such as a Write document or Cardfile card. While you work with the application, you open Sound Recorder to select a sound file. The second method is to start from Sound Recorder.

► To embed a sound file, starting from Write or Cardfile

1. Open the Cardfile card or Write document into which you want to embed a sound file.
2. If you are using Write, move the insertion point to the place you want the sound file inserted. If you are using Cardfile, the sound file will be inserted in the upper-left corner of the card.
3. If you are using Cardfile, choose Picture from the Edit menu.
A check mark next to the Picture command indicates it is in effect.
4. From the Edit menu in Cardfile or Write, choose Insert Object.
A dialog box appears. All applications on your computer that support object linking and embedding are listed.
5. Select Sound.
6. Choose the OK button.
Sound Recorder opens.
7. From the Edit menu in Sound Recorder, choose the Insert File command.
The Insert File dialog box appears.
8. Select the sound file you want to embed, and then choose the OK button.
Or you can record a new sound. (For more information, see Chapter 12, "Additional Accessories.")

9. From the File menu, choose Update.
This embeds the sound file you selected into the document.
10. From the File menu, choose Exit.
This returns you to the Write document or Cardfile card, where you can continue working.

► **To embed a sound file, starting from Sound Recorder**

1. Open Sound Recorder.
2. Create a sound file, or open an existing one.
3. From the Edit menu, choose Copy.
A copy of the sound file is placed onto the Clipboard.
4. If you want to save the sound file, choose Save from the File menu.
5. Open the Write document or Cardfile card into which you want to embed the sound file.
6. If you are using Write, place the insertion point at the location you want the sound file to appear. If you are using Cardfile, the sound file will be placed in the upper-left corner of the card.
7. If embedding a sound file into a card in Cardfile, choose Picture from the Edit menu.
A check mark next to the Picture command indicates it is in effect.
8. From the Edit menu in Write or Cardfile, choose Paste.
9. The Sound Recorder application icon representing the embedded sound file appears in the Write document or Cardfile card.

To play the embedded sound file, double-click it. Or select the icon, choose Sound Object from the Edit menu, and then choose Play from the Sound Object cascading menu.

Editing an Embedded Sound File

You can edit a sound file only by using Sound Recorder.

► **To edit an embedded sound file**

1. Select the embedded sound file you want to edit.
2. From the Edit menu in Write or Cardfile, choose Sound Object, and then from the cascading menu choose Edit.
Sound Recorder opens with the sound file displayed.

3. Edit the sound file as needed.
4. From the File menu in Sound Recorder, choose Update.
This updates the embedded sound file in the Write document or Cardfile card.
5. From the File menu in Sound Recorder, choose Exit.
Sound Recorder closes.

Linking a Sound Recorder File

When you link or embed a sound file created by using Sound Recorder, the Sound Recorder application icon is placed in the destination document. This icon represents the sound file. When you activate this icon (either by double-clicking it, or by choosing the Sound Object command from the Edit menu and then choosing Play from the cascading menu), the sound plays.

► To link a Sound Recorder file

1. Open Sound Recorder.
2. Create a sound file, or open the sound file you want to link.
3. Save your sound file.
4. From the Edit menu, choose Copy.
A copy of the sound file is placed onto the Clipboard.
5. Open the Write document or Cardfile card into which you want to link the sound file.
6. If you are using Cardfile, choose Picture from the Edit menu.
A check mark next to the Picture command indicates it is in effect.
7. If you are using Write, place the insertion point at the location you want the sound file to appear. If you are using Cardfile, the sound file will appear in the upper-left corner of the card.
8. From the Edit menu in Write or Cardfile, choose Paste Link.
9. Save the Write document or Cardfile card.
You now have the original sound file, plus a link to that sound file in the Write document or Cardfile card.

Editing a Linked Sound File

Any changes you make to a linked sound file appear in all files that contain links to the sound file.

► **To edit a linked sound file**

1. Select the linked sound file you want to edit.
2. From the Edit menu in Write or Cardfile, choose Sound Object, and then choose Edit from the cascading menu.

Sound Recorder opens with the sound file displayed.

3. Edit the sound file as needed.
4. From the File menu in Sound Recorder, choose Save.

This updates the linked sound file to reflect your changes in the Write document or Cardfile card.

5. From the File menu in Sound Recorder, choose Exit.

Sound Recorder closes.

Note The linked sound file is updated as soon as the changes are made, regardless of whether the link is set to update manually or automatically. The update setting affects only the image that represents a linked file in the destination document. Since the image that represents a linked sound file is an application icon, there is no image to update.

Maintaining Links

After you create a linked object, you can do the following:

- Decide whether the object should be updated manually or automatically.
- Create a network of links so that one object is in many documents and you can change the object from any of the linked documents.
- Break a link.
- Delete a link.
- Fix a broken link.

Controlling How Linked Objects Are Updated

You can update a linked object in two ways: automatically or manually. By default, linked objects are updated automatically.

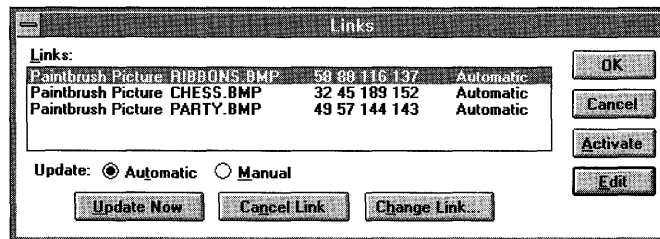
The image of an object that is linked manually does not change when the object in the source document changes. The object's image gets updated in the destination document only when you decide to update it.

When the linked object is represented by an icon instead of by an image of the object, as in the case of a link to a sound or animation document, the update setting doesn't matter because in these cases there is no image to update.

► To change the way a linked object is updated

1. Open the Write document or Cardfile card that contains the linked object.
2. If you are using Cardfile, choose Picture from the Edit menu.
3. From the Edit menu, choose Links.

The Links dialog box appears.



4. From the list in the Links box, select the link or links whose update option you want to change.
5. Select the Automatic or Manual option button. This option applies to all linked drawings you select in the dialog box.
6. Choose the OK button.

► To update a manual link

1. Open the Write document or Cardfile card that contains the linked object.
2. If you are using Cardfile, choose Picture from the Edit menu.
3. From the Edit menu, choose Links.

The Links dialog box appears.

4. Select the link or links you want to update.
5. Choose the Update Now button.
6. Choose the OK button.

Creating Multiple Links

There are two ways to create more than one link to a source document. You can create a link by using the procedure described earlier in this chapter, or you can simply copy an existing link. The result is the same—more than one document contains a link to the original object. You can change the object from within any document that contains a link to the source document, or you can change the source document itself. Either way, the changes are reflected everywhere that the linked object appears.

For example, suppose you are writing two articles—one more technical than the other—for two publications, and you want both articles to contain the same Paintbrush drawing. Each article is a separate Write document.

You write both articles and then create the drawing in Paintbrush. Next, you link the drawing into article A. Then you copy the link from article A to article B. Although it appears as if you are copying the drawing, you are copying only the link to the original document. The image of the drawing appears in article B. If you change the drawing from within either article, or in the original Paintbrush file, the drawing changes in both articles and in the Paintbrush file.

► To copy an existing link

1. Open the Write document or Cardfile card containing the object whose link you want to copy.
2. If you are using Cardfile, choose Picture from the Edit menu.
3. Select the object.
4. From the Edit menu, choose Copy.
A copy of the link is placed onto the Clipboard.
5. Open the Write document or Cardfile card into which you want to insert the link.
6. If you are using Cardfile, choose Picture from the Edit menu.
7. If you are using Write, move the insertion point to the place you want the presentation of the link to appear. In Cardfile, the link will be inserted in the upper-left corner of the card.
8. From the Edit menu, choose Paste.

The object appears in the Write document or Cardfile card.

Breaking a Link

You can break a link so that a Paintbrush drawing can no longer be changed from within the Write document or Cardfile card where it appears. You are breaking the connection between the drawing in the original Paintbrush document and the linked drawing in the Write document or Cardfile card. The original Paintbrush drawing still exists. After you break a link, to change the drawing in the destination document you must cut and paste it into Paintbrush, make your changes, and then copy and paste it back into the destination document.

► To break a link

1. Open the Write document or Cardfile card that contains the object whose link you want to break.
2. If you are using Cardfile, choose Picture from the Edit menu.
3. Select the object.
4. From the Edit menu, choose Links.

The Links dialog box appears, with the link to the selected object highlighted.

5. Choose the Cancel Link button.
6. Choose the OK button.

The drawing is still in the document. Only the link has been removed.

Deleting a Link

Deleting a link is different from breaking a link. When you break a link, the drawing still exists in the destination document. When you delete a link, the drawing is deleted at the same time.

► To delete a link

1. Open the Write document or Cardfile card that contains the object whose link you want to delete.
2. If you are using Cardfile, choose Picture from the Edit menu.
3. Select the object.
4. From the Edit menu, choose Cut.

Both the link to the drawing and the drawing are removed from the document.

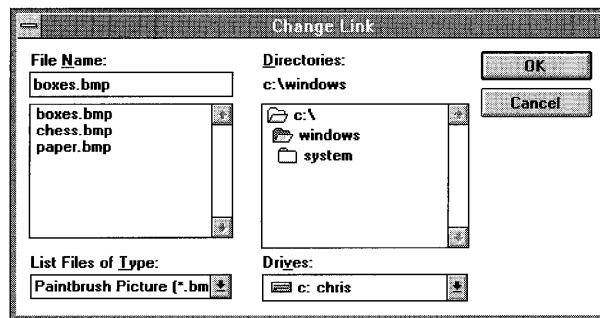
Fixing a Broken Link

If you change the name of a source document that contains linked objects, the links to those objects break because they are connected to a filename that no longer exists. From the destination document, you must change the name of the document that the object is linked to so that the link will work properly again.

If, for any other reason, a link no longer works, try activating the object again to open the source document. If this is not successful, you might need to delete the linked object and try linking it again.

► To fix a broken link

1. Open the Write document or Cardfile card that contains the object whose link you want to change.
2. If you are using Cardfile, choose Picture from the Edit menu.
3. Select the object.
4. From the Edit menu, choose Links.
The Links dialog box appears.
5. Choose the Change Link button.
The Change Link dialog box appears.



6. In the File Name list, select the source document you want the object to link to.
7. Choose the OK button.
The Links dialog box reappears with the name of the new source document selected.
8. Choose the OK button.

This closes the Links dialog box. If you changed the link so that it is pointing to a different document, the new object now appears in the destination document.

Changing Formats

Information can be stored on the Clipboard in a variety of formats. This facilitates the transfer and sharing of information between applications that may use different formats.

When you use the Copy command to send information to the Clipboard, the source application actually sends the information in more than one format. Then, when you paste the information from the Clipboard, the destination application can select the format that is easiest for it to use and display (the application's default format).

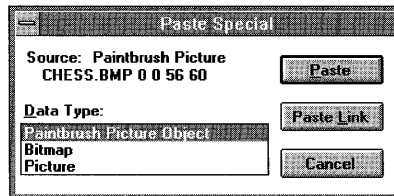
You can change the format that the destination application selects from the Clipboard by using the Paste Special command. You use this command to select a different format before choosing the Paste or Paste Link command.

When you choose the Paste Special command, a dialog box lists other available formats for the information currently on the Clipboard, with the default format for the Paste command selected. You can select a different format, and then choose the Paste or Paste Link command from this dialog box. If you choose the Paste command from the Paste Special dialog box without selecting a different format, this is the same as choosing Paste directly from the Edit menu.

Note Not all applications provide the Paste Special command. Write and Cardfile, both applications that support object linking and embedding, provide the Paste Special command as described. Check the application's documentation to see how the Paste Special command is being used.

► To change formats

1. Copy onto the Clipboard the information you want to embed or link.
2. Open the document into which you want to embed or link the information.
If you opened a Cardfile card, choose Picture from the Edit menu.
If you opened a Write file, position the cursor where you want the object to appear.
3. From the Edit menu, choose Paste Special.
The Paste Special dialog box appears.



4. From the Data Type list, select the format you want to use.
5. Choose the Paste button to embed the object or the Paste Link button to link it.

Note Depending on the application used to create the object, or whether the object is in a saved document, the Paste Link button may not be available.

Working with Object Packager

There is another way to embed or link objects. Instead of embedding or linking the object, you can embed an icon that represents the object. This icon is called a *package*. Packages can contain either embedded objects or links to documents, but packages themselves are always embedded.

A package has the same properties as any embedded object. When you activate a package, the object it contains is displayed, or played, as in the case of a sound or animation package.

For example, suppose you are writing a report that refers to an article on the report topic. You want the article to be available for those who are interested in reading it. Placing the article as a package in your report makes the information easily accessible. To view the article, you simply open the package.

By using Object Packager, an application supplied with Windows, you can create a package and insert it into a destination document. You can use Object Packager to:

- Insert a complete document as a package into a destination document.
- Insert part of a document as a package into a destination document.
- Insert an MS-DOS command line to be carried out in a destination document.
- Customize the icon that represents a packaged object.
- Change the label of an icon.

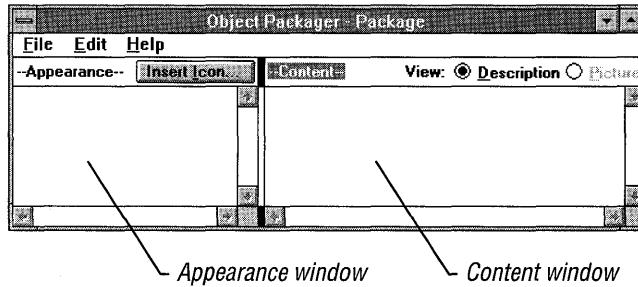
You can only insert a package into an application that supports object linking and embedding. Check the application's documentation to determine whether the application supports this functionality.

Packaging an Entire Document

A package can contain either an embedded document or a link to a document. How you create the package determines its contents. Use Object Packager to package an embedded document. Use File Manager to package an embedded document or a link to a document.

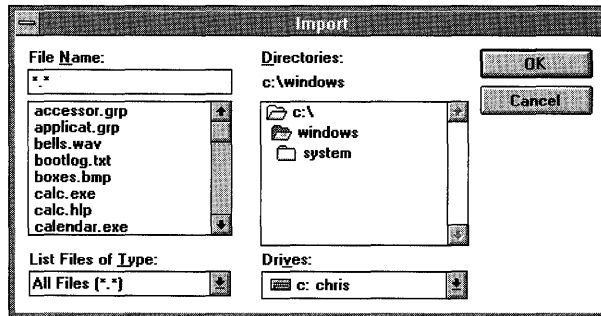
► **To package an entire document by using Object Packager**

1. Open Object Packager.



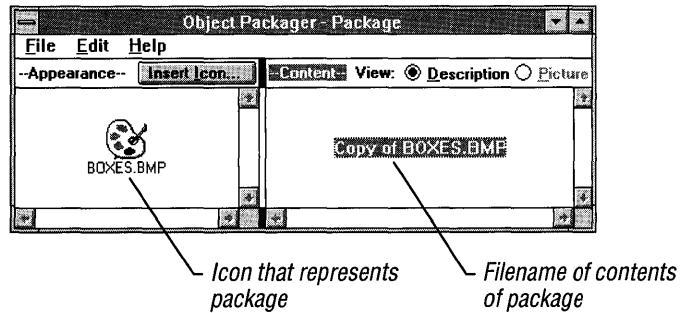
2. Select the Content window either by clicking the window or pressing TAB.
3. From the File menu, choose Import.

The Import dialog box appears.

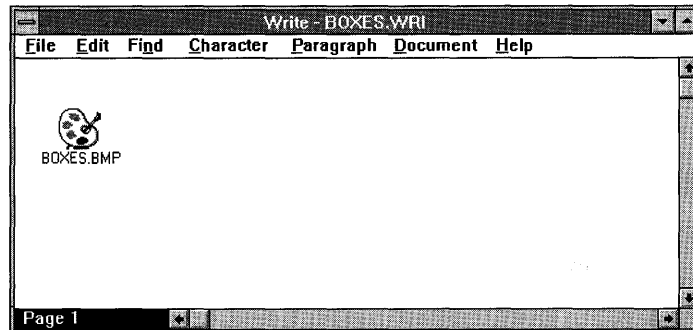


4. Select the directory containing the document you want to insert as a package.
5. Select the document's filename, or type it in the File Name box.
6. Choose the OK button.

The filename appears in the Content window, and the icon of the application used to create the document appears in the Appearance window. You can change the icon by choosing the Insert Icon button, and you can change the label by choosing Label from the Edit menu.



7. From the Edit menu in Object Packager, choose Copy Package.
8. Open the document into which you want to insert the package.
The application used to create the document must support object linking and embedding.
9. Move the insertion point to the place you want the package to appear.
10. From the Edit menu in the document, choose Paste.
The package appears in the document.



To view the contents of the package, double-click it. Or from the Edit menu choose Package Object, and then from the cascading menu choose Activate Contents.

Using File Manager

Using File Manager, you can package an embedded document or a link to a document in three ways. You can:

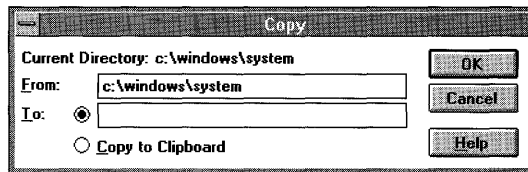
- Copy the document, using the Clipboard, from File Manager to Object Packager, and then to the destination document where you paste it as a package.
- Copy the document, using the Clipboard, from File Manager to the destination document, and paste it as a package.
- Use the mouse to create a package in the destination document.

The application you use to create the object being linked or embedded determines which method you can use to package it. Depending on when the application was developed (before or after this version of Windows), some of these methods may not be available. Check your application documentation to determine whether the application supports object linking and embedding.

► To create a package by using File Manager and Object Packager

1. Open File Manager.
2. Open the directory containing the document you want to package.
3. Select the document's filename.
4. From the File menu, choose Copy.

The Copy dialog box appears.



5. Select the Copy To Clipboard option button.
6. Choose the OK button.
7. Open Object Packager.
8. Select the Content window.

9. From the Edit menu in Object Packager, choose Paste Link to package a link to a document, or choose Paste to package an embedded document.

The filename appears in the Content window, and the icon of the application used to create this document appears in the Appearance window. You can change the icon by choosing the Insert Icon button or change the label by choosing Label from the Edit menu.

10. From the Edit menu, choose Copy Package.
11. Open the document into which you want to insert the package.
12. Move the insertion point to the place you want the package to appear.
13. From the Edit menu in the document, choose Paste.

The package appears as an icon in the document. To see the contents of the package, double-click the icon. Or choose Package Object from the Edit menu, and then choose Activate Contents from the Package Object cascading menu.

With most applications that support object linking and embedding, you do not need to use Object Packager to embed a document as a package. Using File Manager, you can copy a document onto the Clipboard and then embed it as a package directly into the destination document; or you can use the mouse to package an embedded or linked object by dragging and dropping the file icon.

► **To package an entire document by using the Clipboard**

1. Open File Manager.
2. Open the directory containing the document you want to insert.
3. Select the document's filename.
4. From the File menu, choose Copy.
The Copy dialog box appears.
5. Select the Copy To Clipboard option button.
6. Choose the OK button.
7. Open the document into which you want to insert the package.
8. Move the insertion point to the place you want the package to appear.
9. From the Edit menu in the document, choose Paste Link to package a linked document, or choose Paste to package an embedded document.

The package appears as an icon in the document. To see the contents of the package, double-click the icon. Or from the Edit menu, choose Package Object, and then from the cascading menu choose Activate Contents.

► **To package an entire document by dragging and dropping the file icon**

1. Open File Manager.
2. Select the directory containing the source document.
3. Open the destination document. Be sure that both the File Manager window that contains the source document and the window containing the destination document are visible.
4. Move the insertion point to the place you want the package to appear in the destination document.
5. To package an embedded document, drag the icon of the source document into the window containing the destination document.

To package a linked document, press CTRL+SHIFT while dragging the icon of the source document into the window containing the destination document.

The pointer changes to a file icon, and it moves out of the directory window as you move the mouse.

The package appears at the current insertion-point location.

Note This feature may not be available in all applications.

Packaging a Partial Document

You may want to package only part of a document (such as a paragraph, chart, or spreadsheet). After you copy the partial document to Object Packager, it is represented by an icon that you can paste into the destination document.

From the destination document, you can choose the icon to view the contents of the package. The package contains the object (partial document) you initially copied onto the Clipboard from the source document.

You can only package partial documents that have been created by a server application (an application whose objects can be embedded or linked into other applications).

► **To embed or link part of a document as a package**

1. Open the document containing the object you want to package. The object must have been created by a server application.
If you are planning to link this object, the document must be named and saved.
2. Select the object you want to package.
3. From the Edit menu, choose Copy.

4. Open Object Packager.
5. Select the Content window by either clicking the window or pressing TAB.
6. From the Edit menu, choose Paste to embed the object or Paste Link to link it.
7. From the Edit menu, choose Copy Package.
8. Open the document into which you want to insert the package.
9. Move the cursor to the place you want the package to appear.
10. From the document's Edit menu, choose Paste.

The package appears as an icon in the document. To see the contents of the package, double-click the icon. Or from the Edit menu, choose Package Object, and then from the cascading menu choose Activate Contents.

Packaging an MS-DOS Command-Line Command

You can insert an MS-DOS command-line command into a document in the form of a package in order to run a batch program or start another application.

► To insert an MS-DOS command-line command in a document

1. Open Object Packager.
2. From the Edit menu, choose Command Line.
3. Type a command. If you are typing the name of a program file, include the full path.
4. Choose the OK button.

The command appears in the Content window.

5. Choose the Insert Icon button.
6. In the Insert Icon dialog box, select an icon.

Or choose the Browse button. In the Browse dialog box, select a program file (for example, PROGMAN.EXE), and then choose the OK button. Then select an icon.

7. Choose the OK button.

The icon appears in the Appearance window.

8. From the Edit menu, choose Copy Package.
9. Open the document you want to place the package into, and, if applicable, move the cursor to the place where you want the package to appear.

In some applications, the package is automatically placed in the upper-left corner of the window.

10. From the application's Edit menu, choose Paste.

The package appears.

To run the program or carry out the command, double-click the icon. Or from the Edit menu, choose Package Object, and then from the cascading menu choose Activate Contents.

Changing the Icon

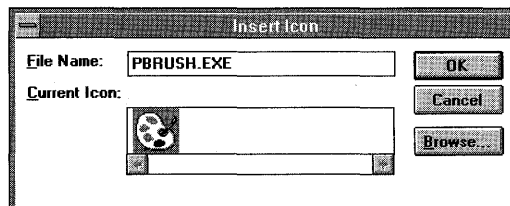
When you use Object Packager to create a package, the Appearance window displays the icon for the package, as it will appear in the destination document. By default, the icon is the same as the icon of the application used to create the object.

For example, if you used Paintbrush to create an object, the Paintbrush icon is displayed in the Appearance window in Object Packager.

If you want to use a different icon, you can either choose another application icon (one that is provided with Windows), or create your own custom image.

► To change the icon

1. Open Object Packager.
2. From the File menu, choose Import.
The Import dialog box appears.
3. Select the file you want the package to contain.
4. Choose the OK button.
The default icon appears in the Appearance window.
5. Choose the Insert Icon button.
The Insert Icon dialog box appears.



The name of the program file used to create the document appears in the File Name box, and the icons associated with that program file appear in the Current Icon box.

6. To change the icon, type the name of the program file whose icon you want to use into the File Name box.

If you are not sure which icons are available, choose the Browse button to open the Browse dialog box. In the Browse dialog box, select a program file, and then choose the OK button.

From the Windows directory, choose PROGMAN.EXE to see a list of additional icons.

7. In the Current Icon box, select the new icon, if there is more than one to choose from.
8. Choose the OK button.

The new icon appears in the Appearance window.

► **To create your own icon**

1. Open the source document.
2. Copy onto the Clipboard the object you want to insert into the destination file.
3. Switch to Object Packager.
4. Select the Content window by clicking the window or pressing TAB.
5. From the Edit menu, choose Paste to embed the object or Paste Link to link it.

The default icon appears in the Appearance window.

6. Select the Appearance window.
7. From the Edit menu, choose Copy.
8. Switch to Paintbrush.
9. From the Edit menu, choose Paste.

The icon that was in the Appearance window of Object Packager is now pasted onto the Paintbrush drawing area.

10. Make changes to this icon, or start over and create a new design.

To save your changes, choose Save from the File menu.

11. Select the drawing.
12. From the Edit menu, choose Copy. This places a copy of the new icon onto the Clipboard.
13. Switch to Object Packager.
14. Select the Appearance window by clicking the window or pressing TAB.
15. From the Edit menu, choose Paste.

The new image or drawing appears in the Appearance window. When you create your own icon image, it has no label.

16. To embed the package, choose Copy Package from the Edit menu.

17. Open the document into which you want to insert the package.
18. Move the cursor to the place you want the package to appear.
19. From the Edit menu, choose Paste.

The package appears in the document with your custom icon.

Changing the Label of the Package

Each package has a label (or title) that indicates what document it contains. The default label depends on the contents of the package.

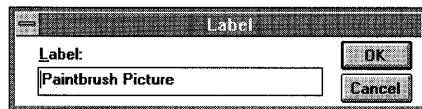
- If you packaged an entire document by using File Manager, the default label is the filename of the document.
- If you packaged a partial document, the default label is the object type and the application used to create the object. For example, a label for a drawing from Paintbrush would be "Paintbrush Picture."

Under certain circumstances you cannot add a label, such as when you are using a custom image you created.

► To change the label

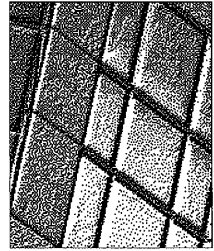
1. Open Object Packager.
2. From the Edit menu, choose Label.

The Label dialog box opens.



3. Type the text for the new label.
4. Choose the OK button.

Optimizing Windows



Chapter 14

What Is Optimizing?

Optimizing is customizing your system so that it uses its resources most efficiently for the tasks you usually perform. Typically, optimizing involves improving one or more aspects of your system's performance, but sometimes sacrificing something else. For example, you might be able to run more applications at one time, and those applications might run faster, but you may have less disk space available as a result. In Microsoft Windows, optimizing your system means working with the following resources.

Resource	Why is it important?
Speed	Your system's speed affects the time it takes for Windows or an application to start up, carry out a task, redisplay a window, switch between applications, and so on.
Memory	The amount of memory your system has determines how many applications you can run simultaneously, and how much information applications can store in memory at a time. It can also affect the speed at which Windows performs. Windows runs more slowly when there is little or no available memory.
Available disk space	The amount of available hard disk space can affect your system's speed and efficiency. Some applications use disk space to store temporary files while they run. Windows can also use some of your available disk space as <i>virtual memory</i> . Virtual memory provides Windows with more memory than the computer actually has.

The most important thing you can do to improve how Windows performs is to configure your system memory properly. After you configure your system memory for optimum performance with Windows, you can use other procedures to improve performance further. The next section will help you understand memory. For information about configuring memory, see "Configuring Your System" later in this chapter.

Understanding Memory

Memory exists on your computer's main system board or on add-in memory boards. Before information is processed by the computer or displayed on the screen, it is first placed in memory. For example, application files are usually stored on a hard disk. When you run an application, its files are loaded into memory for processing. Memory also provides temporary storage for applications and data.

In general, the more memory you have, the more applications you can run simultaneously in the Windows environment. You can increase the amount of memory on your system by plugging a memory board into a slot inside the computer, or by adding memory modules to an existing memory board. For example, you might add a 2 MB memory board to a system that already has 1 MB of memory, or you might add memory chips to an existing board if there is room.

Your system may have up to four kinds of memory:

- Conventional memory
- Extended memory
- Expanded memory
- Virtual memory

The following sections explain each type of memory.

Identifying Your System Memory Configuration

Because your system memory configuration significantly affects your system's performance, it's important to know how much and what type of memory your computer has. On most computers, whenever you turn on the power, you can watch the screen for a count of how much memory you have. However, this won't show you what type of memory is there.

If you have MS-DOS version 4.0 or later, you can find out about your memory configuration by using the MS-DOS **mem** command.

► To find out about your system's memory configuration

1. If Windows is running, quit Windows by choosing Exit Windows from the File menu in Program Manager.
2. At the MS-DOS prompt, type **mem**, and then press ENTER.
MS-DOS displays information about the type and amount of memory your computer has.
3. To restart Windows, type **win**, and then press ENTER.

Another way to identify your system memory configuration is to use a diagnostics tool that is designed specifically for your computer. Most computers and memory boards come with such tools that indicate exactly what types of memory you have and how much of each type you have. Some programs even assist you in changing your memory configuration. For more information about the program(s) that came with your computer and any memory boards you have installed, consult the documentation that accompanied them.

Conventional Memory

Conventional memory exists on all personal computers. Most computers have at least 256K of conventional memory and can accommodate up to 640K of conventional memory.

When you start your computer, MS-DOS uses some of your computer's conventional memory. Next, MS-DOS runs the commands listed in your CONFIG.SYS and AUTOEXEC.BAT files. Running these commands also uses conventional memory. Windows uses the remaining memory to manage your system and run your applications.

Extended Memory

Extended memory is general-purpose memory beyond 1 MB on 80286, 80386, and 80486 computers. Windows needs extended memory in order to run. Extended memory requires an *extended-memory manager*. Extended-memory managers coordinate the use of your system's extended memory so that several applications do not use the same memory at the same time. Windows comes with the extended-memory manager HIMEM. For more information about using HIMEM, see "Using MS-DOS Memory Managers" later in this chapter.

Note Many 80286 and 80386 computers come with 640K of conventional memory and an additional 384K of "upper" memory, for a total of 1 MB of conventional memory. The additional 384K is not accessible by all applications and is usually used by device drivers, such as display drivers.

Expanded Memory

Expanded memory exists separately from your system's conventional and extended memory. Most personal computers can accommodate expanded memory.

Expanded memory is installed on an expanded-memory board and comes with an *expanded-memory manager*. Applications must request access to expanded memory from the expanded-memory manager. Most applications are unable to use expanded memory because they were not designed to interact with an expanded-memory manager. Because an expanded-memory manager gives applications access to only a limited amount of expanded memory at a time, using expanded memory is slower than using extended memory.

Windows and Windows applications don't use expanded memory. However, if you have non-Windows applications that require expanded memory you should still be able to run those applications in Windows. When running Windows on an 80286 computer, most applications that require expanded memory can access it only if it physically exists on your computer. On 80386 and 80486 computers, *expanded-memory emulators* can simulate expanded memory for use by applications that require it. Windows running in 386 enhanced mode can simulate expanded memory by using an expanded-memory emulator called EMM386. For more information, see "Using Expanded Memory" later in this chapter.

Some expanded-memory boards, such as the AST RAMpage! AT or Intel Above Board, can be set up with extended memory, with expanded memory, or with both. For most 80386 systems, Windows runs best if you set up your expanded-memory board with all extended memory. For information, see "Configuring Your System" later in this chapter.

For more information about expanded memory, see "Using Expanded Memory" later in this chapter.

Virtual Memory

Virtual memory is the space on your hard disk that Windows uses as if it were actually memory. Windows does this through the use of *swap files*. For more information about swap files, see "How Windows Uses Swap Files" later in this chapter.

The benefit of using virtual memory is that you can run more programs at one time than your system's physical memory would usually allow. The drawbacks are the disk space required for the virtual-memory swap file, and the decreased execution speed when swapping is required.

Understanding Disk Space

Disks provide storage for program files and data files. Information stored on disks remains there even when you turn off your computer. The most common types of disks are floppy disks and hard disks. Applications and other files are stored magnetically on most disks, much as information is stored on a cassette tape. In this chapter, *disk space* refers to space that is available on your hard disk.

Generally, it's a good idea to keep at least one megabyte of free space on your hard disk (that is, space not used by system and data files). There are several reasons for this:

- Applications use disk space to save documents and other data files.
- Windows and some applications use available disk space to temporarily store information that does not fit in memory.
- Windows uses available disk space to temporarily store information that is being printed.

Checking Your System's Disk Space

It's a good idea to know how much disk space is available on your system. The following procedures describe how to determine this.

► To check the amount of free disk space when Windows is running

1. In the Main group, choose the File Manager icon.
2. Choose the drive icon for the drive you want to check.

For example, to find out how much disk space is free on drive D, choose the D drive icon.

A number in the status bar at the bottom of the File Manager window indicates how many bytes of disk space are currently available on that disk drive. (If the status bar does not appear, you can display it by choosing Status Bar from the Options menu.)

Often, there is less free disk space when you are running Windows than when you are not running Windows. This is because Windows uses *swap files*, which take up some disk space. (For more information about Windows swap files, see the following section, "How Windows Uses Swap Files.") To determine how much disk space Windows is using, compare the amount of free disk space when Windows is running to the amount of free disk space when Windows is not running.

► **To check the amount of free disk space when Windows is not running**

1. Quit Windows.
2. At the MS-DOS prompt, type:

dir

MS-DOS displays information about the files on the current drive, in the current directory. The last line of information tells you how many bytes of disk space are free on that drive.

If you need more disk space, you may be able to delete some unnecessary files from your hard disk. For information about files that you can delete, see “Deleting Unnecessary Files” later in this chapter.

How Windows Uses Swap Files

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When running in 386 enhanced mode, Windows can make optimal use of memory by *swapping*. Swapping involves temporarily moving information from memory to a file on the hard disk, which makes the memory available for other applications. When Windows swaps information to the hard disk, it stores the information in a *swap file*. A swap file is a hidden file that reserves space on the hard disk. When the information temporarily stored in the swap file is needed, Windows moves it back into memory.

The amount of available disk space determines how large your swap file can be. The larger the swap file, the more information Windows can temporarily store. You can limit the size of the Windows swap file if you need to conserve disk space. For more information about swap files, see “Working with Windows Swap Files” later in this chapter.

In standard mode, each time you start a non-Windows application, Windows creates a temporary *application swap file* for that application. When you switch from the application, Windows moves some or all of the application from memory to the swap file, making the memory available for the application you are switching to. When you quit the application, Windows deletes any application swap files it created. (Windows does not use application swap files when running in 386 enhanced mode.)

The amount of available disk space determines how many application swap files Windows can create; this, in turn, determines how many non-Windows applications you can start at one time. For more information about application swap files, see “Working with Application Swap Files” later in this chapter.

Configuring Your System

The most effective way to improve how Windows manages your system is to configure your system memory correctly. The best configuration for you depends on the type of computer you have, which mode you run Windows in, and the memory requirements of the applications you run.

Your system memory configuration consists of not only the hardware installed on your system, but also the software settings, programs, and device drivers listed in your CONFIG.SYS file. When you set up Windows on your computer, the Setup program checks the settings in your computer's CONFIG.SYS file. During setup, you can choose to have the Setup program update your CONFIG.SYS file as needed so that it includes the settings and command lines necessary to run Windows.

The following sections provide basic recommendations for configuring different types of computers for use with Windows. Each section describes the memory your system should have and lists the command lines your CONFIG.SYS file should contain. After reading the section that applies to your computer, look for ways to further improve performance in Windows by reading the rest of this chapter.

Configuring an 80386 or 80486 Computer

When you start Windows by typing **win** at the MS-DOS prompt on an 80386 or 80486 computer, Windows determines how much memory is available and starts in the mode most appropriate for your system.

To find out what mode Windows is running in, choose the About Program Manager command from the Help menu in Program Manager.

To run Windows most efficiently, your 80386 or 80486 computer should have the following memory:

- 640K of conventional memory.
- Extended memory. The more extended memory your system has, the better.

To run Windows in standard mode, you need at least 256K of unused conventional memory and at least 256K of available extended memory.

To run Windows in 386 enhanced mode, you need at least 200K of unused conventional memory and at least 1024K of available extended memory.

- If you have a memory board that can be configured as either expanded or extended memory, configure it as extended memory. (For information about how to configure your memory board, see the documentation that came with the memory board.)

Your CONFIG.SYS file should contain the following command lines:

- A command line for an extended-memory manager such as HIMEM.

To use extended memory, Windows requires HIMEM or a compatible memory manager. When you install Windows, the Setup program installs HIMEM and adds the HIMEM command line to your CONFIG.SYS file. The command line for HIMEM must be specified in the CONFIG.SYS file before any specifications for device drivers that use extended memory.

- If necessary, a command line for the expanded-memory manager that came with your expanded-memory board, if you have one. For information, see the documentation supplied with your expanded-memory board.
- A **files** command line. In general, if you are running non-Windows applications in Windows, make sure **files** is set to at least 30.
- The **buffers** command line. In general, you should set **buffers=20** or less. If you are using SMARTDrive, you can set **buffers=10**. If you are using MS-DOS version 5.0 or later, you can set **buffers=30**.
- If necessary, a command line for the expanded-memory emulator EMM386.
- If necessary, a command line for the device driver EGA.SYS.

If your system has an enhanced graphics adapter (EGA) and you run non-Windows applications with Windows in standard mode, your CONFIG.SYS file should contain a command line such as the following:

```
device=c:\windows\ega.sys
```

If you set up Windows to use an EGA, Windows places this line in your CONFIG.SYS file during the setup process.

- A **shell** command specifying which command interpreter is used when you switch to the MS-DOS prompt. For example, if your MS-DOS files are located in the MSDOS directory on drive C, the **shell** command line should read as follows:

```
shell=c:\msdos\command.com /p /e:1024
```

This specifies COMMAND.COM as the command interpreter, makes the command interpreter permanent, and sets an environment size of 1024 bytes.

Configuring an 80286 Computer

The 80286 computer can accommodate both expanded and extended memory. You can configure most expanded-memory boards so that they provide all expanded memory, all extended memory, or a mixture of both. However, you cannot reconfigure most extended-memory boards; they provide only extended memory.

To run Windows most efficiently, your 80286 computer should have the following memory:

- 640K of conventional memory.
- At least 256K of available extended memory. The more extended memory your system has, the better.
- As much expanded memory as necessary for non-Windows applications that require it.

Some non-Windows applications require expanded memory. To run such an application on an 80286 computer—either with Windows or from MS-DOS—your system must include as much expanded memory as the application needs.

If your 80286 system has a configurable expanded-memory board, you should configure it so that it provides only as much expanded memory as the applications need. To improve how Windows performs, configure any additional memory as extended. (For information about how to reconfigure your expanded-memory board, see the documentation that came with it.)

Your CONFIG.SYS file should contain the same command lines that were listed in the previous section for 80386 or 80486 computers, except for the line that specifies EMM386.EXE.

Improving the Efficiency of Your Hard Disk

The amount of free disk space is one factor that determines your system's performance. In addition, it is important that the information taking up space on your disk be structured as efficiently as possible. This section describes various methods you can use to improve hard-disk efficiency. When using these methods, always start by making backup copies of your files.

You can perform the following tasks to improve your hard disk's efficiency:

- Delete files you don't need.
- Use the **chkdsk** command to recover lost disk space.
- Run a disk-compaction program.

Caution Always quit Windows before using the **chkdsk** command with the **/f** option; never run **chkdsk /f** from within Windows. Loss of data might result.

The following sections explain each method.

Deleting Unnecessary Files

If your disk is getting full, you should delete files you don't need or don't use. Depending on how you use Windows, you might also be able to delete certain Windows files. It is particularly important to delete unnecessary files before running a disk-compaction program. There are three categories of files you might want to delete:

- Windows files that were installed by the Setup program, but which you do not need or plan to use. For details, see the list later in this section.
- Application files, documents, or programs that you no longer need or use.
- Temporary files that are left on your hard disk when your computer fails unexpectedly.

Caution Do not delete any Windows files other than the ones listed following these procedures.

► To delete unnecessary Windows files

1. If you plan to delete Windows wallpaper or screen-saver files, first use Control Panel to change these settings to "None."
2. While running Windows, quit all applications except Program Manager.
3. In the Main group, choose the Windows Setup icon.
4. From the Options menu, choose Add/Remove Windows Components.
5. Choose the Files button for the Windows component that contains the files you want to delete.
6. Follow the instructions on the screen to remove files from your hard disk.

You can also delete unnecessary files that don't appear in the Windows Setup dialog boxes. Remember that by deleting these files, you make the corresponding Windows features unavailable.

► To delete other unnecessary files

1. Quit Windows.
2. Delete any files that remain in your TEMP directory, the directory that applications use to store temporary files. To find out which directory is set as your TEMP directory, look in your AUTOEXEC.BAT file for the **set temp=** command.

You should periodically delete the files in your TEMP directory. To avoid deleting a temporary file that is in use, quit Windows and any applications before you delete files in your TEMP directory.

3. Delete any files that start with the characters ~WOA. These files are application swap files that were created in standard mode. Usually, Windows deletes application swap files when you quit the associated applications; however, these files might remain on your hard disk if Windows stops running unexpectedly. You can safely delete application swap files if Windows is not running.
4. Delete any file named WIN386.SWP. This file is a temporary Windows swap file created in 386 enhanced mode. Usually, Windows deletes it when you quit Windows. However, a temporary Windows swap file might be left on your hard disk if your computer stops running unexpectedly. You can safely delete WIN386.SWP if Windows is not running. (Do not delete files named 386SPART.PAR or SPART.PAR.)
5. If you want, delete any unwanted files or documents.

You can delete the following Windows files if you do not plan to use them. Remember that by deleting files, you make the corresponding Windows features unavailable.

Filename(s)	Description
*.BMP	Bitmap files with the .BMP filename extension. The Setup program automatically installs several bitmap files for use as desktop wallpaper.
SOL.EXE, SOL.HLP	Solitaire game and its Help text.
WINMINE.EXE, WINMINE.HLP	Minesweeper game and its Help text.
PBRUSH.EXE, PBRUSH.HLP, PBRUSH.DLL	Paintbrush accessory, its Help text, and its dynamic-link library.
WRITE.EXE, WRITE.HLP	Write accessory and its Help text.
CALENDAR.EXE, CALENDAR.HLP	Calendar accessory and its Help text.
CALC.EXE, CALC.HLP	Calculator accessory and its Help text.
CARDFILE.EXE, CARDFILE.HLP	Cardfile accessory and its Help text.
TERMINAL.EXE, TERMINAL.HLP	Terminal accessory and its Help text.
RECORDER.EXE, RECORDER.HLP, RECORDER.DLL	Recorder accessory, its Help text, and its dynamic-link library.
CLOCK.EXE	Clock accessory.
EMM386.EXE	Expanded-memory emulator. (Do not delete this file if you're planning to reconfigure extended memory.)

Using the Chkdsk Command

The MS-DOS **chkdsk** command can repair lost clusters that are taking up space on your hard disk. Information can get “lost” when an application stops running unexpectedly, leaving fragments of files on the hard disk without saving or deleting them properly. Over time, these fragments can accumulate and take up disk space.

When you run the **chkdsk** command with the **/f** option, it finds and fixes any lost clusters. If you want, **chkdsk** can convert them to visible files that you can first examine and then delete if not usable.

Caution Always quit Windows before running the **chkdsk** command with the **/f** option; never run **chkdsk /f** from Windows. Loss of data might result.

Basic Recommendations

- Run **chkdsk /f** occasionally to be sure there are no lost file clusters on your disk.
- Run **chkdsk /f** before running a disk-compaction program.
- Run **chkdsk /f** if an application stops running unexpectedly.

► To repair lost files by using chkdsk

1. Quit Windows.
2. Change to the hard disk you want to clean up. For example, to change to drive D, type **d:** at the MS-DOS prompt.
3. Type the command **chkdsk /f** and then press ENTER.

The **/f** option tells **chkdsk** to fix any lost clusters it finds.

4. If **chkdsk** finds any lost clusters, it asks if you want to convert the lost clusters to files. If you want **chkdsk** to place the lost clusters into files, type **y** for Yes.

When you type **y**, **chkdsk** fixes any lost clusters and then converts them to visible files with filenames similar to FILE0001.CHK. It puts the files it finds in the root directory. The **chkdsk** program also displays information about the disk it just checked.

If you type **n**, **chkdsk** fixes any lost clusters but does not convert them to files. If you type **n**, you can skip the remaining steps in this procedure.

5. Use the MS-DOS **type** command to examine the .CHK files. For example, to examine the file FILE0001.CHK, type **type file0001.chk** at the MS-DOS prompt. (To stop the **type** command, press CTRL+C. To control the scrolling on the screen, press CTRL+S.)

Sometimes, a .CHK file might contain information you want to keep. For example, if a word-processing application stops running before you save your edits, you might find your lost edits in a recovered .CHK file.

6. Delete any .CHK files you don't want.

Running a Disk-Compaction Program

Over time, as applications create and delete files on your hard disk, information on your disk can become *fragmented*. Fragmentation occurs when a file, instead of being stored in a single location, is split into fragments that are stored in different locations on the disk. Although fragmentation doesn't affect the validity of the information—your files are still complete—it takes much longer to read them from the disk. It also takes longer for applications to write files back to the disk.

You can use a disk-compaction program to regroup fragmented files. Compacting your hard disk can significantly speed up the time it takes for Windows and applications to start.

Windows does not include a disk-compaction program. However, various disk-compaction programs that you can run with Windows are available. (Disk-compaction programs are sometimes called defragmentation utilities or disk organizers.) For details, see your local computer store.

Caution Unless you have a disk-compaction program designed to run from within Windows, you should always run these programs directly from MS-DOS, before starting Windows. You should also quit all other applications and programs before starting a disk-compaction program.

► To compact a hard disk

1. Delete any unnecessary files from the disk by following the steps outlined in “Deleting Unnecessary Files” earlier in this chapter.
2. Quit Windows, and then change to the hard disk you want to compact.
3. Type the command **chkdsk /f** and then press ENTER.
Never run **chkdsk /f** from within Windows. For details about running **chkdsk /f**, see the previous section, “Using the Chkdsk Command.”
4. Be sure that you are not running any programs that use the hard disk.
5. Run your disk-compaction program according to the manufacturer's instructions.

Freeing Memory Before Starting Windows

If you sometimes run out of memory when running applications, you might be using too much memory before you start Windows. You can make a larger amount of memory available by limiting how much memory is in use before you start Windows. If memory-resident software is already using memory, then Windows cannot use that memory.

The following section explains how to “streamline” your CONFIG.SYS and AUTOEXEC.BAT files so that they start only the programs that you really need. It also explains how to conserve conventional memory when starting memory-resident software.

Modifying the CONFIG.SYS and AUTOEXEC.BAT Files

Your CONFIG.SYS and AUTOEXEC.BAT files may contain commands that load device drivers and other programs when you start your computer. You can make more memory available to Windows by removing unnecessary commands from these files.

This procedure explains how to modify the CONFIG.SYS and AUTOEXEC.BAT files. Recommendations for streamlining each file follow this procedure.

► To modify the CONFIG.SYS or AUTOEXEC.BAT file

1. Make a system disk that includes a backup copy of both your CONFIG.SYS file and your AUTOEXEC.BAT file.

You can make a system disk by starting File Manager and then choosing Make System Disk from the Disk menu. Then copy your current CONFIG.SYS and AUTOEXEC.BAT files to the disk. (These files are usually located in the root directory of your first hard disk, which is usually drive C.) For more information, see Chapter 4, “File Manager.”

2. Use a text editor such as Notepad to open and edit the files on your hard disk. Do not use an application such as Write to edit these files. Such applications can add characters that prevent MS-DOS from correctly processing the files.
3. Edit the command lines in each file. (For specific information about the command lines in each file, see the sections that follow.)
4. Disable any command lines for unnecessary device drivers and programs by using the **rem** command.

When streamlining your CONFIG.SYS and AUTOEXEC.BAT files, it is better to simply disable command lines than to delete them. That way, if you accidentally disable a command line you really need, you can restore it easily. To disable a command line, insert the **rem** command (for “remark”) at the beginning of the line. For example, to disable the following CONFIG.SYS command line:

```
device=c:\device\smartdrv.exe
```

type **rem** in front of it, as follows:

```
rem device=c:\device\smartdrv.exe
```

5. Save the files.

6. When you have finished editing both files, restart your computer.

If your system does not start properly, insert the system disk you created in step 1 into drive A, and start your computer again. If you know which command line(s) are causing the problem, edit the appropriate file (CONFIG.SYS or AUTOEXEC.BAT) on your hard disk, and restart your computer. Or, to start over, copy the backup version of the file(s) from the system disk to the root directory of your hard disk.

Note If you use the **rem** command to disable command lines in your CONFIG.SYS file, and you are using a version of MS-DOS earlier than 4.0, you'll see a message such as "Unrecognized command in CONFIG.SYS" when you start your computer. Once you are sure that your computer works properly with the command lines disabled, you might want to delete the disabled command lines to avoid the message.

Streamlining the CONFIG.SYS File

The CONFIG.SYS file is a text file that defines MS-DOS device drivers and specifies your MS-DOS configuration. For example, a typical CONFIG.SYS file might specify the location of the MS-DOS file COMMAND.COM, define an extended-memory manager, and specify how many files an application can have open at once. MS-DOS runs the command lines in CONFIG.SYS whenever you start or restart your computer, and runs them before those in your AUTOEXEC.BAT file. (Your CONFIG.SYS file is located in the root directory of your startup drive, which is usually drive C. If you start your system by using a floppy disk, CONFIG.SYS is located in the root directory of that disk.)

You can make more memory available to Windows by removing unnecessary commands from this file.

► To streamline the CONFIG.SYS file

- Disable command lines for any unnecessary device drivers.

Your CONFIG.SYS file should define only device drivers that you absolutely need. (Device drivers are defined by using the DEVICE command.)

Do not disable the HIMEM.SYS command line. When you install Windows, the Setup program adds this command line to your CONFIG.SYS file if your system needs this device driver. For information about the device drivers your system needs, see the section that applies to your system in "Configuring Your System" earlier in this chapter.

- Make sure the **buffers** setting is between 10 and 20.

The buffers command line sets the number of disk buffers that MS-DOS allocates in memory when your computer starts. These buffers allow MS-DOS to

improve disk-access time in certain cases. The larger the number you specify for buffers, the more conventional memory is used up.

Setting buffers to a value higher than 20 might improve disk access time in some cases. However, doing so might also use more memory. If you are using MS-DOS version 5.0 or later, you can set **buffers=30** without using more memory.

- If your CONFIG.SYS file includes the **lastdrive** command, set the last drive to a letter such as **j** or **k**, rather than to **z**. (If you use a network, this may limit the number of network drives you can use simultaneously.)
- If your CONFIG.SYS file contains a **shell** command that specifies your environment space, try specifying a smaller environment. A small environment limits how many environment variables you can define by using the **set** command in MS-DOS, but a large environment could take up memory. Environment space should always be at least 1024 bytes.

Streamlining the AUTOEXEC.BAT File

The AUTOEXEC.BAT file contains commands that MS-DOS runs when you start or restart your computer (immediately after it carries out the commands in your CONFIG.SYS file). Your AUTOEXEC.BAT file is located in the root directory of your first hard disk, which is usually drive C. If you start your system by using a floppy disk, AUTOEXEC.BAT is located in the root directory of that disk.

Typically, an AUTOEXEC.BAT file starts memory-resident programs (such as network software) and sets up environment variables that are used later by applications. In addition, your AUTOEXEC.BAT file might set your MS-DOS prompt or start pop-up programs such as Borland SideKick. You can make more memory available to Windows by removing unnecessary commands from this file.

Leave intact any command lines that start or enable a network.

► To streamline the AUTOEXEC.BAT file

- Disable command lines that start pop-up programs or other memory-resident software. Instead of starting memory-resident programs from AUTOEXEC.BAT, you can start them from within Windows. For more information about running memory-resident software, see the following section, “Conserving Memory When Starting Memory-Resident Programs,” and Chapter 7, “Non-Windows Applications.”

- If you have a RAM drive, you might want to set your TEMP variable to the RAM disk. Doing so can speed up applications that store temporary files in the directory specified by the TEMP variable. For example, if your RAM drive has the drive letter E, you would place the following lines in the AUTOEXEC.BAT file:

```
mkdir e:\temp  
set temp=e:\temp
```

The first command creates the directory \TEMP on the RAM drive. The second command sets the TEMP variable to that directory. For more information about the TEMP variable, see “Using the TEMP Environment Variable” later in this chapter. For more information about RAM drives, see “Using RAMDrive” later in this chapter.

Conserving Memory When Starting Memory-Resident Programs

You need to start some memory-resident programs (such as network software) before starting Windows. This ensures that the programs are available to all applications that you run with Windows. However, starting them before starting Windows takes memory away from non-Windows applications.

There are two ways to conserve memory when starting memory-resident programs:

- If a particular non-Windows application needs a memory-resident program, you can start both the program and the application from the same batch file. This gives the application access to the program and does not take memory away from other applications. For more information about running batch programs with Windows, see “Using a Batch Program to Run Memory-Resident Programs” in Chapter 7, “Non-Windows Applications.”
- If only Windows applications use the memory-resident program, you can start it from the WINSTART.BAT file. WINSTART.BAT contains a batch program that Windows runs after starting in 386 enhanced mode. It is not created by Windows, so if you want to use it, you need to create it and place it in your Windows directory.

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When you start a program from WINSTART.BAT, that program is available to Windows applications but not to non-Windows applications. This prevents the program from taking memory away from non-Windows applications.

Some memory-resident programs do not work when started from WINSTART.BAT. For information, see the documentation that came with the program.

Setting Multitasking Options

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When Windows is running in 386 enhanced mode, you may need to specify how applications share resources. You can do this by using Control Panel.

You use the Scheduling options in the 386 Enhanced dialog box to determine how Windows performs when running more than one application. These options are described in the following table. For information about running more than one non-Windows application, see Chapter 7, "Non-Windows Applications," and Chapter 8, "PIF Editor."

Use	To
Minimum Timeslice	<p>Specify the minimum number of milliseconds an application can run before Windows gives processor control to another application. All Windows applications share one time slice, whereas each non-Windows application gets its own time slice.</p> <p>The smaller the time slice, the more frequently Windows switches between applications. Frequent switching makes running more than one application at a time seem smoother. However, overall system performance declines. Specifying a larger time slice increases the individual application's speed but makes switching between applications more apparent.</p>
Windows In Foreground	<p>Specify the amount of processing time (the proportion of total time slices) usually shared by all Windows applications when a Windows application is the active application. The range of numbers is 1 through 10000.</p> <p>Windows uses this value, and the value specified for the background priority of all non-Windows applications, to allocate processor time accordingly. For more information about setting the background priority for non-Windows applications, see Chapter 8, "PIF Editor."</p> <p>When a non-Windows application is the active (foreground) application, Windows uses the value specified for the Windows In Background option.</p>
Windows In Background	<p>Specify the amount of processing time (the proportion of total time slices) usually shared by all Windows applications when a non-Windows application is running in the foreground. The range of numbers is 1 through 10000.</p>

Use	To
Windows In Background (continued)	Windows uses this value, the value specified for the foreground priority of the active non-Windows application, and the value specified for the background priority of all non-Windows applications that are currently running in the background, to allocate processor time accordingly. For more information about setting the foreground and background priorities for non-Windows applications, see Chapter 8, “PIF Editor.”
Exclusive In Foreground	Specify that Windows always gets 100 percent of the computer’s processing time whenever a Windows application is the active application. In other words, if a Windows application is active in the foreground, non-Windows applications in the background do not run.

Note If the multitasking values for Windows applications and the foreground and background priority values for non-Windows applications do not provide enough processor time for your applications to run efficiently, Windows dynamically changes the multitasking values in Control Panel. For more information about setting the foreground and background priorities for non-Windows applications, see Chapter 8, “PIF Editor.”

Working with Windows Swap Files

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When Windows is running in 386 enhanced mode, Windows frees up memory and speeds things up by swapping information from memory to a *swap file* on your hard disk. A swap file is a file that reserves space on the hard disk for Windows to use for temporarily storing information. During Windows setup, Windows creates a swap file based on the type and amount of available space on your hard disk. The Setup program will create a permanent swap file if it can. Otherwise, Windows creates a temporary swap file whenever you start Windows in 386 enhanced mode.

A temporary swap file is named WIN386.SWP. It is created on your hard disk while Windows is running and deleted when you quit Windows. It can shrink or grow in size as necessary.

A permanent swap file consists of two files, SPART.PAR and 386SPART.PAR. The SPART.PAR file is a read-only file and is located in your Windows directory. 386SPART.PAR is a hidden file and is located in the root directory of the drive displayed under Current Settings in the Virtual Memory dialog box. Do not delete, move, or rename these files.

Using a permanent swap file improves the speed of Windows because the 386SPART.PAR file is contiguous, and accessing a contiguous file generally takes less time than accessing a noncontiguous file.

Note If a version of Windows has already been installed on your hard disk, it's possible that an old version of the 386SPART.PAR swap file still exists. This file takes up hard-disk space that could be utilized as virtual memory. To delete the old version of this file and recover the hard-disk space, choose the 386 Enhanced icon in the Control Panel window, and then choose the Virtual Memory button.

When you install Windows, the Windows Setup program checks to determine whether your hard-disk controller is compatible with the 32-bit disk-access feature. If it is compatible, a check box appears in the Virtual Memory dialog box. If you are using a permanent swap file, the Use 32-Bit Disk Access check box is selected. This feature provides increased performance when you are using MS-DOS Prompt and running non-Windows applications.

Note The Windows version 3.1 swap-file functionality, provided by the 386 Enhanced feature of Control Panel, replaces the Windows version 3.0 Swapfile program.

You can determine if you are using a Windows swap file, and its size and type, by choosing the 386 Enhanced icon in the Control Panel window.

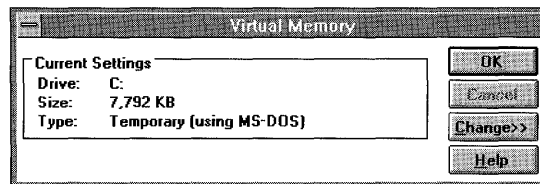
► **To display information about your swap file**

1. In the Main group, choose the Control Panel icon.
2. In the Control Panel window, choose the 386 Enhanced icon.

The 386 Enhanced dialog box appears.

3. Choose the Virtual Memory button.

The Virtual Memory dialog box appears, which displays the current swap-file settings.



Changing Swap-File Settings

You can change the drive location, size, and type of the swap file that Windows is using. Generally, you should leave these set to their default values. However, there might be times when you want to change the settings. For example, if you work with an application that requires a large amount of memory, you might want to create a larger swap file.

► **To change swap-file settings by using Control Panel**

1. In the Main group, choose the Control Panel icon.
2. In the Control Panel window, choose the 386 Enhanced icon.
3. In the 386 Enhanced dialog box, choose the Virtual Memory button.
The Virtual Memory dialog box appears.
4. Choose the Change button.
The Virtual Memory dialog box expands.
5. From the Drive list, select the drive where you want the swap file to be located. For example, if you have a second hard disk drive that has more space, you could select its drive letter.
6. From the Type list, select the type of swap file you want to use. If you choose None, Windows will not use a swap file the next time you start Windows.
7. In the New Size box, type the size in kilobytes for the new swap file, or press ENTER to accept the size recommended by Windows.
8. To turn on or off 32-bit disk access, select the Use 32-Bit Disk Access check box.

Caution Using 32-bit disk access may be unreliable on some battery-powered portable computers when the computer's power-saving features are enabled.

9. Choose the OK button.
After you make changes in the Virtual Memory dialog box and choose the OK button, a dialog box appears telling you to restart Windows so that your changes will take effect.
10. Choose the Restart button. Do not press CTRL+ALT+DEL.

For help with the Virtual Memory dialog box, choose the Help button or press F1 while using the dialog box.

Note If you run Windows in 386 enhanced mode, you can conserve disk space by preventing Windows from swapping any information to the disk. You should not prevent swapping unless disk space is at a premium, because swapping can

increase the number of applications you can run at one time. To prevent Windows from swapping, select None in the Type box in the New Settings area of the expanded Virtual Memory dialog box.

Working with Application Swap Files

When you start a non-Windows application in standard mode, Windows creates a temporary *application swap file* for that application. (Windows does not use application swap files in 386 enhanced mode.) When you switch from the application, Windows moves some or all of the application from memory to the application swap file. This makes the memory available to other applications. When you quit the application, Windows deletes the application swap file.

Application swap files are hidden files with names that start with the characters ~WOA. Windows puts these files in the directory specified by the **swapidisk** setting in your SYSTEM.INI file. If the **swapidisk** setting is not specified, Windows places the files in the directory specified by the TEMP environment variable in your AUTOEXEC.BAT file. If there is no TEMP environment variable specified, Windows places swap files in the root directory of the first hard disk (or first floppy disk drive, if you start your system from a floppy disk). For information about using the TEMP environment variable, see “Using the TEMP Environment Variable” later in this chapter.

The location Windows uses to store application swap files can affect the time it takes to switch to and from non-Windows applications.

Basic Recommendations

- Usually, it is not a good idea to set **swapidisk** to a RAM drive. If the **swapidisk** setting or the TEMP environment variable specifies a RAM drive, when Windows tries to swap application information from memory to disk, Windows instead swaps it to another area of memory. This is only useful if you have much more memory than you require for running applications. For more information, see “Using RAMDrive” later in this chapter.
- Set the **swapidisk** setting to a hard disk with at least 512K of free disk space. If you have more than one hard disk, set **swapidisk** to the disk with the most free space.

The more disk space Windows can use for application swap files, the more non-Windows applications you can run at one time.

- If you have more than one hard disk and the disks differ in speed, set the **swapidisk** setting to the fastest disk (provided it has enough free space).

► **To change the location Windows uses for application swap files**

1. Open your SYSTEM.INI file by using a text editor such as Notepad. Make sure that you don't use an application such as Write to edit this file. Such applications can add characters that prevent MS-DOS from correctly processing the file.

Your SYSTEM.INI file is located in your Windows directory.

2. Find or add the [NonWindowsApp] section of the file.

If you're using Notepad, you can find this section by choosing Find from the Search menu, typing [NonWindowsApp] and then choosing the OK button.

3. Add or change the **swapdisk** setting.

Set **swapdisk** to the directory and drive you want.

For example, if you want Windows to create application swap files in the TEMPFILE directory on drive D, type the following:

swapdisk=d:\tempfile

4. Save your SYSTEM.INI file.
5. Quit and restart Windows.

For more information about SYSTEM.INI settings, use Write to open the SYSINI.WRI file located in the Windows directory.

Using SMARTDrive

SMARTDrive is a disk-caching program provided with Windows. SMARTDrive saves information read from your hard disk in a *disk cache* in your computer's extended memory. When an application tries to read that information from the hard disk, SMARTDrive supplies the information directly from memory instead.

SMARTDrive also temporarily stores information to be written to disk in the disk cache. SMARTDrive later writes this information to the hard disk, when system resources are in less demand.

You start SMARTDrive by typing the **smartdrv** command at the MS-DOS prompt before you start Windows, or by adding a command line to your AUTOEXEC.BAT file. When you install Windows, the Setup program adds the **smartdrv** command to your AUTOEXEC.BAT file. For information about using the command, see the following sections, "Installing SMARTDrive" and "Using the SMARTDrive Command Line."

Windows runs much faster when using a disk cache. It is recommended that you use SMARTDrive if your system has a hard disk and at least 2 MB of memory. Because how you set up SMARTDrive depends on the applications you run and your system memory configuration, there is no single “best setting” for SMARTDrive. After installing SMARTDrive, you might want to experiment to find the best settings for your system.

Installing SMARTDrive

When you install Windows, the Setup program copies the SMARTDrive file to your hard disk and adds the **smartdrv** command line to your AUTOEXEC.BAT file. If, for some reason, Setup did not install SMARTDrive on your system, or if you later removed SMARTDrive, you can install it by using the following procedure.

► To install SMARTDrive

1. Make a backup copy of your AUTOEXEC.BAT file.
2. Open your AUTOEXEC.BAT file by using a text editor such as Notepad.
3. Add the command line for SMARTDrive to your AUTOEXEC.BAT file.

For example, the following command line would work well on a system with at least 2 MB of memory. It tells MS-DOS to create a disk cache, the size of which depends on your system's memory configuration.

c:\windows\smartdrv

When you don't specify any options, SMARTDrive uses the default values. For information about SMARTDrive command-line options and default values, see the following section, “Using the SMARTDrive Command Line.”

4. Disable or remove any other command lines for disk-caching software.
5. Save the changes to your AUTOEXEC.BAT file.
6. Quit Windows, and then restart your computer.

Note If you have a SCSI (small computer system interface) hard disk, you may need to use the double-buffering feature of SMARTDrive. For more information, see “Using Double Buffering” later in this chapter.

Using the SMARTDrive Command Line

You can start the SMARTDrive program by typing **smartdrv** at the MS-DOS prompt before you start Windows, or by placing a command line in your AUTOEXEC.BAT file. The SMARTDrive command line has the following form:

```
[drive:][path]smartdrv.exe [[drive[+|-]]...] [/e:ElementSize]
[InitCacheSize [WinCacheSize]] [/b:BufferSize] [/c] [/r] [/l] [/q] [/s] [/?]
```

An explanation of each part of the command line follows.

Use this value	To
<i>drive</i>	Specify the letter of the disk drive for which you want to control caching. If you don't specify a drive letter, floppy disk drives are read-cached but not write-cached, hard disk drives are read- and write-cached, and CD-ROM and network drives are ignored. You can specify multiple disk drives.
<i>path</i>	Specify the location of the SMARTDRV.EXE file.
<i>+ -</i>	Enable (+) or disable (-) caching. Use the plus (+) and minus (-) signs to override the default settings. If you specify a drive letter without a plus or minus sign, read-caching is enabled and write-caching is disabled. If you specify a drive letter followed by a plus sign (+), read- and write-caching are enabled. If you specify a drive letter followed by a minus sign (-), read- and write-caching are disabled.
<i>/e:ElementSize</i>	Specify in bytes the amount of the cache that SMARTDrive moves at a time. Valid values are 1024, 2048, 4096, and 8192. The default value is 8192.
<i>InitCacheSize</i>	Specify the size in kilobytes of the cache when SMARTDrive starts (before Windows is running). The size of the disk cache affects how efficiently SMARTDrive runs. In general, the larger the cache, the less often SMARTDrive needs to read information from the disk, which speeds up your system's performance. If you do not specify an <i>InitCacheSize</i> value, SMARTDrive sets the value according to how much memory your system has (see the table below this list).
<i>WinCacheSize</i>	Limit to what amount (in kilobytes) Windows can reduce the cache size. Windows reduces the size of the cache to recover memory for its own use. Windows and SMARTDrive then cooperate to provide optimum use of your system memory. When you quit Windows, Windows restores the cache to its normal size. The default value depends on how much available memory your system has (see the table below this list). If you specify a value for <i>InitCacheSize</i> that is smaller than the value specified for <i>WinCacheSize</i> , <i>InitCacheSize</i> is set to the same size as <i>WinCacheSize</i> .

Use this value	To
<i>/b:BufferSize</i>	Specify the size of the read-ahead buffer. A read-ahead buffer is additional information that SMARTDrive reads when an application reads information from the hard disk. For example, if an application reads 512K of information from a file, SMARTDrive then reads the amount of information specified by <i>BufferSize</i> and saves it in memory. The next time the application needs to read information from that file, it can read it from memory instead. The default size of the read-ahead buffer is 16K. Its value can be any multiple of <i>ElementSize</i> .
<i>/c</i>	Write all cached information from memory to the hard disk. SMARTDrive writes information from memory to the hard disk at times when other disk activity has slowed. You might use this option if you are going to turn off your computer and want to make sure all cached information has been written to the hard disk.
<i>/r</i>	Clear the contents of the existing cache and restart SMARTDrive.
<i>/l</i>	Prevent SMARTDrive from loading into upper memory blocks (UMBs), even if there are UMBs available. You can use this option if you are using MS-DOS version 5.0 or later and UMBs are enabled.
<i>/q</i>	Prevent the display of SMARTDrive information on your screen.
<i>/s</i>	Display additional information about the status of SMARTDrive.
<i>/?</i>	Display online Help about the SMARTDrive command and options.

The following table shows what the default values for *InitCacheSize* and *WinCacheSize* will be, depending on the amount of available extended memory your computer has.

Extended Memory	InitCacheSize	WinCacheSize
Up to 1 MB	All extended memory	Zero (no caching)
Up to 2 MB	1 MB	256K
Up to 4 MB	1 MB	512K
Up to 6 MB	2 MB	1 MB
6 MB or more	2 MB	2 MB

Caution Check that SMARTDrive has completed all write-caching before you turn off your computer. To make sure this has happened, type **smartdrv /c** at the MS-DOS prompt. After all disk activity has stopped, you can safely turn off your computer.

Using Double Buffering

If you have a SCSI (small computer system interface) hard disk, you may need to use the double-buffering feature of SMARTDrive. Double buffering provides compatibility for hard-disk controllers that cannot work with virtual memory.

When you run Setup, it places a SMARTDrive command line in the AUTOEXEC.BAT file. The command line in the AUTOEXEC.BAT file is required in order for you to use SMARTDrive. If necessary, Setup also places a command line in the CONFIG.SYS file. The command line in the CONFIG.SYS file is required in order for you to use the double-buffering feature of SMARTDrive. The command line in the CONFIG.SYS file takes the following form:

```
device=c:\windows\smartdrv.exe /double_buffer
```

Most hard-disk controllers do not need to use double buffering. Therefore, Setup does not add the command to the CONFIG.SYS file in most cases. When Setup is unable to determine whether double buffering is required, it adds the command line to the CONFIG.SYS file.

If your computer does not require double buffering, you can remove the command line from the CONFIG.SYS file.

► **To determine whether you can remove the SMARTDrive command line from CONFIG.SYS**

1. Make sure the SMARTDrive driver has been loaded using the CONFIG.SYS command line and that double buffering is enabled.
2. In the Main group, choose the MS-DOS Prompt icon.
3. At the MS-DOS prompt, type **smartdrv** and then press ENTER.
SMARTDrive displays information about your system.
4. Look at the column labeled “Buffering.” If every line in this column reads “no,” you can remove the **device=c:\windows\smartdrv.exe /double_buffer** command line from your CONFIG.SYS file.

Using the TEMP Environment Variable

Many applications use temporary files to store data while they’re running. Some applications store temporary files in the directory specified by the TEMP (or TMP) environment variables. For information about how a particular application stores temporary files, see the documentation that came with the application.

You set an environment variable by using the **set** command in MS-DOS. Typically, the **set** command is in the AUTOEXEC.BAT file. For example, the following command line sets the TEMP variable to the C:\TEMPFILE directory:

```
set temp=c:\tempfile
```

Setting the TEMP variable affects only those applications that check for the value of TEMP.

Note Some applications check for the value of TMP instead of or in addition to TEMP. In this case, you would also specify **set tmp=c:\tempfile** in the AUTOEXEC.BAT file.

Because MS-DOS allows you to create only a limited number of files in the root directory of a disk, but lets you create as many files as you need within a subdirectory, you should set the TEMP variable to a subdirectory.

The location you specify for temporary files can affect the speed of applications that use the TEMP variable. If you have more than one hard disk, you should specify that temporary files be stored on the fastest hard disk.

If you use RAMDrive, you might want to set the TEMP variable to your RAM drive. Because it's much faster to read information from memory than from a hard disk, an application that uses temporary files might run faster if it stores its temporary files on a RAM drive. Because most applications delete their temporary files when they're finished using them, you don't need to worry about saving copies of those files before turning off your computer. However, if your applications require large amounts of space for temporary files, making a RAM drive large enough for their use might take up too much memory. This could prevent Windows from running or could make your entire system run more slowly.

Windows sometimes places application swap files in the directory specified by the TEMP variable. For more information about application swap files, see "Working with Application Swap Files" earlier in this chapter.

Using MS-DOS Memory Managers

To use your computer's extended or expanded memory, you must install a memory manager. A memory manager is a device driver that provides access to a particular type of memory. The following sections describe how to use several MS-DOS memory managers.

Using the HIMEM Extended-Memory Manager

HIMEM is an extended-memory manager—a program that coordinates the use of your system's extended memory so that no two applications use the same memory at the same time.

You install HIMEM by adding the HIMEM command line to your CONFIG.SYS file. The HIMEM command line must come before any command lines for applications or device drivers that use extended memory.

Note You should always use the version of HIMEM that came with the version of Windows you are using.

Using the HIMEM Command Line

The HIMEM command line has the following form:

```
device=[drive:][path]himem.sys [/hmamin=m] [/numhandles=n] [/int15=xxxx]  
[/shadowram:on/off] [/machine:name] [/a20control:on/off] [/cpuclock:on/off]
```

An explanation of each part of the command line follows. In most cases you won't need to specify command-line options—the default values are designed to work with most hardware.

Use this value	To
device=	Install a device driver—in this case, HIMEM. You must include this part of the command line.
[drive:][path]himem.sys	Specify the location of the HIMEM program file. For example, if HIMEM.SYS is in the root directory of drive C, type c:\himem.sys . HIMEM.SYS should always be located on the same drive that contains your MS-DOS files. If the HIMEM.SYS file is in the root directory of your startup drive, you don't need to include a path. However, you must always include the filename (HIMEM.SYS).
/hmamin=<i>m</i>	Specify how many kilobytes of memory an application must require for HIMEM to give that application use of the high memory area (HMA). Only one application can use the HMA at a time; HIMEM allocates the HMA to the first application that meets the memory-use requirements set by this option. You can specify a value from 0 to 63. Set /hmamin to the amount of memory required by the application that uses the most HMA memory.

Use this value	To
/hmamin=<i>m</i> <i>(continued)</i>	<p>The /hmamin option is not required; the default value is zero. Omitting this option (or setting it to zero) specifies that HIMEM allocate the HMA to the first application that requests it, regardless of how much of the HMA the application is going to use.</p> <p>The /hmamin option has no effect when Windows is running in 386 enhanced mode.</p>
/numhandles=<i>n</i>	<p>Specify the maximum number of extended-memory block (EMB) handles that can be used simultaneously. You can specify a value from 1 to 128; the default value is 32. Each additional handle requires an additional 6 bytes of memory.</p> <p>The /numhandles option has no effect when Windows is running in 386 enhanced mode.</p>
/int15=<i>xxxx</i>	<p>Allocate the amount of extended memory (in kilobytes) to be reserved for the Interrupt 15h interface. Some older applications use the Interrupt 15h interface to allocate extended memory rather than using the XMS (eXtended-Memory Specification) method provided by HIMEM. If you use these applications, you can ensure enough memory is available to them by setting <i>xxxx</i> to 64 KB larger than the amount required by the application.</p> <p>You can specify a value from 64 to 65535; however, you cannot specify more memory than your system has available. If you specify a value less than 64, the value becomes 0. The default value is 0.</p>
/shadowram:on/off	<p>Specify whether to disable shadow RAM. Some computers make ROM code run faster by “shadowing” it in RAM—that is, by copying the ROM code into faster RAM memory at startup. However, this uses some extended memory. Usually, on computers that use shadow RAM and have less than 2 MB of RAM, HIMEM attempts to disable shadow RAM to recover additional extended memory for Windows to use. (HIMEM can disable shadow RAM only on certain types of systems.) When HIMEM disables shadow RAM, the ROM code runs in the slower ROM instead of RAM; therefore, your computer might run slightly slower.</p> <p>To leave the ROM code running from RAM, even on systems with less than 2 MB of memory, include the value /shadowram:on. To have HIMEM disable shadow RAM, include the value /shadowram:off.</p>

Use this value**To*****/machine:name***

Specify what type of computer you are using. Usually, HIMEM can detect your system type successfully; however, there are a few computers that HIMEM cannot detect. On such systems, HIMEM uses the default system type (IBM AT or compatible). You might need to include the ***/machine*** option if your computer is a type that HIMEM cannot detect and if HIMEM does not work properly on your system by using the default system type. Currently, systems that require this option include Acer 1100, Wyse, and IBM 7552.

The value for *name* can be any of the codes or their equivalent numbers listed in the following table.

Code	Number	Computer type
at	1	IBM AT or 100% compatible
ps2	2	IBM PS/2
ptlcascade	3	Phoenix Cascade BIOS
hpvectra	4	HP Vectra (A & A+)
att6300plus	5	AT&T 6300 Plus
acer1100	6	Acer 1100
toshiba	7	Toshiba 1600 & 1200XE
wyse	8	Wyse 12.5 Mhz 286
tulip	9	Tulip SX
zenith	10	Zenith ZBIOS
at1	11	IBM PC/AT
at2	12	IBM PC/AT (alternative delay)
css	12	CSS Labs
at3	13	IBM PC/AT (alternative delay)
philips	13	Philips
fasthp	14	HP Vectra
ibm7552	15	IBM 7552 Industrial Computer
bullmicral	16	Bull Micral 60

Use this value	To
/a20control:on off	Specify whether HIMEM is to take control of the A20 line even if A20 was on when HIMEM was loaded. The A20 handler gives your computer access to the HMA. If you specify /a20control:off , HIMEM takes control of the A20 line only if A20 was off when HIMEM was loaded. The default setting is /a20control:on .
/cpuclock:on off	Specify whether HIMEM is to affect the clock speed of your computer. If your computer's clock speed changes when you install HIMEM, specifying /cpuclock:on may correct the problem; however, enabling this option slows down HIMEM. The default setting is /cpuclock:off .

Sample HIMEM Command Lines

This section shows three sample HIMEM command lines and explains what they do.

Sample One: Running HIMEM with Default Values The following command line runs HIMEM by using the default values:

```
device=himem.sys
```

The command line does not include a path for HIMEM.SYS; therefore, MS-DOS searches for the HIMEM.SYS file only in the root directory of your startup drive. Because this command line does not include additional options, HIMEM uses the default values for those options. HIMEM allocates the HMA to the first application that requests it and allows the simultaneous use of up to 32 extended-memory handles.

Sample Two: Controlling Use of the HMA with HIMEM The following command line specifies that an application can access the HMA only if that application uses at least 40K of memory:

```
device=c:\himem.sys /hmamin=40
```

The command line specifies that the HIMEM.SYS file is located in the root directory on drive C. Because no other options are specified, HIMEM uses the remaining default values.

Sample Three: Increasing the Number of Memory Handles that HIMEM Provides

The following command line specifies that up to 128 extended-memory handles can be used simultaneously.

```
device=c:\devices\himem.sys /numhandles=128
```

The command line specifies that the HIMEM.SYS file is located in the DEVICES directory on drive C and that HIMEM supports a maximum of 128 handles.

Using RAMDrive

RAMDrive is a memory-resident program that enables you to use part of your system memory as if it were a hard disk drive. This memory area is called a *RAM drive* because it exists in random access memory (RAM). RAM drives are much faster than hard disk drives because your computer can read information faster from memory than from a hard disk. A RAM drive appears to be a normal hard disk drive; you can use it just as you would any hard disk drive. The most important difference between a real disk drive and a RAM drive is that because it exists only in memory, information on a RAM drive is lost when you turn off or restart your computer.

Basic Recommendations

- Install RAMDrive only if you really need a RAM drive. In many cases, using the same amount of memory for a disk cache such as SMARTDrive improves your system's speed more than RAMDrive would.
- You might want to install RAMDrive if you use a diskless workstation on a network, and the workstation has plenty of memory.
- You might also want to install RAMDrive if you often run applications that use many small temporary files. In that case, set up a RAM drive of about 256K, and set your TEMP environment variable to the RAM drive. For more information, see "Using the TEMP Environment Variable" earlier in this chapter.

Note You should always use the version of RAMDrive that came with the version of Windows you are using.

Setting Up RAMDrive

When you set up Windows, the Setup program puts a copy of the RAMDRIVE.SYS file in your Windows directory.

► To set up RAMDrive

1. Configure your system memory for optimum efficiency with Windows.
For more information, see “Configuring Your System” earlier in this chapter.
2. Make a system disk that includes a backup copy of your CONFIG.SYS file.
You can make a system disk by starting File Manager and then choosing Make System Disk from the Disk menu. Then copy your current CONFIG.SYS file to the disk. For more information about performing these tasks, see Chapter 4, “File Manager.”
3. Open your CONFIG.SYS file by using a text editor such as Notepad.
Your CONFIG.Sys file is usually located in the root directory of your hard disk.
4. Add a command line for RAMDRIVE.SYS to your CONFIG.SYS file.

The command line specifies the location of the RAMDRIVE.SYS file and how much memory to allocate to RAMDrive. The following is a typical RAMDrive command line:

```
device=c:\windows\ramdrive.sys 256 /e
```

This command line allocates 256K of extended memory to RAMDrive and specifies that RAMDRIVE.SYS is in the Windows directory on drive C. For more information about command-line options, see the following section, “Using the RAMDrive Command Line.”

If you run RAMDrive in extended memory, the RAMDRIVE.SYS command line must come after the command line that starts HIMEM.SYS.

5. Save the changes to your CONFIG.SYS file.
6. Restart your computer.

Once your computer has started, you can access the RAM drive by typing at the MS-DOS prompt the drive letter that was assigned to it. RAM drives are assigned the next available drive letter.

Using the RAMDrive Command Line

The RAMDrive command line has the following form:

```
device=[drive:][path]ramdrive.sys [DiskSize [SectorSize [NumEntries]]] [/e/a]
```

An explanation of each part of the command line follows.

Use this value	To
device=	Install a device driver—in this case, RAMDrive. You must include this part of the command line.
<i>[drive:]</i> <i>[path]</i> ramdrive.sys	Specify the path of the RAMDrive program file. For example, if RAMDRIVE.SYS is in the WINDOWS directory on drive C, type c:\windows\ramdrive.sys . If the RAMDRIVE.SYS file is in the root directory of your startup drive, you don't need to include a path. However, you must always include the filename (RAMDRIVE.SYS).
<i>DiskSize</i>	Specify how many kilobytes of memory you want to use for the RAM disk. For example, to create a 640K RAM drive, specify 640 . If you don't specify an amount, RAMDrive will create a 64K RAM drive. You can specify a value from 4 to 32767. However, you cannot specify more memory than your system has available.
<i>SectorSize</i>	Specify the sector size in bytes. The size can be 128, 256, or 512 bytes. (If you include a <i>SectorSize</i> value, you must also include a value for <i>DiskSize</i> .) Generally, you should use the default sector size of 512 bytes.
<i>NumEntries</i>	Limit the number of files and directories you can create in the RAM drive's root directory. The limit can be from 2 to 1024 entries; the limit you specify is rounded up to the nearest sector size boundary. If you do not specify a limit, you can create up to 64 entries in the RAM drive's root directory. (If you include a value for <i>NumEntries</i> , you must also include values for <i>DiskSize</i> and <i>SectorSize</i> .) If there is not enough memory to create the RAM drive as specified, RAMDrive will try to create it with a limit of 16 directory entries. This may result in a RAM drive with a different limit from the one you specified.
/e	Create the RAM drive in extended memory. For RAMDrive to use extended memory, your system must be configured so that it provides extended memory, and the command line for the extended-memory manager (such as HIMEM.SYS) must appear in your CONFIG.SYS file <i>before</i> the RAMDrive command line. In general, it is best to create a RAM drive in extended memory if your system has extended memory.

Use this value	To
/a	<p>Create the RAM drive in expanded memory.</p> <p>For RAMDrive to use expanded memory, your system must be configured so that it provides expanded memory, and the command line for the expanded-memory manager (such as EMM386, 386MAX, CEMM, or QEMM) must appear in your CONFIG.SYS file <i>before</i> the RAMDrive command line.</p>

Although specifying a memory type is optional, it is highly recommended. If you omit both the /a and the /e options, RAMDrive uses your system's conventional memory. It is not a good idea to use conventional memory for a RAM drive, as doing so impacts the performance of Windows.

Using Other Memory-Disk Programs with Windows

Although you can use other memory-disk programs in conjunction with Windows, it is best to use RAMDrive. When you run RAMDrive in extended memory, it cooperates with the version of HIMEM that comes with Windows.

Using Expanded Memory

If your system has expanded memory that meets the Lotus/Intel/Microsoft (LIM) Expanded Memory Specification (EMS) standard, Windows running in standard mode can use that expanded memory when running non-Windows applications that require expanded memory. Windows running in 386 enhanced mode does not use expanded memory. If you want to run applications that require expanded memory in 386 enhanced mode, you need to convert the expanded memory to extended memory and then use the EMM386 expanded-memory emulator.

If your system has no expanded memory, but you have a non-Windows application that requires it, you can do one of the following:

386

- You can run the application in 386 enhanced mode. When running in 386 enhanced mode, Windows can simulate expanded memory for applications that need it.
- You can run the application in standard mode, using EMM386 to simulate expanded memory. For more information, see the following section, "Installing the EMM386 Expanded-Memory Emulator."

If you have an 80286 computer and a non-Windows application that requires expanded memory, you need an expanded-memory board. You also need to be sure that the expanded-memory manager that came with your expanded-memory

board is installed. For more information, see the documentation that came with your expanded-memory board.

Installing the EMM386 Expanded-Memory Emulator

If you are running Windows in standard mode on an 80386 or 80486 computer that has no expanded memory, and you have a non-Windows application that requires expanded memory in order to run, you need to install an *expanded-memory emulator*. An expanded-memory emulator is a program that simulates expanded memory. Windows includes the expanded-memory emulator EMM386. When you set up Windows, the Setup program copies the EMM386.EXE file to your Windows directory.

► To install EMM386

1. Configure your system memory for optimum efficiency with Windows. For more information, see “Configuring Your System” earlier in this chapter.
2. Make a system disk that includes a backup copy of your CONFIG.SYS file.
You can make a system disk by starting File Manager and then choosing Make System Disk from the Disk menu. Then copy your current CONFIG.SYS file to the disk. For more information about performing these tasks, see Chapter 4, “File Manager.”
3. Open your CONFIG.SYS file by using a text editor such as Notepad.
Your CONFIG.SYS file is usually located in the root directory on your hard disk.
4. Add a command line for EMM386 to your CONFIG.SYS file.
The following is a typical EMM386 command line:
device=c:\windows\emm386.exe 512
This command allocates 512K of memory to EMM386 and specifies that EMM386.EXE is in the WINDOWS directory on drive C. For more information about command-line options, see the following section, “Using the EMM386 Command Line.”
The EMM386 command line must come after the command line that starts HIMEM, but before any command lines for programs that use expanded memory.
5. Disable or remove any other command lines for expanded-memory-management software.
6. Save the changes to your CONFIG.SYS file.
7. Restart your computer.

Note If possible, you should use the version of EMM386 that came with the version of Windows you are using.

Using the EMM386 Command Line

The EMM386 command line has the following form in the CONFIG.SYS file:

```
device=[drive:][path]emm386.exe [onofflauto] [/nohigh] [memory]
[MemoryOptions]
```

An explanation of each part of the command line follows.

Use this value	To
device=	Install a device driver—in this case, EMM386. You must include this part of the command line.
[drive:][path]emm386.exe	Specify the location of the EMM386 program file. For example, if EMM386.EXE is in the WINDOWS directory on drive C, type c:\windows\emm386.exe . If the EMM386.EXE file is in the root directory of your startup drive, you don't need to include a path. However, you must always include the filename (EMM386.EXE).
[onofflauto]	Activate EMM386 if set to on , suspend EMM386 if set to off , or place EMM386 in auto mode if set to auto . Auto mode enables expanded-memory support only when a program calls for it. The default value is on . Use the emm386 command at the MS-DOS prompt to change this value after EMM386 has started.
/nohigh	Specify that no part of EMM386 is loaded into upper memory blocks (UMBs). By default, a portion of EMM386 is loaded into UMBs. If UMB space is at a premium, use this option to save approximately 3K of UMB space.
memory	Specify how many kilobytes of memory you want EMM386 to use. For example, to give EMM386 640K of memory, specify 640 . You can specify a value from 16 to 32768. (EMM386 rounds the value down to the nearest multiple of 16.) However, you cannot specify more extended memory than your system has available. This value is optional; if you don't specify an amount, EMM386 uses 256K of memory.
MemoryOptions	Fine-tune the way EMM386 uses memory. You can use the EMM386 memory options to control the location of the EMS page frame, determine how EMM386 uses certain addresses, and so on. For more information, see the following section, "Specifying EMM386 Memory Options."

Specifying EMM386 Memory Options Under most circumstances, you don't need to specify memory options on the EMM386 command line, because EMM386 usually runs properly by using the default values.

However, in some cases, you may want to control how EMM386 uses memory—for example, where EMM386 puts the EMS page frame, or which addresses it can use for EMS pages. EMM386 provides several command-line options that you can use to fine-tune the way it uses memory. You can use as many of these options as you want, in any order you want. Be sure to include the options you want after the EMM386 path and memory amount (if any).

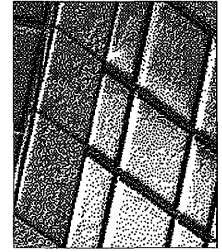
An explanation of each EMM386 memory option follows.

Use this option	To														
w=on w=off	Enable or disable support for the Weitek Coprocessor. To enable support, include the value w=on in the command line. To disable support, include the value w=off instead. By default, Weitek Coprocessor support is disabled.														
frame=address	Specify the base address of the 64K page frame. You can specify values in the ranges 8000h through 9000h and C000h through E000h, in increments of 400h. Usually, you do not need to specify a base address; by default, EMM386 uses a contiguous 64K region of memory, and does not place the page frame below C000:0000. However, sometimes it is not possible to identify adapter memory absolutely. If a conflict occurs, you may need to ensure that EMM386 places the page frame at a particular location. You can also use the frame option to specify a more specific base address. For example, to place the page frame at C800:0000, type frame=C800 on the EMM386 command line. If you use the frame option, you cannot use the m option or the /p option.														
mx	Specify the address of the page frame. You can specify a value from 1 through 14. The following list shows each value and its associated base address in hexadecimal: <table style="margin-left: 40px;"> <tbody> <tr> <td>1 => C000h</td> <td>8 => DC00h</td> </tr> <tr> <td>2 => C400h</td> <td>9 => E000h</td> </tr> <tr> <td>3 => C800h</td> <td>10 => 8000h</td> </tr> <tr> <td>4 => CC00h</td> <td>11 => 8400h</td> </tr> <tr> <td>5 => D000h</td> <td>12 => 8800h</td> </tr> <tr> <td>6 => D400h</td> <td>13 => 8C00h</td> </tr> <tr> <td>7 => D800h</td> <td>14 => 9000h</td> </tr> </tbody> </table>	1 => C000h	8 => DC00h	2 => C400h	9 => E000h	3 => C800h	10 => 8000h	4 => CC00h	11 => 8400h	5 => D000h	12 => 8800h	6 => D400h	13 => 8C00h	7 => D800h	14 => 9000h
1 => C000h	8 => DC00h														
2 => C400h	9 => E000h														
3 => C800h	10 => 8000h														
4 => CC00h	11 => 8400h														
5 => D000h	12 => 8800h														
6 => D400h	13 => 8C00h														
7 => D800h	14 => 9000h														

Use this option	To
mx (<i>continued</i>)	Values ranging from 10 through 14 should be used only on computers with 512K of memory. If you use the m option, you cannot use the frame option or the /p option.
/pmmmm	Specifies the address of the page frame. Valid values for <i>m</i> are in the ranges 8000h through 9000h and C000h through E000h, in increments of 400h. If you use the /p option, you cannot use the frame option or the m option.
pn=address	Define the segment address of a specific page. The p option has the form pn=address , in which <i>n</i> is the number of the page you are specifying, and <i>address</i> is the segment address. For example, to place page 4 at the address CC00, type p4=CC00 on the EMM386 command line. Valid values for <i>n</i> are in the range 0 through 255. Valid values for <i>address</i> are in the ranges 8000h through 9C00h and C000h through EC00h, in increments of 400h. The addresses for pages 0 through 3 must be contiguous in order to maintain compatibility with version 3.2 of the LIM EMS. If you use the frame , m , or /p option, you cannot use the p option to specify addresses for pages 0 through 3.
x=mmmm-nnnn	Prevent EMM386 from using a particular range of addresses for an EMS page. To specify the range, include this option on the command line, followed by the range of addresses you want to exclude. Valid values for <i>m</i> and <i>n</i> are in the range A000h through FFFFh and are rounded down to the nearest 4-kilobyte boundary. For example, to prevent EMM386 from using segments A000:0000 through B000:0000, type the value x=A000-B000 on the command line. The x option takes precedence over the i option if the two ranges overlap.
i=mmmm-nnnn	Specify a range of segment addresses to be used (included) for an EMS page or for RAM. Valid values for <i>m</i> and <i>n</i> range from A000h through FFFFh and are rounded down to the nearest 4-kilobyte boundary. The x option takes precedence over the i option if the two ranges overlap.
b=address	Specify the lowest address available for EMS "banking" (swapping of 16-kilobyte pages). Valid values are in the range 1000h through 4000h. By default, 4000:0000 is the lowest address. To specify a different low address, include this option on the command line, followed by the address you want. For example, to make 3000:0000 the lowest address, include the value b=3000 .

Use this option	To
L= <i>minXMS</i>	Ensure that the specified amount of extended memory will still be available after EMM386 is loaded. Specify the amount of memory in kilobytes. For example, to ensure that 640K of extended memory will be available after loading EMM386, type the value L=640 on the command line.
a= <i>altregs</i>	Specify how many fast alternate register sets you want to allocate to EMM386. For example, to allocate 16 register sets to EMM386, type the value a=16 on the command line. You can specify a number from 0 to 254; the default setting is 7 sets. Every alternate register set adds about 200 bytes to the size in memory of EMM386.EXE.
h= <i>handles</i>	Specify how many handles EMM386 can use. For example, to let EMM386 use 127 handles, type the value h=127 on the command line. You can specify from 1 to 255 handles; the default setting is 64.
d= <i>nnn</i>	Specify how many kilobytes of memory should be reserved for buffered direct memory access (DMA). This value should reflect the largest DMA transfer that will occur while you use EMM386.EXE, not counting floppy disk DMA. You can specify from 16 to 256 kilobytes; the default setting is 16.
ram	Provide access to both expanded memory and the upper memory area. This option is valid only if you are running MS-DOS version 5.0 or later.
noems	Provide access to the upper memory area but prevent access to expanded memory that conforms to the LIM specification version 3.2. This option is valid only if you are running MS-DOS version 5.0 or later.

Maintaining Windows with Setup



Chapter 15

When you first set up the Microsoft Windows operating system, you ran the Windows Setup program. During this process, you provided Windows with information about the hardware and software you use.

If you make additions or changes to this hardware or software, you need to inform Windows by running the Setup program again. In most instances, you can run it from within Windows. Other situations require you to run Setup from outside Windows. This chapter describes how to use Setup to maintain Windows.

Running Setup from Windows

By running the Setup program from within Windows, you can:

- Change some of the hardware options you specified when you first set up Windows. This can include installing a device driver — for a display (monitor), keyboard, mouse, or network — that is not supplied with Windows.
- Install other device drivers not supplied with Windows version 3.1.
- Set up applications already on your hard disk so that you can use them with Windows.
- Add or remove optional Windows components.

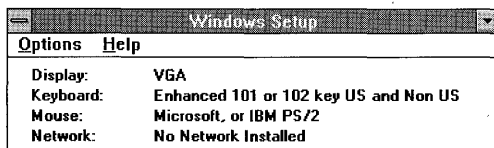
To install printer drivers, use Windows Print Manager. For more information, see Chapter 6, “Print Manager.” To install multimedia drivers, use Windows Control Panel. For more information, see Chapter 5, “Control Panel.”

Caution Before running a setup program for any other Microsoft application, you must quit Windows Setup. Otherwise, the application’s setup program may fail. Also, it is a good idea to quit all your running applications before you start Setup. This is because you must restart Windows or your computer after using the Setup program in order for the changes to take effect.

► **To run the Setup program from within Windows**

- In the Main group, choose the Windows Setup icon. (Double-click the icon. Or use the arrow keys to move the selection cursor to the icon, and then press ENTER.)

The Windows Setup window appears. It lists your current hardware and software settings.



Changing Settings

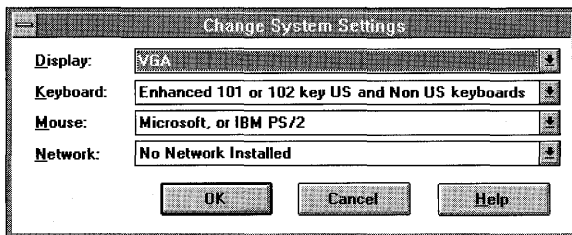
You might want to add a mouse to your system, upgrade the display (monitor) you specified when you first ran the Setup program, or make other changes to your hardware.

For information about changing to a driver not supplied with Windows, see the next section, "Installing a Device Driver Not Supplied with Windows Version 3.1."

► **To change your display, keyboard, mouse, or network**

1. Be sure your hardware is set up to match the setting to which you are changing.
2. From the Options menu, choose Change System Settings.

The Change System Settings dialog box appears.



3. Open the list for the setting that you want to change by clicking the arrow at the right of the list. Or press TAB to move to the setting that you want to change, and then press ALT+DOWN ARROW to open the list.
4. Make sure your hardware is listed, and then select the setting you want by using the mouse or the arrow keys.

5. Choose the OK button.

If Setup finds the selected device driver already on your system, it asks whether you want to use the installed driver or install a new one.

Setup may request that you insert a Windows disk into drive A. If it does, insert the disk, or type the path of the appropriate device-driver file. Then choose the OK button.

A dialog box appears that contains a Restart Windows button and may contain a Reboot button.

6. If no Reboot button appears, choose the Restart Windows button.

If the Reboot button appears, make sure there are no disks in any drive, and then choose the Reboot button. Your system restarts. Then restart Windows.

Note If you do not want to change drivers, but instead want to update or copy a Windows version 3.1 driver, you need to quit Windows and run Setup from MS-DOS. For more information, see “Running Setup from MS-DOS” later in this chapter.

Installing a Device Driver Not Supplied with Windows Version 3.1

A set of device drivers is supplied with Windows version 3.1, and additional drivers become available periodically. For information about these drivers, contact your hardware manufacturer.

Microsoft also provides the Windows Driver Library (WDL), which contains device drivers made available after Windows version 3.1 was released. Device drivers are added to the WDL as they become available. If you have a modem, you can download WDL device drivers from network services including CompuServe, GENie, Microsoft OnLine, various user-group bulletin-board services (BBSs on the APCUG network), and the electronic downloading service maintained by Microsoft (206-637-9009). Users who do not have a modem may obtain disks by calling Microsoft Customer Support Services at 1-800-426-9400.

Note If your copy of Windows was acquired outside the United States, the package contains a subsidiary information card listing bulletin-board services (BBSs) from which you can obtain updated device drivers. The card also lists local subsidiary telephone numbers you can call to obtain drivers if no BBS is available or you cannot access a BBS.

Before running the Setup program to install a device driver, check for any special installation instructions that came with the driver. There may be other things you need to do to set up the hardware. Some drivers supply setup information files that tell Windows Setup what type of files (such as font files) the driver supports. If you are not sure what your driver supports, contact the hardware manufacturer.

► **To install a device driver not supplied with Windows version 3.1**

1. Be sure your hardware is set up to match the setting to which you are changing.
2. From the Options menu, choose Change System Settings.

The Change System Settings dialog box appears.

3. Open the list for the setting that you want to change by clicking the arrow at the right of the list. Or press TAB to move to the setting that you want to change, and then press ALT+DOWN ARROW to open the list.
4. Scroll to the bottom of the list, and then select Other.

Select Other even if the driver you are updating already appears on the list, so Setup will prompt you for the driver file.

Setup prompts you for the disk containing the device driver.

5. Insert the disk into drive A. Or, if the driver is located on a hard disk, type the path of the driver. Then choose the OK button.

Setup displays a list of the device drivers on that disk.

6. Select the appropriate driver, and then choose the OK button.

You may be prompted for additional disks if more than one disk was provided by the hardware manufacturer. You might also be prompted for specific Windows version 3.1 disks.

Setup then copies the appropriate files to your Windows SYSTEM directory and displays the updated list of your hardware.

7. Choose the OK button.

A dialog box appears that contains a Restart Windows button and may contain a Reboot button.

8. If no Reboot button appears, choose the Restart Windows button.

If the Reboot button appears, make sure there are no disks in any drive, and then choose the Reboot button. Your system restarts. Then restart Windows.

Note If you installed a device driver and the change prevents Windows from running correctly (for example, if you chose an incorrect display driver), you need to run Setup from MS-DOS to install the correct driver. For more information, see "Running Setup from MS-DOS" later in this chapter.

Setting Up Existing Applications

After you install an application on your system, you can use Setup to set it up to run with Windows. Setup also adds a program-item icon to Windows Program Manager so you can start the application by choosing the icon.

Note A quick way to set up an application and create a program-item icon for it is to drag its program-file icon from Windows File Manager and drop it onto a Program Manager group window or icon. For more information, see Chapter 3, “Program Manager.”

You can either set up a specific application or have Setup search for and set up multiple applications. Procedures for both options follow.

Setup will set up only those non-Windows applications for which Windows has a program information file (PIF). Windows includes setup information (as PIFs) for many major applications, but not all. If no PIF exists for the application you want, you can create one. For information about creating a PIF, see Chapter 8, “PIF Editor.”

► **To have Setup search for and set up applications**

1. From the Options menu, choose Set Up Applications.

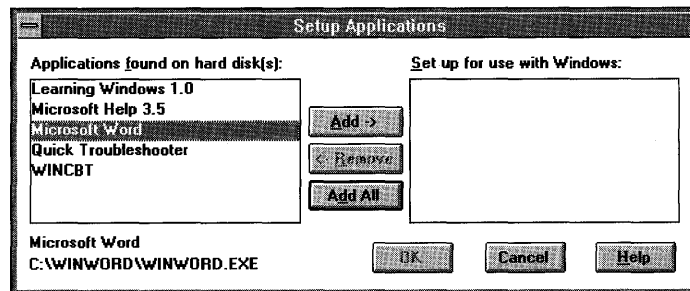
Setup displays a dialog box that asks whether you want Setup to search for applications to set up or whether you want to specify an application.

2. Select the Search For Applications option button, and then choose the OK button.

Setup displays a dialog box where you specify that Setup search for applications on one or more specific drives, and/or the current path.

3. Click the search options you want. Or use the UP ARROW or DOWN ARROW key to move to the options, and then press the SPACEBAR to select them.
4. Choose the Search Now button.

At the completion of the search, Setup displays a dialog box, listing the applications found.



In the Applications Found On Hard Disk(s) list box, Setup lists the names of all the applications it found. (If you cancel the search, the dialog box will display applications Setup found before canceling occurred.) When you select one of these applications, the path of that application appears in the lower-left corner of the dialog box.

Note In some cases, two or more applications may use the same program filename. If Setup finds a naming conflict, it displays a dialog box asking you to specify the name of the application you want. For more information, see the next section, “PIF Information for Non-Windows Applications.”

5. Select from the list the applications you want to add.

You can select more than one application. Click each application you want to select. Or press **TAB** to move to the list box, use the **UP ARROW** or **DOWN ARROW** key to move to the application you want, and then press the **SPACEBAR** to select it.

If you change your mind about selecting an item, you can cancel the selection by clicking it again or, by using the keyboard, moving to it and pressing the **SPACEBAR** again.

6. After you select all the applications you want, choose the Add button to move them to the Set Up For Use With Windows list. Or press **ALT+A**.

To add all the listed applications, choose the Add All button. Or press **ALT+D**.

If you change your mind about adding an application after you add it, click the application name, and then choose the Remove button. Or press **TAB** to move to the application name, press the **SPACEBAR** to select it, and then press **ALT+R** to move it back to the Applications Found On Hard Disk(s) list.

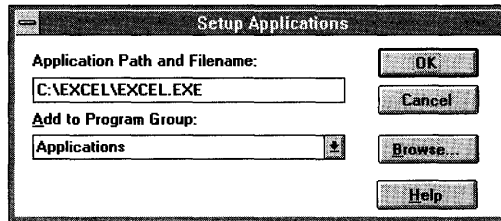
7. Once you have selected the applications you want Windows to set up, choose the OK button.

► To set up a specific application with Windows

1. From the Options menu, choose Set Up Applications.

Setup displays a dialog box that asks whether you want Setup to search for applications to set up or whether you want to specify an application.

2. Select the “specify” option button, and then choose the OK button.
A dialog box appears.

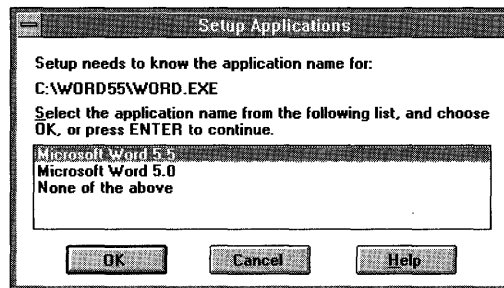


3. Type the application's path and filename.
Or choose the Browse button to select the filename you want.
4. In the Add To Program Group list, select a program group to add the application to. (If you don't select a group, the application will be added to the Applications group.)
5. Choose the OK button.

PIF Information for Non-Windows Applications

When you run a non-Windows application, Windows uses a program information file (PIF) to determine how to run the application. For more information about PIFs, see Chapter 7, “Non-Windows Applications,” and Chapter 8, “PIF Editor.”

When the Setup program sets up a non-Windows application for use with Windows, it searches for a PIF, based on the application's program filename. Sometimes two or more applications have the same program filename, with a PIF supplied for each, and Windows cannot determine which PIF to use. When this occurs, you will see a dialog box similar to the following.



► **To specify an application**

- Select the name of the application you want to set up, and then choose the OK button.

In some cases, a single application will have more than one PIF associated with it. For example, there might be one PIF for an older version of the application and one for a newer version, or there might be a PIF that specifies that the application be run by using certain optional parameters.

If more than one PIF exists for an application, Setup displays a dialog box where you can specify which PIF to use.

► **To specify a PIF for an application**

- Select the description of the PIF you want to set up, and then choose the OK button.

Adding and Removing Windows Components

Some parts of Windows are not essential to its operation. To save space on your hard disk, you might choose not to set up these components during Setup. Later, you might decide you have adequate space for some or all of the optional components and want to add them. Or, after you have been using Windows for a time, you might decide to delete some optional components in order to free up space on your hard disk.

You can add and remove the following Windows components completely or partially by using Windows Setup:

- Readme Files
- Windows Accessories
- Windows Games
- Screen Savers
- Wallpapers and Other Miscellaneous Files

Caution When you remove components, the files are deleted from your system. If you want to add them later, you will need to use your Windows version 3.1 disks to supply the files.

Adding or Removing Complete Components

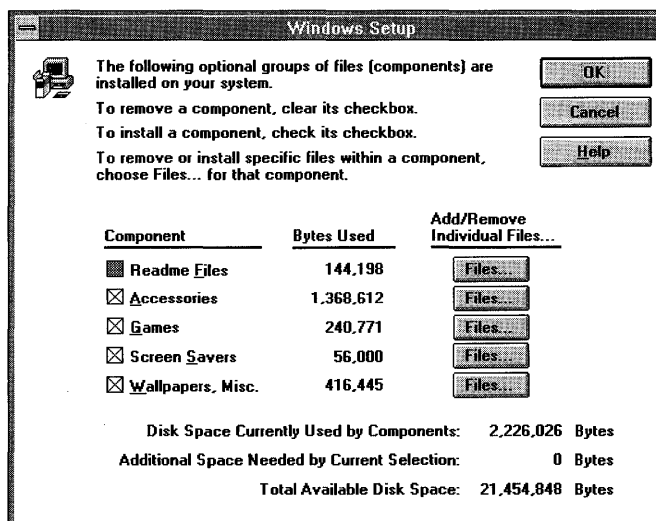
You can add or remove all of a Windows component at once if you want. For example, you might want to add all of the Windows games to your system.

► **To add or remove an entire Windows component**

1. From the Options menu, choose Add/Remove Windows Components.

Setup displays a dialog box that lists all of the optional components and the disk space required to set them up on your system.

The name of each component currently on your system is marked with an “X” in its check box. These components can be removed.



Disk Space Currently Used By Components shows the total disk space required by all selected components. This number increases or decreases as you select or clear the components' check boxes. Total Available Disk Space shows the total unused disk space on your system. This number changes after components or files have been added or removed.

2. To add an entire component (for example, all Readme files), select the check box next to it. To delete a component, clear the check box.

If you are using the keyboard, press TAB (or the UP ARROW or DOWN ARROW) to move to the component name, and then press the SPACEBAR to select or clear the check box.

3. If you are adding a component, a dialog box appears, requesting you to insert the appropriate Windows version 3.1 disk. Place the disk in the drive, and then choose the OK button.
4. In the Windows Setup dialog box, choose the OK button.

Adding or Removing Partial Components

If you want, you can add or remove only specific files rather than the entire component. For example, you can select certain Windows accessories to add, and omit others.

► To add or remove part of a component

1. From the Options menu, choose Add/Remove Windows Components.

Setup displays a dialog box that lists the optional components and the disk space required to set them up on your system.

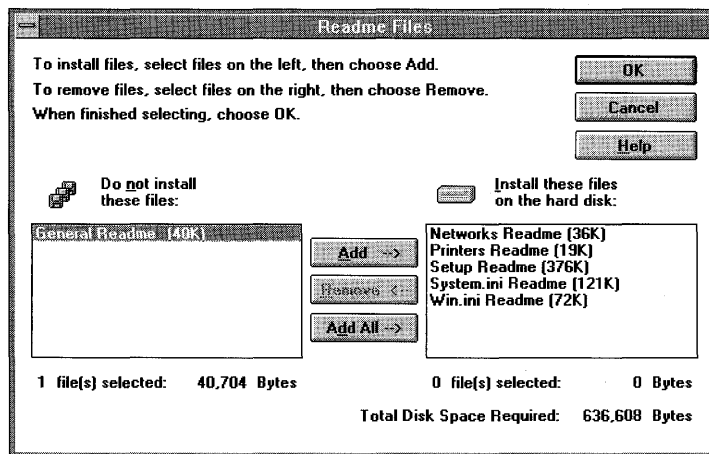
The name of each component currently on your system is marked with an “X” in its check box. These components can be removed.

Disk Space Currently Used By Components shows the total disk space required by all selected components. This number increases or decreases as you select or clear the components' check boxes. Total Available Disk Space shows the total unused disk space on your system. This number changes after components or files have been added or removed.

2. To add or delete part of a component (for example, specific Readme files), click the Files button next to it.

Or press TAB to move to the Files button, and then press the SPACEBAR to choose it.

A dialog box appears, listing the component's files. Files on the right are currently included on your system and can be removed. Files on the left are not included and can be added.



3. Select the names of the files you want to add or remove, and then choose the Add or Remove button. Total Disk Space Required shows the total disk space needed by the files that you want to set up on your system.
 4. Choose the OK button.
 5. In the Windows Setup dialog box, choose the OK button.
 6. If you are adding files, a dialog box may appear, asking you to insert the appropriate Windows version 3.1 disk. Place the disk in the drive, and then choose the OK button.
- If you are deleting files, a dialog box appears, asking you to confirm the deletion. Choose the Yes or Yes To All button to delete.

Running Setup from MS-DOS

By running Setup from MS-DOS, you can:

- Install an updated version of a device driver that you previously installed.
- Change your Codepage setting for Windows.

Caution Do not attempt to run Setup from MS-DOS Prompt in Windows. To run Setup from MS-DOS, you must first quit Windows.

Updating an Installed Device Driver

When you first set up Windows on your system, the appropriate drivers were installed for some of the devices on your system, such as your keyboard, mouse, and display (monitor). If you want to update one of these device drivers, you can do so by running Setup from outside Windows.

For information about updating other drivers, such as those for multimedia devices, see Chapter 5, “Control Panel.”

► To install an updated version of a Windows device driver

1. Quit Windows.
2. In your Windows directory, type **setup** at the MS-DOS prompt, and then press ENTER.

The System Information screen appears.

3. Select the setting for the driver you want to update (use the UP ARROW or DOWN ARROW key to move to the setting), and then press ENTER.

A screen listing the available drivers appears.

4. Scroll to the bottom of the list (using the UP ARROW or DOWN ARROW key), select "Other," and then press ENTER.

Setup requests the disk containing the updated driver.

5. Insert the disk or type the path of the driver file, and then press ENTER.

Setup returns you to the MS-DOS prompt. The new driver will be used the next time you start Windows.

Changing the Code Page

In Windows, the Codepage setting determines the *character set* (the characters for the language you are using on your system) that will be used by non-Windows applications running in a window, in addition to filenames using extended characters, and your keyboard layout. When Windows is first set up on your system, Setup detects the code page used by MS-DOS and sets up Windows to use the same one. If you subsequently change your MS-DOS code page, you will need to update the Codepage setting in Windows to match it, as follows.

► To change to another code page

1. Quit Windows.
2. In your Windows directory, type **setup** at the MS-DOS prompt, and then press ENTER.

The System Information screen appears.

3. Select the Codepage setting (use the UP ARROW or DOWN ARROW key to move to Codepage), and then press ENTER.

A screen listing the available code pages appears.

4. Select the code page you want to use, and then press ENTER.
5. When the System Information screen appears, press ENTER again.
Setup requests you to verify that you want to change code pages.
6. Press F3 to verify the change.

Setup requests you to supply the disk with the new code-page file.

7. Insert the disk or type the path of the code-page file, and then press ENTER.

After copying the file, Setup returns you to the MS-DOS prompt. The new code page will take effect the next time you start Windows.

Recovering If Things Go Wrong

Occasionally, changes you have made to your Windows configuration may leave Windows unable to run. For example, you might have specified the wrong device driver when you were updating your system. You can usually correct the problem by running Setup from MS-DOS.

► To correct an incorrect device-driver installation

1. Quit Windows.
2. From your Windows directory, type **setup** at the MS-DOS prompt, and then press ENTER.

The System Information screen appears.

3. Select the setting for the driver you want to change (use the UP ARROW or DOWN ARROW key to move to the setting), and then press ENTER.

A screen listing the available drivers appears.

4. Follow the instructions on the screen, being sure to select the correct driver(s).

Note If Windows still won't run after you have reinstalled the driver by using this procedure, check with your hardware manufacturer to ensure that you have the correct driver.

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Windows and Networks

Appendix A

Using Windows with Networks

The Microsoft Windows operating system provides many features that make it easier to work with a network's resources. Before you use these features, you should be aware of some basic guidelines for using networks. This appendix outlines Windows network features and lists guidelines for using networks.

For information about setting up Windows from a network, see *Getting Started with Microsoft Windows*.

Windows Network Features

The following list describes what you can do with Windows and networks and where to find information about the Windows network features.

You can do the following:

- Configure Windows for a particular type of network. For information, see Chapter 15, "Maintaining Windows with Setup."
- Connect your system to a particular network drive. On some networks, you can browse through network drives to find the one you want. For information, see Chapter 4, "File Manager."
- Set options that are specific to your network. For information, see Chapter 5, "Control Panel."
- Set up network printer connections. On some networks, you can browse through network drives to find the printer you want. For information, see Chapter 6, "Print Manager."
- Take advantage of special features offered by Windows Print Manager when you use a network printer. For information, see Chapter 6, "Print Manager."

Guidelines for Using Networks

You can avoid many problems when using Windows with a network by following these guidelines:

- Read the NETWORKS.WRI file that is included with this version of Windows to make sure your network software is compatible with Windows. This file contains information about running Windows with your specific network.

- Always start the network before you start Windows.

You can connect to network drives and printers after you start Windows, but the network software must be running on your computer before you start Windows. If you try to start your network after you have started Windows, your system may not run correctly.

- Some networks fail if you log in or log out at the MS-DOS prompt while running Windows. Some networks support logging in or out by using the Network option in Windows Control Panel. If your network does not support this feature, log in before you start Windows.
- If you are using a shared copy of Windows or a shared copy of another application, use the same letter to designate the network drive on your system every time you connect to that drive.

For example, if you use the drive letter W when you connect to the network drive to set up a shared copy of Windows, Windows records W as the path it should use in the future to look for the shared Windows files. If the next time you connect to the same network drive you use a letter other than W, you will not be able to start Windows correctly.

If you do need to specify a different drive letter when you connect to a network drive in order to use a shared application, be sure to change the path that Windows uses to find the application.

- Every time you connect to a network printer, use the same port for that particular printer.

Control Panel retains the printer settings for a particular port. If you change the port you are using for a printer, the settings for the new port may not be correct for that printer.

If you do need to change the port your printer is connected to, be sure to use Control Panel to change the printer settings.

Terminal Emulation Tables

Appendix B

This appendix defines the technical specifications for terminal emulations when you use the Microsoft Windows Terminal application. There are two tables for each terminal emulation, which provide the following information:

- The IBM PC equivalent keystrokes and the corresponding characters transmitted
- The functions supported by Windows and their corresponding escape sequences

Note The letter “l” is italicized (*l*) in all tables to help distinguish it from the numeral “1.”

VT-52 Terminal – Keyboard

The following are the IBM PC equivalent keystrokes and corresponding characters transmitted for the Digital Equipment Corporation VT-52 Terminal keystrokes.

VT-52 keyboard	IBM PC keyboard	Characters transmitted	
		ASCII	HEX
PF1	F1	ESC P	1B 50
PF2	F2	ESC Q	1B 51
PF3	F3	ESC R	1B 52
PF4	F4	ESC S	1B 53
LEFT ARROW	LEFT ARROW	ESC D	1B 44
UP ARROW	UP ARROW	ESC A	1B 41
RIGHT ARROW	RIGHT ARROW	ESC C	1B 43
DOWN ARROW	DOWN ARROW	ESC B	1B 42

The host computer may prompt you to put your keyboard in *keyboard application mode*, a terminal-emulation mode required for some applications. The keystrokes and characters for keyboard application mode are listed here.

VT-52 keyboard	IBM PC keyboard	Characters transmitted	
		ASCII	HEX
0	0	ESC ? p	1B 3F 70
1	1	ESC ? q	1B 3F 71
2	2	ESC ? r	1B 3F 72
3	3	ESC ? s	1B 3F 73
4	4	ESC ? t	1B 3F 74
5	5	ESC ? u	1B 3F 75
6	6	ESC ? v	1B 3F 76
7	7	ESC ? w	1B 3F 77
8	8	ESC ? x	1B 3F 78
9	9	ESC ? y	1B 3F 79
-	-	ESC ? m	1B 3F 6D
,	, (or *)	ESC ? l	1B 3F 6C
.	.	ESC ? n	1B 3F 6E
ENTER	+	ESC ? M	1B 3F 4D
LEFT ARROW	LEFT ARROW	ESC O D	1B 4F 44
UP ARROW	UP ARROW	ESC O A	1B 4F 41
RIGHT ARROW	RIGHT ARROW	ESC O C	1B 4F 43
DOWN ARROW	DOWN ARROW	ESC O B	1B 4F 42

VT-52 Terminal – Functions

The following are the supported functions for the Digital Equipment Corporation VT-52 Terminal and their corresponding escape sequences.

Function	Escape sequence
ANSI MODE ENTER	ESC <
CURSOR MOVE DOWN	ESC B
CURSOR MOVE HOME	ESC H
CURSOR MOVE LEFT	ESC D
CURSOR MOVE RIGHT	ESC C

Function	Escape sequence
CURSOR MOVE UP	ESC A
CURSOR POSITION SET	ESC Y <i>l c</i>
ERASE TO END OF LINE	ESC K
ERASE TO END OF SCREEN	ESC J
IDENTIFY	ESC Z
KEYPAD APPLICATION	ESC =
KEYPAD NUMERIC	ESC >
LINEFEED REVERSE	ESC I

VT-100 Terminal – Keyboard

The following are the IBM PC equivalent keystrokes and corresponding characters transmitted for the Digital Equipment Corporation VT-100 Terminal keystrokes.

Note To use the function keys for DEC VT-100 (ANSI) terminal emulation, **SCROLL LOCK** must be turned on. If **SCROLL LOCK** is turned off, the function keys and arrow keys have normal Windows (not VT-100) functionality, such as F1 being the key you press for Help.

VT-100 keyboard	IBM PC keyboard	Characters transmitted	
		ASCII	HEX
PF1	F1	ESC O P	1B 4F 50
PF2	F2	ESC O Q	1B 4F 51
PF3	F3	ESC O R	1B 4F 52
PF4	F4	ESC O S	1B 4F 53
LEFT ARROW	LEFT ARROW	ESC [D	1B 5B 44
UP ARROW	UP ARROW	ESC [A	1B 5B 41
RIGHT ARROW	RIGHT ARROW	ESC [C	1B 5B 43
DOWN ARROW	DOWN ARROW	ESC [B	1B 5B 42

The host computer may prompt you to put your keyboard in *keyboard application mode*, a terminal-emulation mode required for some applications. The keystrokes and characters for keyboard application mode are listed here.

VT-100 keyboard	IBM PC keyboard	Characters transmitted	
		ASCII	HEX
0	0	ESC O p	1B 4F 70
1	1	ESC O q	1B 4F 71
2	2	ESC O r	1B 4F 72
3	3	ESC O s	1B 4F 73
4	4	ESC O t	1B 4F 74
5	5	ESC O u	1B 4F 75
6	6	ESC O v	1B 4F 76
7	7	ESC O w	1B 4F 77
8	8	ESC O x	1B 4F 78
9	9	ESC O y	1B 4F 79
-	-	ESC O m	1B 4F 6D
,	, (or *)	ESC O l	1B 4F 6C
.	.	ESC O n	1B 4F 6E
ENTER	+	ESC O M	1B 4F 4D
LEFT ARROW	LEFT ARROW	ESC O D	1B 4F 44
UP ARROW	UP ARROW	ESC O A	1B 4F 41
RIGHT ARROW	RIGHT ARROW	ESC O C	1B 4F 43
DOWN ARROW	DOWN ARROW	ESC O B	1B 4F 42

VT-100 Terminal – Functions

The following are the supported functions for the Digital Equipment Corporation VT-100 Terminal and their corresponding escape sequences.

Substitute one or more values (separated by semicolons) from the specified table (* Tn) for the <x1> and <x2> parameters.

Substitute a value specifying the desired number of characters or lines for the <n> parameter.

Substitute a value specifying the desired line and column number for the <l> and <c> parameters.

Substitute a value specifying the desired row numbers for the top row and bottom row of the scrolling region for the <tr> and
 parameters.

Function	Escape sequence
ANSWER SEQUENCE TO REQUEST	ESC [<l> ; <c> R
BACKSPACE	^H
CARRIAGE RETURN	^M
CHARACTER DELETE	ESC [<n> P
CHARACTER INSERT	ESC [<n> @
CHARACTER WIDTH DOUBLE	ESC # 6
CHARACTER WIDTH SINGLE	ESC # 5
CURSOR MOVE DOWN	ESC [<n> B
CURSOR MOVE LEFT	ESC [<n> D
CURSOR MOVE RIGHT	ESC [<n> C
CURSOR MOVE UP	ESC [<n> A
CURSOR POSITION SET	ESC [<l> ; <c> H
CURSOR POSITION SET (ABSOLUTE)	ESC [<l> ; <c> f
CURSOR RESET	ESC 8
CURSOR SAVE	ESC 7
ERASE ENTIRE LINE	ESC [2 K
ERASE ENTIRE SCREEN	ESC [2 J
ERASE FROM START OF LINE	ESC [1 K
ERASE FROM START OF SCREEN	ESC [1 J
ERASE NORMAL DATA FROM START OF SCREEN	ESC [? 1 J
ERASE NORMAL DATA ON LINE	ESC [? 2 K
ERASE NORMAL DATA ON SCREEN	ESC [? 2 J
ERASE NORMAL DATA TO END OF LINE	ESC [? 0 K
ERASE NORMAL DATA TO END OF SCREEN	ESC [? 0 J
ERASE NORMAL DATA TO START OF LINE	ESC [? 1 K
ERASE TO END OF LINE	ESC [0 K
ERASE TO END OF SCREEN	ESC [0 J
ESCAPE	ESC
IDENTIFY	ESC Z
INDEX	ESC D
INDEX REVERSE	ESC M
KEYPAD APPLICATION	ESC =
KEYPAD NUMERIC	ESC >
LINE DELETE	ESC [<n> M
LINEFEED	^J
LINE HEIGHT DOUBLE (BOTTOM)	ESC # 4
LINE HEIGHT DOUBLE (TOP)	ESC # 3
LINE INSERT	ESC [<n> L

Function	Escape sequence
NEXT LINE	ESC E
READ CURSOR POSITION	ESC [6 n
READ STATUS	ESC [5 n
RING BELL	^G
SET SCROLLING REGION	ESC [<tr> ; r
TAB CLEAR	ESC [g
TAB CLEAR ALL	ESC [3 g
TAB MOVE-HORIZONTAL	^I
TAB SET	ESC H
TERMINAL MODES RESET	ESC [<x1> l (* T1)
TERMINAL MODES SET	ESC [<x1> h (* T1)
TERMINAL PARAMETERS REQUEST	ESC [{sol} x
TRANSMIT DEVICE ATTRIBUTES	ESC [c
SET MEDIA COPY OFF	ESC [4i
SET MEDIA COPY ON	ESC [5i
VIDEO ATTRIBUTE SET	ESC [<x2> m (* T2)
CHANGE G0 CHAR SET UK	ESC (A
CHANGE G0 CHAR SET US ASCII	ESC (B
CHANGE G1 CHAR SET UK	ESC) A
CHANGE G1 CHAR SET US ASCII	ESC) B
CHANGE G0 CHAR SET TO GRAPHICS	ESC (0
CHANGE G1 CHAR SET TO GRAPHICS	ESC) 0
G0 ALTERNATE CHARACTER ROM (Standard Character Set)	ESC (1
G1 ALTERNATE CHARACTER ROM (Standard Character Set)	ESC) 1
G0 ALTERNATE CHARACTER ROM (Special Graphics)	ESC (2
G1 ALTERNATE CHARACTER ROM (Special Graphics)	ESC) 2

Terminal Modes <x1>

Function	Escape sequence
LINEFEED/NEWLINE	?0
APPLICATION/CURSOR KEYS	?1
ANSI/VT-52	?2
132/80 COLUMN	?3
SMOOTH/JUMP SCROLL	?4
REVERSE/NORMAL SCREEN	?5
RELATIVE/ABSOLUTE ORIGIN	?6
CHARACTER WRAP ON/OFF	?7
AUTO REPEAT ON/OFF	?8
INTERLACE ON/OFF	?9

Video Attributes <x2>

Function	Escape sequence
ATTRIBUTES OFF	0
BOLD	1
UNDERSCORE	4
BLINK	5
NEGATIVE (REVERSE)	7

Keyboard Shortcuts

Appendix C

This appendix lists key combinations you can use in the Microsoft Windows operating system. Many commands on menus also have keyboard equivalents; the key combinations for these commands are shown next to the commands on the menus.

General Windows Keys

Use the following keys throughout Windows.

System Keys

The following keys can be used in a window or a full screen, regardless of the application you are using.

Press	To
F1	Start Help if the application has Help.
CTRL+ESC	Switch to Task List.
ALT+ESC	Switch to the next application, whether it is running in a window or running as an icon.
ALT+TAB	Switch to the application you last used. Or switch to the next application, by pressing and holding down ALT while repeatedly pressing TAB. To return to your original application, keep holding down the ALT key, and press ESC.
SHIFT+ALT+TAB	Switch to previous applications by pressing and holding down ALT+SHIFT while repeatedly pressing TAB. To return to your original application, keep holding down the ALT key, and press ESC.
PRINT SCREEN	Copy an image of the screen onto the Clipboard. (This works for non-Windows applications only if they are running in text mode.)

Press	To
ALT+PRINT SCREEN	Copy an image of the active window onto the Clipboard.
ALT,SPACEBAR	Open the Control menu for an application window.
ALT,HYPHEN	Open the Control menu for a document window.
ALT+SPACEBAR	Opens the Control menu for a non-Windows application running in a window.
ALT+F4	Quit an application or close a window.
CTRL+F4	Close the active group window or document window.
ALT+ENTER	Switch a non-Windows application between running in a window and running in a full screen.
An arrow key	Move a window after you choose Move from the Control menu. Or change the size of a window after you choose Size from the Control menu.

Menu Keys

Use the following keys to select menus and choose commands.

Press	To
ALT or F10	Select or cancel selection of the first menu on the menu bar.
A character key	Choose the menu or command whose underlined letter or number matches the one you type.
LEFT ARROW or RIGHT ARROW	Move between menus.
UP ARROW or DOWN ARROW	Move between commands.
ENTER	Choose the selected menu name or command.
ESC	Cancel the selected menu name. Or close the open menu.

Dialog Box Keys

Use the following keys when working in a dialog box.

Press	To
TAB	Move from option to option (left to right and top to bottom).
SHIFT+TAB	Move from option to option in reverse order.
ALT + a character key	Move to the option or group whose underlined letter or number matches the one you type.
An arrow key	Move the selection cursor from option to option within a group of options. Or move the cursor left, right, up, or down within a list or text box.
HOME	Move to the first item or character in a list or text box.
END	Move to the last item or character in a list or text box.
PAGE UP or PAGE DOWN	Scroll up or down in a list, one screen at a time.
ALT+DOWN ARROW	Open a list.
SPACEBAR	Select an item or cancel a selection in a list. Select or clear a check box.
CTRL+SLASH (/)	Select all the items in a list (when you can select multiple items).
CTRL+BACKSLASH (\)	Cancel all selections except the current selection.
SHIFT + an arrow key	Extend or cancel the selection in a text box one character at a time.
SHIFT+HOME	Extend or cancel the selection to the first character in a text box.
SHIFT+END	Extend or cancel the selection to the last character in a text box.
ENTER	Carry out a command. Or choose the selected item in a list, and then carry out the command.
ESC or ALT+F4	Close a dialog box without completing the command.

Cursor Movement Keys

Use the following keys where applicable to move the cursor or insertion point in text boxes and other places where you can type text, such as in Windows Notepad or Write.

Press	To move the insertion point
UP ARROW	Up one line.
DOWN ARROW	Down one line.
RIGHT ARROW	Right one character.
LEFT ARROW	Left one character.
CTRL+RIGHT ARROW	Right one word.
CTRL+LEFT ARROW	Left one word.
HOME	To the beginning of the line.
END	To the end of the line.
PAGE UP	Up one screen.
PAGE DOWN	Down one screen.
CTRL+HOME	To the beginning of the document.
CTRL+END	To the end of the document.

Editing Keys

Use the following keys to edit text in a dialog box or window.

Press	To
BACKSPACE	Delete the character to the left of the insertion point. Or delete selected text.
DEL	Delete the character to the right of the insertion point. Or delete selected text.
CTRL+INS or CTRL+C	Copy the selected text and place it onto the Clipboard.
SHIFT+DEL or CTRL+X	Delete the selected text and place it onto the Clipboard.
SHIFT+INS or CTRL+V	Paste text from the Clipboard into the active window.
CTRL+Z or ALT+BACKSPACE	Undo the last editing action.

Text Selection Keys

The following keys can be used in most Windows applications. However, some of the keys listed here might not work in all places where you can select text or in all applications. All of the following selections begin at the insertion point. If text is already selected, pressing the keys cancels the selection.

Press	To select or cancel selection of
SHIFT + LEFT or RIGHT ARROW	One character at a time to the left or right.
SHIFT + UP or DOWN ARROW	One line of text up or down.
SHIFT+PAGE UP	All text, one screen up.
SHIFT+PAGE DOWN	All text, one screen down.
SHIFT+HOME	Text to the beginning of the line.
SHIFT+END	Text to the end of the line.
CTRL+SHIFT+LEFT ARROW	The previous word.
CTRL+SHIFT+RIGHT ARROW	The next word.
CTRL+SHIFT+HOME	Text to the beginning of the document.
CTRL+SHIFT+END	Text to the end of the document.

Program Manager Keys

When working with group windows in Windows Program Manager, use the following keys.

Press	To
An arrow key	Move between items within a group window.
CTRL+F6 or CTRL+TAB	Move between group windows and icons.
ENTER	Start the selected application.
SHIFT+F4	Arrange the open group windows side by side (“tile” them).
SHIFT+F5	Arrange the open group windows so that each title bar is displayed (“cascade” them).
CTRL+F4	Close the active group window.
ALT+F4	Quit Windows.

File Manager Keys

Use the following keys in Windows File Manager.

Directory Tree Keys

When working with the directory tree, use the following keys.

Press	To
TAB or F6	Move between the directory tree, the contents list, and the drive icons.
LEFT ARROW or BACKSPACE	Select the directory listed above the current subdirectory.
RIGHT ARROW	Select the first subdirectory, if one exists, listed below the current directory.
ENTER	Display or hide any subdirectories.
SHIFT+ENTER	Open a new window displaying the contents of the selected directory.
UP ARROW or DOWN ARROW	Select a directory listed above or below the current directory.
CTRL+UP ARROW	Select the previous directory at the same level, if one exists.
CTRL+DOWN ARROW	Select the next directory at the same level, if one exists.
PAGE UP	Select the directory one screen up from the current directory.
PAGE DOWN	Select the directory one screen down from the current directory.
HOME or BACKSLASH (\)	Select the root directory.
END	Select the last directory in the list.
A character key	Select the next directory whose name begins with the specified letter or number.

File and Directory Keys

Use the following keys when working with the list of files and subdirectories in the current directory.

Press	To
TAB or F6	Move between the directory tree, the contents list, and the drive icons.
PAGE UP	Select the file or directory one screen above the current selection.
PAGE DOWN	Select the file or directory one screen below the current selection.
HOME	Select the first file or directory in the list.
END	Select the last file or directory in the list.
A character key	Select the next file or directory whose name begins with the specified letter or number.
SHIFT + an arrow key	Select or cancel selection of multiple items.
CTRL+SLASH (/)	Select all items in the list.
CTRL+BACKSLASH (\)	Cancel all selections in the list except the current selection.
SHIFT+F8	Select nonconsecutive items or cancel the selections. Press SHIFT+F8, and then use the arrow keys and the SPACEBAR.
An arrow key	Move the cursor, or scroll to other items in the window.
SPACEBAR	Select or cancel the selection of nonconsecutive items marked by a blinking cursor.
ENTER	Open a directory or start an application.
SHIFT+ENTER	Open a new window displaying the contents of the selected directory.

Drive Icon Keys

When working with drive icons, use the following keys.

Press	To
TAB or F6	Move between the directory tree, the contents list, and the drive icons.
CTRL + a drive letter	Change to the drive icon that matches the specified letter.
LEFT ARROW or RIGHT ARROW	Move between drive icons.
SPACEBAR	Change drives.
ENTER	Open a new directory window.

Calculator Keys

See Chapter 12, “Additional Accessories,” for Windows Calculator keyboard tables.

Calendar Keys

Use the following keys in Windows Calendar.

Day View Keys

Use the following keys in the Day view.

Press	To
UP ARROW	Move to the previous time.
DOWN ARROW or ENTER	Move to the next time.
PAGE UP	Move to the previous screen.
PAGE DOWN	Move to the next screen.
CTRL+HOME	Move to the starting time.
CTRL+END	Move to 12 entries after the starting time.
TAB	Move between the appointment area and the scratch pad.
SHIFT+DEL	Delete the selection and place it onto the Clipboard.
CTRL+INS	Copy the selection and place it onto the Clipboard.
SHIFT+INS	Paste the Clipboard contents into the appointment area or scratch pad.
CTRL+PAGE UP	Move to the previous day.
CTRL+PAGE DOWN	Move to the next day.

Month View Keys

Use the following keys in the Month view.

Press	To
UP ARROW	Move to the previous week.
DOWN ARROW	Move to the next week.
PAGE UP	Move to the previous month.
PAGE DOWN	Move to the next month.
TAB	Move between a date and the scratch pad.
ENTER	Change to the Day view.

Cardfile Keys

Use the following keys in Windows Cardfile.

Press	To
PAGE DOWN	Scroll forward one card in Card view. Move forward one page of index lines in List view.
PAGE UP	Scroll backward one card in Card view. Move back one page of index lines in List view.
CTRL+HOME	Bring the first card in the file to the front.
CTRL+END	Bring the last card in the file to the front.
SHIFT+CTRL + a character key	Bring a card to the front of the file. Cardfile displays the first card whose index line begins with the letter or number you press.
DOWN ARROW	Scroll one card forward in List view.
UP ARROW	Scroll one card backward in List view.

Clipboard Viewer Keys

Use the following keys when using the Windows Clipboard Viewer.

Press	To
DEL	Clear the Clipboard contents.
SHIFT+DEL	In a document, delete a selection and place it onto the Clipboard.
CTRL+INS	In a document, copy a selection and place it onto the Clipboard.
SHIFT+INS	In a document, paste the Clipboard contents into a document.
PRINT SCREEN	Copy an image of the entire screen onto the Clipboard. (This works for non-Windows applications only if they are running in text mode.)
ALT+PRINT SCREEN	Copy an image of the active window onto the Clipboard.

Control Panel Keys

Use the following keys in Windows Control Panel.

Press	To
An arrow key	Move among icons in the Control Panel window. Or, in the Color dialog box, move among colors in the Basic Colors and Custom Colors palettes.
SPACEBAR	In the Color dialog box, select a color in the Basic Colors and Custom Colors palettes.
RIGHT ARROW or LEFT ARROW	Move the selected scroll box in the Desktop, Mouse, and Keyboard dialog boxes.
TAB	Select a port in the Ports dialog box. Or select a column in the MIDI Setup, Key Map, and Patch Map dialog boxes.

Help Keys

Use the following keys to get Help from any window.

Press	To
F1	Display the Help Contents for the application. If the Help window is already open, pressing F1 displays the Contents for How To Use Help. In some applications (such as Program Manager and File Manager), pressing F1 displays a Help topic on the selected command, dialog box option, or system message.
SHIFT+F1	Add a question mark to the pointer. You can then click the command, click the screen region, or press the key or key combination you want to know more about. This feature is available only in certain applications.

Help Window Keys

Use the following keys while working in Help.

Press	To
TAB	Move clockwise among jumps in the topic.
SHIFT+TAB	Move counterclockwise among jumps in the topic.
CTRL+TAB	Select all the jumps in a topic. Or cancel selection of a jump.
CTRL+INS	Copy the current Help topic onto the Clipboard without displaying the Copy dialog box. Or copy an entire annotation or a portion of it onto the Clipboard.
SHIFT+INS	Paste the contents of the Clipboard into the Annotation dialog box.
ALT+F4	Quit Help.

Media Player Keys

Use the following keys in Windows Media Player.

Press	To
TAB	Move from button to button (left to right).
SHIFT+TAB	Move from button to button (right to left).
SPACEBAR	Choose a button.
LEFT ARROW	Move the playing position back when the scroll bar is selected.
RIGHT ARROW	Move the playing position forward when the scroll bar is selected.
PAGE UP	Move the playing position back in large increments when the scroll bar is selected.
PAGE DOWN	Move the playing position forward in large increments when the scroll bar is selected.
HOME	Move the playing position to the beginning when the scroll bar is selected.
END	Move the playing position to the end when the scroll bar is selected.

Notepad Keys

See “Cursor Movement Keys” and “Text Selection Keys” in the “General Windows Keys” section earlier in this appendix.

Object Packager Keys

Use the following key in Windows Object Packager.

Press	To
TAB	Move the selection cursor between the Content and Appearance windows.

Paintbrush Keys

Use the following keys in Windows Paintbrush.

Mouse Equivalent Keys

Use the following keys if you do not have a mouse.

Pressing	Is equivalent to
INS	Clicking the left mouse button
DEL	Clicking the right mouse button
F9+INS	Double-clicking the left mouse button
F9+DEL	Double-clicking the right mouse button
INS + an arrow key	Dragging the cursor

Undo Keys

Use the following keys to undo your last editing action.

Press	To
BACKSPACE	Undo all or part of what you have drawn since selecting a tool. Press BACKSPACE, and then drag the cursor over the part of the drawing you want to undo.
CTRL+Z	Undo everything you have drawn since selecting a tool.

Movement Keys

Use the following keys to move around the drawing area.

Press	To move
TAB	Among the Toolbox, Linesize box, Palette, and drawing area in a counterclockwise direction.
SHIFT+TAB	Among the Toolbox, Linesize box, Palette, and drawing area in a clockwise direction.
An arrow key	Around the drawing area.
SHIFT+HOME	To the left side of the drawing area.
SHIFT+END	To the right side of the drawing area.
PAGE UP	Up one screen.
PAGE DOWN	Down one screen.
HOME	To the top of the drawing area.
END	To the bottom of the drawing area.
SHIFT+LEFT ARROW	To the left one space.
SHIFT+RIGHT ARROW	To the right one space.
SHIFT+UP ARROW	Up one line.
SHIFT+DOWN ARROW	Down one line.
SHIFT+PAGE UP	Left one screen.
SHIFT+PAGE DOWN	Right one screen.

PIF Editor Keys

Use the following keys in Windows PIF Editor.

Press	To
TAB	Move from option to option (left to right and top to bottom).
SHIFT+TAB	Move from option to option in reverse order.
ALT + a letter key	Move to the option or group whose underlined letter matches the one you type. If the option is a check box, it also sets or clears the option.
An arrow key	Move the selection cursor from option to option within a group of options.
SPACEBAR	Select or clear a check box.

Sound Recorder Keys

Use the following keys in Windows Sound Recorder.

Press	To
TAB	Move from button to button (left to right).
SHIFT+TAB	Move from button to button (right to left).
SPACEBAR	Choose a button.
LEFT ARROW or RIGHT ARROW	Move backward or forward when the scroll bar is selected.
PAGE UP	Move back 1 second when the scroll bar is selected.
PAGE DOWN	Move forward 1 second when the scroll bar is selected.
HOME	Move to the beginning of the sound when the scroll bar is selected.
END	Move to the end of the sound when the scroll bar is selected.

Write Keys

Use the following keys in Windows Write. When the key combination includes a 5, it refers to the 5 key on the keypad.

See also “Cursor Movement Keys” and “Text Selection Keys” in the “General Windows Keys” section earlier in this appendix.

Movement Keys

Use the following keys to move the insertion point around in a document.

Press	To
5+RIGHT ARROW	Move to the next sentence.
5+LEFT ARROW	Move to the previous sentence.
5+DOWN ARROW	Move to the next paragraph.
5+UP ARROW	Move to the previous paragraph.
5+PAGE DOWN	Move to the next page, according to the last repagination.
5+PAGE UP	Move to the previous page, according to the last repagination.

Editing Keys

Use the following keys to edit text.

Press	To
CTRL+ENTER	Insert a manual page break.
SHIFT+DEL	Delete a selection and place it onto the Clipboard.
CTRL+INS	Copy a selection and place it onto the Clipboard.
SHIFT+INS	Paste the Clipboard contents into a document.
CTRL+Z or ALT+BACK-SPACE	Undo the last typing or editing action.
DOWN ARROW	Select a picture when the cursor is above the upper-left corner of the picture.
An arrow key	Move the Size Picture cursor. Move a selected picture after you choose the Move Picture command from the Edit menu.
CTRL+SHIFT+HYPHEN	Insert an optional hyphen.
ALT+F6	Switch between the document and the Find or Replace dialog box. Or switch between the Header or Footer window and the Page Header or Page Footer dialog box.



Glossary

386 enhanced mode A mode in which Windows runs to access the virtual-memory capabilities of the 80386 processor. In this mode, Windows appears to use more memory than is physically available and provides multitasking for non-Windows applications. *See also* standard mode, virtual memory.

A

active The window or icon that you are currently using or that is currently selected. Only one window or icon can be active at a time. Keystrokes and commands affect the active window or icon. If a window is active, its title bar changes color to differentiate it from other windows. If an icon is active, its label changes color. Windows or icons on the desktop that are not selected are inactive.

ANSI character set The American National Standards Institute 8-bit character set. It contains 256 characters.

application A computer program used for a particular kind of work, such as word processing or database management. This term is used interchangeably with “program.” *See also* Windows application, non-Windows application.

application icon A graphic that represents a running application. This icon appears only after you start an application and then minimize (reduce) it.

application shortcut key A key combination that brings a running application to the foreground. You can assign an application shortcut key in Program Manager or in a PIF (program information file).

application swap file A temporary file that Windows uses to store a non-Windows application when you switch to another application. This leaves more room in memory for running applications. Windows uses application swap files in standard mode only. *See also* swap file.

application window The window containing the work area and menu bar for an application. The name of the application appears at the top of this window. An application window may contain multiple document windows.

archive attribute A file characteristic that indicates whether the file has been changed since it was last backed up. This attribute is usually set when the file is created or modified, and then cleared when the file is backed up by using the MS-DOS **xcopy**, **backup**, or **restore** command.

arrow keys On your computer keyboard, the keys you use to navigate around your screen. Each key is marked with an arrow and is named for the direction in which the arrow points: There is an UP ARROW, DOWN ARROW, LEFT ARROW, and RIGHT ARROW key. *Also known as* direction keys.

ASCII character set The American Standard Code for Information Interchange 7-bit character set. It consists of the first 128 (0–127) characters of the ANSI character set (and most other 8-bit character sets). The ASCII character set is the most universal character-coding set.

associate To identify a filename extension as “belonging” to a certain application. When you open a file with an extension that has been associated with an application, the application starts automatically. Files that are associated with an application are called document files. *See also* document file.

attributes Information about a file that indicates whether the file is read-only, hidden, or system, and whether it has been changed since it was last backed up. *See also* archive attribute, hidden file, read-only file, system file.

AUTOEXEC.BAT file A batch program (set of commands) that is automatically carried out by the MS-DOS operating system whenever the computer is started or restarted. The file contains basic startup commands that help configure the system.

automatic link A link whose Update option is set to automatic. When you edit a linked object, the changes are made to the visual presentation (image) of the object in all documents that contain an automatic link to the object. *See also* manual link, link, object linking and embedding.

B

background The area behind and outside the active window, including the desktop and any other application windows or icons. *See also* foreground.

background application An application that is running but is not active. The application cannot receive user input. *See also* foreground application.

batch program A text file that contains MS-DOS commands. When you run the batch program, MS-DOS carries out the commands in the file as if you had typed them at the MS-DOS prompt.

baud rate The speed at which information can be transferred through a COM (serial) port.

binary file A file containing information that is in machine-readable form; it can be read only by an application. In Terminal, these files are not converted or translated during the transfer process.

binary transfer A method of transferring binary files to a remote computer.

bitmap An image stored as a pattern of dots (or pels).

boot To start or restart your computer, loading the MS-DOS operating system from your hard disk or floppy disk. *See also* hard disk, floppy disk, system disk.

branch A segment of the File Manager directory tree, representing a directory and any subdirectories within it.

browse To look through files and directories. Some dialog boxes have a Browse button, which opens another dialog box that lists files and directories so that you can easily select the file you want.

buffer A temporary storage place for information.

C

cartridge font A font contained in a cartridge that physically plugs into your printer. Font cartridges are often used by laser printers such as those in the HP LaserJet family, but some dot-matrix printers also use font cartridges. *See also* font cartridge.

cascade A way of arranging open windows on the desktop so that they overlap each other, with the title bar of each window remaining visible.

cascading menu A menu that opens from a command on another menu. A command that opens a cascading menu has a right arrow next to it.

channel map Specifies destination channels, output devices, and patch maps for MIDI channel messages.

character set A group of letters, numbers, and symbols that have some relationship in common. For example, the ASCII character set contains characters that make up the ASCII coding scheme.

check box A small, square box that appears in a dialog box and that can be selected or cleared. When the check box is selected, an X appears in the box. A check box represents an option that you can turn on or off.

choose To use a mouse or keyboard to pick an item that begins an action in Windows. You choose commands on menus to perform tasks, and you choose icons to start applications.

clear To turn off an option by removing the X from a check box. You clear a check box by clicking it, or selecting it and pressing the SPACEBAR.

click To press and release a mouse button quickly.

client application An application whose documents can accept linked or embedded objects.

Clipboard A temporary storage location used to transfer data between documents and between applications. Typically, you transfer data to the Clipboard by using an application's Copy or Cut command, and you insert data from the Clipboard by using the application's Paste command. You use Clipboard Viewer to view the contents of the Clipboard.

close To remove a window or dialog box, or quit an application. You can close a window by using the Close command on the Control menu. When you close an application window, you quit the application.

collapse To "hide" subdirectories below a selected directory in File Manager.

color scheme A predefined combination of colors that Windows uses for its screen elements. You can choose a color scheme or create your own by using Control Panel.

COM port *See* serial port.

command A word or phrase, usually found in a menu, that you choose in order to carry out an action. You choose a command from a menu, or type a command at the MS-DOS prompt. You can also type a command in the Run dialog box in File Manager or Program Manager.

command button In a dialog box, a button that carries out an action. A command button often has a label that describes the action it carries out (for example, Cancel, Help, or Install). Choosing a command button that is followed by an ellipsis (for example, Browse...) causes another dialog box to appear.

command line The commands you type to run an application. You can type the commands at the MS-DOS prompt or in the Run dialog box in File Manager or Program Manager.

command prompt *See* MS-DOS prompt.

communications settings Settings that specify how information is transferred from your computer to a device (usually a printer or modem). *See also* serial port.

compound device An MCI device that uses media files, compared to a simple device, which does not require media files. For example, to run a compound device such as a MIDI sequencer, you must specify a MIDI file. *See also* Media Control Interface, MIDI.

compound document A document that contains information created by using more than one application.

CONFIG.SYS file A text file that contains configuration commands used when you start your computer. Commands in the CONFIG.SYS file enable or disable system features, set limits on resources, and extend the operating-system functionality by loading device drivers.

confirmation message A message that appears after you specify certain actions, prompting you to confirm that you want to continue with the action or to specify that you want to cancel it. For example, File Manager displays a confirmation message before deleting a file.

control codes In Terminal, codes that specify commands or formatting instructions (such as linefeeds or carriage returns) in a text file. Control codes are usually preceded by a caret (^). You enter these codes when you are assigning Terminal commands or formatting instructions to function keys.

Control menu A menu that contains commands you can use to manipulate the window. Application icons and some dialog boxes also have a Control menu. To open the Control menu, you use the Control-menu box at the left of the title bar in a window, or you select an application icon. *See also* Control-menu box.

Control-menu box The icon that opens the Control menu for the window. It is always at the left of the title bar.

conventional memory Up to the first 640K of memory in your computer. MS-DOS uses this memory to run applications.

copy To put a copy of the selected text or item onto the Clipboard so that you can transfer it to another location. Most Windows applications have a Copy command on the Edit menu that performs this task. You can also copy entire files from one location to another by using File Manager.

current directory The directory that you are currently working in. In File Manager, the current directory is selected (highlighted) in the directory tree.

cursor *See* insertion point.

cut To move data from a document into a temporary storage area called the Clipboard. Most Windows applications have a Cut command (on the Edit menu) that performs this task.

cutout An area of a drawing you select by using the Scissors or Pick tool in Paintbrush.

D

data file Any file created within an application: a word-processing document, a spreadsheet, a database file, or a chart, for example. *Also known as* document. *See also* text file.

default button In some dialog boxes, the command button that Windows automatically selects. The default button has a bold border, indicating that it will be chosen if you press ENTER. You can override a default button by choosing Cancel or another command button.

default printer The printer that is used if you choose the Print command without first specifying which printer you want to use. You can have only one default printer, which you can specify by using Control Panel or Print Manager. The printer you use most often should be the default printer.

default settings Settings that are supplied with Windows. For example, if you print a document from Windows without specifying margin settings, Windows uses its preset margins.

desktop The screen background for Windows on which windows, icons, and dialog boxes appear.

desktop pattern A design that appears across the desktop. You can use Control Panel to create your own pattern or choose a pattern provided by Windows.

destination directory The directory to which you intend to copy or move one or more files.

destination document A document containing a link to an object in a source document.

device A component of the system's hardware configuration, such as a modem, printer, mouse, sound card, or disk drive.

device contention Occurs when more than one application is trying to use the same device, such as a modem, while Windows is running in 386 enhanced mode.

device driver Software that controls how a computer communicates with a device, such as a printer or mouse. For example, a printer driver translates information from the computer into information the printer can understand.

dialog box A window that appears temporarily to request information. Many dialog boxes have options you must choose before Windows can carry out a command.

dimmed Unavailable or disabled. A dimmed button or command is displayed in light gray instead of black, and it cannot be chosen.

direction keys *See* arrow keys.

directory Part of a structure for organizing your files on a disk. A directory can contain files and other directories (called subdirectories). The structure of directories and subdirectories on a disk is called a directory tree. *See also* directory tree, subdirectory.

directory icon In File Manager, an icon that represents a directory on your disk.

directory path *See* path.

directory tree In File Manager, a graphical display of the directory structure of a disk. The directories on the disk are shown as a branching structure that resembles a tree. The top-level directory is known as the root directory.

directory window A File Manager window that displays the directory structure of your disk and the files and directories on the disk.

disk A medium for storing information. Information stored on a disk remains there even when you turn your computer off, unlike information stored in memory (RAM). A floppy disk can be inserted and removed from a floppy disk drive, whereas a hard disk is permanently mounted inside its drive. *See also* disk drive.

disk cache A portion of memory set aside for temporarily holding information read from a disk.

disk drive A device used for storing and retrieving information on disks. *See also* disk, floppy disk, hard disk.

display adapter Hardware that converts (adapts) video memory to video output.

dithered color *See* nonsolid color.

document Whatever you create with an application, including information you type, edit, view, or save. A document may be a business report, a spreadsheet, a picture, or a letter, for example, and is stored as a file on a disk.

document file A file that is associated with an application. When you open a document file in File Manager, the associated application starts and loads the file.

document-file icon In File Manager, represents a file that is associated with an application. When you choose a document-file icon, the associated application starts and loads the file.

document window A window within an application window. There can be more than one document window open at a time.

double-click To rapidly press and release a mouse button twice without moving the mouse. Double-clicking carries out an action, such as starting an application.

downloadable font *See* soft font.

drag To move an item on the screen by selecting the item and then pressing and holding down the mouse button while moving the mouse. For example, you can move a window to another location on the screen by dragging its title bar.

drive *See* disk drive, RAM drive.

drive icon An icon in File Manager that represents a disk drive. Different icons depict floppy disk drives, hard disk drives, network drives, RAM drives, and CD-ROM drives.

drive letter The letter assigned to a drive—for example, C. *See also* disk drive.

driver *See* device driver.

E

embed To insert information (an object) that was created in one document into another document (most often the two documents were created with different applications). The embedded object can be edited directly from within the document. To embed, you must be using applications that support object linking and embedding. *See also* link, object.

embedded object Information created in one document and inserted into another document (most often the two documents were created with different applications). Embedded objects can be edited from within the destination document. *See also* linked object.

EMS memory *See* expanded memory.

emulation mode A mode in which a device such as a printer can emulate the actions of a different device. *See also* terminal emulation.

environment variable Environment information, such as a drive, path, or filename, associated with a symbolic name that can be used by MS-DOS. You use the MS-DOS **set** command to define environment variables.

EPT port A port requiring a special card and software. Only certain printers, such as the IBM Personal Pageprinter, use this port.

exclusive application A non-Windows application that has the sole use of the computer's resources while it is the active application and Windows is running in 386 enhanced mode. You can specify whether an application gets exclusive use of resources by modifying the application's PIF or by using the Settings command on the application's Control menu. When an exclusive application is running in a window, it gets most, but not all, of the resources. *See also* PIF.

expand In File Manager, to show hidden directory levels in the directory tree. You can expand a single directory level, one branch of the directory tree, or all branches at once.

expanded memory Memory in addition to conventional memory that some non-Windows applications use. Expanded memory is an older standard being replaced by the use of extended memory. Only EMS-compatible software can use expanded memory. Windows running in 386 enhanced mode simulates expanded memory for applications that need it. *Also known as* EMS memory.

expanded-memory emulator A program that converts extended memory into expanded memory.

extend selection To select more than one item. For example, in File Manager you can select a group of files to be moved or copied.

extended memory Memory beyond 1 megabyte (MB) in 80286, 80386, and 80486 computers. Windows uses extended memory to manage and run applications. Extended memory typically is not available to non-Windows applications or MS-DOS. *See also* XMS memory.

extended-memory manager A program that prevents different applications from using the same part of extended memory at the same time.

extension The period and up to three characters at the end of a filename. An extension usually identifies the kind of information a file contains. For example, files that you create by using Calendar have the extension .CAL.

F

file A collection of information that has been given a name and is stored on a disk. This information can be a document or an application.

file attribute *See* attributes.

file format The way information is structured in a file. Applications always store data files in a particular format. A format readable by one application may not be readable by another application.

filename The name of a file. Windows uses MS-DOS naming conventions.

filename extension *See* extension.

fixed disk *See* hard disk.

fixed-width font *See* monospaced font.

flexible box In Paintbrush, a square box that changes shape as you move the mouse. You use

a flexible box to define an area of the picture you want to change, cut, copy, or move.

floppy disk A disk that can be inserted in and removed from a floppy disk drive. *See also* hard disk, disk drive.

flow control In Control Panel and Terminal, the processes used to regulate the rate at which information is transferred from one device to another. One device sends a signal to the other when information can be transferred. *Also known as* handshake.

font A set of letters, numbers, punctuation marks, and symbols that are a given size and design. *See also* scalable typeface.

font cartridge A piece of hardware that is plugged into a printer to supply one or more fonts. *See also* cartridge font.

font family A group designation that describes the general look of a font. For example, the Roman font family contains proportionately spaced fonts with serifs.

font size *See* point size.

footer Text that appears at the bottom of document pages when they are printed.

foreground The area of the screen that the active window occupies. *See also* background.

foreground application The application you are working with. The foreground application appears in the active window. *See also* background application.

format (1) The way text is set up on a page. (2) To prepare a disk for holding information. Formatting a disk deletes all information that was previously on it. (3) The way information is structured in a file, often specific to one application. *See* file format.

full-screen application A non-Windows application that is displayed in the entire screen—rather than a window—when running with Windows. You can specify whether a non-Windows application runs in a full screen or a window by modifying the PIF or using the Control menu. *See also* PIF.

G

General MIDI specification Defines a standard setup for MIDI files, including channel settings, instrument patch settings, and key assignments. *See also* MIDI.

graphics mode The mode that enables applications to display images in addition to text. Windows applications always run in graphics mode, whereas non-Windows applications can run in either graphics or text mode.

graphics resolution The level of quality at which Windows prints graphics. The higher the resolution, the better the quality of the printed graphics. Higher-resolution graphics take longer to print and use more disk space.

group A collection of applications, accessories, or documents within Program Manager. Grouping these items makes them easier to find when you want to start them.

group icon The icon that represents a group in Program Manager when the group window is minimized (reduced). To open a group and view its contents, you choose the group icon.

group window A window that displays the items in a group within Program Manager. These items may be applications, accessories, or documents.

H

handshake *See* flow control.

hard disk A disk that is permanently mounted in its drive. *Also known as* fixed disk. *See also* disk, disk drive, floppy disk.

hardware The equipment that makes up your computer system, including such items as the keyboard, mouse, disk drives, and monitor.

header Text that appears at the top of every page of a document when it is printed.

hidden file A file that is not intended to be viewed in a directory listing, such as your Windows swap file. The hidden attribute specifies whether a file is hidden. *See also* attributes.

high memory area (HMA) The first 64K of extended memory. This area is used by some applications and by Windows.

highlighted Indicates that an object or text is selected and will be affected by your next action. Highlighted text appears in reverse video on monochrome monitors or in color on some color monitors. Highlighted objects might change color or be surrounded by a selection cursor. You can change the color of the highlight by using Control Panel.

HMA *See* high memory area.

hue In Control Panel, the position of a color along the color spectrum. For example, green is between yellow and blue. *See also* luminosity, saturation.

I

i/o addresses Locations within the input/output address space of your computer used by a device, such as a printer or modem. The address is used for communication between software and a device.

icons Graphical representations of various elements in Windows, such as disk drives, applications, embedded and linked objects, and documents.

import To create a package by inserting an existing file into Object Packager. When you import a file, the icon of the application you used to create the file appears in the Appearance window, and the name of the file appears in the Contents window.

inactive window Any open window that you are not currently working in. *Also known as* background window.

index line In Cardfile, the bar at the top line of each card that contains the title of the card.

information area In Cardfile, the area below the index line, into which you type information.

initialization files Files with the extension .INI that contain information that defines your Windows environment. Windows and applications use the information stored in these files.

insertion point The place where text will be inserted when you type. The insertion point usually appears as a flashing vertical bar in an application's window or in a dialog box. *Also known as* cursor.

interrupt A signal that a device sends to the computer when the device is ready to accept or send information.

interrupt request lines (IRQ) Hardware lines over which devices can send interrupts (signals indicating that the device is ready to accept or send information). Typically, each device connected to the computer uses a separate IRQ.

K

keyboard buffer A temporary storage area in memory that keeps track of keys that you typed, even if the computer did not immediately respond to the keys when you typed them.

key map A MIDI patch-map entry that translates key values for certain MIDI messages—for example, the keys used to play the appropriate percussion instrument or a melodic instrument in the appropriate octave.

L

link (n) A reference in a destination document to where an object exists in a source document.

link (v) To create a reference in a destination document to an object in a source document. When you link an object, you are inserting a visual presentation of the object into the destination document. The linked object can be edited directly from within the destination document. When the object changes in the source document, the changes appear in the destination document. *See also* embed, object.

linked object In a destination document, a visual presentation (such as an icon or bitmap) of an object.

list box Within an application window or dialog box, a type of box that lists available choices—for example, a list of all files in a directory. If all the choices do not fit in the list box, there is a scroll bar.

local printer A printer that is directly connected to one of the ports on your computer. *See also* network printer.

LPT port *See* parallel port.

luminosity In Control Panel, the brightness of a color on a scale from black to white. For example, light blue has a higher luminosity than a darker blue or dark red, but may have about the same luminosity as a light pink. *See also* hue, saturation.

M

macro In Recorder, a series of recorded actions. You can use Recorder to create macros. When you run a macro, Recorder carries out all the recorded actions.

manual link A link whose Update option is set to manual. When the linked object is edited, its visual presentation (image) does not reflect the changes until you manually update the link. *See also* automatic link, link, object linking and embedding.

mark To select text in a non-Windows application so that you can copy it onto the Clipboard.

Maximize button The small box containing an up arrow at the right of the title bar. Mouse users can click the Maximize button to enlarge a window to its maximum size. Keyboard users can use the Maximize command on the Control menu.

Media Control Interface (MCI) A standard control interface for multimedia devices and files. Using MCI, a multimedia application can control a variety of multimedia devices and files. Windows provides two MCI drivers: one controls the MIDI sequencer, and one controls sound for .WAV files.

media file A file containing multimedia data, such as sound or animation.

memory A temporary storage area for information and applications. *See also* RAM, ROM, conventional memory, expanded memory, extended memory.

memory-resident program A program that is loaded into memory and is available even when another application is active. *Also known as* a terminate-and-stay-resident (TSR) program. *See also* pop-up program.

menu A list of available commands in an application window. Menu names appear in the menu bar near the top of the window. You open a menu by selecting the menu name. *See also* Control menu.

menu bar The horizontal bar containing the names of the application's menus. It appears below the title bar.

MIDI Acronym for Musical Instrument Digital Interface, a standard protocol for communication between musical instruments and computers.

MIDI file A file containing all the information required to play a sound by using a MIDI device.

MIDI sequencer A program that plays or records sounds stored as MIDI files. Windows provides an MCI MIDI sequencer. *See also* Media Control Interface.

MIDI setup Specifies the type of MIDI device you are using, its channel mappings, and the port it is connected to.

Minimize button The small box containing a down arrow at the right of the title bar. Mouse users can click the Minimize button to reduce a window to an icon. Keyboard users can use the Minimize command on the Control menu.

modem A communications device that enables a computer to transmit information over a telephone line.

monospaced font A font in which all characters have uniform widths, such as Courier New. *See also* proportional font.

mouse pointer *See* pointer.

MS-DOS prompt At the MS-DOS command line, the character or characters that appear at the beginning of the line, indicating that the computer is ready to receive input. *Also known as* command prompt.

Musical Instrument Digital Interface *See* MIDI.

multimedia A combination of various media, such as sound, graphics, animation, and video.

multitasking A computer's ability to run more than one application at the same time.

N

network A group of computers connected by cables or other means and using software that enables them to share equipment (such as printers and disk drives) and exchange information.

network drive A disk drive that is available to multiple users and computers on a network. Network drives often store data files for many people in a work group.

network printer A printer shared by multiple computers over a network. *See also* local printer.

nonsolid color A color produced by a pattern of differently colored dots that simulate the desired color. A solid color on one device (such as a 256-color monitor) may be a nonsolid color on another device. *Also known as* dithered color. *See also* solid color.

non-Windows application "Non-Windows application" is used in this guide as a shorthand term to refer to an application that is designed to run with MS-DOS but not specifically with Windows and that may not be able to take full advantage of all Windows features (such as memory management).

O

object In the context of object linking and embedding, information such as a drawing, chart, or sound file that can be linked to or embedded into another document. *See also* link, embed.

object linking and embedding (OLE) A way to transfer and share information between applications. *See also* link, embed, object.

open To display the contents of a file in a window or to enlarge an icon to a window.

option (1) A choice in a dialog box. (2) In an MS-DOS command line, a parameter used to control how a command is carried out. Typically, an option starts with a slash (/). For example, to start Microsoft Word in character mode, you type **word /c** at the MS-DOS prompt. The /c is the option. *See also* parameter.

option button A small, round button that appears in a dialog box. Within a group of related option buttons, you can select only one.

P

package A small drawing (or icon) that represents an embedded or linked object. When you choose the package, the application used to create the embedded or linked object either plays the object (for example, a sound file) or opens and displays the object (for example, text or graphics).

parallel interface An interface between a computer and a printer in which the computer sends multiple bits of information to the printer simultaneously. Parallel and Centronics interfaces are the same type. *See also* serial interface.

parallel port A connection on a computer, usually LPT1, where you plug in the cable for a parallel printer. Windows supports parallel ports LPT1 through LPT3.

parallel printer A printer with a parallel interface, which you connect to a parallel port.

parameter Information added to the command that starts an application. A parameter can be a filename or any type of information up to 62 characters in length. *See also* option.

parity An error-checking procedure in which the number of 1's must always be the same—either even or odd—for each group of bits transmitted without error.

paste To copy the contents of the Clipboard into an application. Many applications have a Paste command on the Edit menu that performs this task.

patch map The part of a channel-map entry that translates instrument sounds, volume settings, and (optionally) key values for a channel.

path Specifies the location of a file within the directory tree. For example, to specify the path of a file named SYSTEM.INI located in the WINDOWS directory on drive C, you would type `c:\windows\system.ini`.

pel The smallest graphic unit that can be displayed on the screen, usually a single-colored dot. Pel is the abbreviation for picture element. *Also known as* pixel.

PIF (program information file) A file that provides information about how Windows should run a non-Windows application. For example, you use a PIF to direct Windows to run a non-Windows application in a full screen rather than in a window, or to specify a start-up directory.

pixel *See* pel.

plotter font A font created by a series of dots connected by lines that can be scaled to different sizes (used by plotters). *Also known as* vector font.

point To move the pointer on the screen until it rests on the item you want to select.

point size The height of a printed character specified in units called points. A point equals 1/72 of an inch. *Also known as* font size.

pointer The arrow-shaped cursor on the screen that follows the movement of a mouse (or other pointing device) and indicates which area of the screen will be affected when you press the mouse button. The pointer may change shape during certain tasks. *Also known as* mouse pointer.

pointing device An input device you use to move the pointer on the screen, choose commands, press buttons, select text, create drawings, and so on. For example, a mouse is a pointing device.

pop-up program A memory-resident program that is loaded into memory but isn't visible until you press a certain key combination or until a certain event occurs, such as receiving a message. *See also* memory-resident program.

port A connection or socket on the computer. Ports are used for connecting devices, such as printers, monitors, and modems, to your computer, and for sending information from your computer to the devices. Serial ports (COM) and parallel ports (LPT) are the most commonly used ports.

printer driver A program that controls how your computer and printer interact. A printer-driver file supplies Windows with such information as the printing interface, description of fonts, and features of the installed printer.

printer fonts Fonts that are stored in your printer's memory, or soft fonts that are sent to your printer before a document is printed. Because the font works only with the printer, Windows can only approximate the font's appearance on the screen. *See also* screen font, soft font, TrueType fonts.

print queue A list of files that have been sent to a printer. The list indicates the file currently printing and those waiting to be printed.

program file An executable file that starts an application or program. A program file has an .EXE, .PIF, .COM, or .BAT filename extension.

program information file *See* PIF.

program items The applications and documents that make up a group in Program Manager. Program items are represented as icons in a group window.

program-item icon The icon that represents an application or document in Program Manager. You can start an application or open a document by choosing its program-item icon. (To choose the icon, you double-click it. Or you can use the arrow keys to move the selection cursor to it, and then press ENTER.)

proportional font A font in which different characters have varying widths, such as Times New Roman. *See also* monospaced font.

protected mode A computer's operating mode that is capable of addressing extended memory directly.

protocol A set of rules that define how computers communicate with each other.

Q

queue *See* print queue.

quick format Deletes the file allocation table and root directory of a disk, making it appear empty, but it does not delete the file information on the disk or scan the disk for bad areas. This serves as a quick way to format a previously formatted disk.

R

RAM (random access memory) The memory that can be used by applications to perform necessary tasks while the computer is on. When you turn the computer off, all information in RAM is lost. *See also* virtual memory, ROM.

RAM drive A portion of memory that is used as if it were a hard disk drive. RAM drives are much faster than hard disks because your computer can read information faster from memory than from a hard disk. However, information on a RAM drive is lost when you turn off or restart your computer. *Also known as* virtual drive.

raster font *See* screen font.

read-only file A file that you can read but cannot make changes to. The read-only attribute specifies whether a file is read-only. *See also* attributes.

reduce To minimize a window to an icon at the bottom of the desktop by using the Minimize button or the Minimize command. A minimized application continues running, and you can select the icon to make it the active application.

resolution Indicates the number of dots that make up an image on a screen or printer. The larger the number of dots, and thus the higher the resolution, the finer and smoother images can appear when displayed at a given size.

Restore button The small button containing both an up and down arrow at the right of the title bar. The Restore button appears only after you have enlarged a window to its maximum size. Mouse users can click the Restore button to return the window to its previous size. Keyboard users can use the Restore command on the Control menu.

ROM (read-only memory) Memory that can be read, but not modified. The contents of this memory is retained even when the computer is turned off.

root directory The top-level directory of a disk. The root directory is created when you format the disk. From the root directory, you can create files and other directories.

S

saturation In Control Panel, the purity of a color's hue, moving from gray to the pure color. For example, a very dark blue may have mostly black with only a small amount of blue, and thus would have a very low saturation. *See also* hue, luminosity.

scalable typeface A set of letters, numbers, punctuation marks, and symbols that are a given design but can be scaled to any size.

scaled point size A point size that approximates a specified point size for use on the screen. For example, text that prints at 10 point on the printer may be represented by a slightly larger font on the screen to make up for the screen's lower resolution.

screen font The font that is displayed on your screen, which may approximate a printer font so that documents look approximately the same on the screen as they do when printed.

screen saver A moving picture or pattern that appears on your screen when you have not moved the mouse or pressed a key in Windows for a specified period of time. Screen savers

prevent screen damage that is caused when the same areas of light and dark are displayed for long periods of time.

scroll To move through text or graphics (up, down, left, or right) in order to see parts of the file or list that cannot fit on the screen.

scroll arrow An arrow on either end of a scroll bar that you use to scroll through the contents of the window or list box.

scroll bar A bar that appears at the bottom and/or right edge of a window whose contents are not entirely visible. Each scroll bar contains a scroll box and two scroll arrows.

scroll box In a scroll bar, the small box that shows the position of information currently in the window or list box relative to the contents of the entire window.

scroll buffer In Terminal, the buffer that holds information that does not fit on the screen.

select To mark an item so that a subsequent action can be carried out on that item. You usually select an item by clicking it with a mouse or pressing a key. After selecting an item, you choose the action that you want to affect the item. *See also* choose.

selection cursor The marking device that shows where you are in a window, menu, or dialog box and what you have selected. The selection cursor can appear as a highlight or as a dotted rectangle around text.

sequencer *See* MIDI sequencer.

serial interface An interface between a computer and a serial device, such as a printer or modem, by which the computer sends single bits of information to the device, one after the other. Serial, asynchronous, and RS232 interfaces are all the same type. *See also* parallel interface.

serial printer A printer using a serial interface, which you connect to a serial port.

serial port A connection on a computer, usually COM1, where you plug in the cable for a serial device. Common serial devices are printers and modems. Windows supports COM1 through COM4.

server A computer that provides disk space, printers, or other services to computers over a network. *See also* network drive, network printer.

server application A Windows application that creates objects that can be linked and embedded into other documents. *See also* client application.

shortcut key A key or key combination that you press to carry out a command or action. If a command has a shortcut key, the key combination is listed to the right of the command name on the menu. For example, pressing the shortcut key ALT+F4 closes the active application.

simple device An MCI device that does not use media files. For example, an audio compact-disc player is a simple device. *See also* compound device, Media Control Interface.

soft font A font, usually provided by a font vendor, that must be installed on your computer and sent to the printer before it can be printed. *Also known as* downloadable font.

software The set of instructions that make computer hardware perform tasks. Programs, operating systems, device drivers, and applications are all software.

solid color A color that appears on a display when all pels are the same color. On a monochrome display, there are only two solid colors: black and white. *See also* nonsolid color.

sound driver A program that applications use to play sounds on your computer.

sound file A file containing audio information that an application can play on your computer. You can assign a sound file to a system event, such as starting Windows, so that you are alerted by a sound when the event occurs.

source directory The directory that contains the file or files you intend to copy or move.

source document The document from which a linked object originates.

special characters Characters not found on your computer's keyboard. These are accessible through Character Map, an application in the Accessories group.

split bar Divides a window into two parts. In File Manager, a directory window is divided by a split bar: The directory tree is on the left, and the contents of the current directory are on the right.

standard mode A Windows operating mode that can be used with 80286, 80386, and 80486 computers. This mode provides access to extended memory and also enables you to switch between non-Windows applications, but it does not provide virtual memory or enable non-Windows applications to run in the background or in a window. *See also* 386 enhanced mode.

status bar A line of information usually located at the bottom of a window. In File Manager, the status bar shows the number of bytes available on the disk and the total disk capacity. Not all windows have a status bar, and in many applications, it is optional.

subdirectory A directory within another directory.

swap file An area of your hard disk that is set aside for exclusive use by Windows in 386 enhanced mode. Windows temporarily transfers information from memory to the swap file to free memory for other information. Swap files can be either temporary or permanent. *See also* application swap file.

switch *See* option.

synthesizer A device that produces sound from digital instructions rather than from recorded sound.

system disk A disk that contains the MS-DOS system files necessary to start MS-DOS. You can have more than one system disk; however, the disk from which MS-DOS is loaded when you start your computer is called the boot disk.

system file A file that contains information required for running the MS-DOS operating system. A system file is not shown in the directory listing. The system attribute specifies whether a file is a system file. *See also* attributes.

system time The time according to your computer's internal clock.

SYSTEM.INI file A Windows initialization file that contains settings you can use to customize Windows for your system's hardware.

T

Task List A window that shows all the applications you have running and enables you to switch between them. You can open Task List by choosing Switch To from the Control Menu or by pressing CTRL+ESC.

terminal emulation In Terminal, a setting that causes your computer to emulate a hardware terminal (a device used to display data received from a remote computer).

terminate-and-stay-resident (TSR) program
See memory-resident program.

text box In a dialog box, a box in which you type information needed to carry out a command. The text box may be blank or may contain text when the dialog box opens.

text editor An application used to create, view, and modify text files; for example, Notepad.

text file A file containing only letters, digits, and symbols. A text file usually consists of characters coded from the ASCII character set. *Also known as* data file. *See also* document file, binary file.

text mode The mode that enables applications to display text but not graphic images. Many non-Windows applications run in text mode. *See also* graphics mode.

text transfer A method for transferring text files from Terminal to a remote computer.

tile A way of arranging open windows so that no windows overlap but all windows are visible. Each window takes up a portion of the screen.

timeout If a device is not performing a task, the amount of time a computer should wait before detecting it as an error.

time slice The amount of processor time allocated to an application, usually measured in milliseconds. Each application can run for this specified amount of time before the next application is given control.

title bar The horizontal bar (at the top of a window) that contains the title of the window or dialog box. On many windows, the title bar also contains the Control-menu box and Maximize and Minimize buttons.

TrueType fonts Fonts that are scalable and sometimes generated as bitmaps or soft fonts, depending on the capabilities of your printer. TrueType fonts can be sized to any height, and they print exactly as they appear on the screen. *See also* printer font, screen font.

TSR Acronym for terminate-and-stay-resident program. *See* memory-resident program.

U

upper memory area The 384K area of address space adjacent to the 640K of conventional memory. This area is usually reserved for running your system's hardware, such as your monitor, and is not considered part of total memory because applications cannot store information in this area. In 386 enhanced mode, Windows can access unused portions of this area.

upper memory blocks (UMBs) Areas of the upper memory area that contain general-purpose memory and that can be used to hold device drivers or other memory-resident programs in order to leave more conventional memory available for applications.

V

vector font *See* plotter font.

virtual drive *See* RAM drive.

virtual memory A memory-management system used by Windows in 386 enhanced mode that enables Windows to run as if there were more memory than is actually present. The amount of virtual memory available equals the amount of free random-access memory (RAM) plus the amount of disk space allocated to a swap file that Windows uses to simulate additional RAM.

volume label A name that identifies a disk. The volume label appears in the title bar of a directory window in File Manager.

W

wallpaper An image being displayed on the desktop background.

wildcard A character that represents one or more other characters. In filenames, you can use the question mark (?) to represent any single character and the asterisk (*) to represent any character or group of characters that might match that position in other filenames. For example, *.EXE represents all files that end with the .EXE filename extension.

WIN.INI file A Windows initialization file that contains settings you can use to customize your Windows environment.

window A rectangular area on your screen in which you view an application or document. You can open, close, and move windows, and change the size of most windows. You can open several windows at a time, and you can often reduce a window to an icon or enlarge it to fill the entire desktop. Sometimes windows are displayed within other windows. *See also* application window, document window.

Windows application "Windows application" is used in this guide as a shorthand term to refer to an application that is designed to run with Windows and does not run without Windows. All Windows applications follow similar conventions for arrangement of menus, style of dialog boxes, and keyboard and mouse use.

Windows character set The character set used to display Windows and Windows applications. It is based on the ANSI character set. *See also* ANSI character set.

word wrap A feature that moves text from the end of a line to the beginning of a new line as you type. With word wrap, you do not need to press ENTER at the end of each line in a paragraph.

workspace The area of a window that displays the information contained in the application or document you are working with.

X

XMS memory Extended memory that can be accessed by using the eXtended Memory Specification from Lotus, Intel, Microsoft, and AST. Applications work with an extended-memory manager, which makes sure only one application is using a portion of memory at any one time.

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