

3+Open™ MS OS/2 Documentation Set

*MS Operating System/2 Desktop Reference
MS Operating System/2 User's Guide*



Open

3+Open™ MS® OS/2 Documentation Set

MS Operating System/2 Desktop Reference
MS Operating System/2 User's Guide

**A member of the 3+Open family of products. For use with OS/2,
version 1.0 or 1.1, and DOS, version 3.1 or higher.**

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Microsoft® Operating System/2 Desktop Reference

Version 1.1

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Commands

A command is any word or phrase that you can choose from a menu or type at a prompt in order to carry out an action. MS OS/2 commands are built into programs: the menu commands are part of Presentation Manager; the command-line commands are part of the MS OS/2 command interpreter (**cmd**) or the DOS command interpreter (**command**).

The command-line commands include special sets of commands for configuring your system and for running batch files.

Presentation Manager Commands

Control Panel

Preferences Menu

- Screen Colors
- Border Width
- Warning Beep
- Mouse
- Logo Display
- Country

Installation Menu

- Add Font
- Delete Font
- Add Printer Driver
- Delete Printer Driver
- Add Queue Processor
- Delete Queue Processor

Setup Menu

- Communications Port
- Printer Defaults
- Printer Connections
- Spooler Options
- Spooler Queues
- Queue Connections

Exit Menu

- Exit Control Panel
- Resume

File System

File Menu

Open
Print
Associate
Move
Copy
Delete
Rename
Change Attributes
Create Directory
Select All
Deselect All
Undo Selection

Options Menu

Display Options
Full File Details
File Options
Minimize On Run

Tree Menu

Show Outline Tree
Expand One Level
Expand Branch
Expand All
Collapse Branch

Arrange Menu

Cascade
Tile

Window Menu

Refresh
Close All Directories
Directory Tree

Exit Menu

Exit File System
Resume

Spooler Queue Manager

Queue Menu

Hold Queue
Release Queue
Hold All Jobs
Release All Jobs
Cancel All Jobs

Special Menu

Refresh
Auto Refresh

Job Menu

Job Details
Cancel Job
Print Job Next
Repeat Job
Start Job Again
Hold Job
Release Job

Start Programs

Program Menu

Start
Add
Change
Delete
Copy
Minimize On Run

Group Menu

Add
Delete
Rename
Main Group
Utility Programs
Demonstration Programs

Task Manager

Task Menu

Switch To
Close
Minimize After Use

Shutdown Menu

Shutdown Now
Resume Task Manager

Arrange Menu

Cascade
Tile

System Menu

The following commands appear in various combinations on the System menus of MS OS/2 applications that run in a window. The first five commands always appear, although some of them may be inactive:

Restore
Move
Size
Minimize
Maximize

These additional commands appear on the System menus of some applications:

Close
Help
Large Font
Next Window
Scroll
Small Font
Task Manager

MS OS/2 Commands

chcp	path
chdir	prompt
cls	rename
copy	rmdir
date	set
del	start
detach	time
dir	type
dpath	ver
exit	verify
mkdir	vol

DOS Commands

break	path
chcp	prompt
chdir	rename
cls	rmdir
copy	set
date	time
del	type
dir	ver
exit	verify
mkdir	vol

Batch Commands

call	if
echo	pause
endlocal (OS/2 only)	rem
extproc (OS/2 only)	setlocal (OS/2 only)
for	shift
goto	

Configuration Commands

break (DOS only)	priority
buffers	protectonly (OS/2 only)
codepage	protshell (OS/2 only)
country	rem
device	rmsize (DOS only)
devinfo	run
diskcache	set
fcbs (DOS only)	shell (DOS only)
iopl (OS/2 only)	swappath
libpath	threads
maxwait	timeslice
memman	trace
pauseonerror	tracebuf

Utilities

A utility is a program that is included as part of MS OS/2 but is separate from the MS OS/2 and DOS command interpreters. You start a utility by typing its name.

MS OS/2 Utilities

ansi	label
attrib	mode
backup	more
chkdsk	patch
cmd	print
comp	recover
createdd	replace
ddinstal	restore
diskcomp	sort
diskcopy	spool
e (System Editor)	trace
fdisk	tracefmt
find	tree
format	unpack
help	xcopy
keyb	

DOS Utilities

append	label
assign	mode
attrib	more
backup	patch
chkdsk	print
command	recover
comp	replace
diskcomp	restore
diskcopy	setcom40
edlin	sort
find	subst
format	tree
graftabl	unpack
help	xcopy
join	

Device Drivers

A device driver tells MS OS/2 how to handle a device that is installed on your system. This manual contains descriptions of the following drivers, which are included on your MS OS/2 Installation disk:

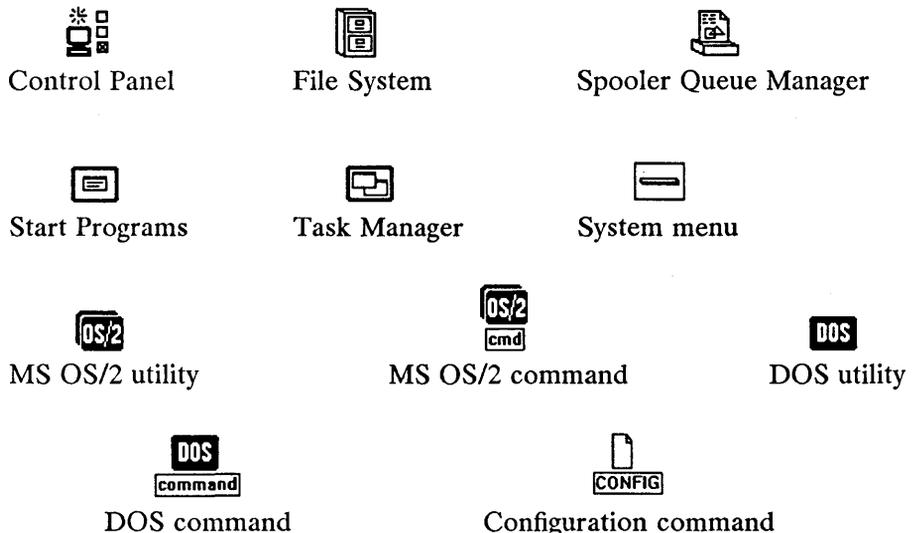
ANSI.SYS
COM0x.SYS
EXTDSKDD.SYS
MOUSExxx.SYS
POINTDD.SYS
VDISK.SYS

Notational Conventions

To help you locate and interpret information easily, this manual uses icons, a standard syntax format and terminology, and specific typographic conventions. The following sections describe these elements.

Icons

The following icons appear in the left margin and indicate where the command or utility described in the adjacent text can be used.



Syntax

Syntax represents the order in which you must type a command-line command or utility and any arguments and options that follow it. Elements that appear in bold type must be typed exactly as they appear in the syntax line; items that appear in *italic* are placeholders that represent specific information that you will need to supply. Unless specified otherwise, you may type commands, arguments, and options in either uppercase or lowercase letters.

The following is a sample syntax line:

```

  ①      ③      ⑤      ⑦
  |      |      |      |
sample [+r | -r] [drive:][path]filename [...] [options]
      ②      ④      ⑥      ⑧

```

The meaning of each of these elements is as follows:

Number	Element	Meaning
1	sample	Specifies the name of the command or utility.
2	[]	Indicates items that are optional. To include the optional information described within the brackets, type only the information, not the brackets themselves.
3	|	Separates two mutually exclusive choices in a syntax line; for example: break [on | off] Type only one of these choices (that is, break on or break off); do not type the pipe symbol itself.
4	<i>drive:</i>	Specifies a drive. You need to specify a drive with a filename only if you are using a file that is <i>not</i> on the current drive.
5	<i>path</i>	Specifies a complete directory path, using the following syntax: <i>[\directory][\directory...] \directory</i> You need to specify a path with a filename only if the file is not in the current directory.

6	<i>filename</i>	Specifies a file and includes any filename extension. The <i>filename</i> argument cannot be a device name or drive letter.
7	...	Indicates that an argument can be repeated several times in a command line. Type only the information, not the ellipsis (...) itself.
8	<i>options</i>	Specifies one or more command options. An option begins with a slash; for example, /p.

Other placeholders used in syntax lines in this manual include the following:

Placeholder	Meaning
<i>source</i>	Specifies the drive, directory, file, or device that will be transferred to a specified destination or used as input to a command.
<i>destination</i>	Specifies the drive, directory, file, or device that <i>source</i> will be transferred to.
<i>string</i>	Specifies a group of characters to be treated as a unit. A string can include letters, numbers, spaces, or any other characters and is usually enclosed in double quotation marks. Some commands, such as find , work with strings of text.

Typographic Conventions

The following typographic conventions are used in this reference:

Convention	Use
bold	Command-line commands, utilities, options, and portions of syntax that must be typed exactly as shown.
<i>italic</i>	Variables and placeholders that represent information you must provide.
monospace	Sample command lines, program code, program output, and examples.
ALL CAPITALS	Filenames, directory names, and acronyms.
SMALL CAPITALS	Names of keys on your keyboard.

Key combinations and key sequences appear in the following formats:

Notation	Meaning
KEY+KEY	A plus sign (+) between keynames means you must press the keys at the same time; for example, “Press ALT+ESC” means that you press the ALT key and hold it down while you press and release the ESC key.
KEY, KEY	A comma (,) between keynames means you must press the keys in sequence; for example, “Press ALT, SPACEBAR” means that you press the ALT key and release it, and then you press the SPACEBAR and release it.
DIRECTION keys	Arrow keys on your computer keypad are called DIRECTION keys. The individual names refer to the direction the arrow on the key points: UP, DOWN, RIGHT, and LEFT.

Add



Adds a new, empty group to Start Programs.

When you choose this command from the Group menu, a dialog box appears, asking you for the name of the new group. The group name can be up to 60 characters and can include letters, numbers, spaces, and any symbols except the backslash (\). Once you have added a new group, you can use either the Copy command or the Add command from the Program menu to add programs to the group.



Adds a program to the current group in Start Programs.

When you choose this command from the Program menu, a dialog box appears, containing text boxes in which you can type the following information:

- A title for the program. This title is added to the current group in Start Programs. You can use any title you like for the program; it does not have to be the program's usual name, and it does not have to have anything to do with the name of the file that contains the program. The title can be up to 60 characters and can include letters, numbers, spaces, and any symbols except the backslash (\). You can use a given title only once in a single group, but you can use the same title in more than one group. You can also add the same program to a group more than once, as long as you use different titles.
- The program's path and full filename. If you specify only the filename, MS OS/2 first searches the directory from which you started OS/2 and then searches the directories specified by the PATH environment variable.
- Arguments to the program. For example, if you want the **format** utility to format the disk in drive A, specify **a:** as an argument. If you want the program to prompt you for arguments each time it is run, place a question mark (?) in this text box.
- The current directory. The default is the root directory of the current drive.

Add Font



Adds a new font to your system.

Fonts are used by your printer or by an application to create different typefaces for your documents or on your screen. These fonts are contained in font files, each of which may contain several fonts (for example, the TIMES.FON font file contains fonts for Times Roman, Times Roman Bold, and Times Roman Italic, among others).

When you choose this command, a dialog box appears, asking you to insert the disk that contains the font file you want to add. The dialog box also contains a text box in which you can type the drive letter and path of the directory where the font file is located. (Don't type the font-file name, just the drive and path.) When you choose the Enter button in this dialog box, another dialog box appears, listing the font files in the directory you've specified; you can then choose the font files you want to add from that list.

Add Printer Driver



Adds a printer driver to your system.

When you choose this command, a dialog box appears, asking you to insert the disk that contains the printer-driver file you want to add. The dialog box also contains a text box in which you can type the drive and path of the directory where the printer-driver file is located. (Don't type the name of the file, just the drive and path.) When you choose the Enter button in this dialog box, another dialog box appears, listing the printer-driver files in the directory you've specified; you can then choose the printer drivers you want to add from that list.

Add Queue Processor



Adds a queue processor to your system.

When you choose this command, a dialog box appears, asking you to insert the disk that contains the queue-processor file you want to add. The dialog box also contains a text box in which you can type the drive letter and path of the directory where the queue-processor file is

located. (Don't type the name of the file, just the drive and path.) When you choose the Enter button in this dialog box, another dialog box appears, listing the queue-processor files in the directory you've specified; you can then choose the queue processors you want to add from that list.

Ansi



ansi [**on** | **off**]

Turns the support on or off for ANSI escape sequences. The default is **on**.

If you type **ansi** by itself, the utility displays the current setting.

ANSI.SYS



device=[*drive:*][*path*]**ansi.sys**

Directs MS OS/2 to load the ANSI.SYS device driver. To use this command, place it in your CONFIG.SYS file.

When this driver is loaded, you can use ANSI escape sequences in a DOS session to move the cursor, set the color for characters, and set the number of character rows and columns for the screen.

ANSI escape sequences are the default in a full-screen OS/2 session.

For a list of the escape sequences used in the ANSI.SYS device driver, see the *Microsoft Operating System/2 User's Guide*.

Append

DOS**append** [/e | ; | [drive:]path[;...]]

Tells an application which directories besides the current directory it should search for data files.

/e Stores the appended paths in the environment. You should use **/e** by itself, without any drive or path. MS OS/2 accepts this option only the first time you use **append** after starting MS OS/2. If you use the **/e** option a second time, you receive an error message.

; When used by itself (**append ;**), deletes the existing appended path. You also use semicolons to separate multiple paths.

drive:path

Specifies the directory path an application searches for data files. You can specify more than one path, separating them with semicolons.

Each time you use **append**, the new path you specify takes the place of the previous path. If you use the **/e** option the first time you use **append**, each new path will be stored in the MS OS/2 environment.

If you type **append** by itself, the utility displays the current data path.

The **append** utility achieves the same results in the DOS session as the **dpath** command does in a full-screen OS/2 session.

Example To tell an application to search the REPORTS and NOTES subdirectories of the DATA directory on the current drive, and the REPORTS directory on drive B, type the following:

```
append \data\reports;\data\notes;b:\reports
```

Assign

DOS**assign** [drive1=drive2] [...]

Assigns the drive letter of one drive to a different drive, so that if you request the first drive you get the second.

drive1

Specifies the drive letter you want to reassign.

drive2

Specifies the drive letter you want to substitute for *drive1*.

Do not type a colon (:) after the drive letters.

You can make more than one drive assignment in a single command line.

If you type **assign** by itself, the utility resets all drive letters to their original drives.

Do not use **assign** unless you need to. You can easily forget that you've reassigned a drive letter and end up changing files on an unexpected drive. Also, many programs (for example, the **backup** and **restore** utilities) require information about a drive's characteristics in order to work properly. If you have reassigned drive letters, these may not work as you expected.

Example Suppose you want to run an application on your hard disk (drive C) and the application requires you to put your program disk in drive A and your data disk in drive B. To send all references to drives A and B to drive C, type the following:

```
assign a=c b=c
```

Associate



Associates a filename extension with a program or removes an existing association. When a filename extension is associated with a program, choosing a filename that has that extension both starts the program and opens the file as a data file for the program.

When you choose this command, a dialog box appears. If you have selected a filename, the dialog box contains a list of programs associated with the filename's extension. If you have selected a program, the dialog box contains a list of the filename extensions associated with the program. You can add or delete programs or filename extensions by selecting them and then choosing the Add or Delete button.

Example If you associate the filename extension .DOC with the Microsoft Word program and you choose the filename LETTER.DOC, Word starts and the LETTER.DOC file is opened as a Word file.

Attrib (Attributes)



attrib [**+r** | **-r**] [**+a** | **-a**] [*drive:*][*path*]*filename* [**/s**]

Changes or displays the attributes of the file you specify. The attributes determine whether the file is read-only and whether it is affected when you use the **backup**, **restore**, and **xcopy** utilities. For more information, see the individual utility descriptions.

- +r** Makes the file read-only.
- r** Allows the file to be changed or deleted.
- +a** Sets the archive flag of the file.
- a** Clears the archive flag of the file.

filename

Specifies the file for which you want to change the attributes. You can use wildcard characters to affect more than one file.

- /s** Changes the attributes of all files named *filename* in subdirectories as well as in directories.

To see the attributes of a particular file, type only **attrib** and the filename. If the letter **A** appears in the listing, the archive attribute is set for the file; if **R** appears in the listing, the read-only attribute is set.



Works the same way in the DOS session as described above.

Example To make all the files read-only in the directory \SCHEDULE\MEETINGS on drive C, and in all its subdirectories, type the following:

```
attrib +r c:\schedule\meetings\*. * /s
```

Auto Refresh



Tells the Spooler Queue Manager to update the list of queues and jobs automatically every time the list changes.

To turn Auto Refresh on, choose the command; a check mark appears next to it. To turn Auto Refresh off, choose the command again; the check mark is removed.

Backup



backup *drive1:[path][filename]* *drive2: [/s] [/m] [/a] [/f]*
[/d:date [/t:time]] [/l:[path]logname]

Makes backup copies of files from one disk and stores them on another. You can then use the **restore** command to copy these files back to their original location.

drive1:

Specifies the drive that contains the files you want to make backups of.

filename

Specifies a single file you want to make a backup of. You can use wildcard characters to make backups of a group of files with similar names.

drive2:

Specifies the drive that contains the disk where you want to store the backup files. The files are placed in the root directory of this drive.

- /s** Makes backup copies of the contents of all the subdirectories.
- /m** Makes backup copies of only the files that have been changed since the last backup operation and turns off the archive bit of the original file.
- /a** Adds the backup files being created to the backup files on the destination disk without deleting the files that are already there. This option will not work if any of the files were previously backed up using the **backup** utility from MS-DOS® version 3.21 or earlier.
- /f** Formats the destination disk if it is unformatted. This option does not format a nonremovable disk, nor does it format a disk that is already formatted.

/d:date

Makes backup copies of only the files that were changed on or after the date specified.

/t:time

Makes backup copies of only the files that were changed at or after the time specified. Do not use this option without the ***/d:date*** option.

/l:logname

Creates a log file in the root directory of the start-up disk and puts a log of the backup operation in that file. You can specify a different directory for the log file. If you do not specify a filename, **backup** names the file **BACKUP.LOG**.

The backup files are stored in the **BACKUP.nnn** and **CONTROL.nnn** files; *nnn* is the number of the disk (starting from 001). As each disk is filled, **backup** prompts you for the next disk.

The source and destination disks do not have to be the same type; you can back up files from a hard disk to a floppy disk, or from one kind of floppy disk to another. If you don't specify the **/a** option, **backup** erases all the files that are already on the destination disk.

DOS

Works the same way in the DOS session as described above.

Do not try to make backups of files located on a drive that you have assigned, joined, or substituted by using the **assign**, **join**, or **subst** utility. If you do, you may not be able to restore the files by using the **restore** utility.

Example If you want to make backup copies of all the files in the **\FILM\CRITIQUE** directory on drive C and store them on an unformatted disk in drive A, type the following:

```
backup c:\film\critique a: /f
```

Border Width

MD

Changes the width of the window borders on your screen.

When you choose this command, a dialog box appears, containing a text box in which you can type a value for the border width. The value can be any number in the range 1 to 50; the default is 4.

Break

DOS

command

break [on | off]

Tells MS OS/2 when to check for the key combination CTRL+C (or CTRL+BREAK) in the DOS session and to stop the program or batch file that is running when it encounters the combination.

Depending on the program you are running, you may press CTRL+C in the DOS session to stop an activity (for example, to stop sorting a file). Ordinarily, MS OS/2 checks to see whether you have pressed CTRL+C only while it is reading from the keyboard or writing to the screen or the printer. If you type **break on**, you extend CTRL+C checking to other activities, such as reading from or writing to a disk. The default in the DOS session is **off** (unless otherwise set in your CONFIG.SYS file by the **break** configuration command).

The **break** command has no effect on a full-screen OS/2 session; MS OS/2 always checks for CTRL+C.

If you type **break** by itself, the command displays its current setting.

Some programs are designed to respond to CTRL+C at any time; the **break** command does not affect them.

In the DOS session, when you use CTRL+C to stop the processing of a batch file, MS OS/2 displays a message that asks you to confirm whether you want to stop the batch process. In a full-screen OS/2 session, however, you receive no message; once you press CTRL+C, the batch file stops.

Break



CONFIG

break=on | off

Tells MS OS/2 when to check for the CTRL+C (or CTRL+BREAK) key combination in the DOS session and to stop the program or batch file that is running when it encounters the combination. To use the **break** configuration command, place it in your CONFIG.SYS file.

If **break** is off, MS OS/2 checks whether you have pressed CTRL+C only when it is reading from the keyboard or sending something to the screen or the printer. When **break** is on, MS OS/2 also checks for CTRL+C every time it reads from or writes to a disk. The default setting for **break** in the DOS session is **off**.

The **break** configuration command has no effect on a full-screen OS/2 session; MS OS/2 always checks for CTRL+C.

Buffers



buffers=number

Sets the number of buffers in memory. To use this command, place it in your CONFIG.SYS file.

number

Specifies the number of buffers available. This must be a number in the range 1 to 100; the default is 3.

Buffers are work areas MS OS/2 uses to hold data when it is reading from or writing to a disk. Each buffer uses 512 bytes of memory. You can speed up your system's performance by increasing the number of buffers available, but when you do so you also reduce the amount of memory available. For applications like word processors, you'll get the best performance with between 10 and 20 buffers; if you expect to create many subdirectories, you may want to increase the number of buffers to between 20 and 30.

Example To tell your system to create 20 disk buffers, include the following line in your CONFIG.SYS file:

```
buffers=20
```

Call



call [drive:][path]batchfile [arg]

Calls one batch file from another. You use **call** in a batch file in order to run another batch file and then return to the first one. Although **call** can be used from the command prompt, it is designed to be placed in a batch file.

batchfile

Specifies the name of the batch file (without extension) that you want to call from within another batch file.

arg

Specifies an argument to the batch file being called.

When you use **call**, MS OS/2 treats everything in the batch file that you call as though it were a single command; once that command has been carried out (that is, once the second batch file has been run), MS OS/2 resumes running the first batch file where it left off.

Do not use pipes or redirection symbols with the **call** command.

You cannot call DOS batch files (files with the extension **.BAT**) from an MS OS/2 batch file (a file with the extension **.CMD**) or from **cmd**, the MS OS/2 command interpreter.



Works the same way in the DOS session as described above, except that you cannot call MS OS/2 batch files (files with the extension **.CMD**) from a DOS batch file (a file with the extension **.BAT**) or from **command**, the DOS command interpreter.

Example To run the file **CHECKNEW.CMD** from another MS OS/2 batch file and pass it the **/t** argument, type the following in the first batch file:

```
call checknew /t
```

Cancel All Jobs



Removes all the jobs from a printer queue. If one of the jobs is printing, it stops printing and disappears from the queue.

When you choose this command, a dialog box appears, asking you to confirm that you want to cancel all the jobs in the queue.

Note that if your printer uses a print buffer, the contents of this buffer continue to be printed until the buffer is empty, even after all jobs are removed from the queue.

Cancel Job



Removes a job from the printer queue. If the job is printing, it stops printing and disappears from the queue.

When you choose this command, a dialog box appears, asking you to confirm that you want to cancel the job.

Note that if your printer uses a print buffer, the contents of this buffer continue to be printed until the buffer is empty, even after the job is removed from the queue.

Cascade



Resizes and rearranges the directory windows within the File System window so that they overlap and part of each window is visible (usually including the title bar).

The windows all become the same size, if possible, and are arranged from top left to bottom right.



Resizes and rearranges application windows within the screen window so that they overlap and part of each window is visible (usually including the title bar).

The windows all become the same size, if possible, and are arranged from top left to bottom right.

Change



Changes the name of a program in Start Programs, and changes or adds to the information that Start Programs uses in starting the program.

When you choose this command, a dialog box appears, containing text boxes in which you can enter the following information:

- A title for the program (this is the title that will appear in the list in Start Programs). The title can be up to 60 characters and can include letters, numbers, spaces, and any symbols except the backslash (\). You can use a given program title only once within each group, but you can include the same program more than once in a group if you use different titles.
- The filename and directory path of the file that contains the program. If you give only the filename, MS OS/2 first searches the directory from which you started MS OS/2 and then searches the directories specified by the PATH environment variable for the program.
- The current directory. The default is the root directory of the current drive.
- Arguments that you want to give the program. If you want to be prompted for arguments whenever the program starts, type a question mark (?) in this text box.
- Program type (Presentation Manager or Other). If you choose Other, another dialog box appears, asking you whether you want the program to run in a window or full-screen, or whether you want the application to decide.

Every program in Start Programs must have a program name and a filename and directory path; the other information is optional.

Change Attributes



Changes the attributes of a file or files.

When you choose this command, a dialog box appears, containing four check boxes: Read Only, Archive, Hidden, and System. You can use these check boxes to turn the appropriate attributes on or off.

When Read Only is turned on, the file can be read but not changed.

When Archive is turned on, the **backup**, **restore**, and **xcopy** utilities treat the file as a new or changed file.

When Hidden is turned on, the file will not appear in the list in a directory window unless you have also turned on the Hidden Files check box by using the Display Options command on the Options menu.

When System is turned on, MS OS/2 recognizes the file as a system file. The file will not appear in the list in a directory window unless you have also turned on the Hidden Files check box by using the Display Options command on the Options menu.

Chcp (Change Code Page)



chcp [*nnn*]

Switches to the specified system code page, which must have been defined previously in your CONFIG.SYS file.

nnn Specifies the code page to be used. This argument must be a three-digit number from the list under the **codepage** command.

If you type **chcp** by itself, the command displays the active code page and the prepared code pages for that session.

This command can be used only if code pages have been previously prepared with the **codepage** command.

Any program that you run after starting a new code page uses the new code page. Programs that started running before you started the new code page still use the original code page.



Works the same way in the DOS session as described above, except that when you type **chcp** by itself, the command displays only the active code page.

Example To switch the code page to 863 (French-Canadian), type the following:

```
chcp 863
```

Chdir (Change Directory)



chdir [*drive:*][*path*]

Changes the current directory. You can abbreviate **chdir** as **cd**.

If you type **chdir** by itself, the command displays the current directory of the current drive.

You cannot use **chdir** to change drives, but you can use it to change the current directory of another drive. If you then switch to that drive, you will be in the directory you specified. Typing **chdir** plus the letter of another drive displays the name of the current directory on that drive.

DOS
command

Works the same way in the DOS session as described above.

Examples To change from your current directory to the ENTREE subdirectory, type the following:

```
cd entree
```

To change from your current directory to its parent directory, type the following:

```
cd ..
```

To return to the root directory, type the following:

```
cd \
```

If your current directory is POETRY and its parent directory is BOOKS, and you want to change to the FICTION directory, which is also under BOOKS, type the following:

```
cd ..\fiction
```

Chkdsk (Check Disk)

OS/2

```
chkdsk [drive:][path][filename] [/f] [/v]
```

Checks a disk for errors and displays a summary of how space is used on that disk.

drive:

Specifies the disk drive to check.

filename

Specifies the file to check. You can use wildcard characters to specify a group of files. **Chkdsk** will report how many of the specified files are stored in noncontiguous sectors.

/f Tells MS OS/2 to correct errors it finds on the disk. If you do not specify this option, **chkdsk** does not correct any errors, even if you respond with "Y" to the prompt.

/v Displays the name of each file in each directory as it is checked.

If you type **chkdsk** by itself, the utility displays the status of the disk in the current drive. If you specify a filename but no drive, **chkdsk** displays the status of the disk in the current drive and of the individual file.

If you specify the **/f** option, **chkdsk** shows an error if there are any open files on the disk. If you do not specify **/f** and there are open files, **chkdsk** may report that there are lost clusters on the disk. This happens when the disk's file allocation table has not been updated regarding open files.

Do not try to fix errors while you are using the multitasking features of MS OS/2, such as background printing or spooling.

The **chkdsk** utility will not fix errors on the disk from which you started MS OS/2. For more information about interpreting **chkdsk** messages and about fixing errors on your start-up disk, see the *Microsoft Operating System/2 User's Guide*.

DOS

Works the same way in the DOS session as described above, except that the DOS version displays the amount of memory used in the DOS session.

You cannot use **chkdsk** on drives that you have assigned, joined, or substituted by using the **assign**, **join**, or **subst** utility.

Close



Closes File System or Control Panel.

This command has the same effect as the Exit command that is on an application's Exit menu.



Closes an application from the Task Manager list.

You must select the application to close before you choose the Close command.

This command has the same effect as the Exit command that is on an application's Exit menu.

Close All Directories



Closes all the directory windows you have open in File System, leaving only the Directory Tree window visible.

Cls (Clear Screen)



cls

Clears the screen, leaving only the prompt and the cursor.



Works the same in the DOS session as described above.

Cmd (MS OS/2 Command Interpreter)



cmd [*drive:*][*path*] [*/s*] [*/c command(s)*] | [*/k command(s)*]

Starts an MS OS/2 command interpreter in the specified directory on the specified drive.

drive:path

Specifies the location of the new command interpreter. If you do not specify a drive and/or path, MS OS/2 uses the command interpreter specified by the COMSPEC environment variable.

/s Tells the new command interpreter not to set up the signal handler.

/c *command(s)*

Tells the new command interpreter to perform the command or commands specified and then return control to the command interpreter that called it.

/k *command(s)*

Tells the new command interpreter to perform the command or commands specified and then continue to run.

If you type **cmd** by itself, MS OS/2 starts the new command interpreter in the current session.

When you start a command interpreter, you also create a command environment. This environment is a copy of the environment from which you started the command interpreter. You can change this new environment without affecting the old environment.

For an alternative way to run **cmd** and have it start other commands, see the **start** command.

Example To start **cmd** and have it check the disk in drive B and then end, type the following:

```
cmd /c chkdsk b:
```

Codepage



codepage=xxx[,yyy]

Selects the code pages that the system will use. To use this command, place it in your CONFIG.SYS file.

xxx Specifies the first code page. This must be a three-digit number from the list on the next page.

yyy Specifies the optional second code page. This must be a three-digit number from the list on the next page.

If you specify two code pages, you will be able to switch between them by using the **chcp** command.

Code page, keyboard, and country are interrelated. A code page is a set of characters that are available to your system for use on the screen, for printing, and for sending to any other sort of output. Your keyboard layout tells your system which characters from the character set correspond to which keystrokes; this can be different from country to country. The country you are working in (or for which you want to set up your system) determines which two code pages you should use. (For a list of country codes and their corresponding code pages, see the **country** command.) You can change keyboard layouts without having to change code pages.

MS OS/2 supports the following five code pages:

Code page	Character set
437	United States
850	Multilingual
860	Portuguese
863	French-Canadian
865	Nordic

The United States code page (437) includes most of the characters needed for most Western European languages, but the Multilingual code page (850), which is also used by systems other than personal computers, is more versatile and more complete. You would usually want to specify code page 850 as the second code page, no matter what national code page you specified first. For tables of the character sets in the five code pages, see the Appendix, "Code Pages and Keyboard Layouts."

If you are setting up an outside device, such as a printer, to use code pages, you must also use the **devinfo** command to tell the outside device which code pages to use. For more information, see the **devinfo** command.

Example To set up your system to use code pages 437 and 850, include the following line in your CONFIG.SYS file:

```
codepage=437,850
```

Collapse Branch



Completely collapses the selected branch of the directory tree so that none of the subdirectories in that branch will be displayed.

If the directory that is selected in the Directory Tree window is already collapsed or does not have any subdirectories, this command is disabled.

To use this command, Show Outline Tree must be active.

COM0x.SYS



device=[*drive:*][*path*]**com0x.sys**

Directs MS OS/2 to load the COM0x.SYS device driver, which allows you to use your system's serial communications port. To use this command, place it in your CONFIG.SYS file.

- x* Specifies which communications-port device driver to load. For an IBM PC/AT or compatible computer, *x* must be 1. For an IBM PS/2 computer, *x* must be 2.

Example To direct MS OS/2 to load the communications-port driver for your IBM PC/AT or compatible computer, add the following line to your CONFIG.SYS file:

```
device=c:\os2\com01.sys
```

Note If you have a Microsoft serial mouse, you must include the MOUSEA02.SYS device driver in CONFIG.SYS before including the COM01.SYS device driver, as follows:

```
device=c:\os2\mousea02.sys  
device=c:\os2\com01.sys
```

Command



command [*drive:*][*path*] [**/c** *command(s)*] [**/p**] [**/e:***size*]

Starts a secondary DOS command interpreter in the DOS Session.

drive:path

Specifies the location of the secondary command-interpreter. If you do not specify a drive and/or path, MS OS/2 uses the command interpreter specified by the COMSPEC environment variable.

/c *command(s)*

Tells the secondary command interpreter to perform the command or commands specified and then return control to the primary command interpreter.

/p Tells the secondary command interpreter to stay in memory. This disables the **exit** command; you must restart your system in order to remove the secondary command interpreter.

/e:size

Specifies the size of the DOS environment, in bytes. This number must be in the range 160 to 32768; it is rounded up to a multiple of 16. The default is 160.

When you start a command interpreter, you also create a command environment. This environment is a copy of the environment from which you started the command interpreter. You can change the new environment without affecting the old environment.

Example To start a secondary DOS command interpreter and have it check the disk in drive B and then return to the primary command interpreter, type the following:

```
command /c chkdsk b:
```

Communications Port



Sets the parameters for a communications port (COM1, COM2, or COM3).

When you choose this command, a dialog box appears, in which you can choose settings for baud rate, word length, parity, stop bits, and the handshake protocol for the communications port. (You can also set these values by choosing the Printer Connections command and then choosing the Comms button from the Printer Connections dialog box.)

For more information about these settings, see the **mode** utility.

Comp (Compare)



comp [*drive:*][*path*][*filename1*] [*drive:*][*path*][*filename2*]

Compares two files or sets of files to see whether they are the same.

filename1

Specifies the name of the first file.

filename2

Specifies the name of the second file. If *filename2* is the same as *filename1* except that the file is on a different drive, you can type just the drive letter of the second file.

If you specify only a path or a drive, without any filename, **comp** assumes that you want to compare all the files in that directory or on that drive.

If you type **comp** by itself, the utility prompts you for the filenames. You can use wildcard characters to specify a group of files.

If the files found in one directory differ in size from the files found in the other directory, **comp** displays a message asking if you want to continue. If the files are the same size but their contents differ, **comp** automatically displays the location and contents of each nonmatching byte.



Works the same way in the DOS session as described above.

Examples To compare each file with the extension .DOC in the current directory on drive C with each file of the same name with the extension .BAK on drive B, type the following:

```
comp c:*.doc b:*.bak
```

To compare the files in the root directory on drive A with the contents of the TEMP directory on drive C, type the following:

```
comp a: c:\temp
```

To compare the contents of the SALES directory with the current directory, type the following:

```
comp \sales
```

Control Panel



Changes system settings.

Some settings, such as time and date, can be adjusted directly in the main Control Panel window. You can make other settings by selecting one of the Control Panel menus: Preferences, Setup, Installation, or Exit.

- The Preferences menu contains the Screen Colors, Border Width, Warning Beep, Mouse, Logo Display, and Country commands.
- The Setup menu contains the Communications Port, Printer Defaults, Printer Connections, Spooler Options, Spooler Queues, and Queue Connections commands.
- The Installation menu contains the Add Font, Delete Font, Add Printer Driver, Delete Printer Driver, Add Queue Processor, and Delete Queue Processor commands.
- The Exit menu contains the Exit Control Panel and Resume commands.

For more information about a specific Control Panel command, see the individual entry for the command.

Copy



Copies a file, a group of files, a directory, or a group of directories.

When you choose this command, a dialog box appears, containing two text boxes: From and To. The From text box shows the names of the files or directories you have selected from the directory window. In the To text box, you can type the drive and path of the destination directory (the directory you want to copy your files or directories to). You don't need to type the drive letter unless you are copying to a different drive.

If you are copying only one file or directory, you can copy it and rename it at the same time by typing a new name in the To text box. If

you rename a directory, it shows a new date and time of creation when you display full file details; otherwise, the date and time stay the same.

You can copy multiple files or multiple directories (or even files and directories together) by extending the selection in the directory window before you choose Copy, or by typing multiple names in the From text box. You can also copy multiple files with similar filenames by using wildcard characters.

Unlike the command-line **copy** command, the Presentation Manager Copy command does not recognize multiple destination filenames; it ignores all but the first name in the To text box.

Warning If you are copying a file and you supply a destination filename that already exists, MS OS/2 overwrites the destination file. (If you have turned on the Confirm On Replace option by using the File Options command on the Options menu, MS OS/2 first displays a dialog box, asking you whether you want to overwrite the file.)

If you want to copy multiple files, do not specify a destination filename. If you do, MS OS/2 will copy the first source file and give it the destination filename; then copy the second source file, give it the same destination filename, and overwrite the first file; and so on until all the files have been copied. The result is one file, and its contents will be the contents of the last source file.

If you are copying multiple directories and you supply a destination name, MS OS/2 will copy the first source directory and give it the destination name, then copy the remaining source directories into the first as subdirectories.



Copies a program title in Start Programs to another group.

When you select a program title from the Start Programs list and then choose this command, a dialog box appears, containing a list box with the names of the existing groups of programs and a text box where, optionally, you can type a new title for the program. To complete the command, select the group to which you want to copy the program title and choose the Copy button.

This command does not copy files; it only copies the title of the program as it is listed in Start Programs.

(You can also use this command instead of the Add command to create an additional title for a program within the same group.)

Copy



copy *source* [+ *source* [...]] [/a | /b] *destination* [/a | /b] [/v]

Copies information from a source to a destination. The source is usually a file or files, but it can also be a directory or the output of a device (such as the keyboard); the destination can be one or more files or a device.

source

Specifies where the information will be copied from. If the source is a file, MS OS/2 assumes that the file is in the current directory on the current drive, unless you tell it otherwise by specifying a drive and path. The source can also be a drive or a directory. You can copy multiple files by using wildcard characters. You can copy multiple source files to one destination file by specifying multiple source filenames separated with plus signs (+). If the source is a device, MS OS/2 takes the input from that device and copies it to the destination.

destination

Specifies where the information will be copied to. The destination can be a single file or you can use wildcard characters to specify a group of files. The destination can also be a directory or a device. If you specify only a drive as the destination, MS OS/2 copies to the current directory on that drive; if you do not specify a drive, MS OS/2 assumes that the destination is on the current drive. If the destination is a file that does not already exist, **copy** creates a new file; if the file already exists, **copy** writes over the old file.

- /v Verifies one by one that the sectors written on the destination disk are recorded properly.
- /a Treats the source or destination as ASCII text. This option applies to the filename preceding it and all remaining filenames in the command until **copy** encounters a /b option, in which case the /b option applies to the filename that precedes it. When /a comes after the source, **copy** copies everything up to the first CTRL+Z character, which it interprets as an end-of-file mark, and does not copy anything after that. When /a comes after the destination, **copy** adds an end-of-file character as the last character of the destination file. When you are copying multiple files to one destination, the default option is always /a.

- /b** Treats the source or destination as a binary file. This option applies to the filename preceding it and all remaining filenames in the command until **copy** encounters a **/a** option, in which case the **/a** option applies to the filename that precedes it. When **/b** comes after the source, **copy** copies everything and does not interpret any CTRL+Z characters as end-of-file marks. When **/b** comes after the destination filename, **copy** does not add an end-of-file character to the new file.

When you use **copy** to append files to an existing file without changing the existing filename (including its extension), you must specify that filename as the first source file, followed by the names of the files you want to append.

When you copy a single file to a new file, the new file has the same date and time as the original. When you combine files into a new file, the new file has the current date and time.



Works the same in the DOS session as described above, except that you cannot specify multiple filenames on the command line.

Examples To copy the file COMPANY.NEW from the current drive and directory to the CUSTOMER directory on the disk in drive B, type the following:

```
copy company.new b:\customer
```

To copy all the files in the directory REPORTS on your hard disk (drive C) to the disk in drive A, type the following:

```
copy c:\reports\*.* a:
```

To combine the files INTRO.RPT, BODY.RPT, and SUM.RPT from your working drive and directory and place them in a file called REPORT on the disk in drive B, type the following:

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

If you omit the destination filename, MS OS/2 combines the files and stores them under the name of the first specified file.

To combine all files with the extension .TXT into one file named COMBIN.DOC, type the following:

```
copy *.txt combin.doc
```

To combine each file that has the extension .TXT with the corresponding file that has the extension .REF and place the results into files with the extension .DOC (for example, VIDEO.TXT and VIDEO.REF would be combined as VIDEO.DOC), type the following:

```
copy *.txt + *.ref *.doc
```

To copy all files with the extension .TXT and all files with the extension .REF into one file named COMBIN.DOC, type the following:

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

Country



Sets the format and characters used to display time, date, numbers, and currency. By default, MS OS/2 uses the United States format.

When you select this command, a dialog box appears, in which you can specify the settings you want.

Note Before using this command, be sure that you have correctly set up code-page information in your CONFIG.SYS file. For more information about how to do this, see the *Microsoft Operating System/2 User's Guide* and the entries in this reference for the **codepage** and **devinfo** commands.

Country



```
country=xxx[, [drive:][path]filename]
```

Tells MS OS/2 which country to set up the system for. To use this command, place it in your CONFIG.SYS file.

xxx Specifies the country by using a three-digit country code from the list on the next page. You must include all three digits, even if the code begins with a zero. The default is 001 (United States).

filename

Specifies the file that contains information on country conventions and supported code pages. If you do not specify a drive or path, MS OS/2 looks for this file in the current directory of the current drive. If you do not specify **filename**, MS OS/2 uses the default

COUNTRY.SYS file in the root directory of the drive from which you started MS OS/2.

The country you choose determines the MS OS/2 conventions for such things as time and date format, decimal separators, and the order in which the **sort** utility sorts ASCII characters. The country you specify with the **country** command also determines which code pages you should specify with the **codepage** command.

The following list shows the countries or languages that you can specify with the **country** command, the corresponding country codes, and the code pages supported for each country:

Country or language group	Country code	Code pages
Australia	061	850,437
Belgium	032	850,437
Canada (English)	001	850,437
Canada (French)	002	863,850
Denmark	045	865,850
Finland	358	850,437
France	033	850,437
Germany	049	850,437
Italy	039	850,437
Latin America	003	850,437
Netherlands	031	850,437
Norway	047	865,850
Portugal	351	860,850
Spain	034	850,437
Sweden	046	850,437
Switzerland	041	850,437
United Kingdom	044	850,437
United States	001	850,437

Note Although not shown in the list, the following countries or languages are also available with special versions of MS OS/2: Arabic, Asia, Hebrew, Japan, Korea, and Taiwan.

In the preceding list, the first of the two code pages for each country is the default code page for that country. If you do not include the **codepage** command in your CONFIG.SYS file, MS OS/2 uses the system default code page.

Example To set up your system for the Netherlands and tell MS OS/2 to look for COUNTRY.SYS in the OS2 directory on the disk in drive A, include the following line in your CONFIG.SYS file:

```
country=031,a:\os2\country.sys
```

Create Directory



Creates one or more directories.

When you choose this command, a dialog box appears, containing a text box in which you can type the name of the directory you want to create. You can create multiple directories by typing multiple directory names in the text box, separating each by a single space. If the new directory is to be a subdirectory of the current directory, you need type only the directory name; if you want the new directory to be a subdirectory of a different directory, you must type the directory path.

Createdd (Create Dump Disk)



createdd *drive*:

Prepares a disk that can be used to copy the contents of memory.

drive:

Specifies the drive that contains the disk to be used for copying memory contents.

The **createdd** utility prepares a special disk to be used to copy the contents of memory. A copy of memory contents may be helpful in identifying system problems.

To copy memory contents to a disk, insert the disk prepared by using **createdd** into the disk drive and press CTRL+ALT+NUMLOCK twice. If

there is more information than can fit on the single disk, MS OS/2 prompts you to insert additional disks. These additional disks need only to have been formatted. When the copying operation is completed, MS OS/2 prompts you to reinsert the disk created by using **createdd** to receive a summary record of the operation. (If you use more than one disk, you receive summary information for each disk.) The system then stops, and you must restart it.

Do not start the copying operation while the hard disk is being read from or written to. This could disrupt directory information on the hard disk, causing files to be lost.

Example To prepare a disk in drive A for copying memory contents, type the following:

```
createdd a:
```

Date



date [*month-day-year*]

Sets the system calendar by telling it the current date.

month

Specifies a number in the range 1 to 12.

day Specifies a number in the range 1 to 31.

year Specifies a four-digit number in the range 1980 to 2079. You can abbreviate this number by using the last two digits of the year, in the range 80 to 79.

You can use slashes (/) or periods (.) instead of hyphens (-) to separate the month, day, and year.

If you type **date** by itself, the command shows you the current date and then prompts you for a new date. If you don't want to change the date, just press ENTER.

If you have used the **country** configuration command in your CONFIG.SYS file to alter the date format (for instance, to specify a date as day-month-year), the **date** command will reflect that change.



Works the same way in the DOS session as described above.

Example To set the system date to May 1, 2017, type the following:

```
date 5-1-17
```

Ddinstal



ddinstal

Provides an automated way to install new devices and their device drivers on your system without running the installation program again. **Ddinstal** copies the device driver to your system and adds the appropriate **device** command to your CONFIG.SYS file.

To install a device using the **ddinstal** utility, type **ddinstal** and press ENTER. The utility will prompt you to insert the disk that contains the device driver to be installed.

Del (Delete or Erase)



del [*drive:*][*path*]*filename* [...]

Deletes a file or group of files.

filename

Specifies the name of the file to be deleted. You can use wildcard characters to delete more than one file in a directory; you can also specify more than one file by typing their names individually, separated by spaces.

You can type **del *.*** to delete all the files in the current directory. (You cannot, however, delete the directory itself by using **del**.) To delete all the files in another directory, type only **del** followed by the

directory name. To prevent you from accidentally deleting important files, the following message appears when you type either of the preceding commands:

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

Warning Once you have deleted a file from your disk, it is gone; you cannot recover it. Be sure you have specified the right file or files, with the correct path, before you press ENTER.

You can type **erase** instead of **del** if you prefer; they have the same effect.



Works the same way in the DOS session as described above, except that in the DOS session you cannot specify multiple filenames. You can, however, use wildcard characters to delete more than one file in the same directory.

Example To delete all the files in the current directory of drive C that have the extension .BAK, and to delete the file OLDSTUFF.DOC in the directory MEMOS on drive B, type the following:

```
del c:*.bak b:\memos\oldstuff.doc
```

Delete



Deletes a file, a group of files, a directory, or a group of directories.

When you choose this command, a dialog box appears, containing a text box with the names of the files or directories you have selected from the directory window. You can add to or change these names by typing new names or modifying the names that are already there.

You can delete multiple files or multiple directories (or even files and directories together) by extending the selection in the directory window before you choose Delete or by typing multiple names in the text box. You can also delete multiple files with similar filenames by using wildcard characters.

You can also set two options for Delete: Confirm On Delete and Confirm On Subtree Delete. For details about these two options, see the File Options command.



Deletes a group from Start Programs.

When you choose this command from the Group menu, a dialog box appears, containing a list box with the names of the existing program groups. To delete a group, select it from the list box and then choose the Delete button.

A group must be empty before you can delete it; to delete the program names in the group, use the Delete command from the Program menu. You cannot delete the last group in Start Programs, even if it is empty.



Deletes a program title from Start Programs.

When you select the title of a program from the list in the current group and then choose this command from the Program menu, a dialog box appears, asking you whether you want to delete the selected program title.

Deleting a program from Start Programs does not delete the file that contains the program; it only removes the program's title from the current group. This means that you can no longer start the program from Start Programs (unless you have it in another group).

Delete Font



Deletes a font from your system.

When you choose this command, a dialog box appears, containing list boxes with the names of the font files and fonts on your system. Select the font file containing the font you want to delete in the Font File box and the font itself in the Font Names box.

Because font files contain several fonts, you must remove all the fonts you have added to your system before you can delete the file itself.

Delete Printer Driver



Deletes a printer driver and, optionally, a printer-driver file from your system.

When you choose this command, a dialog box appears, listing the available printer drivers and showing the name of the printer-driver file for the currently selected driver. You delete a printer driver by selecting its name from the list and choosing the Delete button.

After you delete a printer driver, MS OS/2 asks you if you also want to delete the corresponding printer-driver file. If you choose the Yes button, the file is deleted. Do not delete the file if it contains other printer drivers you have added to the system. If you delete a printer-driver file and later need it, you must reinstall the file from your backup copy.

Delete Queue Processor



Deletes a queue processor from your system.

When you choose this command, a dialog box appears, listing the available queue processors and showing the name of the queue-processor file for the currently selected queue processor. You delete a queue processor by selecting its name from the list and choosing the Delete button.

Demonstration Programs



Switches you to the Demonstration Programs group. Programs in this group demonstrate the features of MS OS/2 in ways that are entertaining as well as instructional.

When you first start MS OS/2, the Main Group is automatically selected. To switch to the Demonstration Programs group, select the Group menu and choose Demonstration Programs. Start Programs then places a check mark next to Demonstration Programs and displays the list of programs in this group.

Deselect All



Removes the selection from all but one of the files and directories in the active directory window; the file or directory that you selected most recently is the only one left selected.

Detach



detach *command* [*options*]

Detaches a special process to run in the background while you go on to another task.

command

Specifies any MS OS/2 program or command that does not require you to type input from the keyboard.

options

Specifies any valid options that the program or command can accept in the command line.

When you detach a process, MS OS/2 starts it as an independent process, displays the process identification (PID) number, and immediately displays the MS OS/2 prompt. You can then type other commands while the detached process is running in the background.

You should not detach programs that require keyboard input.

You can run programs in the background sequentially by listing their names in order, separated by ampersands (&).

You cannot stop a detached process; it must complete itself on its own. If you delete the parent process (quit the command interpreter, for instance), the detached process still runs until it is finished.

If you try to detach a program that should not be run in the background, you could ruin files or lose valuable information. The documentation for the program should tell you whether it can be detached safely.

Examples To create an alphabetically sorted listing of the SORT.IN file and put it in a file called SORT.OUT, and to have this process run in the background so that you can run another process while it is sorting, type the following:

```
detach sort < sort.in > sort.out
```

To copy files from the current directory to drive D and then place the directory listing in FILES.LST, and to have these processes run in the background, type the following:

```
detach copy *.* d: & dir d: > files.lst
```

Device



device=[drive:][path]filename [arguments]

Tells MS OS/2 where to find the file that contains a device driver. To use this command, place it in your CONFIG.SYS file.

filename

Specifies the name of the file that contains the device driver. If this file is not in the root directory of the start-up drive, you must include the drive and/or path.

arguments

Specifies any valid options or other variables for the specific device driver.

Each device connected to your system needs its own device driver, and each driver requires a separate **device** line in your CONFIG.SYS file.

You generally receive a device driver on a disk when you buy a new device; be sure that you place the device driver in the directory you specify with the **device** command.

MS OS/2 processes **device** commands in the order in which they appear in your CONFIG.SYS file and before it processes any **run** commands in the file.

Example To use the Microsoft InPort® mouse and tell MS OS/2 that the device driver is in the OS2 directory on your hard disk (drive C), include the following line in your CONFIG.SYS file:

```
device=c:\os2\mousea04.sys
```

Devinfo (Device Information)



deinfo=*devtype,subtype,[drive:][path]filename*
[,ROM=[[({*xxx*[,*yyy*)]][,...]]]

Prepares a device to use code pages. To use this command, place it in your CONFIG.SYS file.

devtype

Specifies the type of device: keyboard, monitor, or parallel printer. See the list on the next page for possible values.

subtype

Specifies the style or model of the device. For a keyboard, this argument would specify the keyboard layout. See the list on the next page for possible values.

filename

Specifies the file that contains information about the code pages for that device. See the list on the next page for possible values.

ROM=

Tells MS OS/2 that code pages are available to a printer, either in the printer's read-only memory or in a cartridge. This and the following options apply only to parallel printers.

xxx Specifies a code page that is available for a parallel printer. Each code page is identified by a three-digit number; for a list of the possible code pages, see the **codepage** command. A printer may support more than one code page.

yyy Specifies a font identification number that identifies a font on a parallel printer and associates that font with a particular code page. A code page may have more than one font associated with it. See your printer manual for font identification numbers.

You must include a separate **devinfo** command in your CONFIG.SYS file for each device connected to your system, including the keyboard and the monitor, if you want to be able to switch code pages. The **devinfo** command tells MS OS/2 what kind of device you have connected to your system and where to find the code-page or keyboard information for that device.

MS OS/2 automatically places certain **devinfo** commands in your CONFIG.SYS file during the installation process.

The following list shows the values you can give to *devtype*, *subtype*, and *filename*:

Argument	Keyboard	Monitor	Printer
<i>devtype</i>	KBD	SCR	PRN, LPT1, LPT2, LPT3
<i>subtype</i>	<i>keyboard code</i>	EGA, VGA	4201, 5202
<i>filename</i>	KEYBOARD.DCP	VIOTBL.DCP	4201.DCP, 5202.DCP

Keyboard code is a two-letter code that identifies the keyboard layout for a particular country. For a list of the possible keyboard codes, see the **keyb** utility.

Examples To prepare your keyboard to use the code pages you have specified with the **codepage** command, to use the United Kingdom keyboard layout, and to look for the file that contains code-page information in the OS2 directory on your hard disk (drive C), include the following line in your CONFIG.SYS file:

```
devinfo=kbd,uk,c:\os2\keyboard.dcp
```

To prepare an IBM Quietwriter III to use code pages 437 and 850, with multiple fonts, include the following line in your CONFIG.SYS file (type this as a single line, even though it appears here on more than one line):

```
devinfo=lpt1,5202,5202.dcp,rom=(437,011),  
(437,085), (437,254), (437,159), (850,254),  
(850,159)
```

Dir (Directory)



dir [*drive:*][*path*][*filename*] [...] [/p] [/w]

Displays a list of the files on a disk or in a directory, with information about the size of each file and when it was created, the number of files in the directory, and the number of bytes free on the disk.

path Specifies the directory whose listing you want to display.

filename

Specifies a particular file whose listing you want to display. If you specify a filename, **dir** displays information about that file alone. You can use wildcard characters to get information about groups of files with similar names—for example, to compare the dates and sizes of several files with the same extension.

/p Displays the listing one screenful at a time.

/w Lists only the filenames (including their extensions) and displays them across the width of the screen in several columns.

You can specify several drives, directory paths, or filenames. For each different drive or directory you specify, **dir** displays a separate list of files. If, however, you specify more than one file or group of files in the same directory, **dir** displays them in a single list for that directory.

If you type **dir** by itself, the command displays information on all the files in the current directory of the current drive.



Works the same way in the DOS session as described above, except that in the DOS session you cannot specify multiple directories or filenames. You can, however, use wildcard characters in filenames.

Example To display a list of all the files in the LETTERS directory on drive C and a list of all the files with the extension .LTR in the OFFICE directory on drive B, and to display them as short, wide lists across the screen, type the following:

```
dir c:\letters b:\office\*.ltr /w
```

Directory Tree



Displays the contents of the Directory Tree window.

Every directory window that is currently open in File System is listed on the Window menu; the Directory Tree window is always listed first, and the name of the active window has a check mark next to it. (If more than eight windows are open at once, including the Directory Tree window, the ninth name listed is More; if you choose More, a dialog box appears, listing all the open directory windows.) To display the Directory Tree window if it is not the active window, choose Directory Tree from the menu.

Diskcache



diskcache=*n*

Enables disk caching and tells MS OS/2 how much space in memory to set aside for the disk cache. To use this command, place it in your CONFIG.SYS file.

n Specifies the number of kilobytes of memory to be set aside for the disk cache. This number must be in the range 64 to 7200.

A disk cache is an extra buffer in which MS OS/2 stores information that it has recently read from your hard disk. When an application needs to read information from the hard disk, it looks first in the disk cache to see if the information is there. Since it is much faster to read from the disk cache than to read from the hard disk, disk caching can speed up your system. However, the disk cache uses part of system memory, so less memory will be available to an application.

MS OS/2 uses part of the memory set aside for the disk cache for control information. The amount of memory required for control information depends on the size of your hard disk(s).

To change the size of the disk cache, you change the **diskcache** command in your CONFIG.SYS file and then restart your system.

Example To set aside 128 kilobytes of memory for disk caching, include the following line in your CONFIG.SYS file:

```
diskcache=128
```

Diskcomp (Disk Compare)



diskcomp [*drive1:*] [*drive2:*]

Compares two floppy disks track by track.

drive1:

Specifies the drive letter of the first disk being compared.

drive2:

Specifies the drive letter of the second disk being compared.

Since **diskcomp** automatically determines the number of sides and sectors per track by looking at the format of the first disk, both disks must be of the same type (for instance, high-density 5¼-inch disks).

If you specify only one drive, **diskcomp** compares the floppy disk in *drive1* with the floppy disk in the current drive. If you specify the same drive for both *drive1* and *drive2*, **diskcomp** assumes that you want to use only one drive and prompts you to change disks as needed during the comparison. If you type **diskcomp** by itself, the utility assumes that you want to use only the current drive and prompts you to insert the two disks, as appropriate. (If the current drive is not a floppy-disk drive, you will see an error message.)



Works the same way in the DOS session as described above.

You cannot use **diskcomp** on drives that you have assigned, joined, or substituted by using the **assign**, **join**, or **subst** utility.

Example To compare two high-density floppy disks when you have only one high-density disk drive (drive A), type the following:

```
diskcomp a: a:
```

Diskcomp prompts you to insert each disk in turn, as needed, during the comparison.

Diskcopy



diskcopy [*drive1:*] [*drive2:*]

Makes a duplicate of a floppy disk.

drive1:

Specifies the drive that contains the floppy disk to be copied (the source disk).

drive2:

Specifies the drive that contains the floppy disk that will become the duplicate (the destination disk).

The two disks must be of the same type (for example, high-density 5¼-inch floppy disks). **Diskcopy** formats the destination disk if it is unformatted, with the same number of sides and sectors per track as the source.

You can copy a disk using only one drive, either by not specifying any drives or by specifying the same drive for both source and destination. **Diskcopy** prompts you to insert the two disks as needed. If you do not specify any drives, **diskcopy** assumes that you want to use the current drive.

Diskcopy writes over the information on the destination disk, even if it doesn't have to format the disk, so any information that is already on the disk is lost.



Works the same way in the DOS session as described above.

You cannot use **diskcopy** on drives the you have joined or substituted by using the **join** or **subst** utility. **Diskcopy** ignores any assignments that you have made using the **assign** utility.

Example To copy the floppy disk in drive A to a floppy disk in drive B, type the following:

```
diskcopy a: b:
```

Display Options



Determines how the information about files and directories will be displayed in a directory window in File System.

If you have selected the Directory Tree window before you choose this command, the options you choose affect all the directory windows; if you have selected any other directory window before you choose this command, the options you choose affect only that directory window.

When you choose this command, a dialog box appears, containing a text box for the names of the files to be displayed and three distinct sets of option buttons or check boxes that you can use to change display options. You can type specific filenames in the text box, or you can type filenames with wildcard characters in them, to display only filenames of a particular type. The default is *.* , which displays all files.

The buttons and boxes in the Include area determine which files and directories are displayed. The check boxes in the Display area determine how much information is displayed about each file and directory. The option buttons in the Sort By area determine whether the files and directories are sorted by name, extension, date and time, or size.

Dpath (Data Path)



dpath [*;* | [*drive:*]*path*[*;*...]]

Tells an application which directories besides the current directory it should search for data files (files with extensions other than .EXE, .COM, .BAT, or .CMD).

; When used alone (**dpath ;**), clears all data-path settings. You also use semicolons to separate multiple data paths.

path

Specifies the path of the directory that you want the application to search. You can specify more than one path, separating them by semicolons (**;**).

If you type **dpath** by itself, the command displays the current data path.

Each time you use the **dpath** command, the new data path you specify takes the place of the previous path. The data path is stored in the MS OS/2 environment. Only applications that are written to take advantage of **dpath** will use the data path specified.

The **dpath** command sets a data path for a single application's session. If you start a new command interpreter from within a session where **dpath** is defined, the new session inherits the **dpath** setting.

The **dpath** command works much the way the **path** command does, except that **dpath** is used by an application to search for data files, whereas **path** is used by commands and utilities outside of applications.

The **dpath** command achieves the same results in a full-screen OS/2 session as the **append** utility does in the DOS session.

Example To tell an application to search for data files in the SYMPHONY directory and the COUNTRY subdirectory of the BANDS directory on the current drive, and in the ROCK subdirectory of the BANDS directory on drive B, type the following:

```
dpath \symphony;\bands\country;b:\bands\rock
```

E (System Editor)



Provides editing functions that let you create and edit text files in MS OS/2.

For more information about the MS OS/2 System Editor, see "System Editor."

Echo



echo [on | off] *message*

Turns on or off the feature that displays batch-file commands on the screen while they are being processed, or simply displays the specified message on the screen. Although **echo** can be used from the command prompt, it is designed to be placed in a batch file.

message

Specifies a line of text to be displayed.

If you type **echo** by itself, the command displays its current setting.

Normally, commands in a batch file are displayed (“echoed”) on the screen when MS OS/2 receives them. You can turn off this feature by specifying **echo off** in the batch file; none of the subsequent lines are displayed on the screen until MS OS/2 encounters an **echo on** command. You can also turn off the echoing of any single command in a batch file, including the **echo off** command, by preceding the command with the **@** symbol.

You can display a message from a batch file (whether the echo feature is turned on or off) by specifying **echo message** in the file. If you want to display a message of more than one line, you must start each line with **echo**.



Works the same way in a DOS batch file (.BAT extension) as it does in an OS/2 batch file (.CMD extension).

Example To turn the echo feature off and then have a batch file display the message “This batch file formats and checks new disks.”, type the following in the batch file:

```
echo off
echo This batch file formats and checks
echo new disks.
```

Edlin


edlin [*drive:*][*path*] *filename*

Lets you create and edit text files.

filename

Specifies the name of the file you want to edit.

Edlin is a line-oriented text editor with a number of single-letter commands. Each line of text is preceded by a number, which you use

to reference that line in the text file. **Edlin** accepts up to 254 characters per line.

Once started, **edlin** displays an asterisk as a prompt. You type commands at the prompt to insert, delete, change, copy, or move lines within the file. If you are working in a file, you can return to the asterisk prompt by pressing CTRL+C. In addition to using the **edlin** commands, you can also use the MS OS/2 editing keys to edit individual lines.

You can use the following symbols to reference a line number or range of line numbers:

Symbol	Meaning
#	Specifies the line after the last line in the file.
.	Specifies the current line.
+ or -	Specifies a line relative to the current line; for example, +3 means three lines past the current line.

The following list summarizes the **edlin** commands:

Command	Purpose
<i>line</i>	Edits the line number or numbers specified.
a	Appends lines from disk to memory.
c	Copies lines.
d	Deletes lines.
e	Ends the editing session and saves edits.
i	Inserts lines of text.
L or l	Lists a range of lines.
m	Moves a range of text to a specified line.
p	Pages through a file 23 lines at a time.
q	Ends the editing session without saving the file.
r	Replaces text.
s	Searches for text.
t	Transfers the contents of another file into the file being edited.
w	Writes specified lines from memory to disk.

For details about using **edlin**, see your DOS manual.

Endlocal



endlocal

Restores the drive, directory, and environment settings that were in effect before the **setlocal** command changed them. You can use this command only in a batch file.

You can use multiple **setlocal** commands in a batch file without including corresponding **endlocal** commands; each succeeding **setlocal** overrides the previous one. If an **endlocal** command is not found in a batch file after the last **setlocal** command, the original drive, directory, and environment settings are restored when the batch file ends.

You can use this command only in OS/2 batch files (files with the extension .CMD).

Example If you want to use **setlocal** in a batch file to set an alternative search path for certain commands to use and then you want to reset the original path after those commands are finished, type the following in the batch file:

```
setlocal
path c:\test;a:\temp
.
.
endlocal
```

Erase

See del.

Exit



Closes and exits from the application. To continue without exiting, choose Resume.

Exit



exit

Ends the current command interpreter and returns control to the program from which it was started.

If you have used **cmd** to start another MS OS/2 command interpreter, **exit** ends that program and returns you to the parent command interpreter. If you type **exit** from the parent command interpreter, the full-screen OS/2 session ends.



Works the same way in the DOS session as described above, except that in the DOS session **exit** ends the current DOS command interpreter (**command**), unless it is the parent command interpreter. You cannot end the parent command interpreter.

Expand All



Expands all the branches of the directory tree completely, so that every level of subdirectories in every branch is displayed in the Directory Tree window.

Expand All can be chosen only if Show Outline Tree is active.

Expand Branch



Expands the selected branch of the directory tree completely, so that every level of subdirectories in that branch is displayed in the Directory Tree window.

Expand Branch can be chosen only if Show Outline Tree is active.

Expand One Level



Expands the selected branch of the directory tree by one level, so that the next-lower level of subdirectories in that branch is displayed in the Directory Tree window.

Expand One Level can be chosen only if Show Outline Tree is active.

EXTDSKDD.SYS



device=[drive:][path]extdiskdd.sys [/d:drive] [/t:tracks] [/s:sectors] [/h:heads] [/c] [/f:type]

Directs MS OS/2 to load the EXTDSKDD.SYS device driver. To use this command, place it in your CONFIG.SYS file.

When this driver is loaded, you can access a disk by using a logical drive letter. You can associate the letter with an external disk drive, or you can associate a second name (an alias) with an internal or external disk drive and copy to and from that same disk drive.

/d:drive

Specifies the physical drive number. The number must be in the range 0 to 255. The first physical floppy-disk drive (drive A) is drive 0; a second physical floppy-disk drive is drive 1; a third physical floppy-disk drive, which must be external, is drive 2.

/t:tracks

Specifies the number of tracks per side of a block device. The number must be in the range 1 to 999; the default is 80.

/s:sectors

Specifies the number of sectors per track. The number must be in the range 1 to 99; the default is 9.

/h:heads

Specifies the number of disk read/write heads. The number must be in the range 1 to 99; the default is 2.

/c

Indicates that change-line (doorlock) support is available for the drive.

/f:type

Specifies the type of drive. This value must be 0 (160/180K or 320/360K), 1 (1.2 megabyte), or 2 (720K, the default).

Examples To associate an alias with an internal 1.2-megabyte drive A, include the following line in your CONFIG.SYS file:

```
device=c:\os2\extdskdd.sys /d:0 /t:80 /s:15 /h:2 /c /f:1
```

If you want to copy from the external disk drive to that same external drive, include the following lines in your CONFIG.SYS file:

```
device=c:\os2\extdskdd.sys /d:2  
device=c:\os2\extdskdd.sys /d:2
```

The first line associates a drive letter with the external disk drive. The second line associates an additional drive letter (an alias) with that same external drive.

Extproc (External Batch Processor)



extproc [*drive:*][*path*]*filename* [*options*]

Defines an external batch processor for a batch file. You can use this command only in a batch file.

filename

Specifies the name of the file that contains the external batch processor. The filename must include the extension. You can also include a drive and a directory path, if necessary.

options

Specifies any valid options for the new batch processor.

By putting this command as the first line of your batch file, you tell MS OS/2 to start a different batch processor and use that to run the batch file.

You can use this command only in OS/2 batch files (files with the extension .CMD).

Example To run a batch file by using a batch processor called BORNE.EXE, which is in the BATCH directory on your hard disk (drive C), instead of by using `cmd`, type the following as the first line of your batch file:

```
extproc c:\batch\borne.exe
```

F1 (Key)

See Help (F1 Key).

Fcbs (File Control Blocks)



fcbs=x,y

Tells MS OS/2 how many file control blocks (FCBs) it can have open at one time and how many of those it cannot automatically close when too many FCBs are open. To use this command, place it in your CONFIG.SYS file.

- x* Specifies the maximum number of file control blocks that can be open at one time. This number must be in the range 1 to 255; the default is 16.
- y* Specifies the number of file control blocks that MS OS/2 cannot close automatically. This number must be in the range 0 to 255 and must be less than or equal to *x*; the default is 8.

If a program tries to open more than *x* files by using file control blocks, MS OS/2 closes one of the open files in order to make room for each new one. MS OS/2 tries to close the least recently used file first, but the **fcbs** command protects the first *y* files against being closed.

This command affects only the DOS Session.

File control blocks are an old method of managing files. You should use the **fcbs** command only if a DOS application requires you to do so.

Example To tell MS OS/2 that it can open only four files by using file control blocks and that it cannot close the first two of those files, include the following line in your CONFIG.SYS file:

```
fcbs=4, 2
```

Fdisk (Fixed Disk)



fdisk

Prepares a hard disk for formatting.

The **fdisk** utility displays a series of menus to help you partition your hard disk for MS OS/2. With **fdisk**, you can do the following:

- Create a primary or extended MS OS/2 partition.
- Create a logical drive in the extended partition.
- Change the active partition.
- Delete an MS OS/2 partition.
- Delete a logical drive from the extended partition.
- Display partition data.
- Display information about a logical drive in the extended partition.
- Select the next fixed-disk (hard-disk) drive for partitioning if the system has multiple fixed disks.

For more information about this utility, see the *Microsoft Operating System/2 User's Guide*.

File Options



Sets options that determine whether the system displays warning messages before deleting or overwriting files and after creating new copies of files.

When you choose this command, a dialog box appears, containing four check boxes: **Confirm On Delete**, **Confirm On Subtree Delete**, **Confirm On Replace**, and **Verify On Copy**. These options have the following effects:

- When **Confirm On Delete** is turned on, MS OS/2 displays a dialog box asking you for confirmation before deleting a file or an empty directory.
- When **Confirm On Subtree Delete** is turned on, MS OS/2 displays a dialog box asking you for confirmation before deleting a directory that has files or subdirectories in it.

- When Confirm On Replace is turned on, MS OS/2 displays a dialog box asking you for confirmation before overwriting an existing file.
- When Verify On Copy is turned on, MS OS/2 compares the new and old copies after copying a file and displays a dialog box if the copies are not identical.

File System



Displays, organizes, and lets you work with directories and files on your computer. You can also run programs from File System by choosing the name of a file.

File System has six menus: File, Options, Tree, Arrange, Window, and Exit. These menus contain the following commands:

- The File menu contains the Open, Print, Associate, Move, Copy, Delete, Rename, Change Attributes, Create Directory, Select All, Deselect All, and Undo Selection commands.
- The Options menu contains the Display Options, Full File Details, File Options, and Minimize On Run commands.
- The Tree menu contains the Show Outline Tree, Expand One Level, Expand Branch, Expand All, and Collapse Branch commands.
- The Arrange menu contains the Cascade and Tile commands.
- The Window menu contains the Refresh, Close All Directories, and Directory Tree commands.
- The Exit menu contains the Exit File System and Resume commands.

For information about a specific File System command, see the individual entry for the command.

Find



find [/v] [/c] [/n] "string" [[drive:][path][filename] [...]]

Searches the file or files you specify, or the input you give it, for a specific string of text and displays all the instances of that string that it finds.

- /v** Displays all lines that do *not* contain *string*.
- /c** Displays only the total number of lines found.
- /n** Displays each line that contains *string*, with a number in front of it that indicates its position within the file.

string

Specifies the group of alphanumeric characters you want to search for. You must enclose the string in double quotation marks (" "). Since **find** is case-sensitive, you must type uppercase and lowercase letters exactly as you want the utility to search for them.

filename

Specifies the file in which to search for *string*. If the file is not in the current directory of the current drive, you must also specify a drive and/or path. You cannot use wildcard characters when specifying filenames, but you can specify several files with one **find** command. If you do not specify a filename, **find** searches standard input.

If you specify **/c** with **/v**, **find** displays the number of lines that do not contain *string*. If you specify **/c** with **/n**, **find** ignores **/n**.



Works the same way in the DOS session as described above, except that you cannot specify multiple filenames.

Example To search for the string "I told him no, but did he listen?" in the files CHAPTER1.DOC and CHAPTER2.DOC on drive A, and to display the lines that contain the string along with their relative line numbers, type the following on one line:

```
find /n "I told him no, but did he listen?"  
a:\chapter1.doc a:\chapter2.doc
```

For



for [%]*%x* in (*item* [...]) **do** *command*

Performs a command for a set of files or other items that you specify. Although **for** can be used from the command prompt, it is designed to be placed in a batch file.

%%x

Specifies the variable that will be affected by *command*. The values of *item* are substituted sequentially for this variable. You can use any single character for *x*.

item

Specifies a file or other item that you want to substitute for %%x so that *command* will affect it. You can specify multiple items, separated by spaces. These items are substituted sequentially for %%x. You can use wildcard characters in item names and you can use replaceable parameters as items.

command

Specifies the command you want to perform on the items you have specified. This can be any MS OS/2 command or utility. You can also include any valid arguments for the command or utility that you specify.

The **for** command substitutes the first item for the placeholder %%x and performs a command on that item; then **for** substitutes the second item for %%x and performs the command again; and so on until no items remain. For more information about replaceable parameters, see the *Microsoft Operating System/2 User's Guide*.

If you use **for** directly from the command line, use only one percent sign in front of *x* (%*x*). In a batch file, however, you must use two percent signs, to distinguish this **for** variable from a replaceable parameter, which can be a number (%0-%9) or a string (%*variable*%).



Works the same way in a DOS batch file (.BAT extension) as it does in an OS/2 batch file (.CMD extension), except that *command* must be a DOS command or utility.

Example To delete in turn each of the three files REPORT, MEMO, and ADDRESS, type the following in a batch file:

```
for %%f in (report memo address) do del %%f
```

Format



format *drive:* [/4] [/t:*tracks*] [/n:*sectors*] [/v:*label*]

Prepares a disk so that it can store MS OS/2 files.

drive:

Specifies the drive that contains the disk you want to format. This information is required.

/4 Formats a 5¼-inch double-sided disk in a high-density drive. If you are using a low-density drive, you may not be able to reliably read disks formatted with this option.

/t:tracks

Formats a 3½-inch disk to the number of tracks specified by *tracks*. The size of the specified drive determines the default value for *tracks*.

/n:sectors

Formats a 3½-inch disk to the number of sectors specified by *sectors*. The size of the specified drive determines the default value for *sectors*.

/v:label

Specifies the volume label, a name used by programs to identify the disk. The label can be up to 11 characters. If you do not specify this option, the **format** utility prompts you for a volume label after formatting is complete.

You must use this utility to format all new disks so that MS OS/2 can use them. The **format** utility creates the directory and the file allocation tables on the disk. **Format** uses the drive type to determine the default format for the disk.

You cannot format a disk that is in use.

Warning **Format** erases all information that is already on the disk, so be sure you specify the correct drive.



Works the same way in the DOS session as described above.

You cannot use **format** with drives that you have assigned, joined, or substituted by using the **assign**, **join**, or **subst** utility.

Example To format a floppy disk in drive A and give it the label OLDLETTERS, type the following:

```
format a: /v:oldletters
```

Full File Details



Displays full details of the files and directories in a directory window in File System.

If the Directory Tree window is the active window when you choose this command, the command affects the entire system. Otherwise, it affects only the directory window that is active when you choose the command.

Full file details include the size of the file, the date and time it was created, and any attributes that have been set for the file. When this command is not active, only the names of the files and directories are displayed.

Choosing this command turns the full file details on; choosing it again turns them off. When this command is in effect, a check mark appears next to the command name on the Options menu.

Goto



goto *label*

Directs MS OS/2 to go to a particular line in a batch file and continue processing commands from that point.

label

Specifies the location in the batch file where MS OS/2 should continue processing commands. *Label* can be any string you choose, but **goto** uses only the first eight valid characters to identify the label. Spaces, tabs, and certain common separators such as the equal sign (=) and the semicolon (;) are not valid characters in a label; it is best to use only letters and numbers.

The specified label should appear on a line by itself, preceded by a colon (:); this line is ignored in batch processing, except as a marker for the **goto** command. The label line can be either before or after the **goto** command in the file.

The **goto** command simply ignores invalid separators if they appear in the label line, but when it encounters a space or a tab, it stops reading the label. The following label lines, then, are equivalent:

```
:lab
:lab e1
:--lab e1
:==lab
==:;;lab e1
```



Works the same way in a DOS batch file (.BAT extension) as it does in an MS OS/2 batch file (.CMD extension).

Example To format the disk in drive A and either go to the end of the file if no errors occur or display an error message if the formatting isn't completed successfully, type the following in a batch file:

```
@echo off
format a: /s
if errorlevel 0 goto end
echo An error occurred during formatting.
dir a:
:end
echo End of batch file.
```

Graftabl (Graphics Table)



graftabl [xxx] [?] [/status]

Loads the special graphics characters of an extended character set into memory so that your monitor can display these characters if you are using a display adapter in graphics mode.

- xxx** Specifies the code page that defines the extended character set. This must be a three-digit number from the list on the next page; the default is 437 (United States).
- ?** Displays the number of the active code page and a list of the available code pages.

/status

Displays the number of the active code page. You can abbreviate **/status** as **/sta**.

The following code pages can be loaded by using the **graftabl** utility:

Code	Character set
437	United States
860	Portuguese
863	French-Canadian
865	Nordic

Warning If you type **graftabl** by itself, the utility tells you which code page is active, but it also automatically loads the default code page (437). Therefore, if you have a different code page loaded, typing **graftabl** by itself will identify that code page but also change it.

Example To enable MS OS/2 to display the special graphics characters of the Portuguese extended character set, type the following:

```
graftabl 860
```

Help



Displays Help information about running a full-screen OS/2 application in a window. This command appears on the System menu only when you are running such an application.

Help



help [**on** | **off** | *messageid*]

Displays Help information about MS OS/2 and about error or warning messages displayed in a full-screen OS/2 session or in the DOS session.

- on** Displays a Help line at the top of your screen. This line tells you how to get help and how to get back to Task Manager. This version of the **help** command replaces your current prompt setting with the Help line and the current drive letter.
- off** Removes the Help line from your screen.

messageid

Identifies the particular Help message that you want more information about. The message identification number consists of three letters—for example, **SYS**—followed by a four-digit number. You can also specify the number without the letters and leading zeroes (for example, **SYS0002** can be specified as **2**).

If you type **help** by itself, a list of Help options and information is displayed.

DOS

Works the same way in the DOS session as described above.

Example To get more information about the error message “**SYS0002: File not found**”, type the following:

```
help sys0002
```

MS OS/2 then displays the following information:

```
SYS0002: The system cannot find the file specified.  
Explanation: The filename is incorrect or  
does not exist. Action: Check the filename and  
retry the command.
```

Help (F1 Key)

Displays Help information for the Presentation Manager application you are running. When you press the F1 key, the displayed information refers to the part of the program you are working in.

This feature is available only in Presentation Manager applications. For help in a full-screen OS/2 session or the DOS session, use the **help** command.

Hold All Jobs



Temporarily stops all jobs currently in the queue from printing. If one of the jobs is already printing, it stops printing.

If you send new jobs to the printer after you have chosen this command, they will print.

Note that if your printer uses a print buffer, the contents of this buffer continue to be printed until the buffer is empty, even after you choose this command.

To release the held jobs so that they can print, use the Release All Jobs command.

Hold Job



Temporarily stops a job from printing. If the job is in the middle of printing, it stops printing.

Note that if your printer uses a print buffer, the contents of this buffer continue to be printed until the buffer is empty, even after you choose this command.

To release the job so that it can print, use the Release Job command.

Hold Queue



Temporarily changes a queue's status, so that the jobs waiting in that queue won't print. If one of the jobs is already printing, it finishes printing.

To release the queue so that the jobs in it can print, use the Release Queue command.

If



if [not] *condition command*

Carries out the given command only if the specified condition is met. If you include the word **not**, MS OS/2 carries out the command only if the condition is *not* met. Although **if** can be used from the command prompt, it is designed to be placed in a batch file.

condition

Specifies one of three conditions that determine whether MS OS/2 carries out the command:

errorlevel *number*

When a program finishes, it sends an exit code to MS OS/2. If the exit code returned by the last program you ran was greater than or equal to *number*, MS OS/2 carries out the command.

string1 == *string2*

If the first string is exactly the same as the second string, MS OS/2 carries out the command. Uppercase or lowercase is significant. The strings must not include separators such as commas, semicolons, equal signs, and spaces.

exist [*drive:*][*path*] *filename*

If the filename exists in the specified directory, MS OS/2 carries out the command. You can specify a drive and a path before *filename*; otherwise, MS OS/2 looks for *filename* in the current directory.

command

Specifies the command to carry out if the given condition is met.



Works the same way in a DOS batch file (.BAT extension) as it does in an OS/2 batch file (.CMD extension).

Example To display the message “Can’t find data file” if the file BOOK.DAT does not exist in the current directory, type the following in a batch file:

```
if not exist book.dat echo Can't find data file
```

iopl (Input/Output Privilege)



iopl=yes | no | *program*[,...]

Specifies whether data input/output privilege may be given to a process that requests it in a full-screen OS/2 session. To use this command, place it in your CONFIG.SYS file.

- yes** Allows MS OS/2 to give input/output privilege to a process.
no Prevents MS OS/2 from giving input/output privilege to a process. This is the default.

program

Specifies a program that will be granted input/output privilege. You can specify more than one program, separating the names with commas.

Some MS OS/2 applications need to have direct access to hardware such as the display adapter. The **iopl** command tells MS OS/2 whether to give them that access.

You should use the **iopl** command only if an application requires you to do so.

This command has no effect on applications that are running in the DOS session.

Job Details



Displays information about the job you have selected from the printer queue and lets you change the priority of the job.

When you choose this command, a dialog box appears, showing you the following information:

- Name and identifying number of the job
- Date and time the job was created
- Job's priority in the queue
- Name of the printer driver and the port your printer is using
- Size of paper the document will be printed on
- Name of the queue processor
- Information about the parameters for the queue processor and the network

The job priority is a number in the range 1 to 99 (the lowest priority is 1; the highest priority is 99); you can change the priority by changing this number.

Join

DOS

`join [[drive1: drive2:path] | [drive1: /d]]`

Temporarily renames the disk in the first drive as a directory on the disk in the second drive. While a “join” is in effect, you cannot use the drive letter of the first drive to identify it.

drive1:

Specifies the drive you want to join to a directory on *drive2*.

Specifies the drive and path of the directory to which you want to join *drive1*. The directory must be a subdirectory of the root directory of *drive2*. If the directory already exists, it must be empty; if it does not exist, MS OS/2 creates it.

Deletes an existing joined directory. You must specify *drive1* to identify which “join” is to be deleted, but you must not specify *drive2:path* with the */d* option.

The entire directory structure of the disk in *drive1* appears to be in the directory you have specified on the disk in *drive2*.

The following utilities do not work on a drive that you have joined to a directory on another drive:

backup	format
chkdsk	label
diskcomp	recover
diskcopy	restore
fdisk	

If you type **join** by itself, the utility displays a list of the joined directories currently in effect.

Example To join drive B to the directory PROJECTS on drive A, type the following:

```
join b: a:\projects
```

Keyb (Keyboard)



keyb [*code* [*subcode*]]

Directs MS OS/2 to use a country-specific keyboard layout other than the United States layout.

code

Specifies the keyboard layout by country, using a two-letter code from the list on the next page.

subcode

Specifies a keyboard layout for countries that have more than one layout, using a three-digit subcode from the list below.

The following keyboard layouts are available:

Code	Keyboard	Subcode
BE	Belgium	120
CF	Canada-French	058
DK	Denmark	159
FR	France	189, 120
GR	Germany	129
IT	Italy	141, 142
LA	Latin America	171
NL	Netherlands	143
NO	Norway	155
PO	Portugal	163
SF	Switzerland-French	150F
SG	Switzerland-German	150G
SP	Spain	172
SU	Finland	153
SV	Sweden	153
UK	United Kingdom	166, 168
US	United States	103

Subcodes are associated only with enhanced keyboards. Because France, Italy, and the United Kingdom have more than one enhanced-keyboard layout available, MS OS/2 uses the subcode to identify the specific layout to use.

To use the **keyb** utility, you must have a **devinfo** command for your keyboard in your CONFIG.SYS file. For more information, see the **devinfo** command.

This utility affects all programs that you run and all sessions.

If you type **keyb** by itself, the utility displays the current code-page setting.

Examples To use a German keyboard layout, type the following:

```
keyb gr
```

To return to using the US keyboard layout, type the following:

```
keyb us
```

Label



```
label [drive:][label]
```

Assigns a disk a new volume label.

drive:

Specifies the drive that contains the disk to which you want to give a new label.

label

Specifies a new volume label for the disk in the specified drive. The label may be up to 11 characters, including spaces. Do not use any of the following characters in a volume label:

```
* ? / \ | . , ; : + = < > [ ] ( ) & ^
```

If you do not specify a drive, MS OS/2 assigns *label* to the disk in the current drive.

This label, which is simply a name for the disk, is used by programs to identify the disk and is displayed when you use the **dir** command to get information about a disk's contents.

If you type **label** by itself, the utility displays the label of the disk in the current drive and prompts you to either type a new volume label or press ENTER to retain the current label.



Works the same in the DOS session as described above.

Do not use **label** on drives that you have assigned, joined, or substituted by using the **assign**, **join**, or **subst** utility.

Example To give the label OLD STUFF to the disk in drive A, type the following:

```
label a:old stuff
```

Large Font



Changes the size of the letters used to display text in an OS/2 application running in a window, so that fewer lines will fit on the screen. The width of the letters doesn't change, but they become taller.

When you enlarge the window to its maximum size, the maximum number of lines displayed remains the same whether you are using the smaller or larger font size. This is because the window itself changes size when you change the font size (that is, a maximized window with the small font is smaller than one with the large font).

This command reverses the effect of the Small Font command. When the letters on the screen are in the larger font size, this command appears as Small Font on the menu.

Libpath (Library Path)



libpath=[drive:]path[;[drive:]path][...]

Tells MS OS/2 what directories to search for dynamic-link libraries. To use this command, place it in your CONFIG.SYS file.

drive:

Specifies the drive where dynamic-link libraries are located. If you do not specify a drive, MS OS/2 searches the disk in the current drive.

path

Specifies the directory to search for dynamic-link libraries. You can specify more than one directory, separating the names with semicolons (;).

MS OS/2 does not automatically search the current directory for dynamic-link libraries; you can specify the current directory by substituting a period (.) for the first *drive:path* argument.

Example To tell MS OS/2 to look for dynamic-link libraries in the current directory and in the directory DYNLIB on your hard disk (drive C), include the following line in your CONFIG.SYS file:

```
libpath=.;c:\dynlib
```

Logo Display



Changes the length of time an application's logo is displayed.

When you choose this command, a dialog box with three option buttons appears, offering you a choice of display times: Indefinite (until you turn it off), None (no logo is displayed), and Timed (you specify a time, in milliseconds).

Main Group



Switches you to the primary group of programs in Start Programs.

Every group that currently exists in Start Programs is listed on the Group menu; the Main Group is always listed first, and the name of the group that is currently displayed has a check mark next to it. (If there are more than eight groups, the ninth name listed is More; if you choose More, a dialog box appears, listing all the current program groups in alphabetical order.) To display the names of the programs in the Main Group if they are not currently displayed, choose Main Group from the menu.

Maximize



Enlarges a window to its maximum size.

The maximum size depends on the application; for most Presentation Manager applications it is the entire screen, but for some applications it may be smaller.

If the application is already enlarged to its maximum size, this command is inactive.

This command is not on the System menu of the Control Panel application.

Maxwait (Maximum Wait)



maxwait=x

Sets the maximum time a process must wait before MS OS/2 increases its priority. To use this command, place it in your CONFIG.SYS file.

x Specifies the number of seconds a process must wait before it is given a higher priority. This number must be in the range 1 to 255; the default is 3.

A process is allocated time to run by the MS OS/2 scheduler. When an active process is unable to run for the number of seconds specified by **maxwait**, the process receives a temporary increase in priority for one execution cycle (time slice). See the **timeslice** command for more information about time slices.

The **maxwait** command has no effect if the **priority** command is set to **absolute**.

Example To tell MS OS/2 to give priority to processes after they have waited two seconds, include the following line in your CONFIG.SYS file:

```
maxwait=2
```

Memman (Memory Management)



memman=[swap | noswap][,move | nomove]

Specifies whether MS OS/2 can swap memory segments between memory and disk and whether it can temporarily move segments. To use this command, place it in your CONFIG.SYS file.

swap
Allows swapping of segments.

noswap
Prevents swapping of segments.

move

Allows moving of segments.

nomove

Prevents moving of segments.

If you are setting only **move** or **nomove**, you must still include the comma.

MS OS/2 places a **memman** command in your CONFIG.SYS file during the installation process. If you start MS OS/2 from a hard disk, the default is **memman=swap,move**; if you start from a floppy disk, the default is **memman=noswap,move**.

If you allow swapping, then moving is allowed too, but the reverse is not automatically true.

For a discussion of swapping and moving memory segments, see the *Microsoft Operating System/2 User's Guide*.

Example To prevent MS OS/2 from swapping or moving data segments while you are running a time-dependent application, include the following line in your CONFIG.SYS file:

```
memman=noswap,nomove
```

Minimize



Shrinks a window and turns it into an icon. The application is still running but now takes up the smallest space possible on the screen.

If the application is already an icon, the Minimize command is inactive.

Minimize After Use



Shrinks Task Manager to an icon when you switch to another application. When you exit from the application, the Task Manager window reappears.

If this command is not in effect, the Task Manager window stays on the screen when you switch to another application.

Once you have chosen this command, it remains in effect until you choose it again. While the command is in effect, a check mark appears next to the command name on the menu.

Minimize On Run



Shrinks File System to an icon when you run an application from File System. When you exit from the application, the File System window reappears.

If this command is not in effect, the File System window stays on the screen when you switch to another application.

Once you have chosen this command, it remains in effect until you choose it again. While the command is in effect, a check mark appears next to the command name on the menu.



Shrinks Start Programs to an icon when you start an application.

If this command is not in effect, the Start Programs window stays on the screen when you start an application.

Once you have chosen this command, it remains in effect until you choose it again. While the command is in effect, a check mark appears next to the command name on the menu.

Mkdir (Make Directory)



mkdir [*drive:*][*path*]*directoryname* [[*drive:*][*path*]*directoryname* [...]]

Creates a directory. You can abbreviate **mkdir** as **md**.

directoryname

Specifies the name of the new directory. Unless you specify a different drive and path, **mkdir** creates the new directory as a sub-directory of the current directory.

You can create more than one directory at a time by typing multiple directory names. Each directory for which you do not specifically indicate a drive and path will be created as a subdirectory of your current directory.



Works the same way in the DOS session as described above, except that in the DOS session you cannot specify multiple directory names.

Example To create the directory CLIENT, and the subdirectory PETE under it, on drive A, type the following:

```
mkdir a:\client a:\client\pete
```

Mode

Sets operating parameters for communication and output devices that you may connect to or add to your computer. These devices include parallel and serial printers, modems, and screens. The **mode** utility lets you change settings by using a command line instead of physically setting switches in your computer.

The **mode** utility has several discrete purposes. The following sections explain the different ways in which you can use **mode**.

Mode: Configuring a Parallel Printer



```
mode LPTn[:] [chars],[lines],p
```

Controls the line and character spacing of the output on a parallel printer.

n Specifies the number of the parallel port the printer is connected to. This number can be 1, 2, or 3; the default is 1. (You can use PRN in place of LPT1; they are equivalent.) The colon is optional. You must specify a printer port.

chars

Specifies the number of characters per line. This number can be either 80 or 132; the default is 80. If you enter nothing for this parameter, **mode** does not change the current number of characters per line.

lines

Specifies vertical spacing, the number of lines per inch. This number can be either 6 or 8; the default is 6. If you enter nothing

for this parameter, **mode** does not change the current vertical spacing. You must type the comma before *lines*, even if you did not specify a new value for *chars*.

- p** Turns on “infinite retry,” which tells **mode** to keep trying to send output to the printer if a time-out error occurs. This option causes part of the **mode** utility to remain resident in memory. You must type both commas before **p**, even if you did not specify new values for *chars* and *lines*. If you do not specify this option, infinite retry is turned off.

If your system gets stuck in a time-out loop, where **mode** keeps trying to send output to the printer but cannot succeed, you can exit from the loop by pressing CTRL+C.

DOS

Works the same way in the DOS session as described above.

Example To tell the printer connected to your computer’s second parallel-printer port (LPT2) to print at 80 characters per line and 8 lines per inch, type the following:

```
mode lpt2 80,8
```

Mode: Configuring a Serial Port

OS/2

```
mode COMm[:] [baud[,parity][,databits][,stopbits]]  
[,to=state][,xon=state][,idsr=state][,odsr=state]  
[,octs=state][,dtr=state][,rts=state]
```

Sets the parameters for communication with a serial printer or other device that uses a serial port. This is the port you would use for asynchronous communication.

- m** Specifies the number of the serial port you want to use. This number can be 1, 2, or 3; the default is 1. The colon is optional.

If you omit any of the following four arguments, **mode** uses the most recent settings. The **mode** utility recognizes these arguments by their positions, so if you leave out an argument, you must still type the comma that precedes the next one.

baud

Specifies the first two digits of the transmission rate in bits per second: 110, 150, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, or 19200. This argument is required, except when you are merely checking the current settings.

parity

Specifies how the system uses the parity bit to check for errors in transmission. The possible values are N (no parity), O (odd parity), E (even parity), M (mark; parity bit always 1), and S (space; parity bit always zero); the default is E.

databits

Specifies the number of data bits in a character. This number can be 5, 6, 7, or 8; the default is 7.

stopbits

Specifies the number of stop bits that define the end of a character. This number can be 1, 1.5, or 2. If the baud rate is 110, the default for *stopbits* is 2; otherwise, the default is 1. If you specify 1.5 for *stopbits*, you must specify 5 for *databits*.

You may list the following options in any order after the *stopbits* argument, separating them with commas. The default settings listed for these options apply only when you first start your computer; thereafter, the default setting for an option is its previous setting.

to=on | off

Specifies whether infinite time-out processing is enabled (**on**) or disabled (**off**). The default is **on**.

xon=on | off

Specifies whether the XON/XOFF protocol for data-flow control is enabled (**on**) or disabled (**off**). The default is **off**.

idsr=on | off

Specifies whether input handshaking that uses the DSR (Data Set Ready) circuit is enabled (**on**) or disabled (**off**). The default is **on**.

odsr=on | off

Specifies whether output handshaking that uses the DSR (Data Set Ready) circuit is enabled (**on**) or disabled (**off**). The default is **on**.

octs=on | off

Specifies whether output handshaking that uses the CTS (Clear to Send) circuit is enabled (**on**) or disabled (**off**). The default is **on**.

dtr=on | off | hs

Specifies whether the DTR (Data Terminal Ready) circuit is enabled (**on**) or disabled (**off**), or whether DTR handshaking is enabled (**hs**). The default is **on**.

rts=on | off | hs | tog

Specifies whether the RTS (Request to Send) circuit is enabled (**on**) or disabled (**off**), whether RTS handshaking is enabled (**hs**), or whether RTS toggling is enabled (**tog**). The default is **on**.

If you type **mode COMn** by itself, the utility displays the current setting for the specified serial port.

DOS

Works the same way in the DOS session as described above, except that you cannot use the options **to=state**, **xon=state**, **idsr=state**, **odsr=state**, **octs=state**, **dtr=state**, or **rts=state**, and there is an additional option, **p**.

p Specifies a time-out value of about thirty seconds for DOS programs that directly control the hardware. You must use the **setcom40** utility to tell the program the address of the serial port before you use the port. The **p** option must always be last on the command line.

Some programs require the additional information that you can specify with the MS OS/2 version of the **mode** utility. If you are going to use one of those programs, you must configure your serial port from a full-screen OS/2 session, not the DOS session.

Example To set the baud rate to 300, set the parity to odd, leave the number of data bits set to 7, and set the number of stop bits to 2, for your computer's first serial port, type the following:

```
mode com1: 300,o,,2
```

Mode: Setting Up the Display

OS/2

mode display[,rows]

Sets the way text is displayed on your screen, including the number of characters per line, the number of lines per screen, and whether the text is in color.

display

Specifies the kind of display adapter you are using: 40, 80, BW40, BW80, CO40, CO80, or MONO. For each of these options, 40 and 80 indicate the number of characters per line. BW means that color has been disabled even though you have a color graphics adapter; CO means that color has been enabled. MONO specifies a monochrome display adapter, which always has 80 characters per line.

rows

Specifies the number of rows (lines) on the screen: 25, 43, or 50. Which of these are valid depends on the kind of display adapter you have. The default when you first start your computer is 25; thereafter, the previous setting is the default.

When you use **mode** to change the display, it affects only the current session.

DOS

Works the same way in the DOS session as described above.

Example To set a display so that it uses color, 80 characters per line, and 43 lines per screen (assuming the display adapter can handle such settings), type the following:

```
mode co80,43
```

Mode: Setting Floppy-Disk Verify Capability
OS/2

```
mode dskt [ver=on | off]
```

Specifies whether MS OS/2 should verify that data is correctly written to a floppy disk. The default is **ver=off**.

If you type **mode dskt** by itself, the utility displays the current setting.

DOS

Works the same way in the DOS session as described above.

More



more < *source*

Reads from standard input and displays what it reads, one screenful at a time. After each screenful, **more** prompts you to press a key in order to display the next screenful.

source

Specifies the source of the input. You can redirect input from a file or an MS OS/2 command or utility. For more information about redirection, see the *Microsoft Operating System/2 User's Guide*.

You can use **more** to view the contents of a long file or the results of a command screenful by screenful.



Works the same way in the DOS session as described above, except that in the DOS session **more** creates temporary files in which to store information until it is displayed. For this reason, you cannot use the DOS version of **more** if the current disk is full or write-protected.

Examples To view the contents of the file IDEAS.OLD one screenful at a time, type the following:

```
more < ideas.old
```

To sort the file IDEAS.OLD alphabetically and view the output one screenful at a time, type the following:

```
sort < ideas.old | more
```

Mouse



Changes the active button on your mouse.

When you choose this command, a dialog box appears, containing a check box that you can select in order to swap the left and right mouse buttons.

MOUSExxx.SYS



device=[*drive:*][*path*]**mouse***xxx.sys* [**mode**=*mode*] [**qsize**=*size*]
[**serial**=*device*] [**model**=*style*]

Directs MS OS/2 to load the specified mouse device driver. To use this command, place it in your CONFIG.SYS file.

When the mouse driver and the POINTDD.SYS device driver are loaded, you can use a pointing device with DOS and MS OS/2 programs that support such devices.

xxx Specifies the type of mouse you are using. Possible values for *xxx* are included in the list on the next page.

mode=*mode*

Specifies whether you'll be using the mouse in an OS/2 session, the DOS session, or both sessions. Acceptable values for *mode* are **p** (protected mode, OS/2 session), **r** (real mode, DOS session), and **b** (both); the default is **b**.

qsize=*size*

Specifies the size, in bytes, of the queue buffer to be allocated for each MS OS/2 session. The number must be in the range 1 to 100; the default is 10.

serial=*device*

Specifies the communications port to which the mouse is connected. Acceptable values are COM1 and COM2 for IBM PC/AT and compatible computers, and COM1 through COM8 for IBM PS/2 computers. The default value is COM1 for a serial mouse. This option is not used with a parallel mouse.

model=*style*

Specifies the model of Microsoft mouse you are using. Acceptable values are 099 (mouse with green buttons) and 199 (mouse with gray buttons or serial mouse with white buttons).

To set up a mouse device driver, you must first choose the driver that matches your mouse hardware and your computer. The following list tells you which driver to use with your mouse:

Driver	Mouse
MOUSEA00.SYS	Mouse Systems Mouse
MOUSEA01.SYS	Visi-On Mouse
MOUSEA02.SYS	Microsoft Serial Mouse for IBM Personal Computers (models 039-099 and 039-199)
MOUSEA03.SYS	Microsoft Bus (parallel) Mouse for IBM Personal Computers (models 037-099 and 037-199)
MOUSEA04.SYS	Microsoft InPort (parallel) Mouse for IBM Personal Computers
MOUSEA05.SYS	IBM Personal System/2 Mouse for IBM PC/AT and compatible computers
MOUSEB00.SYS	Mouse Systems Mouse
MOUSEB01.SYS	Visi-On Mouse
MOUSEB02.SYS	Microsoft Serial Mouse for IBM Personal Computers (models 039-099 and 039-199)
MOUSEB05.SYS	IBM Personal System/2 Mouse for Models 50, 60, 70, and 80

Note MOUSEAxx.SYS drivers are used with IBM PC/AT or compatible computers. MOUSEBxx.SYS drivers are used with IBM Personal System/2 computers.

Regardless of which mouse driver you choose, you must always set up the POINTDD.SYS device driver for the mouse pointer.

If you are using a serial mouse, the **device=mousexxx.sys** command must precede any **device=com0x.sys** commands in your CONFIG.SYS file.

Move



Moves a file, a group of files, a directory, or a group of directories from one directory to another.

When you choose this command, a dialog box appears, containing two text boxes: From and To. The From text box shows the names of the files or directories you have selected from the directory window. In the

To text box, you can type the drive and path of the destination directory (the directory you want to move your files or directory to). You don't need to type the drive letter unless you are moving to a different drive.

If you are moving only one file or directory, you can move it and rename it at the same time by typing a new name in the To text box. If you rename a directory, it will show a new date and time of creation when you display full file details; otherwise, the date and time will stay the same.

You can move multiple files or multiple directories (or even files and directories together) by extending the selection in the directory window before you choose Move, or by typing multiple names in the From text box. You can also move multiple files with similar filenames by using wildcard characters.

MS OS/2 does not recognize multiple destination names; it ignores all but the first name in the To text box.

Warning If you are moving a single file and you supply a destination filename that already exists, MS OS/2 will overwrite the file. (If you have turned on the Confirm On Replace option by using the File Options command, MS OS/2 will first display a dialog box asking whether you want to overwrite the file.)

If you want to move multiple files, do not specify a destination filename. If you do, MS OS/2 will move the first source file and give it the destination filename; then move the second source file, give it the destination filename, and overwrite the first file; and so on until all the files have been moved. The result is one file, and its contents will be the contents of the last source file. The other source files will be lost.

If you are moving multiple directories and you supply a destination directory name, MS OS/2 will move the first source directory and give it the destination name, then move the remaining source directories into the first as subdirectories.



Lets you move a window.

When you choose this command, you can use the **DIRECTION** keys to move the window to a new position on the screen. Press **ENTER** to fix the window in its new position, or press **ESC** to return the window to its old position.

Next Window



Switches to the next open application window. This is the last application window you used before switching to or starting the current application window.

This command appears on the System menu only for full-screen OS/2 applications running in a window.

Open



Opens a directory window in File System, starts a program, or starts a program and opens a data file for that program.

If you have selected a directory name in File System, choosing Open creates a directory window that lists the files and subdirectories in the selected directory.

If you have selected the name of a program, choosing Open starts the program.

If you have selected the name of a data file that has been associated with a program by using the Associate command, choosing Open starts the program and opens the selected file.

Note You cannot start a DOS program or open a DOS data file from File System; you must switch to the DOS session first and then type the name of the program, or the command that starts the program, at the DOS prompt.

Patch



patch [*drive:*][*path*]*filename* [**/a**]

Inserts a section of program code into an existing MS OS/2 program or application to change the way the program runs. Any file that can be written to can be patched.

filename

Specifies the file to patch.

/a Specifies the automatic operation mode. With the **/a** option, *filename* is a file containing instructions for patching one or more files automatically.

Patch has two modes of operation: automatic and interactive. Interactive mode is the default. In this mode, you supply the path of the file you want to patch in the **patch** command line. **Patch** then prompts you for the offset at which a patch is to be made (**patch** can change bytes at any position in a file or add bytes to the end of a file) and for the patch contents. You must type both the offset and the patch contents in hexadecimal notation.

After you supply the hexadecimal offset, **patch** displays the 16 bytes at that offset. You can then change any or all of the 16 bytes. If you decide not to make any changes, you can press the ESC key.

The cursor is initially positioned on the first byte. To change this byte, type one or two hexadecimal digits. To leave the byte unchanged and move to the next byte, press the SPACEBAR. Press the BACKSPACE key to move the cursor back if you make a mistake. If you move the cursor past the last byte displayed, **patch** displays the next 16 bytes. This cycle continues until you press the ENTER key.

When you press ENTER, **patch** saves the patch information and asks if you want to make any more patches. If you respond with "Y", **patch** again prompts you for an offset. After you have entered all the patches you want to make and responded with "N" at the "more patches" prompt, **patch** displays the patches on the screen and asks if they should be applied. If you respond with "Y", all of the saved patch requests are written to disk in the same order in which they were entered.

DOS

Works the same way in the DOS session as described above.

Warning You should use **patch** only if you understand the need for a patch, how to make the patch, and the effect the patch will have on program operation. Before you use the **patch** utility, be sure to make backup copies of the files to which the patches will be applied.

Path

OS/2
cmd

path [;| [drive:]path[;...]]

Tells MS OS/2 where to search for a command file or application if the program is not in the current directory.

; When used alone (**path ;**), clears all search-path settings. You also use semicolons to separate multiple paths.

path Specifies the path of the directory that you want MS OS/2 to search for command files. If you do not specify a drive, MS OS/2 searches the disk in the current drive.

If you type **path** by itself, the command displays the current search path.

The **path** command affects only the current session. To set a path for all sessions, you must place the **path** command in your CONFIG.SYS file. For more information on using **path** in your CONFIG.SYS file, see the **set** command.

DOS
command

Works the same way in the DOS session as described above.

Example To tell MS OS/2 to search for a command file in the directories BIN and WORD on drive C and the subdirectory WORD of the APPS directory on drive A, type the following:

```
path c:\bin;c:\word;a:\apps\word
```

Pause



pause [*comment*]

Suspends processing of a batch file and displays a message that asks the user to press any key to continue.

comment

Specifies the message you want to have appear before the line "Press any key when ready...". The message can be any combination of up to 121 characters.

You can use this command to make a batch program pause any time the user has to do something, such as read a message or insert a disk, before continuing with the program.



Works the same way in a DOS batch file (.BAT extension) as it does in an OS/2 batch file (.CMD extension).

Example To have your batch program pause and prompt the user to insert a new disk in drive A before continuing, type the following at the appropriate point in the batch file:

```
pause Please put a new disk into drive A.
```

Pauseonerror



pauseonerror=yes | no

Tells MS OS/2 whether to pause if it encounters an error while processing your CONFIG.SYS file during system start-up. To use this command, place it in your CONFIG.SYS file.

If **pauseonerror** is set to **yes** (the default), then whenever MS OS/2 encounters an error while processing your CONFIG.SYS file, it stops, displays an error message, and prompts you to press ENTER to continue the start-up process. If you have set **pauseonerror** to **no**, MS OS/2 displays an error message when it encounters an error, but it does not stop.

Example To tell MS OS/2 to process your CONFIG.SYS file without pausing when it encounters errors, include the following line in your CONFIG.SYS file:

```
pauseonerror=no
```

PMSHELL.EXE



pmshell.exe filename1.ini filename2.exe

Specifies the initialization file and the command interpreter to be used by the Presentation Manager user interface (PMSHELL.EXE).

filename1

Names the MS OS/2 initialization file to be used.

filename2

Names the command interpreter to be used.

During MS OS/2 installation, the following line is placed in your CONFIG.SYS file:

```
protshell=c:\os2\pmshell.exe c:\os2\os2.ini c:\os2\cmd.exe
```

If you place your initialization file or command interpreter somewhere other than the OS2 directory on drive C, you need to tell MS OS/2 where it is by changing its path in the **protshell** command line in your CONFIG.SYS file.

Example To tell MS OS/2 that your initialization file and command interpreter are located in the root directory on drive D, change the **protshell** command to read as follows:

```
protshell=d:\pmshell.exe d:\os2.ini d:\cmd.exe
```

POINTDD.SYS



device=[drive:][path]pointdd.sys

Directs MS OS/2 to load the POINTDD.SYS device driver. To use this command, place it in your CONFIG.SYS file.

To use a mouse with MS OS/2, you must set up the POINTDD.SYS driver as well as the MOUSExxx.SYS driver. The POINTDD.SYS driver provides information that MS OS/2 needs in order to draw the mouse pointer.

Example To use a Microsoft InPort Mouse, you must include the following two lines in your CONFIG.SYS file:

```
device=c:\os2\pointdd.sys
device=c:\os2\mousea04.sys
```

Print



Prints a file.

When you select a filename from File System and then choose this command, MS OS/2 sends the file to the default printer. To choose a different printer, you must change the default printer. For information on changing the default printer, see the Printer Defaults command.

Print



print [/d:device] [/b] [drive:][path]filename [...]

or

print [/d:device] [/t| /c]

Sends a file to a device to be printed.

/d:device

Tells MS OS/2 which printer to use. The default is LPT1.

/b Tells MS OS/2 not to interpret CTRL+Z characters in the file as end-of-file characters.

filename

Tells MS OS/2 which file to print. If you specify more than one file, the files are printed in the order you type them in the command line.

/t Stops all printing and removes all files from the print queue, if the spooler is active for the specified device.

/c Stops printing the file being printed and removes it from the print queue, if the spooler is active for the specified device.

DOS

Works the same way in the DOS session as described above, except that you cannot use the */t* and */c* options.

Example To print the file PENCIL.TST on the printer connected to your computer's third parallel port (LPT3), type the following:

```
print /d:lpt3 pencil.tst
```

Print Job Next



Changes the priority of a job so that it is the next job to print.

This command causes the print job selected to be moved to the top of the list of waiting print jobs. If another job is already printing, the selected job starts printing as soon as the other job finishes.

You can also change the priority of a print job by selecting the Job Details command on the Job menu.

Printer Connections



Associates printers, ports, and printer drivers, and sets parameters or chooses options for them.

When you choose this command, a dialog box with lists of printer names and port names appears. You can associate a printer with a port by selecting a printer name from the first list and a port name from the second list.

The dialog box also contains command buttons labeled Names, Drivers, Setup, and Comms. When you choose any of these buttons, further dialog boxes appear. Choose the Names command button to associate a printer driver with a particular printer, add or change the name of a printer, and specify network options. Choose the Drivers command button to select a default printer driver. Choose the Setup command button to set printer-driver options. Choose the Comms command button to set parameters for a communications port.

Printer Defaults



Selects a default printer for the system and sets the values for printer time-outs.

When you choose this command, a dialog box appears, containing a list box from which you can select the name of the printer you want to make the default printer (the printer to which applications and other programs in your system send files you ask them to print).

The dialog box also contains text boxes in which you can change the length of time (in seconds) for the printer time-outs. The printer time-outs tell your system how long to keep trying to send a file to a printer and how long to wait before trying again if the file did not print the first time.

Priority



priority=absolute | dynamic

Determines how a process receives enough priority over other processes to run. To use this command, place it in your CONFIG.SYS file.

In MS OS/2, processes have three priority classes: time-critical, normal, and idle-time. Each of these classes has 32 priority levels, which MS OS/2 uses to schedule processes. In the normal class, MS OS/2 may adjust the priority level dynamically (that is, according to changing circumstances).

absolute

Prevents the system from dynamically changing the priority of processes in the normal class. The **absolute** setting gives all processes that are running an equal share of central-processing-unit (CPU) time.

dynamic

Instructs MS OS/2 to try to determine which process needs CPU resources most in any given interval of time (time slice). The **dynamic** setting gives more CPU time to the process that is running in the foreground. This is the default setting. For more information about time slices, see the **timeslice** command.

You should use the **priority** command only if an application requires you to do so.

Prompt



prompt [*string*]

Changes the prompt for the current MS OS/2 command interpreter. This change affects only the current session.

string

Specifies the new prompt. You can specify any character string you want, or you can use any of the **\$x** character combinations

listed below to customize your prompt. (You can combine text and these character combinations in any order.) Any spaces that you type will appear as part of the prompt.

The following character combinations are available for use in customizing your prompt:

Combination	Action
\$\$	Displays the dollar-sign character (\$).
\$_	Begins a new line on the screen.
\$a	Displays an ampersand (&).
\$b	Displays the pipe symbol (|).
\$c	Displays a left parenthesis [().
\$d	Displays the current date.
\$e	Specifies the beginning of an ANSI escape code.
\$f	Displays a right parenthesis [)].
\$g	Displays the greater-than sign (>).
\$h	Represents the backspace character; this erases the previous character from the prompt.
\$i	Displays the Help line.
\$l	Displays the less-than sign (<).
\$n	Displays the current drive letter.
\$p	Displays the current drive letter and directory path.
\$q	Displays the equal sign (=).
\$t	Displays the current time.
\$v	Displays the MS OS/2 version number.

If you type **prompt** by itself, the command resets the prompt to the system default, which displays only the current drive and directory, in brackets.



Works the same way in the DOS session as described above, except that you cannot use **\$a**, **\$c**, and **\$f**.

Example To change your prompt so that it tells you the time on one line and the current drive and directory on the next, followed by a space and a greater-than sign, type the following:

```
prompt The time is $t$h$h$h$h$h$h$h$h$h$h$ _$p $g
```

The new prompt has the following form:

```
The time is 13:37  
C:\OS2 >
```

Notice that the **\$h** characters erased the seconds and hundredths of seconds from the time display.

Protectonly



protectonly=yes | no

Tells MS OS/2 whether to enable the DOS session. To use this command, place it in your CONFIG.SYS file.

During MS OS/2 installation, the **protectonly=no** command is placed in your CONFIG.SYS file so that you can run the DOS session. To set up your system to run the Presentation Manager and full-screen OS/2 sessions only, change this line to **protectonly=yes**.

Protshell (Protected Shell)



protshell=[drive:][path]filename [arguments]

Tells MS OS/2 what user interface to use and which command interpreter to use in a full-screen OS/2 session.

filename

Specifies the file that contains the user interface. If this file is not in the root directory of the start-up drive, you must include the drive and/or path.

arguments

Specifies the drive, path, and filename of the MS OS/2 initialization file and command interpreter. For more information about these arguments, see the entry for PMSHELL.EXE.

The following line is placed in your CONFIG.SYS file during MS OS/2 installation:

```
protshell=c:\os2\pmshell.exe c:\os2\os2.ini c:\os2\cmd.exe
```

This command tells MS OS/2 to use the Presentation Manager user interface and the **cmd** command interpreter in full-screen OS/2 sessions.

This command has no effect on the DOS session.

Queue Connections



Associates a print queue with a printer and sets the default queue for a printer.

When you choose this command, a dialog box appears, containing lists of available printers and available queues and a text box with the name of the current default queue. You can associate a queue with a printer by selecting a printer name from the first list and a queue name from the second list. The last queue name you select appears in the Default text box; to change this setting, select another name from the queue list.

Recover



recover [*drive:*] | [*drive:*][*path*] *filename*

Reconstructs all the files from a disk that has a damaged directory structure or reconstructs a single file from a disk that has bad sectors.

drive:

Specifies the drive containing the disk with the files you want to try to reconstruct. If you specify only a drive, **recover** tries to reconstruct the entire contents of the disk in that drive.

filename

Specifies the file you want to try to reconstruct. If you do not specify a drive or path, **recover** assumes that the file is in the current directory on the current drive. You cannot use wildcard characters in *filename*.

If you type **recover** by itself, the utility tries to reconstruct all the files in the current directory on the current drive.

Warning Before you use this utility, be sure you have a full backup of all the files on your disk and then try to restore your files with the **restore** utility. If this fails, use the **recover** utility to try to reconstruct the lost files one by one. Do not use **recover** to reconstruct an entire disk unless the entire disk is unreadable.

MS OS/2 recovers a file by reading it, sector by sector, skipping the bad sectors.

DOS

Works the same way in the DOS session as described above.

You cannot use **recover** with drives that you have assigned, joined, or substituted by using the **assign**, **join**, or **subst** utility.

Example To try to reconstruct the file REPORT.TXT from the disk in drive B that has bad sectors, type the following:

```
recover b:\report.txt
```

Refresh



Updates the information in all the directory windows in File System.

This command takes effect immediately.



Updates the list of queues and jobs shown by the Spooler Queue Manager.

This command takes effect immediately.

To tell the system to update the list every time it changes, use the Auto Refresh command.

Release All Jobs



Restores the priority of all the jobs that have been held in a print queue, so that they can print. If one of the jobs was printing when all the jobs were held, it starts printing again.

This command reverses the effect of the Hold All Jobs command.

Release Job



Restores the priority of a print job that has been held, so that the job can print. If the job was printing when it was held, it starts printing again.

This command reverses the effect of the Hold Job command.

Release Queue



Restores the status of a queue that has been held, so that the jobs in that queue can print.

This command reverses the effect of the Hold Queue command.

Rem (Remark)



rem [*comment*]

Displays a message while a batch file is running or includes a descriptive comment in the batch file.

comment

Specifies the message you want to put in the batch file. *Comment* can be any combination of characters that fits on one line.

If **echo** is on when MS OS/2 encounters a **rem** line, the line is displayed; if **echo** is off, the line is not displayed.

If the comment you want to put in the batch file is too long to fit on one line, you must use **rem** again for each line in the comment. You can also use **rem** without *comment* to add spacing between blocks of comments or remarks.



Works the same way in a DOS batch file (.BAT extension) as it does in an OS/2 batch file (.CMD extension).

Example The following batch file uses **rem** both to include comments in the file and to add spacing between the comments:

```
echo off
rem This batch file performs a disk check on
rem the disk in drive A and then displays the
rem disk directory in wide format.
rem
rem To allow the user to indicate a disk drive
rem from the command line, modify the batch
rem file to use replaceable parameters.
rem
chkdsk a:
dir a: /w
```

Rem (Remark)



rem [*text*]

Includes a remark or descriptive comment in your CONFIG.SYS file. Lines that begin with **rem** are not processed by MS OS/2.

text

Specifies the remark or comment that you want to include in your CONFIG.SYS file. *Text* may be any string of characters that fits on one line.

If the comment you want to put in the CONFIG.SYS file is too long to fit on one line, you must use **rem** again for each line of the comment. You can also use **rem** without *text* to add spacing between blocks of comments or remarks.

Example To leave a comment in a configuration file for another person's use or to remind yourself of the purposes of the commands in the file, begin each line of the comment with **rem**, as in the following:

```
rem MS OS/2 uses CONFIG.SYS to configure your system.  
rem This command (rem) allows you to insert  
rem comments in CONFIG.SYS that remind you  
rem what a particular command is supposed to do.
```

Rename



Renames a file, a directory, or a group of files with similar names.

When you choose this command, a dialog box appears, containing two text boxes: From and To. The From text box shows the name of the file or directory you selected from the directory window. You can edit the contents of this box if you want to rename a file or directory other than the one selected. In the To text box, you can type the new filename or directory name.

When you rename a directory, the date and time of the directory's creation change; when you display full file details, you see the new date and time.

You can rename a group of files with similar names by using wildcard characters in both the old and the new name.

Warning If you try to rename a file or directory with a name that already exists, MS OS/2 displays an error message or, if Confirm On Replace is on, asks you to confirm that you want to overwrite the file or directory that originally had that name.

If you try to rename multiple files by typing multiple filenames in the From text box, MS OS/2 renames the first file and then displays an error message or, if Confirm On Replace is on, asks you to confirm that you want to overwrite the first file.



Changes the name of a program group in Start Programs.

When you choose this command, a dialog box appears, containing a list box and a text box. You can select a group name from the list of current groups in the list box and then type the new name in the text box.

A group name can be up to 60 characters and can include letters, numbers, spaces, and any symbols except the backslash (\). When you choose the Rename button, the name changes and you switch to the group you just renamed.

Rename



rename [*drive:*][*path*]*filename1 filename2*

Changes the name of a file. You can abbreviate **rename** as **ren**.

filename1

Specifies the old name of the file. If you do not specify a drive and path, MS OS/2 assumes that the file is in the current directory on the current drive.

filename2

Specifies the new name of the file. You cannot specify a drive or path for the new name; **rename** changes only the name of the file.

You can use wildcard characters in *filename1* and *filename2*.

You cannot use **rename** to move files from one drive or directory to another.

If a file with the name specified for *filename1* already exists in the directory, MS OS/2 displays an error message.



Works the same way in the DOS session as described above.

Example To change the extension of all the files in the current directory in drive B that have a .DOC extension from .DOC to .TXT, type the following:

```
rename b:*.doc *.txt
```

Repeat Job



Creates a new copy of a job in the print queue. The new job has the same characteristics as the old job.

Replace



replace [*drive:*][*path*]*filename* [[*drive:*]*path*] [**/a**] [**/p**] [**/r**] [**/s**] [**/w**]

Selectively replaces files on the destination disk with new versions of those files from the source disk, or adds new files to the destination disk.

filename

Specifies the source file that will replace the file in the destination directory. You can use wildcard characters in the source filename to replace groups of files with similar names.

path

Specifies the directory that contains the file to be replaced or to which you want to add the file. If you do not specify a directory, **replace** uses the current directory on the current drive.

- /a** Adds only the files specified in *filename* that do not exist in the destination directory, and does not replace existing files. This option is incompatible with the **/s** option.
- /p** Prompts you for confirmation before replacing or adding a file.
- /r** Replaces read-only files as well as unprotected files. If you do not use this option and you try to replace a read-only file, the replacement process stops and you see an error message.
- /s** Replaces files in the subdirectories of the destination directory if the filenames match those specified in *filename*. **Replace** never searches subdirectories of the source directory. This option is incompatible with the **/a** option.
- /w** Tells **replace** to wait for you to insert a disk before beginning to search for source files. Otherwise, **replace** starts replacing or adding files immediately.

This command is usually used to update the software on your hard disk. You cannot use **replace** to update hidden files or system files.



Works the same way in the DOS session as described above.

Examples To update your phone-list file, PHONES.CLI, in all the directories on your hard disk (drive C) with the latest version of PHONES.CLI from the disk in drive B, type the following:

```
replace b:\phones.cli c:\ /s
```

To add several new printer drivers from the disk in drive A to the directory MSTOOLS on your hard disk (drive C), type the following:

```
replace a:*.prd c:\mstools /a
```

Restore



Restores a window to the size and position it had before it was either shrunk to an icon or enlarged to its maximum size.

If the application is neither shrunk to an icon nor enlarged to its maximum size, this command is inactive.

Restore



```
restore drive1: [drive2:][path][filename] [/s] [/p] [/b:date] [/a:date]  
[/e:time] [/l:time] [/m] [/n]
```

Restores backup files that were created by using the **backup** utility.

drive1:

Specifies the drive that contains the backup disk on which the backup copies of your files are stored.

drive2:

Specifies the drive that contains the destination disk to which you want to restore the files. The destination disk does not have to be of the same type as the source disk. If you do not specify *drive2*, **restore** uses the current drive.

filename

Specifies the file or files that you want to restore. You can use wildcard characters to specify multiple files with similar names.

If you do not specify a filename, **restore** looks in the current directory on the current drive for filenames that match those found on *drive1*.

/s Restores the files in subdirectories of the directory that contains *filename*.

/p Prompts you for confirmation before restoring read-only files or files that have changed since the last backup operation.

/b:date

Restores only files that were modified on or before the specified date.

/a:date

Restores only files that were modified on or after the specified date.

/e:time

Restores only files that were modified at or before the specified time. You should use this option only if you use the **/b:date** or **/a:date** option.

/l:time

Restores only files that were modified at or after the specified time. You should use this option only if you use the **/b:date** or **/a:date** option.

/m Restores only files that have been modified since the last backup operation, and turns off the archive bits of the restored files.

/n Restores only files that no longer exist on the destination disk.

The **restore** utility can restore files only to their original directory.

The **restore** utility cannot restore CMD.EXE, COMMAND.COM, or the hidden system files.

Restore restores backup files that were created by using the MS OS/2 **backup** utility or the MS-DOS **backup** utility (including versions 3.21 and earlier of MS-DOS, even though they use a different structure for backup files).

DOS

Works the same in the DOS session as described above.

You cannot use **restore** on drives that have been assigned, joined, or substituted with the **assign**, **join**, or **subst** command.

Example To restore all the files on drive A with the extension .NEW that were backed up from the directory LETTERS on the disk in drive B, type the following:

```
restore a: b:\letters\*.new
```

Resume



Returns you to the application from which you selected the command.

This command appears on the application's Exit menu (Control Panel and File System) or Shutdown menu (Task Manager). Its effect is the same as the effect of pressing ALT or F10 after selecting the menu—the menu disappears and you are back in the work area of the application window.

Rmdir (Remove Directory)



rmdir [*drive:*]*path* [...]

Deletes a directory. You can abbreviate **rmdir** as **rd**.

path Specifies the directory that you want to delete.

Before you can delete a directory, you must delete all the files and sub-directories in that directory. (The empty directory still shows listings for the working directory [.] and the parent directory [..] if you list its contents with the **dir** command.)

You can delete more than one directory at a time by specifying each directory separately on the same command line.



Works the same way in the DOS session as described above, except that in the DOS session you cannot specify multiple directories.

Example To remove the directory BILLS and the directory NOTICES from the root directory on drive B, type the following:

```
rmdir b:\bills b:\notices
```

Rmsize (Real-mode Size)



rmsize=x

Sets the amount of memory that MS OS/2 reserves for the DOS session. To use this command, place it in your CONFIG.SYS file.

- x* Specifies the size, in kilobytes, of the portion of memory reserved for the DOS session. This number must be in the range 0 to 640. The default depends on the total amount of system memory.

MS OS/2 uses the first *x* kilobytes of memory (“low memory”) in your computer to run the DOS session; memory above *x* kilobytes is used for the rest of MS OS/2 (apart from certain device drivers and essential MS OS/2 functions that use a small portion of the first *x* kilobytes).

The default size of *x* depends on how much memory your system has, but it is always the largest size possible on your system (up to the maximum of 640K). The default size is typically either 512K or 640K—the amount of memory installed below 1024K.

Because the **rmsize** command affects only the DOS session, it has no effect unless **protectonly** is set to **no** (the default setting). (If **protectonly** is set to **yes**, you cannot run the DOS session at all.)

For information about setting the size of the environment for the DOS session, see the **shell** command.

Note The memory reserved by the **rmsize** command cannot be swapped, so this memory is unavailable to any other program or process.

Example To reserve only 384K of memory for the DOS session, include the following line in your CONFIG.SYS file:

```
rmsize=384
```

Run



run=[drive:][path]filename [arguments]

Starts a background program when you start your system. To use this command, place it in your CONFIG.SYS file.

filename

Specifies the program you want to start, which must be one that can run in the background. You must include the extension (.COM or .EXE), and you must give the drive and path if the file is not located in the root directory of your start-up drive. *Filename* cannot be a batch file.

arguments

Specifies any valid options or other variables for the application.

You can include more than one **run** command in your CONFIG.SYS file.

MS OS/2 processes all the **device** commands in your CONFIG.SYS file before it starts processing any **run** commands.

While processing a CONFIG.SYS file, MS OS/2 preserves the difference between uppercase and lowercase letters in arguments; this can be important for some programs that are case sensitive.

Screen Colors



Changes the colors of the different elements on your screen.

When you choose this command, a dialog box appears, containing a list of all the elements of the screen (for instance, window borders, screen background, title bar, and window text); a sample screen with a sample window, so that you can see the effects of the changes you make; and three color bars, on which you can adjust the color, the shade, and the amount of color for each element.

Scroll



Allows you to use the **DIRECTION** keys (the directional arrow keys and the **PAGE UP** and **PAGE DOWN** keys) on your keyboard to scroll the contents of a window when they do not fit in one screen.

Once you have chosen this command, it remains in effect until you choose it again. While it is in effect, a check mark appears next to the command name on the menu.

This command appears on the System menu only for full-screen OS/2 applications running in a window.

Select All



Selects all the files and directories in the active directory window. All the filenames and directory names are highlighted.

Set



set [*string1*=[*string2*]]

Defines an environment variable by naming the variable and giving a value for it.

string1

Specifies the name of the environment variable you want to set (for example, **PATH**, **INIT**, **LIB**, or **PROMPT**).

string2

Specifies the string of characters, paths, or filenames that defines the current value of the environment variable.

If you type **set** by itself, the command displays the current values for all the environment variables in the current session.

If you type **set string1=**, **set** removes the current value for that environment variable.

For more information about environment variables, see the *Microsoft Operating System/2 User's Guide*.

You can also use the **set** command to define the replaceable batch parameters by name, instead of by number. For more information about using **set** in batch files and start-up files, see the *Microsoft Operating System/2 User's Guide*.

This version of the **set** command affects only the current session.



Works the same way in the DOS session as described above.

Example To set the INCLUDE environment variable so that the Microsoft C Optimizing Compiler can find include files in the directory INC on drive C, type the following:

```
set include=c:\inc
```

Set



```
set string1=string2
```

Defines an environment variable by naming the variable and giving a value for it. To use this version of the **set** command, place it in your CONFIG.SYS file.

string1

Specifies the name of the environment variable you want to set (for example, PATH, INIT, LIB, or PROMPT).

string2

Specifies the string of characters, paths, or filenames that defines the current value of the environment variable.

The following **set** commands are placed in your CONFIG.SYS file during MS OS/2 installation to set the search paths for **cmd** and other programs:

```
set path=c:os2;c:\os2\system;c:\os2\install;c:\;  
set dpath=c:os2;c:\os2\system;c:\os2\install;c:\;
```

For more information about environment variables, see the *Microsoft Operating System/2 User's Guide*.

You can also use the **set** command in your CONFIG.SYS file to define the replaceable batch parameters by name instead of by number. For more information about using **set** with batch files and in your start-up files, see the *Microsoft Operating System/2 User's Guide*.

This version of the **set** command affects all sessions.

Setcom40

DOS

setcom40 COM x =on| off

Sets the address of the specified serial port so that a DOS application can find the port and use it.

x Specifies the number of the serial port for which you want to set the address. This number can be 1, 2, or 3.

on Sets the address of the serial port in memory.

off Removes the address of the serial port from memory.

You will need to use this utility if you used the **device** configuration command in your CONFIG.SYS file to load COM0 x .SYS; most DOS applications send their output directly to the serial port, rather than through this device driver, so they must have the port address.

You must set the port address before you start the DOS application.

Do not use **setcom40** if a program in either the Presentation Manager or a full-screen OS/2 session is using COM0 x .SYS to control access to the serial port that you want to use. Be sure that any MS OS/2 program that is using the serial port (including the spooler, which may have files queued up waiting to use the port) is finished running before you try to use the port from the DOS session. Conversely, once you have set **setcom40** to **on** and given a DOS application access to a serial port, be sure that that application has finished running before you switch out of the DOS session.

Examples To set the address of serial port COM2 so that an application can use the port in the DOS session, type the following:

```
setcom40 com2=on
```

To remove the address of COM2 from memory and give access to the port back to MS OS/2, type the following:

```
setcom40 com2=off
```

Setlocal



setlocal

Saves the current drive, directory, and environment settings and tells MS OS/2 that any changes to these settings that you make in a batch file are valid only while the batch file is running. You can use this command only in a batch file.

After typing **setlocal** on a line by itself, you can set any variables you want for the purposes of the batch file; MS OS/2 restores the original settings when it encounters an **endlocal** command or a new **setlocal** command, or when the batch file ends.

You can use multiple **setlocal** commands in a batch file without including corresponding **endlocal** commands; each succeeding **setlocal** overrides the previous one.

You can use this command only in OS/2 batch files (files with the extension .CMD).

Example To have MS OS/2 search in the root directory of the disk in drive B for programs, even though your normal path doesn't include drive B, type the following in the batch file:

```
setlocal
path b:
.
.
endlocal
```

Shell



shell=[drive:][path]filename [arguments]

Tells MS OS/2 which command interpreter to use in the DOS session. To use this command, place it in your CONFIG.SYS file.

filename

Specifies the name of the file (including its extension) that contains the DOS-session command interpreter. The default filename is COMMAND.COM. You must include the drive and/or path if the command interpreter is not in the root directory of the start-up drive.

arguments

Specifies any valid options or other variables for the command interpreter.

The **shell** command itself does not accept arguments, but if the alternative command interpreter does, you can include them as part of the command.

If you specify a filename other than **COMMAND.COM**, MS OS/2 starts the command interpreter you specify instead of **command** when it starts the DOS session. Since the DOS commands are included in **command**, they will not be available to you unless they are also included in your new command interpreter.

Example To specify **command** as the DOS-session command interpreter, set the environment size to 512 bytes, and tell **command** to stay in memory, include the following command in your **CONFIG.SYS** file:

```
shell=c:\os2\command.com /e:512 /p
```

Shift

**shift**

Shifts the positions of the numbered replaceable parameters (%0–%9) in a batch file, so that you can deal with more than ten values.

Each time MS OS/2 encounters **shift**, it discards the value in %0 and shifts each of the other values to the next lowest parameter: The value in %1 moves to the %0 position, %2 moves to %1, and so on. This frees the last parameter, %9, so that the eleventh value that you type shifts into %9.

You can use **shift** as many times as you need to in a batch file. You can use **shift** even if there are fewer than ten values.

There is no backward **shift** command. After you have used **shift** once, the value in the original %0 is gone and the batch file cannot use it again.



Works the same way in a DOS batch file (.BAT extension) as it does in an OS/2 batch file (.CMD extension).

Example The following batch file (named COPYTO.COM or COPYTO.BAT) uses **shift** to copy a list of files to your current directory:

```
echo off
if "%1"==" " goto usage
:start
copy %1
shift
if "%1"==" " goto done
goto start
:usage
echo * This batch program copies any number
echo * of files to your current directory.
echo *
echo * Usage: copyto file1 file2 file3 [...]
:done
```

Show Outline Tree



Changes the way directories are displayed in the Directory Tree window, so that you can control the amount of directory information provided.

The Show Outline Tree command displays the directory structure with icons that indicate whether another directory level exists. You can choose these icons to collapse or expand those branches of the directory tree. When the branch is in its expanded state, there is a minus-sign (-) icon; choosing the icon then collapses the branch. When the branch is in its collapsed state, there is a plus-sign (+) icon; choosing the icon then expands the branch to the next level. If the Show Outline Tree command is not in effect, the directory structure appears in expanded form, but without the icons.

Shutdown Now



Closes application windows and quits applications, so that only the DOS session and the Start Programs, Task Manager, and Spooler Queue Manager applications are left running.

When you choose this command, a dialog box appears, asking you to confirm that you want to close all applications. Some applications also display their own dialog boxes asking you to confirm that you want to quit. Any application with unsaved files displays a dialog box asking you whether you want to save the files.

Size



Changes the size of a window.

Once you have chosen this command, you can use the **DIRECTION** keys to move the window's borders in order to change its size and shape. Press **ENTER** to fix the window in its new size and shape, or press **ESC** to return the window to its previous size and shape.

Small Font



Changes the size of the letters used to display text in an OS/2 application running in a window, so that more lines fit on the screen. The width of the letters doesn't change, but they become shorter.

When you enlarge the window to its maximum size, the maximum number of lines displayed remains the same whether you are using the smaller or larger font size. This is because the window itself changes size when you change the font size. You cannot enlarge the window to the full-screen size when the Small Font command is in effect.

This command reverses the effect of the Large Font command. When the letters on the screen are in the smaller font size, this command appears as Large Font on the menu.

Sort



sort [/r] [/+n] < *source*

Sorts lines of input in alphabetical and numeric order and sends the output lines to the screen.

- /r** Sorts the lines in reverse order (that is, from Z to A, then from 9 to 0) according to the first character of each line.
- /+n** Starts sorting the lines according to the character in column *n* (that is, the *n*th character from the beginning of the line). If you do not specify this option, **sort** starts sorting according to the first character of each line.

source

Specifies the source of the input. The keyboard is the default, but you can also redirect a file or the output from another command. For more information about redirection, see the *Microsoft Operating System/2 User's Guide*.

Sort uses the collating sequence table that is appropriate to the country-code and code-page settings. It does not distinguish between uppercase and lowercase letters.

Note If you try to sort a file that is too large, the **sort** utility gives you an error message. A file is too large if it is larger than 63K or if the number of lines is greater than $((\text{file size in bytes} + 768) / 4)$. To sort a large file, split the file into two or more smaller files and try the utility again.

DOS

Works the same way in the DOS session as described above.

Examples To sort the contents of the file PHONE.TXT in reverse alphabetical order and display the output on your screen, type the following:

```
sort /r < phone.txt
```

To sort a listing of the filenames in the CLIENTS directory on drive B and send the sorted list to the file CLIENTS.LST on drive C, type the following:

```
dir b:\clients | sort > c:\clients.lst
```

Spool

OS/2

spool [/d:device1] [/o:device2]

Starts the printer spooler so that MS OS/2 can print files in the background while doing something else. By using the spooler, you can control the printing of files from several different applications.

/d:device1

Identifies the parallel port that is connected to the printing device. This is the device that the original printing command was sending

its output to. The default is LPT1. You cannot specify a serial device as *device1*, but you can use any parallel device (printer, plotter, etc.) that supports monitors.

/o:device2

Identifies the output printing device. You can specify any parallel port (LPT1, LPT2, LPT3, or PRN) or any serial port (COM1, COM2, etc.). If you do not specify *device2*, **spool** uses *device1* as the default.

The spooler intercepts files that are being sent by the **print** utility or the printing command of an application to a printer connected to a parallel port, holds them temporarily in a directory on disk, and then prints them one at a time.

Because the output device can be different from the one specified in the printing command, you can use the **spool** utility to redirect parallel-printer output (for example, to an asynchronous serial device).

The **spool** utility affects all sessions.

Example To spool your print jobs and print them on a serial printer connected to COM1, type the following:

```
spool /o:com1
```

Spooler Options



Turns the print spooler on or off and changes the directory that the spooler uses to store files.

When you choose this command, a dialog box appears, containing a check box you can use to select the spooler and a text box in which you can change the spooler path. When you turn the check box on, the spooler starts immediately. As long as the check box is on, the spooler starts each time you start your system. When you turn the check box off, it does not affect the spooler until the next time you start your system.

Spooler Queue Manager



Sets up printers, and controls and organizes print jobs.

This application lets you send and control print jobs for more than one printer and set up multiple print queues.

Spooler Queue Manager has three menus: Queue, Job, and Special.

- The Queue menu contains the Hold Queue, Release Queue, Hold All Jobs, Release All Jobs, and Cancel All Jobs commands.
- The Job menu contains the Job Details, Cancel Job, Print Job Next, Repeat Job, Start Job Again, Hold Job, and Release Job commands.
- The Special menu contains the Refresh and Auto Refresh commands.

For more information about a specific Spooler Queue Manager command, see the individual entry for the command.

Spooler Queues



Associates a print queue with a queue processor; changes the options for a queue processor; and adds, changes, or deletes a queue name.

When you choose this command, a dialog box with lists of the available queues and queue processors appears. You associate a queue and a queue processor by selecting the name of a queue from the first list and the name of a queue processor from the second list. You can associate only one queue processor at a time with a queue.

The dialog box also contains command buttons labeled Names and Setup. When you choose these buttons, further dialog boxes appear. You can use the Names button to add, change, or delete a queue processor and to specify any relevant network options. (Network options are determined by your network software. See your network manual for any options you may need to specify.) You can use the Setup button to change options for the queue processor, such as how problems are reported and handled.

Start



Starts the program you have selected from the list in the current group in Start Programs.

Start



```
start ["session" ] [/k | /c | /n] [/f] [/fs | /win | /pm] [/i]
[drive:][path]command[.ext] [options]
```

or

```
start "session" [/k | /c] [/f] [/fs | /win | /pm] [/i]
" [drive:][path]command[.ext] [options]"
```

or

```
start ["session" ] [/k] [/f] [/fs | /win] [/i]
```

Starts an MS OS/2 command interpreter and tells it to carry out the command you specify.

session

Specifies the name of the new session as it will appear in Task Manager. The name can be up to 60 characters and can include spaces; it must be surrounded by double quotation marks. If you do not specify a name, **start** uses the filename you specified for the *command* argument. If you do not specify either *session* or *command*, **start** uses CMD.EXE.

- /k** Tells the command interpreter to run the command you specify and then keep the session open when the command is completed. This option is the default unless *command* starts a Presentation Manager application, in which case the default is **/n**. You cannot use **/k** with the **/pm** option.
- /c** Tells the command interpreter to carry out *command* and then end the session and return to the program from which it was started. You cannot use this option with the **/pm** option.
- /n** Tells MS OS/2 to run *command* without starting the command interpreter. This option is the default if *command* starts a Presentation Manager application. You cannot use **/n** if you have

enclosed the command and its options in double quotation marks (see the following *options* description), nor can you use */n* if *command* is a batch file or attempts to use a batch file (batch files require **cmd** as their batch processor).

- /f** Tells MS OS/2 to run the command in the foreground. Note that if you use several **start** commands in a batch file, you can use only one */f* option; MS OS/2 ignores all but the first one.
- /fs** Tells MS OS/2 to run the command as a full-screen application in the foreground, in a session independent of Presentation Manager.
- /win** Tells MS OS/2 to run the command in a Presentation Manager window.
- /pm** Tells MS OS/2 to run the command as a Presentation Manager application. You cannot use this option with the */k* or */c* option, nor can you use it if *command* is a batch file.
- /i** Tells **start** to use the environment set in your CONFIG.SYS file. The environment includes environment variables such as PATH, DPATH, and the drive and directory for a session.

command[*.ext*]

Specifies the command you want the command interpreter to carry out. This may be an MS OS/2 command, a utility, a batch file, or a command that starts an application. If you do not specify an extension, MS OS/2 searches for *command* with the extensions .COM, .EXE, and .CMD, in that order.

options

Specifies any valid options for *command*. If you specify *options*, you need to enclose *command* and *options* in double quotation marks so that **start** will not attempt to interpret the options as its own.

The **start** command runs *command* as an independent program according to the type of application it is. You can override the **start** defaults by using the */fs*, */win*, or */pm* option.

If you type **start** without specifying a command, MS OS/2 starts a command interpreter (**cmd**) without running a command.

Example To start an MS OS/2 command interpreter and run an application named Videophile in the foreground session, type the following (assuming that the command you use to start Videophile is **videop**):

```
start "Videophile" /f videop
```

Start Job Again



Stops a job that is printing and starts it printing again from the beginning.

This command affects only a job that is already printing.

Start Programs



Starts programs and organizes them into groups.

From Start Programs, you can start Presentation Manager applications, as well as MS OS/2 batch programs, commands, utilities, and applications.

Start Programs lists programs in groups. The list that appears when you start Presentation Manager is for the Main Group.

Start Programs has two menus: Program and Group.

- The Program menu contains the Start, Add, Change, Delete, Copy, and Minimize On Run commands
- The Group menu contains the Add, Delete, and Rename commands and the names of the current groups in Start Programs, with a check mark next to the name of the active group.

For more information about a specific Start Programs command, see the individual entry for the command.

Subst (Substitute)



```
subst [[drive1: drive2:path] | [drive1: /d]]
```

Temporarily substitutes a drive letter for another drive letter and directory path. While a substitution is in effect, MS OS/2 regards any reference to *drive1* as a reference to *drive2:path*.

drive1:

Specifies the drive letter you want to substitute for a directory on *drive2*.

drive2:path

Specifies the drive and path of the directory for which you want to substitute *drive1*.

/d Deletes an existing substitution. You must specify *drive1* to identify which substitution is to be deleted, but you must not specify *drive2:path* with the **/d** option.

If you type **subst** by itself, the utility displays the substitutions currently in effect.

The following utilities do not work on a drive you have substituted for a directory on another drive:

backup	format
chkdsk	label
diskcomp	recover
diskcopy	restore
fdisk	

Example To substitute the drive letter F for the directory path \MONTHLY\FEBRUARY\WEEKENDS on the disk in drive A, type the following:

```
subst f: a:\monthly\february\weekends
```

Swappath



swappath=drive:[path] [space]

Specifies the location of the swap file that temporarily holds the information being swapped from memory if you have enabled swapping between memory and disk. To use this command, place it in your CONFIG.SYS file.

drive:

Specifies the drive on which the swap file is located.

space

Specifies the minimum amount of disk space, in kilobytes, to leave free on the swap drive. This number must be in the range 0 to 32767; the default is 512.

The **swappath** command takes effect only if the **memman** command in your CONFIG.SYS file is set to allow swapping.

For information about swapping, see the **memman** command.

Example To tell MS OS/2 to put the swap file in the TEMP directory on your hard disk (drive C) and to reserve 1024 kilobytes of free disk space on the swap drive, include the following line in your CONFIG.SYS file:

```
swappath=c:\temp 1024
```

Switch To



Switches to the application you have selected from the list in Task Manager.

You can also switch to the application by simply selecting it from the list and pressing ENTER.

System Editor



Provides editing functions that let you create and edit text files in MS OS/2.

The following list describes the System Editor commands and their functions. While all of the commands listed can be typed at the System Editor command line, some have keyboard equivalents as well.

Command	Keyboard Equivalent	Function
Autosave		Automatically saves a file after a specified number of lines have been changed.
Backspace	BACKSPACE	Deletes the character to the left of the cursor.
Backtab	SHIFT+TAB	Moves the cursor back one tab stop.
Backward	PAGE UP	Scrolls up one screen page.
Bottom	CTRL+END	Moves the cursor to the last line of the file.
Cancel	F3	Quits System Editor.
Change		Replaces specified text with new text.
Copymark	ALT+C	Copies marked text to the line below the cursor.
Cursorbottom		Moves the cursor to the bottom of the screen.
Cursormid		Moves the cursor to the middle of the screen.
Cursortop		Moves the cursor to the top of the screen.
Delete	CTRL+BKSP	Deletes the current line.
Deletebol	CTRL+B	Deletes characters from the beginning of the line to the cursor.
Deletechar	DEL	Deletes the character under the cursor.
Deleteeol	CTRL+E	Deletes characters from the cursor to the end of the line.
Deletemark	ALT+D	Deletes marked text.
Dos	F4	Runs an MS OS/2 command from the System Editor command line.
Down		Moves the cursor down a specified number of lines.
E		Starts the System Editor.
End	END	Moves the cursor to the end of the current line.
Endline	END	Moves the cursor to the end of the current line.

Enter	ENTER	Inserts a blank line.
File	ALT+F4	Saves the current file and exits from System Editor.
Forward	PAGE DOWN	Scrolls down one screen page.
Get		Copies a specified file into the current file at the line below the cursor.
Help	F1	Displays System Editor Help.
Home	HOME	Moves the cursor to the beginning of the current line.
Insert	INS	Inserts a blank line below the cursor.
Insertbefore		Inserts a blank line before the current line.
Inserttoggle	INS	Switches between insert and replace modes.
Join	ALT+J	Joins the current line with the line below it.
Left	LEFT	Moves the cursor left a specified number of characters.
Linebottom		Puts the current line at the bottom of the screen.
Linemid		Puts the current line in the middle of the screen.
Linetop		Puts the current line at the top of the screen.
Locate		Finds the specified text the first time it appears after the cursor.
Markline	ALT+L	Marks a line or block of lines for copying, moving, or deleting.
Movemark	ALT+M	Moves marked text to the line below the cursor.
Name		Changes the name of the current file.
Nextfile	F2	Displays the next open file.
Pgdn	PAGE DOWN	Scrolls down one screen page.
Pgup	PAGE UP	Scrolls up one screen page.
Prevfile	ALT+F2	Displays the previously opened file.

Quit	F3	Exits from System Editor without saving current changes.
Right	RIGHT	Moves the cursor right a specified number of characters.
Save	ALT+F3	Saves the current file without exiting from System Editor.
Split	ALT+S	Splits the current line at the cursor.
Tab	TAB	Moves the cursor forward one tab stop.
Top	CTRL+HOME	Moves the cursor to the beginning of the file.
Undo	F9	Restores a line to the way it was before you changed it.
Unmark	ALT+U	Unmarks text that has been marked.
Up		Moves the cursor up a specified number of lines.

Task Manager



Lists the programs you have running and lets you switch to or end another program, arrange windows, or shut down your system.

Task Manager contains three menus: Task, Arrange, and Shutdown.

- The Task menu contains the Switch To, Close, and Minimize After Use commands.
- The Arrange menu contains the Cascade and Tile commands.
- The Shutdown menu contains the Shutdown Now and Resume Task Manager commands.

For more information about a specific Task Manager command, see the individual entry for the command.

Task Manager



Switches to Task Manager.

Threads



threads=x

Tells MS OS/2 how many threads it can run at one time. To use this command, place it in your CONFIG.SYS file.

- x* Specifies the number of threads. This number must be in the range 64 to 255; system installation sets the number to 128. Because threads take up memory in your system, it is recommended that you do not increase the number of threads unless your application tells you to do so or you receive a message telling you that you have run out of threads.

A thread is part of an application or other process that can be scheduled by MS OS/2 to run on its own. A process generally contains multiple threads, which act like small programs that perform particular tasks in each process. Approximately forty of the threads you specify with the **threads** command are system threads that MS OS/2 uses (the number may vary, depending on how your system is configured). These threads are not available to applications.

Tile



Resizes and rearranges the directory windows within the application window so that they are next to each other, without overlapping.



Resizes and rearranges application windows, except those that have a fixed size, such as Control Panel, so that they are next to each other, without overlapping.

The windows are resized so that together they fill the entire screen window, except for an area at the bottom for icons. Fixed-size windows appear in front of the tiled windows.

Time



time [*hours:minutes*][:*seconds*[.*hundredths*]]

Sets the system clock by telling it the current time.

hours

Specifies a number in the range 0 to 23.

minutes

Specifies a number in the range 0 to 59.

seconds

Specifies a number in the range 0 to 59; the default is 0.

hundredths

Specifies a number in the range 0 to 99; the default is 0.

MS OS/2 keeps track of time in a 24-hour format and uses the time information to update directory listings whenever you create or change a file.

You may use either colons (:) or periods (.) to separate the hours, minutes, and seconds. To separate hundredths, you must use a period.

If you type **time** by itself, the command displays the current time and then prompts you for a new time. If you don't want to change the time, just press ENTER.



Works the same way in the DOS session as described above.

Example To set the system time to 1:36 P.M., type the following:

```
time 13:36
```

Timeslice



timeslice=*x*[,*y*]

Sets the amount of time that MS OS/2 allocates to a thread before checking the priority of other threads. Time slices are the units of time that MS OS/2 uses to schedule its activities. To use this command, place it in your CONFIG.SYS file.

- x* Specifies the minimum length of the time slice, in milliseconds; the default is 32.
- y* Specifies the maximum length of the time slice, in milliseconds. This number must be equal to or greater than *x*. If you do not specify *y*, MS OS/2 uses *x* as the maximum length also. If you do not include **timeslice** in your CONFIG.SYS file, the default value of *y* is 248.

When **timeslice** is set to 32 (the default), the process that is running in the foreground receives the most CPU time. For more information about this topic, see the **maxwait** and **priority** commands.

Example To set the minimum length of the time slice to 45 milliseconds and the maximum length to 148 milliseconds, include the following line in your CONFIG.SYS file:

```
timeslice=45,148
```

Trace



trace [**on** | **off**] [*eventcode* | *tdf*], [*eventcode* | *tdf*][...]

Turns the system trace on or off.

on Starts tracing system events.

off Stops tracing system events.

eventcode

Specifies an event by using a decimal code number in the range 0 to 255. You use the event code to selectively turn on or off the tracing of specified system events. You can specify more than one event code, separating them with commas.

tdf Specifies a trace definition file. The filename must not include a drive, path, or filename extension.

The system trace records actions, such as hardware interrupts or system functions, that MS OS/2 has taken or processed while running. These actions are known as events and are identified by event codes. This information can be useful if you are writing a program to run with MS OS/2.

The **trace** utility is similar to the **trace** configuration command. However, the **trace** utility cannot create a trace buffer in which to store the trace information. Therefore, the utility will not work unless either the **trace** or the **tracebuf** configuration command is in your CONFIG.SYS file when you start your system.

If you do not specify an event code, **trace** turns the system trace on or off for all events.

If you type **trace** by itself, the utility displays the current setting of the system trace.

Example To tell MS OS/2 to trace events 0 and 1, and no other system events, first type the following to turn off the system trace:

```
trace off
```

Then type the following to turn on the trace for the events you want recorded:

```
trace on 0, 1
```

Trace



```
trace=on | off [eventcode[, eventcode][...]]
```

Turns the system trace on or off. To use this command, place it in your CONFIG.SYS file.

on Starts tracing system events.

off Stops tracing system events. This is the default setting.

eventcode

Specifies a single event by using a decimal code number in the range 0 to 255. The **trace** command turns the system trace on or off for only those events. You can specify more than one event code, separating them with commas.

The system trace records actions, such as hardware interrupts or system functions, that MS OS/2 has taken or processed while running. These actions are known as events and are identified by event codes. This information can be useful if you are writing a program to run with MS OS/2.

If you do not specify an event code, **trace** turns the system trace on or off for all events.

If you specify an invalid event code, MS OS/2 still traces the other events listed but gives you an error message.

If you include the **trace** command in your CONFIG.SYS file but do not use the **tracebuf** command to specify a size for the trace buffer, MS OS/2 sets aside the default of 4 kilobytes of memory for the trace buffer.

Example To turn on the system trace for all events except those that have the event codes 31 through 34, include the following lines in your CONFIG.SYS file:

```
trace=on
trace=off 31, 32, 33, 34
```

Tracebuf (Trace Buffer)



tracebuf=x

Sets the size of the system-trace buffer, where MS OS/2 stores information about system events that are being traced. To use this command, place it in your CONFIG.SYS file.

x Specifies the size, in kilobytes, of the trace buffer. This number must be in the range 1 to 63; the default is 4.

If you include the **trace** command in your CONFIG.SYS file but do not use the **tracebuf** command to specify a size for the trace buffer, MS OS/2 sets aside the default of 4 kilobytes of memory for the trace buffer.

You must include either the **trace** or **tracebuf** command in your CONFIG.SYS file in order for system tracing to work.

Tracefmt (Trace Formatter)



tracefmt

Displays the contents of the system-trace buffer.

Tracefmt analyzes and formats each trace record in the system-trace buffer and then displays the formatted trace records. (You may want to redirect the **tracefmt** output to a file.) These formatted trace records, which consist of heading information and other trace-event information, are displayed in reverse chronological order, starting with the most recent event.

The system-trace buffer must be created when you start your system; to create the buffer, include either the **trace** or the **tracebuf** configuration command in your CONFIG.SYS file. If you have not done this, there is no buffer and **tracefmt** has nothing to display.

Tree



tree [*drive:*] [*/f*]

Displays the path of each directory on a disk and lists all the subdirectories (and, as an option, all the files as well).

drive:

Specifies the drive that contains the disk for which you want to display the directory structure. If you do not specify a drive, the utility displays the directory structure of the disk in the current drive.

/f Lists the names of all the files in each directory and subdirectory on the disk.



Works the same way in the DOS session as described above.

Example To display a list of all the directories and files on the disk in drive B, one screenful at a time, type the following:

```
tree b: /f | more
```

Type



type [*drive:*][*path*]*filename* [...]

Displays the contents of one or more text files, in the order specified, without modifying them.

filename

Specifies the name of the text file you want displayed. You can specify multiple filenames, and you can use wildcard characters to specify groups of files with similar names.

If you use **type** to display a file that contains tabs, **type** expands all the tabs to eight spaces.

If you use **type** to display a binary file or a file created by an application, you may see unusual characters, such as bells, formfeeds, and escape-sequence symbols, in addition to the text.



Works the same way in the DOS session as described above, except that in the DOS session you cannot specify multiple filenames, nor can you use wildcard characters.

Example To display the contents of the file REPORT.JAN from the disk in drive B, type the following:

```
type b:report.jan
```

Undo Selection



Cancels the last selection you made and restores the selection before that. That is, the files or directories that were selected before your last selection are selected again.

If you choose this command twice in succession, without making a new selection in between, nothing happens the second time.

Unpack



unpack [*drive:*][*path*]*filename* [*drive2:*][*path2*] [*/v*]

Decompresses and copies a compressed file.

filename

Specifies the name of the compressed file. This filename has an @ symbol as the third character of its extension.

drive2:

Specifies the drive you want the files to be copied to. If you do not specify a drive, **unpack** uses the current drive.

path2

Specifies the directory you want the files to be copied to. If you do not specify a directory, **unpack** uses the current directory on the specified drive. The **unpack** utility uses the original filename and extension as the destination filename.

/v Verifies that the version level of **unpack** is the same as that of MS OS/2.

The MS OS/2 installation program uses the **copy** command to copy uncompressed files from the installation disks to your system and uses the **unpack** utility to decompress and copy compressed files—those with an @ symbol as the third character of their extension.

The **unpack** utility also copies files that are not compressed, so you can use **unpack** to copy a disk that contains both kinds of files.

The **unpack** utility uses the date, time, and any file attributes of the original, compressed file in the header of the uncompressed file.



Works the same way in the DOS session as described above.

Example To decompress the compressed files on a floppy disk in drive A that contains both compressed and uncompressed files, and then copy all the files on the disk to the root directory of your hard disk (drive C), type the following:

```
unpack a:\*.* c:\
```

Utility Programs



Switches you to the Utility Programs group, which contains such useful programs as System Editor and Control Panel.

When you first start MS OS/2, the Main Group is automatically selected. To switch to the Utility Programs group, select the Group menu and choose Utility Programs. Start Programs then displays the list of programs in this group and places a check mark next to Utility Programs on the Group menu.

VDISK.SYS



device=[drive:][path]vdisk.sys [*vdisk-size*][, *sector-size*][, *entries*]

Directs MS OS/2 to load the VDISK.SYS device driver. To use this command, place it in your CONFIG.SYS file.

When this driver is loaded, it creates a virtual disk drive, which is a disk drive simulated in memory. Information stored in memory can be accessed quickly.

vdisk-size

Specifies the size, in kilobytes, of the virtual disk drive. The default is 64K.

sector-size

Specifies the sector size, in bytes. This number must be 128, 256, 512, or 1024; the default is 128.

entries

Specifies the number of directory entries. This number must be in the range 2 to 1024; the default is 64.

The maximum size of a virtual disk depends on the amount of available memory in your system, up to 4 megabytes. If the virtual-disk size specified is too large to fit in memory, VDISK.SYS will try to make a 16K virtual disk. This may result in a virtual disk with a different number of directory entries than you specified.

When you specify a value for the number of directory entries, the value is rounded up to the nearest sector-size boundary. For example, if you give a value of 43 and your sector size is 512 bytes, 43 will be rounded up to 48, which is the next multiple of 16 (there are sixteen 32-byte directory entries in 512 bytes.)

MS OS/2 recognizes the *vdisk-size*, *sector-size*, and *entries* arguments by their positions. If you omit *vdisk-size* or *sector-size*, you must type a comma before the next argument, as a placeholder. (If you include all three arguments, you can use spaces instead of commas.)

You must place the **device=vdisk.sys** command *after* any **device=extdiskdd.sys** commands in your CONFIG.SYS file.

Ver (Version)



ver

Displays the MS OS/2 version number.



Works the same way in the DOS session as described above.

Verify



verify [on | off]

Turns write verification on or off.

When verification is on, each time MS OS/2 writes a file to a disk it checks whether the information was written correctly (that none of it was written to bad sectors, for example) and displays an error message if it cannot successfully write the file to the disk. The default setting is **off**.

If you type **verify** by itself, the command displays a message telling you whether verification is on or off in the current session.

This command affects only the current session.

DOS

command

Works the same way in the DOS session as described above.

Vol (Volume Label)

DOS/2

cmd

vol [*drive:*] [...]

Displays the volume label of the specified disk, if it has one.

drive:

Specifies the drive containing the disk for which you want to know the label. You can see the labels of more than one disk by specifying more than one drive. If you do not specify a drive, **vol** displays the volume label of the disk in the current drive.

DOS

command

Works the same way in the DOS session as described above, except that in the DOS session you cannot specify multiple drive names.

Example To find out what the volume labels are for the disk in drive A and for your hard disk (drive C), type the following:

```
vol a: c:
```

Warning Beep

Turns on or off the sound that accompanies error messages and other warnings from the system.

The first time you choose this command, it turns the warning sound off; the next time, it turns the warning sound on again. When the warning sound is on (the default), the command name has a check mark next to it on the Preferences menu.

Xcopy (External Copy)



xcopy [*drive1:*][*path1*][*filename1*] [*drive2:*][*path2*][*filename2*]
[*/s*] [*/e*] [*/p*] [*/v*] [*/a*] [*/m*] [*/d:date*]

Copies files and directories, including any subdirectories, from one disk to another.

drive1:

Specifies the drive that contains the disk from which you want to copy files (the source disk). You can use this argument by itself, with *path1*, or with *path1* and *filename1*. If you specify just *drive1*, **xcopy** copies all the files in the current directory on that drive.

path1

Specifies the directory where the files you want to copy are located. If you specify *path1* without *drive1* or *filename1*, **xcopy** copies all files in the specified directory on the current drive.

filename1

Specifies the name of the file you want to copy. You can use wildcard characters to copy multiple files with similar names.

drive2:

Specifies the drive that contains the disk to which you want to copy files (the destination disk). You can use this argument by itself, with *path2*, or with *path2* and *filename2*. If you specify just *drive2*, **xcopy** copies files to the current directory on that drive and uses the original filenames.

path2

Specifies the directory you want the files copied to. If you specify *path2* without *filename2*, **xcopy** uses the original filenames.

filename2

Specifies the filename to which you want to copy the file. You can use wildcard characters to give multiple files similar names.

- /s* Copies directories and subdirectories, unless they are empty. If you omit this option, **xcopy** works within a single directory.
- /e* Copies all subdirectories, even if they are empty. If you use this option, you must also use the */s* option.
- /p* Prompts you to confirm whether you want to create each new file.
- /v* Verifies each new file as it is written, to make sure that the new file is identical to the old one.

/a Copies files that have their archive bits set, without modifying the archive bit of the original file.

/m Copies files that have their archive bits set and turns off the archive bit of the original file.

/d:date

Copies files that were modified on or after the specified date. The format of *date* depends on the country code you are using; the default is *mm-dd-yy*.

DOS

Works the same way in the DOS session as described above.

Example To copy all the files, directories, and subdirectories, even empty ones, on the disk in drive A to the disk in drive B, and to verify each file as it is copied, type the following:

```
xcopy a:\ b: /s /e /v
```


Appendix Code Pages and Keyboard Layouts

MS OS/2 allows you to customize your system for the country you work in (or want to set up the system for) by specifying a country or language, a character set, and a keyboard layout. The character sets (code pages) and keyboard layouts available are shown in the following sections. For information on setting these for your system, see the **code-page**, **country**, and **keyb** commands in the alphabetical section of this manual.

Note The following countries or languages are also supported in special versions of MS OS/2: Arabic, Asia, Hebrew, Japan, Korea, and Taiwan.

Code Pages

A code page is a set of characters that are available to your system for use on the screen, for printing, and for sending any other sort of output. MS OS/2 supports the following five code pages:

437 United States

Hex Digits 1st → 2nd ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶		0	@	P	`	p	Ç	É	á	⋮	⊥	⊥	α	≡
-1	☺	◀	!	1	A	Q	a	q	ü	æ	í	⋮	⊥	⊥	β	±
-2	☹	↕	"	2	B	R	b	r	é	Æ	ó	⋮	⊥	⊥	Γ	≥
-3	♥	!!	#	3	C	S	c	s	â	ô	ú	|	⊥	⊥	π	≤
-4	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⊥	⊥	⊥	Σ	f
-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	⊥	⊥	⊥	σ	J
-6	♠	—	&	6	F	V	f	v	á	û	ª	⊥	⊥	⊥	μ	÷
-7	•	↕	'	7	G	W	g	w	ç	ù	º	⊥	⊥	⊥	τ	≈
-8	■	↑	(	8	H	X	h	x	è	ÿ	¿	⊥	⊥	⊥	Φ	◦
-9	○	↓	)	9	I	Y	i	y	ë	Ö	⌈	⊥	⊥	⊥	⊙	•
-A	◉	→	*	:	J	Z	j	z	è	Ü	⌈	⊥	⊥	⊥	Ω	•
-B	♂	←	+	;	K	[	k	{	ï	é	½	⊥	⊥	⊥	δ	√
-C	♀	⊥	,	<	L	\	l	|	î	£	¼	⊥	⊥	⊥	∞	"
-D	♪	↔	-	=	M	]	m	}	ï	¥	ı	⊥	⊥	⊥	∅	²
-E	🎵	▲	.	>	N	^	n	~	Ä	Pt	«	⊥	⊥	⊥	ε	■
-F	☀	▼	/	?	O	_	o	△	Å	f	»	⊥	⊥	⊥	∩	

850 Multilingual

Hex Digits 1st 2nd	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶		0	@	P	'	p	Ç	É	á	⋮	⊥	ø	Ó	.
-1	☺	◀	!	1	A	Q	a	q	ü	æ	í	⋮	⊥	Ð	β	±
-2	☹	↕	"	2	B	R	b	r	é	Æ	ó	⋮	⊥	Ê	Ô	=
-3	♥	!!	#	3	C	S	c	s	â	ô	ú	|	⊥	Ë	Ö	%
-4	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⊥	—	È	ø	¶
-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	⊥	ı	Ö	§
-6	♠	—	&	6	F	V	f	v	â	û	ª	Â	ã	í	μ	÷
-7	•	↕	'	7	G	W	g	w	ç	ù	º	À	Ã	î	þ	˘
-8	■	↑	(	8	H	X	h	x	ê	ÿ	ı	©	⊥	Ï	Ð	°
-9	○	↓	)	9	I	Y	i	y	ë	ÿ	®	⊥	⊥	⊥	Ú	¨
-A	☉	→	*	:	J	Z	j	z	è	Û	⊥	||	⊥	⊥	Û	•
-B	♂	←	+	;	K	[	k	{	ï	ø	½	⊥	⊥	■	Û	¹
-C	♀	⊥	,	<	L	\	l	|	î	£	¼	⊥	⊥	■	ý	³
-D	♪	↔	-	=	M	]	m	}	ì	Ø	ı	⊥	⊥	⊥	ÿ	²
-E	🎵	▲	.	>	N	^	n	~	Ä	×	«	¥	⊥	ı	'	■
-F	☀	▼	/	?	O	_	o	△	Å	f	»	⊥	⊥	■	'	

860 Portuguese

Hex Digits 1st 2nd	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶		0	@	P	'	p	Ç	É	á	⋮	⊥	⊥	α	≡
-1	☺	◀	!	1	A	Q	a	q	ü	À	í	⋮	⊥	⊥	β	±
-2	☹	↕	"	2	B	R	b	r	é	Ê	ó	⋮	⊥	⊥	Γ	≥
-3	♥	!!	#	3	C	S	c	s	â	ô	ú	|	⊥	⊥	π	≤
-4	♦	¶	\$	4	D	T	d	t	ä	ö	ñ	⊥	—	⊥	Σ	f
-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	⊥	⊥	⊥	σ	J
-6	♠	—	&	6	F	V	f	v	Á	Ú	ª	⊥	⊥	⊥	μ	÷
-7	•	↕	'	7	G	W	g	w	ç	ù	º	⊥	⊥	⊥	τ	≈
-8	■	↑	(	8	H	X	h	x	ê	ı	ı	⊥	⊥	⊥	Φ	°
-9	○	↓	)	9	I	Y	i	y	Ë	ÿ	®	⊥	⊥	⊥	Θ	•
-A	☉	→	*	:	J	Z	j	z	è	Û	⊥	||	⊥	⊥	Ω	•
-B	♂	←	+	;	K	[	k	{	ï	ø	½	⊥	⊥	■	δ	√
-C	♀	⊥	,	<	L	\	l	|	Ó	£	¼	⊥	⊥	■	∞	ª
-D	♪	↔	-	=	M	]	m	}	ì	Û	ı	⊥	⊥	⊥	ø	²
-E	🎵	▲	.	>	N	^	n	~	Ä	Pt	«	⊥	⊥	⊥	ε	■
-F	☀	▼	/	?	O	_	o	△	Å	Ó	»	⊥	⊥	■	ñ	

863 French Canadian

Hex Digits 1st 2nd	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶		0	@	P	`	p	Ç	É	|	▤	└	┘	α	≡
-1	☺	◀	!	1	A	Q	a	q	ü	È	'	▥	┌	┐	β	±
-2	☛	↕	"	2	B	R	b	r	é	Ê	ó	▧	└	┘	Γ	≥
-3	♥	!!	#	3	C	S	c	s	â	ô	ú	┌	└	┘	π	≤
-4	♦	¶	\$	4	D	T	d	t	Ã	Ë	¨	┌	└	┘	Σ	ƒ
-5	♣	§	%	5	E	U	e	u	à	Ï	¸	┌	└	┘	σ	J
-6	♠	—	&	6	F	V	f	v	¶	û	³	┌	└	┘	μ	÷
-7	•	↕	'	7	G	W	g	w	ç	ù	˘	┌	└	┘	τ	≈
-8	■	↑	(	8	H	X	h	x	ê	ÿ	ı	┌	└	┘	Φ	°
-9	○	↓	)	9	I	Y	i	y	ë	Ô	ƒ	┌	└	┘	⊙	•
-A	⊙	→	*	:	J	Z	j	z	è	Ü	ƒ	┌	└	┘	Ω	•
-B	♂	←	+	;	K	[	k	{	ï	ø	½	┌	└	┘	δ	√
-C	♀	└	,	<	L	\	l	|	î	£	¼	┌	└	┘	∞	°
-D	♪	↔	-	=	M	]	m	}	=	Û	¾	┌	└	┘	∅	²
-E	🎵	▲	.	>	N	^	n	~	Ä	Û	«	┌	└	┘	ε	■
-F	☼	▼	/	?	O	_	o	△	§	f	»	┌	└	┘	∩	

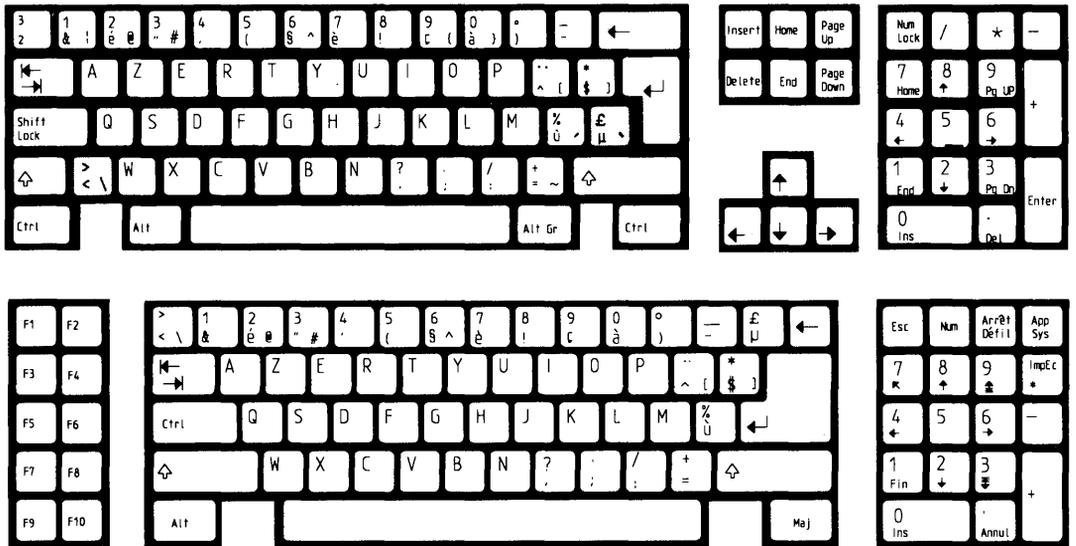
865 Nordic

Hex Digits 1st 2nd	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0		▶		0	@	P	`	p	Ç	É	á	▤	└	┘	α	≡
-1	☺	◀	!	1	A	Q	a	q	ü	æ	ı	▥	┌	┐	β	±
-2	☛	↕	"	2	B	R	b	r	é	Æ	ó	▧	└	┘	Γ	≥
-3	♥	!!	#	3	C	S	c	s	â	ô	ú	┌	└	┘	π	≤
-4	♦	¶	\$	4	D	T	d	t	ã	ö	ñ	┌	└	┘	Σ	ƒ
-5	♣	§	%	5	E	U	e	u	à	ò	Ñ	┌	└	┘	σ	J
-6	♠	—	&	6	F	V	f	v	á	û	ª	┌	└	┘	μ	÷
-7	•	↕	'	7	G	W	g	w	ç	ù	º	┌	└	┘	τ	≈
-8	■	↑	(	8	H	X	h	x	ê	ÿ	ı	┌	└	┘	Φ	°
-9	○	↓	)	9	I	Y	i	y	ë	Ö	ƒ	┌	└	┘	⊙	•
-A	⊙	→	*	:	J	Z	j	z	è	Ü	ƒ	┌	└	┘	Ω	•
-B	♂	←	+	;	K	[	k	{	ï	ø	½	┌	└	┘	δ	√
-C	♀	└	,	<	L	\	l	|	î	£	¼	┌	└	┘	∞	°
-D	♪	↔	-	=	M	]	m	}	i	Ø	i	┌	└	┘	∅	²
-E	🎵	▲	.	>	N	^	n	~	Ä	Pt	«	┌	└	┘	ε	■
-F	☼	▼	/	?	O	_	o	△	Å	f	»	┌	└	┘	∩	

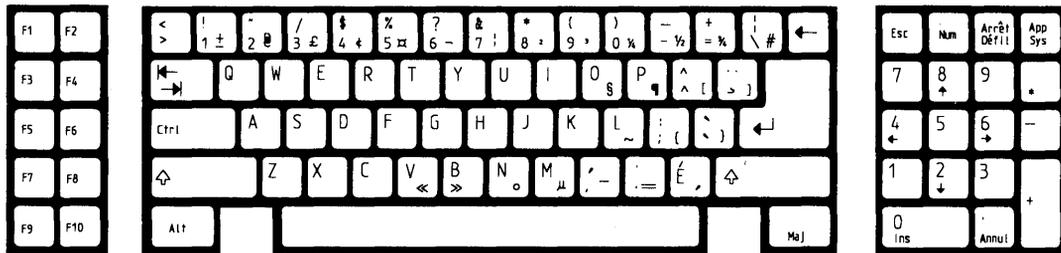
Keyboard Layouts

The keyboard layout tells your system which characters from the character set specified by your code-page setting correspond to which key-strokes. You can change keyboard layouts without changing code pages. MS OS/2 supports the following keyboard layouts:

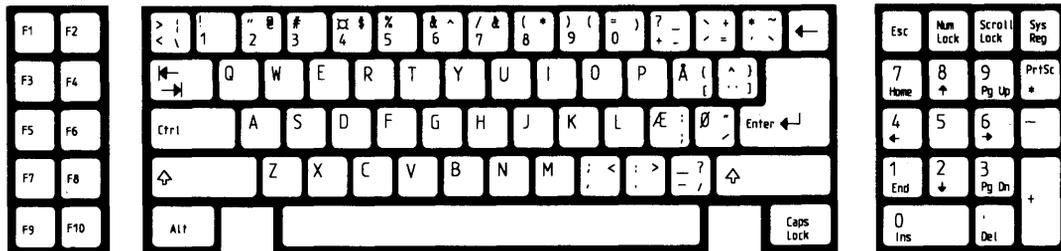
Belgium



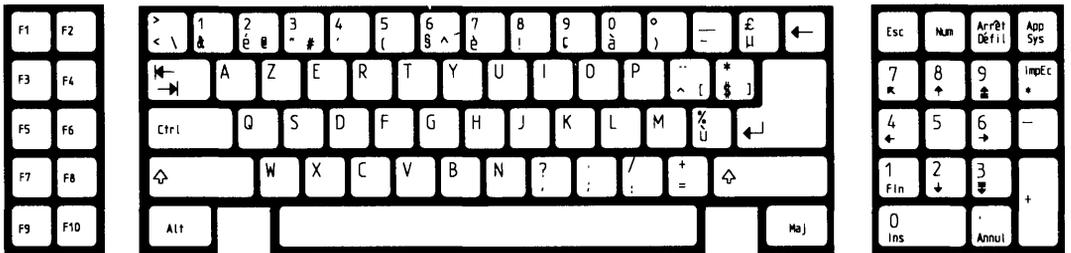
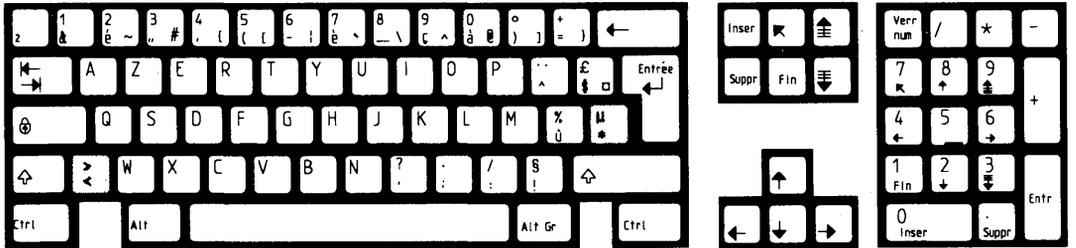
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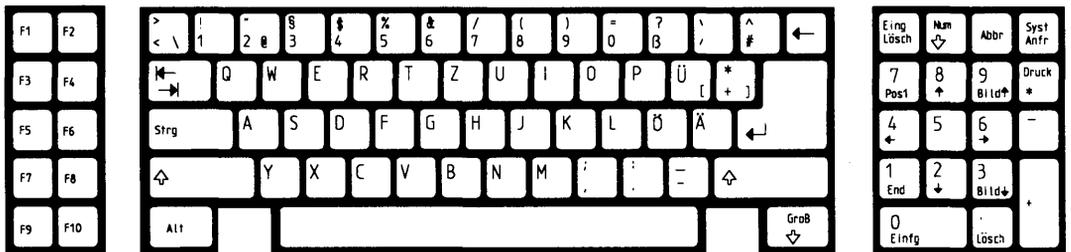
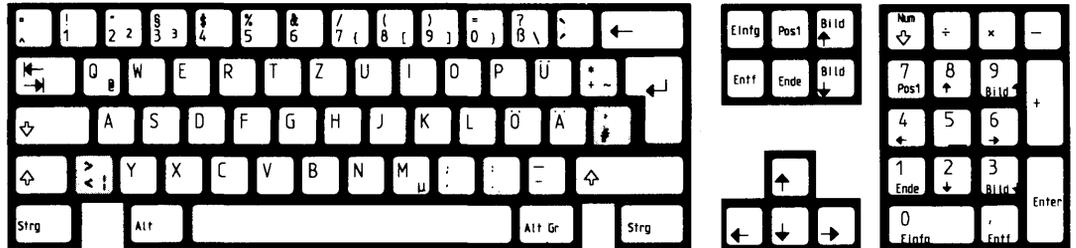
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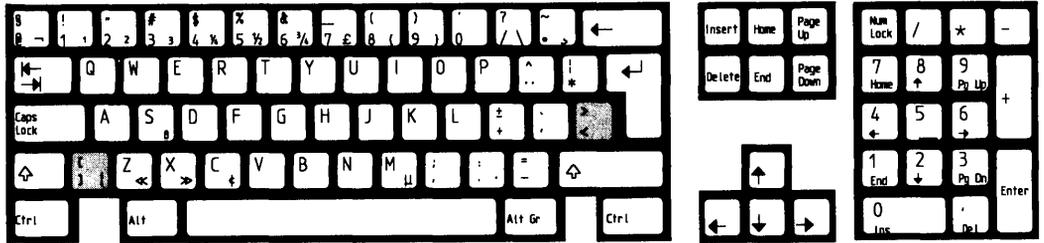
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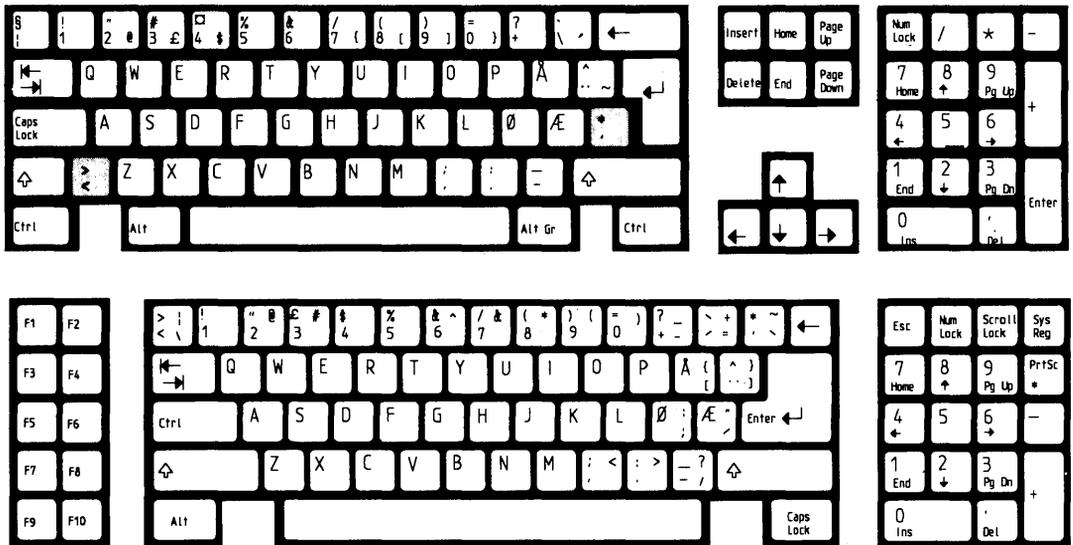
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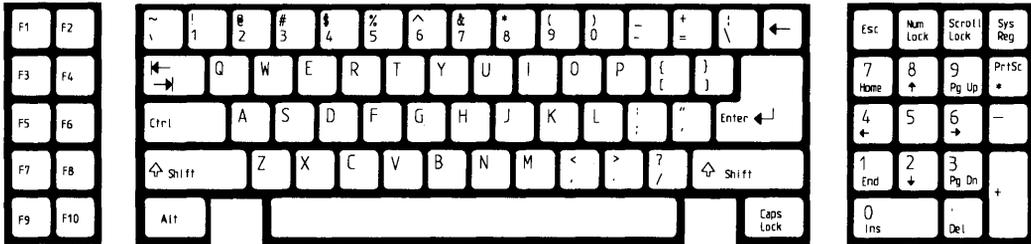
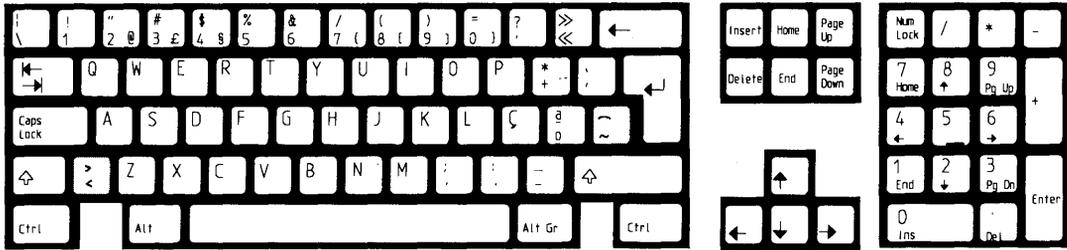
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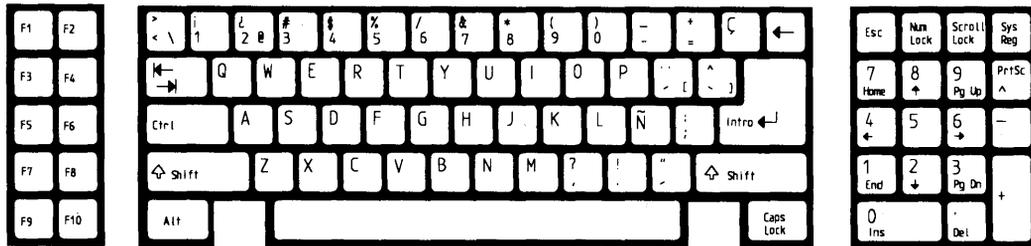
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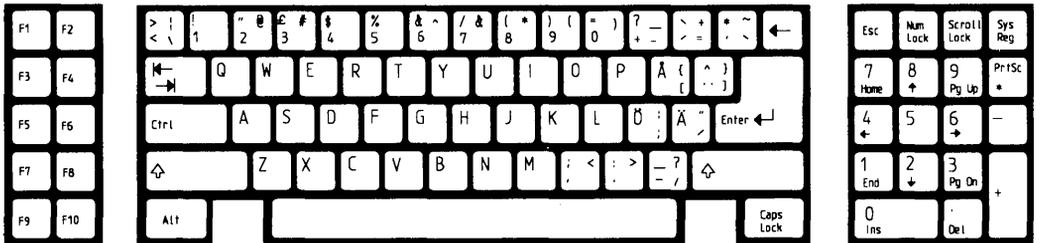
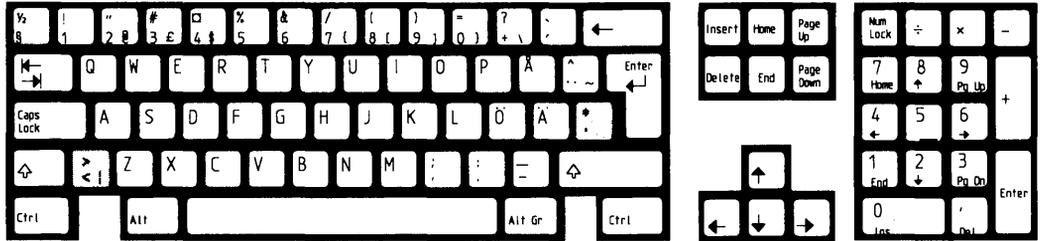
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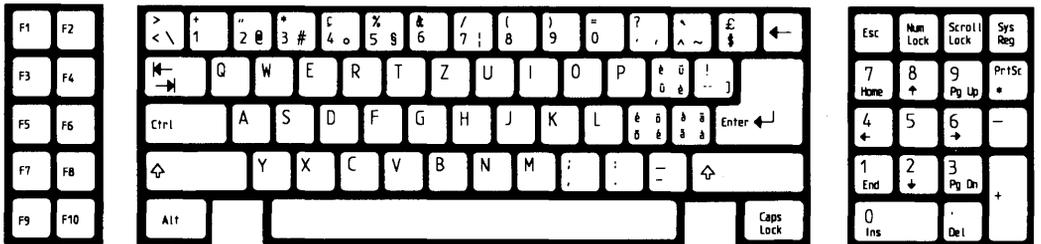
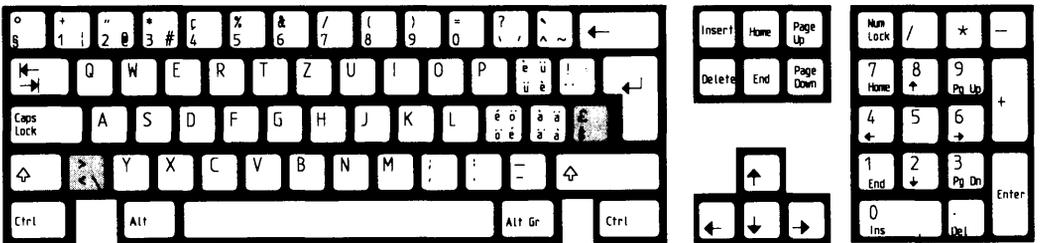
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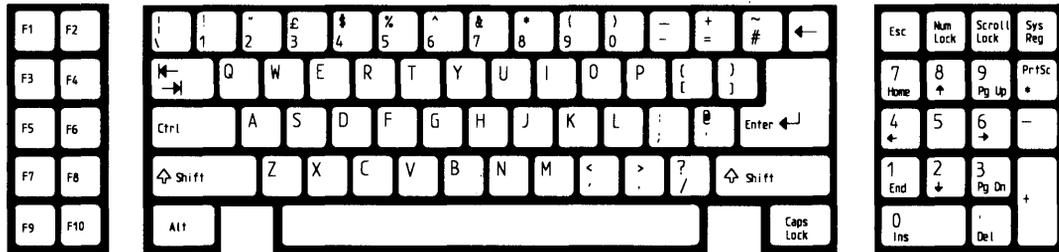
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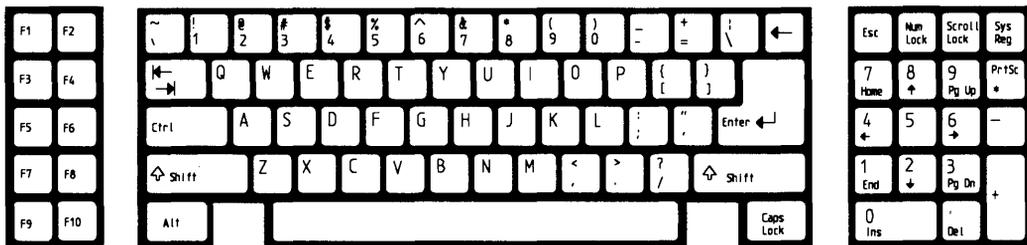
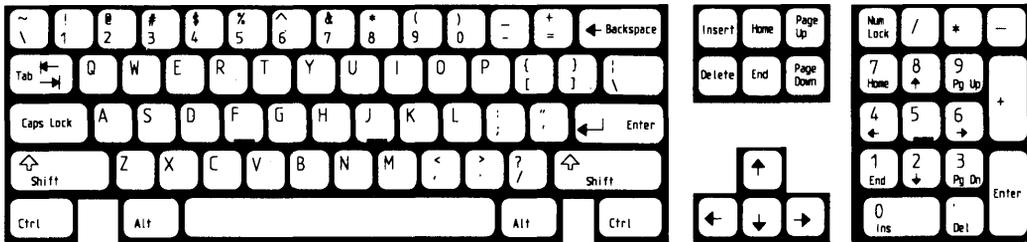
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United Kingdom



United States





Microsoft® Operating System/2 User's Guide

Version 1.1

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Welcome

The *Microsoft® Operating System/2 User's Guide* is designed to be a comprehensive, easy-to-use guide to Microsoft Operating System/2 (MS OS/2), including the graphical environment of Presentation Manager and the powerful multitasking capabilities of MS OS/2.

This guide is divided into three parts and has a terminology section and two appendixes (“ANSI Escape Sequences” and “Running DOS from Your Hard Disk”). It is designed for both beginning users and those who are familiar with advanced computer topics.

In this guide, you will find the following parts:

Part I: Using Presentation Manager

Chapters in this part explain basic concepts that you will need when working in the graphical environment of Presentation Manager:

- Using Presentation Manager windows
- Starting applications
- Working with files, directories, and disks
- Printing
- Changing system settings

Part 2: Using Cmd and the DOS Session

Chapters in this part describe using **cmd**, the MS OS/2 command interpreter, and **command**, the DOS command interpreter. The following topics are discussed:

- Using **cmd** commands
- Writing batch programs
- Using MS OS/2 utility programs to manage files, directories, and disks
- Using DOS
- Using the System Editor

Part 3: Configuring and Maintaining Your System

Chapters in this part describe how to customize your system by doing the following:

- Creating start-up files
- Changing your CONFIG.SYS file
- Changing system hardware

How to Use This Guide

This guide is organized as a comprehensive reference and is arranged by task. It is not necessary to read it straight through. You are given instructions for accomplishing each task; some shortcuts and alternative methods are also provided.

You may find this guide too detailed if you are just getting started. For a hands-on introduction to the MS OS/2 operating system, see the *Microsoft Operating System/2 Learning Guide*. For information about installing MS OS/2 and for a brief tour of the system, see *Microsoft Operating System/2 Getting Started*.

Before using this guide, you should install MS OS/2 on your system.

Notational Conventions

To help you locate and interpret information easily, this guide uses specific typographic conventions and a standard syntax format and terminology. The following typographic conventions are used in this guide:

Convention	Used for
bold	Command-line commands, utilities, options, and portions of syntax that you must type exactly as shown.
<i>italic</i>	Variables and placeholders that represent information you must provide.
monospace	Sample command lines, program code, program output, and examples.
ALL CAPITALS	Filenames, directory names, and acronyms.
SMALL CAPITALS	Names of keys on your keyboard.
Initial Capitals	Presentation Manager commands and menu names.

Key combinations and key sequences appear in the following format:

Notation	Meaning
KEY+KEY	A plus sign (+) between keynames means you must press the keys at the same time; for example, “Press ALT+ESC” means that you press the ALT key and hold it down while you press the ESC key.
KEY, KEY	A comma (,) between keynames means you must press the keys in sequence; for example, “Press ALT, SPACEBAR” means that you press the ALT key and release it, and then press the SPACEBAR and release it.
DIRECTION keys	Arrow keys on your computer keypad indicate DIRECTION keys. The names refer to the direction the arrow on the key points: UP, DOWN, RIGHT, and LEFT.

Syntax Conventions

Syntax represents the order in which you must type a command-line command or utility and any arguments and options that follow it. You may type commands, arguments, and options in either uppercase or lowercase letters. The following elements are used in syntax lines in this guide:

Notation	Meaning
[]	Indicates optional items. To include the optional information described within the brackets, type only the information, not the brackets themselves.
<i>drive:</i>	Specifies a disk drive. You need to specify a drive name along with a filename only if you are using a file that is <i>not</i> on the current drive. The colon (:) must be typed as shown.
<i>path</i>	Specifies a complete directory path, using the following syntax: $[\backslash\textit{directory}\dots][\backslash\textit{directory}\dots]\backslash\textit{directory}$ You need to specify a path with a filename only if the file is not in the current directory.

filename Specifies a file and includes a filename extension; for example, REPORTS.AUG.

... Indicates that an argument can be repeated several times in a command line. Type only the information, not the ellipsis (...) itself.

Using a Mouse and the Keyboard

You can use both a mouse and the keyboard with MS OS/2. In this guide, textured bars point out instructions for performing a particular task. If separate sets of instructions are provided for the mouse and the keyboard, the mouse procedure is described first. The following icons appear in the left margin:



Mouse icon

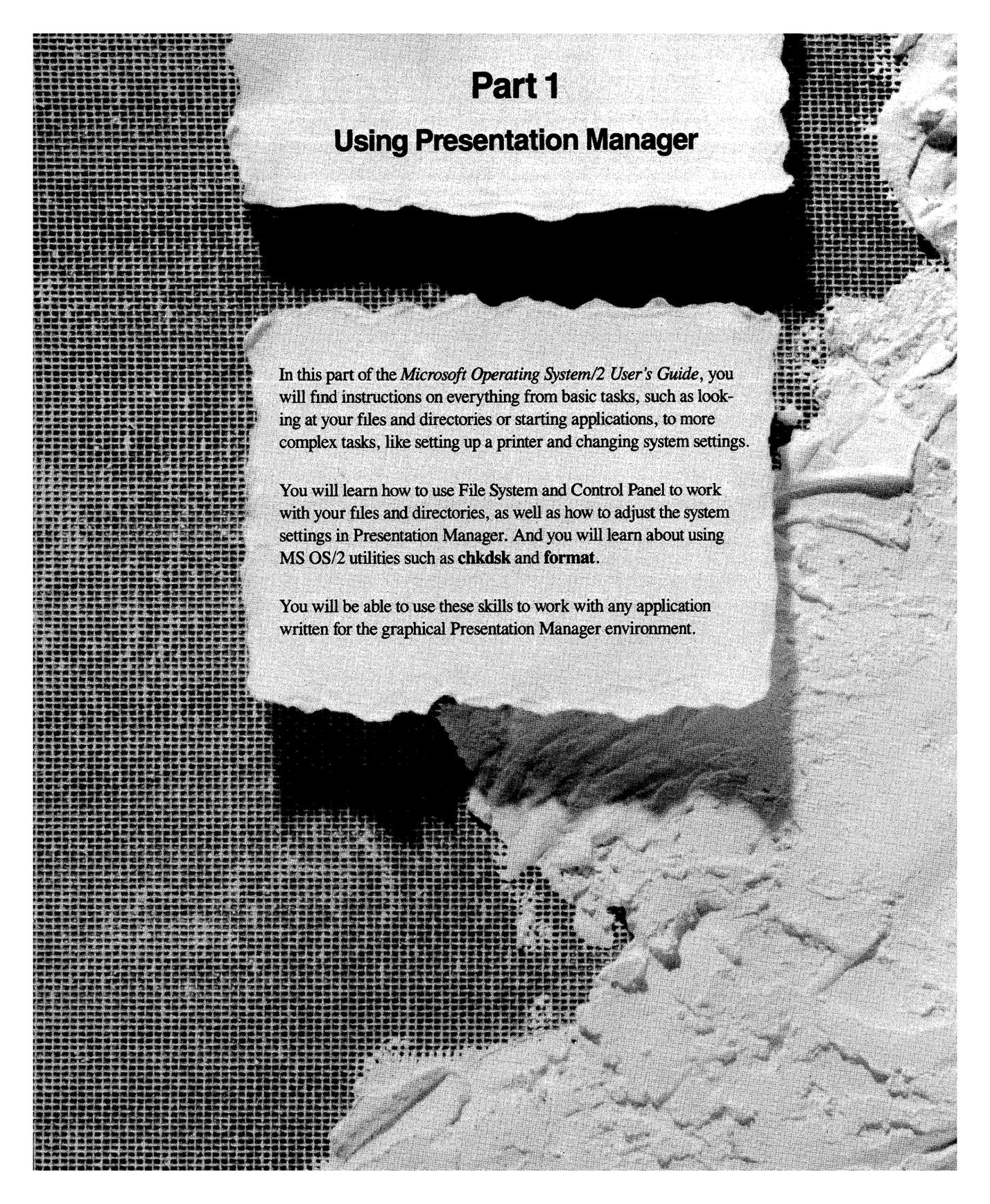


Keyboard icon

You can use either a single-button or a multiple-button mouse with Presentation Manager. If you have a mouse with more than one button, use the left button. Your applications may respond to other buttons, but Presentation Manager recognizes the left button. You can change which button Presentation Manager recognizes. For information about how to do this, see Chapter 6, "Changing System Settings with Control Panel."

The following list describes mouse actions used in this guide:

Action	Meaning
Point	Move the mouse pointer until the tip rests on a specific object or area on your screen.
Click	Press and release the mouse button. To click an object means to point to that object (for example, an icon or a menu name) and press and release the mouse button.
Double-click	Press and release the mouse button twice in rapid succession.
Drag	Press the mouse button and hold it down while moving the mouse pointer.



Part 1

Using Presentation Manager

In this part of the *Microsoft Operating System/2 User's Guide*, you will find instructions on everything from basic tasks, such as looking at your files and directories or starting applications, to more complex tasks, like setting up a printer and changing system settings.

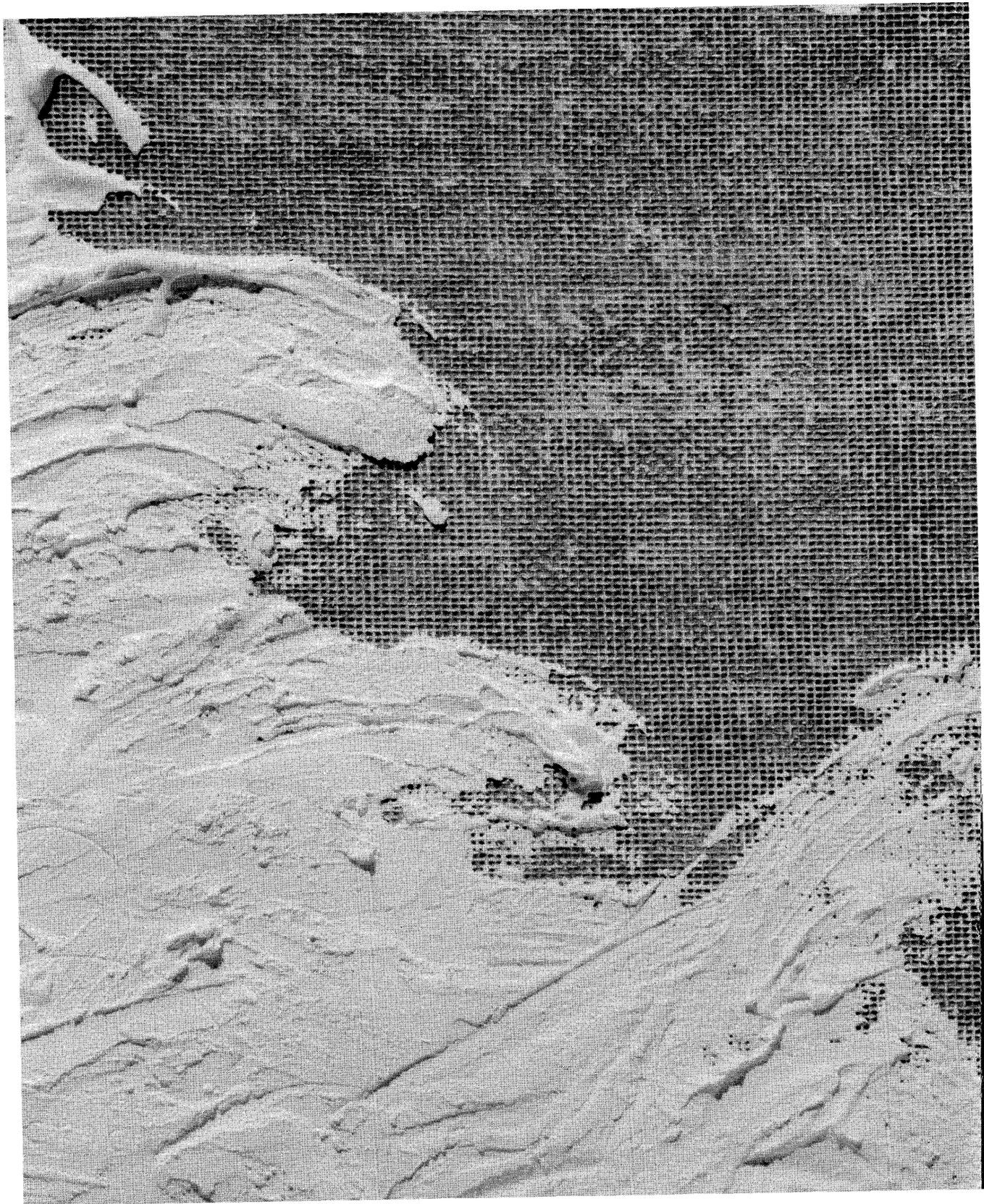
You will learn how to use File System and Control Panel to work with your files and directories, as well as how to adjust the system settings in Presentation Manager. And you will learn about using MS OS/2 utilities such as **chkdsk** and **format**.

You will be able to use these skills to work with any application written for the graphical Presentation Manager environment.



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1 Presentation Manager Skills

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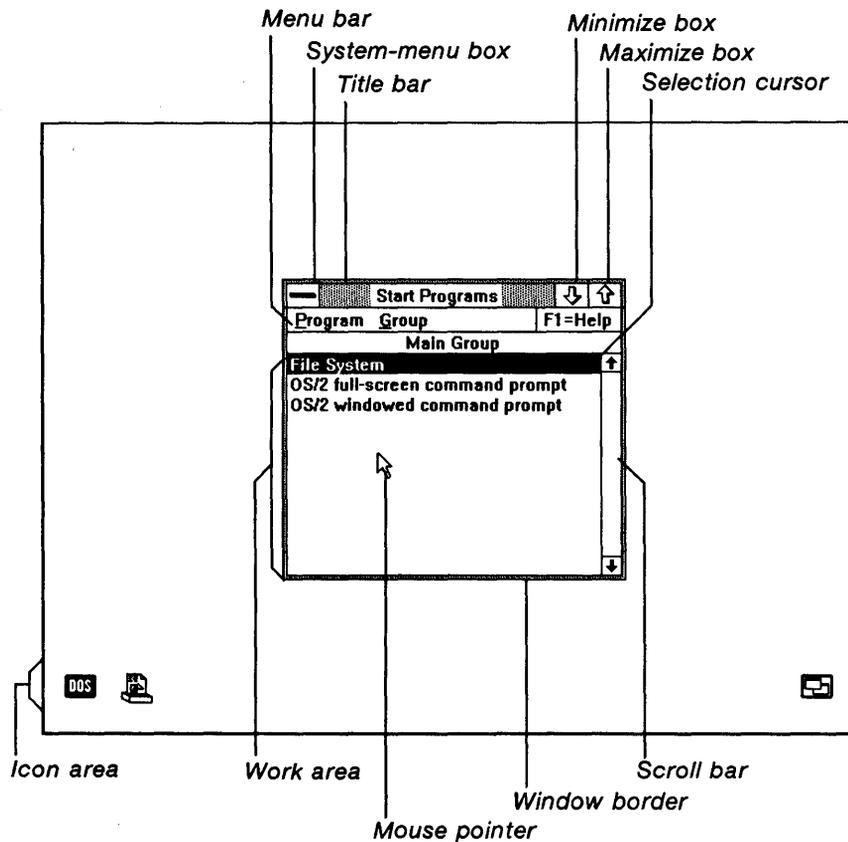
Introduction

Presentation Manager is a graphical environment within Microsoft Operating System/2 (MS OS/2) that presents applications in windows and is designed to provide an easy-to-use, standard interface for applications. You can quickly switch from one application to another by using a mouse button or the keyboard. If you have not worked with a graphical interface before, there are a few skills and terms you need to learn. Once you have mastered these skills, you can use them with any Presentation Manager application. This chapter provides information on the following Presentation Manager skills:

- Selecting menus
- Choosing commands
- Completing dialog boxes
- Sizing, moving, and arranging windows
- Using icons
- Getting Help information

Presentation Manager Basics

In Presentation Manager, applications run in windows. These windows divide your screen so that you can see several different applications at once. With Presentation Manager, you have several ways you can arrange windows and control applications.



The Presentation Manager Window

Here are some terms that will help you learn about and use Presentation Manager windows:

- The *selection cursor* shows where you are on your screen. If you have a mouse installed, you will also see an *arrow pointer*.
- The *work area* is where you do most of your work with an application. For example, if you start a text editor, the contents of a document file appear in the work area. In Start Programs, the first application you see when you start Presentation Manager, the work area contains a list of applications you can start.

- The *title bar*, located at the top of each application window, displays the name of the application.
- The *menu bar* contains the names of the command menus in an application.
- The *System-menu box* displays the System menu. This menu is common to all Presentation Manager applications. You use its commands to size, move, and close windows, and to switch to other applications.
- The *Maximize box* enlarges your windows. If you don't have a mouse, you can use the Maximize command from the System menu.
- The *Minimize box* shrinks your windows to icons. If you don't have a mouse, you can use the Minimize command from the System menu.
- The *icon area* is the area along the bottom of your screen. When you shrink application windows to icons, the icons appear in this area. When you first start Presentation Manager, the icons for the DOS session, Spooler Queue Manager, and Task Manager appear at the bottom of your screen.

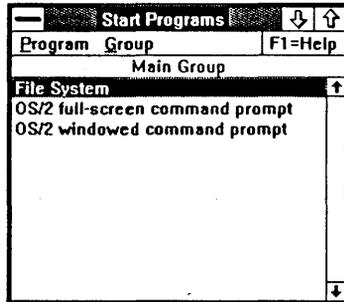
About Selecting

In Presentation Manager, you must select the area or object your next action is going to affect. You select a window and then work in it, you select a command and then MS OS/2 carries it out, you select an area within a file and then do something to it. The way you select varies, depending on the task. Selections are displayed in a variety of ways. Remember this basic concept: first select, then carry out the action.

Presentation Manager always shows you where you are in a window and what you've selected. The selection cursor identifies your place in a window. You move the selection cursor using either a mouse or the keyboard. The selection cursor changes shape, depending on the kind of application you're working with and the kind of task you're trying to accomplish. For example, in dialog boxes, the selection cursor is a dotted box that shows you which dialog-box control is selected.

Selecting Items in Windows

In the work area of many windows, you can select only one item at a time; for example, a disk drive or an application.



 To select an item by using a mouse, do the following:



▶ Click the item.

 To select an item by using the keyboard, do the following:



▶ Press the DIRECTION keys to move the selection cursor to the item.

In some windows, you can select several objects at once. This action is called extending a selection. For more information, see the next section, “Extending a Selection in a Window.”

Extending a Selection in a Window

In some windows, you can extend a selection to include more than one item; for example, a block of files that are next to each other or a group of files scattered throughout a window.

 To select a block of several items by using a mouse, do the following:



- 1 Click the first item in the block that you want to select.
- 2 Press and hold down SHIFT and click the last item in the block.

 To select a block of several items by using the keyboard, do the following:

 ► Press SHIFT+DIRECTION key.

 To select a group of scattered items by using a mouse, follow these steps:

 ► Press and hold down CTRL and click the items you want to select.

 To select a group of scattered items by using the keyboard, do the following:

- 
 - 1 Press the DIRECTION keys to move to each item.
 - 2 Press the SPACEBAR when you reach an item you want to select.

 If you are using a mouse, you can cancel any selection from a group of selected items by doing the following:

 ► Click the selected item again and press the SPACEBAR.

 To cancel a selection by using the keyboard, do the following:

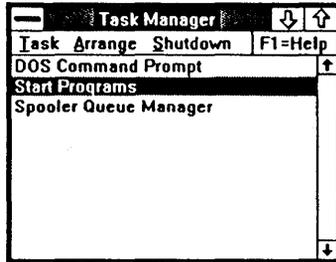
- 
 - 1 Press the DIRECTION keys to move to the item.
 - 2 Press the SPACEBAR.

Selecting the Active Window

In Presentation Manager, the application window you are currently working in is called the *active window*. The active-window title bar is a different color to distinguish the active window from other windows. Each time you start Presentation Manager, three Presentation Manager applications start automatically: Start Programs, Task Manager, and Spooler Queue Manager. The DOS session, a special environment for running DOS programs, starts as well. You can also start applications that run in a full screen rather than in the Presentation Manager window. When you are running more than one application at time, you must select the application you want to work in.

There are several ways to switch between applications. In this section, some of the methods for moving between applications are summarized. For more complete information on running applications, see Chapter 2, "Running Applications with MS OS/2."

You can use Task Manager to switch between applications. Task Manager maintains a list of all the applications you are running.



To switch to Task Manager by using a mouse, do the following:



- ▶ Double-click the Task Manager icon.



To switch to Task Manager by using the keyboard, do the following:



- ▶ Press CTRL+ESC.

To switch to another application by using a mouse, do the following:



- ▶ Double-click the application title.

To switch to another application by using the keyboard, do the following:



- 1 Press the DIRECTION keys to select the application title.
- 2 Press ENTER.

You can also switch directly to an application without using Task Manager. There are several techniques, depending on whether the application is running in a window and whether or not you use a mouse.

 If an application is visible in the Presentation Manager screen, you can switch to it by using a mouse:

-  ► To switch to an application running in a window, click the application window.

Or

- To switch to an application running as an icon, double-click the icon.

 You can use the following key combinations to switch between applications by using the keyboard:

To switch	Press
 Between applications running in windows	ALT+TAB
Between all applications, including full-screen applications	ALT+ESC

Continue using the key combination until the application you want appears.

For more information on running applications and using Task Manager, see Chapter 2, "Running Applications with MS OS/2."

Commands and Menus

Presentation Manager commands are organized in *menus*. Each application has its own menus, with a System menu common to all applications. The System menu is represented by a box in the upper-left corner of each window; all other menus are represented by names in the menu bar below the title bar at the top of each window.

In Presentation Manager, you select a menu, then choose a command from that menu. Choosing a command carries out an action.

Choosing a Command

You can choose a command by using either a mouse or the keyboard.

 To choose a command by using a mouse, do the following:

-  1 Click the menu name on the menu bar.
- 2 Click the command name.

If you're using the keyboard, you have two ways to choose commands from menus: the basic method and the direct-access method.

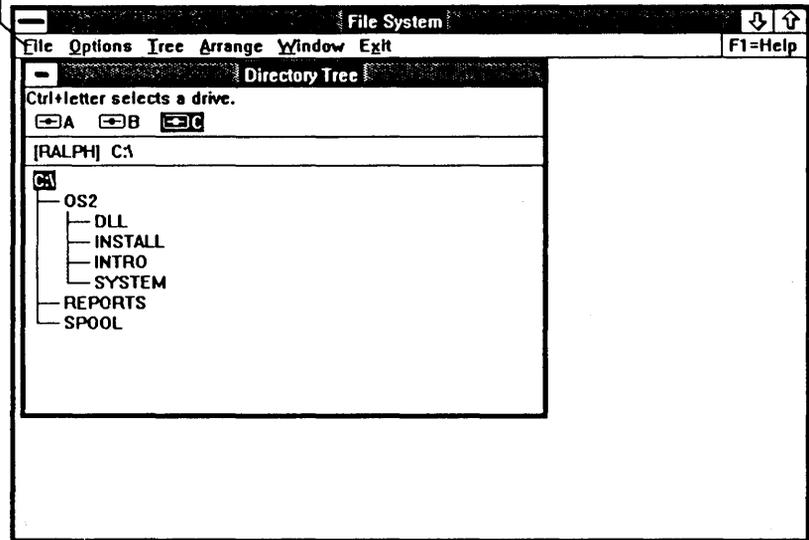
 The basic method uses the DIRECTION keys. To choose a command by using the basic method, do the following:

-  1 Press ALT or F10 to select the menu bar.
- 2 Press the LEFT or RIGHT keys to select a menu on the menu bar.
- 3 Press ENTER to display the menu.
- 4 Press the UP or DOWN keys to select the command you want.
- 5 Press ENTER to choose the command.

 If your application shows underlined letters in command and menu names, you can use the direct-access method. To choose a command by using the direct-access method, do the following:

-  1 Press ALT or F10.
- 2 Press the underlined letter in the menu name.

Underlined letters in menu names



- 3 Press the underlined letter in the command name.

Note If more than one menu or command name shares the same underlined letter, Presentation Manager selects the first menu or command listed. Press the underlined letter again to select the next menu or command. To see the menu or choose the command, press ENTER.

If you decide you don't want to choose a command, you can cancel the menu.

 If you are using a mouse, you can cancel a menu without making another selection, by doing the following:

-  ► Click in a blank area outside the menu.

 To cancel a menu and move back to the application work area by using the keyboard, do the following:

-  ► Press ALT or F10.

Pressing ESC also cancels the menu; however, the selection cursor remains on the menu bar so that you can select another menu. To move back to the application work area, press ESC again.

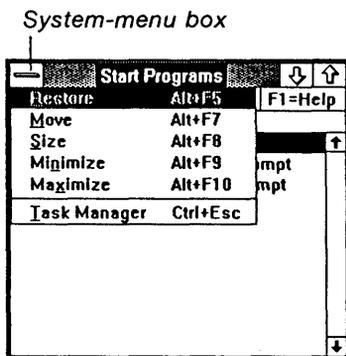
A *check mark* next to a command name on a menu indicates the command has been chosen and is active.



An *ellipsis (...)* next to a command name on a menu indicates that a dialog box will appear when the command is selected. For more information, see "Using a Dialog Box," later in this chapter.

The System Menu

In addition to application menus, a System menu appears in the upper-left corner of each window; it is represented by the System-menu box.



You use System-menu commands to manipulate windows; for example, to change their size or move them on your screen, and to switch

between applications. Some dialog boxes also have System menus. The following table describes the System-menu commands:

Command	Action
Restore	Restores a window to its former size after it has been enlarged (by using the Maximize command) or shrunk to an icon (by using the Minimize command).
Move	Moves a window to another position on your screen.
Size	Changes the size of a window.
Minimize	Shrinks a window to an icon.
Maximize	Enlarges a window to its maximum size.
Close	Closes a window.
Task Manager	Selects the Task Manager window (Task Manager lists the programs you have running and lets you choose which one you want to work in).

Some applications do not have all of these commands listed on their System menus. For example, the Close command is not on the System menu in Start Programs because you cannot close the Start Programs window.

Although you choose commands from the System menu as you would from any other menu, you select the System menu in a different way.

 To select the System menu by using a mouse, do the following:



- In a window, click the System-menu box in the upper-left corner of the window; in an icon, click the icon.

 To select the System menu by using the keyboard, do the following:



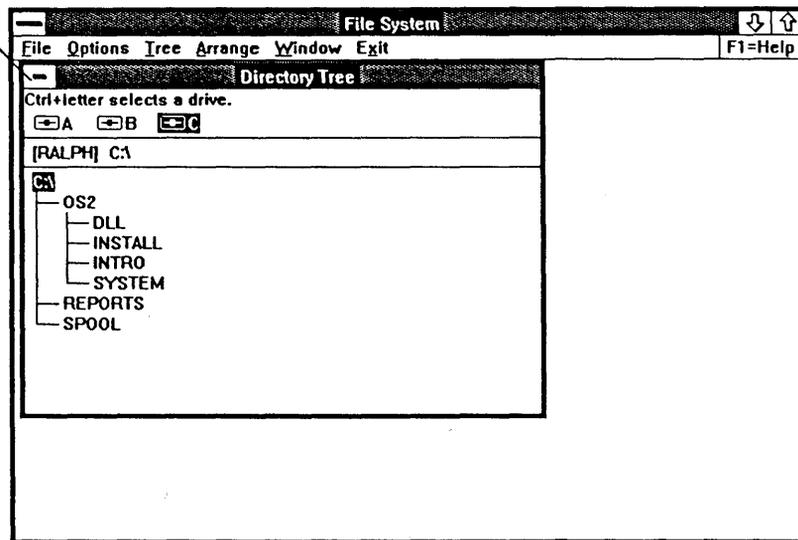
- Press ALT+SPACEBAR or SHIFT+ESC.

You can then use either the basic method or the direct-access method to choose the command you want.

Commands in Work-Area Windows

In some applications, such as File System, you can open windows within the application work area. These windows also have System menus but you select them a little differently.

System-menu box



 To select the System menu from a window within an application by using a mouse, do the following:

-  ► Click the System-menu box in the window.

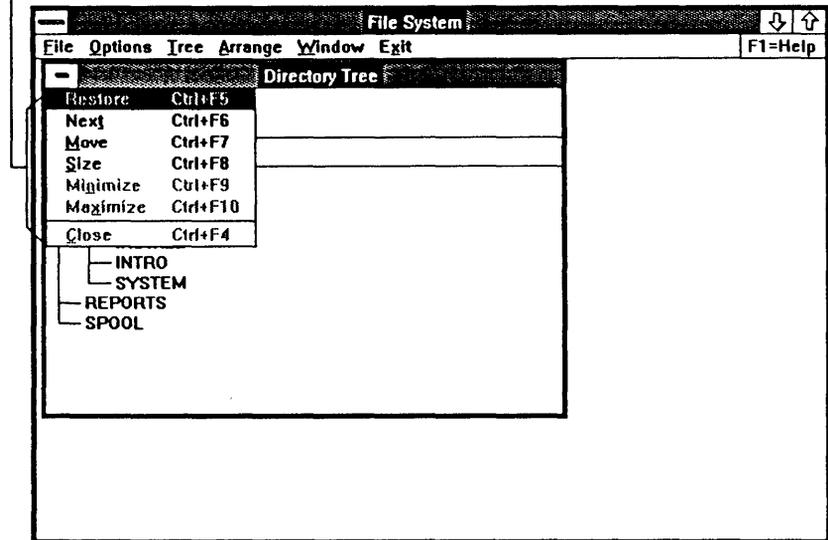
 To select the System menu from a window within an application by using the keyboard, do the following:

-  **1** Press **SHIFT+ESC** to select the System menu in the main application window.
- 2** Press the **RIGHT** key.

 The following is a shortcut for selecting the System menu from a window in an application by using the keyboard:

-  Press and hold down CTRL and press - (hyphen key).

System-menu commands

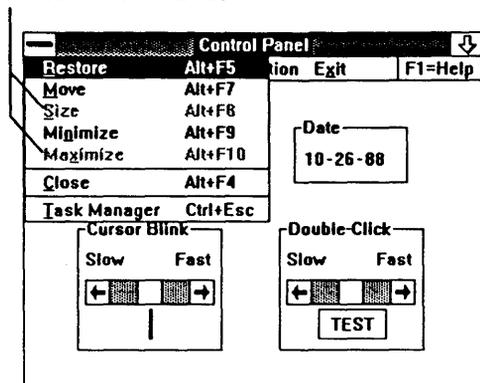


The commands on the System menu of a work-area window vary depending on the application; for example, in some Presentation Manager applications you cannot enlarge work-area windows by using the Maximize command. For more information, see your application manual.

Inactive Commands

When you see a command name grayed on its menu, it means the command is inactive and cannot be used.

Inactive commands



You may have to select something before you can use the command, or it may be that the command cannot be used with your application; for example, the Control Panel window has a fixed size, so you cannot use either the Maximize or the Size command.

Shortcut Keys

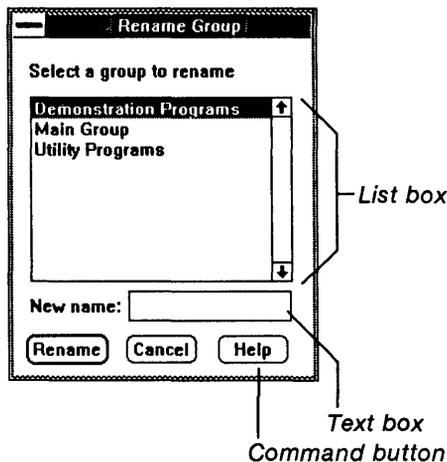
Some menus have shortcut keys, usually listed to the right of the command name. Often these keys are a combination of a function key and the ALT or CTRL key. You use these keys to choose a command without first selecting the menu where the command is located. The following list shows the System-menu shortcut keys:

Command	Press
Restore	ALT+F5
Move	ALT+F7
Size	ALT+F8
Minimize	ALT+F9
Maximize	ALT+F10
Close	ALT+F4
Task Manager	CTRL+ESC

For example, to enlarge a window by using the shortcut keys for the Maximize command, you select the window and press ALT+F10.

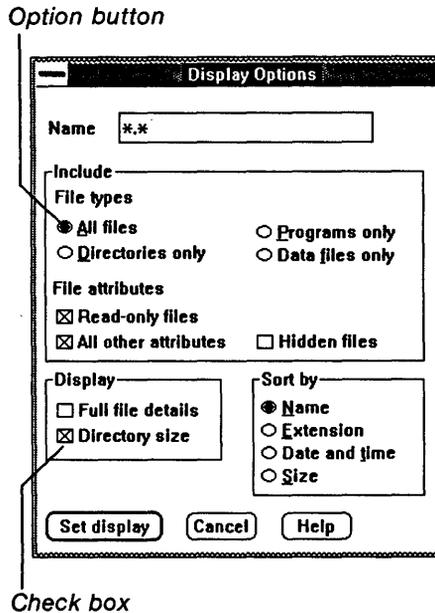
Using a Dialog Box

Presentation Manager displays a dialog box when additional information is needed to carry out a command. The dialog box contains areas where you provide information; there are different kinds of areas, depending on the kind of information needed.



The following are a few terms that will help you learn about and use dialog boxes:

- The *text box* is where you type information. The text you type appears to the left of the *insertion point*, a flashing vertical line.
- A *list box* contains the names of available choices. For example, in the preceding illustration the names of program groups appear in a list box.
- A *command button* carries out a command when it is chosen. These buttons have labels that indicate what they do; for example, Rename, Cancel, or Help. Choosing a command button may cause another dialog box to be displayed. For example, choosing the Help button causes a Help dialog box to appear.



- A round *option button* lets you select an option for a particular command. In a group of option buttons, only one option at a time can be selected.
- A square *check box* also lets you select an option for a particular command. In a group of check boxes, several or all options can be selected at one time.
- A *grayed command* or *grayed option* is inactive, which means that it cannot currently be used.

Dialog boxes usually display information that reflects what you have selected on your screen; for example, a filename in File System. They also display previously selected options or Presentation Manager default options.

Moving in a Dialog Box

You can move around a dialog box to make several selections from different groups of options. The area you are working in is usually marked by a selection cursor or a flashing insertion point. Often, moving to an area selects the area as well.

In some cases, you must move within an area to select one option from a group of options; for example, a filename within a list box or one option button in a group of option buttons.

 If you are using a mouse, you can move to and select any item or area in a dialog box by doing the following:

 ► Click the item or area.

 If you are using the keyboard, you can move from area to area in a dialog box by doing the following:

 ► Press TAB.

 To move in the opposite direction through a dialog box, do the following:

 ► Press SHIFT+TAB.

 Often, you can select an area by moving to it. However, sometimes you must also make a selection in the area; for example, when you move to a check box. To select the option, do the following:

 ► Press the SPACEBAR.

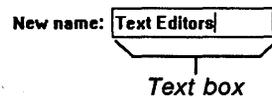
You can cancel a selection by pressing the SPACEBAR again.

Selecting in a Dialog Box Area

Sometimes you must move and select inside a dialog box area; for example, when you want to select text in a text box. The mouse and keyboard techniques for selecting inside a dialog box are different from those you use for moving between areas or for selecting areas. Selection techniques may vary depending on the kind of area you are working in: text box, list box, or a group of option buttons. The following sections explain how to move and select within the different kinds of dialog-box areas: text boxes, list boxes, option-button groups, check boxes, and command buttons.

Working with a Text Box

You can move and select text in a text box by using either a mouse or the keyboard. You can quickly delete and revise information by selecting text in a text box.



 To select text in a text box by using a mouse, do the following:

-  ► Drag the pointer across the text you want to select.

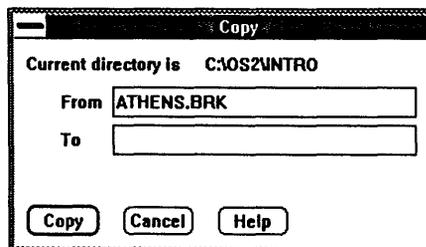
 Moving and selecting in a text box are separate actions when you are using the keyboard. Use the following keys to move in a text box:

To move	Press
 Right or left on a line	DIRECTION keys
Left to the beginning of a line	HOME
Right to the end of a line	END

 To select text in a text box by using the keyboard, do the following:

-  ► Press and hold down SHIFT and press a DIRECTION key to extend the selection.

Often a text box contains text that reflects a selection from your application window; for example, a filename.



You can delete or edit this information.

 To delete text in a text box by using the keyboard, follow these steps:

-  1 Move to the text box.
- 2 Select the text.
- 3 Type the new text.

 To edit text in a text box by using the keyboard, do the following:

-  1 Move to the text box.
- 2 Select the text you want to change.
- 3 Type the new text.

Working with a List Box

As you move in a list box by using either a mouse or the keyboard, the selection cursor shows you which item or items you have selected.

Screen colors



 To make a selection by using a mouse, do the following:

-  ► Click the item.

 If you are using the keyboard, there are several keys you can use to move and select in a list box:

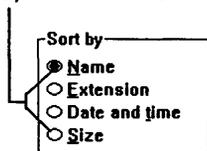
To move	Press
 Up or down one item at a time	DIRECTION keys
Up to the first item in list	HOME

Down to the last item in list	END
Up to first item in the visible portion of list	PAGE UP
Down to last item in the visible portion of list	PAGE DOWN

Working with an Option Button

In Presentation Manager, you can select only one option button from a group of option buttons. Moving to a button selects it. Darkened options are selected.

Option buttons



 To select an option button by using a mouse, do the following:

-  ► Click the option button.

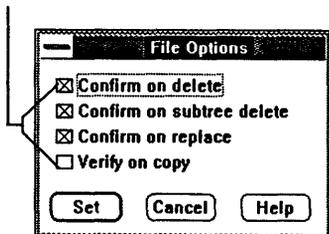
 To select an option button by using the keyboard, do the following:

-  ► Press a DIRECTION key or, if the option name contains an underlined letter, press the underlined letter.

Working with a Check Box

In Presentation Manager, check boxes are used in a dialog box when you can select more than one option from a group of options. Check boxes that contain an "X" are selected.

Check boxes



 To select a check box by using a mouse, do the following:

-  ► Click the check box.

 If you are using the keyboard, you must first move to a check box and then select it. To move to and select a check box by using the keyboard, follow these steps:

-  **1** Press TAB to move to the check box.
- 2** Press the SPACEBAR to select the check box.

To cancel the selection, press the SPACEBAR again.

Working with a Command Button

In Presentation Manager, command buttons carry out actions; for example, completing commands or displaying dialog boxes.

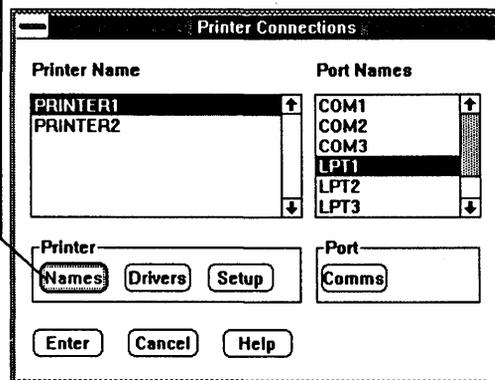
 To choose a command button by using a mouse, do the following:

-  ► Click the command button.

 To choose a command button by using the keyboard, follow these steps:

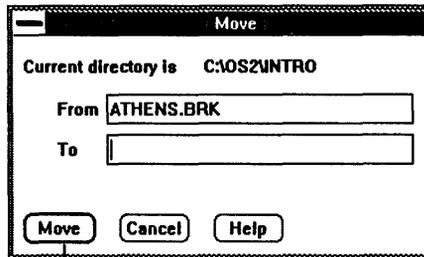
-  **1** Press TAB to move to the command-button area.
The selection cursor appears within the selected command button, and the button border changes color.

Selected command button



- 2 To move to another command button, press a DIRECTION key.
- 3 To choose the selected command button, press ENTER.

When the dialog box first appears, one command button has a dark border. This represents the option you are most likely to want (the default).



Default command button

 To automatically choose the default command button, do the following:

-  ► Press ENTER.

Note Even if you have moved to another area of the dialog box, pressing ENTER still carries out the default command.

Closing a Dialog Box

 After you complete a dialog box and choose a command button, the dialog box closes and the command takes effect. To close the dialog box without completing the command, do the following:

- Choose the Cancel command button.

Some dialog boxes have System menus. You can use the Close command from this menu to close a dialog box that has no Cancel button.

 You can cancel any dialog box by doing the following:



▶ Press ESC.

Moving a Window or an Icon

You can move a window or an icon to a different place on your screen by using a mouse or the keyboard.

 To move a window by using a mouse, do the following:



- 1 Point to the title bar of the window you want to move.
- 2 Drag the title bar to move the window to its new location.
Gray borders mark the window position.
- 3 After moving the window to its new location, release the mouse button.

 To move an icon by using a mouse, do the following:



- 1 Point to the icon you want to move.
- 2 Drag the icon to the new location.
- 3 Release the mouse button.

 To move a window or icon by using the keyboard, do the following:

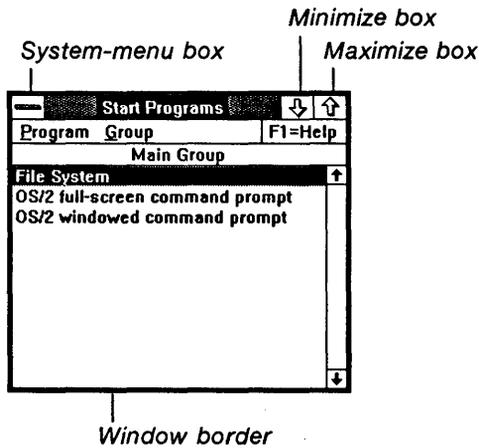


- 1 Select the window or icon you want to move by using Task Manager or by pressing ALT+TAB.
- 2 Select the System menu by pressing ALT+SPACEBAR or SHIFT+ESC.
- 3 Press M to choose the Move command.
Gray borders mark the window or icon position.
- 4 Use the DIRECTION keys to move the window or icon.
An outline of the window moves as you press the DIRECTION keys.
- 5 After moving the window or icon to its new location, press ENTER.

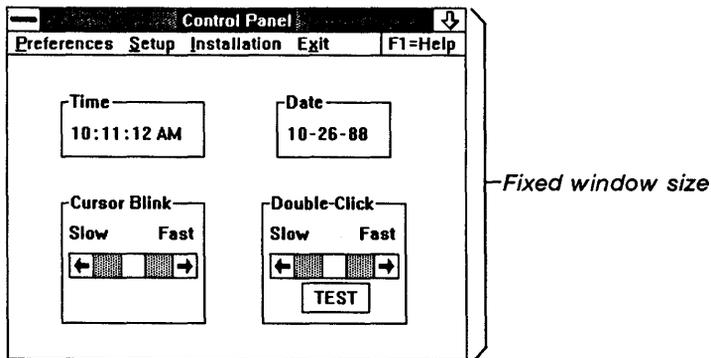
Changing the Size of a Window

Windows can be arranged several ways on your screen. If you are using a mouse, you can directly manipulate each window border to change its size. If you are using the keyboard, the System-menu commands let you

change the window size and shape (you can also change window size by using the Maximize, Minimize, and Restore boxes, which are explained later in this chapter).

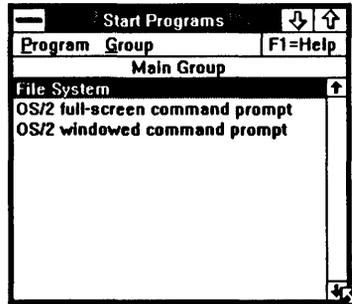


Note Some application windows are limited in the ways they can be sized. Some applications, such as Control Panel, have a fixed size. You can only shrink these application windows to icons and restore them.



 To change the size of a window by using a mouse, follow these steps:

-  **1** Select the window you want to size by using Task Manager or by clicking in the window.
- 2** Point to a border or corner that you want to move.
The mouse pointer becomes a two-headed arrow.



Two-headed arrow

- 3** Drag the corner or border until the window is the size you want.
- 4** Release the mouse button.

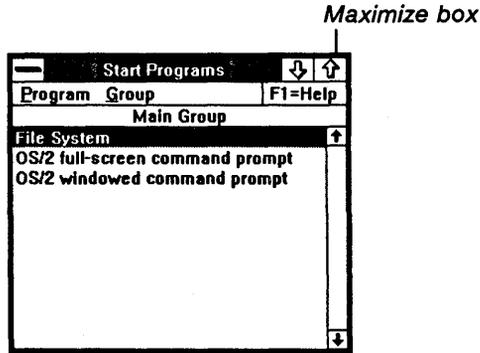
 If you are using the keyboard, use the Size command to change the size of your windows by doing the following:

-  **1** Select the active window by using Task Manager or by pressing ALT+TAB.
- 2** Select the System menu by pressing SHIFT+ESC.
- 3** Press S to choose the Size command.
- 4** Press one DIRECTION key to select the border you want to move.
- 5** Press the DIRECTION keys to move the border.
- 6** When you finish adjusting the border, press ENTER.

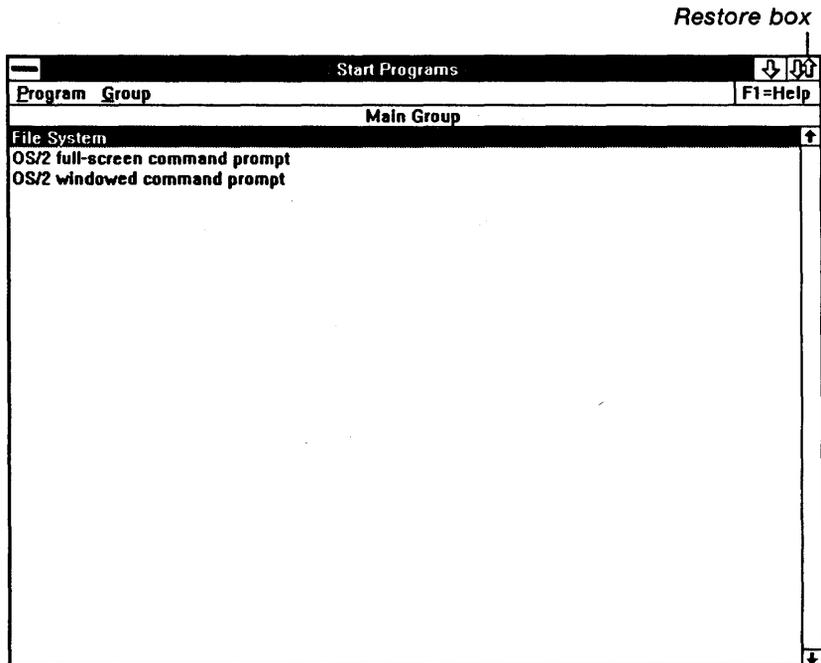
Enlarging a Window or an Icon

 You can enlarge a window to its maximum size by using a mouse:

- ▶  Select the window you want to enlarge by using Task Manager or by clicking in the window; then click the Maximize box.



The Maximize box disappears and the Restore box takes its place.



 To enlarge an icon by using a mouse, follow these steps:



- 1 Click the icon you want to enlarge.
The System menu appears.
- 2 Click the Maximize command.

 To enlarge a window or an icon by using the keyboard, do the following:



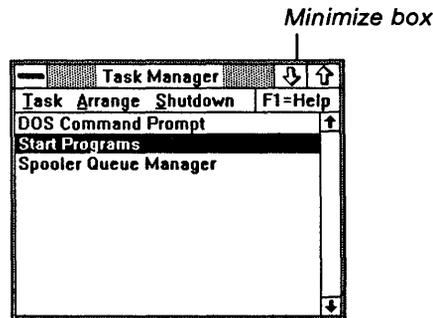
- 1 Select the window or icon you want to enlarge by using Task Manager or by pressing ALT+TAB.
- 2 Select the System menu by pressing SHIFT+ESC.
- 3 Press X to choose the Maximize command.

Shrinking a Window to an Icon

You can shrink a window to an icon when you finish working with it and want it available for later use. The application is still running in memory (represented by an icon), but it is not taking up space in your work area. You can select and move icons on your screen in the same way you select and move windows. When you want to work with your application in a window again, you can use the Maximize or Restore commands to enlarge it.

 To shrink a window by using a mouse, use the Minimize box in the upper-right corner of the window. Follow these steps:

-  **1** Select the window you want to shrink by using Task Manager or by clicking in the window.
- 2** Click the Minimize box.



 If you are using the keyboard, follow these steps to shrink your window to an icon:

-  **1** Select the window you want to shrink by using Task Manager or by pressing ALT+TAB.
- 2** Select the System menu by pressing SHIFT+ESC.
- 3** Press N to choose the Minimize command.

Restoring a Window or an Icon

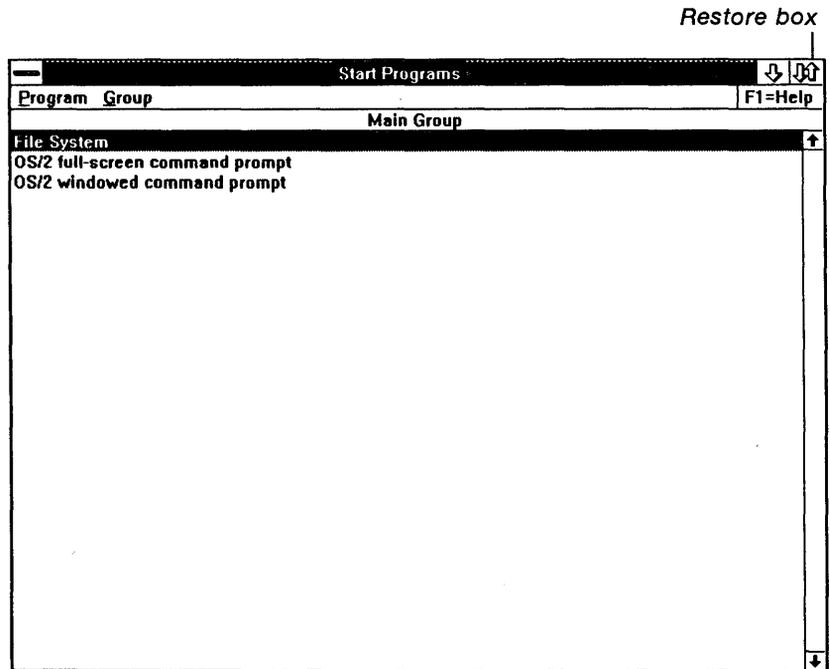
You can restore a window to its previous size after you have shrunk it to an icon or enlarged it to fill your screen. The Restore command returns a window to its original size, or to the size you last made it. The Restore command also returns your window to its original location on your screen.

 If you are using a mouse, you can use the Restore box to return a window to its previous size by doing the following:



- 1 Select the window that you want to restore.

The Restore box is in the upper-right corner of the window.



- 2 Click the Restore box.

 To restore an icon to its previous size by using a mouse, do the following:



- Double-click the icon.

 If you are using the keyboard, follow these steps to restore a window or an icon:

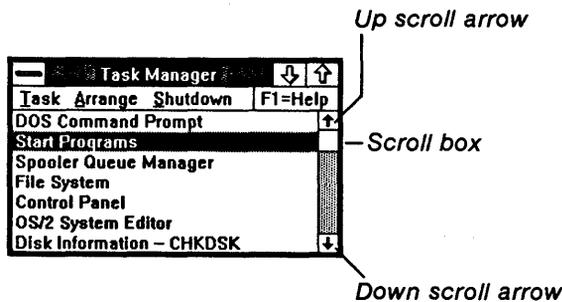
-  **1** Select the window or icon that you want to restore by using Task Manager or by pressing ALT+TAB.
- 2** Select the System menu by pressing SHIFT+ESC.

Restore	Alt+F5
Move	Alt+F7
Size	Alt+F8
Maximize	Alt+F9
Task Manager	Ctrl+Esc

- 3** Press R to choose the Restore command.

Using a Scroll Bar

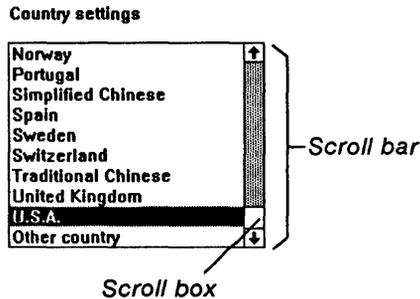
Some Presentation Manager application windows and dialog boxes have scroll bars that you can use to view information when it doesn't fit in one window.



 You can use a mouse to scroll a file or information in a dialog box by doing the following:



- 1 Drag the small box (the scroll box) in the scroll bar to the position in the scroll bar that corresponds to the general location where you want to work (beginning, middle, or end of the file or in a dialog box).



- 2 Release the mouse button.

The following list details how to scroll more precisely by using a mouse:

To scroll	Do this
One line	Click the scroll arrows at either end of the vertical scroll bar.
One screen	Click the scroll bar on either side of the vertical scroll box.
Continuously	Point to the scroll arrows at either end of the scroll bar and hold down the mouse button.

 If you are using the keyboard, do the following to scroll after you have reached the last character or item in a window:



- Press the DIRECTION key with the arrow that points in the direction you want to scroll.

For example, to scroll right, go to the far-right character or item in a window and keep pressing the RIGHT key.

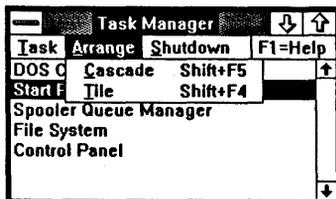
In addition, some applications allow you to scroll by the screenful (that is, as much as will fit in one window or dialog box at one time). The

following list shows keys that you can use in some applications to move in a file or dialog box; not all applications use these keys in the same way, so try them out with each application:

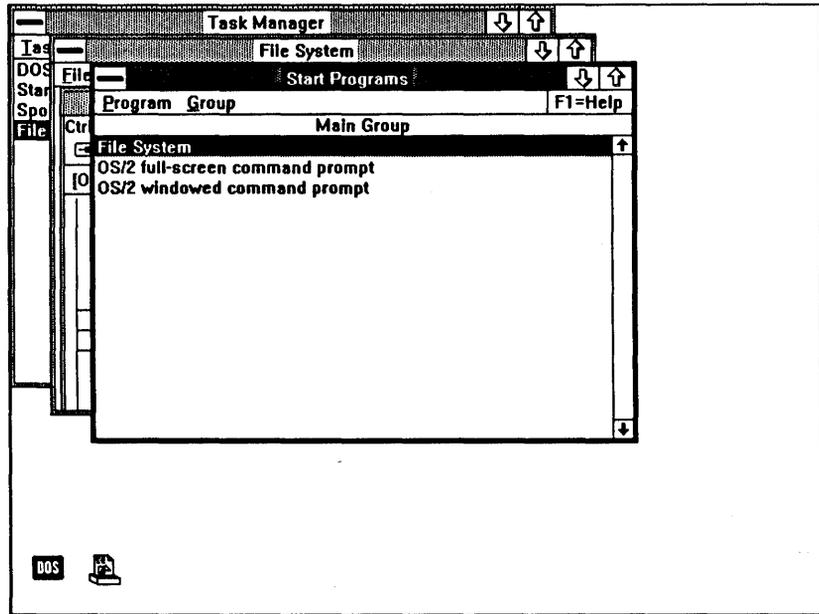
To scroll	Press
Up one screen	PAGE UP
Down one screen	PAGE DOWN
Up to the window beginning	HOME
Down to the window end	END
Left one screen	CTRL+PAGE UP
Right one screen	CTRL+PAGE DOWN

Arranging Windows

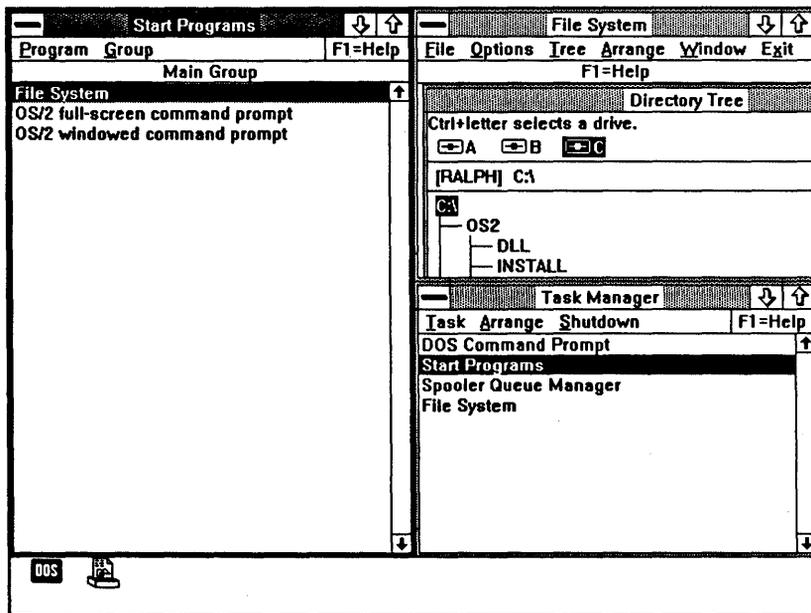
Having several windows open at one time can make it difficult to see all of your applications while you work. You can use Task Manager to arrange your application windows on your screen. The commands on the Arrange menu help you do this.



The Cascade command arranges application windows in an overlapping pattern so that the title bar of each application window remains visible.



The Tile command sizes and arranges application windows side-by-side so that all windows are visible. The icon area at the bottom of your screen is reserved for icons.



If you are using a mouse, follow these steps to use the commands on the Arrange menu:

- 1 Select Task Manager by double-clicking the Task Manager icon. If the icon is not visible, choose the Task Manager command from the System menu in the active window.
- 2 Click the Arrange menu on the menu bar.
- 3 Click either the Cascade command or the Tile command.

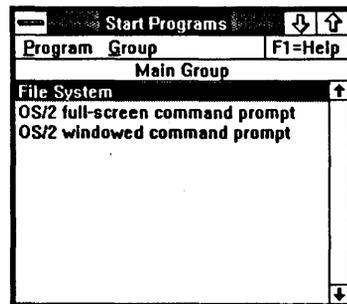
 If you are using the keyboard, follow these steps to use the Arrange-menu commands:

-  **1** Select Task Manager by pressing CTRL+ESC or by choosing the Task Manager command from the System menu in the active window.
- 2** Press ALT, A to select the Arrange menu.
- 3** To choose the Cascade command, press C. To choose the Tile command, press T.

Using Help

Most Presentation Manager applications have online Help information. You can get Help information by using the keyboard or mouse.

Online Help information



 If you are using a mouse, do the following to receive Help information:

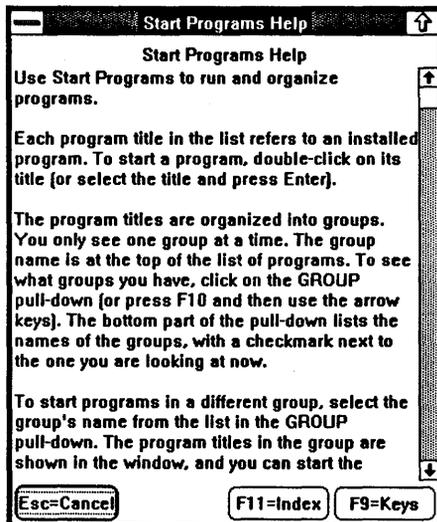
-  ► Click Help on the menu bar.

 If you are using the keyboard, do the following to receive Help information:

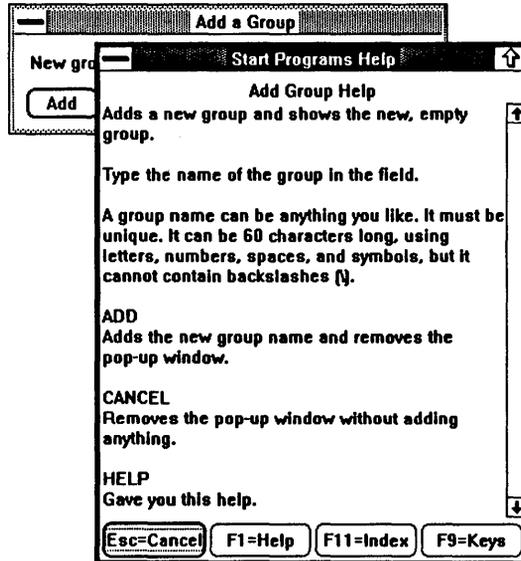


▶ Press F1.

The Help window appears in front of your application window.

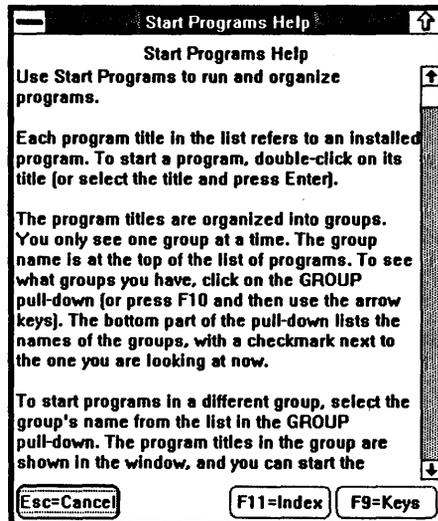


You can use Help at any time while you're working with your Presentation Manager application. Help information takes into account what you've selected in the application window. For example, if you've selected a menu, the Help window contains information on the commands in the menu; if you're working in a dialog box, the Help window contains information on the areas of the dialog box.



Using the Online Index

Help also contains an online index to all Help topics.



Index button

-  To look at the Help index by using a mouse, do the following:
 -  ► Click the Index button in the Help window.
-  To look at the Help index by using the keyboard, do the following:
 -  ► Press F11, or press ALT+F1.
-  To get information on a particular Help-index topic by using a mouse, do the following:
 -  ► Double-click the topic title you want.

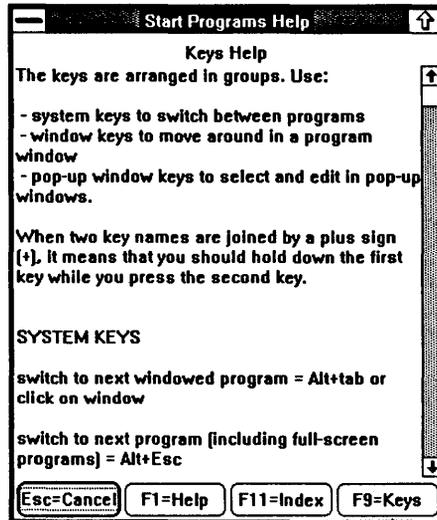
 To get information on a particular Help-index topic by using the keyboard, do the following:



- 1 Press the DIRECTION keys to select the topic title you want.
- 2 Press ENTER.

Keyboard Information

By looking at the Keys Help window, you can find out how different keys are used in your application.



Keys button

 To open the Keys Help window by using a mouse, do the following:



- ▶ Click the Keys button in the Help window.

 To open the Keys Help window by using the keyboard, do the following:



- ▶ Press F9.

Closing the Help Window

The Help window remains open and in front of your application window. When you are finished with the Help window, you must close it.

 To close the Help window by using a mouse, do the following:



► Click the Cancel button.



To close the Help window by using the keyboard, follow these steps:



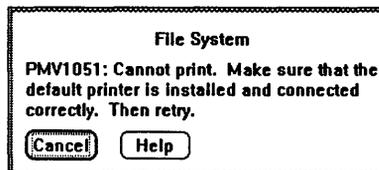
- 1 Select the System menu.
- 2 Choose the Close command.

Or

► Press ESC.

Working with MS OS/2 Messages

When MS OS/2 encounters problems that require your action, it sends messages to your screen. There are several types of messages displayed, depending on the type of problem encountered. When you are working in Presentation Manager, most messages appear in dialog boxes. A Presentation Manager message tells you what caused the problem; for example, a directory path that cannot be found. These dialog boxes also contain Cancel and Help command buttons you can use to cancel the message or to get further information.



Other problems, especially those caused by your computer system, cause messages to appear in a full screen. For example, if you forget to close a disk-drive door when you attempt to format a floppy disk, the following message may appear:

```

Session Title: Format diskette

SYS0039: The A: device is not ready.

Return the error to the program
End the program
Retry the operation
  
```

The problem, identified by a message number, is shown along with the available options for correcting the problem.

 To choose an option, do the following:



► Press the DIRECTION keys to select the action you want, and then press ENTER.

The following options are available:

Option	Action
Return the error to the program	Sends the error back to your application. If possible, you return to your application. Additional error messages may appear in your application.
End the program	Closes your application.
Retry the operation	Causes the application to try the action again. Choose this option when there is a problem you can correct, such as closing a disk-drive door.

You can use the message number to get additional information by using the **help** command in the MS OS/2 command interpreter (**cmd**). For

more information on the **help** command, see Chapter 8, "Using MS OS/2 Utilities," and the *Microsoft Operating System/2 Desktop Reference*.

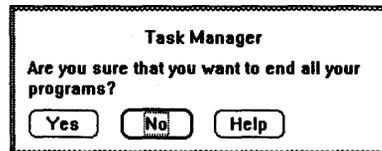
Quitting Presentation Manager

Before you turn off your computer, you can use the Shutdown Now command in Task Manager to close all of your applications. The Shutdown Now command on the Shutdown menu also gives you a chance to save settings you have made in applications such as File System.

 Follow these steps to quit Presentation Manager:

- 1 Switch to Task Manager.
- 2 Select the Shutdown menu and choose the Shutdown Now command.

The following dialog box appears:



- 3 Choose the Yes button if you want to quit Presentation Manager. Choose the No button to cancel the command and continue working in Presentation Manager.
- 4 If you have open applications, additional dialog boxes may appear, asking if you want to save files or settings before closing each application. Respond to each dialog box.
After all applications are closed, a dialog box appears, informing you that all applications have ended.
- 5 Turn off your computer or, to resume working with Presentation Manager, choose the Cancel button.

If you choose the Resume Task Manager command on the Shutdown menu, you return to Task Manager.

2 Running Applications with MS OS/2

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Introduction

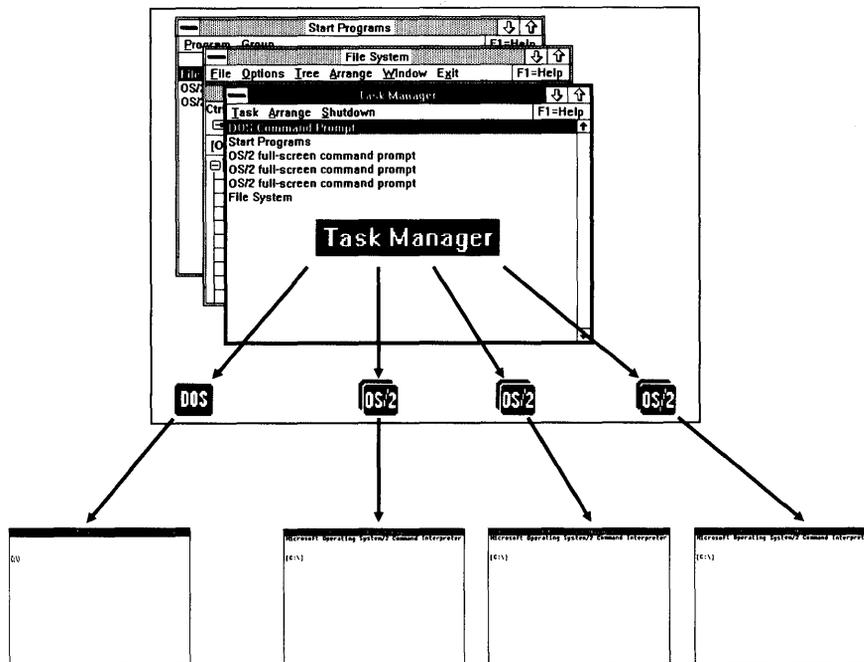
Presentation Manager includes two applications that let you take advantage of the multitasking ability of MS OS/2:

- *Start Programs* is used to start applications written for the graphical environment of Presentation Manager, as well as full-screen OS/2 applications. A full-screen OS/2 application is an application that runs in its own screen rather than as part of a Presentation Manager window. Some full-screen OS/2 applications are not designed to run in the graphical environment of Presentation Manager. Other full-screen OS/2 applications will run in windows in Presentation Manager.
- *Task Manager* is used for switching between applications. You can use Task Manager to switch to Presentation Manager applications, full-screen OS/2 applications, or one DOS application. All of your applications continue to run. You can switch between them without quitting or closing files. When you switch back to an application, you can continue your work where you left off.

This chapter explains how to use Start Programs to start applications. It also describes how to start a DOS application, and details other methods for starting applications. It explains how to switch between applications by using a mouse, the keyboard, and Task Manager. You will also find information on running full-screen OS/2 applications in Presentation Manager windows.

About Sessions

MS OS/2 organizes the tasks your computer performs into *sessions*: separate environments where your applications run. There are three basic kinds of sessions: Presentation Manager, DOS, and full-screen OS/2.



The Presentation Manager session is where applications written for the special Presentation Manager graphical environment run. Two Presentation Manager applications—Start Programs and Task Manager—are tools you use to organize and switch between all three kinds of sessions: Presentation Manager, DOS, and full-screen OS/2. Each Presentation Manager application you start is listed by name in Task Manager.

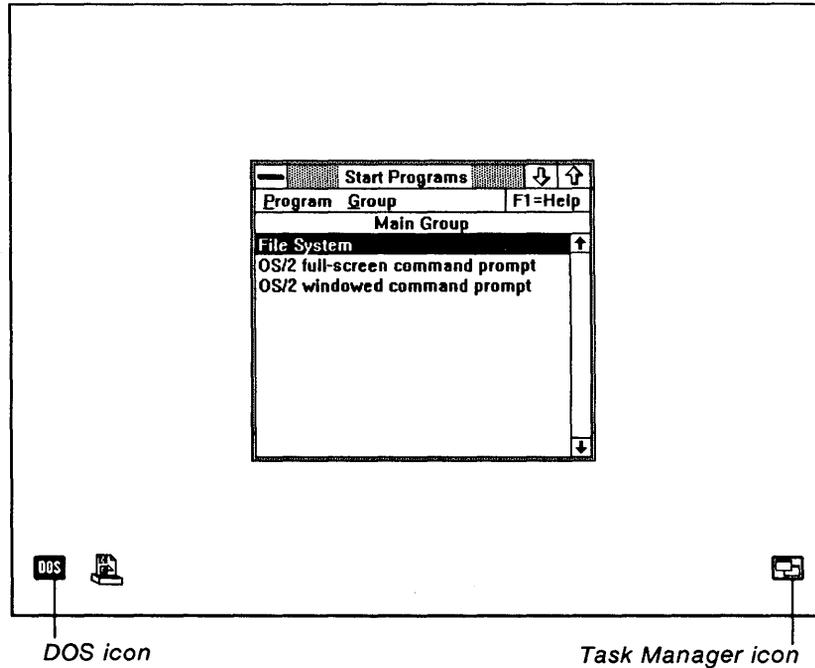
You can run one application written for DOS in the DOS session. This session is almost like having a separate 640-kilobyte computer that is running DOS. You can run only one application at a time, but Presentation Manager lets you switch to the DOS session any time you like by using Task Manager. The DOS session starts when you start Presentation Manager and is represented on the Presentation Manager screen by the DOS icon. The DOS session is listed in Task Manager as the DOS Command Prompt.

You run an OS/2 application in the full-screen OS/2 session. These are applications that are not designed for the Presentation Manager graphical environment. You can start up to 12 separate full-screen OS/2 sessions, running one application in each session. In a full-screen OS/2 session, an application runs in a full screen; you cannot see the Presentation Manager session. When you switch back to the Presentation Manager session, you see each full-screen OS/2 session represented by an icon. Each session is listed by name in Task Manager.

Some full-screen OS/2 applications can also run in windows, sharing the screen with Presentation Manager applications. For example, the MS OS/2 command interpreter, `cmd`, can run in a window. When a full-screen OS/2 application is running in a window, it is running in the Presentation Manager session. Many of the advantages of a Presentation Manager application are available through the System-menu commands. When you are working with a full-screen application in a window, however, the commands, mouse, and keyboard work exactly as they did in a full screen.

Starting an Application with Start Programs

The Presentation Manager Start Programs application starts your applications. It starts automatically when you turn on your computer or press CTRL+ALT+DEL. It shares the screen with the DOS session, Spooler Queue Manager, and Task Manager icons.



Applications you can start are listed in Start Programs. Start Programs divides applications into groups. The Main Group is the first group that appears when you start Presentation Manager.

To start an application from Start Programs by using a mouse, do the following:

- ▶ Double-click the application name.

 If you are using the keyboard, do the following to start an application:



- 1 Press the DIRECTION keys to select the application you want to start.
- 2 Press ENTER.

 You can also use the Start command on the Program menu to start an application by using either a mouse or the keyboard by doing the following:

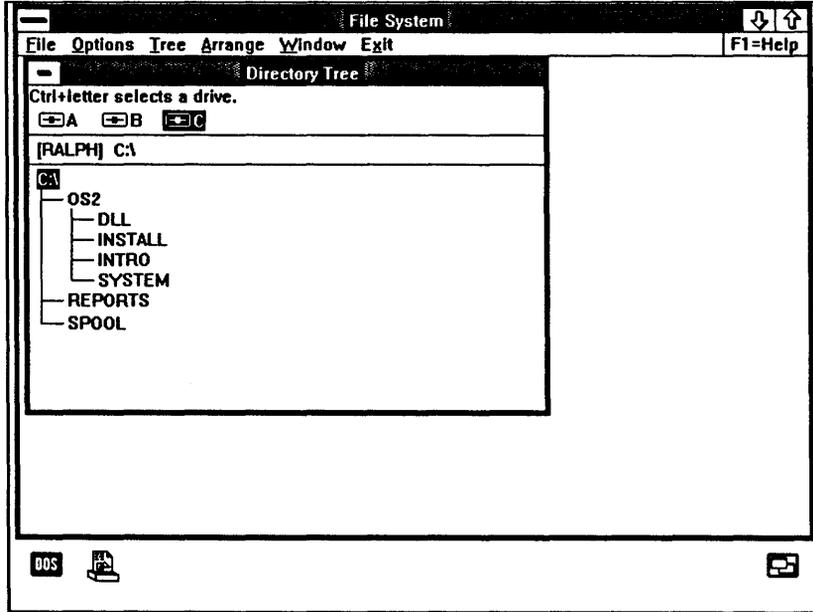
- 1 Select the application in the Start Programs window.
- 2 Select the Program menu and choose the Start command.

After you start an application from Start Programs, the Start Programs window remains open. You can use the Minimize On Run command on the Program menu to automatically shrink Start Programs to an icon each time you start an application.

 To use the Minimize On Run command, do the following:

- ▶ Select the Program menu and choose the Minimize On Run command.

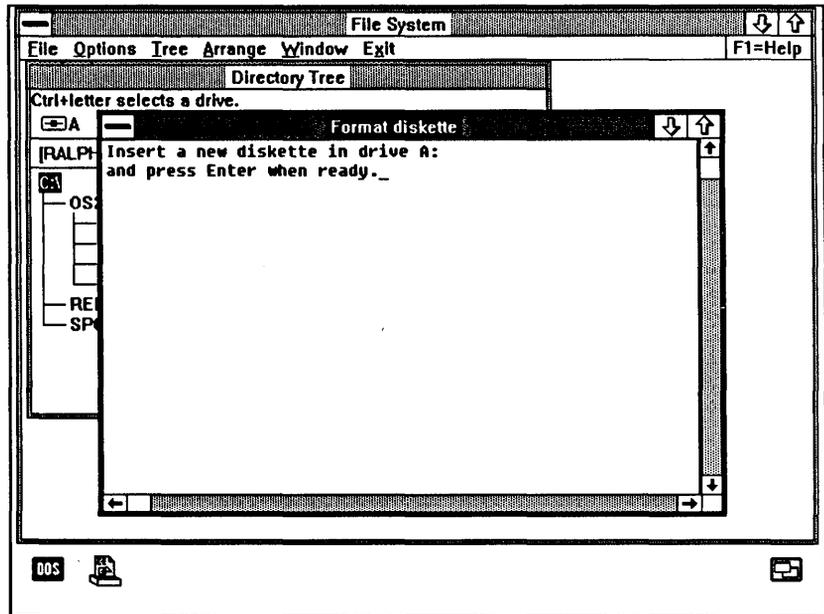
Depending on the kind of application you start from Start Programs, your screen will look different. If you start a Presentation Manager application, like File System or Control Panel, the application runs in a window in front of other application windows.



If the program you start is a full-screen OS/2 application—for example, OS/2 Full-Screen Command Prompt—the Presentation Manager screen disappears and the application screen takes its place.



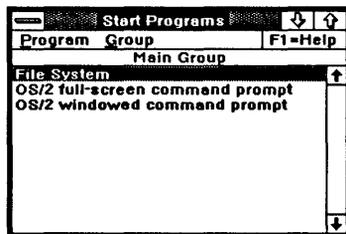
If the application is a full-screen OS/2 application that runs in a window, like Format Diskette, the application runs in a window in front of other Presentation Manager application windows.



This window, however, is somewhat different from other Presentation Manager application windows. It has a System menu and a title bar, but no menu bar. For more detailed information on working with full-screen OS/2 applications running in windows, see “Working with a Full-Screen OS/2 Application in a Window,” later in this chapter.

Changing Program Groups

Applications in Start Programs are divided into *program groups*. The first group you see when you start Presentation Manager is the Main Group.



The following list describes the Main Group programs:

- **File System** is a Presentation Manager application that helps you view and organize your files and directories. You can also use File System to start applications. You'll find more details on using File System in Chapter 3, "Using File System."
- **OS/2 Full-Screen Command Prompt** is the Start Programs listing for the MS OS/2 command interpreter, **cmd**, running as a full-screen application. When you start this application, the Presentation Manager screen disappears and you see the MS OS/2 command prompt.
- **OS/2 Windowed Command Prompt** is **cmd** running in a window with Presentation Manager applications. Running **cmd** this way allows you to view your other applications. You can also shrink the **cmd** window to an icon.

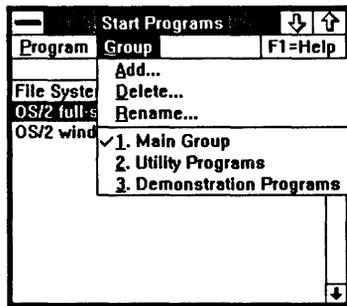
In addition to applications in the Main Group, Start Programs contains a Utility Programs group with the following entries:

- **Control Panel** is a Presentation Manager application you use to set up printers, change country information and screen colors, and set system information such as the date and time.
- **Disk Information—CHKDSK** is an MS OS/2 utility program that you use to check for errors and available storage space on your disks.

- Format Diskette is an MS OS/2 utility program that you can use to format floppy disks in drive A.
- OS/2 System Editor is a text editor you can use to create and change text files.

To change program groups in Start Programs, do the following:

- 1 Select the Group menu in Start Programs.



The different program groups are listed at the bottom of the menu. A check mark appears next to the current group.

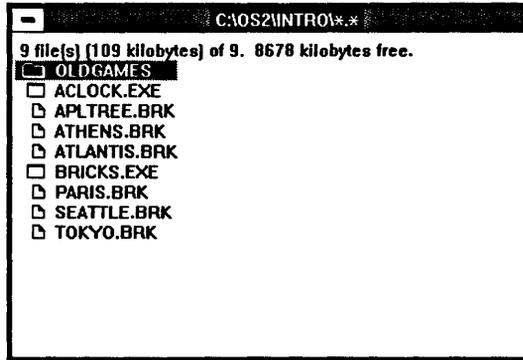
- 2 Choose the group you want.

You can add new groups or change the programs in a group by using the commands on both the Program and the Group menus. For information on adding new groups, see “Creating a Program Group,” later in this chapter. For information on changing programs in Start Programs groups, see “Copying an Application in Start Programs,” later in this chapter.

Starting an Application from File System

In Presentation Manager, you can choose among several ways to start applications. In addition to starting an application by using Start Programs, you can also start an application by opening an application file

in File System. Application files are called *program files* and usually have the filename extension .EXE, .COM, or .CMD. In File System directory windows, you can recognize program files by their file icons.

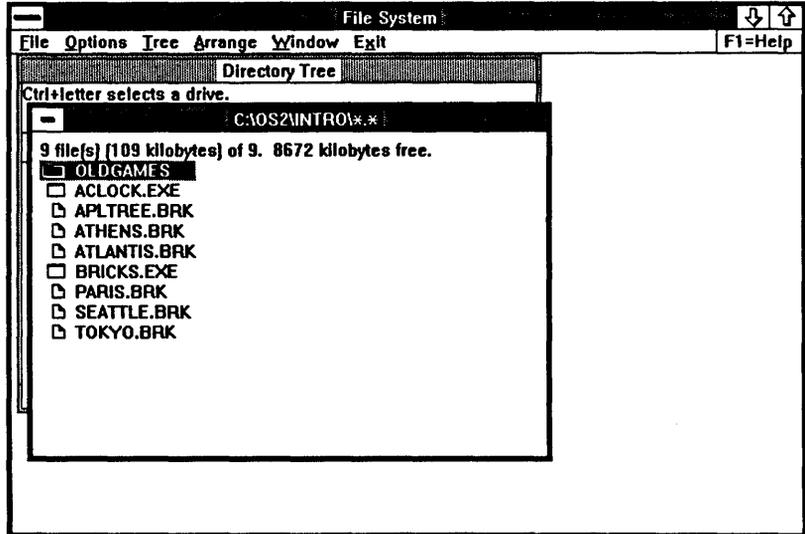


Note The information in this section is intended to be an introduction to File System. For more complete information on starting applications from File System, see Chapter 3, "Using File System."

You can start an application from File System by using either a mouse or the keyboard.

 To start an application by using a mouse, do the following:

-  **1** Switch to Start Programs and select the Main Group.
- 2** Start File System.
- 3** In the Directory Tree window, double-click the name of the directory that contains the application you want to start.



- 4 Double-click the application filename.

 If you are using the keyboard, follow these steps to start an application from File System:



- 1 Switch to Start Programs and select the Main Group.
- 2 Start File System.
- 3 In the Directory Tree window, press the DIRECTION keys to select the name of the directory that contains the application you want to start, and then press ENTER.
The directory window opens.
- 4 In the directory window, press the DIRECTION keys to select the program file for the application you want to start, and then press ENTER.

Starting an Application from the MS OS/2 Command Interpreter

You can also start applications from the MS OS/2 command interpreter, **cmd**.

 To start an application from the MS OS/2 command interpreter, do the following:

- 1 Select the Main Group in Start Programs and start either OS/2 Full-Screen Command Prompt or OS/2 Windowed Command Prompt.
- 2 At the MS OS/2 prompt, type the name of the application you want to start and any command-line arguments, and then press ENTER.

Your screen will look different if your application runs in a window or if it runs in a full screen. If you start a full-screen OS/2 application, you see only the application screen. If you start a Presentation Manager application or a full-screen OS/2 application that runs in a window, the application window appears in front of other application windows.

When you complete your work with a particular application, you can quit the application. You can also quit the MS OS/2 command interpreter.

 To quit the MS OS/2 command interpreter, follow these steps:

- ▶ At the MS OS/2 prompt, type **exit** and press ENTER.

Or

- ▶ If you are running the MS OS/2 command interpreter in a window, you can quit by closing the window.

 If you are using a mouse, follow this step to close the MS OS/2 command-interpreter window:



- ▶ Double-click the System menu.

 If you are using the keyboard, follow these steps to close the MS OS/2 command-interpreter window:



- 1 Press SHIFT+ESC to select the System menu.
- 2 Choose the Close command.

Starting a DOS Application

In Presentation Manager, you start DOS applications differently from MS OS/2 applications. You can run one DOS application at a time in a special environment called the DOS session, almost as if the application is on a separate computer running DOS. You can switch between the DOS session and other MS OS/2 applications, but the multitasking capabilities of MS OS/2 are not available in the DOS session. The DOS session is represented by an icon at the bottom of your screen when you start Presentation Manager.



To run a DOS application, you must first switch to the DOS session.



To switch to the DOS session by using a mouse, do the following:



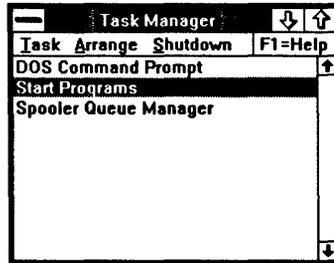
► Double-click the DOS icon.



If you are using the keyboard or if the DOS icon is not visible on your screen, use Task Manager to switch to the DOS session. Follow these steps:



- 1 Press CTRL+ESC.
The Task Manager window appears.



- 2 Choose the DOS Command Prompt entry from the list of applications.

 To start a DOS application, do the following:

-  ► At the DOS prompt, type the command that starts the application you want and any command-line arguments, and then press ENTER.

You can run only one DOS application at a time in the DOS session; however, you can switch back to Presentation Manager and use other MS OS/2 applications without quitting your DOS application. Details on switching between applications are provided in the following section.

Note You may experience problems with some DOS graphics applications when you switch between the DOS session and another session. In some DOS graphics applications the screen may not be restored correctly when you return to it from another session. If this occurs, close the DOS graphics application before switching to another session.

Switching Between Applications

After you start more than one application, you need to switch between applications and choose the application you want to work with. There are several ways to accomplish this depending on whether you use a mouse or the keyboard.

Switching Between Visible Applications

 You can use a mouse to switch quickly between applications that are visible in your Presentation Manager screen by doing the following:

- ▶  To switch to an application running in a window, click the application window.

Or

- ▶ To switch to an application running as an icon, double-click the icon.

 To switch between applications by using the keyboard, do the following:

- ▶  Press ALT+TAB.
Repeat this step until you reach the application you want.

Switching Between Icons

If you switch to an application that is running as an icon, the application title and the System menu appear. To work with this application, you must first restore it.

 To restore an icon, do the following:

- ▶ Choose the Restore command.

 You can also use the following keyboard technique to switch between Presentation Manager applications and full-screen OS/2 applications or the DOS session without choosing the Restore command:

- ▶ Press ALT+ESC.
Repeat this step until you reach the application you want.

Switching Between Applications by Using Task Manager

Another way to switch between applications is to use Task Manager, which helps you keep track of your applications and can be used to switch quickly between them. Task Manager starts when you start Presentation Manager; it is always running. Its icon is in the lower-right portion of your screen. You can switch to Task Manager from the DOS session or from a full-screen OS/2 application, as well as from Presentation Manager.



Task Manager icon

To switch to Task Manager from its icon by using a mouse, do the following:

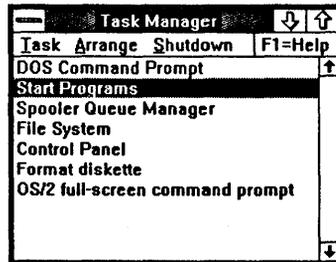


- ▶ Double-click the Task Manager icon.

To switch to Task Manager by using the keyboard, do the following:



- ▶ Press CTRL+ESC.



You can also switch to Task Manager by using the Task Manager command on the System menu by doing the following:

- ▶ Select the System menu and choose the Task Manager command. The applications you are currently running are listed in Task Manager.

 To switch to another application by using a mouse, do the following:



- ▶ Double-click the application name.

 To switch to another application by using the keyboard, do the following:



- ▶ Press the DIRECTION keys to select the name of the application you want to switch to, and then press ENTER.

 You can use the Task Manager Switch To command on the Task menu to switch to the selected application by doing the following:

- 1 In the Task Manager window, select the application you want.
- 2 Select the Task menu and choose the Switch To command.

 You can automatically shrink Task Manager to an icon after switching to an application by doing the following:

- ▶ Select the Task menu and choose the Minimize After Use command.

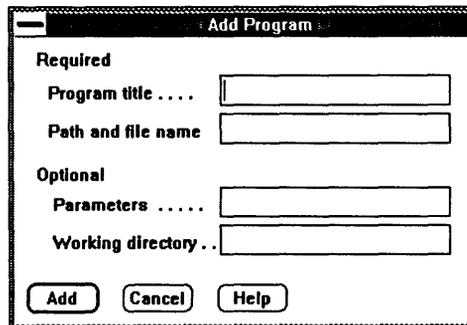
Adding an Application to Start Programs

To make starting applications easier and faster, you can add them to Start Programs with the Add command. This command stores the name of your application, its path, and any command arguments in Start Programs.

 To add an application to Start Programs, follow these steps:

- 1 Switch to Start Programs.
- 2 Select the program group you want to add your application to.
- 3 Select the Program menu and choose the Add command.

The Add Program dialog box appears.



- 4 Type the requested information in the dialog box.
For more information on completing the Add Program dialog box, see the list following this procedure.
- 5 To add the application, choose the Add button.

The following list describes each area of the Add Program dialog box:

- In the Program Title text box, you type the title of your application. This is the name that will appear in the Start Programs list. You can use any name you want, as long as it is unique within the program group.
- In the Path and File Name text box, you type the disk-drive letter and a colon (:); the directory path, separating each directory in a directory path with a backslash (\); and the filename of your application.
For example, to add the XCOPY.EXE application file on drive C in your OS2 directory, you would type the following:
c:\os2\xcopy.exe
- In the Parameters text box, you type any command arguments; for example, a filename or an option. Type these arguments just as you would if you were typing the command at the MS OS/2 prompt. Argument information is optional but some applications do not run correctly without this information.
To display a dialog box requesting argument information each time you start the application, type a question mark (?) in the Parameters text box.
- In the Working Directory text box, you type the location of the directory you want to work in with your application; for example, the directory that contains particular text files for a text-editing program.

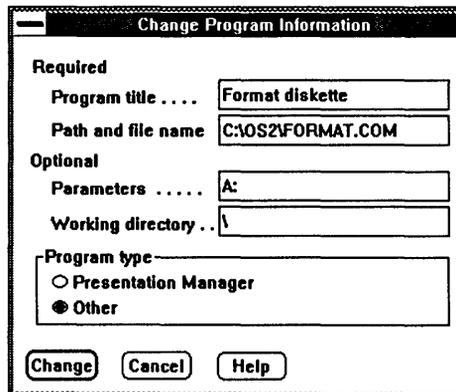
Changing Application Information in Start Programs

You can change any application information used by Start Programs by using the Change command on the Program menu. For example, you may want to change the working directory for the application or provide an additional argument, such as a filename. For full-screen OS/2 applications, you can use the Change command to change whether an application runs in a window or in a full screen.

To use the Change command to change program information, follow these steps:

- 1 Switch to Start Programs.
- 2 Select the application you want from its program group.
- 3 Select the Program menu and choose the Change command.

The Change Program Information dialog box appears, displaying the current program information.



- 4 Move to the dialog-box area you want to change and type the correct information.
- 5 Choose the Change button.

The last section in the dialog box, Program Type, lists two options: Presentation Manager and Other. Presentation Manager can determine what the application type is—Presentation Manager or Other—and whether the application should be run in a window or in a full screen. Presentation Manager applications always run in windows.

Some applications run in a window or in a full screen, depending on what is specified by the application.

To change the default for running your application full-screen or in a window, do the following:

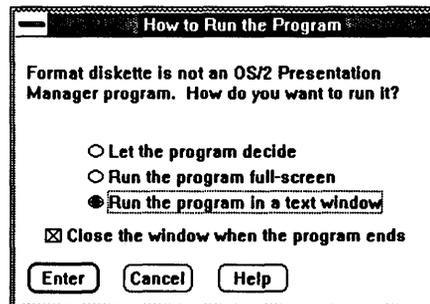
- 1 Switch to Start Programs.
- 2 Select the application you want to change (it cannot be a Presentation Manager application).
- 3 Select the Program menu and choose the Change command.

The Change Program Information dialog box appears. The Other option in the Program Type section is selected.



- 4 Choose the Change button.

The How to Run the Program dialog box appears.



- 5 If you want your application to run in a full screen, select the Run the Program Full-Screen option. If you want your full-screen OS/2 application to run in a window, select the Run the Program in a Text Window option. If you want your application to determine whether it runs in a window or in a full screen, select the Let the Program Decide option.

If you select the Run the Program in a Text Window option, you can also turn on the Close the Window When the Program Ends check box. This automatically closes the window when you quit your application.

- 6 Choose the Enter button.

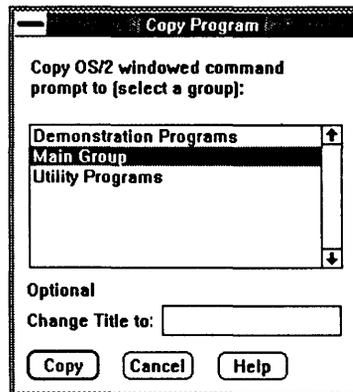
Copying an Application in Start Programs

You can copy applications to different groups in Start Programs by using the Copy command on the Program menu. You may want to include a frequently used application, such as the MS OS/2 command interpreter (`cmd`), in more than one program group.

To copy an application to a different group, follow these steps:

- 1 Switch to Start Programs.
- 2 Select the Group menu and choose the application group.
- 3 Select the application name in Start Programs.
- 4 Select the Program menu and choose the Copy command.

The Copy Program dialog box appears.



The name of the application you selected in Start Programs appears at the top of the dialog box.

- 5 Select the group to which you want to copy the application.
- 6 To change the application name in its new group, type the new name in the Change Title To text box.
- 7 Choose the Copy button.

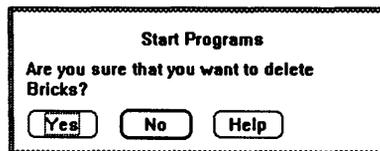
Deleting an Application from Start Programs

You can delete any application listed in Start Programs by using the Delete command on the Program menu.

 To delete an application, do the following:

- 1 Switch to Start Programs.
- 2 Select the Group menu and choose the application group.
- 3 Select the application name in Start Programs.
- 4 Select the Program menu and choose the Delete command.

The following dialog box appears:



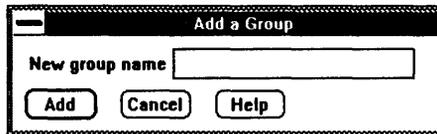
- 5 Choose the Yes button to delete the application. Choose the No button to return to Start Programs. Choose the Help button for information on the Delete command.

Creating a Program Group

You can create a new program group in Start Programs by using the Add command on the Group menu. The program-group name you create appears in the list on the Group menu.

 To add a program group to Start Programs, follow these steps:

- 1 Switch to Start Programs.
- 2 Select the Group menu and choose the Add command.
The Add a Group dialog box appears.



- 3 Type the name of the group in the New Group Name text box.
- 4 Choose the Add button.

After you add a new group, Start Programs automatically switches to that group. You add applications by using the Add command on the Program menu. You can also switch to another group and copy applications to the new group by using the Copy command. For more information on copying applications from one group to another, see “Copying an Application in Start Programs,” earlier in this chapter.

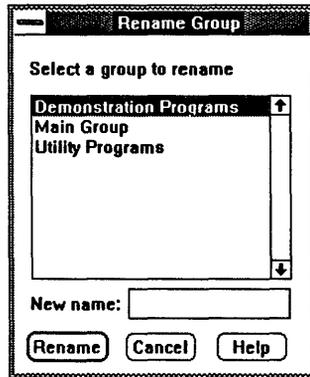
Renaming a Program Group

You can change the name of a program group in Start Programs by using the Rename command on the Group menu.

 To rename a program group, follow these steps:

- 1 Switch to Start Programs.
- 2 Select the Group menu and choose the Rename command.

The Rename Group dialog box appears.



- 3 Select the group name you want to change.
- 4 Type the new name in the New Name text box.
- 5 Choose the Rename button.

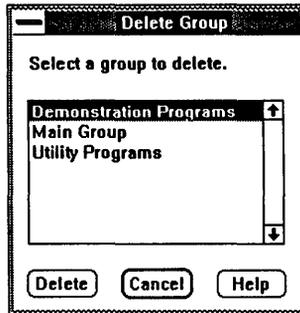
Deleting a Program Group

You can remove a program-group name from the group listing by using the Delete command on the Group menu. However, you must first remove all applications from the group by using the Delete command on the Program menu.

To delete a group name, do the following:

- 1 Switch to Start Programs.
- 2 Select the Group menu and choose the Delete command.

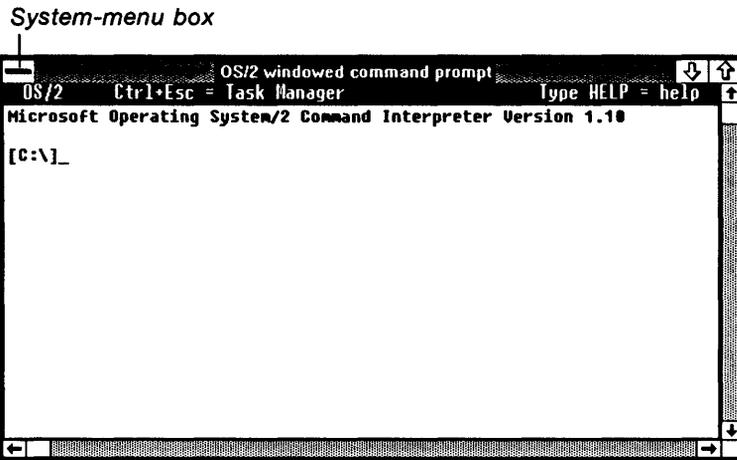
The Delete Group dialog box appears.



- 3 Select the name of the group you want to delete (the group should not contain any applications).
- 4 Choose the Delete button.

Working with a Full-Screen OS/2 Application in a Window

Many full-screen OS/2 applications can run in windows even though they are not specifically designed as Presentation Manager applications. Running an application in a window gives you many of the advantages of a Presentation Manager application: you can size the window, you can use a mouse to switch to the application, and you have easy access to other applications.

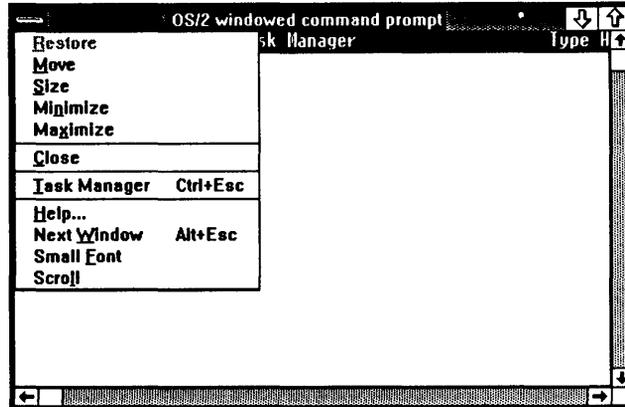


 If you are using a mouse, you can select the System menu from an MS OS/2 application, by doing the following:

-  ► Click the System-menu box.

 To select the System menu by using the keyboard, do the following:

-  ► Press ALT or press SHIFT+ESC.

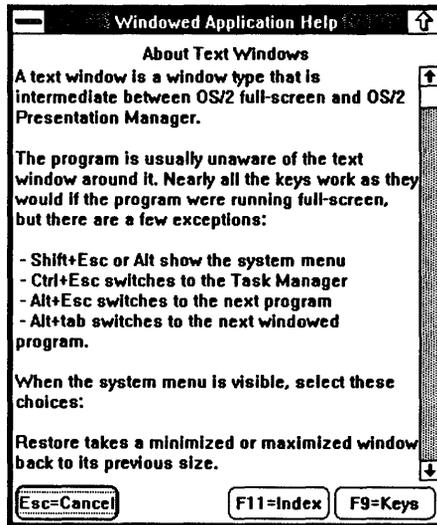


The System menu of a full-screen OS/2 application running in a window has additional commands on it to help you use Presentation Manager features. These commands are described in the following sections.

Using Help

There is Help information available on running an application in a window; however, you get Help information on a full-screen OS/2 application running in a window in a different way than you do on a regular Presentation Manager application.

- To get Help information on running a full-screen OS/2 application in a window, do the following:
 - ▶ Select the System menu and choose the Help command.
 The Help window appears, containing general information on working with full-screen OS/2 applications running in windows.



The Help window itself is a Presentation Manager application and works the same way that other Presentation Manager windows work.

 When you finish looking at the Help information, you can use a mouse to close the Help window by doing the following:

-  ► Click the Cancel button.

 To close the Help window by using the keyboard, do the following:

-  ► Press ESC.

Moving Between Applications

You can switch to another application from a full-screen OS/2 application running in a window the same way you switch from an application running in Presentation Manager: by clicking in another window, by

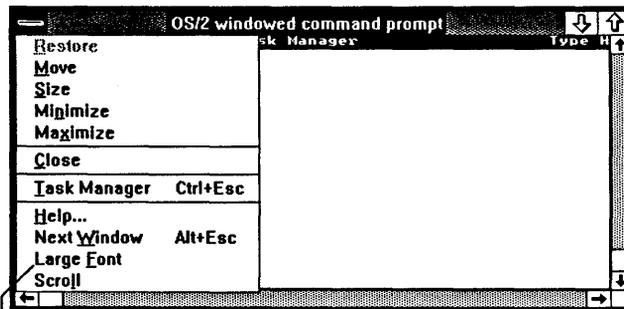
pressing ALT+ESC or ALT+TAB to move to the next application, or by pressing CTRL+ESC to switch to Task Manager. In addition, the Next Window command on the System menu lets you switch to another application.

- ☛ To switch to another application by using the Next Window command, do the following:
 - ▶ Select the System menu and choose the Next Window command.

Reducing the Size of the Text Font

You can reduce the size of the text characters displayed by a full-screen OS/2 application running in a window by using the Small Font command on the System menu. Reducing the size of the characters allows more information to appear inside a window.

- ☛ To reduce the size of text characters by using the Small Font command, do the following:
 - ▶ Select the System menu and choose the Small Font command. The characters in the window become smaller. In the System menu, the Small Font command is replaced by the Large Font command.



Large Font command

- ☛ To restore the text characters to their original size, do the following:
 - ▶ Select the System menu and choose the Large Font command.

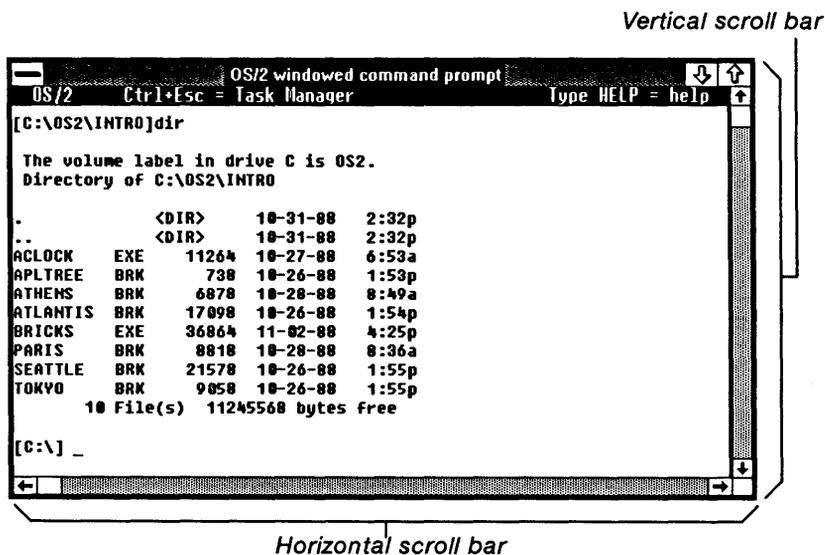
Scrolling a Window

When you are running a full-screen OS/2 application in a window, you may not be able to see all of the information in one application screen. You can scroll the contents of the window to see more information by using either the scroll bars or the Scroll command on the System menu.

To scroll a window by using a mouse, do the following:



- ▶ Click the scroll bars at the side or bottom of the window.



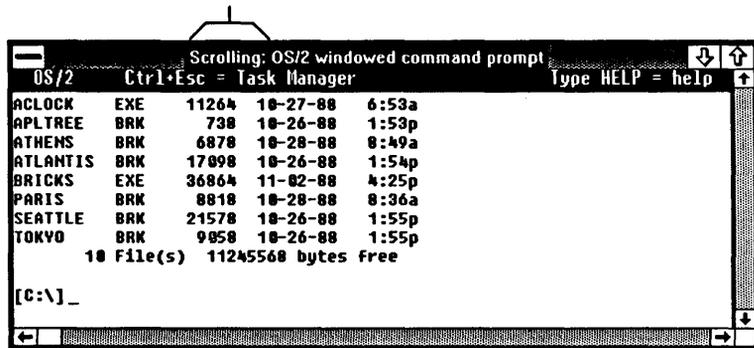
If you are using the keyboard, you can use the Scroll command on the System menu to scroll the contents of the window. Do the following:



- 1 Select the System menu and choose the Scroll command.

A check mark appears next to the Scroll command on the System menu and the title bar of the window changes to show that the Scroll command is in effect.

Scroll command turned on



- 2 Press the DIRECTION keys to scroll the window.
- 3 After you complete scrolling, select the System menu and choose the Scroll command again.

The following list details how to use the DIRECTION keys to scroll through the contents of an application window:

To scroll	Press
Up one line	UP
Down one line	DOWN
Right one character	RIGHT
Left one character	LEFT

Sizing a Window

You change the size of full-screen OS/2 application windows in much the same way you change the size of Presentation Manager application windows: by using a mouse or choosing the Size, Minimize, Maximize, or Restore commands on the System menu. These commands work a little differently, however, in full-screen OS/2 application windows.

 To size a full-screen OS/2 application window by using a mouse, follow these steps:

-  **1** Point to the border or corner that you want to move.
The mouse pointer becomes a two-headed arrow.
- 2** Drag the corner or border until the window is the size you want.
- 3** Release the mouse button.

 To size a full-screen OS/2 application window by using the keyboard, follow these steps:

-  **1** Select the System menu and choose the Size command.
- 2** Press one DIRECTION key to choose the border you want to move (make sure that you have not chosen the Scroll command; you cannot size the window if the Scroll command is in effect).
- 3** Press the DIRECTION keys to move the border until the window is the size you want.
- 4** Press ENTER.

If you choose the Small Font command, the window becomes smaller and you are limited in how much you can size it. The same amount of information is displayed but the character size is reduced.

You can enlarge a full-screen OS/2 application window to a maximum size that is smaller than a Presentation Manager window. The icon area remains visible on your screen. If you choose the Small Font command, the maximum size of the window is reduced.

When you enlarge a full-screen OS/2 application window to its maximum size, the scroll bars disappear.

 To enlarge a full-screen OS/2 application window to its maximum size by using a mouse, do the following:

-  ► Click the Maximize box.

 To enlarge a full-screen OS/2 application window to its maximum size by using the keyboard, do the following:

-  ► Select the System menu and choose the Maximize command.

 You can shrink a full-screen OS/2 application window to an icon by using a mouse. Do the following:

-  ► Click the Minimize box.

 To shrink a full-screen OS/2 application window to an icon by using the keyboard, do the following:

-  ► Select the System menu and choose the Minimize command.

When you reduce to an icon a full-screen OS/2 application that is running in a window, the following icon appears at the bottom of your screen:



Quitting an Application

When you finish working in a full-screen OS/2 application that is running in a window, you can quit your application and save your work.

 To quit your application and close the window, do the following:

- Select the System menu and choose the Close command.

 You can also use the Task Manager Close command to quit an application and close the window by doing the following:

- 1 Switch to Task Manager and select the application you want to close.
- 2 Select the Task menu and choose the Close command.

Presentation Manager can automatically close an application window when you quit the application. For more information on this option,

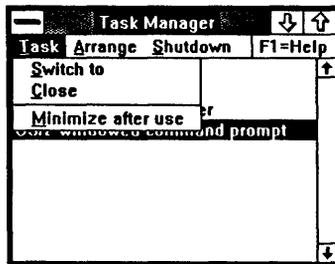
see "Changing Application Information in Start Programs," earlier in this chapter.

Quitting a Presentation Manager Application

You can quit a Presentation Manager application by using the application Exit or Close command or by closing the application in Task Manager. Be sure you save any changes in an application file before using the Close command.

 To use Task Manager to close a Presentation Manager application, do the following:

- 1 Switch to Task Manager and select the application you want to close.
- 2 Select the Task menu and choose the Close command.



3 Using File System

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Introduction

This chapter explains File System, a Presentation Manager application that lets you quickly look at and organize your directories and files. From the Directory Tree window you can see the overall directory structure, as well as the contents of individual directories. You use File System commands to copy, delete, or rename your files.

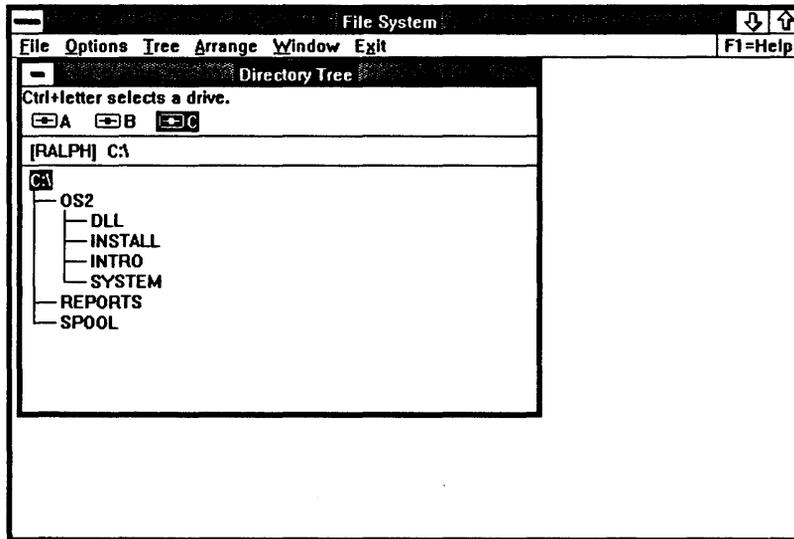
Starting File System

File System is a Presentation Manager application and is started from Start Programs.

 To start File System, do the following:

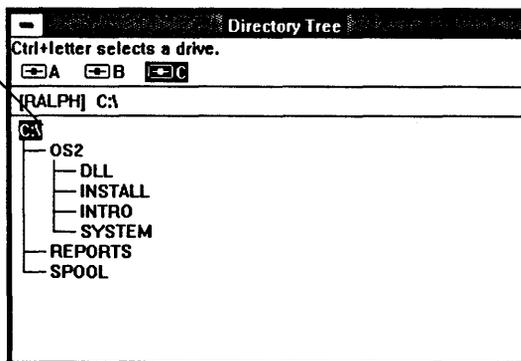
- 1 Move to Start Programs.
- 2 Select the Group menu and choose Main Group.
- 3 Choose File System.

File System appears on your screen with the Directory Tree window displayed in the work area. The Directory Tree window lets you see the layout of your directories and subdirectories on any disk drive. From this window, you can open windows to look at files and subdirectories in individual directories. You can select different drives in order to look at their directory structure. You can open as many directory windows as you like; however, there is only one Directory Tree window.



The MS OS/2 multilevel file system resembles a tree. The tree begins with the *root directory*—the name of the first directory on the disk drive. The root directory is created when you format a disk. It appears as a backslash (\).

Root directory



The branches of the tree are the directories you create from the root directory. Each directory can contain more directories.

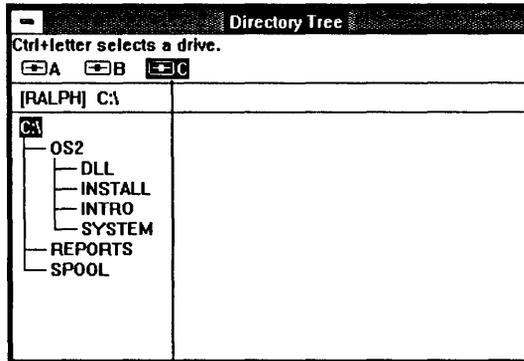
The Directory Tree window contains the following parts:

- The *System-menu box* is in the upper-left corner of the Directory Tree window. You use its commands to move and size the window and to move to other windows in File System.
- The *drive icons* represent disk drives on your computer. A selection cursor shows the current disk drive. A drive letter and a colon (:) represent disk drives. The current drive is listed at the top of the Directory Tree window.
- The *volume label* is a name that identifies your disk; it appears in square brackets ([]). You see this information only if you give your disk a volume label.
- The *directory path* shows the selected directory in the Directory Tree window.
- The *current directory* is the directory marked by the selection cursor in the Directory Tree window. File System commands affect this directory.
- Directories are listed in alphabetical order beneath the root directory (\). All directories are joined to the root directory by a vertical line. If there are any subdirectories below a directory, they appear beneath the directory, connected by a vertical line.
- *Scroll bars* appear if there are more directories and subdirectories than will fit in one Directory Tree window.

The Directory Tree window resembles an application window in Presentation Manager. You can size and move windows within the File System work area; however, you cannot shrink windows to icons.

Changing Disk Drives

When you start File System, the Directory Tree window shows the directory structure on the current disk drive—the disk drive you are working on. The selected disk-drive icon represents the current disk drive.



Disk-drive icon

To look at directories on other disk drives, you must select another disk drive, which then becomes the current disk drive.

 To select a disk drive by using a mouse, do the following:



► Click the disk-drive icon.

 To select a disk drive by using the keyboard, do the following:

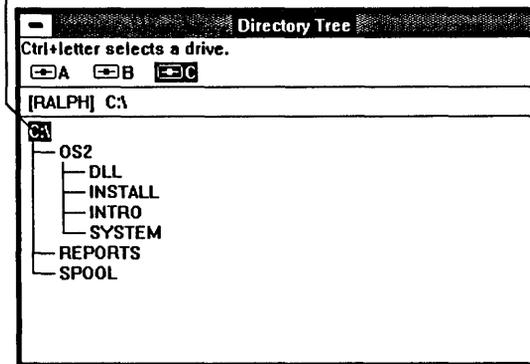


► Press and hold down CTRL, and then press the disk-drive letter.

Changing Directories in the Directory Tree Window

In the Directory Tree window, the selection cursor shows the current directory.

Current directory



You can only select one directory at a time in this window. To change to a different directory, you move the selection cursor.

 To move the selection cursor by using a mouse, do the following:

 ► Click the directory name.

 To select a directory by using the keyboard, do the following:

 ► Press UP or DOWN.

The following list describes several additional keys you can use to move and select in the Directory Tree window.

To select	Press
Root directory	CTRL+HOME
Last directory listed	CTRL+END
First subdirectory of a selected directory, if one exists	RIGHT
Next directory level up from a selected directory, if one exists	LEFT

Directory one window up from a selected directory	PAGE UP
Directory one window down from a selected directory	PAGE DOWN
Directory name or filename	Initial letter

Opening a Directory Window

The Directory Tree window shows you the overall structure of your directories. To see the contents of a directory, you must open a directory window.

Directory windows open in front of the Directory Tree window. All the files and any subdirectories are displayed. The disk drive and directory path appear at the top of the window in the title bar. The directory path shows the location of the directory in relation to the root directory. Directory names are separated by backslashes (\).

 To open a directory window by using a mouse, do the following:



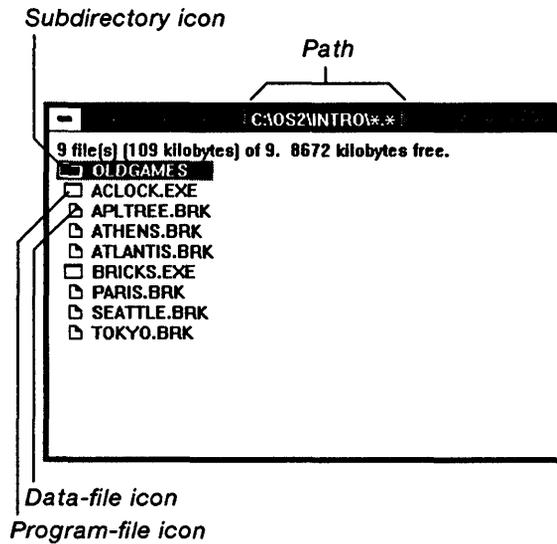
► In the Directory Tree window, double-click the directory name.

 To open a directory window by using the keyboard, do the following:



1 In the Directory Tree window, press the UP or DOWN key to select the directory you want to open.

2 Press ENTER.



Files with a .EXE, .COM, or .CMD filename extension are distinguished by the following icon, which indicates that they are program files:



Other files, such as text files, are distinguished by the following icon (these files are called *data files* in Presentation Manager):



Subdirectories appear at the top of the list of files and are distinguished by the following subdirectory icon:



Selecting in a Directory Window

In directory windows, you must select directories and files before you can use most File System commands.

Selecting a Directory or File

 To select a directory or file by using a mouse, do the following:



▶ Click the directory name or filename.

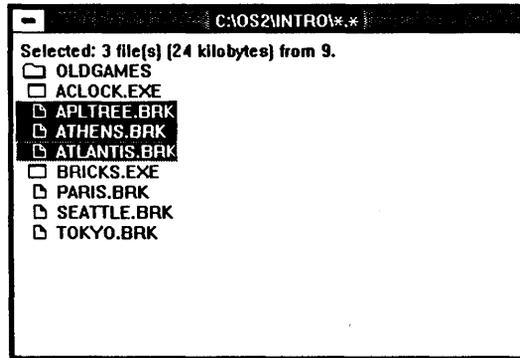
 The following list explains how to select directories or files by using the keyboard:

 To select	Press
Directory name or filename	UP or DOWN
Last directory or file listed	END
First directory or file listed	HOME
File or directory one directory window up	PAGE UP
File or directory one directory window down	PAGE DOWN
Directory name or filename	Initial letter

Note The PAGE UP and PAGE DOWN keys scroll the directory window up or down one window. The selection cursor remains in the same relative position in the window; for example, if the first file in the window is selected before you press the key, the first file in the new directory listing is selected. If you size the directory window so that it displays all files and directories, the selection cursor does not move when you press PAGE UP and PAGE DOWN.

Extending a Selection

In directory windows, you can select more than one item at a time. This is called extending a selection. For example, you can select several files and copy them to another directory.



 To extend a selection by using a mouse, follow these steps:

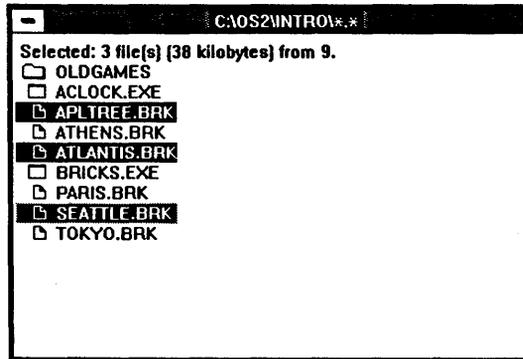
-  1 Select the first item you want in the group by clicking the filename or directory name.
- 2 Press and hold down SHIFT and click the last item in the group.

 To extend a selection by using the keyboard, follow these steps:

-  1 Press the DIRECTION keys to move to the first item you want to select.
- 2 Press SHIFT+DIRECTION key(s) to extend your selection to the remaining items in the group.

Selecting a Scattered Group of Items

You can also extend your selection to include scattered files or directories.



 To select a scattered group of items by using a mouse, do the following:



▶ Press and hold down CTRL and click each item.

 To select a scattered group of items by using the keyboard, follow these steps:



- 1 Press the DIRECTION keys to move to each item.
- 2 Press the SPACEBAR to select an item.

Selecting All Files

 To select all files in a directory window, follow these steps:

- 1 Select the File menu.
- 2 Choose the Select All command.

Canceling a Selection

 To cancel a selection by using a mouse, do the following:

-  ► Click the item and press the SPACEBAR.

 To cancel a selection by using the keyboard, follow these steps:

-  **1** Press the DIRECTION keys to move to the item.
- 2** Press the SPACEBAR.

You can also use two File System commands on the File menu to cancel selections in directory windows: Deselect All and Undo Selection.

File	
Open	Enter
Print	Shift+Print Screen
Associate...	
Move...	
Copy...	
Delete...	Delete
Rename...	
Change attributes...	
Create directory...	
Select all	Ctrl+A
Deselect all	Ctrl+I
Undo selection	F9

You can cancel a selection in a directory window by using the Deselect All command. The selection cursor does not move.

 To cancel all selections, do the following:

- 1** Select the File menu.
- 2** Choose the Deselect All command.

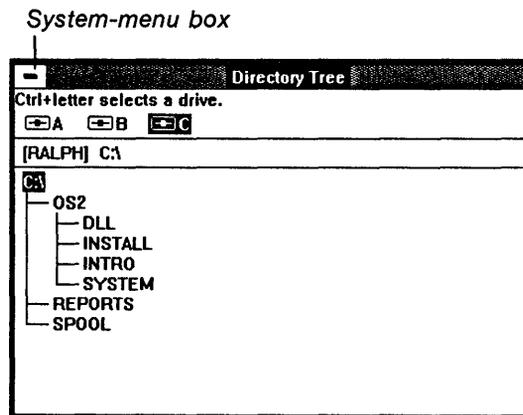
You can cancel your most recent selection in a directory window by using the Undo Selection command.

■ To undo your last selection, follow these steps:

- 1 Select the File menu.
- 2 Choose the Undo Selection command.

Using the System Menu in a File System Window

Each window in File System has a System menu. It is located in the upper-left corner of the window.



■ To select the System menu by using a mouse, do the following:

- ▶ Click the System-menu box.

■ To select the System menu in a File System window by using the keyboard, do the following:

- ▶ Press ALT+SPACEBAR and then press the RIGHT key, or press and hold down CTRL and press - (hyphen key).

The following list describes the commands on the System menu in File System windows:

Command	Action
Next	Selects the next window in the work area
Move	Moves the active window in the work area
Size	Changes the size of the active window
Close	Closes the active window

Selecting a Window

If more than one window is open in File System, you must select the window you want to work in. There are several ways to do this by using a mouse or the keyboard.

 To select a window by using a mouse, do the following:



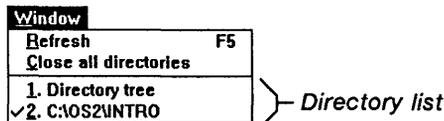
► Click the window.

 To select a window by using the keyboard, you use the Next command on the System menu in the active window. Follow these steps:



- 1 To select the System menu in the active window, press and hold down CTRL and press - (hyphen key).
- 2 Press T to choose the Next command.
- 3 Repeat this process until you select the window you want.

You can also use the Window menu to select windows. The Window menu lists all windows, including the Directory Tree window and any open directory windows (listed by directory name). As you open directory windows, each directory name is added to the Window menu.



 To select a window by using the Window menu, do the following:

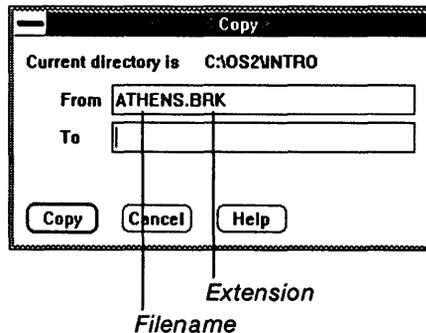
- 1 Select the Window menu.
- 2 Choose the window you want.

Using File System Commands

Before you start working with File System commands, you should become familiar with MS OS/2 naming conventions for files, directories, and disk drives. Although with File System you can use the selection cursor to select files, directories, or disk drives, you may occasionally need to type the names for these items; for example, in a dialog box or while you are working with the MS OS/2 command interpreter.

Naming Files and Directories

The filenames and directory names you create in MS OS/2 can be up to eight characters long. You can add an *extension*, three additional characters, to a filename or directory name, but these must be separated from the name by a period (.).



Often, applications such as word processors automatically add extensions when you create files.

The following characters are reserved for MS OS/2 and cannot be used in directory names or filenames:

< > + = ; , . " / \ []

MS OS/2 also reserves some filenames for its use. The following filenames are reserved:

CLOCK\$	LPT2
COM1	LPT3
COM2	NUL
COM3	POINTERS\$
CON	PRN
KBD\$	SCREENS\$
LPT1	

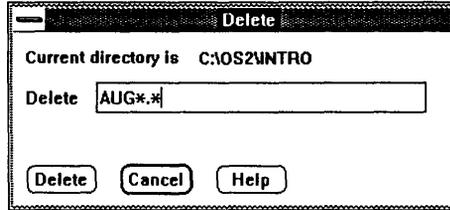
There are two useful characters called *wildcard characters*—the question mark (?) and asterisk (*). These characters have special meaning to MS OS/2. They can take the place of any other characters when you are specifying filenames to MS OS/2.

The question mark replaces any single character. For example, AUG?.TXT matches the files AUG1.TXT, AUG2.TXT, and AUGA.TXT.

Printer Name

PRINTER1	↑
PRINTER2	
	↓

The asterisk replaces zero or more characters in a filename. It matches any character. For example, AUG*.* matches any filename that begins with AUG: the filenames from the previous example (AUG1.TXT, AUG2.TXT, and AUGA.TXT), as well as filenames such as AUGUST.DOC or simply AUG.

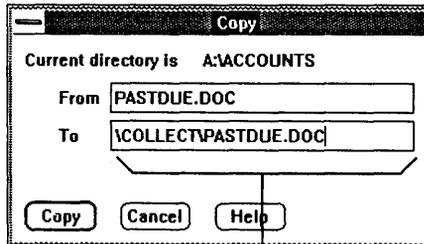


Specifying File Locations

When you are using System commands in File System, you can specify the exact location of a file or directory. This is called giving the *path*. The path includes all directory information MS OS/2 needs to find a file and has the following form:

`[\directory...][\directory...]directory`

The information inside the square brackets ([]) is optional, indicating that you could have more than one directory in a path. Each directory name is separated by a backslash (\). The first backslash represents the root directory. You need to specify a path with a filename only if the file is not in the current directory.



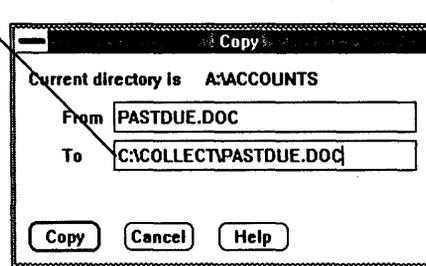
Path

You can add a disk-drive designation to a path. You need to add this information if, for example, you are copying a file to a directory on a different disk-drive. The disk-drive designation has the following form:

drive:

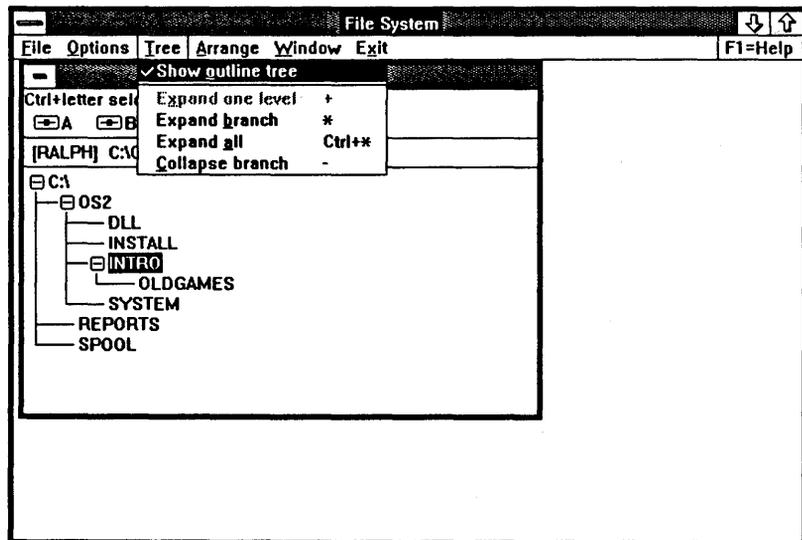
The following example shows the drive designation, path, and filename—the PASTDUE.DOC file in the ACCOUNTS directory on drive A will be copied to the COLLECT directory on drive C.

Disk drive where file will be copied



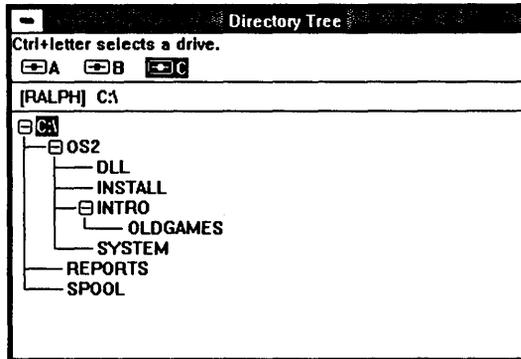
Changing Information in the Directory Tree Window

You can use the Tree menu commands to change the way directories are displayed in the Directory Tree window.



When you first start File System, the entire directory structure is shown. All directories and subdirectories are listed in the Directory Tree window.

The first command on the Tree menu, Show Outline Tree, lets you control the amount of directory information that is displayed for individual directories.



If you choose the Show Outline Tree command, a minus sign (-) is added to the directory name in the window. You use these to "collapse," or hide, individual subdirectories.



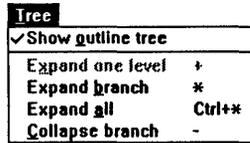
After a directory is collapsed, only the directory name is displayed, no subdirectories are listed beneath the directory name, and the minus sign changes to a plus sign (+).



You "expand" a collapsed directory to see the directory levels again.

 To change the information displayed in the Directory Tree window, do the following:

- ▶ Select the Tree menu and choose the Show Outline Tree command.



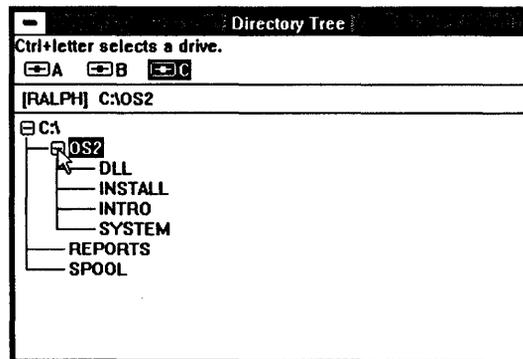
After choosing the Show Outline Tree command, you can use the other commands on the Tree menu to control the amount of information you want displayed in the Directory Tree window.

Collapsing a Directory Level

You can collapse a directory so that the subdirectories are hidden—the minus sign (-) changes to a plus sign (+) next to the directory name.

 To collapse a directory level by using a mouse, do the following:

-  1 Select the directory you want to collapse.
- 2 Click the minus sign (-) to the left of a directory name.



 To collapse a directory level by using the keyboard, do the following:

-  1 Select the directory you want to collapse using the DIRECTION keys.
- 2 Select the Tree menu and choose the Collapse Branch command, or press - (minus or hyphen key).

Expanding a Directory

You can expand a directory to see its subdirectories.

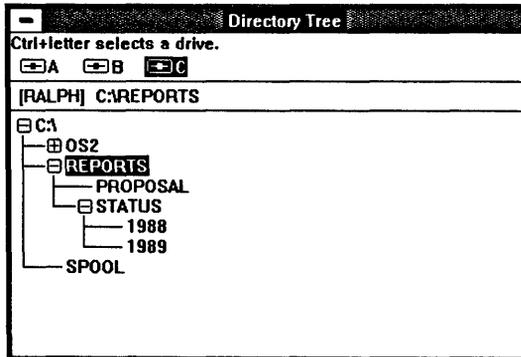
 To expand a directory by using a mouse, follow this step:

- ▶ Click the plus sign (+) next to the directory you want to expand.

 To expand a directory by using the keyboard, do the following:

- 1 Select the directory you want to expand.
- 2 Select the Tree menu and choose the Expand One Level command, or press + (plus key).

Another command on the Tree menu, Expand Branch, lets you see all the directory levels beneath a selected directory.



 Follow these steps to use the Expand Branch command:

- 1 Select the directory you want to expand.
- 2 Select the Tree menu and choose the Expand Branch command.

 To display all the directory levels in the Directory Tree window at once, do the following:

- ▶ Select the Tree menu and choose the Expand All command.

Changing Information in a Directory Window

In directory windows, files are listed by filename only and are sorted in alphabetical order (the default). You can change how files are listed and what file information is displayed by using the Display Options and Full File Details commands on the File System Options menu.

Options	
Display options...	F2
Full file details	Ctrl+=
File options...	
Minimize on run	

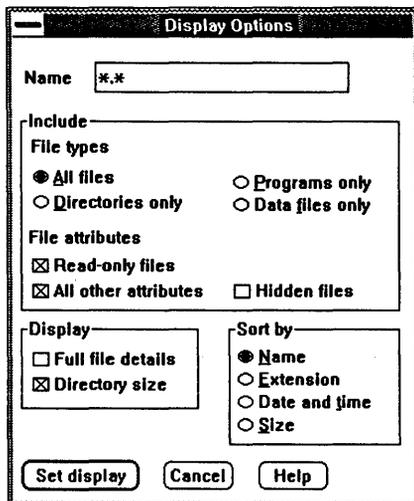
The Display Options command gives you several choices regarding how file information is shown in directory windows. You can control which files are listed, how the files are sorted, and how much file information appears.

You can also control whether the changes you make affect the file listings in all directory windows or in an individual window. If the Directory Tree window is the active File System window when you use either command, the changes you make will affect all directory windows. If a directory window is active, the changes will affect only that directory window.



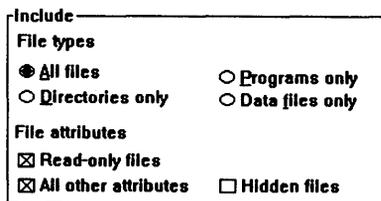
To change how information is shown in a directory window, do the following:

- 1 Select the directory window you want to change (to change all the directory windows, select the Directory Tree window).
- 2 Select the Options menu and choose the Display Options command. The Display Options dialog box appears.



- 3 Change any of the settings in the dialog box.
For more information on completing each section of the Display Options dialog box, see the information following this list.
- 4 Choose the Display Now button. If the Directory Tree window is active, choose the Set Display button. To cancel your changes, choose the Cancel button.

In the Name text box, you can specify which files you want to include in the listing. The default is *.* , meaning all the files in the directory. The Include section of the Display Options dialog box controls which files are included in the directory listing.



Under File Types in the Include section, you can select which of the following files you want listed:

- All Files (the default)
- Directories Only
- Programs Only (files with a .COM, .EXE, or .CMD filename extension)
- Data Files Only (files other than program files)

Under File Attributes in the Include section, you can select one or all of the following attributes you want listed with your files (file attributes are part of the directory information that identifies a file to MS OS/2):

- Read-Only Files (the default, files that cannot be edited or changed)
- All Other Attributes (the default)
- Hidden Files (files that do not appear in directory listings)

The Display section contains the Full File Details and Directory Size check boxes.

Display

<input type="checkbox"/> Full file details
<input checked="" type="checkbox"/> Directory size

The Full File Details option displays all file information—file size, date and time the file was created, and file attributes—on each file in the directory window. The Directory Size option (the default) displays the size of the directory and the number of selected files at the top of each directory window. You can choose both options.

The Sort By section determines the order in which the files appear in a directory window.

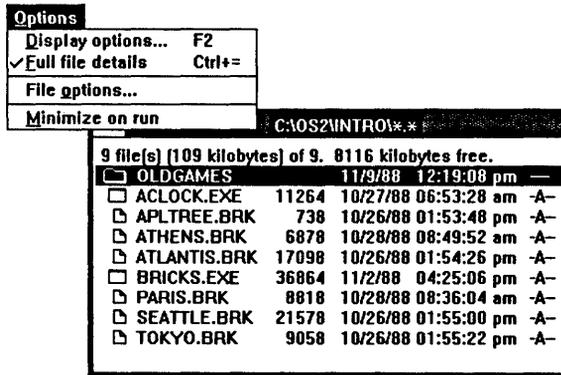
Sort by

<input checked="" type="radio"/> Name
<input type="radio"/> Extension
<input type="radio"/> Date and time
<input type="radio"/> Size

You can sort files in the following ways:

- Alphabetically by name (the default)
- Alphabetically by file extension
- By date and time the file was created
- By size (the largest file appears first)

You can use the Full File Details command on the Options menu as a shortcut to displaying complete file information in directory windows.



Choosing this command has the same effect as turning on the Full File Details check box in the Display Options dialog box.

Follow these steps to use the Full File Details command:

- 1 Select the directory window you want (if you want to see complete file information for all directory windows, select the Directory Tree window).
- 2 Select the Options menu and choose the Full File Details command.

Updating a File System Window

As you use File System commands to organize and manage your files, the information in directory windows may become out-of-date or inaccurate. You can use the Refresh command on the Window menu to update all of your directory windows and the Directory Tree window.

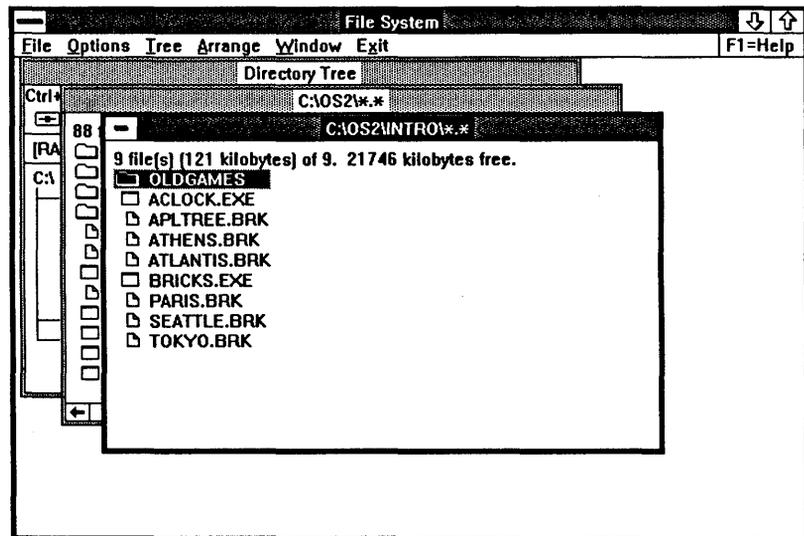
 To use the Refresh command, do the following:

- ▶ Select the Window menu and choose the Refresh command.

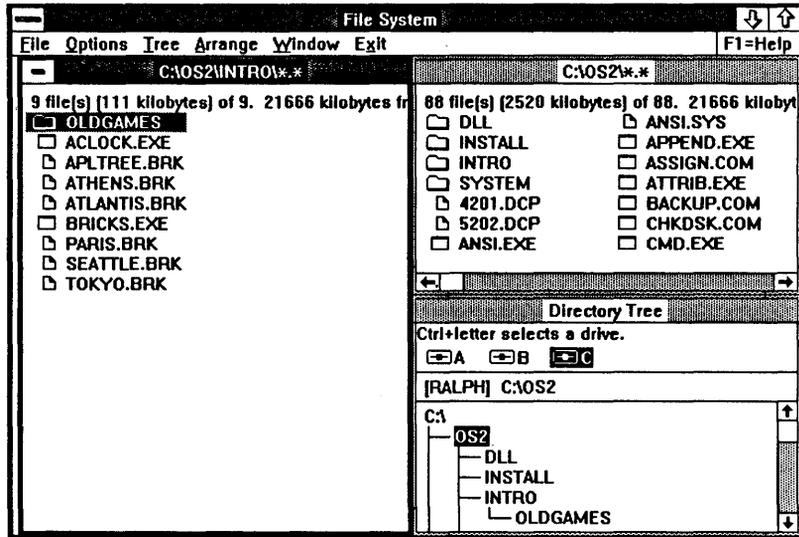
Arranging Windows in File System

File System has two commands on the Arrange menu to help you organize the way windows appear on your screen: Cascade and Tile. These commands arrange File System windows the same way the Cascade and Tile commands in Task Manager arrange your Presentation Manager screen.

The Cascade command arranges windows so that they overlap, starting in the upper-left corner of the File System work area. The title bar of each window remains visible.



The Tile command arranges windows so that each window is visible side-by-side and none of the windows overlap.



To use the Tile or Cascade command, do the following:

- ▶ Select the Window menu and choose either the Tile or Cascade command.

Working with Directories

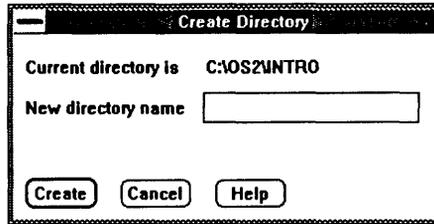
You can also use File System commands while you work with directories.

Creating a Directory

You can create new directories by using the Create Directory command. File System creates a subdirectory of the current directory. To create a directory in a different location, you type the complete path of the new directory in the Create Directory dialog box (for example, \1989\books).

To use the Create Directory command, follow these steps:

- 1 Select the File menu and choose the Create Directory command. The Create Directory dialog box appears.



The current directory is shown in the dialog box.

- 2 To create a subdirectory of the current directory, type the name in the New Directory Name text box; to create a directory in a different location, type the complete directory path.
- 3 Choose the Create button.

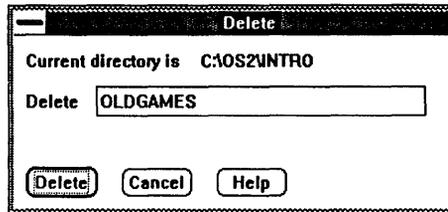
You can copy files into the directory by using the Move or Copy commands on the File menu, or you can create files by using your application. For more information on these commands, see “Working with Files,” later in this chapter.

Deleting a Directory

You can delete a directory by using the Delete command on the File menu. Deleting a directory also deletes any files or directories within the directory.

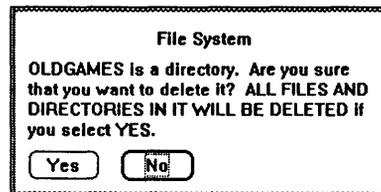
To delete a directory, do the following:

- 1 Select the directory you want to delete from the Directory Tree window or from a directory window.
- 2 Select the File menu and choose the Delete command.
The Delete dialog box appears.



The selected directory name is displayed in the Delete text box.

- 3 Choose the Delete button.
A warning message appears, asking you to confirm that you want to delete the directory and any files or directories contained within it.

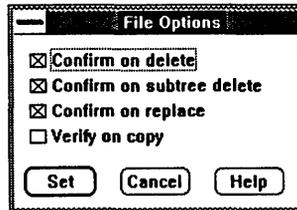


- 4 Choose the Yes button to delete the directory; choose the No button to cancel the command.

You can turn off the Delete warning message by using the File Options command on the Options menu. Warning messages appear when you use some File System commands.

 Follow these steps to use the File Options command:

- 1 Select the Options menu and choose the File Options command.
The File Options dialog box appears.



- 2 Turn off the Confirm On Subtree Delete check box.
- 3 Choose the Set button.

Moving a Directory

You can move a directory by dragging it with a mouse or by using the Move command on the File menu.

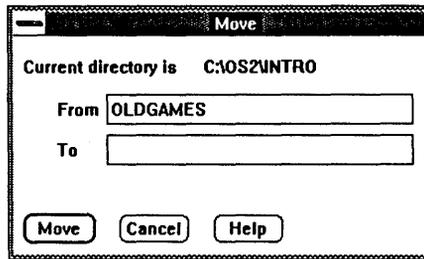
 To move a directory by using a mouse, follow these steps:

- 1  Open a window on the directory that contains the directory you want to move (for example, if the directory is in your root directory, open a root-directory window).
- 2 Open a directory window on the destination directory.
- 3 Click the directory you want to move.
- 4 Press and hold down ALT and drag the directory icon to the destination directory window.

Both windows must be visible in order for you to move directories by using a mouse. When you release the mouse button, a copy of the directory appears in the destination directory window. You can move a directory only to another directory window, not to the Directory Tree window.

 To move a directory by using the keyboard, follow these steps:

-  **1** Open a window on the directory that contains the directory you want to move.
- 2** Select the directory you want to move.
- 3** Select the File menu and choose the Move command.
The Move dialog box appears.



The directory you selected appears in the From text box.

- 4** Type the destination directory in the To text box.
- 5** Choose the Move button.

You can move more than one directory at a time by extending your selection. For more information on extending a selection in a directory window, see "Selecting in a Directory Window," earlier in this chapter.

Copying a Directory

You can copy one directory to another by using either a mouse or the Copy command on the File menu.

 To copy directories by using a mouse, follow these steps:

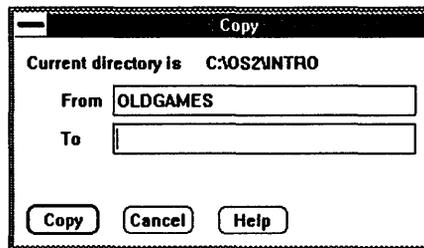
-  **1** Open a window on the directory that contains the directory you want to copy (for example, if the directory is a subdirectory of your root directory, open a root-directory window).
- 2** Open a directory window on the destination directory.
- 3** Drag the directory icon to the destination directory window.

Both directory windows must be visible in order for you to copy directories by using a mouse. When you release the mouse button, a copy of the directory appears in the destination directory window.

 Follow these steps to copy directories by using the keyboard:



- 1 Open a window on the directory that contains the directory you want to copy.
- 2 Select the directory you want to copy.
- 3 Select the File menu and choose the Copy command.
The Copy dialog box appears.



The directory you selected appears in the From text box.

- 4 Type the destination directory in the To text box.
- 5 Choose the Copy button.

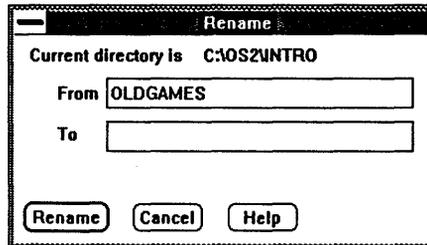
You can copy more than one directory at a time to a destination directory by extending your selection in the directory window. For more information on extending a selection in a directory window, see “Selecting in a Directory Window,” earlier in this chapter.

Renaming a Directory

You can rename a directory by using the Rename command on the File menu.

To rename a directory, do the following:

- 1 Open a window on the directory that contains the directory you want to rename.
- 2 Select the directory you want to rename.
- 3 Select the File menu and choose the Rename command.
The Rename dialog box appears.



The directory you selected appears in the From text box.

- 4 Type the new name in the To text box.
- 5 Choose the Rename button.

Working with Files

File System commands can be used to organize your files.

Moving a File

You can move a file by dragging it with the mouse or by using the Move command on the File menu.

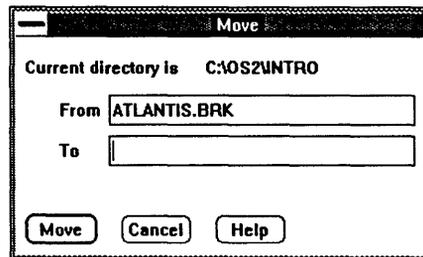
 To move a file between directories by using a mouse, follow these steps:

-  **1** Open a window on the directory that contains the file you want to move.
- 2** Open a window on the destination directory.
- 3** Click the file you want to move.
- 4** Press and hold down ALT and drag the file icon to the destination directory.

Both directory windows must be visible in order for you to move files by using a mouse.

 To move a file by using the keyboard, follow these steps:

-  **1** Open a window on the directory that contains the file you want to move.
- 2** Select the file in the directory window.
- 3** Select the File menu and choose the Move command.
The Move dialog box appears.



The file you selected appears in the From text box.

- 4** Type the destination directory in the To text box.
- 5** Choose the Move button.

You can move more than one file to another directory by extending your selection in the directory window or by using wildcard characters to specify filenames in the Move dialog box.

Copying a File

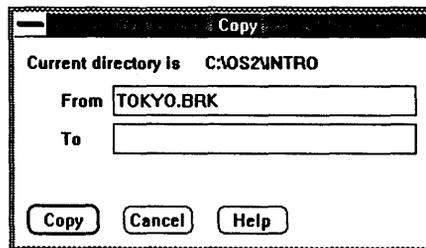
You can copy a file by using a mouse or by using the Copy command on the File menu. If you use a mouse to copy a file, the file must be copied to a different directory. To create a copy of a file in the same directory, use the Copy command on the File menu.

 To copy a file by using a mouse, follow these steps:

-  **1** Open a window on the directory that contains the file you want to copy.
- 2** Open a window on the destination directory.
- 3** Click the file you want to copy.
- 4** Drag the file icon to the destination directory.

 Follow these steps to copy a file by using the keyboard:

-  **1** Open a window on the directory that contains the file you want to copy.
- 2** Select the file you want to copy.
- 3** Select the File menu and choose the Copy command.
The Copy dialog box appears.

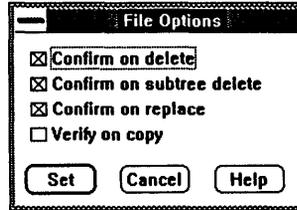


The file you selected appears in the From text box.

- 4** Type the new filename, or the path of the directory you want to copy the file to, in the To text box.
- 5** Choose the Copy button.

You can copy more than one file at a time, either by using wildcard characters to specify filenames in the Copy dialog box or by extending your selection in the directory window.

The File Options command on the Options menu contains two options that you can use when copying files: Confirm On Replace and Verify On Copy.



The Confirm On Replace check box displays a warning message if you attempt to copy a file to an existing filename. The Verify On Copy check box tells File System to check that an exact copy of the file was created.

To turn on the Confirm On Replace option and/or the Verify On Copy option, do the following:

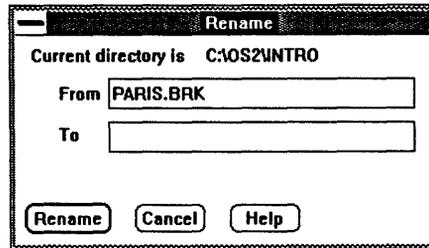
- 1 Select the Options menu and choose the File Options command.
- 2 Turn on the options you want.
- 3 Choose the Set button.

Renaming a File

You can rename a file by using the Rename command on the File menu. Follow these steps:

- 1 Open a window on the directory that contains the file you want to rename.
- 2 Select the file you want to rename.
- 3 Select the File menu and choose the Rename command.

The Rename dialog box appears.



The file you selected appears in the From text box.

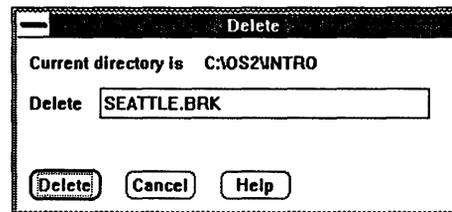
- 4 Type the new name in the To text box.
- 5 Choose the Rename button.

Deleting a File

 You can delete a file by using the Delete command on the File menu. Follow these steps:

- 1 Open a window on the directory that contains the file you want to delete.
- 2 Select the file you want to delete.
- 3 Select the File menu and choose the Delete command.

The Delete dialog box appears.



The file you selected appears in the Delete text box.

- 4 Choose the Delete button.

You can delete more than one file at a time, either by using wildcard characters to specify filenames in the Delete dialog box or by selecting more than one file in the directory window.

Note You cannot delete some MS OS/2 files. If you attempt to delete an MS OS/2 system file or a file that an application is using, you receive a message that the file cannot be deleted at the present time. Because MS OS/2 is a multitasking system, it protects you from deleting files that other programs are using, and protects you from deleting important system files, such as the OS2.INI file or the program files that are part of the operating system.

Printing a File

You can use the Print command on the File menu to print text files from File System. Most MS OS/2 applications have a print command you can use to print files that were created with the application. You should use that command, rather than the File System Print command, whenever possible. Before you use the Print command, you should set up your printer. If you did not set up a printer when you installed MS OS/2, add your printer using Control Panel. For more information, see Chapter 5, "Printing Files."

 To print files from File System, follow these steps:

- 1 Select the file you want to print.
- 2 Select the File menu and choose the Print command.

Starting an Application

You can start an MS OS/2 application from File System by opening the program file. Application files have a .COM, .EXE, or .CMD file-name extension. If the application can run in a window, the window will appear in front of File System when you start it. If the application is a full-screen application, the application screen will replace the Presentation Manager screen.

If the application is a DOS application, you cannot start it from File System. You must move to the DOS session to start it.

Note If you plan to use an application frequently, add it to Start Programs rather than starting it from File System. For more information on adding applications to Start Programs, see Chapter 2, "Running Applications with MS OS/2."

 To start an application by using a mouse, do the following:

-  **1** Open the directory window that contains the application file.
- 2** Double-click the filename.

 To start an application by using the keyboard, do the following:

-  **1** Open the directory window that contains the application file.
- 2** Select the application filename.
- 3** Select the File menu and choose the Open command.

Or

- ▶ Select the filename in the directory window and press ENTER.

You can use the Minimize On Run command on the Options menu to automatically shrink File System to an icon whenever you start an application.

Options	
Display options...	F2
Full file details	Ctrl+=
File options...	
<input checked="" type="checkbox"/> Minimize on run	

 To use the Minimize On Run command, do the following:

- ▶ Select the Options menu and choose the Minimize On Run command.

Associating Application Files

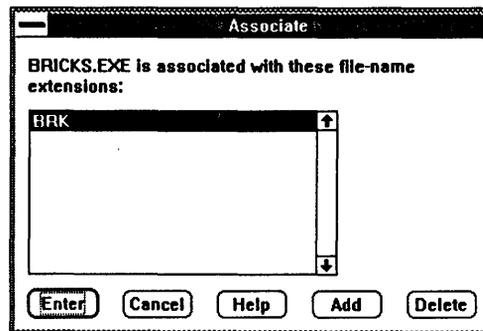
The Associate command allows you to associate an application file with other filename extensions. For example, you can associate data files with the application you used to create them. Often, the data files created with an application have a particular filename extension; for example, files created with the Bricks application have the filename extension .BRK. With the Associate command, you can associate the data filename extension with the application so that opening the data file in File System starts the application.

You can associate files in two ways:

- By selecting the program file and providing the filename extensions you want to associate with it.
- By selecting a filename extension and providing the program file you want to associate with it.

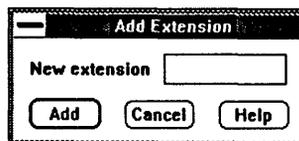
 Follow these steps to use the Associate command:

- 1 Open a directory window that contains a file you want to associate. The file can be either a program file or a file with the filename extension that you want to associate.
- 2 Select the file you want to associate.
- 3 Select the File menu and choose the Associate command. The Associate dialog box appears.



The program file or the filename extension of the data file is displayed. Any files or filename extensions that are already associated are listed.

- 4 Choose the Add button. The Add Extension dialog box appears.



- 5 To associate an extension with a program file, type the extension in the New Extension text box and choose the Add button.

To associate an application file with an extension, type the path of the program file in the New Program text box and choose the Add button.

- 6 Choose the Enter button.

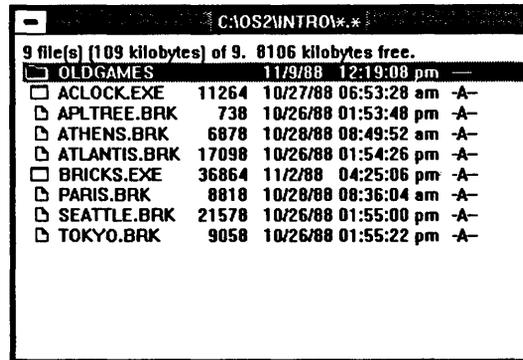
You can associate a filename extension with more than one application. Then when you open a file with an associated filename extension, a dialog box appears, asking you to select the application you want to start.

 You can remove a file or a filename extension from the list of associated files. Follow these steps:

- 1 Open a directory window that contains the application file or filename extension you want to delete.
- 2 Select the file that you want to delete from the list of associated files.
- 3 Select the File menu and choose the Associate command.
If you choose an application file, a list of filename extensions associated with it is displayed. If you choose a file with an associated extension, a list of associated program files is displayed.
- 4 Select the item, either the program file or the filename extension, you no longer want associated.
- 5 Choose the Delete button.
- 6 Choose the Enter button.

Setting File Attributes

File attributes are part of the directory information for a file. This information helps identify a file to MS OS/2 and controls the kinds of operations you perform on the file. You can see the file attributes in a directory window by choosing the Full File Details command on the Options menu. This displays all the file information, including the attribute information, in a directory window.



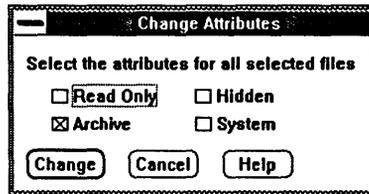
Attributes can be turned on and off using the Change Attributes command on the File menu. There are four MS OS/2 file attributes:

- The *Read Only* attribute prevents a file from being changed. When it is turned on, the letter “R” appears in the attribute information column in the directory listing.
- The *Archive* attribute is turned on by MS OS/2 utilities such as **backup** and **xcopy**. When it is turned on, the letter “A” appears in the attribute information column in the directory listing. Other applications such as text editors then turn off this attribute to show that the file has been changed.
- The *Hidden* attribute prevents a file from appearing in most directory listings. When it is turned on, the letter “H” appears in the directory listing. You can display hidden files by using the Display Options command on the Options menu.
- The *System* attribute identifies a file as an MS OS/2 system file. When it is turned on, the letter “S” appears in the directory listing. You cannot delete the file when this attribute is set.

This attribute, like the Hidden attribute, prevents a file from appearing in directory listings.

 To turn file attributes on or off, do the following:

- 1 Open a directory window that contains the file for which you want to set attributes.
- 2 Select the file.
- 3 Select the File menu and choose the Change Attributes command. The Change Attributes dialog box appears.



- 4 Turn on or off the attributes you want.
- 5 Choose the Change button.

You can change the attributes of more than one file at a time by extending your selection in the directory window.

Closing a Directory Window

You can close any windows in File System except the Directory Tree window. You can close directory windows by using the Close command on the System menu or by using a mouse.

 To close a directory window by using a mouse, do the following:



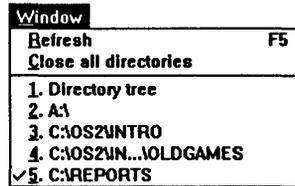
- ▶ Double-click the System-menu box in the directory window.

 To close a directory window by using the keyboard, do the following:



- ▶ Press and hold down CTRL and press - (hyphen key) to select the System menu in the directory window and choose the Close command.

You can close all directory windows at once by using the Close All Directories command on the Window menu.



To close all directories, do the following:

- ▶ Select the Window menu and choose the Close All Directories command.

Quitting File System

You can quit File System by using the Exit File System command on the Exit menu. File System asks if you want to save your settings. If you choose to save settings, settings created with the following commands are saved:

- Display Options (Options menu)
- File Options (Options menu)
- Minimize On Run (Options menu)
- Show Outline Tree (Tree menu)

To quit File System, do the following:

- 1 Select the Exit menu and choose the Exit File System command. The Exit File System dialog box appears.
- 2 To save your settings, turn on the Save Settings check box.
- 3 Choose the Yes button.

If you choose the Resume command on the Exit menu, you return to File System.



4 Maintaining Disks

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Introduction

MS OS/2 utilities are programs you can use to accomplish common tasks such as formatting floppy disks, making backup copies of files, and checking available storage space on disks. How you start a utility depends on the task you want to accomplish. For example, if you want to provide additional information such as a destination-disk drive or a filename when you start a utility, it makes sense to start the MS OS/2 command interpreter, **cmd**, and start the utility from the MS OS/2 command line. On the other hand, if MS OS/2 does not need any additional information in order to run the utility correctly, you should start it from File System. If you use a utility frequently, you may want to add it to Start Programs.

In this chapter, you'll find information on starting utilities from Start Programs. For more information on how to start utilities or other programs, see Chapter 2, "Running Applications with MS OS/2"; Chapter 8, "Using MS OS/2 Utilities"; and Chapter 11, "Maintaining Your System." For additional information on a particular utility, see the entry for the utility in the *Microsoft Operating System/2 Desktop Reference*.

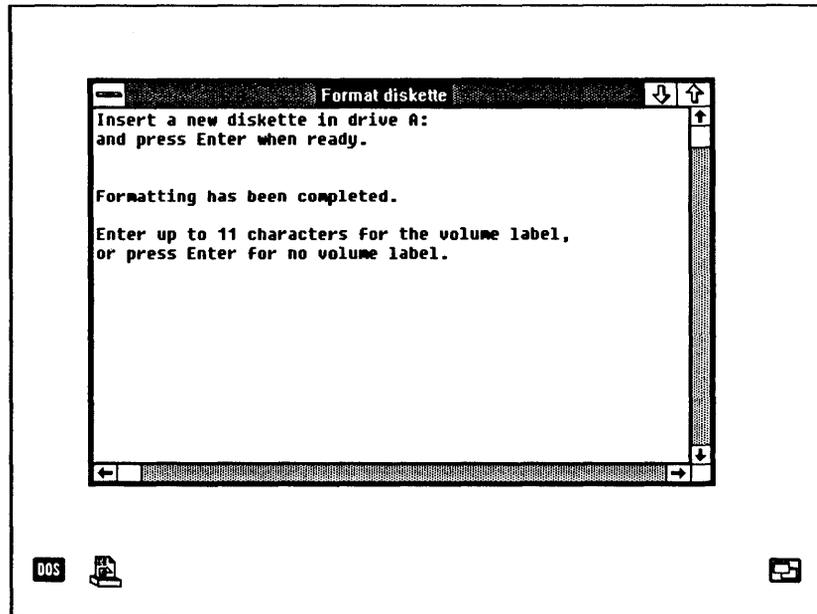
Formatting a Floppy Disk

Before you use new floppy disks, you must format them by using the **format** utility. This prepares the disk so that MS OS/2 can store and retrieve information. The **format** utility writes directory information to the floppy disk, checks for unusable parts of the disk, and asks you to name the disk by prompting you for a *volume label*, a name that identifies the disk; this label can be up to eleven characters.

 To start the **format** utility from Start Programs to format a floppy disk, do the following:

- 1 Move to Start Programs.
- 2 Select the Group menu and choose the Utility Programs group.
- 3 Choose Format Diskette.
- 4 The **format** utility starts and prompts you to insert a new floppy disk in drive A.
- 5 Insert the disk and press ENTER.

As the disk is formatted, MS OS/2 displays messages showing its progress. After the formatting is complete, MS OS/2 prompts you for a volume label.



- 6 Type the name you want, or press ENTER if you don't want to name the disk.
- 7 MS OS/2 then asks if you want to format another disk. Choose either the Yes button or the No button.

~~8~~ To format a floppy disk in drive B, do the following:

- 1 Move to Start Programs.
- 2 Start OS/2 Windowed Command Prompt.
- 3 Type **format b:** at the prompt, and then press ENTER.
MS OS/2 asks you to insert a disk in drive B.
- 4 Insert the disk and press ENTER.

Checking Disk Space

The `chkdsk` utility shows you how much storage capacity your computer has available. In the DOS session, `chkdsk` also shows how much memory is available (memory in the DOS session is limited to 640K).

The following example is a typical `chkdsk` report:



```
Completed: Disk Information - CHKDSK
Volume RALPH created -- 10-10-1988 3:55pm

31715328 bytes total disk space.
  0 bytes in 1 hidden files.
 22528 bytes in 8 directories.
15448064 bytes in 338 user files.
 30720 bytes in bad sectors.
16214016 bytes available on disk.
```

The report begins by showing the disk volume label, if any, then the following information:

- Total disk space in bytes.
- The number of bytes occupied by hidden files. Hidden files are usually system files that don't appear in directory listings.
- The number of bytes occupied by directories.
- The number of files and bytes occupied by *user files*. User files are all files on your system except hidden files and directories.
- The number of bytes occupied by *bad sectors* on the disk, areas that cannot be used to store information.
- The total number of bytes available on the disk.

To convert the number of bytes available to kilobytes, divide the number of bytes by 1024.

 To start the **chkdsk** utility, do the following:

- 1 Move to Start Programs.
- 2 Select the Group menu and choose the Utility Programs group.
- 3 Choose Disk Information—CHKDSK.

The **chkdsk** utility checks the storage space on the disk drive you started MS OS/2 from, and then displays a report.

- 4 After **chkdsk** finishes reporting on the disk drive, select the System menu and choose the Close command to close the window.

 You can also check disk space on other disk drives. Follow these steps:

- 1 Move to Start Programs.
- 2 Start OS/2 Windowed Command Prompt.
- 3 At the **cmd** prompt, type **chkdsk**, the disk-drive letter (of the drive you want to check), and a colon (:).

For example, you would type **chkdsk a:** to check the storage capacity of drive A.

- 4 After **chkdsk** finishes reporting on the disk drive, select the System menu and choose the Close command to close the window.

If a disk contains errors that affect recovering information, **chkdsk** displays a message. For more information on interpreting **chkdsk** messages and correcting disk errors, see Chapter 11, “Maintaining Your System” and the **chkdsk** entry in the *Microsoft Operating System/2 Desktop Reference*.

5 Printing Files

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Introduction

Two Presentation Manager applications, Spooler Queue Manager and Control Panel, help you set up printers and control and organize your printing.

When you install MS OS/2 on your computer, the installation program asks for information about your printer. You can change this information by adding new printers, changing existing printers, or adding new printing software using the commands in Control Panel.

Spooler Queue Manager lets you control your print job after it is sent to your printer. With Spooler Queue Manager, you can cancel jobs or hold print jobs during printing. Spooler Queue Manager starts each time you start Presentation Manager. Its icon appears in the icon area when you turn on your computer or restart MS OS/2 by pressing CTRL+ALT+DEL.

Printing a File

If you have a printer connected to your computer, you can print text files from Presentation Manager, from the MS OS/2 command interpreter (`cmd`), from the DOS session, or by using your application's print command.

 To print a text file from Presentation Manager, follow these steps:

- 1 Switch to Start Programs and start File System.
- 2 In File System, open a directory window that contains the file you want to print.

- 3 In the directory window, select the file you want to print.
- 4 Select the File menu and choose the Print command.

File	
Open	Enter
Print	Shift+Print Screen
Associate...	
Move...	
Copy...	
Delete...	Delete
Rename...	
Change attributes...	
Create directory...	
Select all	Ctrl+A
Deselect all	Ctrl+I
Undo selection	F9

 You use the **print** utility to print files from the MS OS/2 command interpreter (**cmd**) or from the DOS session by doing the following:

- 1 Switch to Start Programs and start OS/2 Windowed Command Prompt. To print from the DOS session, use Task Manager to switch to the DOS session.
- 2 At the prompt, type **print**, the directory path (if necessary), and the filename of the file you want to print.
- 3 Press ENTER.

For example, to print the file PROPOSAL.TXT in the PROJECT directory on drive C, you type the following:

print c:\project\proposal.txt

For more information on the **print** utility, see Chapter 8, "Using MS OS/2 Utilities," and the **print** entry in the *Microsoft Operating System/2 Desktop Reference*.

To print from your application, see your application manual for information on its print command.

Managing Printing with Spooler Queue Manager

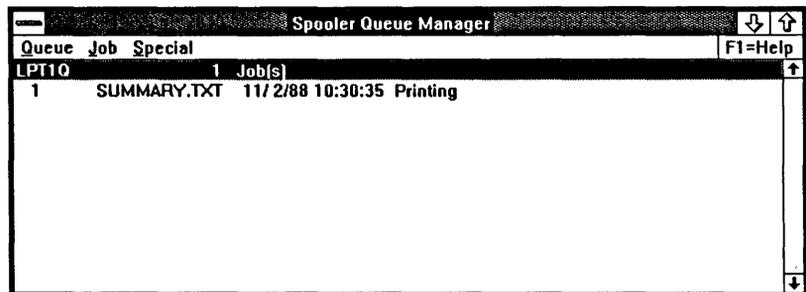
Spooler Queue Manager helps you control printing. You should be familiar with the following terms before you use Spooler Queue Manager:

- A *print queue* is a list of files waiting to be printed. You must connect your printer to a print queue. A printer can have more than one queue, but it can be connected to only one queue at a time.
- A *print job* is a file that has been sent to your printer.
- A *job identifier* is a number that identifies the print job.

With Spooler Queue Manager, you can see the status of all of your print jobs. You can see status information on an entire print queue or on individual print jobs.

To check on the status of a print job, do the following:

- ▶ Switch to Spooler Queue Manager.



In the Spooler Queue Manager work area you see each print queue listed along with the number of print jobs (files) in the queue. Each print job is identified by a job identifier, a filename, and the date and time it was sent to your printer.

You use the selection cursor to select a print job or queue before you can use Spooler Queue Manager commands. You can select only one item at a time. If you select a print queue, you can use the commands on the Queue menu; if you select a print job, you can use the commands on the Job menu.

Controlling Print Queues

You can stop, restart, or cancel printing by controlling the print queue; for example, you may need to stop printing to change paper or fix a problem with your printer. You use the commands on the Queue menu to control print queues.

You can stop printing by using the Hold Queue command on the Queue menu. If a file is printing when you choose this command, it finishes printing.

To use the Hold Queue command, follow these steps:

- 1 Select a print queue in the Spooler Queue Manager work area.
- 2 Select the Queue menu and choose the Hold Queue command.



To resume printing, do the following:

- 1 Select the print queue in the Spooler Queue Manager work area.
- 2 Select the Queue menu and choose the Release Queue command.

Controlling Print Jobs

You can control print jobs—files that you are printing on a printer—using Spooler Queue Manager commands.

Looking at Print Job Information

You can find out information on a particular print job by using the Job Details command on the Job menu.

NOTE To see print job information, do the following:

- 1 Select the print job you want in the Spooler Queue Manager work area.
- 2 Select the Job menu and choose the Job Details command.

The Job Details dialog box appears (for an explanation of the information in the different dialog box areas, see the list following this procedure).

The screenshot shows a dialog box titled "Job Details" with the following fields and values:

Comment String	|←|	|→|
Document Name	|←|PROPOSAL.TXT	|→|
Job Identifier	6	
Device	IBM4201	
Job Priority	50	
Forms Code		
Queue Processor Name	PMPRINT	
Processor Parameters	|←|	|→|
Networking Parameters	|←|	|→|
Date	11/ 1/88	
Time	14:12:32	

At the bottom of the dialog box, there are two buttons: "Enter" and "F1=Help".

- 3 When you finish looking at the print job information, choose the Enter button.

The following list explains the different options that appear in the Job Details dialog box areas.

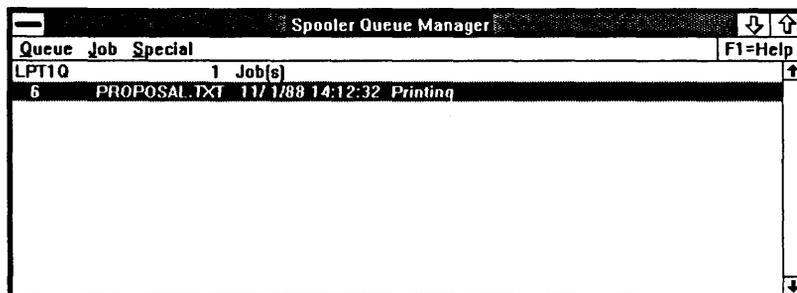
- The Comment String section lists the name of the application you used to send the print job. This section may be blank. If you print a file from the MS OS/2 command interpreter (**cmd**) or from the DOS session, "System" appears in this section.
- The Document Name section contains the name of the file you are printing.
- The Job Identifier section contains the identification number of your print job in the queue.
- The Device section contains the name of the device driver (the program that controls your printer). The name of the printer port appears in this area when your job is printing.
- The Job Priority box indicates the priority of your print job. This is represented by a number from 1 through 99; the default is 50 (the higher the number, the higher the priority).
- The Forms Code section shows the print-job paper size.
- The Queue Processor Name section contains the name of the program that sent the print job to your printer.
- The Processor Parameters section contains any additional information needed by the queue-processing program.
- The Networking Parameters section contains any additional information needed for sharing your printer over a network.
- The Date section shows the date you sent the print job to your printer.
- The Time section shows the time you sent the print job to your printer.

Canceling a Print Job

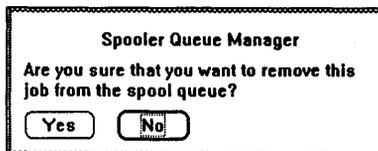
You can prevent a file from printing or stop it completely by canceling the print job. When you cancel a print job, the job is removed from the print queue.

To cancel a print job, use the Cancel Job command on the Job menu. Follow these steps:

- 1 Select the print job you want to cancel in the Spooler Queue Manager work area.



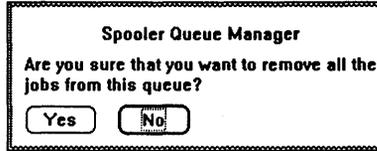
- 2 Select the Job menu and choose the Cancel Job command. A dialog box appears, asking you to confirm the cancellation.



- 3 Choose the Yes button to cancel the print job.

■ You can cancel all print jobs in a print queue by doing the following:

- 1 Select the queue name in the Spooler Queue Manager work area.
- 2 Select the Queue menu and choose the Cancel All Jobs command.
A dialog box appears, asking you to confirm that you want all the jobs removed from the queue.



- 3 Choose the Yes button to cancel the print jobs.

Moving a Print Job in the Print Queue

You can prioritize a particular print job so that it prints ahead of other jobs in the queue by using the Print Job Next command on the Job menu. The file is printed as soon as the printer becomes available.

■ To move a print job to the top of the queue, follow these steps:

- 1 Select the print job in the Spooler Queue Manager work area.
- 2 Select the Job menu and choose the Print Job Next command.
The priority of the print job is set to 99—the highest priority.

You can also change the priority of a print job by using the Job Details command on the Job menu. The priority of a print job is represented by a number from 1 through 99; the default is 50 (the higher the number, the sooner the job is printed).

To change the priority of a print job, do the following:

- 1 Select the print job in the Spooler Queue Manager work area.
- 2 Select the Job menu and choose the Job Details command.

The Job Details dialog box appears, displaying information on the job.

The screenshot shows a dialog box titled "Job Details" with the following fields and values:

Comment String	|←|	|→|
Document Name	|←|	PROPOSAL.TXT |→|
Job Identifier	6	
Device	IBM4201	
Job Priority	50	
Forms Code		
Queue Processor Name	PMPRINT	
Processor Parameters	|←|	|→|
Networking Parameters	|←|	|→|
Date	11/ 1/88	
Time	14:12:32	

At the bottom of the dialog box, there are two buttons: "Enter" and "F1=Help".

- 3 Move to the Job Priority box and select the current priority; type a new priority—a number from 1 through 99.
- 4 Choose the Enter button.

Files are printed in the order of their priority. If print jobs share the same priority, they are printed in the order they appear in the Spooler Queue Manager work area.

Repeating a Print Job

You can print a file more than once by using the Repeat Job command on the Job menu.

☰ Follow these steps to use the Repeat Job command:

- 1 Select the print job in the Spooler Queue Manager work area.
- 2 Select the Job menu and choose the Repeat Job command.

Starting a Print Job Over

Sometimes you may want to stop and restart a print job that is currently printing; for example, when you have problems with your printer. You can restart a job by using the Start Job Again command on the Job menu. Spooler Queue Manager stops and restarts the job.

☰ To start a print job over, follow these steps:

- 1 In the Spooler Queue Manager work area, select the print job you want to start over. The job must currently be printing. The status information for the print job in Spooler Queue Manager must be "Printing."
- 2 Select the Job menu and choose the Start Job Again command.

Holding a Print Job

You can temporarily prevent print jobs from printing by using the Hold Job command on the Job menu. The print job is held until you release it by using the Release Job command.

☰ To use the Hold Job command, do the following:

- 1 In the Spooler Queue Manager work area, select the print job you want held.
- 2 Select the Job menu and choose the Hold Job command.



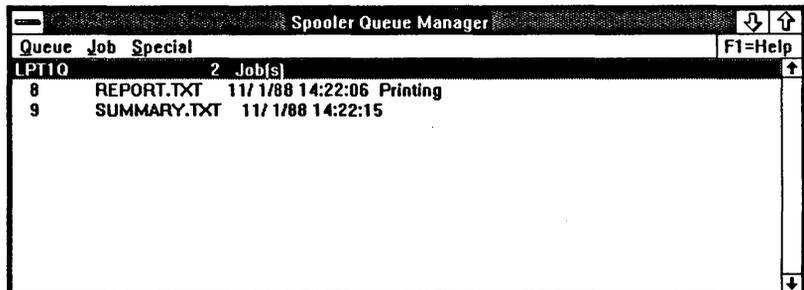
To release a job, follow these steps:

- 1 In the Spooler Queue Manager work area, select the print job that is held.
- 2 Select the Job menu and choose the Release Job command.



You can temporarily prevent all jobs from printing by using the Hold All Jobs command on the Queue menu. Follow these steps:

- 1 In the Spooler Queue Manager work area, select the print queue that contains the jobs you want held.



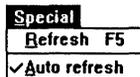
- 2 Select the Queue menu and choose the Hold All Jobs command.

To release all print jobs held in a queue, you can use the Release All Jobs command by doing the following:

- 1 In the Spooler Queue Manager work area, select the print queue that contains the jobs you want to release.
- 2 Select the Queue menu and choose the Release All Jobs command.

Updating Spooler Queue Manager Information

The information in the Spooler Queue Manager work area is always changing as print jobs finish and new print jobs are started. Two commands on the Special menu can be used to keep this information current.



The Auto Refresh command automatically updates the listings in the Spooler Queue Manager work area each time information changes. This command is in effect by default and a check mark appears by its name on the Special menu.

You can turn the Auto Refresh command on and off by doing the following:

- ▶ Select the Special menu and choose the Auto Refresh command.

If the Auto Refresh command is not in effect, you can update print-job information in the Spooler Queue Manager work area by using the Refresh command.

To use the Refresh command, do the following:

- ▶ Select the Special menu and choose the Refresh command.

Setting Up a Printer with Control Panel

You use Control Panel to change how your printer is set up, add and remove printers, and set up a default printer (if you have more than one printer installed) for your system. Control Panel also lets you change Spooler Queue Manager options such as print-queue names and printer connections.

When you set up MS OS/2, the installation program asks for information about your printer. You see these settings in Control Panel. The information in this section will help you change settings or create new ones. In many cases, the settings you create when you set up MS OS/2 are sufficient.

■ To start Control Panel, do the following:

- 1 Move to Start Programs.
- 2 Select the Group menu and choose the Utility Programs group.
- 3 Choose Control Panel.

Before you use the printer commands in Control Panel, there are a few terms you should know:

- *Printer names* are names you assign to your printers. If you installed a printer when you set up MS OS/2, the printer name is PRINTER1 (the default).
- The *default printer* is the printer your files are sent to by your application. If you have more than one printer installed, you must choose a printer to be the default printer.
- *Ports* are the slots in your computer where you connect your printer. There are three printer ports (LPT1, LPT2, LPT3) and three communications ports (COM1, COM2, COM3). You connect parallel printers to printer ports and serial printers to communications ports. You connect a printer to a particular port by plugging it in or, if you are sharing a printer over a network, by assigning it to a port using a network command. If you add a printer to your system, you must use Control Panel to select the port the printer will use.
- *Printer drivers*, sometimes called device drivers, are programs that control printing and let you set options such as print quality, paper size, and direction for a particular printer. If you set up your printer when you set up MS OS/2, you installed a printer driver as well. Using Control Panel, you can change the settings for an existing printer or change or add printer drivers when you change or add printers. In order to use a printer with MS OS/2 you must install the printer driver and associate it with your printer.

- *Queues* are lists of files or print jobs waiting to be printed. Spooler Queue Manager maintains these queues. In order to print files, the printer must be connected to a queue. You make this connection by using Control Panel. You can change the name of a print queue or create a new name by using Control Panel.

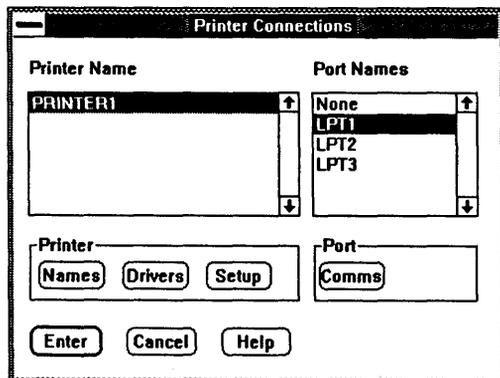
Adding a Printer

You add a printer to your system by using Control Panel. Before you start this procedure, you should know the following information about your printer:

- That the necessary physical connections have been made.
See your printer manual for more information on installing your printer. If you are sharing your printer over a network, see your network manual or system administrator for more information.
- Which port your printer is connected to.
- Which printer driver you want to use.

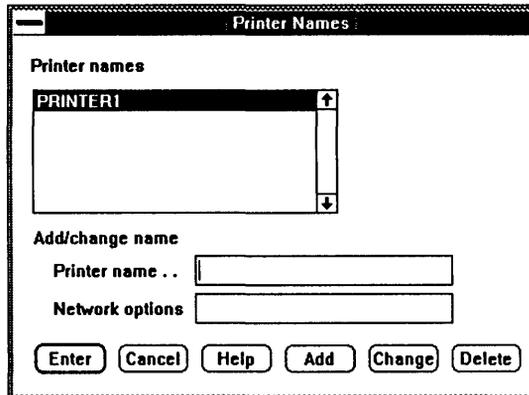
To add a printer, follow these steps:

- 1 In Control Panel, select the Setup menu and choose the Printer Connections command.
The Printer Connections dialog box appears, displaying the printer names and printer ports.



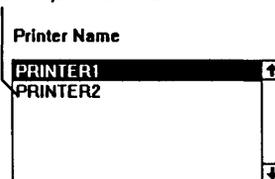
- 2 To create a name for a new printer, choose the Names button in the Printer section.

The Printer Names dialog box appears, displaying printer names.



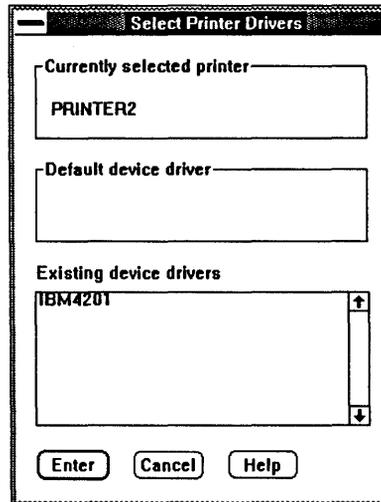
- 3 In the Add/Change Name text box, type the new printer name.
- 4 If you are using a printer over a network, type the network options you need to share the printer in the Network Options text box (see your network manual or system administrator for more information on the options you need for your particular printer).
- 5 Choose the Add button.
- The name of the new printer appears in the Printer Names list box.
- 6 Choose the Enter button to return to the Printer Connections dialog box. The new printer name appears in the Printer Name list box.

New printer name

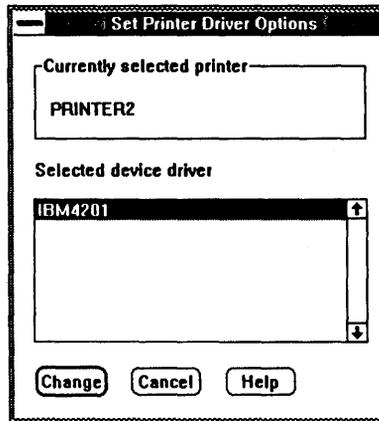


- 7 Select the new printer name in the Printer Name list box.

- 8 To assign a printer driver to the new printer name, choose the Drivers button in the Printer section.
The Select Printer Drivers dialog box appears, displaying your printer in the Currently Selected Printer section. The printer-driver files appear in the Existing Device Drivers list box.

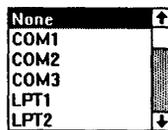


- 9 In the Existing Device Drivers list box, select the printer driver you want to assign to the new printer (if you need to add a new printer-driver file, see "Adding and Deleting a Printer Driver," later in this chapter). The printer driver appears in the Default Device Driver box.
- 10 Choose the Enter button to return to the Printer Connections dialog box.
- 11 To set printer options for the new printer, choose the Setup button. The Set Printer Driver Options dialog box appears, displaying the printer driver that is assigned to the printer.

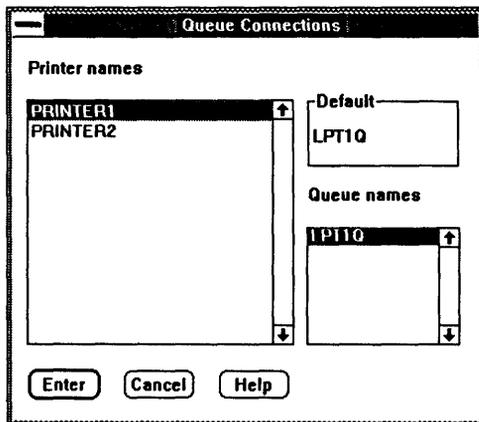


- 12 Choose the Change button.
A dialog box appears, displaying the current settings for your particular printer. The settings and options available vary, depending on your printer.
- 13 If necessary, change these settings and choose the Enter button to return to the Printer Connections dialog box.
- 14 To connect the new printer to a port, move to the Port Names list box.

Port Names

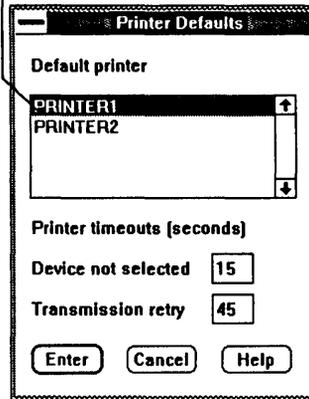


- 15 Select the port you want to connect your printer to.
If you connect your printer to COM1, COM2, or COM3 (a communications port), you must set additional options. See "Changing Printer-Port Connections," later in this chapter, for more information.
- 16 Choose the Enter button.
- 17 To connect the new printer to a print queue, select the Setup menu in Control Panel and choose the Queue Connections command.
The Queue Connections dialog box appears, displaying the printer names and print-queue names for your system.



- 18 In the Printer Names list box, select the new printer name.
- 19 Move to the Queue Names list box and select the print queue you want to use with your new printer. The queue name appears in the Default box.
- 20 Choose the Enter button.
- 21 To use the new printer, you must first select it as the default printer for your system. Select the Setup menu and choose the Printer Defaults command.
The Printer Defaults dialog box appears, displaying the default printer.

Default printer



- 22 Select your new printer in the Default Printer list box.
- 23 Choose the Enter button.

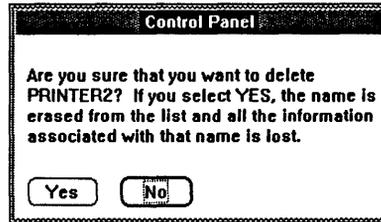
Deleting a Printer

You can delete a printer by deleting the printer name using Control Panel.

NOTE To delete a printer, do the following:

- 1 In Control Panel, select the Setup menu and choose the Printer Connections command.
- 2 Choose the Names button.
A dialog box appears, listing your printers.
- 3 In the Printer Names list box, select the printer you want to remove, and then choose the Delete button.

A dialog box appears, asking you to confirm deleting the printer.



4 To remove the printer, choose Yes.

5 Choose the Enter button.

The Printer Names dialog box closes and the Printer Connections dialog box appears again.

6 Choose the Enter button.

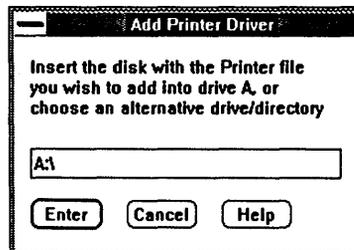
Adding and Deleting a Printer Driver

Printer-driver files, sometimes called device drivers, are programs that control how your printer prints. These files are copied to your hard disk when you install MS OS/2. You can use the Add Printer Driver command to add additional printer drivers.

To add a printer driver, follow these steps:

1 In Control Panel, select the Installation menu and choose the Add Printer Driver command.

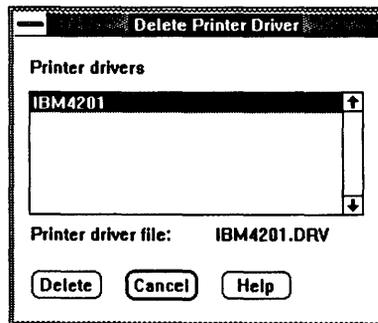
The Add Printer Driver dialog box appears, asking you to insert in drive A the disk that contains the printer-driver files.



- 2 Insert your printer-driver disk or type the directory path for the printer-driver files (printer-driver files copied to your hard disk when you installed MS OS/2 are located in the \OS2\DLL directory).
- 3 Choose the Enter button.
The Add Printer Driver dialog box appears, displaying the printer-driver files.
- 4 Select the printer driver you want in the Printer Drivers list box. The name of the printer driver you select appears in the Printer Driver File section.
- 5 Choose the Add button.
- 6 If the printer-driver file is already copied to your hard disk, a message appears, asking you if you want to replace the existing file. Choose the Yes button to replace the existing file; choose the No button to add the printer driver without replacing any files.

 You delete a printer-driver file by using the Delete Printer Driver command on the Installation menu. Follow these steps:

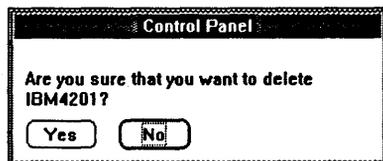
- 1 In Control Panel, select the Installation menu and choose the Delete Printer Driver command.
The Delete Printer Driver dialog box appears, displaying the printer drivers installed on your system.



- 2 In the Printer Drivers list box, select the printer driver you want to delete.

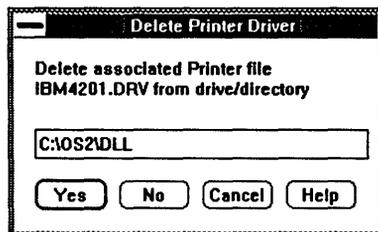
- 3 Choose the Delete button.

A dialog box appears, asking you to confirm deleting the printer driver.



- 4 To delete the printer driver, choose the Yes button.

The Delete Printer Driver dialog box appears, displaying the directory path where the printer-driver file is located.



- 5 To delete the file, choose the Yes button.

Changing Printer Names

Printers are identified by name. You can change this information—add new names, delete old names, or change existing printer names—by using the Printer Connections command. If you share a printer over a network, you can provide network information, in addition to the printer name, by using this command.

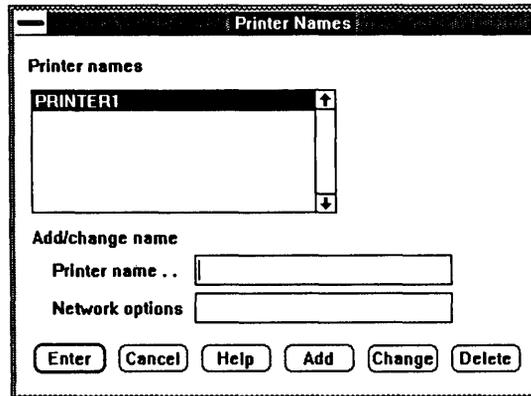
To change printer names, follow these steps:

- 1 Select the Setup menu and choose the Printer Connections command.

The Printer Connections dialog box appears, listing the printers and printer ports on your system.

- 2 Choose the Names button.

The Printer Names dialog box appears, listing the printer names on your system.



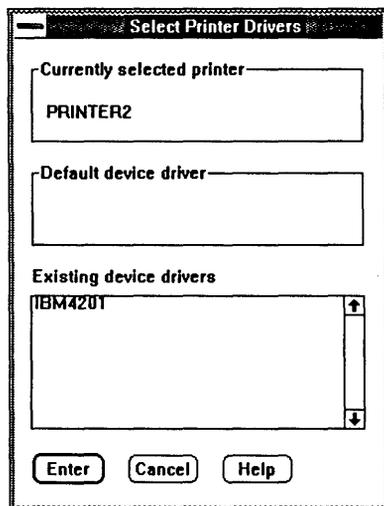
- 3 To add a new printer name, type the new name in the Add/Change Name text box and choose the Add button.
- 4 To change a printer name, select the name in the Printer Names list box and type the new name in the Add/Change Name text box and choose the Change button.
- 5 To delete a printer name, select the name in the Printer Names list box and choose the Delete button.
- 6 To add or change network options, select the name in the Printer Names list box and type the network information in the Network Options text box (see your network manual for the options you need for your printer).
- 7 When you finish changing the printer-name information, choose the Enter button.
- The Printer Names dialog box closes and the Printer Connections dialog box appears again.
- 8 Choose the Enter button.

Changing Printer-Driver Connections

A printer driver is a program that controls printing for a particular printer. If you added a printer when you installed MS OS/2, the printer-driver file was copied to your hard disk and connected to PRINTER1 (the default). After you add a printer driver to your system, you must connect it to a printer name.

You create or change printer-driver connections by using the Printer Connections command. Follow these steps:

- 1 In Control Panel, select the Setup menu and choose the Printer Connections command.
The Printer Connections dialog box appears.
- 2 Select the printer name you want to change drivers for in the Printer Name list box.
- 3 Choose the Drivers button.
The Select Printer Drivers dialog box appears, displaying the current printer name, the default printer driver, and a list of available printer drivers.



- 4 Select the printer driver in the Existing Device Drivers list box.
- 5 Choose the Enter button.
The Select Printer Drivers dialog box closes and the Printer Connections dialog box appears again.
- 6 Choose the Enter button.

Setting Printer Options

You can set or change printer options such as paper size and printing quality by using the Printer Connections command on the Setup menu. Printer options vary from printer to printer.

To set printer options, do the following:

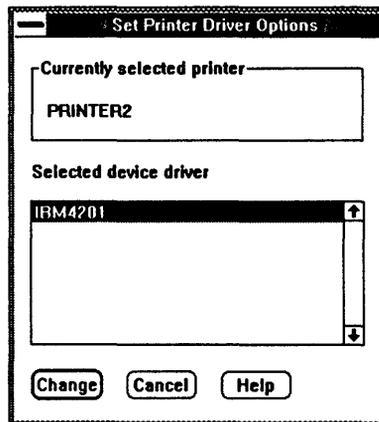
- 1 In Control Panel, select the Setup menu and choose the Printer Connections command.

The Printer Connections dialog box appears.

- 2 In the Printer Name list box, select the printer you want.

- 3 Choose the Setup button.

The Set Printer Driver Options dialog box appears.



The printer you selected appears in the Currently Selected Printer box; the printer driver appears in the Selected Device Driver box.

- 4 Choose the Change button.

A dialog box appears, showing the current options set for your particular printer. These settings vary, depending on the printer you have selected.

- 5 Change any of the settings and choose the Enter button to return to the Set Printer Driver Options dialog box.

- 6 Choose the Cancel button to return to the Printer Connections dialog box.

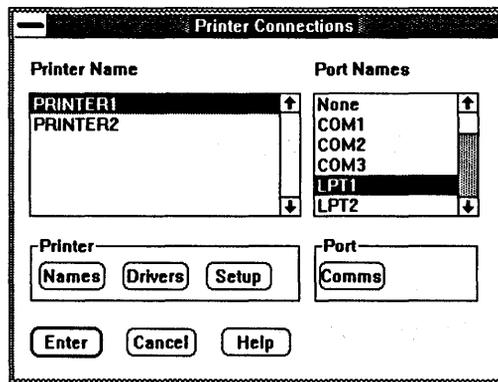
- 7 Choose the Enter button.

Changing Printer-Port Connections

In order to use a printer, you must connect it to a port. You use the Printer Connections command in Control Panel to connect a printer to a port by doing the following:

- 1 In Control Panel, select the Setup menu and choose the Printer Connections command.

The Printer Connections dialog box appears, displaying the names of the printers and ports installed on your system.



- 2 In the Printer Name list box, select the printer you want to connect to a port.

When you select a printer, a port is selected in the Port Names list box. This is the port to which the printer is currently connected. If the printer is not connected to any port, None is selected in the Port Names list box.

- 3 To change the port, move to the Port Names box and select the port you want to connect the printer to.
- 4 Choose the Enter button.

You can connect only one printer to one port. If another printer is already connected to the selected port, a message appears. Connect one printer to None in the Port Names list box and connect the other printer to the port you want.

If you are connecting a serial printer to one of the communications ports (COM1, COM2, or COM3), you must set the options for the

port, such as baud rate and parity (see your printer manual for information on the correct settings to use). You can do this using either the Communications Port or Printer Connections command on the Setup menu.

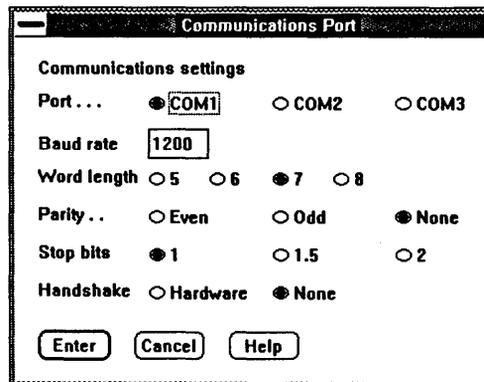
 To change serial-communications-port settings, follow these steps:

- 1** Select the Setup menu and choose the Printer Connections command.

The Printer Connections dialog box appears, displaying the current printer connections.

- 2** Choose the Comms button.

The Communications Port dialog box appears, displaying available serial ports and port settings.



- 3** In the Port section, choose a port (the current settings for the port appear).
- 4** Select the appropriate options.
- 5** Choose the Enter button.
The Printer Connections dialog box appears again.
- 6** Choose the Enter button.

Making changes to serial port settings is also discussed in Chapter 6, “Changing System Settings with Control Panel.”

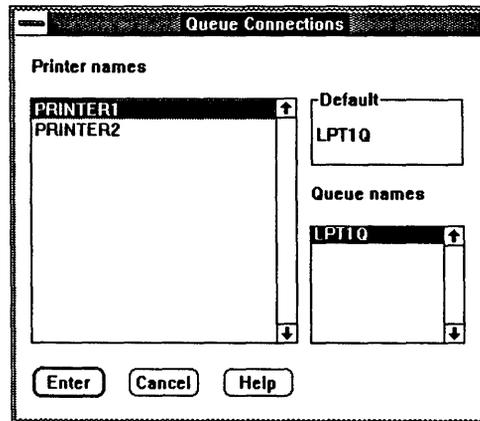
Changing Print-Queue Connections

Before you can print using Spooler Queue Manager, you must connect a printer to a print queue. You make this connection by using the Queue Connections command on the Setup menu.

To connect a printer to a print queue, follow these steps:

- 1 In Control Panel, select the Setup menu and choose the Queue Connections command.

The Queue Connections dialog box appears, displaying printer names and print-queue names.



- 2 Select the printer you want in the Printer Names list box.
- 3 Move to the Queue Names list box and select the print queue you want to connect to your printer.
The print-queue name appears in the Default box.
- 4 Choose the Enter button.

Changing the Default Printer

When you send a file to your printer from an application or by using the **print** command, the job is sent to the default printer on your system. If you have more than one printer installed on your system, you can change the default printer by using the Printer Defaults command on the Setup menu.

To change the default printer, follow these steps:

- 1 In Control Panel, select the Setup menu and choose the Printer Defaults command.
The Printer Defaults dialog box appears, displaying a list of your printers. The default printer is selected.
- 2 Select the printer you want as your new default printer.
- 3 Choose the Enter button.

Using the Printer Defaults command, you can change the amount of time MS OS/2 waits before notifying you that there is a problem with a particular print job. The following settings in the Printer Timeouts section of the Printer Defaults dialog box control this waiting period:

- The Device Not Selected setting controls the number of seconds MS OS/2 tries to send a file to a printer before reporting that the printer is off-line.
- The Transmission Retry setting controls the number of seconds MS OS/2 waits before sending a job back to a particular printer when a problem occurs.

Both settings represent seconds and can range from 1 through 999.

To change the Printer Timeouts settings, do the following:

- 1 In Control Panel, select the Setup menu and choose the Printer Defaults command.
- 2 Move to the Device Not Selected setting and type the new setting.
- 3 Move to the Transmission Retry setting and type the new setting.
- 4 Choose the Enter button.

Changing Spooler Queue Manager Settings

You make adjustments to Spooler Queue Manager by using Control Panel commands. These commands let you start and stop Spooler Queue Manager, change its settings, or add spooler software.

Starting Spooler Queue Manager

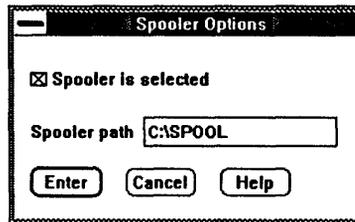
Spooler Queue Manager starts automatically when you start MS OS/2 by turning on your computer. You can control whether it starts when you start your system by using the Spooler Options command. Using

this command, you can also change the directory where Spooler Queue Manager stores files.

If you turn off Spooler Queue Manager by using this command, it continues to run until you turn off your computer or restart it (by pressing CTRL+ALT+DEL). The next time you start your computer, Spooler Queue Manager will not start. To restart Spooler Queue Manager, use the Spooler Options command again.

To start or stop Spooler Queue Manager when you start your computer, follow these steps:

- 1 In Control Panel, select the Setup menu and choose the Spooler Options command.
The Spooler Options dialog box appears, listing the directory path where Spooler files are stored.



- 2 To turn off Spooler Queue Manager, turn off the Spooler Is Selected check box.
To turn on Spooler Queue Manager, turn on the Spooler Is Not Selected check box.
- 3 To change the directory where Spooler Queue Manager files are stored, type a new directory path in the Spooler Path text box.
- 4 Choose the Enter button.

Changing Print Queues

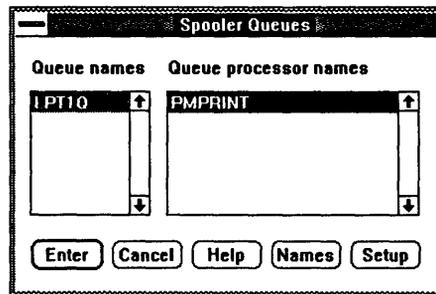
Print queues are lists of files waiting to be printed. You can see what print jobs are waiting in the queue by using Spooler Queue Manager. To add, delete, or change print queues, you use the Spooler Queues command on the Setup menu in Control Panel.

When you add a print queue with Control Panel, you must also assign it a *queue processor*. A queue processor is the program that prepares a file before sending it to your printer. Queue processors are installed on your system when you install MS OS/2. You can also change some options for these programs.

☛ To change the print queue, follow these steps:

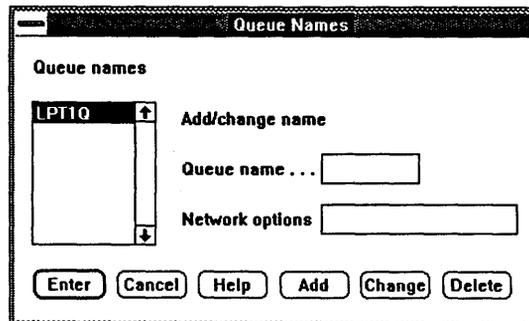
- 1 In Control Panel, select the Setup menu and choose the Spooler Queues command.

The Spooler Queues dialog box appears, displaying the existing queue names and the queue processors.



- 2 To add, delete, or change a print-queue name, choose the Names button.

The Queue Names dialog box appears, displaying the print-queue names.



- 3 To add a new queue, type the new queue name in the Queue Name text box and choose the Add button.
- 4 To change a queue name, select the queue name in the Queue Names list box, type the new name in the Queue Name text box, and choose the Change button.
- 5 To delete a queue name, select the queue name in the Queue Names list box and choose the Delete button.
- 6 To add or change any network information for a queue, select the queue name in the Queue Names list box and type the network information in the Network Options text box (see your network manual for information on the options for your printer).
- 7 When you finish making changes to the queue-name information, choose the Enter button.
The Spooler Queues dialog box reappears.
- 8 If you add a new queue, you must assign it a queue processor. Select the queue name in the Queue Names list box and select the queue processor in the Queue Processor Names list box.
- 9 Choose the Enter button.

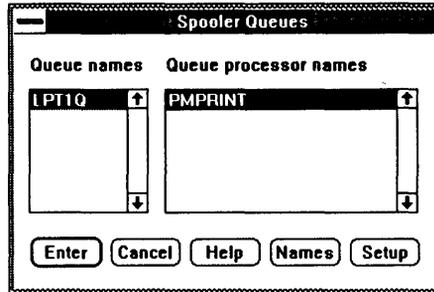
Changing Print-Queue Options

You can set print-queue options, such as how printing errors are reported, by using Control Panel. The options you can set are determined by the queue-processor program. To set options, you use the Spooler Queues command on the Setup menu.

 To change print-queue options, do the following:

- 1 In Control Panel, select the Setup menu and choose the Spooler Queues command.

The Spooler Queues dialog box appears, displaying the print-queue names and queue processors.



- 2 Select the print queue or queue processor you want to set options for.
- 3 Choose the Setup button.
A dialog box appears, displaying the options available for the selected queue processor.
- 4 Change the options you want.
- 5 Choose the Select button.
The Spooler Queues dialog box reappears.
- 6 Choose the Enter button.

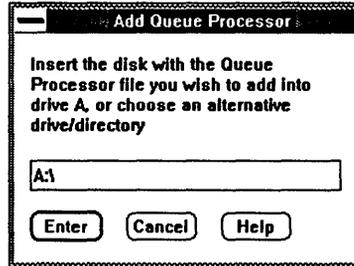
Adding a Queue Processor

When you install MS OS/2, a program called a queue processor is copied to your hard disk for use by Spooler Queue Manager. Queue processors control the way files are sent to your printer. If you need to add or change the queue processor, you can use the Add Queue Processor command on the Installation menu.

To add a queue processor, follow these steps:

- 1 In Control Panel, select the Installation menu and choose the Add Queue Processor command.

The Add Queue Processor dialog box appears, requesting you to insert the disk that contains the queue-processor file in drive A.



- 2 Insert the disk or type the directory path for the queue-processor file in the text box and choose the Enter button.
The Add Queue Processor dialog box appears, showing the queue processors on the disk.
- 3 Select the queue processor you want to add and choose the Add button.
A dialog box appears, asking you to confirm the directory to which the queue-processor file will be copied.
- 4 Choose the Yes button to copy the file.

You can change the directory that contains your queue-processor files, but you may need to edit your CONFIG.SYS file as well, so that Spooler Queue Manager can find the files. See Chapter 13, "Using MS OS/2 Configuration Commands," for information on changing your CONFIG.SYS file.

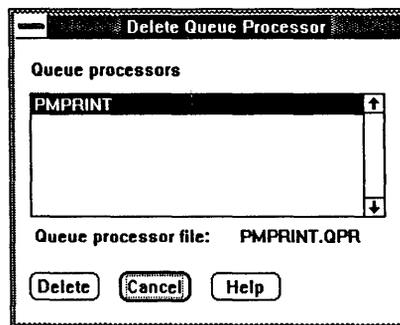
Deleting a Queue Processor

You can delete queue-processor files by using the Delete Queue Processor command on the Installation menu.

 To delete a queue processor, follow these steps:

- 1 In Control Panel, select the Installation menu and choose the Delete Queue Processor command.

The Delete Queue Processor dialog box appears, displaying the queue processors installed on your system.



- 2 Select the queue processor you want to delete.
A dialog box appears, asking you to confirm that you want to delete the queue processor.
- 3 Choose the Yes button to delete the queue processor.
A dialog box appears, showing the directory path of the queue-processor file and asking you to confirm that you want to delete the file.
- 4 Choose the Yes button to delete the file.



6 Changing System Settings with Control Panel

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Introduction

You can adjust system settings, such as the date or screen colors in Presentation Manager windows, by using Control Panel. Some settings, such as the time or date, can be adjusted directly in the main Control Panel window. Other settings, such as screen colors or baud rates for a modem or serial printer, are set using Control Panel menus and commands.

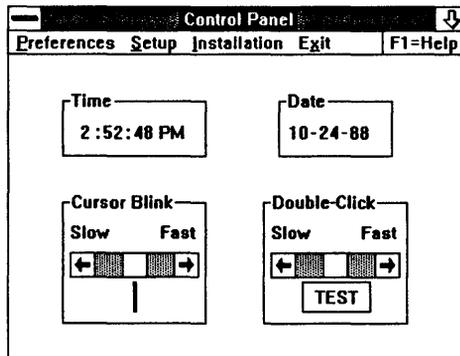
Starting Control Panel

To start Control Panel, do the following:

- 1 Move to Start Programs.
- 2 Select the Group menu and choose the Utility Programs group.
- 3 Choose Control Panel.

When you start Control Panel, it creates a window that contains the following sections:

- Time
- Date
- Cursor Blink
- Double-Click



Quitting Control Panel

Once you finish adjusting your system settings, you can quit Control Panel.

 To quit Control Panel, do the following:

- ▶ Select the Exit menu and choose the Exit Control Panel command. The Resume command on the Exit menu returns you to Control Panel.

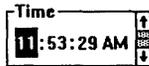
Changing the Time

You can use Control Panel to change the system time. The time you set is reflected in any applications that use the system time. You change the time by directly adjusting settings in the Time section in the Control Panel work area.

 Follow these steps to change the time by using a mouse:



- 1 Click the hours, minutes, or seconds that you want to change.



- 2 Click the up arrow to increase the number or the down arrow to decrease the number.

 To change the time by using the keyboard, do the following:



- 1 Press TAB to move to the Time section.
- 2 Press the RIGHT or LEFT key to select the part of the time (hours, minutes, or seconds) that you want to change.
- 3 Press the UP key to increase the number; press the DOWN key to decrease the number.

The system time changes when you move to another section or when you quit Control Panel.

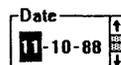
Changing the Date

Some applications use the system date to record when files are created or when changes to files occur. You change the system date in much the same way that you change the time.

 If you are using a mouse, follow these steps to change the date:



- 1 Click the month, day, or year that you want to change.



- 2 Click the up arrow to increase the number; click the down arrow to decrease the number.

 If you are using the keyboard, follow these steps to change the date:



- 1 Press TAB to move to the Date section.
- 2 Press the RIGHT or LEFT key to select the part of the date (month, day, or year) that you want to change.
- 3 Press the UP key to increase the number; press the DOWN key to decrease the number.

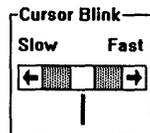
Changing the Cursor-Blink Rate

Some applications have a cursor or insertion point that blinks. The blink rate is the frequency at which the cursor flashes. The vertical cursor within the Cursor Blink section reflects the current setting.

 To change the cursor-blink rate by using a mouse, do the following:



- ▶ Click the right arrow to increase the rate; click the left arrow to decrease the rate.



You can also change the cursor-blink rate by dragging the scroll box within the scroll bar.

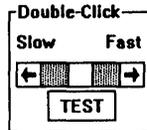
 Follow these steps to change the cursor-blink rate by using the keyboard:



- 1 Press TAB to move to the Cursor Blink section.
- 2 Press the RIGHT key to increase the rate; press the LEFT key to decrease the rate.

Changing the Mouse Double-Click Rate

When you double-click the mouse button, Presentation Manager interprets your action by the speed with which one click follows another. You can change this speed by adjusting the setting in the Double-Click section.



 Do the following to change the mouse double-click rate:



- ▶ Click the right arrow to increase the rate; click the left arrow to decrease the rate.

Or

- ▶ Drag the scroll box within the scroll bar.

 To test the new double-click setting, do the following:



- ▶ Double-click the Test command button.
The button color changes according to the new double-click rate.

Selecting Screen Colors

 You use the Screen Colors command on the Preferences menu to adjust the text color, background colors, and shades of gray on your screen. You can specify color, shade, and amount of color for the following screen areas:

- Screen Background
- Application Work area
- Window Background

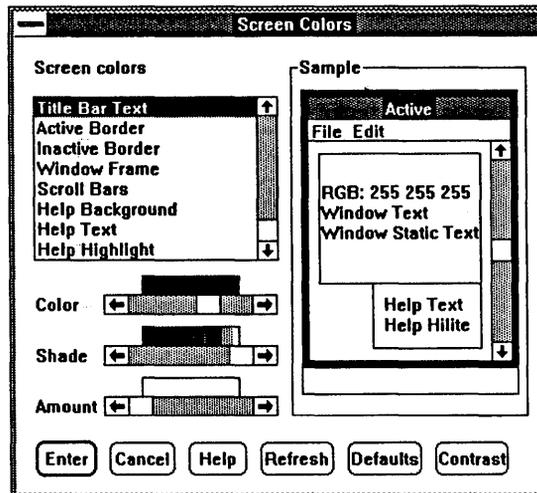
- Window Text
- Window Static Text (for example, headings)
- Menu Bar
- Menu Text
- Active Title Bar (selected)
- Inactive Title Bar
- Title Bar Text
- Active Border
- Inactive Border
- Window Frame (the border that surrounds a window)
- Scroll Bars
- Help Background
- Help Text
- Help Highlight

You change colors by first selecting a part of the screen in the Screen Colors list box and then using the Color, Shade, and Amount scroll bars to change the color. The Color scroll bar controls the color; the shade and the intensity of the color are controlled by the other two scroll bars. After you pick a color, experiment to find the combination that you want. You can see your changes to the area you selected in the Sample box. The numbers in the Sample box represent the RGB (red, green, blue) settings respectively, from 0 to 255. The setting 0 0 0 represents no color (black); the setting 255 255 255 represents fully saturated color (white).

 To change screen colors, follow these steps:

- 1 Select the Preferences menu and choose the Screen Colors command.

The Screen Colors dialog box appears.



- 2 In the Screen Colors list box, select the part of the screen or window you want to adjust.
- 3 To change the color, move to the Color scroll bar. Available colors are shown in the color palette above the scroll bar. Scroll to the right or to the left to choose a color.
- 4 To change the brightness, move to the Shade scroll bar and scroll to the right to brighten the color (increase the amount of white); scroll to the left to darken the color.
If the Shade scroll box is at the extreme left of the scroll bar, the color is black. If the scroll box is at the extreme right, the color is white.
- 5 To change the amount of color, move to the Amount scroll bar and scroll to the right for a more vibrant, intense color; scroll to the left for less intensity.
If the Amount scroll box is at the extreme left of the scroll bar, adjustments to the Color and Shade scroll bars result in black, white, and shades of gray.

- 6 To return to the previous color settings, choose the Refresh button. The Screen Colors dialog box remains open.
- 7 To re-create Presentation Manager default color settings, choose the Defaults button. The Screen Colors dialog box remains open.
- 8 When you finish adjusting your screen colors, choose the Enter button.

 You can also adjust the contrast on your screen by using the Screen Colors command if you have an IBM Enhanced Color Display (ECD) or compatible monitor. To adjust the contrast, follow these steps:

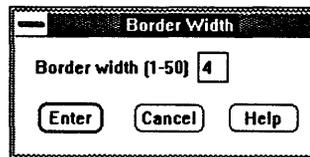
- 1 Select the Preferences menu and choose the Screen Colors command.
- 2 Choose the Contrast button.
The Adjust Screen Contrast dialog box appears.
- 3 Turn the contrast button on your monitor until the dark and light bands of color appear equally bright.
- 4 When you finish adjusting the contrast, choose the Cancel button.

Changing the Window Border Width

You can adjust the width of window borders using the Border Width command on the Preferences menu. However, you cannot change the width of a fixed-size window, such as the Control Panel window.

 To change the border width, follow these steps:

- 1 Select the Preferences menu and choose the Border Width command.
The Border Width dialog box appears.



- 2 The Border Width dialog box displays the current width. To change the width, type a new number from 1 through 50. The larger the number, the wider the border.
- 3 Choose the Enter button.

Turning Off the Warning Beep

When you use MS OS/2, your computer may make a beeping sound; for example, when you press the wrong key. You can turn off the beep by using the Warning Beep command on the Preferences menu.

You can tell if the beep feature is turned on by looking at the Preferences menu. A check mark appears next to the Warning Beep command.



To turn the beep on or off, do the following:

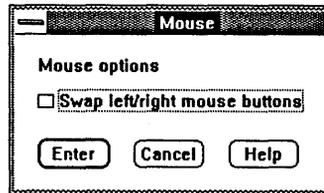
- Select the Preferences menu and choose the Warning Beep command.

Changing Mouse Options

The Mouse command in the Preferences menu lets you change which mouse button you press. Presentation Manager generally uses only the left mouse button. You can switch usage from the left mouse button to the right mouse button (and vice versa).

Follow these steps to switch mouse buttons:

- 1 Select the Preferences menu and choose the Mouse command.
The Mouse dialog box appears.



- 2 Turn on the Swap Left/Right Mouse Buttons check box.
- 3 Choose the Enter button.

If you switch mouse buttons, applications that normally use the right button to carry out tasks will use the left button.

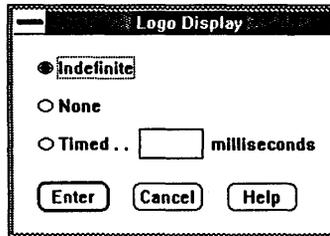
Adjusting the Logo Display Time

When you start some Presentation Manager applications, a logo appears before the application screen appears. You control how long a logo is displayed by using the Logo Display command. The choices are to display the logo until you press ENTER, to display the logo for a specified number of milliseconds, or not to display the logo.

To change the logo display time, do the following:

- 1 Select the Preferences menu and choose the Logo Display command.

The Logo Display dialog box appears.



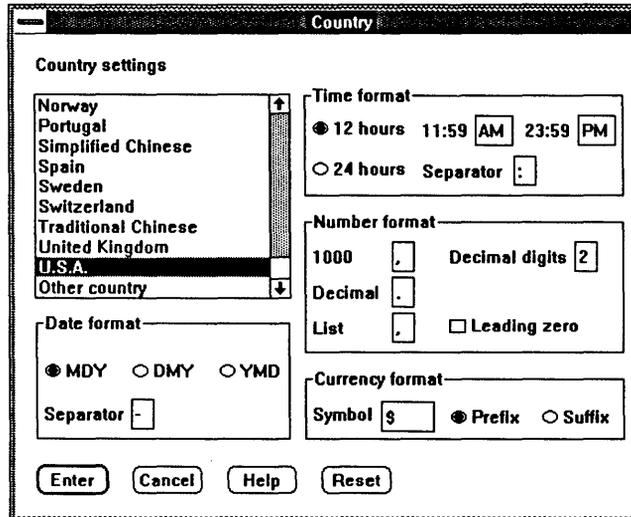
- 2 Select the logo display option you want: Indefinite displays the logo until you press ENTER; None eliminates the logo display; Timed displays the logo for the number of milliseconds you type in the Milliseconds box. You can type a number from 1 through 32767.
- 3 To save your changes, choose the Enter button.

Changing Country Settings

You can set variables (such as date, number, and time formats) for a particular country by using the Country command on the Preferences menu. You can use the predefined settings for each country, modify the existing country settings, or create a special set of settings for your own use.

To change the country-settings information, follow these steps:

- 1 Select the Preferences menu and choose the Country command.
The Country dialog box appears.



- 2 In the Country Settings list box, select the appropriate country name. To create a new setting, select Other Country.
The country settings automatically change to correspond to the country you select.
- 3 Make changes to any of the settings you want.
For more information on completing the Country dialog box, see the list following this procedure.
- 4 If you want to return to the original settings, choose the Reset button. The Country dialog box remains open.
- 5 To save your new country settings, choose the Enter button.

The following list explains the various sections in the Country dialog box:

- The Country Settings section contains a list of available country names.
The Other Country entry is used to create your own set of country settings.
- The Date Format section controls how dates are displayed.

Date format

MDY DMY YMD

Separator

You can choose one of three options: month–day–year (MDY); day–month–year (DMY); or year–month–day (YMD). The Separator text box shows the symbol used to separate the day, month, and year; for example, a slash (/) or a period (.).

- The Time Format section contains two options: a 12-hour-clock option and a 24-hour-clock option.

Time format

12 hours 11:59 AM 23:59 PM

24 hours Separator

If the country you choose uses a 12-hour clock, “AM” and “PM” appear in the text box. The Separator text box shows the symbol used to separate hours and minutes; for example, a colon (:).

- The Number Format section controls how numbers are displayed.

Number format

1000 Decimal digits

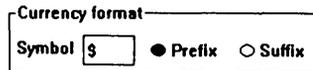
Decimal

List Leading zero

The 1000 box shows the symbol used to separate the “1” from the “000”; for example, a comma (,). The Decimal text box contains the

symbol used to separate integers from decimals; for example, a period (.). The List text box contains the symbol used to separate lists of numbers. In the Decimal Digits box, the number of decimal digits is displayed. If the Leading Zero check box is turned on, a zero is displayed for numbers less than 1; for example, 0.59.

- The Currency Format section controls the currency symbol and its location in relation to a number: as a prefix or a suffix.



Setting Up a Communications Port

You use the Communications Port command on the Setup menu to set up a serial communications port for a communications device, such as a modem or a serial printer.

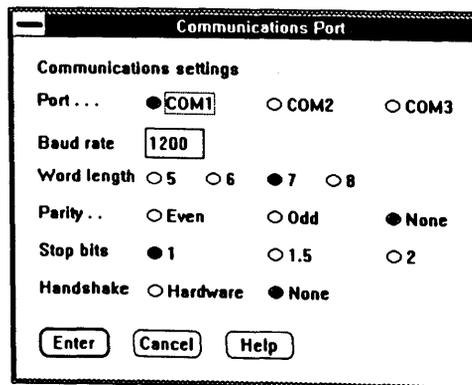
Note If you are setting up a serial printer, check your printer manual to make sure that the port settings you select are correct.



To set up a communications port, follow these steps:

- 1 Select the Setup menu and choose the Communications Port command.

The Communications Port dialog box appears.



- 2 Select a port.
The settings for that port appear.
- 3 Select the options you want.
For more information on completing the Communications Port dialog box, see the list following this procedure.
- 4 Choose the Enter button.

The following list explains the various sections of the Communications Port dialog box:

- The Port section connects a communication device to one of three ports: COM1, COM2, or COM3.
- The Baud Rate section controls the speed at which information is sent and received. Examples of baud rates include 1200, 1800, 2400, and 7200.
- The Word Length section controls the number of bits used in sending individual characters.
- The Parity section sets how your communication device checks for errors in sending and receiving information. If your device checks for parity, select the Even or Odd option where appropriate; if it does not check for parity, select the None option.
- The Stop Bits section controls end-character signals.
- The Handshake section controls how a communication device signals the beginning and end of a transmission.

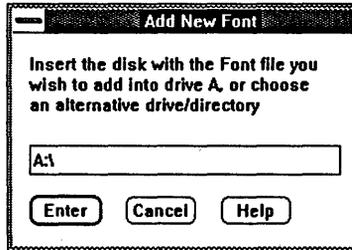
For information on the settings for your particular device, see your owner's manual.

Adding a Font File

Applications use fonts and typefaces for displaying text on your screen and for printing. These fonts are contained in font files; one font file may contain several fonts. For example, the font file `TIMES.FON` contains fonts for Times Roman, Times Roman Bold, and Times Roman Italic, among others. To add a new font for use with your printer, you must copy the font file and add the individual font using the Add Font command in Control Panel. Font files copied to your hard disk when you installed MS OS/2 are located in the `\OS2\DLL` directory.

To add a font, follow these steps:

- 1 Select the Installation menu and choose the Add Font command. The Add New Font dialog box appears, asking you to insert in drive A the disk that contains the font file.



- 2 Insert the font-file disk in the disk drive and choose the Enter button. The Add New Font dialog box appears, displaying the font files and font names on the disk. Each font file contains several fonts.
- 3 In the Font Files list box, select the font file that contains the font you want to add. Fonts contained in the font file appear in the Font Names list box.
- 4 In the Font Names list box, select the font you want to add. You must add each font separately.
- 5 To add a font, choose the Add button. The Add New Font dialog box appears, showing where the font file will be copied.
- 6 Choose the Yes button to copy the font file. If you do not want to copy the font file, choose the No button.

You do not need to copy font files that were copied to your hard disk when you installed MS OS/2. If the file has already been copied to your hard disk, Control Panel displays a warning message before copying the file.

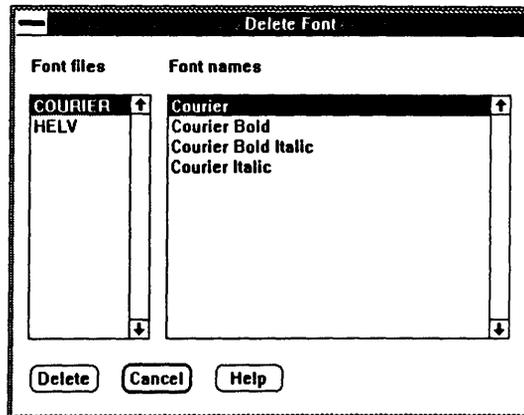
If you change the directory to which the font files are copied, you may also have to edit your CONFIG.SYS file. See Chapter 13, "Using MS OS/2 Configuration Commands," for more information on changing this file.

Deleting a Font File

You can remove fonts by using the Delete Font command. Since font files contain several fonts, you must first remove all the fonts before you can delete the file itself.

To remove a font, follow these steps:

- 1 Select the Installation menu and choose the Delete Font command. The Delete Font dialog box appears, displaying the font files and font names on your system.



- 2 In the Font Files list box, select the font file that contains the font you want to delete (font names appear in the Font Names list box).
- 3 In the Font Names list box, select the font you want to delete.
- 4 A dialog box appears, asking you to confirm deleting the font. Choose the Yes button to delete the font.
- 5 If you remove all fonts in a font file, a dialog box appears, asking if you want to delete the font file. Choose the Yes button to delete the file.

Part 2

Using Cmd and the DOS Session

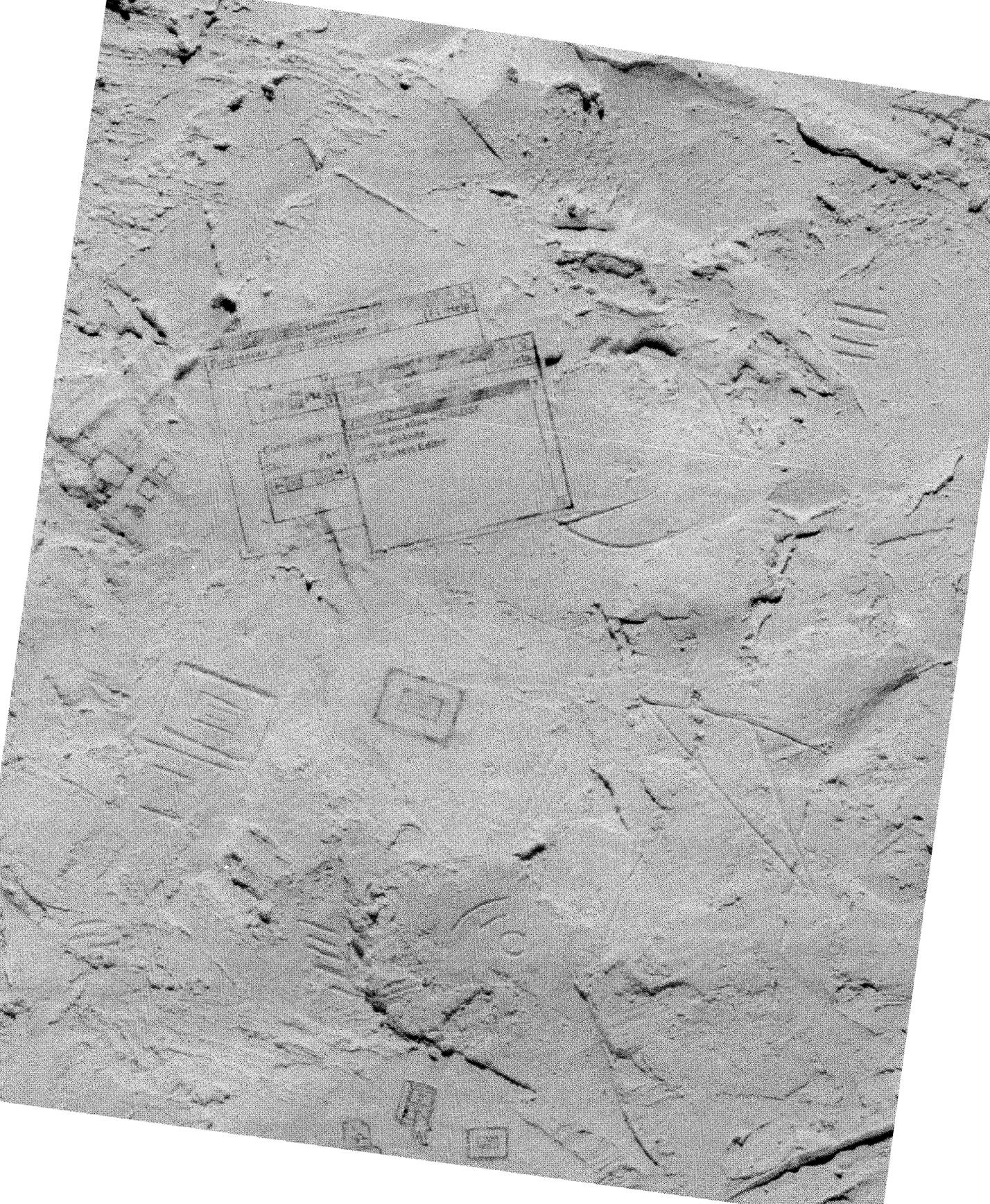
This part of the *Microsoft Operating System/2 User's Guide* describes how to work with MS OS/2 if you prefer to work with a non-graphical command-line user interface.

You will learn how to use the MS OS/2 command interpreter, **cmd**, including how to start and stop the program and how to run **cmd** commands, start programs, and create batch programs.

MS OS/2 utilities are also explained. You can use utilities to carry out tasks with files, directories, and devices.

You will learn how to run programs in the DOS session and how to use the DOS command interpreter, **command**. Instructions are also provided for running DOS programs and MS OS/2 utilities in the DOS session.

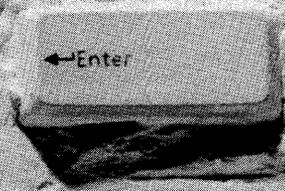
Finally, you will learn about System Editor, a text editor that you can use to edit your files.

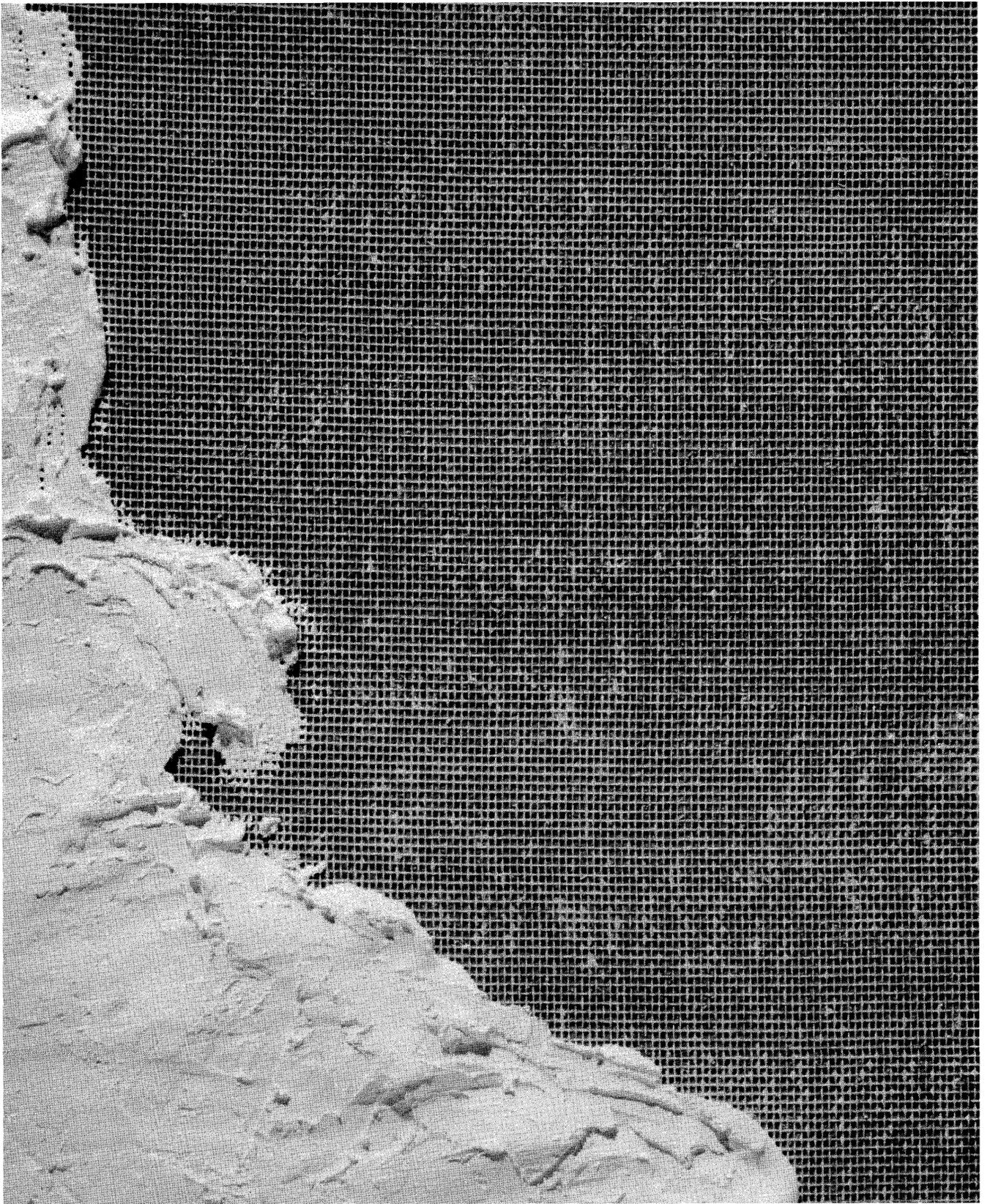


Part 2

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MS OS/2





7 Running Cmd

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Introduction

The MS OS/2 command interpreter, **cmd**, is a program that translates what you type at a prompt into commands that your computer can understand. When you install MS OS/2, the **cmd** prompt looks like the following:

```
[c:\]
```

You can run **cmd** in a full-screen OS/2 session or in a window. Instead of the Presentation Manager graphical environment, **cmd** provides a command-line interface. This means that **cmd** displays a prompt where you type commands to start other programs.

Cmd contains a set of built-in commands that help you to manage files and directories, create and run batch programs, and set system features. **Cmd** also lets you start other programs, so it provides an alternate to Start Programs if you're working in a full-screen session or if you're running **cmd** in a window.

This chapter describes how to start and quit the **cmd** program, and how to use **cmd** commands. For information about utilities that can be run from the **cmd** program, see Chapter 8, "Using MS OS/2 Utilities."

Starting and Quitting Cmd

 You can start **cmd** either in a full-screen OS/2 session or in a window in the Presentation Manager session. From the Main Group in Start Programs, do one of the following:

- ▶ To start **cmd** in a full-screen session, choose OS/2 Full-Screen Command Prompt from the Main Group in Start Programs.

Or

- ▶ To start **cmd** in a window, choose OS/2 Windowed Command Prompt from the Main Group in Start Programs.

If you start **cmd** in a full-screen session, the screen clears and the **cmd** prompt appears in the full screen. If you start **cmd** in a window, a new window appears in the Presentation Manager session and the **cmd** prompt appears in the window.

Note You can also start **cmd** from File System by double-clicking the **CMD.EXE** file. For more information about File System, see Chapter 3, "Using File System."

 To quit **cmd**, type **exit** at the prompt. If **cmd** is running in a full-screen session, Task Manager appears. If **cmd** is running in a window, the window closes and Start Programs appears.

If you want to switch from a full-screen session to Task Manager, press **CTRL+ESC**.

Using Commands

You can use several MS OS/2 commands to manage your files and directories. This section describes **cmd** commands and explains how to use them.

Starting Commands

 After you have started **cmd**, you are ready to use commands. At the **cmd** command prompt, do the following:

- ▶ Type the name of the command, followed by any arguments, and press **ENTER**.

In addition to commands built into **cmd**, you can also start MS OS/2 utilities and other full-screen programs. To start other MS OS/2 programs, see the manual that accompanies your program, and "Running Programs," later in this chapter.

When you use **cmd** commands, you may see error messages appear on your screen. You can use the Help program to get an explanation of the error message. For more information about Help, see Chapter 8, "Using MS OS/2 Utilities."

Setting Up the System

Cmd contains several built-in commands that are useful for setting up your system. They are as follows:

Command	Purpose
cls	Clears your screen.
date	Displays and sets the system date.
time	Displays and sets the system time.
prompt	Changes the cmd prompt.
ver	Displays the MS OS/2 version number.
chcp	Changes the current code page.

These commands are described in the following sections.

Clearing the Screen

The **cls** command clears your computer screen. To use this command, type the following:

```
cls
```

Your screen clears, and the MS OS/2 command prompt appears in the upper-left corner of the screen.

Setting and Displaying the Date

You can set and display the system date by using the **date** command. MS OS/2 uses this date to update the directory listing whenever you create or change a file or directory. The date that you set applies to all sessions.

To use the **date** command, type the following:

```
date
```

You'll see a message like the following:

```
The current date is Fri 3-24-89
Enter the new date: (mm-dd-yy) _
```

To keep the current date, press **ENTER**. To change the date, type the new date at the cursor, separating the month, day, and year with hyphens (-), slashes (/), or periods (.). For example, the dates 6-1-89, 6/1/89, and 6.1.89 are equivalent.

Note If your system is set up for a country other than the United States, the date and time format you use may differ from what is shown here. The **country** command in the CONFIG.SYS file sets this format. For more information about the **country** command, see Chapter 13, "Using MS OS/2 Configuration Commands."

You can also specify the date directly after the **date** command, as follows:

```
date 3-1-89
```

Setting and Displaying the Time

You can set and display the system time with the **time** command. This command works setting the internal clock in your computer. MS OS/2 uses this time to update the directory listing whenever you create or change a file or directory. The time that you set applies to all sessions.

To use the **time** command, type the following:

```
time
```

You'll see a message like the following:

```
The current time is: 10:21:39.03
Enter the new time: _
```

To keep the current time, press ENTER. To change the time, type the new time at the cursor, separating hours, minutes, seconds, and hundredths of a second with colons (:) or periods (.). The separator between seconds and hundredths of a second must be a period. The hour is based upon a 24-hour clock. Seconds and hundredths of a second are optional.

You can also specify the time directly after the **time** command, as follows:

```
time 13:30
```

Changing the Cmd Prompt

You can change the way your prompt looks by using the **prompt** command. **Prompt** recognizes several character combinations, all of them beginning with a dollar sign (\$), which display different characters in the prompt. The **prompt** command affects only the current session.

■ To change the prompt, type **prompt** followed by one or more character combinations. For example, to change the prompt to an equal sign followed by a greater-than sign, type the following:

```
prompt $q$g
```

Now your prompt looks like this:

```
=>
```

You can use any of the following character combinations to create your prompt:

Characters	Prompt
\$\$	Dollar sign (\$)
\$t	Current time
\$d	Current date
\$p	Current directory on the current drive
\$v	Version number
\$n	Default drive
\$g	Greater-than sign (>)
\$l	Less-than sign (<)
\$b	Pipe symbol (|)
\$_	New line (the equivalent of pressing ENTER)
\$e	ANSI escape code
\$q	Equal sign (=)
\$h	Backspace (to erase a character in the prompt)
\$i	Help line
\$c	Left parenthesis [(] (in cmd only)
\$f	Right parenthesis [)] (in cmd only)
\$a	Ampersand (&) (in cmd only)

If you type **prompt** by itself, the prompt changes to the default system prompt.

Displaying the Version Number

■ To display the MS OS/2 version number, use the **ver** command. To use **ver**, type the following:

```
ver
```

Changing the Code Page

To display or switch the current code page, use the **chcp** command. This code page defines a character correspondence table that is used to set up foreign-language versions of MS OS/2. Five code pages are supported: Multilingual (850), United States (437), Portuguese (860), French-Canadian (863), and Nordic (865).

Before you can switch to a different code page, you must set up your system for code-page switching. This can be done during installation of MS OS/2. Or you can modify your CONFIG.SYS file by following the instructions found in Chapter 13, "Using MS OS/2 Configuration Commands."

To find out which code page(s) are prepared for your system, type **chcp** by itself. To switch to a different code page, type **chcp** followed by the number of the code page. For example, to switch to the French-Canadian code page, type the following:

```
chcp 863
```

For a list of countries and their supported code pages, see Chapter 13, "Using MS OS/2 Configuration Commands."

Managing Files, Directories, and Drives

MS OS/2 provides several commands that help you manage files, directories, and drives. These commands are as follows:

Command	Purpose
dir	Displays the contents of a directory.
mkdir (md)	Makes a new directory.
chdir (cd)	Switches to a different directory.
rmdir (rd)	Removes a directory.
type	Displays the contents of a file.
copy	Copies a file.
del (erase)	Deletes a file.
rename (ren)	Renames a file.
vol	Displays the volume label of the current drive.

Alternate forms of the commands are shown in parentheses.

Unless you specify otherwise, all commands that you type at the **cmd** prompt work with the contents of the current directory. Many of these commands accept options, which are letters preceded by a slash (/) that modify how a command works. While most command options are described in this chapter, see the *Microsoft Operating System/2 Desktop Reference* for a complete listing and description of the options for each command.

Displaying Directory Information

To display a listing of the contents of a directory, use the **dir** command. A directory listing consists of individual directory entries, each of which describes one file or subdirectory in that directory.

You can display the directory listing for your current directory, for a specific directory or file, for more than one directory, or for a group of files. In addition, the **dir** command can display the listing in a multiple-column format or a page-by-page format. These options are described in the following sections.

Displaying the Contents of the Current Directory

To display the contents of the current directory, type the **dir** command without any arguments.

For example, suppose that you are in a directory called **FINANCE**. To display the directory entries for this directory, type the following:

dir

Cmd displays a listing like the following on your screen:

```
The volume label in drive C is RALPH.
Directory of C:\FINANCE

.                <DIR>          1-30-89   9:10a
..               <DIR>          1-30-89   9:10a
BUSINESS         <DIR>          1-30-89   9:11a
PERSONAL        <DIR>          1-30-89   9:12a
TAXES           <DIR>          10-15-89  8:47a
1QUARTER SUM    452      4-20-89  10:31a
2QUARTER SUM    590      7-27-89   9:05a
3QUARTER SUM    524     10-08-89  3:54p
REPORT TXT      1168     11-08-89  2:15p
          9 File(s)  1880064 bytes free
```

Here's what each directory entry contains:

- The volume label of your current drive
- The name of the current drive and directory
- The filename and filename extension (if any), or the directory name
- The size of the file (in bytes)
- The date that the file or directory was created or last modified
- The time that the file or directory was created or last modified

Note If your system is set up for a country other than the United States, your time and date formats may differ from what is shown here. This information is specified by the **country** configuration command in your CONFIG.SYS file. For more information about time and date formats for other countries, see Chapter 13, "Using MS OS/2 Configuration Commands."

Directories have <DIR> listed after their names. At the end of the listing, **dir** lists the number of files in the directory and the number of bytes that are free on the disk. It's a good idea to check your available disk space regularly, especially if your disk space is limited.

If you're viewing a directory listing for a directory other than the root directory, you'll see periods (. and ..) listed as directory entries. These characters are a shorthand notation for the current (.) and parent (..) directories. The current directory is the one you are now working in, and the parent directory is the directory that is one level above the current directory.

 You can use this notation in any **cmd** command or utility to specify the current or parent directory. For example, to see the directory listing for a parent directory, type the following:

```
dir ..
```

 You can also display directory entries for the current directory on a different drive. For example, to see what's in the current directory on drive A, type the following:

```
dir a:
```

A listing of the directories and files for drive A will appear on your screen.

Viewing a Directory Listing for a Specific Directory or File

The **dir** command lets you view any directory listing without changing your current directory.

To do this, you must tell **cmd** the path of the directory you want to view. You can specify the directory's full path from the root directory, or you can specify a relative path from your current directory. Although you can always type the full path of a directory, it's not required.

For example, suppose you have your business-travel schedules stored in the TRAVEL subdirectory of the \FINANCE\BUSINESS directory. To view the files in your TRAVEL subdirectory from the root directory, type the following:

```
dir \finance\business\travel
```

However, if you are in the FINANCE directory, you can just type the path from the current directory to the TRAVEL subdirectory:

```
dir business\travel
```

If you prefer to see your personal-travel schedules, stored in the TRAVEL subdirectory of the \FINANCE\PERSONAL directory on drive A, type the following:

```
dir a:\finance\personal\travel
```

Note If you will be doing much work in another directory, you can also use the **chdir** command to move to that directory before using the **dir** command. The **chdir** command is described in detail in “Changing to Another Directory,” later in this chapter.

Displaying the Contents of More than One Directory

You can display directory listings for more than one directory by typing the name of each directory after the **dir** command.

For example, suppose that you are planning to purchase new desks and lamps for your employees. Although you have price lists for many items in your current directory, you would like to see the directory listings that pertain only to desks and lamps. To see the directory listings for the DESKS subdirectory, which is on your current drive, and to see the directory listing for the LAMPS directory, which is on drive A, type the following:

```
dir desks a:\lamps
```

You will first see the directory listing for DESKS, followed by the listing for LAMPS:

```
The volume label in drive C is RALPH.
Directory of C:\DESKS

.           <DIR>          6-23-89   2:58p
..          <DIR>          6-23-89   2:58p
STUDY      DSK           899      6-09-89  12:35p
TOOLS      DSK          3821     2-02-89   1:41p
WORK       DSK           16       3-16-89   8:40a
           3 File(s)          1646592 bytes free
```

```
The volume label in drive A is INVENTORY.
Directory of A:\LAMPS
```

```
.           <DIR>          4-28-89   6:30p
..          <DIR>          4-28-89   6:30p
DESK       LMP           240      1-09-89   1:02p
TABLE      LMP          1234     4-16-89   3:54p
SPOT       LMP           80       2-10-89   8:59a
           3 File(s)          512 bytes free
```

Displaying Directory Listings for a Group of Files

NOTE You might find that you want to view directory listings for a specific group of files. For example, to view the directory listings in your current directory for all of the files that have the filename extension .DOC, type the following:

```
dir *.doc
```

The asterisk (*) is a *wildcard character*, which has a special meaning to **cmd**. MS OS/2 wildcard characters tell **cmd** to replace the asterisks with any alphanumeric character or string of characters. In the previous example, the files REPORT.DOC, REPLY.DOC, and LETTER.DOC are all displayed.

Wildcard characters can be used with the **dir** command to specify other groups of files. For example, to view all of the files that begin with the letter "R," type the following:

```
dir r*
```

This displays the files REPORT.DOC and REPLY.DOC, but not LETTER.DOC.

To view all files beginning with the string FIN, regardless of their filename extensions, type the following:

```
dir fin*
```

The files FINANCE.TXT, FIND.TXT, and FIN024.DAT are all included in the listing.

In addition to the asterisk, the question mark (?) can also be used as a wildcard character. A question mark in a filename or filename extension means that any character can occupy that position. For example, to display directory listings for trade shows that you have attended, you could type the following:

```
dir show?.*
```

You would see a list that contains SHOW1.SEA, SHOWN.SF, and SHOW3.LA; it would, however, not include SHOW23.SEA (since the question mark stands for only one character).

Displaying a Directory Listing in Wide Format

If you have a large directory with many files, you might not be able to see all of the directory listings on one screen. One way to condense this listing is to display it in wide (/w) format.

Suppose that your ACCOUNTS directory contains files for every account you have. You want to see the names of all the accounts, but you know that it is quite a long list of names.

To display the directory listing in wide format, use the /w option on the command line:

```
dir accounts /w
```

A horizontal listing appears on your screen. You see a multiple-column listing of the filenames in the directory, but they appear without the file size or date/time information. The directory entries are listed alphabetically, from left to right.

Viewing a Directory Listing in Page Format

Just as you read a book, you can look at a directory listing a screenful, or page, at a time. To do this, use the /p option:

```
dir accounts /p
```

The first part of the directory listing is displayed, then the message “Press any key when ready . . .” appears at the bottom of the screen when the screen is full. After you press a key, the second page of the listing appears. This continues until all of the directory entries are displayed, or until you press CTRL+C to stop the operation.

You can also use the /w and /p options together. This option combination displays directory listings in wide format, one page at a time.

Creating a Directory

You can create a directory by using the **mkdir** command. You can create a directory under your current directory, or you can create a directory in a specified drive or location. The short form of the **mkdir** command is **md**.

MS OS/2 always creates the root directory (\) for you. But most users will require additional directories to store system and user files. You can create additional directories, called *subdirectories*, which branch out from the root directory into a multi-level directory structure.

Creating a Directory in the Current Directory

To make a directory in your current directory, type **mkdir** or **md** followed by the name of the new directory. For example, to create a new subdirectory named **INVOICE** under the **FINANCE** directory, go to the **FINANCE** directory and type the following:

```
md invoice
```

If you now type **dir**, you see **INVOICE** listed as a subdirectory:

```
INVOICE <DIR>    6-1-89  4:44p
```

Creating a Directory in a Specified Location

You can also make a new directory anywhere you choose. This means that even if you are in the **INVOICE** subdirectory on drive C, you can make a new directory named **LETTERS** on drive A. Just specify the drive and path of the new directory after the **mkdir** command, as follows:

```
md a:\letters
```

This creates a new directory on drive A named **LETTERS**.

Creating Multiple Directories

To save time, you can create more than one directory at a time. For example, to create the **SUPPLIES** directory as a subdirectory of your current directory, and the **EXPENSES** directory as a subdirectory of the root directory on drive A, type the following:

```
md supplies a:\expenses
```

This creates two directories: one on your current drive, and one on drive A.

Changing to Another Directory

If you want to work in a different directory, you can use the **chdir** command to change directories. The short form of the **chdir** command is **cd**.

 To change to a subdirectory under the current directory, type **cd** followed by the name of the subdirectory. For example, to move from the **FINANCE** directory to the **INVOICE** subdirectory, type the following:

```
cd invoice
```

To change to a directory somewhere else on the directory tree, you must specify the path of the directory.

Moving to the Parent or Root Directory

 You have seen how the **dir** command uses periods to list the current (.) and parent (..) directories in a directory listing. You can easily move to the current directory's parent directory by typing the following:

```
cd ..
```

Each time you type this command, you move one level towards the root directory. For example, suppose you are in the **MEMOS** directory, whose full path is **\FINANCE\LETTERS\MEMOS**. To return to the **\FINANCE** directory, type the following:

```
cd ..\..
```

This takes you out of the **MEMOS** subdirectory and moves you to the **\FINANCE** directory.

 You can also combine the periods (..) with directory names to specify a directory. For example, suppose you're in the **\LETTER\WORK** directory and you want to move to the **\LETTER\FAMILY** directory. You could move up one level by typing **cd ..** and then type **cd family** to move down to the right directory. However, an easier way is to combine the two operations in one step as follows:

```
cd ..\family
```

 To move quickly to the root directory, regardless of where you are in the directory structure, type the following:

```
cd \
```

Removing a Directory

The **rmdir** command removes a directory. The short form of this command is **rd**.

Before you can remove a directory, you must delete all the files in the directory. (For information on deleting, see "Deleting a File," later in this chapter.) You must also move to a directory other than the one you want to delete, since **cmd** will not let you delete a directory that you are currently in.

Note You cannot remove the root directory, and you cannot remove directories that are being used in other sessions.

Removing One Directory

 To remove one directory, make sure that the directory is empty and that you are in a different directory, then type **rd** followed by the name of the directory you want to delete. For example, to delete the sub-directory **LETTERS**, do the following:

- 1** If you are in the **LETTERS** directory, type **cd ..** to switch to the parent directory.
- 2** Type **del letters*.*** to delete all the files in the directory. A message appears, asking you whether you are sure that you want to delete all files. Type **y** to delete all files in the directory.
- 3** Type **rd letters** to remove the directory.

Removing More than One Directory

 To remove more than one directory, type the **rd** command, then specify each directory you want to delete, as follows:

```
rd letters travel
```

Make sure that each directory you want to delete is empty.

Displaying the Contents of a File

 To display the contents of a file, use the **type** command. For example, suppose that you have saved a letter in a file called **MEMOJAN.FIL**. To view the contents of **MEMOJAN.FIL**, type the following:

```
type memojan.fil
```

The contents of the file scroll on your screen:

```
TO:           John Howard
FROM:         Elizabeth Johnson
SUBJECT:      Questionnaires
DATE:        January 12, 1989
```

```
The twenty questionnaires you sent to our
department have been completed and are
enclosed in the accompanying envelope.
```

```
Thank you for encouraging us to participate
in your survey. We look forward to learning
the results!
```

NOTE If the file is large, you may want to temporarily stop the text from scrolling on your screen. To do this, press CTRL+S. To resume scrolling, press CTRL+S again.

Note If you have a large file that you want to view, you might want to use the **more** utility instead of the **type** command. The **more** utility displays the contents of a file a screenful at a time. For information about the **more** utility, see Chapter 8, “Using MS OS/2 Utilities.”

NOTE You can display more than one file at a time by adding additional filenames after the **type** command. For example, to display the files MEMOJAN.FIL and MEMOFEB.FIL, type the following:

```
type memojan.fil memofeb.fil
```

The contents of MEMOJAN.FIL appear first, followed by the contents of MEMOFEB.FIL.

You could also use wildcard characters to display several files. For example, to display the contents of all the files with the extension .FIL, one after the other, type the following:

```
type *.fil
```

You can also use redirection symbols with the **type** command. Redirection is a feature that lets you take the output from a command and send it to a file instead of to the screen. For information about redirection symbols, see “Redirecting Input, Output, and Error Messages,” later in this chapter.

Copying a File

You can copy files from one location to another by using the **copy** command. In addition, **copy** can combine files and create files. Just specify a source file that will be copied and a destination file that will receive the copy. You can copy ASCII as well as binary files (the default is binary), but you cannot append ASCII files by using the **copy** command.

Copying One File to Another

To copy the contents of one file to another file, type **copy** followed by the names of the source file and the destination file.

For example, to copy the contents of the file OLD.TXT to the file NEW.TXT, type the following:

```
copy old.txt new.txt
```

If NEW.TXT doesn't currently exist, it is automatically created, then OLD.TXT is copied to it. If NEW.TXT does exist, it is replaced by the contents of OLD.TXT. Be careful when you copy the contents of a file to an existing file, since the contents of the existing file will become permanently lost.

If you do not specify a directory path, MS OS/2 copies files in the current directory. If you want to specify files in other directories, make sure that you include their directory paths. For example, to copy the contents of OLD.TXT in the current directory to NEW.TXT in drive A, type the following:

```
copy old.txt a:new.txt
```

To copy the contents of a file on drive A called INVOICE.DOC to your current directory and name the new file INVOICE.DOC, type the following:

```
copy a:invoice.doc
```

If you don't specify a destination, the file is copied to the current directory.

Copying a Group of Files

 You can use wildcard characters to copy a group of files to another group of files. For example, to copy the contents of all of the files in the current directory that have the filename extension .EXE to an identical set of files in drive A, type the following:

```
copy *.exe a:
```

You can also copy a group of files to a specific directory. For example, to copy the contents of all of the .TXT files to the LETTERS subdirectory in the FINANCE directory, type the following:

```
copy *.txt \finance\letters
```

There may be times when you'll want to copy an entire directory into another directory. For example, to copy all of the files in the current directory into the REPORTS directory in drive A, type the following:

```
copy *.* a:\reports
```

Be sure the directory exists; if it doesn't, MS OS/2 will create a file called REPORTS in the root directory on drive A, then copy the contents of all of the files into that one file.

Note If you want to copy the contents of an entire floppy disk onto another floppy disk, use the **diskcopy** utility, which is described in Chapter 8, "Using MS OS/2 Utilities."

Appending a File to Another File

In addition to copying files, the **copy** command can append one or more files to an existing file or combine them into a new file. (The original files will still exist, unless you have made one of them the destination file.) To do this, simply list any number of files as arguments to the **copy** command. The files to be combined should be separated by plus signs (+), and you can specify a destination file that the combined files will be copied to.

 For example, suppose that you want to combine two files named JAN.FIL and FEB.FIL. To add the contents of FEB.FIL to JAN.FIL, type the following:

```
copy jan.fil+feb.fil
```

When the operation is completed, **cmd** displays the following message: "1 file(s) copied." The plus sign (+) between the files means that the contents of the FEB.FIL file will be added to the JAN.FIL file. (FEB.FIL will still exist in its original form.)

You can combine several files and copy them to another file. So, if you want to add the contents of the files JAN.FIL, FEB.FIL, and MAR.FIL to a new file called WINTER.FIL, type the following:

```
copy jan.fil+feb.fil+mar.fil winter.fil
```

If you specify a destination file when you append files, the destination file is created and given the current date and time. If you omit a destination file, MS OS/2 combines the files and stores them under the name of the first specified file.

 You can also combine several files into one file by using wildcard characters. The following command takes all files with the .TXT extension and combines them into one file named COMBIN.FIL:

```
copy *.txt combin.fil
```

In the following example, each file that has the extension .TXT is combined with its corresponding .REF file. The result in each case is a file with the same filename, but with the extension .FIL. For example, VIDEO.TXT would be combined with VIDEO.REF to form VIDEO.FIL; AUDIO.TXT would be combined with AUDIO.REF to form AUDIO.FIL; and so on.

```
copy *.txt+*.ref *.fil
```

If .TXT files do not correspond exactly with .REF files, existing files are copied singly to the .FIL files.

The following **copy** command combines all of the files with the extension .TXT and all of the files with the extension .REF into one file named COMBIN.FIL:

```
copy *.txt+*.ref combin.fil
```

Creating a File

In the previous examples, you have seen how to copy files to other files. But the **copy** command can also copy to a file what you type on the keyboard. You simply specify **con** (for console) after the **copy** command. To MS OS/2, the keyboard is known as CON.

For example, to create the file MESSAGE.TXT, type the following:

```
copy con message.txt
```

Then press ENTER and type the text of the message. For example, you could type the following:

```
I have just received your shipment of invoices.
Thanks for your prompt response.
```

```
T. K. Smith
```

To end the note and save it in the file, press CTRL+Z followed by ENTER. You'll see a message saying "1 file(s) copied," then the command prompt again.

If you use the `dir` command to view the directory entries, you'll see that the file MESSAGE.TXT now appears in your directory.

Note The `copy` command has three additional options. The `/v` option verifies a copy operation, the `/a` option copies ASCII files, and the `/b` option copies binary files. For more information on how to use these options, see the *Microsoft Operating System/2 Desktop Reference*.

Deleting a File

Just as you may want to make copies of files, you may also want to remove old or unnecessary files. When you want to delete a file from a disk permanently, you can use the `del` or `erase` command.

Deleting One File

You can delete one file from a directory by typing `del` or `erase` followed by the name of the file.

For example, to delete the file OLD.TXT from the root directory in drive A, type the following:

```
del a:\old.txt
```

Use the `dir` command to verify that the file has been deleted. It's a good idea to go through your directories and delete unnecessary files periodically. Unnecessary files take up valuable disk space.

Deleting a Group of Files

You can use wildcard characters to delete a group of files. For example, suppose you are closing out your accounts with a particular vendor named New Moon Supplies. Your current directory contains a variety of files that record business transactions with this vendor:

```
budget.jan
budget.feb
newmoon.inv
newmoon.acc
newmoon.1
newmoon.2
newmoon.fil
report.fil
```

 To delete all files starting with the filename NEWMOON, type the following:

```
del newmoon.*
```

Now your directory looks like this:

```
budget.jan
budget.feb
report.fil
```

Or, to delete all of the files in your current directory, type the following:

```
del *.*
```

When you try to delete all of the files in a directory, the following message appears: "Are you sure (Y/N)?" If you type **y** and then press **ENTER**, the files will be deleted. If you type **n**, the files will not be deleted, and you will be returned to the prompt.

Use wildcard characters with care—remember that deletions are permanent.

Renaming a File

Occasionally, you may want to change the name of a file. You can use the **rename** command to do this. The short form of this command is **ren**.

 For example, to change the name of the file ADS.FIL on drive C to SPONSORS.FIL, type the following at the prompt:

```
ren c:\ads.fil sponsors.fil
```

You can also rename a group of files. To rename all the files in the current directory that have the extension .TXT so that they have the extension .FIL, type the following:

```
ren *.txt *.fil
```

When you are renaming files, keep these points in mind:

- You cannot rename a file and move it to a different drive or directory in the same step.
- You cannot rename a file using a filename that already exists.

Changing to Another Drive

To change to another drive, type the drive letter followed by a colon (:). For example, if the current drive is drive C, and you want to switch to drive D, type the following:

```
d:
```

This switches to the current directory on drive D.

Displaying the Volume Label

Each disk has a volume label, which is a name you assign to the disk during formatting. You might want to give a floppy disk a unique label to help you identify the disk later. If you have set up logical drives, a volume label can describe the contents of the drive (for example, drive D might be called SMITH, and drive E be called JONES).

To view the label for your current disk, type the following:

```
vol
```

You can also view the label for a different disk, such as the one on drive A, by typing the drive letter after the **vol** command:

```
vol a:
```

You can set the volume label by using the **label** utility, which is described in Chapter 8, “Using MS OS/2 Utilities.”

Running Programs

You can run programs such as applications and utilities from **cmd**. This section describes how to start a program, as well as how to set up the proper environment to run a program and how to modify standard input (input from the keyboard), standard output (output to the screen), and standard error (error messages). This section also describes what happens when you start different types of programs from **cmd**.

Starting a Program from Cmd

 To start a program from **cmd**, do the following:

- ▶ At the prompt, type the command that starts the program, followed by any arguments, and press **ENTER**.

For example, suppose that you want to prepare the payroll checks for your employees by using a spreadsheet program named **SP**. To start the program, type the program's start command, in this case **sp**. Then press **ENTER**.

Note See your program's manual for the specific command that starts the program.

After your program starts, the output you see on the screen depends upon the type of program you are running. Some full-screen programs, for instance, can run in a window as well as in a full screen. If you start them from **cmd** in a window, they run in a window; if you start them from **cmd** in a full-screen session, they run in a full screen. Presentation Manager applications, on the other hand, run in a window even if you start them from **cmd** in a full screen. The following list shows the various types of MS OS/2 programs you can run from **cmd**, and what their output looks like depending on where you start them:

Program type	Started from cmd in a window	Started from cmd in a full screen
Full-screen only	Full-screen output	Full-screen output
Full-screen or window	Window output	Full-screen output
Presentation Manager	Window output	Window output
DOS	Error message	Error message

In MS OS/2, DOS programs can be run only in the DOS session.

Starting a Presentation Manager Application

You can start a Presentation Manager application from `cmd` when it is running in a full screen or in a window. After you type the name of the command and press `ENTER`, your application starts to run in a new Presentation Manager window.

While you're running the application, you won't be able to see the `cmd` prompt at all, even though `cmd` continues to run your application behind the scenes. When you quit your application, the application's window disappears and the `cmd` prompt reappears.

Starting a Full-Screen Program that Can Run in a Window

Some full-screen OS/2 programs can run either in a full screen or in a window. You can start these programs from `cmd` in a full-screen session or from `cmd` in a window.

When the program is started from a full-screen session, it takes up the entire screen until you quit the program. When the program is started from `cmd` in a window, it runs in that same window (not in a new window). After you quit your program, the `cmd` prompt reappears.

Starting a Full-Screen Program that Must Run in a Full Screen

Some full-screen OS/2 programs are designed to be started from `cmd` when it is running in a full screen. If you start the program from `cmd` running in a window, the program's output appears on the full screen, then switches back to the window after the program is through running. Many programs display output on the full screen for only a few moments before switching back to the window.

If this happens, start `cmd` running in a full screen, then start your program.

Setting the PATH and Other Environment Variables

Starting programs from **cmd** is identical to using commands, except that you must be in the directory where the program is located or you must have set the **PATH** environment variable to include that directory. The **PATH** environment variable specifies which directories MS OS/2 will search for programs you start. If you add your program's directory to the search path, MS OS/2 can find and start your program regardless of which directory you are currently working in.

You might also need to set other environment variables, such as **DPATH**, **LIB**, or **TMP**, depending on whether your program requires them. For information on setting environment variables, see "Setting Up the Environment," later in this chapter.

Starting a Program with the Start Command

The **start** command lets you start a program in a new full-screen OS/2 session or in a new window (but not in the DOS session). **Start** provides an alternative to Start Programs, and also lets you start programs from a batch file. Various options to **start** provide you with different ways to start programs.

 To start a new program, type **start** followed by the name of the program. If you type **start** by itself, **cmd** starts running in a new window.

After typing the name of the program, you can specify a program title and options. The **start** command's options are described in the following sections. If you don't supply options, **start** tries to determine the type of program you want to start (full-screen or Presentation Manager), and starts the program in the appropriate session.

If you start a program with the **start** command from a full screen or in a window running **cmd**, a new window is created for your program (if the program can run in a window). If the program cannot run in a window, a new full-screen session is created to run your program. Once programs start running, you can stop them at any time by pressing **CTRL+C**.

The new program starts in a background session or window, not in the one you are currently working in. You will need to switch to that session or window before you can view the program or work with it. (See "Starting a Foreground Program," later in this chapter, for an alternate way to make a new program appear in the foreground.)

Specifying a Program Title

NOTE To specify a program title for the new program, type the title, enclosed in quotation marks, immediately after the **start** command. This title will be displayed in the title bar of the window where the program is running, as well as in the list of programs in Task Manager.

For example, suppose that you want to start a program called SP and you want to give it the program title “Harris Co. Spreadsheet.” To specify the program title when you start the program, type the following:

```
start "Harris Co. Spreadsheet" sp
```

You’ll see SP start in a window. The title bar and the Task Manager entry for SP will both say “Harris Co. Spreadsheet.”

Using Start in Batch Programs

The **start** program is used most often in batch programs for activities such as starting programs during system start-up. If you know that you want a particular program to run every time you start MS OS/2, you may want to use the **start** command in a start-up program. For more information about batch programs, see “Writing Batch Programs,” later in this chapter. For information about start-up programs, see Chapter 12, “Using Start-up Files in MS OS/2.”

Causing Cmd to End Automatically

NOTE You can cause **cmd** to end after a program finishes running, by using the **/c** option. Normally, after a program that was started with the **start** command finishes running, the new session or window that was created does not disappear. When you specify the **/c** option, the new full-screen session or window closes after the program ends.

You can use this option to start a program without keeping an extra copy of **cmd** running. For example, suppose you want to run the **chkdsk** utility when you start or restart MS OS/2 and place the status report for drive A in the file STATUS. You could enter the following line in your STARTUP.CMD file:

```
start /c chkdsk a: > c:status
```

If you don’t specify otherwise, MS OS/2 will create STATUS on your start-up drive (usually drive C). For more information on STARTUP.CMD, see Chapter 12, “Using Start-up files in MS OS/2.”

If you've put this line your STARTUP.CMD file, then every time STARTUP.CMD is run, the **start** command starts **cmd** in a new window, runs **chkdsk**, saves the **chkdsk** status information in the STATUS file, and then closes the window. You can then view the STATUS file to see the status information for drive A.

Starting a Program in a Full Screen

To start a program in a full-screen OS/2 session, use the **/fs** option. Some programs are designed to be run only in a full screen. If you start these from **cmd** running in a window, these programs display their output in a full screen, then switch back to the window, making the output unreadable. The **/fs** option guarantees that when you start the program, it will display its output in a full screen.

Starting a Foreground Program

You can start a program that is displayed in the foreground by specifying the **/f** option. This way, when the program starts you can see it running in the session or window you are currently working in.

Other Options to the Start Command

The **start** command has several other options, which are listed below. For details about these options, see the *Microsoft Operating System/2 Desktop Reference*.

Option	Purpose
/k	Preserves the new session or window after the program ends. This is the default.
/n	Causes a program to start without first starting cmd .
/win	Specifies that the program will be run in a window.
/pm	Specifies that a Presentation Manager application will be started.
/i	Causes the newly started copy of cmd to inherit the environment specified in CONFIG.SYS. The /i option is described in "Inheriting the Environment of the Session," later in this chapter.

Starting a Background Program with the Detach Command

To start programs running in the background, use the **detach** command. These programs run, but they don't run in a session. This means that you can't provide input to them (such as typing commands) and they don't display output. In addition, detached programs do not appear in the Task Manager list.

 To detach a program, type **detach** followed by the name of the program you want to run in the background. For example, if you want to run the **xcopy** utility as a detached program and have it copy all the files in the BIN directory to the disk in drive A, while you go on to use other commands from the prompt, type the following:

```
detach xcopy bin a:
```

Once you start a background program, MS OS/2 starts an independent process for the program, displays the message "The Process Identification Number is *nn*", and displays the **cmd** prompt again. After the prompt appears, you can continue to type commands and run programs while your background program runs.

Programs that can run without user input and that take a long time to run are good candidates for background processing. That way, you don't need to have **cmd** running in a full screen or window just to start one program. It's a good idea to avoid unnecessary full-screen sessions or Presentation Manager windows, because extra sessions and windows slow down the performance of your computer. A keyboard-monitor program is an example of a program that you must run in the background, since this type of program waits for the user to press certain keys before starting.

Since you can't see the output of a background program, you should redirect the output to a file or device. For example, suppose that you want an alphabetical listing of a very large list of names. The following command starts a background process that reads the names from the file NAMES, sorts them, and writes them to the file SORT.DIR:

```
detach sort < names > sort.dir
```

While this is taking place, you can continue to run other programs from the **cmd** prompt. For a detailed explanation of the pipe (|) and redirection symbols (>, <, or >>), see "Redirecting Input, Output, and Error Messages," later in this chapter.

Setting Up the Environment

The environment consists of a collection of variables used by the system. These variables, called environment variables, are user-defined and can be assigned values of your choosing. There are certain environment variables that are commonly used by programs, such as `PATH` and `DPATH`, although you can also define your own environment variables.

When you start a program from `cmd`, the system searches for the program in the directories specified by the `PATH` environment variable. Some programs also use the `DPATH` environment variable, which specifies the data search path to use. If you're a programmer, you might need to set the `LIB` (library search path) and `INCLUDE` (include-file search path) environment variables.

This section describes how to set up the `PATH` and `DPATH` environment variables, as well as how to use the `set` command. For more information about environment variables, see Chapter 13, "Using MS OS/2 Configuration Commands."

Displaying Your Path

After you install your program—but before you run it—you may need to modify your `PATH` environment variable. `cmd` uses this variable to search for programs that you start from `cmd`. When you type a command to start a program, `cmd` first searches your current directory for the program. If it doesn't find it there, `cmd` searches the first directory listed by the `PATH` environment variable, then the second, and so on, until the program is found.

 When MS OS/2 is first installed on your system, a default `PATH` setting is assigned automatically and stored in your environment along with other environment variables. You can view your path by typing the following:

set

Your path is listed on the "`PATH=`" line. More than one directory can be specified, separated by semicolons. (You can also view your path alone by typing `path` by itself. This will display just the "`PATH=`" line.)

You can always run a program if you are already in the directory where it is installed or if you specify the exact path of the program on the command line. It is usually easier, however, to modify your path so that you can run your program while you're in any directory.

Setting Your Path

To modify the PATH environment variable, you can use the **path** command. To use this command, type **path** followed by the directories you want in your search path. Separate directory names with a semicolon (;).

For example, suppose you want to add the APPS directory to your search path. Your current path is set to the OS2 directory and several of its subdirectories. You can type the following to set the new path:

```
path c:\os2;c:\os2\dll;c:\os2\system;c:\os2\intro;c:\apps
```

Restarting MS OS/2 will remove path assignments made with the **path** command.

In addition to the **path** command, you can also use the **set** command to set your search path. This command is described in the following sections. Or you can set your path by using the **set** configuration command. See Chapter 13, “Using MS OS/2 Configuration Commands,” for information on how to use this command.

Setting Up a Data Search Path

You can set up a search path for data files by using the **dpath** command. Just as the **path** command tells **cmd** where to locate program files, the **dpath** command tells programs where to locate data files. A data file is any file not having the file extension **.EXE**, **.COM**, **.CMD** (in a full-screen session or in **cmd** running in a window), or **.BAT** (in the DOS session).

For example, to tell MS OS/2 to search for data files first in your current directory and then in the ACCOUNTS directory, type the following:

```
dpath accounts
```

Note Not all programs use the DPATH variable in their data searches. If it is not used, DPATH is ignored.

Setting an Environment Variable

To set environment variables, you can use the **set** command. You set environment variables by typing **set** followed by the name of the variable, an equal sign (=), and the value.

- ☛ To view your current environment, type **set** by itself. You'll see a list of environment variables and the values that are assigned to them.

The form a value takes depends on what the variable is and what it's used for. For example, while the **PATH** variable requires directory paths, the **PROMPT** variable requires the special characters that define the way the prompt looks.

- ☛ To define or redefine an environment variable, type **set** followed by the name of the variable, an equal sign, and the value. If you want to define an environment variable called **TEMP** and assign the **TEMP** directory on drive **C** to it, type the following:

```
set temp=c:\temp
```

Now if you type **set** by itself, the **TEMP** variable appears in the list.

In most cases, however, you will want to append, not override, any new values to your existing settings. For example, suppose that your current path looks like this:

```
PATH C:\OS2;C:\OS2\DLL;C:\OS2\SYSTEM;C:\OS2\INTRO
```

Also, suppose that you have just installed a spreadsheet program called **SP** in the directory **APPS** and you want to be able to run your program from any directory. You could add the **APPS** directory to the search path by typing in the existing path, then adding the **APPS** directory to the end of the list. An easier way to do this is to use a variable in the **set** command.

- ☛ To append a value to your path, type the following:

```
set path=%path%;c:\apps
```

The *%path%* variable is replaced by the existing path, and **APPS** is appended to the end of the list. After you have set your path, verify that it has been added by typing **set** again.

Deleting a Setting

- ☛ To delete the current setting for an environment variable, type **set** followed by the name of the variable and an equal sign, but do not type a value to be assigned to the variable. For example, to delete the **DPATH** environment variable and its current setting from your environment, type the following:

```
set dpath=
```

Inheriting the Environment of the Session

To start a new copy of **cmd** in a window and have it inherit the environment that was set up when you started your system, use the **start** command with the **/i** option. Normally, when you type **start**, the new copy of **cmd** inherits the environment of the current session. Since you can change the environment at any time by using the **path** and **set** commands, your current environment may not be the same as the one that you originally set up in **CONFIG.SYS**.

NOTE To cause a new copy of **cmd** to inherit the environment set up in **CONFIG.SYS**, type the following:

```
start /i
```

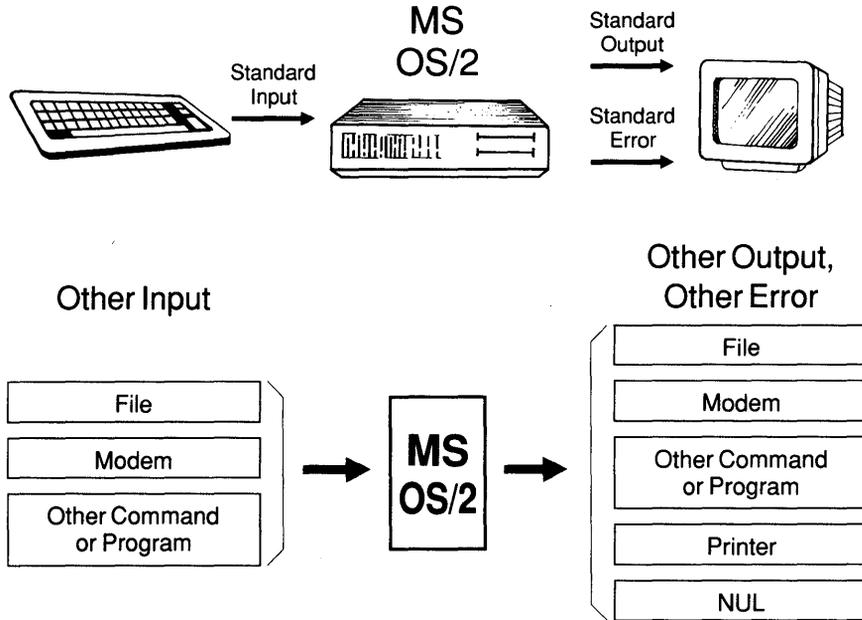
Cmd starts to run in a new window. If you now type **set** by itself, you'll see that the new environment is identical to the environment set in **CONFIG.SYS**. (For information about environment variables set in **CONFIG.SYS**, see Chapter 13, "Using MS OS/2 Configuration Commands." For more information about the **start** command, see "Starting a Program with the Start Command," earlier in this chapter.)

Redirecting Input, Output, and Error Messages

When an MS OS/2 program runs, it usually expects input (data) and it usually produces output (results). For example, the output of the **dir** command is a directory listing that is usually displayed on your screen. In addition, if the system encounters errors while running a program, it produces error messages.

MS OS/2 programs can receive input from different devices, such as a keyboard, a disk file, or a modem. Similarly, programs can send their output and error messages to different destinations, such as a computer screen, a disk file, or a printer.

By default, MS OS/2 programs receive input from the keyboard, and send output to the screen.



Information that you type at the keyboard is called *standard input*, or STDIN, and the information that is sent to the screen is called *standard output*, or STDOUT. In addition, if the system encounters an error condition, it normally sends error messages to the screen. This is called the *standard error*, or STDERR.

If you want MS OS/2 to have input come from a source other than the keyboard, or have output or error messages sent to a device other than the screen, you can use two powerful features of MS OS/2: *redirection symbols* and *pipes*.

Redirection symbols let you change the way that MS OS/2 deals with input and output. Instead of taking input from the keyboard, for example, you could direct MS OS/2 to get data from a file on your disk. Instead of displaying output on the screen, you could send the program's output or error messages to a printer.

Pipes let you take the output of one program and use it as the input to another program.

Redirection symbols and pipes are described in the following sections.

To keep track of data and identify files, MS OS/2 uses *file handles*, and some of these can be useful in redirection. By default, STDIN is assigned the value (or handle) of 0, STDOUT has the value of 1, and STDERR has the value of 2. Valid handle values range from 0 to 9, although handles 3 through 9 must be assigned by programs for them to be used.

Pipes and redirection symbols can be used alone or in combination, to change where input is read from and where output and error messages are written to. This lets you redirect input, output, and error messages to a file or device other than the keyboard or the screen.

Saving Program Output in a File

Instead of displaying messages on the screen, you can have those messages sent to a file on your disk or to a physical device (such as a printer).

- To redirect the standard output (STDOUT) to a file or device, use a greater-than sign (>) in your command. Unless you specify a number before the greater-than sign, the standard output (handle 1) is assumed. This means that > and 1> are equivalent.

For example, to redirect the output of the **dir** command to a file named DIRLIST.TXT, type the following:

```
dir > dirlist.txt
```

If you now use the **type** command to view DIRLIST.TXT, you'll see that the directory listing appears in the file. If the filename you specify doesn't already exist, MS OS/2 creates a new file and stores your directory listing in it. However, if the filename does already exist, MS OS/2 replaces what is in the file with the new data (the old contents of the file are lost), so be sure not to specify the name of an existing file that you want to keep.

Sending Program Output to a Device

- You can also redirect standard output to a device. For example, if you want to send your directory listing to a printer that is attached to your computer's first parallel port (LPT1), type the following:

```
dir > lpt1
```

Or, to send your listing to a terminal that is attached to your computer's first serial communications port (COM1), type the following:

```
dir > com1
```

Remember that your devices must be installed and running properly before you can redirect output to them.

If you don't want output to be displayed on the screen or sent to a device, you can redirect it to NUL. Anything that is sent to NUL is discarded.

 To redirect standard output from the **dir** command to NUL, type the following:

```
dir > nul
```

Note that error messages (STDERR) will still be displayed on your screen, since you have only redirected output.

Finally, if your program sends output to handles 3 through 9, you can redirect standard output to a file or device by specifying the handle number before the greater-than sign. For example, if you typed **myprog 3> outfile**, this would take any output from MYPROG that is sent to handle 3 and send it to OUTFILE.

Appending Output to a File

 If you want to add standard output to a file (instead of replacing the entire file), you can use two greater-than signs (>>) to tell MS OS/2 to append the output of the command (such as a directory listing) to the end of the file you specify. For example, to append your directory listing to an existing file named NEWLIST.TXT, type the following:

```
dir >> newlist.txt
```

When you redirect output with two greater-than signs, the existing contents of the file are not overwritten.

Reading Input from a File

 If you want your program to read input from a file, use a less-than sign (<) in your command. Unless you enter a number before the less-than sign, standard input (handle 0) is assumed. This means that < and 0< are equivalent.

It is often useful to have input for a command come from a source other than the keyboard, such as a file. For example, suppose you have a file called NAMES.FIL that lists the names of several clients. If this list is not in alphabetical order, you could sort the file's contents by typing the following:

```
sort < names.fil
```

The **sort** utility takes the contents of NAMES.FIL as its input and displays the contents alphabetically on the screen.

Reading Input from and Saving Output in a File

You can have a program both read input from a file and save output in another file by combining redirection symbols. For example, to take the sorted client list in NAMES.FIL and save it in a file called CLIENTS.NAM, type the following:

```
sort < names.fil > clients.nam
```

Thus, NAMES.FIL is the input to the **sort** utility and CLIENTS.NAM is the output.

Saving Error Messages in a File

By default, MS OS/2 displays error messages (STDERR) on your screen. It is sometimes helpful, however, to store them in a file. That way, you have a permanent record of any errors you encounter while running a program.

 Suppose you are planning to copy all the files on drive C that contain the filename extension .TXT to drive A. To do this and to create a file to hold the error messages that may appear while the files are being copied, type the following:

```
copy *.txt a: 2> logfile.mes
```

Any error messages that the operating system sends out during the copying operation are now stored in the file LOGFILE.MES. If you use the **type** command to view LOGFILE.MES, you'll see the error messages that would normally be displayed on your screen. In this case, the message might be "SYS0002: The system cannot find the file specified." You must use the number 2 before the redirection symbol to specify that the error messages, not the command's output, are being redirected to LOGFILE.MES.

Sending Both Output and Error Messages to One File

If you want your log file to contain both standard output and standard error messages, you can redirect them both to the same output device or file. This can be useful when you run a detached program, since you can't view the output from programs that are running in the background. After the detached program finishes running, you can view an output file that contains output and error messages that would normally be displayed on your screen.

For example, suppose you want to use the **dir** command to list all the (handle 1) and the standard-error messages (handle 2) to the file LOGFILE.MES, type the following:

```
dir *.txt > logfile.mes 2>&1
```

In this example, "2>&1" tells MS OS/2 that any output written to handle 2 will have the same effect as if it were written to handle 1. Therefore, the LOGFILE.MES file will contain both the output of the **dir** command and any error messages. The order of the symbols and arguments in the command is very important here: "2>&1" must follow the name of the file.

Sending Output and Error Messages to Different Files

If you want output or error messages to be directed to two different files, specify the filenames separately:

```
dir *.txt > outfile.doc 2> errfile.doc
```

Now any output from the **dir** command is in OUTFILE.DOC, and error messages are in ERRFILE.DOC.

Taking Output from One Program and Sending It to Another

Another way that you can manipulate input and output is by using pipes. Pipes work by taking the output of one command and using it as the input for the next command. Using pipes save time, since you can run two, three, or more programs from a single command line.

Piped commands are separated by the pipe symbol (|). When you use pipes, the first command on the command line runs as usual. The output of the first command is piped (that is, used as input) to the command that follows the first pipe symbol. The second command then

runs, using the piped input. This process is repeated until all of the piped commands are processed. By using pipes, you could process the same set of data in several different ways.

For example, to view a directory listing of the current directory and then sort the listing, type the following:

```
dir | sort
```

The **dir** command is carried out and the output (the directory listing) is piped to the **sort** utility. Then the **sort** utility sorts the output and the screen displays an alphabetically sorted directory listing.

Tasks that Use Redirection Symbols and Pipes

You can use redirection symbols and pipes to perform many tasks. The following examples show just a few possible uses.

Sorting a Directory Listing and Saving It in a File

You can pipe the output of one command to another command, and then save the output in a file, by combining the pipe and redirection symbols. A useful technique is to pipe two commands together and send the output to a file. For example, the following command creates a file named **DIRECT.LST** in your working directory:

```
dir | sort > direct.lst
```

The **DIRECT.LST** file now contains a sorted listing of the working directory.

You can also specify a drive other than the default drive. For example, suppose you want to create the file **DIRECT.LST** on drive B and send the sorted data to it. To do this, type the following:

```
dir | sort > b:direct.lst
```

Printing a Sorted Phone List

As you have already seen, you can redirect both the input and the output of a program. It is sometimes useful to print the output of a program. For example, if you wanted to sort a phone list and then print out the sorted list, you could type the following:

```
sort < phone.lst > lpt1
```

The contents of the file **PHONE.LST** becomes the input for the **sort** utility, and then becomes the output to a printer attached to **LPT1**.

Reassigning Standard Input and Standard Output

 You can assign standard input and output to a different keyboard and terminal. For example, to assign standard input and output to the keyboard and terminal attached to COM1, type the following:

```
cmd < com1 > com1
```

This would allow you to run **cmd** on your computer from a remote terminal. This is equivalent to the **ctty** command in MS-DOS.

Preventing Error Messages from Being Displayed

 If you don't want error messages to be displayed on your screen, you can redirect them to NUL. Anything sent to NUL is discarded. To send error messages to NUL, type the following:

```
cmd 2> nul
```

This command starts a new command interpreter (**cmd**) and sends all error messages to NUL.

Piping Several Commands Together

 You can pipe several commands together. For example, to sort several phone lists and display the sorted output one screenful at a time, you could type the following:

```
type *.lst | sort | more
```

All of the phone lists having the filename extension **.LST** are sent as output together to be first sorted, and then displayed one screenful at a time.

Writing Batch Programs

Once you know how to run **cmd** commands, you might want to create your own programs to carry out complex or specialized tasks. **Cmd** lets you combine commands and programs into a single program called a *batch program* or *batch file*. This saves time over typing each command separately at the prompt.

Batch programs let you do the following:

- Run several commands from one batch program.
- Carry out the same batch program with different data.

Batch programs are commonly used to simplify a series of repetitive tasks, thus reducing the amount of typing you need to do. They are also used to create a custom command that is designed for your particular work needs. For example, you might need to copy different directories on a regular basis from your hard disk to a backup floppy disk. Instead of copying each directory separately by typing five **copy** commands at the prompt, you could type the name of the batch program once and let it do the five copying operations for you.

A batch program consists of one or more lines of instructions that **cmd** reads and processes one at a time. As each line is processed, it is displayed (echoed) on your screen. (Later in this chapter you'll learn how to prevent each line from being echoed.)

In this section, you'll learn how to build a simple batch program to perform a series of tasks, then you'll learn how to improve and enhance this program with advanced batch-programming techniques.

Using Batch Commands

A batch program can contain batch commands, **cmd** commands, MS OS/2 utilities, or programs that can be run from **cmd** (including other batch programs). Batch commands give you control over how your commands are carried out. They also let you send or display messages, set variables, and use replaceable parameters.

The MS OS/2 batch commands are as follows:

Command	Purpose
call	Calls one batch program from another batch program.
echo	Turns the echo feature on or off.
endlocal	Restores the drive, directory, and environment settings that were in effect before the setlocal command was used.
extproc	Defines an external batch processor for a batch program.
for	Performs a command for a set of items.
goto	Causes processing to continue at the line after a specified label.
if	Performs a command based on the result of a condition.
pause	Suspends processing of the batch program temporarily.
rem	Adds remarks to a batch program.
setlocal	Defines drive, directory, and environment variables that are used during batch-program processing.
shift	Changes the position of the replaceable parameters in batch-program processing.

Some commands, such as **setlocal** and **endlocal**, can be used only in batch programs, while others, such as **echo**, can be typed at the **cmd** prompt as well as be placed in batch programs.

Creating Simple Batch Programs

You create a batch program by typing commands in a file using System Editor (or any other text editor) or the **copy con** command. (For more information on the **copy con** command, see "Creating a File," earlier in this chapter.) Batch programs that you run from **cmd** must have the filename extension **.CMD**. (Batch programs in the DOS session must have the filename extension **.BAT**. For more information about the DOS session, see Chapter 9, "Using the DOS Session.") It is a good idea to remove blank lines from batch files, since each blank line will cause the **cmd** prompt to be displayed when the program is run.

■ You run a batch program by typing the name of the batch file. (You do not need to type the extension.)

The examples in this discussion have been simplified as much as possible to illustrate batch-programming commands and techniques. When you write a working batch program, however, you will probably want to embellish it with commands that provide error checking and commands that display helpful messages for the user.

The simplest batch programs usually run utilities and display messages on the screen. They perform the same function that you would perform if you typed a series of commands at the **cmd** prompt.

For example, the following is a simple batch program called **Switchto**, stored in the batch file **SWITCHTO.CMD**:

```
@echo off
rem This is a simple batch program
if "%1"==" " goto end
if %1==work cd c:\os2\work
echo Welcome to the WORK directory!
:end
```

This program lets you quickly switch to the directory **\OS2\WORK** on drive **C**, regardless of what directory you are currently working in. To run this program, type the following:

switchto work

The first line, “**@echo off**”, is found in most batch programs. It prevents each batch command from being echoed on your screen as it is being processed by **cmd**.

The second line, “**rem This is a simple batch program**”, is a comment statement used to add messages to batch files. **Cmd** does not process **rem** statements when echoing is turned off, so you are free to add whatever comments you want to your batch programs.

The next two lines use the **if** batch command to check for the first argument typed (**%1**) after the name of the batch file. If you forget to type the argument (“ ”), the **goto** statement transfers control to the label “**:end**” and the program ends. If, however, you type **work** (if **%1==work**), you are switched to the directory **\OS2\WORK**, and the next line displays the message “Welcome to the WORK directory!”

Later sections describe how to use commands, utilities, and batch commands to create your own batch file.

Setting Up Your Environment with a Batch Program

One common way to use batch programs is to set up your environment. For example, you can set environment variables such as PATH and PROMPT in an initialization file.

Suppose you want to create a system initialization file called OS2INIT.CMD. You want to set the environment variable TMP in this file, as well as switch to your HOME directory and start the SP spreadsheet program in the foreground. OS2INIT.CMD would look like this:

```
@echo off
set TMP=c:\tmp
cd \home
start /f sp
```

You could type these commands at the **cmd** prompt each time you start MS OS/2, but putting them in a batch file simplifies this process.

Displaying a Message with a Batch Program

The following example creates a very simple batch program that displays the message, "Use echo to display a message." Use a text editor or the **copy con** command to create a file named SPECIAL.CMD, and type the following:

```
@echo off
rem This program displays a message
echo Use echo to display a message.
```

You can use the **rem** batch command to add comments to your program. Any text after **rem** that is on the same line is treated as a comment. If the echo feature is on, **rem** commands are displayed as your program runs; if echoing is turned off (as in this example), no text is displayed.

As mentioned previously, the **@echo off** command turns off the echo feature, which by default is on. This prevents the commands from being displayed on the screen as they are processed. The at sign (**@**) prevents the text string "echo off" from being displayed as it turns the feature off. The **@echo off** command is often used at the beginning of batch programs to prevent unnecessary output from cluttering up the screen.

Note You can also turn echoing off by typing the **/q** option as an argument to the command that starts your batch program. For this reason, do not use **/q** as an argument to any command in your batch file.

When echoing is off, you can use the **echo** command to display the text that follows it on the same line. You might want to display messages in your batch program to inform yourself or other users of events taking place or to inform them of error conditions that have occurred.

Running a Batch Program

NOTE To run your program, type the name of your file, without the extension, then press ENTER. For example, if your batch file is named SPECIAL.CMD, type **special** to run the batch program. If you want to stop your program before it completes, press CTRL+C.

Creating a Custom Command

After using **cmd** for a while, you might find that there are **cmd** commands and utilities that you use on a daily basis. You can create custom versions of these commands that incorporate the options that you always use.

NOTE As an example, suppose that you work in a complex multilevel directory structure that contains many subdirectories. Also suppose that you must return to your root directory several times a day. To help you do this, you can create a customized version of the **cd** command. Your version will display the message, "Returning to the root directory", switch you to the root directory on drive C, and display the directory listing for the root directory a screenful at a time. To set up this special version of the **cd** command, type the following lines in a file called HOME.CMD in your root directory:

```
@echo off
echo Returning to the root directory
c:
cd \
dir /p
```

Now, no matter what drive or directory you are currently in, you only need to type **home** and MS OS/2 will return you to the root directory on drive C.

Performing a Series of Tasks with a Batch File

A common use of batch files is to perform copying operations to update files or to create backup disks. Suppose that you have specific files in particular directories on a floppy disk that are updated on a weekly basis and then need to be copied to particular directories on your hard disk. Suppose further that the specific files you are interested in are all the files that contain the extensions **.EXE** and **.LIB** and all of

the files in your INCLUDE directory, plus the file README.DOC from the root directory. This copying operation involves the following steps:

- 1 Copy all of the .EXE files that are in the NEW directory on your floppy disk to the BIN directory on your hard disk.
- 2 Copy all of the .LIB files that are in the NEW directory on your floppy disk to the LIB subdirectory of the BIN directory on your hard disk.
- 3 Copy all of the files in the INCLUDE directory on your floppy disk to the INC directory on your hard disk.
- 4 Copy the README.DOC file from the root directory on your floppy disk to the root directory on your hard disk.

You can create a batch program that performs each of these steps by typing the following in a file named TRANSFER.CMD:

```
@echo off
rem This batch program copies files from drive A to drive C
echo Copying files ...
copy a:\new\*.exe c:\bin
copy a:\new\*.lib c:\bin\lib
copy a:\include\*.* c:\inc
copy a:\readme.doc c:\readme.doc
```

The copy commands in the batch file perform the same operations as they would if they were typed on the command line. In this example, the exact directories and files to copy have been specified in the batch file. In later sections, you'll see how you can let a user type in arguments to a batch program.

To run this program, type **transfer** and press ENTER. The .CMD extension is optional. You'll see the copy command display the files being copied as the copying operation progresses.

```
Copying files ...
A:\NEW\MOVE.EXE
A:\NEW\TEST.EXE
      2 file(s) copied.
A:\LIB\SLIBCE.LIB
A:\LIB\MLIBCE.LIB
A:\LIB\LLIBCE.LIB
      3 file(s) copied.
A:\INCLUDE\OS2.H
A:\INCLUDE\TYPES.H
A:\INCLUDE\STDIO.H
A:\INCLUDE\OS2DEF.H
      4 file(s) copied.
A:\README.DOC
      1 file(s) copied.
```

Using Replaceable Parameters

The preceding Transfer program illustrates how one program can perform several copying operations. These operations are fixed, since there is no way to specify which files are copied. But you can also write a batch program that allows you to specify which files to copy.

Batch programs can contain a special symbol called a *replaceable parameter*. This symbol is a percent sign (%) followed by a digit from 0 through 9. For example, suppose you type the **transfer** command followed by three arguments, as follows:

```
transfer \bin \lib \inc
```

If you use the %0, %1, %2, and %3 parameters in your batch file, %0 will be replaced by “transfer”, %1 by “\bin”, %2 by “\lib”, and %3 by “\inc”.

The Transfer program created earlier can be changed so that you can specify on the command line whether you want the BIN, INC, or LIB directories to be copied from your hard disk to a floppy disk in drive A. To accomplish this, you will need three features: the **if** batch command, the **goto** batch command, and the **pause** batch command.

Using the If Batch Command

The **if** batch command causes a command to be carried out if a certain condition is true. The **if** command can have one of the following forms:

Form	Description
if <i>string1</i> == <i>string2</i> <i>command</i>	Compares the character string <i>string1</i> with <i>string2</i> . If they are the same, <i>command</i> is processed.
if exist <i>filename</i> <i>command</i>	Checks whether the named file exists. If the file does exist, <i>command</i> is processed.
if errorlevel <i>number</i> <i>command</i>	Checks the exit code of the command or program that was run just before the if statement. If the command or program returns an exit code that is equal to or greater than the number specified, <i>command</i> is processed.

(For information about exit codes, see “Checking the Error Level,” later in this chapter.)

To test whether the condition is not true, use the **if not** batch command. For example, **if not exist filename command** executes *command* if the filename does not exist.

Using the Goto Batch Command

The **goto** batch command tells your program to switch to a different part of the file and continue processing the commands at that point. The **goto** command has the following form:

goto label

The way you tell the program what part of the file to switch to is by using a *label*. The label is a word or other string of characters that you put in the file, on a line by itself, at the point where you want your program to continue processing commands. For example, **goto end** will cause processing to continue at the command found after the label "end". You identify a label in the batch file by typing a colon (:) in front of it.

Using the Pause Batch Command

The **pause** batch command temporarily stops your program from running and displays the message, "Press any key when ready . . ."

You can continue running the program by pressing a key, or you can quit the program by pressing CTRL+C.

Modifying the Transfer Batch Program

The following example modifies the Transfer program so that the first argument typed on the command line is used in a batch file:

```
@echo off
rem This batch program lets you decide which directory to copy
echo Copying files from %1
pause
:chkargs
if "%1"==" " goto end
if %1==\bin goto copybin
if %1==\inc goto copyinc
if %1==\lib goto copylib
echo %1: Unknown option
goto end
:copybin
copy a:*.exe c:\bin
goto end
:copyinc
copy a:*.inc c:\inc
goto end
:copylib
copy a:lib c:\lib
:end
```

The %1 parameter is used in the **echo** command to display whatever argument the user types. The **pause** command lets users determine whether they want to continue copying, or quit the program by pressing CTRL+C.

The program uses the first **if** command, `if "%1" == "" goto end`, to check whether the user actually typed an argument. If no argument is found, the command causes the program to jump to the label `:.end`. When you are specifying no argument in an **if** command, you must use quotation marks; if you are specifying an argument, the quotation marks are optional.

The next three **if** commands cause the first argument that the user types to be substituted for %1 and compared to the strings `.\bin`, `.\inc`, and `.\lib`. If a match occurs, the program jumps to the `:.copybin`, `:.copyinc`, or `:.copylib` label, respectively. After the program has copied the files, the **goto** command causes the program to jump to the `:.end` label. Notice that if the user types in an argument other than `.\bin`, `.\inc`, or `.\lib` (that is, if none of the **if** conditions were true), the message "Unknown option" is displayed and the program jumps to the `:.end` label.

Specifying More than One Argument

To make your program more powerful, you will probably want to let users specify more than one argument after the batch program. For example, the **Transfer** program that you created previously only processes the first argument typed. It ignores any additional arguments.

To let a user specify two directories, you could modify the **Transfer** program to include the following lines:

```
if %1==\bin goto copybin
if %1==\lib goto copylib
if %2==\bin goto copybin
if %2==\lib goto copylib
```

Both %1 and %2 would be compared to the strings `.\bin` and `.\lib`, and sent to the appropriate **copy** command. But suppose that you want to give a user the option of typing up to 10 arguments after the **transfer** command, with the arguments specified in any order. You would need many **if** commands to test for every possible combination of arguments.

One way to do this is to use the **shift** batch command. This command lets your program process any number of arguments that are typed in any order. Each time **shift** is carried out, the position of the arguments moves down by one. To see how this works, create a file named **DISPLAY.CMD** with the following lines:

```
@echo off
rem This displays a list of arguments
:start
if "%1"==" " goto end
echo %%1 is now %1
shift
goto start
:end
```

Then type **display** followed by a list of numbers for each argument. Each number will be displayed on a line of its own. The statement **if "%1"==" "** checks to see whether all of the arguments have been read. In this example, two percent signs (%%) are used to display the actual percent character ("%1") instead of the %1 argument.

Now you can modify the Transfer program to accept any number of arguments, as follows:

```
@echo off
rem Copying multiple directories
pause
:chkargs
echo Copying files from %1
if "%1"==" " goto end
if %1==\bin goto copybin
if %1==\inc goto copyinc
if %1==\lib goto copylib
echo %1: Unknown option
goto end
:copybin
copy a:*.exe c:\bin
shift
goto chkargs
:copyinc
copy a:*.inc c:\inc
shift
goto chkargs
:copylib
copy a:lib c:\lib
shift
goto chkargs
:end
```

The program compares each argument that the user types to the strings "\bin", "\lib", and "\inc", as it did before. But the **goto** statements now direct the program to return to the ":chkargs" label after each argument is processed. Thus, you can type any number of valid arguments in any order, and the effect is the still same.

Repeating a Task

Sometimes, you may want to perform a task on a set of different elements. For example, you may want to type out the contents of three files, or you may want to copy several directories from a floppy disk to your BIN directory. The **for** statement lets you specify the set of elements that a command will work with. To see its use, type the following line in a file called COUNT.CMD:

```
for %%x in (One Two Three) do echo %%x
```

If you now type **count**, the following message appears:

```
One
Two
Three
```

The **for** command causes the batch processor to substitute each element in the parentheses, one at a time, for “x”. (You can use any character other than the digits 0 through 9 in place of “x”.) Then the program processes whatever command appears after the **do** command.

In the preceding example, each element in the set (One Two Three) is substituted for “x”, then “x” is echoed to the screen. So the first time through the process, “One” is displayed; the second time, “Two” is displayed; and the third time, “Three” is displayed. Thus, the command takes the place of typing the **echo** command three times. In this example, you must use two percent signs (%%) in a batch file to specify the “x” variable. However, if you type the **for** command at the prompt, only one percent sign is needed.

The following batch file, called BINCOPY.CMD, allows you to copy the contents of up to three directories that are in the current directory to your BIN directory on drive C:

```
@echo off
rem Updating %1 %2 %3
for %%x in (%1 %2 %3) do if not exist %%x goto end
for %%x in (%1 %2 %3) do copy %%x c:\bin
:end
```

The first **for** command checks to see whether all of the directories exist. It does this by first substituting the arguments that the user types for %1, %2, and %3, and then using the **if not exist** command after the **do** command to check to see that all of the directories do exist. If a directory does not exist, the program ends. The second **for** command does the actual copying by substituting each argument, one at a time, for the “x” in the **copy** command.

Calling Another Batch Program

You can run, or call, one batch program from another batch program by using the **call** command. When the batch processor encounters this command, it passes control to the called program. When the program is completed, control returns to the original program.

Note If you just start a second batch program from a batch program, the second program will run. However, control will not return to the original batch program after the second program finishes running. You must use the **call** command if you want control to be passed back to the original program.

For example, a main batch program could call other batch programs to perform the actual operations. The following short batch program calls the batch file COPY1.CMD if /c is typed as an argument, or calls the batch file DEL1.CMD if /d is typed as an argument:

```
@echo off
rem This batch file calls other batch files
if %1==/c call copy1
if %1==/d call dell
```

The batch files COPY1.CMD and DEL1.CMD perform the actual copying or deleting, then they return control to the original batch file.

You cannot use pipes or redirection symbols with the **call** command. A batch file can call itself, but it should contain a command that ends it so that you don't remain in an infinite loop.

Setting Variables in Your Batch Program

 You have the option of using variables in your batch programs. These variables are saved in your environment just like the PATH environment variable. To set a variable in your batch program, use the **set** command. For example, to set the variable STDERR to NUL, include the following line in your batch program:

```
set stderr=2^>nul
```

Notice that in a batch file you must use the escape character (^) before the redirection symbol (>). The escape character (which is described later in this chapter) tells the batch processor to treat the greater-than symbol as a character, rather than processing it as a redirection symbol; thus, the string "2>nul" is simply assigned to STDERR without being processed.

If you type `set` after running the program, you will see that `STDERR` has been saved in your environment. To prevent it from being saved, you can type the following to delete the setting:

```
set stderr=
```

There are several ways to use variables in batch files. Suppose you need to create a master phone list every week from various phone-list files in different directories. You want to be able to just type the names of the files that contain the phone lists and have them collected in a file called `PHONE.LST` for later viewing. You decide that you need a batch file that will delete the old phone list, then create a new phone list that contains any phone files you specify on the command line. The batch file will then discard any error messages and display the new phone list on the screen.

```
@echo off
rem This batch file creates a new phone list
del phone.lst
:loop
if "%1"==" " goto displayit
set stdout=^>^>phone.lst & set stderr=2^>nul
type %1 %stdout%
shift
goto loop
rem Now display the phone list
:displayit
type phone.lst %stderr%
```

When you run this batch file, `STDOUT` is replaced by the string `>>phone.lst`, which appends output to the file `PHONE.LST`. So when the `type %1 %stdout%` command is run, `%1` is replaced by the first argument typed, and the contents of the file specified are appended to the `PHONE.LST` file.

When the phone list is displayed, `STDERR` is replaced by the string `2>nul`, which redirects error messages encountered while sending the output of the file to `NUL`. Notice that the ampersand (`&`) (which is described later in this chapter) separates the two operations.

As before, `STDOUT` and `STDERR` are saved as variables in your environment after the program ends. You could assign `STDOUT` or `STDERR` to null values after you run the batch program, or you could set variables that are local to your batch program by using the `setlocal` and `endlocal` batch commands. Just place `setlocal` at the beginning of the program and place `endlocal` at the end of the program. This tells the batch processor that any variables you set are active only while the batch program is running. After you run your program, these variables aren't saved in your environment.

To see how these commands work, look at the batch file LOCAL.CMD:

```
@echo off
setlocal
rem This program keeps the variables STDERR and MYVAR from
rem being saved in your environment.
if "%1"==" " echo Valid arguments /s /m & goto end
if %1==/s set stderr=errfile
if %1==/m set myvar="Hi there!"
set
:end
endlocal
```

This program assigns the variable STDERR to the file ERRFILE (if the user types /s), and it assigns the variable MYVAR to the string "Hi there!" (if the user types /m). It then carries out the set command, which displays your environment settings. You will see that either STDERR or MYVAR appears in the listing of environment variables. However, if you type set after running the batch program Local, STDERR or MYVAR will not appear as environment variables (unless you have set one of them previously).

Checking the Error Level

Some MS OS/2 commands and utilities return an exit code when they are completed; that is, they send a number back to the system to tell it whether the process ran successfully or not. If the command or utility ran successfully, it returns an exit code of 0; if it did not run successfully, it returns an exit code of 1. You can check this value and specify what command will then run by placing the command **if errorlevel** (or **if not errorlevel**) immediately following the line that runs the original command or utility. **if errorlevel** checks to see whether the exit code is equal to or greater than the number you specify.

For example, you could run the **format** utility in a batch file, check to see that the formatting operation was successful (returned an exit code of 0), and display a message on the screen by running the following program:

```
@echo off
format a:
if errorlevel 1 echo A formatting error occurred. & goto end
echo Format successful
:end
```

If the utility returns an exit code above 0, an error message is displayed and processing jumps to the label "end". Otherwise, the string "Format successful" is displayed.

Using Special Characters in a Batch Program

Earlier in this chapter, you saw how redirection and pipe symbols (<, >, >>, and |) could be used to specify more than one command on a line. Other symbols also have special meaning to MS OS/2.

Symbol	Meaning
^	Removes a special character's meaning.
()	Group commands together.
&	Separates multiple commands.
&&	Performs one operation, then another.
||	Performs one operation or another.

While these special characters can all be used on the command line, they are most useful in batch programs. In the following sections, each of these special characters is described.

Removing a Special Character's Function

To remove the meaning of special characters, use the escape character (^) before the character. This lets you use special characters as regular characters in a string.

For example, to redirect the line "hello" into a file named GREET, type the following:

```
echo hello > greet
```

If you use the escape character before the redirection symbol, the redirection symbol loses its meaning. To have the batch processor treat the redirection symbol as an ordinary character, type the following:

```
echo hello ^> greet
```

Now the entire line is echoed to your screen:

```
hello > greet
```

This is useful if you want to display a special character but don't want the symbol to perform any function.

Grouping Commands Together

To group commands together, use parentheses [()]. For example, to display a directory listing of drive A and display the contents of the file DIR.LST on drive C, then sort them together, type the following:

```
(dir a: & type c:dir.lst) | sort
```

Combining More than One Command

To combine several commands, separate each pair of commands with the ampersand (&). For example, to display a directory listing for drive A, the version of MS OS/2, and the volume label of your current drive, type the following:

```
dir a: & ver & vol
```

MS OS/2 processes the individual commands in order, from left to right.

Using the Double Ampersand

The double ampersand (&&) processes the command to the left of the symbol. If the command is successful, it processes the command to the right of the symbol. If the first command is unsuccessful (that is, produces an error), the command to the right is not processed.

For example, the following command displays the contents of the file BUDGET.FIL only if the file exists in the current directory:

```
dir budget.fil && type budget.fil
```

Using the Double Pipe

The double pipe (||) processes either the command to the left of the symbol or the command to the right. If the command to the left is successful, it does not process the command to the right. If the command to the left is unsuccessful (that is, produces an error), then the command to the right is processed.

For example, the following command either deletes the file called LETTER.TMP or displays a directory listing of all files with the file-name extension .TMP:

```
del letter.tmp || dir *.tmp
```

If LETTER.TMP exists, it is deleted. If LETTER.TMP does not exist, a directory listing of all of the files with the .TMP extension is displayed.

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Introduction

MS OS/2 provides programs called *utilities* to help you work with directories and text files, maintain disks, print files, change your keyboard layout, and display help information.

Utilities can run either in a full screen or in a window; you can start them from `cmd` in a full screen, from `cmd` in a window, or from Start Programs. The examples in this chapter assume that you are in a full-screen session and have started `cmd`.

In addition, most of these utilities can also run in the DOS session. Chapter 9, “Using the DOS Session,” describes which of the utilities in this chapter can be run in the DOS session and which ones must be run in a full-screen or Presentation Manager session.

Starting a Utility

 To start a utility from `cmd`, do the following:



- ▶ At the prompt, type the name of the program you want to start, followed by any command-line arguments, and press ENTER.



You can also start a utility from Start Programs, if the utility appears on the list of programs that can be started. Do the following:



- ▶ Double-click the name of the utility.

If you run certain utilities often, you might want to add them to Start Programs. That way, you can run the utility directly from Start Programs without having to start `cmd`. See Chapter 2, “Running Applications with MS OS/2,” for details on how to add programs to Start Programs. For more information about running programs and commands from `cmd`, see Chapter 7, “Running Cmd.”

Some utilities are designed to be run from a full screen. If they are run from a `cmd` window, these utilities will display their output on the full screen, then they will switch back to the window when the utility is finished running. This may happen so quickly that you don’t have time to read the full-screen output. To prevent this from happening, switch to a full-screen session and start the utility again.

Getting Help Information

To display help information about warning or error messages that you may see on your screen, use the Help batch program. Each of these messages consists of a number (for example, SYS1041) and a brief description of the error condition. For a more detailed explanation of the error condition, type **help** followed by the message number.

For example, suppose that you want to use the **type** command to display the file MEMO.FIL. You've forgotten that you had previously deleted this file, and you receive the error message, "SYS0002: The system cannot find the file specified." To see a detailed explanation of this error message, type the following:

```
help sys0002
```

The message number can be shortened to 0002, or just 2, if you prefer. A more detailed explanation of the possible problem and the action you might take to correct the problem appears on the screen:

```
SYS0002: The system cannot find the file specified.
```

```
EXPLANATION: The file named in the command  
does not exist in the current directory or search path  
specified. Or, the filename was entered incorrectly.  
ACTION: Retry the command using the correct filename.
```

Working with Disks

MS OS/2 provides the following utilities to help you work with disks:

Utility	Purpose
format	Formats a disk.
diskcopy	Copies the contents of a floppy disk to another floppy disk.
label	Assigns a volume label to a disk.
diskcomp	Compares the contents of two disks.

These utilities are described in the following sections.

Formatting a Disk

Before you can use a floppy disk, you must prepare it for use by using the **format** utility. You can also format a previously formatted disk. Formatting a disk erases all of its contents, so you will be starting with a clean slate.

Before you format your disk, make sure that you know what type of disk you have and what type of disk drive is in your computer. The following list shows the types of floppy disks that can be formatted with the **format** utility:

Disk Size	Type
5¼-inch	360-kilobyte (low-density)
5¼-inch	1.2-megabyte (high-density)
3½-inch	720-kilobyte (low-density)
3½-inch	1.44-megabyte (high-density)

By default, **format** will format a disk according to the size and type of drive in your computer. If you don't specify options, and if your computer has a low-density drive, **format** assumes that you are formatting a low-density disk; or if your computer has a high-density drive, **format** assumes that you are formatting a high-density disk. (If your computer has more than one type of drive, the density that **format** assumes will depend on which drive you tell **format** to use.) Later in this section you'll learn about options that override this default.

Formatting a 5¼-inch Disk

 To format a 5¼-inch disk (low or high density) in a disk drive of the same size, type **format** followed by the letter of the drive that contains the disk. If you want to format a disk in drive A, type the following:

format a:

Usually, disks are given a volume label that identifies the disk. This label can be up to 11 characters in length. After a disk is formatted, **format** automatically prompts you to type the volume label.

 If you prefer, you can specify the volume label as an argument to **format** by using the option **/v:label** after the drive letter. For example, to give the label REPORTS to the disk in drive A, type the following:

format a: /v:reports

Since you have already specified the volume label, you won't be prompted to type it after the disk is formatted.

Although a high-density (1.2-megabyte) drive is designed to format high-density disks, you can also format a 5¼-inch double-sided low-density (360K) disk by using the option **/4**. For example, to format a low-density disk in drive B, which is a high-density drive, type the following:

format b: /4

Note This option is designed to format low-density disks that will be used in high-density drives. If you format a disk with the **/4** option in a high-density (1.2-megabyte) drive, you might not be able to read that disk in a low-density (360K) drive.

Formatting a 3½-inch Disk

The **format** utility has two options that are used to format 3½-inch disks: **/t:tracks** and **/n:sectors**. These options are normally used to format disks that are of a lower density than the drive (for example, to format a 720K disk in a 1.44-megabyte drive).

The **/t:tracks** option formats a disk to the number of tracks specified. **Tracks** is the number of tracks per disk. For 720K and 1.44-megabyte disks, this value is 80. If you don't specify this option, **format** uses the size of the drive to determine how many tracks the disk should have.

The **/n:sectors** option formats a disk to the number of sectors specified. **Sectors** is the number of sectors per track. For 720K disks, this value is 9, and for 1.44-megabyte disks, this value is 18. For example, to format a 3½-inch low-density (720K) disk in drive A, which is a high-density drive, you should type the following:

format a: /n:9

You can't do the opposite, however. You cannot format a high-density disk in a low-density drive.

Copying a Disk

To copy the contents of a floppy disk in one drive (the source drive) to a floppy disk in another drive (the destination drive), you can use the **diskcopy** utility. If the destination disk is unformatted, **diskcopy** formats the disk with the same number of sides and sectors per track as the source disk. Use this utility with care, since **diskcopy** destroys the existing contents of the destination disk.

NOTE To run **diskcopy**, type **diskcopy** followed by the names of the source and destination drives. The source and destination drives can be the same; if you don't specify any drives, **diskcopy** uses the current drive as both source and destination. The **diskcopy** utility prompts you to insert the source and destination disks at appropriate times and waits for you to press a key before continuing. If errors are found on either disk, a message appears on the screen, describing the drive, track, and side where the error was found. Then the copying operation continues. After copying the first disk, **diskcopy** asks you whether you want to copy another disk.

Diskcopy is most often used to make backup copies of disks. The **diskcopy** utility copies an entire floppy disk faster than the **copy** command does. For example, many applications require you to make backup copies of the installation disk. To do this using **diskcopy**, insert the installation disk in drive A, and a blank, formatted disk in drive B. Then type the following:

diskcopy a: b:

Or, if your computer has only one floppy-disk drive, specify drive A as both the source and the destination drive:

diskcopy a: a:

The **diskcopy** utility prompts you to insert the source or destination disk at appropriate times.

The copying is done track-by-track and produces an identical copy of the original disk. **Diskcopy** does not work on hard disks, and you cannot run this utility on drives that you have used in the **subst** or **join** utilities. Also, **diskcopy** ignores any assignments created by the **assign** utility, and the source and destination disks cannot be virtual or assigned disks. Certain restrictions apply concerning which types of disks can be copied in certain disk drives.

Assigning or Changing the Volume Label

To assign a volume label to a drive, or to change the existing label, use the **label** utility.

 To use this utility, type **label** followed by the drive letter and the label to be assigned to the drive. If you omit the drive letter, the label will be assigned to the current drive. For example, suppose that you want to change the volume label of drive D from APPS to MKTG. Type the following:

label d:

The current label is displayed, and you are then prompted for the new volume label:

```
The volume label in drive D is APPS.  
Enter a volume label of up to 11 characters  
or press Enter for no volume label update.
```

Type **mktg** and press ENTER. If you now type **vol d:** to view the label, you'll see that the label has been changed to MKTG.

 You can enter the volume label directly on the command line as follows:

label d:mktg

No messages are displayed. The prompt appears again after the operation is complete.

Comparing Disks

To compare the contents of a floppy disk in the source drive to the contents of a floppy disk in the destination drive, use the **diskcomp** utility. **Diskcomp** does not work on hard disks. The comparison is done track-by-track, and **diskcomp** automatically determines the number of sides and sectors per track based on the format of the source disk. The source and destination disks must be of the same type.

 For example, suppose that you receive an update package for a word-processing program. When you are in the middle of making a backup copy of the updated version, you are interrupted, and the floppy disk you have just copied gets mixed in with disks that contain old versions of the program. To determine which is the disk you just copied, place the update disk in drive A and one of the unknown disks in drive B, and type the following:

diskcomp a: b:

Or, if your computer has only one floppy-disk drive, specify drive A as both the source and destination drive:

diskcomp a: a:

Diskcomp prompts you to insert the source and destination disks at appropriate times during the disk comparison.

After you run **diskcomp**, an on-screen message tells you whether the contents of the two disks are identical or not, or if they are not the same type of disk. **Diskcomp** then asks you whether you want to compare two more disks.

Working with Files and Directories

MS OS/2 provides the following utilities to help you manage your files and directories:

Utility	Purpose
xcopy	Copies a directory and its contents to another directory.
tree	Displays a listing of all the directories and files on a drive.
attrib	Displays or sets the attributes of files.

The following sections describe these utilities.

Copying Directories and Subdirectories

To copy an entire directory or subdirectory and its contents, use the **xcopy** utility. To use this utility, specify a source directory that files will be copied from and a destination where files will be placed. The source and destination can be a drive, directory path, and/or filename. If you don't specify a drive or directory path, **xcopy** uses the current drive and directory.

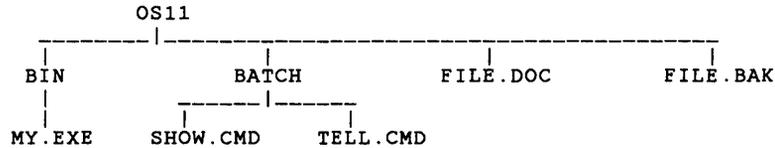
The **xcopy** utility has several useful options. These options are described in the following sections.

Specifying a Directory or Subdirectory

You may want to copy not only the files in a directory, but all of the subdirectories as well. You could copy the files in each subdirectory individually to the destination directory, but this is often very time

consuming. An easier way is to use the **/s** and **/e** options with **xcopy**. The **/s** option copies subdirectories unless they are empty, while **/e** copies subdirectories that are empty. Together these options enable you to copy the files in the specified directory in addition to the files in all of the subdirectories. You must specify both options in order to copy all subdirectories.

To see how these options work, suppose you have a directory named OS11, which has the following subdirectories and files:



If you type the following, you will copy the files in the OS11 directory, as well as the files in the BIN and BATCH subdirectories, to the root directory in drive A:

```
xcopy \os11\*.*/s /e a:\
```

The **xcopy** utility preserves the original directory structure as it copies files and directories: the OS11 directory will appear in the root directory of drive A, BIN and BATCH will appear as subdirectories of OS11, and so on.

Confirming Each Copying Operation

The **/p** option causes the **xcopy** utility to prompt you with “(Y/N) ?” after displaying the name of each source file and before copying it. To copy the file, type **y** for yes. To prevent that file from being copied, type **n** for no.

Verifying Each Copying Operation

You can use the **/v** option to verify that each file is copied accurately. This compares the destination file to the source file to make sure that they are identical.

Displaying the Directory Tree

The **tree** utility displays the entire directory structure for a drive.

To see the names of all the directories and subdirectories on your current drive (starting with the root directory), type **tree** without arguments. To see the names of all the directories and subdirectories on a different drive, specify the name of the drive after **tree**.

For example, to see the names of all the directories on drive B, type the following:

tree b:

The listing might look something like this:

```
Directory path listing
```

```
Path: \ACCOUNTS
```

```
Subdirectories: APRIL
               MAY
```

```
Path: \ACCOUNTS\APRIL
```

```
Subdirectories: None
```

```
Path: \ACCOUNTS\MAY
```

```
Subdirectories: None
```

Since the directory-tree listing may be very long, you will probably want to do one of two things when you use the **tree** utility. You may want to redirect the output to a file, or you may want to use the **more** utility to view the listing one screen at a time.

Redirecting Output to a File

Use the redirection symbol (**>**) to send the directory-tree listing to a file. For example, to see the directories on your current drive and redirect them to the file **TREE.LST**, type the following:

```
tree > tree.lst
```

Then you can use the **type** command to view the file **TREE.LST**, or use the **print** utility to print the file. The **print** utility is discussed in greater detail in “Printing Text Files,” later in this chapter.

Viewing the Directory Tree One Screen at a Time

 If you have many directories and subdirectories, the directory-tree listing may scroll on your screen too fast for you to read. To view the listing one screen at a time, you can pipe the output of the **tree** utility to the **more** utility as follows:

```
tree a: | more
```

Each time a screenful of information is displayed, you'll see the message "-- More --" displayed at the bottom of the screen. Press the SPACEBAR or the ENTER key to display the next screenful.

Displaying Filenames

You can use the **/f** option after the drive letter to display the names of the files within the directories and subdirectories on a drive.

 For example, suppose you want to generate a listing of all the files that you currently have on your hard disk. To display the directories, subdirectories, and all of the files on drive C and redirect them to a file named CONTENTS.LST, type the following:

```
tree c: /f > contents.lst
```

When the names of all the directories and files on your disk are saved in CONTENTS.LST, use the **print** utility to print the listing.

Displaying and Setting File Attributes

You can use the **attrib** utility to display and set file attributes, which are special features that a file can have. The following attributes can be set:

- Read-only
- Archive

If the read-only attribute is set, you can read a file but you can't change its contents. This attribute is commonly used to prevent a file from being deleted or changed accidentally. If the archive attribute is set, certain utilities that copy files to or from a disk (for example, **backup**, **restore**, and **xcopy**) assume that the file has been created or changed in some way since the last copying operation. This information can then be used to selectively copy only recently modified files.

You have the option of turning these attributes on or off. **Attrib** can also display or set the attributes of files contained in subdirectories.

Displaying File Attributes

 To see what attributes are set for one or more files, type **attrib** followed by the names of the files you are interested in. For example, to see which attributes are set on all the files in your current directory, type the following:

```
attrib *.*
```

A file listing appears on your screen, containing letters that signify which attributes are set for the file. The attributes are followed by the drive, directory path, and filename. The attribute letters you might see are as follows:

- If the letter “R” appears, the read-only attribute is set for the file. This means that you can read the file, but you can’t change it.
- If the letter “A” appears, the archive attribute is set for the file. By default, all files have the archive attribute set when they are created or modified. Certain programs, such as **xcopy**, **backup**, and **restore**, can turn off a file’s archive attribute after they run. For more information about how the archive attribute works with these programs, see “Setting the Archive Attribute,” later in this chapter.

To gain a better understanding of how file attributes work, suppose that a directory contains the files **WORD.LST**, **ACCOUNTS.OLD**, and **LETTER.FIL**. If you type **attrib *.***, the following appears on your screen:

```

          R  C:\WORD.LST
A         C:\ACCOUNTS.OLD
A         R  C:\LETTER.FIL

```

Notice that **WORD.LST** and **LETTER.FIL** have their read-only attributes set, so you can read these files but you can’t change them. **ACCOUNTS.OLD** and **LETTER.FIL** both have their archive attributes set, but **WORD.LST** has its archive attribute turned off.

To see the attributes for files that are contained in subdirectories as well as the current directory, use the **/s** option. For example, to see the attributes for all files that are contained in subdirectories as well as your current directory, type the following:

```
attrib *.* /s
```

When you type the preceding command, the subdirectory file entries are listed first, and the current directory entries are listed last.

Keep the following points in mind when you are copying files:

- When you copy a file by using the **copy** command, the archive attribute is automatically turned on for the file you are copying to (the destination file). This is true even if the file being copied (the source file) has its archive attribute turned off.
- If the source file has its read-only attribute set, this attribute is not copied over to the destination file.

Setting the Read-Only Attribute

The read-only attribute determines whether you can write to a file or a set of files. If the read-only attribute is set, it can prevent a file from being accidentally modified. Use the **+r** option to turn on the read-only attribute, and use the **-r** option to turn the attribute off.

 Suppose, for example, that you have saved permanent personnel records in the database file EMPLOY.DBS. To prevent other users from modifying this file, set the read-only attribute by typing the following:

```
attrib +r employ.dbs
```

When other users type **dir** to get a directory listing, the read-only attribute can't be seen. However, if they try to use a text editor to modify the file, or if they try to delete the file, they will be prevented from performing the operation.

If you later want to update the personnel records, turn off the read-only attribute by typing the following:

```
attrib -r employ.dbs
```

Now this file can be changed or deleted.

Setting the Archive Attribute

The archive attribute can be used as a control mechanism with the **backup**, **restore**, and **xcopy** utilities. Use the **+a** option to turn the archive attribute on, and use the **-a** option to turn it off.

The **/m** option that is used with the **backup** and **restore** utilities copies only files that have their archive attribute turned on. The **/m** option then automatically turns off the archive attribute of the original files after copying them. Thus, if the archive attribute is turned off, the file is not backed up or restored.

With the **xcopy** utility, you can choose to use the archive attribute in doing copying operations. If you use the **/a** option, only those files with their archive attributes set will be copied. If you choose the **/m** option, files with their archive attributes set are copied, and **xcopy** automatically turns off the archive attributes of the original files after copying them.

 You won't usually need to turn a file's archive attribute on or off. However, there may be times when you want to modify the way that **backup**, **restore**, or **xcopy** operate on certain files. For example, suppose that each Monday you make a backup disk that contains specific directories by using the **backup** utility with the **/m** option. To save

time, you decide to copy only essential files to the backup disk. Instead of letting **backup** find and copy all of the files that have their attributes set, you can use the **-a** option to turn off the attributes for all of the files that have the extension **.BAK**. To perform this operation, type the following:

```
attrib -a *.bak
```

This means that the files that have the extension **.BAK** will not be copied when you use **backup** to perform the copying operation.

For more information about the **backup** and **restore** utilities, see Chapter 11, “Maintaining Your System.”

Working with Text Files

MS OS/2 provides the following utilities to help you view and work with text files:

Utility	Purpose
more	Displays output from a command or utility, one screen at a time.
sort	Sorts a file alphabetically or numerically.
find	Finds a text string in a file.
comp	Compares two files or sets of files.

The **more** and **sort** utilities (sometimes called *filter* commands) take input from a device or file, process the input, and then send it to an output device or file. As such, they are used in conjunction with redirection symbols or pipes. The **more** and **sort** utilities must be run from **cmd**—they can’t be run from Start Programs. For more information on redirection symbols or pipes, see Chapter 7, “Running Cmd.”

Displaying Output One Screen at a Time

To display output one screen at a time, use the **more** utility. You can use this utility in two ways:

- To view the output of a command or utility one screen at a time
- To view files one screen at a time

You can either redirect an input file or pipe the output of a command or utility to **more**. After the first screen is filled, the message “– More –” appears at the bottom of the screen. Press ENTER to display the next screen of information.

NOTE To view the output of a command or utility one screen at a time, redirect the output to **more**. To do this, use the pipe (|) symbol.

For example, a long directory listing often contains more filenames than can appear in a single screen. You can use the **more** utility to display your directory listing one screenful at a time by typing the following:

```
dir | more
```

Other commands and utilities, such as **type**, display output information that can also be piped to the **more** utility. For example, suppose that you have a long file called **CLIENTS.NEW** that you want to view on your screen. The following command pipes the file to **more**:

```
type clients.new | more
```

When you type the preceding command, the **CLIENTS.NEW** file is displayed one screen at a time.

NOTE You could accomplish the same thing by redirecting a file as input to the **more** utility. You could also view the contents of **CLIENTS.NEW** one screen at a time by typing the following:

```
more < clients.new
```

Sorting Input and Output

To sort input or output according to the character found in a specified column, use the **sort** utility. Most often you would want to sort by the character in the first column—that is, by the first character on each line—but you can sort by any column you want. The character is sorted based upon its location in the character set you are using. What character set you are using depends upon the code page that is set up for your system. (See the *Microsoft Operating System/2 Desktop Reference* for the character sets of the different code pages.)

For the United States character set, the characters are sorted from 0 to 9 and then from A to Z. The **sort** utility does not distinguish between uppercase and lowercase letters. You can sort files of up to 64K in length.

You can use the **sort** utility in two ways:

- To sort a file that has been sent as input to **sort**
- To sort the output of another command or utility

Sorting a File

To sort the lines in a file, redirect an input file to **sort**. Each line in the file is sorted based upon the character found in the first column. For example, suppose that the file INFILE.LST contains the following list of customer names:

```
Draper, John P.
Benson, Clara J.
Wiggins, Bess T.
Peters, Marcus
```

■ To sort the contents of INFILE.LST, type the following:

```
sort < infile.lst
```

The list is then sorted and displayed like this:

```
Benson, Clara J.
Draper, John P.
Peters, Marcus
Wiggins, Bess T.
```

If you want to reverse the order so that the file is sorted from Z to A or from 9 to 0, you can use the **/r** option. For example, if you use this option with INFILE.LST, your sorted file will look like this:

```
Wiggins, Bess T.
Peters, Marcus
Draper, John P.
Benson, Clara J.
```

Sorting Output

■ You can also pipe the output from another command or utility to the **sort** utility. For example, to sort the directory listing for your current directory, type the following:

```
dir | sort
```

You will see your directory listing displayed in alphabetical order.

```

      6 File(s)      841728 bytes free
Directory of C:\CLUB
The volume label in drive C is APPS.
. <DIR>          3-25-89   3:37p
.. <DIR>         3-25-89   3:37p
ACCOUNT  OLD          92   6-25-89   5:52p
CAT      TXT          120  4-16-89   8:26a
LETTER   FIL          252  3-20-89   4:10p
WORD     LST           56   5-10-89  11:16a

```

Sorting by Column

You can specify any column to be used for the sorting. The option `/+n` sorts according to the character in column `n`. For example, to sort your directory listing according to the date it was created or last modified, you could sort according to the date field. Let's say that your date field starts in column 22 of the directory listing. To sort by the date field, type the following:

```
dir | sort /+22
```

Your directory listing now looks like this:

```

Directory of C:\CLUB
LETTER  FIL          252  3-20-89   4:10p
. <DIR>          3-25-89   3:37p
.. <DIR>         3-25-89   3:37p
CAT     TXT          120  4-16-89   8:26a
WORD    LST           56   5-10-89  11:16a
ACCOUNT OLD          92   6-25-89   5:52p
      6 File(s)      841728 bytes free
The volume label in drive C is APPS.

```

Searching for a Text String in a File

To search for a text string in a file, use the **find** utility. If **find** finds the string it is searching for, it displays the name of the file followed by the line that contains the string.

To use the **find** utility, type **find** followed by any options, the string you are searching for (in quotation marks), and the name of the file to search. You cannot use wildcard characters (`*` or `?`) in a filename specification. If you don't specify a filename for the search, standard input is used.

For example, to search for the last name “Smith” in the PHONE.LST file, type the following:

```
find " Smith" phone.lst
```

If you are searching for a string that contains quotation marks (for example, “Hi there!”) you must use two sets of quotation marks before and after the quoted string, and you must use a redirection symbol to redirect input to the utility, as in the following example:

```
find " " " Hi there!" " " < test.doc
```

Although you can’t use wildcard characters to specify filenames to be searched, you can pipe another command to the **find** utility. For example, if you want to search the files PHONE.MKT, PHONE.ENG, and PHONE.SUP for the name “Smith”, pipe the output of the **type** command to the **find** utility as follows:

```
type phone.* | find " Smith"
```

This way, the **find** utility searches through three files instead of one. You can also specify more than one file to search by listing each file separately after the search string.

Displaying Lines that Do Not Contain a String

If you want to search a file and display those lines that do not contain the specified string, use the **/v** option.

For example, suppose that you are searching for client names that are listed in the file CLIENTS.LST. To locate the client names that don’t have the string “Past Due” after their names, type the following:

```
find /v " Past Due" clients.lst
```

Displaying the Number of Lines that Contain a String

To display the numbers of lines that contain the specified string, use the **/c** option. For example, you could find the number of lines that contain the string “Past Due” by typing the following:

```
find /c " Past Due" clients.lst
```

If you specify **/c** with **/v**, the **find** utility displays the number of lines that do not contain the string you typed.

Displaying the Line Number

 To display the line numbers of any lines that contain a specified string, use the **/n** option. The line number is the relative line number counting from the beginning of the file.

If you specify **/c** with **/n**, the **find** utility ignores **/n**.

Comparing Two Files

To compare one file or set of files with a second file or set of files, use the **comp** utility. The files can be on different drives or in different directories.

 To use the **comp** utility, type **comp** followed by the drive, directory path, and filename of both files. If you don't specify a directory path or filename, **comp** assumes that the files are in the current directory on the current drive.

There are several ways in which you can use the **comp** utility.

To compare the contents of drive A with drive C, type the following:

```
comp a: c:
```

To compare the contents of the PROFITS directory on drive A and the PROF directory on drive C, type the following:

```
comp a:\profits c:\prof
```

To compare the contents of two files, \ORIGINAL\SAMPLE.C and \TEST\SAMPLE.C, in different directories, type the following:

```
comp c:\original\sample.c c:\test\sample.c
```

To compare the files in the root directory on drive C that have the extension .ASM with the files in the root directory on drive B that have the extension .BAK, type the following:

```
comp c:\*.asm b:\*.bak
```

If the files being compared are of different sizes, **comp** displays a message telling you of their size differences, and asks you if you want to continue. If you type **y** for yes, **comp** displays the location and contents of any mismatched bytes. After 10 mismatches occur, the comparison stops and you are asked whether you want to compare two more files. An error message appears if **comp** does not find an end-of-file (CTRL+Z) marker in a file.

Printing Text Files

To print any MS OS/2 text file, you can use the **print** utility.

NOTE To use the **print** utility, type **print** followed by a filename. By default, **print** sends the file to the printer that is attached to your computer's LPT1 port. If you want to send the file to a printer that is attached to another port, use the option **/d:device**. For example, to print the file REPORT.FIL on the parallel printer that is attached to LPT2, type this:

```
print /d:lpt2 report.fil
```

The **print** utility automatically feeds one blank page through the printer after the file is printed. Remember that LPT2 and the printer that is attached to it must be set up correctly before you can print to it.

The **print** utility can be used by itself or in conjunction with the print spooler, Spooler Queue Manager. If you plan to use the MS OS/2 spooler, see Chapter 5, "Printing Files," for instructions on how to set up and use the Spooler Queue Manager.

Selecting the Keyboard Layout

To select an alternate keyboard layout, use the **keyb** utility. The keyboard layout defines where the characters in a specified code page will be found on your keyboard.

If you have selected and prepared a code page for a country other than the United States, your keyboard layout will be set up for that country. To change to a keyboard layout for a different country, you must use the **keyb** utility.

NOTE To use **keyb**, type **keyb** followed by a two-letter country code. For example, to select the keyboard layout for Germany, type the following:

```
keyb gr
```

Make sure that the keyboard country code you select is supported by the code page that is installed. The following list shows the keyboard layouts that are available and the two-letter codes that identify them:

Code	Keyboard	Subcode
BE	Belgium	120
CF	French-Canadian	058
DK	Denmark	159
FR	France	189, 120
GR	Germany	129
IT	Italy	141, 142
LA	Latin America	171
NL	Netherlands	143
NO	Norway	155
PO	Portugal	163
SF	Swiss-French	150F
SG	Swiss-German	150G
SP	Spain	172
SU	Finland	153
SV	Sweden	153
UK	United Kingdom	166, 168
US	United States	103

The subcode specifies a keyboard layout for countries that have more than one keyboard layout. Subcodes are associated with enhanced keyboards only. Because France, Italy, and the United Kingdom have more than one enhanced keyboard, the subcode allows you to select the keyboard you want.

Turning ANSI Support On or Off

The `ansi` utility turns the ANSI extended screen and keyboard support on or off. If ANSI support is turned on, a program that you are using (or creating) can use the ANSI escape sequences. An ANSI escape sequence is a series of characters (beginning with an escape character or keystroke) that you can use to define MS OS/2 functions. For more information about ANSI escape sequences, see Chapter 14, "Using MS OS/2 Device Drivers," and Appendix A, "ANSI Escape Sequences."

By default, ANSI support is on. To turn ANSI support off, type the following:

ansi off

To turn ANSI support back on, type the following:

ansi on

To turn ANSI support on in the DOS session, install the device driver ANSI.SYS by including the following line in your CONFIG.SYS file:

device=c:\os2\ansi.sys

For more information about ANSI.SYS, see Chapter 14, "Using MS OS/2 Device Drivers."

Note The following ANSI escape sequences, which set video to graphics modes, are not supported:

Esc[=4h

Esc[=5h

Esc[=6h

9 Using the DOS Session

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Introduction

In addition to the full-screen OS/2 session and the Presentation Manager session, MS OS/2 provides another working environment, called the DOS session.

If you are familiar with DOS and DOS applications, you'll find that the DOS session operates much the way the DOS operating system does. As the name implies, the DOS session is like having MS-DOS® installed and running on your system. You can use files, disk drives, printers, and serial devices just as if you were running DOS. You can run DOS applications, such as Microsoft Word or Microsoft Windows. In addition, many of the MS OS/2 commands and utilities described in Chapter 7, "Running Cmd," and Chapter 8, "Using MS OS/2 Utilities," can be run in the DOS session.

When you're running programs in the DOS session, a command interpreter called **command** provides the interface to MS OS/2. **Command** reads information that you type at the command prompt and translates it into something your computer can understand.

This chapter describes the DOS session and **command**. Specifically, it describes how the DOS session starts up and is initialized, as well as how to do the following:

- Switch to the DOS session
- Start DOS programs
- Run commands from **command**
- Run utilities from **command**

You'll also find lists of the MS OS/2 commands and utilities that can and cannot be run in the DOS session.

How the DOS Session Starts

Whenever you start MS OS/2, it reads the CONFIG.SYS file. This file contains statements that set up the DOS, full-screen OS/2, and Presentation Manager sessions. To start the DOS session, MS OS/2 runs the DOS command-interpreter program that is specified by the **shell** configuration command. By default, the command interpreter is **command**. Other configuration commands in CONFIG.SYS customize the DOS environment; these are listed in the following section. After the DOS session starts, you'll see it represented by the DOS icon in the Presentation Manager session.

Configuring the DOS Environment

During installation, a default DOS environment is set up for you. You can modify this environment by editing your CONFIG.SYS file. The following configuration commands affect the DOS environment:

Command	Purpose
shell	Specifies the DOS command interpreter.
rmsize	Sets up the amount of memory reserved for DOS programs.
break	Sets up CTRL+C checking.
fcbs	Specifies the number of open file-control blocks.
device	Sets up devices used in the DOS session.
protectonly	Disables the DOS session.

For more information about using these configuration commands, see Chapter 13, "Using MS OS/2 Configuration Commands." Also see "Using a Mouse in the DOS Session," later in this chapter, for information about setting up a mouse for the DOS session.

Running AUTOEXEC.BAT

The first time you switch to the DOS session, **command** automatically searches for a batch file called AUTOEXEC.BAT in the root directory of the drive from which you started MS OS/2. (Note that batch files in the DOS session must have the filename extension .BAT, not the .CMD extension that batch files run from **cmd** must have.) If it doesn't find AUTOEXEC.BAT, MS OS/2 runs the **date** and **time** commands. If AUTOEXEC.BAT is found, it starts to run.

By placing batch commands in your AUTOEXEC.BAT file, you can run commands and utilities, and you can customize the DOS session. Like other batch files in the DOS session, AUTOEXEC.BAT can contain the following:

- **Command commands**
- **MS OS/2 utilities**
- **Batch commands**

Typically, the AUTOEXEC.BAT file sets up environment variables and other features. You can also add commands to AUTOEXEC.BAT in order to perform specialized functions. For example, the following AUTOEXEC.BAT file makes your command prompt the name of the current directory followed by the greater-than sign (>). It then changes to the OS2 directory on drive C and sets your TERM environment variable.

```
@echo off
prompt = $p $g
c:
cd \os2
set TERM=vt52
```

In this example, TERM is set for a VT52-type terminal. The @echo off command at the beginning of the file prevents the commands from being displayed on the screen as they run.

Switching to the DOS Session

Whenever you start MS OS/2, the DOS session is automatically started for you. To work in the DOS session, you must switch to it.

■ The following are two ways to switch to the DOS session from Presentation Manager:



- ▶ If you are using a mouse, double-click the DOS icon.

Or



- ▶ If you are using the keyboard, use Task Manager.

For information on using Task Manager and switching between sessions, see Chapter 2, “Running Applications with MS OS/2.”

After you switch to the DOS session, the screen clears and the DOS command interpreter, **command**, displays a prompt. From this prompt, you can start programs, commands, or utilities.

Switching from the DOS Session

Once the DOS session is started, you cannot quit it. The **command** program started by the system will continue to run, even if you type **exit**. To run a program in a full-screen or Presentation Manager session, you must switch out of the DOS session.

 To switch out of the DOS session, you can do one of the following:

▶ Press ALT+ESC to switch to another session.

Or

▶ Press CTRL+ESC to use Task Manager.

When you switch out of the DOS session, any DOS programs that are running will stop until you switch back to the DOS session. However, full-screen or Presentation Manager programs that are running will continue to run when you're in the DOS session.

Starting a DOS Program

 To start a program from **command**, type the name of the program at the prompt and press ENTER.

Remember that not all programs can run in the DOS session. For example, Presentation Manager applications and many full-screen OS/2 programs cannot run in the DOS session. If you run a Presentation Manager application in the DOS session, you will receive the following message:

```
This program requires OS/2 Presentation Manager.
```

Or, if you run an application that is meant to run from **cmd**, you will receive this message:

```
This program cannot be run in DOS mode.
```

In either case, switch to the appropriate session before running your program.

Also, while the DOS session operates much like the DOS operating system, compatibility problems can exist with old DOS applications that are run in the DOS session. Read your application's manual for information about which MS OS/2 environment is required to run the program.

Managing Memory in the DOS Session

Certain DOS applications may recommend that you install a disk cache or virtual disk to improve performance. If you plan to run these applications in the DOS session under MS OS/2, keep the following points in mind:

- The disk-cache program, SMARTDrive, is not supported in MS OS/2. To set up disk caching, use the **diskcache** configuration command in your CONFIG.SYS file.
- The virtual-disk program, Ramdisk, is not supported in MS OS/2. To set up a virtual disk, use the **device** configuration command in your CONFIG.SYS file to load the VDISK.SYS device driver.

For information on setting up the MS OS/2 disk cache, see Chapter 13, "Using MS OS/2 Configuration Commands." For information on installing the VDISK.SYS device driver, see Chapter 14, "Using MS OS/2 Device Drivers."

Also, read your application's manual for additional information concerning memory management with MS OS/2.

Setting Hardware Features in the DOS Session

The DOS session runs independently of the full-screen and Presentation Manager sessions. Features such as hardware settings made with the **mode** utility will be in effect only while you are running the DOS session. When you switch to a full-screen session or to Presentation Manager, the DOS settings will not be in effect.

Using a Mouse in the DOS Session

If you want to use a mouse in the DOS session, make sure that you have specified the proper mouse driver in your CONFIG.SYS file. In addition, some applications, such as Microsoft Word, require you to specify an additional device driver called EGA.SYS. For instructions on how to specify these device drivers in the CONFIG.SYS file, see Chapter 14, "Using MS OS/2 Device Drivers."

Running DOS TSR Programs

Terminate-and-stay-resident (TSR) programs that are designed to run in DOS (for example, the SideKick program) can also run in the DOS session of MS OS/2. Once started, these programs remain active while you're in the DOS session, but they become inactive when you switch to a full-screen session or to Presentation Manager. These programs

can occupy a large amount of memory, and compatibility problems can exist if these programs are run in the DOS session. Be sure to read the program's manual for instructions and restrictions concerning MS OS/2.

Using a DOS Command

Command, like **cmd**, has a set of built-in commands. These commands let you work with files, directories, and devices. Most of these commands are identical to those found in **cmd**.

Command has one additional command, not found in **cmd**:

- **break**

For a description of the **break** command, see the following section, "Setting CTRL+C Checking."

The following **cmd** commands are **not** supported by **command**:

- **detach**
- **dpath**
- **endlocal**
- **extproc**
- **setlocal**
- **start**

In addition, you cannot run the **cmd** program (the MS OS/2 command interpreter) from **command**.

When you run them from **command**, the following commands do not accept multiple drives or filenames:

- **del** (erase)
- **dir**
- **mkdir** (md)
- **rmdir** (rd)
- **type**
- **vol**

Note Certain commands may display slightly different on-screen messages when they run in the DOS session.

Setting CTRL+C Checking

The **break** command lets you set CTRL+C checking. Normally, MS OS/2 only checks to see whether you have pressed CTRL+C while it is reading from your keyboard or while it is sending something to your screen or printer. You can use the **break** command to turn CTRL+C checking on or off.

By default, CTRL+C checking is off. If the **break** command is turned on, CTRL+C checking is turned on for other functions such as disk reading and writing.

■ To find out what the current setting is for **break**, type the following:

break

To turn CTRL+C checking on, type the following:

break on

To turn CTRL+C checking off, type the following:

break off

Some programs may internally set CTRL+C checking. The **break** command does not affect these programs.

You can also set CTRL+C checking by placing a **break** configuration command in your CONFIG.SYS file. For more information about setting CTRL+C checking, see Chapter 13, "Using MS OS/2 Configuration Commands."

Running a Utility in the DOS Session

Most of the MS OS/2 utilities that you can run from **cmd** can also be run from **command**. However, the following utilities can only be run in the DOS session:

- **append**
- **assign**
- **graftabl**
- **join**
- **setcom40**
- **subst**

The following MS OS/2 utilities cannot be run in the DOS session:

- **ansi**
- **createdd**
- **ddinstal**
- **fdisk**
- **keyb**
- **spool**
- **trace**
- **tracefmt**

The utilities that run only in the DOS session are described in the following sections. For a description of the other MS OS/2 utilities, see Chapter 8, "Using MS OS/2 Utilities," and Chapter 11, "Maintaining Your System."

You can run the **print** and **mode** utilities in the DOS session and in a full-screen OS/2 session. However, the way you run the commands differs between sessions. For more information, see the *Microsoft Operating System/2 Desktop Reference*.

Note Certain on-screen messages may differ slightly if a utility is run in the DOS session. This will not affect the utility's usage or function.

Reassigning Paths and Drives

To change how MS OS/2 accesses data and drives, you can use the **append**, **assign**, **join**, and **subst** utilities. For example, certain applications may require that you set the data path, much as you set the PATH environment variable. Or you might want to change drive or directory-path assignments to make working with a particular drive or directory path easier.

Setting a Data Search Path

To set a data search path in the DOS session, use the **append** utility. Unless you specify a particular directory path on a command line, MS OS/2 searches only your current directory for data files. With the **append** utility you can specify additional directories to be searched for data files. MS OS/2 will first search the current directory for a data file, then search the directories that you have specified with the **append** utility. This can be useful if you have data files located in different directories or located across a network.

- Using the **append** utility to set a data search path and store it in the environment requires two steps. First, type the following:

append /e

The **/e** option can only be used the first time you use the **append** utility. This option stores **append** as an environment variable. If you do not want to store **append** in the environment, omit this step.

Second, type **append** followed by the directory paths that you want to add to the data search path. For example, to use the **TEST** directory on drive **A** and the **SAMPLE** directory on drive **C** as the data path, type the following:

append a:\test;c:\sample

You use a semicolon (;) to separate individual directories. The **append** command must not contain more than 128 characters.

In the preceding example, the following will appear on your screen:

```
APPEND=A:\TEST;C:\SAMPLE
```

- To display the data search path, type **append** by itself. When you want to restore the data path to the default (which searches only the current directory for data files), type the following:

append;

To see how **append** might be used, suppose that you have customer-information files stored in the directories **CUST1** and **CUST2** on drive **C**, and in the directory **CUST3** on a floppy disk in drive **A**. You could set up your data search path by typing the following:

append /e
append c:\cust1;c:\cust2;a:\cust3

Now, if you want to display the contents of the file **SMITH.ACC**, which is in one of these three directories, type the following:

type smith.acc | more

MS OS/2 searches the current directory for the file **SMITH.ACC**. If it doesn't find the file, MS OS/2 searches the **CUST1**, **CUST2**, and **CUST3** directories in the order they are listed in. If MS OS/2 finds the file in any of those directories, it displays the contents of the file one screen at time.

Assigning a Drive Letter to Another Drive

To assign a drive letter to another drive, you can use the **assign** utility. Some applications require that you put your data disks in a floppy-disk drive. If you prefer to use a hard disk for your data files, you can use

the **assign** utility to assign a different drive letter to an existing drive. So instead of reading from and writing to an existing drive such as drive A, you can assign drive A to drive C. This means that when you request drive A, you will actually get drive C.

■ To use the **assign** utility, type **assign** followed by the letter of the drive you want to reassign and the letter of the drive you want to assign the first drive to; separate the two drive letters with an equal sign (=). For example, to assign drive A to drive C, type the following:

```
assign a=c
```

Now, if you then type **dir a:**, you will actually see a directory listing for the current directory on drive C.

■ To reset all drives to their original assignments, type the following:

```
assign
```

Note If you plan to use both the **assign** utility and the **append** utility, you must first set the data path by using the **append** utility. You could do this, for example, by including an **append** statement in your AUTOEXEC.BAT file.

The following commands are equivalent:

```
assign a=c  
subst a: c:\
```

Since the **assign** utility disguises the true device type, you should not use **assign** in the following situations:

- With commands that require drive information; for example, **backup**, **restore**, **label**, **join**, **subst**, and **print**
- During normal use of MS OS/2

The **format**, **diskcopy**, and **diskcomp** utilities ignore drive reassignments.

Joining a Drive to a Directory Path

To give a drive the name of a directory path, use the **join** utility. Once you've done this, you don't need to name physical drives with separate drive letters; instead, you just specify a directory path for each drive.

To use this utility, type **join** followed by a drive letter and the path of the directory that will be associated with that disk drive. The drive letter you specify must already exist. You cannot join a drive if it is being used by another process.

- For example, if you want to refer to drive D as the DATA directory on drive C, type the following:

join d: c:\data

If the directory does not exist, MS OS/2 creates it. The directory you specify must be empty, and it must be a subdirectory of the root directory.

Now, if you type **dir c:\data**, you will see the contents of the root directory on drive D. You can also type **join** without arguments to see the currently joined drives and directories.

- To disable the connection between drive D and the DATA directory, use the **/d** option, as follows:

join d: /d

The following utilities do not work on drives used in the **join** utility:

- **chkdsk**
- **diskcomp**
- **diskcopy**
- **format**
- **label**
- **recover**

Keep in mind that once you have used the **join** command to join a drive, MS OS/2 will display an error message if you try to use that drive letter. You must restore the drive by using the **/d** option before you can refer to the drive again.

Substituting a Drive Letter for a Path

To substitute a drive letter for a directory path, use the **subst** utility. This utility associates a path with a drive letter. The drive letter is then known as a virtual drive, which can be referred to just like a physical drive. When MS OS/2 sees the name of a virtual drive, it replaces it with the drive and directory path that you have assigned to it.

To see what virtual drives are currently in effect, type **subst** without options. To set up a new virtual drive, type **subst** followed by the virtual-drive letter and the directory path that will be substituted for it.

For example, to substitute the virtual drive Z for the directory path \ACCOUNTS\PAYABLE on drive C, type the following:

```
subst z: c:\accounts\payable
```

Now, if you type **dir z:**, you will see the contents of the PAYABLE subdirectory of the ACCOUNTS directory on drive C.

To delete a virtual drive, use the **/d** option, as follows:

```
subst z: /d
```

The following commands do not work on drives created by the **subst** utility:

- **chkdsk**
- **diskcomp**
- **diskcopy**
- **format**
- **label**
- **recover**

Displaying Disk Status from the DOS Session

The **chkdsk** utility displays status information about a disk and scans it for errors. You can run **chkdsk** from either **cmd** or **command**. While the command form you use to start the utility is the same for both, you receive additional information about the DOS session if you run **chkdsk** from **command**.

In addition to disk-status information, you receive the following DOS storage information:

```
[DOS mode storage report]
 655328 bytes total storage
 472912 bytes free
```

The “bytes free” line tells you the amount of available memory in the DOS session to run other applications. The “bytes total storage” line tells you how much memory is reserved for the DOS session. By

default, 640 kilobytes are reserved. You can change the amount that is reserved by using the **rmsize** configuration command. For more information about setting the amount of memory for DOS applications, see Chapter 13, “Using MS OS/2 Configuration Commands.”

Enabling an Extended Character Set

To load an extended character set in the DOS session, when your computer’s graphics adapter is operating in graphics mode, use the **graftabl** utility.

To load an extended character set, type **graftabl** followed by a three-digit number that identifies a code page. You can specify any one of the following code pages:

Code page	Extended character set
437	United States (default) code page
860	Portuguese code page
863	French-Canadian code page
865	Nordic code page

For example, to load the French-Canadian extended character set, type the following:

```
graftabl 863
```

To display the current extended character set, along with a list of **graftabl** options, type the following:

```
graftabl ?
```

To display the current extended character set, type the following:

```
graftabl /status
```

To display the current extended character set and load the default extended character set (code page 437), type the following:

```
graftabl
```

For more information about setting up code pages, see Chapter 13, “Using MS OS/2 Configuration Commands.”

Setting COM-Port Availability

To make a serial port available to a DOS program, use the **setcom40** utility.

Some DOS applications use a particular area on the disk to determine the presence of the serial ports COM1 or COM2. The COM01.SYS or COM02.SYS device driver places zeros in these locations to prevent DOS-session programs from using these ports.

You should use the **setcom40** utility if you have used the device configuration command to install COM01.SYS or COM02.SYS (or an equivalent device driver). The **setcom40** utility sets the appropriate address for the serial port before starting a program in the DOS session that uses the port.

■ To use this utility, type **setcom40** followed by the name of the serial port you want to use, and specify whether you want to turn serial-port availability on or off. For example, suppose you have a serial printer attached to COM1 and have installed COM01.SYS. If you want to use a DOS-session program to print a file using that printer, type the following:

```
setcom40 com1=on
```

When you no longer need to use the printer, type the following:

```
setcom40 com1=off
```

Suppose you also want to add an extra terminal to COM2. To do this, type the following:

```
setcom40 com2=on
```

Now, both COM1 and COM2 can be used by DOS programs.

When using serial ports in the DOS session, keep the following points in mind:

- The **setcom40** utility does not affect settings made with the **mode** utility.
- Programs that are running in the DOS session should not try to use serial ports that are being used in full-screen OS/2 or Presentation Manager sessions, or serial ports that are being used by Spooler Queue Manager.
- If a program is using serial ports in the DOS session, it is important to end the program before switching out of the DOS session.

- Two types of DOS-session programs may have problems using serial ports: those that use intermittent hardware interrupts and those that are time-dependent. In addition, some BASIC programs will interfere with the port even when they are not sending input to it or receiving output from it.

For more information about COM0x.SYS device drivers, see Chapter 14, "Using MS OS/2 Device Drivers."

10 Using System Editor

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Introduction

System Editor is the MS OS/2 text editor. You can use it to edit data files, such as CONFIG.SYS, AUTOEXEC.BAT, or any of your own data files.

During installation, MS OS/2 adds System Editor to the Utility Programs group in Start Programs. When you start System Editor, it starts and runs in its own full-screen session, so you can switch between it and any other session.

You cannot use a mouse in System Editor.

Editing Your CONFIG.SYS File

MS OS/2 creates a CONFIG.SYS file during the installation process. In general, it is recommended that you not change the configuration command values that MS OS/2 has assigned. However, if you do decide to change a value, you can use System Editor to do so. Always remember to make a backup copy of your CONFIG.SYS file before making any changes.

Starting and Quitting System Editor

You can start System Editor either from Start Programs or from cmd.

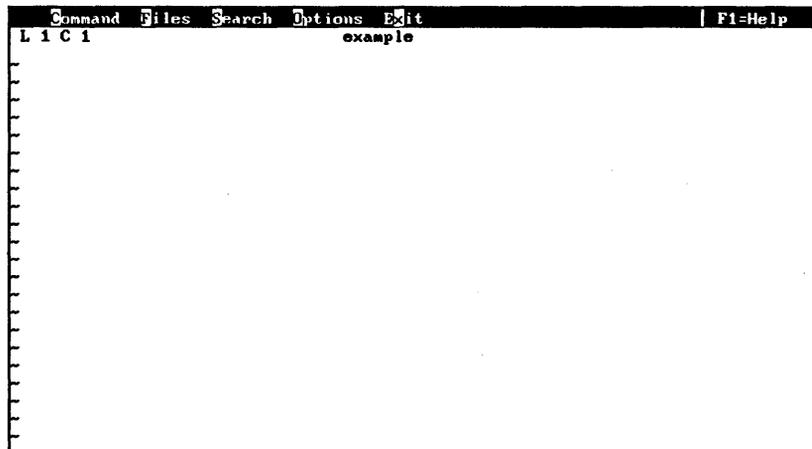
Starting System Editor from Start Programs

- To start System Editor from Start Programs, follow these steps:
 - 1 Select the Group menu, and choose the Utility Programs group.
 - 2 Use the DIRECTION keys to select OS/2 System Editor and press ENTER. Your screen clears and the System Editor screen appears, showing the Edit A File dialog box:

Edit a File	
Enter path and filename [>
Enter Esc=Cancel F1=Help	

- 3 Type the name of the file you want to edit, and press ENTER. If this file does not exist, System Editor creates it.

If you are creating a new file, the System Editor screen looks like this:



Starting System Editor from Cmd

- Do the following to start System Editor from **cmd**:
 - ▶ At the **cmd** prompt, type **e** followed by the name of the file you want to edit, and press ENTER. If this file does not exist, System Editor creates it.

For example, to edit your CONFIG.SYS file using System Editor, type the following at the **cmd** prompt:

e config.sys

This example starts System Editor and opens your CONFIG.SYS file. You can also specify multiple filenames when you start System Editor from **cmd**. For example, you could type the following:

e config.sys autoexec.bat startup.cmd

This example starts System Editor and opens each of the specified files. You can now switch between these files by using the F2 and ALT+F2 keys. For more information about switching between files, see “Working with Multiple Files,” later in this chapter.

Quitting System Editor

 To save your file and quit System Editor, use the Save And Exit This File command:

- 1 Press F10 to select the menu bar.
- 2 Use the LEFT and RIGHT keys to select the Exit menu.
- 3 Use the UP and DOWN keys to choose the Save And Exit This File command.
- 4 Press ENTER.

 To quit System Editor without saving your changes, use the Exit This File command:

- 1 Press F10 to select the menu bar.
- 2 Use the LEFT and RIGHT keys to select the Exit menu.
- 3 Use the UP and DOWN keys to choose the Exit This File command.
- 4 Press ENTER.

If you have made changes to the file, a dialog box appears, telling you that the file has been modified and asking you to confirm that you want to quit System Editor without saving your changes. Type **y** and press ENTER to quit without saving your changes; type **n** and press ENTER to continue using System Editor.

Using Help

 System Editor has online Help information. You get Help by pressing F1. You can use Help at any time while you're using System Editor.

The information that Help presents depends on what you have selected in System Editor. For example, if you've selected a menu, pressing F1 gives you Help information for that menu; if you've selected a command on a menu, pressing F1 gives you information for that command. If nothing is selected, you get a dialog box with general information about using Help.

Using the Help Index

 Help also provides an online index to System Editor commands, so that you can easily find out how a particular command works. To use the index, follow these steps:

- 1 From anywhere in System Editor, press F1. A Help dialog box appears.
- 2 Press F11 (ALT+F1 if your keyboard has only ten function keys). The Help index appears.
- 3 Use the DIRECTION keys to choose the command you want information about, and press ENTER.
- 4 Press ESC to return to the index, or press ESC twice to quit Help.

 You can also use Help to view the current System Editor key assignments. Use Help as follows:

- 1 From anywhere in System Editor, press F1. The Help dialog box appears.
- 2 Press F9. System Editor opens the E.DEF file, and it appears on your screen.
- 3 You can scroll through the file to look at the various key definitions.
- 4 Press F3 to close the file.

Saving a File

 You can save any changes you've made to a file by using the Save And Continue command from the Files menu, or by pressing ALT+F3. This command saves any changes you've made to the current file.

By using the Autosave command from the Options menu, you can also tell System Editor to save your file automatically after a specified number of lines have been changed. The Autosave command creates a backup copy of the file you are editing, in case your system loses its power. If your system loses its power, the backup file is saved in the current directory and given a name of the following form: up to the first five letters of the filename, followed by a three-digit, sequential number, followed by a numerical three-digit extension. For example, a backup copy of the file MOLLY.TXT might be named MOLLY003.000 by the Autosave command.

To use the Autosave command, follow these steps:

- 1 Select the Options menu and choose the Autosave command. The following dialog box appears:

Set Autosave Count	
Lines . . . 10	>
Enter Esc=Cancel F1=Help	

- 2 In the Lines text box, type the number of lines to be changed before System Editor automatically saves your file.
- 3 Press ENTER.

You must still save the file when you quit System Editor, if you want your changes saved in the original file rather than in a backup file.

Typing and Formatting Text

You can start typing as soon as you've opened a file in System Editor. The cursor moves to the right as you type. If your typing goes beyond the borders of the screen, System Editor automatically scrolls the text to the left so that the cursor is always visible.

Moving the Cursor

When you start System Editor, the cursor initially appears in the upper-left corner. If you switch to another file and then come back to the first file, the cursor appears where you left it. You can move the cursor to wherever you want to insert or edit text.

 To move the cursor, press the following keys:

To move the cursor	Press
Up one line	UP
Down one line	DOWN
To the left one character	LEFT
To the right one character	RIGHT
To the beginning of the current line	HOME
To the end of the current line	END
To the beginning of the file	CTRL+HOME
To the end of the file	CTRL+END

Inserting Text

 If you're editing an existing file, you can insert new text into the file. Use the **INS** key to switch between insert and replace modes. The cursor appears as a flashing rectangle when you're in insert mode. As you insert new text, existing text moves to the right of the cursor.

When you start System Editor, you are in insert mode.

Replacing Text

 You can replace existing text by typing over it. Use the **INS** key to switch between insert and replace modes. The cursor appears as a flashing line when you're in replace mode.

Formatting Text

 You can type text exactly as you want it to appear, using the following keys to place the text where you want it:

To do this	Press
Insert a space	SPACEBAR
Delete the character to the left of the cursor	BACKSPACE
Delete the character marked by the cursor	DELETE
End a line of text	ENTER
Indent a line one tab (in insert mode)	TAB
Insert a tab stop (in insert mode)	TAB
Move the cursor back one tab stop	SHIFT+TAB

 To split a line of text, move the cursor to the beginning of the text that you want to move, and press ALT+S. System Editor inserts a blank line and places the text on it.

To join two lines of text, move the cursor to the first of the two lines you want joined, and press ALT+J. System Editor joins the line below with the current line.

Scrolling

If the text in the file is longer or wider than can be shown at one time, you can scroll through the file to view the text.

 You scroll the text of a file by using a DIRECTION key to move the cursor to the edge of the screen, and then pressing the same DIRECTION key again. For example, to see the next two lines below the bottom of the screen, do the following:

- 1 Press the DOWN key until the cursor is at the bottom of the screen.
- 2 Press the DOWN key twice more to display the next two lines of text.

Note When you scroll up or down, the text scrolls one line at a time. When you scroll left or right, however, the text scrolls half a screen at a time, even though the cursor moves only one column within the file.

You can scroll up or down by the screenful, instead of by the line, by using the PAGE UP and PAGE DOWN keys. You can scroll to the beginning or end of a long line by using the HOME and END keys.

Editing a File

You edit a file with System Editor by using commands from menus, from the command line, or from the keyboard. You can delete text, move or copy text to a new location, and search for text within a file. If you change your mind after editing, you can cancel your last edit. You can even change the name of the file you're working on without quitting System Editor.

Deleting Text

Once you've typed text, you can delete it by using the following methods:

To delete	Press
The character to the left of the cursor	BACKSPACE
The character marked by the cursor	DELETE
The current line	CTRL+BACKSPACE
From the cursor to the beginning of the line	CTRL+B
From the cursor to the end of the line	CTRL+E

You can also delete a block of several lines of text at one time. To do this, follow these steps:

- 1 Use the DIRECTION keys to move the cursor to the first line of text you want to delete.
- 2 Press ALT+L to mark the line of text. The line of text is now marked for deleting and is highlighted on the screen. If you change your mind, press ALT+U to remove the mark from the text.

- 3 Use the DIRECTION keys to move the cursor to the last line of text you want to delete.
- 4 Press ALT+L to mark the line of text. The line of text and every line between it and the first marked line are now marked for deletion and are highlighted on the screen. If you change your mind, press ALT+U to remove the mark from the text.
- 5 Press ALT+D to delete the lines of text.

Moving Text

In System Editor, you can move a line or lines of text from one place to another in a text file. Before you can move text, you must mark it. To move text, follow these steps:

- 1 Use the DIRECTION keys to move the cursor to the first line of text you want to move.
- 2 Press ALT+L to mark the line of text. The line of text is now marked for moving and is highlighted on the screen. If you change your mind, press ALT+U to remove the mark from the text.
- 3 If you want to move more than one line of text, use the DIRECTION keys to move the cursor to the last line you want to move, and press ALT+L to mark the line of text. The line of text and every line between it and the first marked line are now marked for moving and are highlighted on the screen.
- 4 Move the cursor to where you want the text to appear (text will be moved to the line below the cursor).
- 5 Press ALT+M to move the line(s) of text.

Copying Text

If you want to use the same text more than once in a file, you can copy existing text to another place in the file. Before you can copy text, you must mark it. To copy text, follow these steps:

- 1 Use the DIRECTION keys to move the cursor to the line of text you want to copy.
- 2 Press ALT+L to mark the line of text. The line of text is now marked for copying and is highlighted on the screen. If you change your mind, press ALT+U to remove the mark from the text.

- 3 If you want to copy more than one line of text, use the DIRECTION keys to move the cursor to the last line you want to copy, and press ALT+L to mark the line of text. The line of text and every line between it and the first marked line are now marked for copying and are highlighted on the screen.
- 4 Move the cursor to where you want the copied text to appear (text will appear on the line below the cursor).
- 5 Press ALT+C to copy the line(s) of text.

Searching for Text

 You can search for specific text in a file by using the Locate command from the Search menu. Follow these steps to search for text:

- 1 Select the Search menu and choose the Locate command. The following dialog box appears:

Locate	
Locate what? . . [>
Enter Esc=Cancel F1=Help	

- 2 In the text box, type the text you want System Editor to find, and press ENTER.

System Editor searches forward from the cursor to the end of the file. If you want System Editor to search the entire file, change the Searchwrap setting to On by using the Searchwrap command from the Options menu.

To find further occurrences of the specified text, repeat the procedure.

Undoing an Edit

 If you change your mind after editing a line and you haven't yet moved the cursor from that line, you can cancel your last edit by doing the following:

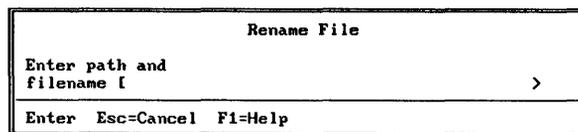
- ▶ Press F9 to restore the line to the way it was before you changed it.

Pressing F9 only works if your edit consisted of typing new text (in either insert or replace mode) or deleting one character.

Changing the Name of a File

 You can change the name of the file you are working in by using the Rename A File command from the Files menu. To do this, follow these steps:

- 1 Select the Files menu and choose the Rename A File command. The following dialog box appears:



Rename File

Enter path and
filename [] >

Enter Esc=Cancel F1=Help

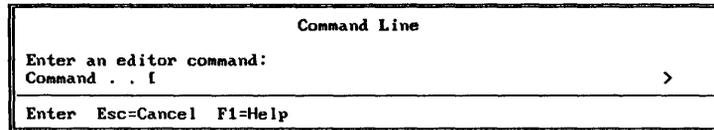
- 2 Type the new filename and press ENTER.

Notice that the new filename now appears in the title bar.

Using the Command Line

 While you can use function keys or key combinations to carry out some of the System Editor commands, you need to type other commands on the System Editor command line. To use the command line, do the following:

- ▶ Press SHIFT+F9. The Command Line dialog box appears.



From here you can type any of the System Editor commands.

For descriptions of the System Editor commands that you can type on the command line, use Help.

Working with Multiple Files

 In System Editor, you can work with several files at a time. Suppose you are editing a file in System Editor. To open a second file for editing, without quitting the active file, follow these steps:

- 1 Select the Files menu, and choose the Edit A File command.
- 2 Type the name of the file you want to work on, and press ENTER.

You now have two files open. You can switch between these files by pressing F2, to switch to the next file, or pressing ALT+F2, to switch to the previous file. When only two files are open, these commands function exactly the same way: they allow you to switch back and forth between the two files.

If you start System Editor from **cmd**, you can specify more than one file on the command line. You can then switch between these files by using the F2 and ALT+F2 keys.

 To start System Editor and switch between files, follow these steps:

- 1 At the **cmd** prompt, type **e filename1 filename2 filename3** and press ENTER.
The file specified by *filename1* appears on your screen.
- 2 Press F2. The file specified by *filename2* now appears on your screen.
- 3 Press F2. The file specified by *filename3* now appears on your screen.

Pressing F2 takes you through the files in the order in which you specified them on the command line. You can go backwards through the order by pressing ALT+F2.

Displaying the Current Directory

-  You can display the current directory without quitting System Editor. You do this by pressing F4. You may want to do this to verify filenames before specifying them in System Editor.

Merging Files

-  You can merge the contents of a file with the file you are working on. To do this, follow these steps:
- 1** Move the cursor to the line just above where you want the merged text to be placed.
 - 2** Select the Files menu and choose the Merge A File command. A dialog box appears, prompting you for the filename.
 - 3** Type the name of the file to be merged, and press ENTER. If the file is in another directory, type the directory path and filename.

The merged text now appears just below the cursor.

Drawing a Box

In System Editor, you can draw boxes within your data file by drawing lines and adding corners. These boxes are used for enhancing the way your file looks on the screen. Use the following key combinations to draw boxes:

To draw	Press
The top-left corner	CTRL+F1
The top-right corner	CTRL+F2
The bottom-left corner	CTRL+F3
The bottom-right corner	CTRL+F4
A horizontal bar	CTRL+F5
A vertical bar	CTRL+F6

Assigning Your Own Key Definitions

 In System Editor, you can assign your own key definitions by modifying the key-definition file, E.DEF. The key-definition file is a data file that tells System Editor how to interpret a particular keystroke. For example, to assign your own key definitions, follow these steps:

- 1 Using System Editor, open the E.DEF file. This is usually found in the directory C:\OS2.
- 2 Using the DIRECTION keys, scroll through the file to locate the key definition that you want to change, and make the change.
- 3 Save the E.DEF file and quit System Editor.

Each of the definition (def) statements defines a particular keystroke. The name of the key or key combination is to the left of the equal sign (=). The command to the right of the equal sign (=) determines the key function. The number sign (#) is a comment symbol, and the text to the right of it describes the function.

 For example, suppose you want to change the key assignment for deleting the current line of text from CTRL+BACKSPACE to CTRL+D. To do this, follow these steps:

- 1 Using System Editor, open the E.DEF file.
- 2 Select the Search menu and choose the Locate command.
- 3 Type **delete current line** in the Locate What? text box, and press ENTER. System Editor takes you to the following line:

```
def c_backspace = delete # delete current line
```

- 4 Change **c_backspace** to **c_d**.
- 5 Save the E.DEF file and quit System Editor.

Now when you use System Editor, you'll press CTRL+D to delete the current line of text.

Using MS OS/2 Commands

 You can also use MS OS/2 commands from the System Editor command line. With this feature you can use an MS OS/2 command without quitting System Editor. To use an MS OS/2 command, follow these steps:

- 1 Press SHIFT+F9 to use the System Editor command line.
- 2 In the Command text box, type **dos** followed by the command you want to use, and press ENTER. For example, if you want to format a disk located in drive A, you type **dos format a:** and press ENTER.

When the command is complete, you return to the System Editor screen.

Note Although you type **dos** on the System Editor command line, the commands that you can run from System Editor are MS OS/2 commands, not DOS commands. Since System Editor runs in a full-screen OS/2 session, you cannot run DOS commands from it.

Part 3

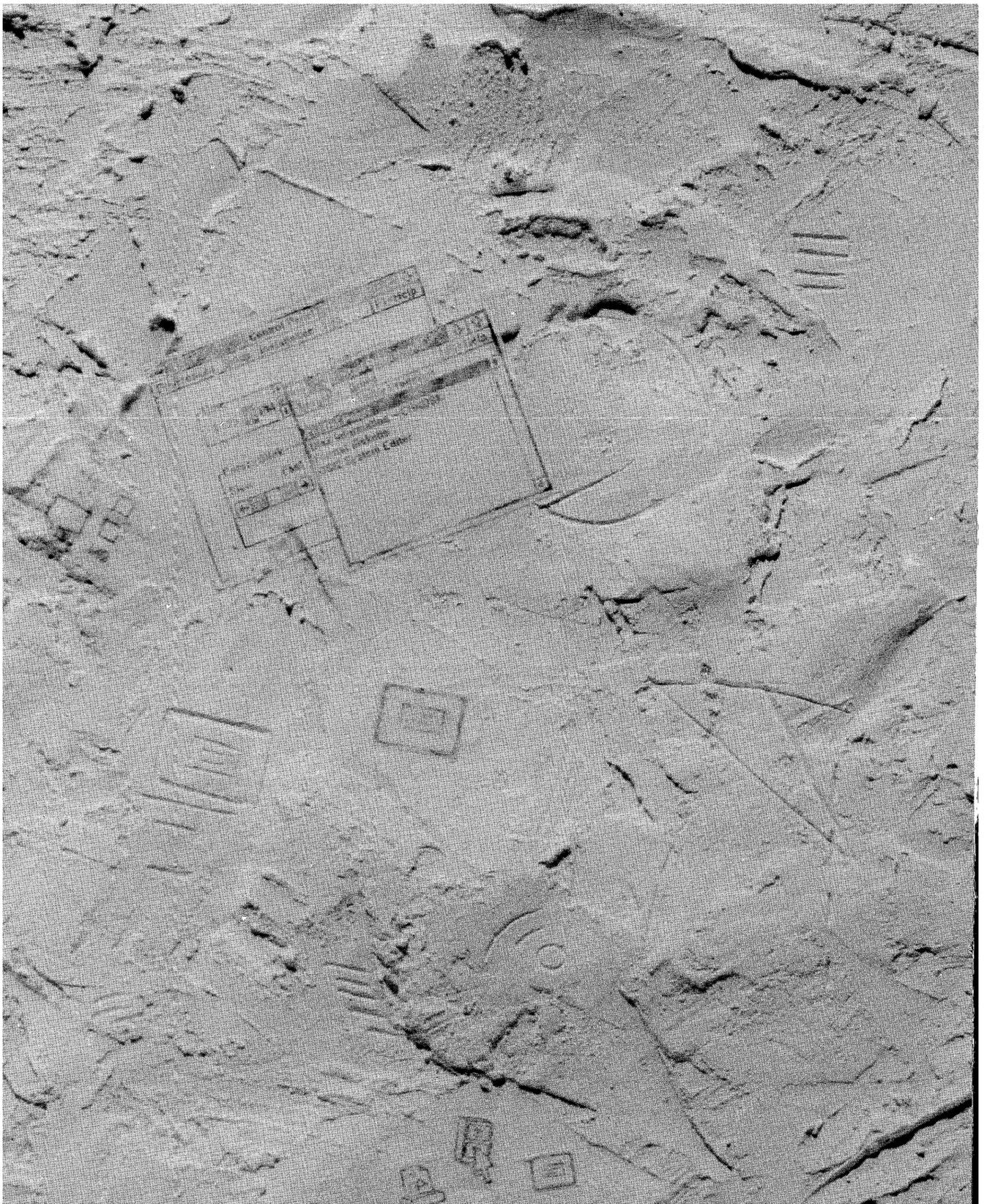
Configuring and Maintaining Your System

This part of the *Microsoft Operating System/2 User's Guide* provides information to help you configure and maintain your system.

You will find information about utilities and commands you can use to perform system-maintenance tasks, such as making backups and configuring and formatting a hard disk.

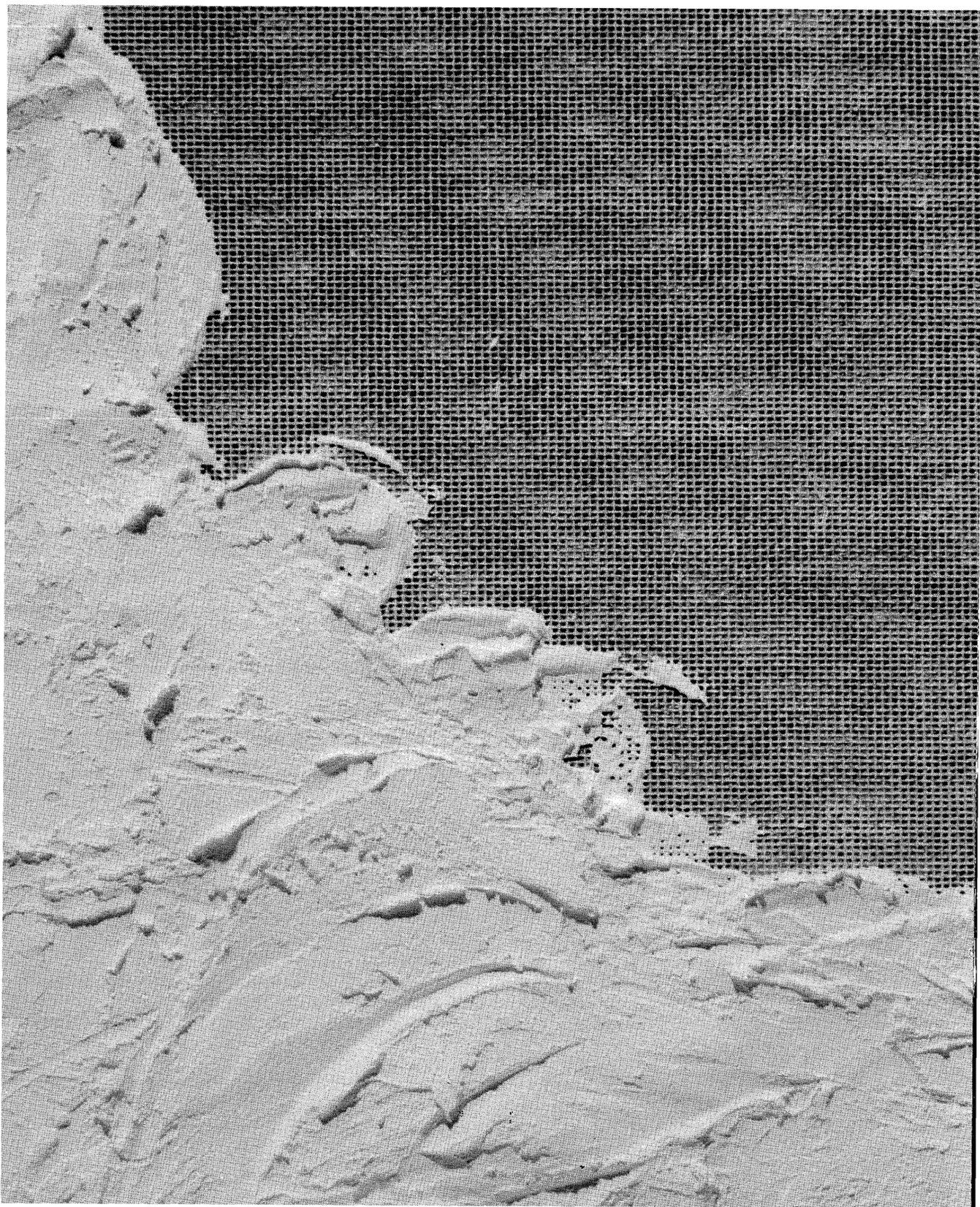
There is also an overview of the start-up files that you can use in MS OS/2.

You will learn about the configuration commands that can be added to your CONFIG.SYS file and how to use device drivers to support new hardware or enable additional features of the system.



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11 Maintaining Your System

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Introduction

This chapter is designed to help you with the tasks of maintaining your system, including maintaining your system's files, directories, and disks. It describes the MS OS/2 disk utilities that you use to perform such tasks as displaying information about a disk, setting up a hard-disk drive, and backing up and restoring files, and it describes how you can use the **mode** utility to give MS OS/2 information about devices that are connected to your system.

Using MS OS/2 Disk Utilities

MS OS/2 provides utilities that help you work with and maintain disks. These utilities are described as follows:

Utility	Purpose
chkdsk	Displays status information about a disk.
backup	Makes backup copies of files.
restore	Restores backup files.
recover	Recovers a file or disk that contains bad sectors.
fdisk	Sets up a hard disk.

You can run all of these utilities in both DOS and full-screen OS/2 sessions, except for the **fdisk** utility, which you can run only in a full-screen OS/2 session.

Unlike commands and utilities that operate on files and directories, disk utilities are designed to help you prepare and maintain floppy and hard disks.

Displaying Disk Information

The **chkdsk** utility displays status information about a disk and checks the disk for errors.

You should run this utility periodically to keep track of how much space is left on a disk and to display any errors found on the disk. If **chkdsk** finds an error, a message appears on the screen, describing the error.

To run **chkdsk**, type **chkdsk** followed by a drive letter or filename. **Chkdsk** always checks a drive; you can check a file as well by specifying a filename. If you specify a filename, **chkdsk** checks the drive and also tells you whether the specified file is contiguous. (You can specify a directory path with the filename.) If you don't specify a drive, **chkdsk** checks the current drive.

For example, to check your hard disk and save the output in the file **REPORT.DSK** on drive A, type the following:

```
chkdsk c: > a:report.dsk
```

A typical status report might look like the following:

```
Volume RALPH created -- 6-27-1989 10:47am  
  
30377984 bytes total disk space.  
 512 bytes in 1 hidden files.  
 83968 bytes in 34 directories.  
28644864 bytes in 959 user files.  
 10240 bytes in bad sectors.  
1638400 bytes available on disk.
```

Hidden files are files that are needed by the system but do not show up when you use the **dir** command to display a directory listing. To discover the names of hidden files, use **chkdsk** with the **/v** option, which is described later in this chapter, in "Displaying Each File on Your Disk," or use File System in the Presentation Manager session.

The *bytes in bad sectors* message shows you how many of the sectors on your disk are defective. These bad sectors are taken care of by the system, so there is usually no reason to worry about bad sectors unless this number becomes very large.

The *bytes available on disk* is the number of unused bytes on the disk. You should check on this value from time to time, especially if disk space is limited.

The **chkdsk** utility may report that it has found lost clusters. To understand what this means, you must understand how MS OS/2 files are stored on a disk. MS OS/2 files are stored in a series of units called sectors, which are grouped into larger units called clusters. When **chkdsk** reports a lost cluster, it doesn't mean that the cluster is deleted. It does mean that the cluster is no longer linked to the file it was a part of. This could occur for many reasons; for example, if you pressed **CTRL+ALT+DEL** while the system was writing to a file. When a cluster is lost, MS OS/2 can't read, write, or modify the data in those clusters. If part of a valuable file is contained in a lost cluster, you won't be able to work with it at all. In addition, lost clusters take up valuable disk space.

If you use the `/f` option, `chkdsk` will fix those lost clusters by writing them to a file. For instructions on how to use the `/f` option, see the following section.

If you specify files to be checked when you use the `chkdsk` utility, you will receive a message that tells you whether the files are stored in contiguous sectors. If a file is not stored in contiguous sectors, the number of its blocks that are stored in noncontiguous sectors is displayed. Although not required, storing files in contiguous sectors enables your computer to read or write to files more efficiently. If many of your files are stored in noncontiguous sectors, you can make all files contiguous by making a backup copy of your disk, reformatting it, and restoring the files to the disk by using a backup utility.

Fixing Errors on Your Disk

 To fix errors on your disk, use `chkdsk` with the `/f` option. You can fix errors only on a disk other than the MS OS/2 start-up disk. This means that if you normally start MS OS/2 from drive C, you can fix errors only on disks that are in drives other than drive C. To fix errors on your hard disk, you must do the following:

- 1 Restart your system by using the MS OS/2 Installation disk.
- 2 Press ESC when the first screen appears. This takes you to the [A:] prompt.
- 3 Insert the disk that contains the file `CHKDSK.COM`.
- 4 Type `chkdsk c: /f` and press ENTER.

 The `chkdsk` utility attempts to recover lost clusters and places them into files that have the extension `.CHK`. Depending upon the condition of the recovered files, the files may or may not be usable.

If the files with lost clusters are ASCII files (data files), you may be able to recover the lost data. If you find that there is text missing from an ASCII file, run `chkdsk` with the `/f` option, then do the following:

- 1 Use the `type` command to look at the contents of each of the `.CHK` files.
- 2 If the missing text appears in one of the `.CHK` files, use a text editor to copy this text back into the original file.

Displaying Each File on Your Disk

Use the **/v** option if you want the name of each file on the disk to be displayed as it is being checked. The **/v** option causes **chkdsk** to display all files, including hidden files. However, the hidden files are not flagged in any way.

Discovering which files are the hidden files can be a challenging process. If you need to know the names of your hidden files, perform the following steps:

- 1 Use the **chkdsk** command without the **/v** option. This tells you the number of hidden files; however, it does not tell you the names of the files.
- 2 Use the **chkdsk** command with the **/v** option to get a listing of all the files on a particular drive.
- 3 Use the **dir** command to get a file listing that doesn't show any hidden files.
- 4 Compare these two listings.

Any file that is in the **chkdsk /v** listing but is not in the **dir** listing is a hidden file.

Since **chkdsk /v** displays filenames left-aligned, you can easily use the **sort** utility to sort files and directories alphabetically. The **sort** utility is described in detail in Chapter 8, "Using MS OS/2 Utilities."

Making Backup Copies of Your Files

The **backup** utility creates a backup copy of one or more files from one disk and stores the backup on another disk. It provides an easy way to make backup copies of files, directories, or entire disks. Using **backup** differs from using the **copy** command or the **xcopy** utility to copy files; when you use **backup** to copy files, the contents of the files are stored in a single file, instead of in individual files. In addition, **backup** has several useful options that let you selectively make backups of specific files.

Note The **backup** utility will not make backup copies of the files **CMD.EXE** or **COMMAND.COM**, or of hidden system files.

It is also possible to make backups of files that are on one kind of disk and store the backup copies on a disk of a different kind. This means that you can make backup files in the following ways:

- Hard disk to floppy disk
- Floppy disk to floppy disk
- Floppy disk to hard disk
- Hard disk to hard disk

You can back up one floppy disk to another floppy disk even if the disks have a different number of sides or sectors.

The **backup** utility is most commonly used to make backup copies of files on your hard disk and store them on a series of floppy disks. That way, if your hard disk becomes corrupted, you have a way of recovering the files that were on it.

Making Backup Files on Another Disk

To run the **backup** utility, type **backup** followed by the drive that contains the disk that you want to back up (the source disk) and the drive that contains the disk that will hold the backup files (the backup disk).

To back up the contents of your current directory to a directory in another drive, specify the drive letters of the source drive and the backup drive. For example, to back up the root directory of drive A to your hard disk, be in the root directory and type the following:

```
backup a: c:
```

To make a backup of the contents of a specified directory, type the drive letter and directory path of the directory you want to copy. For example, to back up the files in the **ORDERS** subdirectory of the **ACCOUNT** directory to a floppy disk in drive A, type the following:

```
backup c:\account\orders a:
```

Suppose you have several files on your hard disk that have the filename extension **.OLD**. To back up the **.OLD** files to a floppy disk in drive B, type the following:

```
backup c:\account\orders\*.old b:
```

By default, any files on the backup disk are erased before the backup files are added to it. If all of the files can't fit on one floppy disk, **backup** prompts you to insert another blank, formatted disk when the current disk is filled.

When the backup is complete and you display a directory listing for the backup disk, you won't see the files you just copied listed individually. Instead, you'll see two files named **BACKUP.00n** and **CONTROL.00n**. These files contain your files and pathnames, and they will be used later to restore these files. On the first backup disk, these two files will be called **BACKUP.001** and **CONTROL.001**; on the second disk, they will be called **BACKUP.002** and **CONTROL.002**; and so on.

If you are copying files to a hard disk, **backup** automatically creates a directory called **\BACKUP**, and it will contain the **BACKUP** and **CONTROL** files.

If you use the **/f** option, **backup** formats the backup disk (floppy disks only) before making the backup.

Making Backups of Subdirectories

If you use the **backup** utility without options, only the files or directory you specify are copied. To copy several directories, or an entire disk, you can use the **/s** option. The **/s** option enables you to create backup copies of subdirectories.

 For example, to back up your entire hard disk to floppy disks on drive A, type the following:

```
backup c: a: /s
```

All files and directories are copied to drive A while maintaining the original directory structure.

Making Backups of Files Modified Since the Last Backup

 The **backup** utility can use the archive attribute to determine which files to back up. If you use the **/m** option, only those files that have been modified since the last backup are copied to the backup disk.

When you use **backup**, those files that have their archive attributes set are found and copied. The **backup** utility then turns off the archive attribute for these files. The next time you make a backup of the same set of files by using the **/m** option, only those files that have been created or modified since the last backup will have their archive attributes set. Thus, only they will be backed up. This is true unless you use the **attrib** utility to modify the archive attributes of certain files.

Adding Files to the Backup Disk

By default, the contents of the backup disk are erased before the source files are added to it. If you want to add files to an existing backup disk without modifying the current contents, use the **/a** option.

Suppose that your backup disk now contains the contents of the ENG directory. You later realize that you also need to make a backup copy of the MKT directory. You could make a second backup disk, or you could add the contents of MKT to the existing backup disk by using the **/a** option. To add the second directory, type the following:

```
backup c:mkt a: /a
```

The BACKUP and CONTROL files now contain the contents of the ENG backup files and the MKT backup files. Any other files that were on the backup disk remain unchanged.

Making Backups of Files Modified After a Certain Date or Time

You might be interested in copying only files that have been modified since a certain date and time. To do this, use the **/d:date** option and, optionally, the **/t:time** option. Note that **/t** cannot be used without **/d**.

Suppose you want to copy only files that have been modified since the beginning of 1988. You would run the **backup** utility and specify the date and time as follows:

```
backup c: a: /d:12-31-87 /t:23:59
```

Any files that were modified after 11:59 P.M. on December 31, 1987, would be copied.

Making a Backup Log

The **/L:logfile** option lets you create a backup log of the files you have copied. This log contains a list of entries, one entry per file. Each entry contains the number of the backup disk and the name of the file. This information can be used to restore a particular file from a floppy disk.

Unless you specify otherwise, the log file is created in the root directory of the start-up drive. If you do not specify a log-file name, the log file is named BACKUP.LOG.

- For example, suppose you want to back up the contents of your current directory on drive C to a floppy disk in drive A. To create a backup log on drive A called LOGFILE, type the following:

```
backup c: a: /L:a:\logfile
```

Restoring Backup Files

To restore backup files to a disk, use the **restore** utility. The **restore** utility can restore files from similar disk types or from differing disk types. Many of the **restore** options are analogous to the **backup** options.

Restoring Files to a Disk

- To restore files that were copied with the **backup** command, type **restore** followed by the drive that contains the disk where the backup files are located (the source drive) and the name of the drive or directory that these files will be copied to (the destination drive). You can restore files only to the directories from which they were backed up.

If you have a floppy disk that contains the backup files, you need only insert the disk that contains the backup files in drive A and type the following to restore the files to the directory \BAK on drive C:

```
restore a: c:\bak
```

Restoring Subdirectories

- If you made backups of subdirectories by using the **backup** utility's **/s** option, you can restore these subdirectories by using the **restore** utility's **/s** option. For example, to restore the contents of all backup files in drive A to the current directory in drive C, type the following:

```
restore a: c: /s
```

Prompting the User Before Restoring Files

It's possible that the directory being restored might contain read-only files or files that have been modified since the last backup. If so, you might not want to restore these files.

The **/p** option displays a warning message and prompts the user with “Replace the file (Y/N)?” To restore the backup file, type **y** for yes. To leave the file unchanged, type **n** for no.

Selecting Files to Restore

Just as you can make backups based on the time or date a file was created or last modified, you can also restore files based on these features. The options that you can use with **restore** are as follows:

Option	Purpose
/b:date	Restores only those files that were last modified on or before <i>date</i> .
/a:date	Restores only those files that were last modified on or after <i>date</i> .
/estime	Restores only those files that were last modified at or earlier than <i>time</i> .
/L:time	Restores only those files that were last modified at or later than <i>time</i> .
/m	Restores only those files that have been modified since the last backup.

You can combine options if you like.

These options work only if the filenames on the source drive are the same as those on the destination drive. In other words, if you are restoring files to an empty directory or to a directory that contains filenames that are different from the backup filenames, these options do not apply.

For example, suppose that you want to update a phone list periodically from a backup floppy disk that is made from the company’s master phone lists. Suppose also that you want to restore the list to a directory named PHONE in drive C. To update those phone lists that haven’t been modified in over a month, you could use the **/b** and **/m** options, specifying a date as follows:

```
restore a: c:\phone /b:5-14-89 /m
```

The **/b** option looks only for those files that were last modified before May 14, 1989. The **/m** option looks for those files that have the archive attribute set, which means that the file has been modified since the last backup.

Restoring Files Not on the Destination Drive

 To restore only those files from the backup disk that do not already exist on the destination drive, use the **/n** option.

For example, suppose you have the files TEMP1.BAK, TEMP2.BAK, and TEMP3.BAK on a backup disk, and TEMP1.BAK and TEMP2.BAK are in the destination directory. If you use the **/n** option, only TEMP3.BAK will be restored.

Recovering Files from a Damaged Disk

If you find that a sector on your disk is damaged, you can use the **recover** utility to try to recover just the file that has been written to the damaged sector, or the entire disk.

Before using this utility, be sure that you have a full backup of all the files on your disk. Then try to restore your files by using the **restore** command. If this fails, use the **recover** utility on one file at a time. Only use **recover** on a disk if the entire disk is unreadable.

 To recover one file, type **recover** followed by the name of the file you want to recover. This causes MS OS/2 to read the file sector-by-sector and to skip the bad sectors. When MS OS/2 finds a bad sector, it labels the damaged sector so that no data will be written to it in the future.

To recover an entire disk, type **recover** followed by the drive letter.

Recover will not work on a network from a remote work station, nor will it work on drives that are used with the **subst** or **join** utilities.

Configuring a Hard Disk

The **fdisk** utility sets up your hard disk for use with MS OS/2. You must always run **fdisk** on a hard disk before using it for the first time. The MS OS/2 installation program does this for you, but later, you might want to run **fdisk** to change the configuration of your disk.

The **fdisk** utility displays a series of menus that let you do the following:

- Create an MS OS/2 partition or logical drive.
- Change the active partition.
- Delete an MS OS/2 partition or logical drive.
- Display partition data or logical-drive information.
- Review or modify the configuration of another hard disk on your computer.

You should run **fdisk** if you need to change the size or number of partitions that are on your hard disk, or if you must restore lost partition information. In addition, you can run **fdisk** any time you want to find out the way your hard disk is configured.

In the following sections, specific examples are used to illustrate how **fdisk** options work. Your computer may display different values when you run **fdisk**, depending upon the size of the hard disk installed in your system.

Warning Reconfiguring your disk by using **fdisk** destroys all existing files. Be sure to have a backup copy of all the files on your disk before you run **fdisk**.

MS OS/2 Partitions and Logical Drives

A hard disk can be organized into separate sections called *partitions*. You can set up one primary and one extended partition. The extended partition is optional. The primary partition is drive C; it is where the start-up files for MS OS/2 must reside. It can also contain user files and directories. An extended partition contains user files or directories, but it cannot contain MS OS/2 start-up files. Within an extended partition, you can have one or more logical drives, each having its own drive letter (for example, D, E, and F).

Most users will want to set up their entire hard disk as the primary partition. That way they can gain access to any file and directory on the disk without having to change to a different logical drive. There are a few users, however, that may find a need to set up and use an extended partition and logical drives. If several workers are sharing one computer, for example, you could have the primary partition (drive C) reserved for system files and shared data files, and use drives D and E for individual user files.

Setting Up Your Hard Disk

☞ If your disk is being configured for the first time, you may need to perform the following steps. The MS OS/2 installation program performs these steps for you. These steps are described in the following sections.

- 1 Set up the primary (start-up) partition.
- 2 Optionally, set up the extended partition and logical drives.
- 3 Restart your system to make the changes permanent.
- 4 Format drive C and any logical drives you have created.

To find out whether your hard disk has already been configured for MS OS/2, try to start MS OS/2 from your hard disk. If it starts, your hard disk is both configured and formatted, and the MS OS/2 system files are on the disk. If MS OS/2 does not start, your disk is not formatted to start MS OS/2, but it may have been configured. Check to see whether the disk has been configured by using the **fdisk** command and then selecting the Display the Partition Data option. This procedure is discussed in greater depth later in this chapter.

Starting the Fdisk Program

The **fdisk** utility is easy to use because it uses menus that lead you through each procedure. Before starting **fdisk**, make sure that you have inserted the MS OS/2 Installation disk in drive A and started your computer, and that the Installation disk contains the file **FDISK.COM**. You cannot run **fdisk** if you start MS OS/2 from the hard disk.

☞ To start **fdisk**, follow these steps:

- 1 Place the MS OS/2 Installation disk in drive A.
- 2 Turn on your computer. If your computer is already turned on, restart your computer by pressing **CTRL+ALT+DEL**.
- 3 When the logo appears, press the **ESC** key. This takes you to the command prompt.
- 4 Type the following at the prompt and press the **ENTER** key:

```
fdisk
```

In response to your typed command, the **fdisk** utility displays the **FDISK Options** menu on your screen. This menu lists five options (if your computer has only one hard disk, the fifth option will not appear on your screen).

FDISK options

Choose one of the following:

1. Create a Microsoft Operating System/2 partition or a logical drive
2. Change the active partition
3. Delete a Microsoft Operating System/2 partition or a logical drive
4. Display the partition data
5. Select Next Fixed Disk Drive

Enter choice: [1]

Press Enter to continue or
Esc to return to Microsoft Operating System/2

Most of the **fdisk** menus display a default value. To choose the default value, press ENTER. To choose another value, just type the value you want and press ENTER.

The following sections describe each of the **fdisk** menu options and show the menus and other information they display. To return to MS OS/2 from the FDISK Options menu, press the ESC key. You can also use the ESC key to return to the FDISK Options menu from any of the other **fdisk** menus.

 To quit **fdisk**, return to the FDISK Options menu and press ESC. If you have created any partitions or logical drives, or if you have changed the active partition, you'll see the following message displayed on your screen:

```
The fixed disk has been updated. The system should
now be restarted. Press Ctrl+Alt+Del.
```

You must restart your system to make the changes permanent. In addition, if you have created any partitions or logical drives, you must format them with the **format** utility before copying any files to them.

Creating the Primary MS OS/2 Partition

The first step in configuring a hard disk is to create a primary partition. You will most likely want your entire hard disk to be in the primary partition, although this is not required.

When you create a primary partition, no partitions must currently exist on the hard disk. This means that if you want to change the size of the primary partition, you must first delete existing partitions and logical drives, then create a new primary partition (see "Deleting an MS OS/2 Partition," later in this chapter, for instructions on deleting partitions). You must create a primary MS OS/2 partition before you can create an extended MS OS/2 partition.

To create the primary MS OS/2 partition, select option 1 from the FDISK Options menu and press ENTER. Fdisk displays the following screen:

```
Create a Microsoft Operating System/2 partition
Choose one of the following:
    1. Create primary Microsoft Operating System/2 partition
    2. Create extended Microsoft Operating System/2 partition
Enter choice: [1]
Press Esc to return to FDISK Options
```

To create the primary MS OS/2 partition, press ENTER to accept the default selection (option 1).

The Create Primary Partition menu appears next. You will see the following message:

```
Do you want to create an active Microsoft Operating System/2
partition of the maximum size (Y/N).....? [Y]
```

If you want to have the entire hard disk in the primary MS OS/2 partition, press ENTER to accept the default selection (yes).

If you want to create a primary MS OS/2 partition that is smaller than the maximum size, type *n* for no. The fdisk utility displays the maximum capacity of your hard disk (in cylinders), and prompts you for the size you want your primary partition to be.

```
Create Primary Microsoft Operating System/2 Partition
The maximum capacity of the fixed disk is 732 cylinders.
Enter partition size.....: [ 730]
No partitions are defined
Press Esc to return to the FDISK Options
```

Type the size of the partition (in cylinders) and press ENTER.

Then fdisk displays status information about the partition it just created and tells you that the primary partition has been created by displaying the following:

Create Primary Microsoft Operating System/2 Partition

Partition	Status	Type	Start	End	Size
1	C:	A	PRI DOS	2	601 600

The maximum capacity of the fixed disk is 732 cylinders.

The primary Microsoft Operating System/2 partition is created

Press Esc to return to the FDISK Options

You'll see the number and drive, status, and type of the partition; the partition's starting and ending cylinder numbers; and the partition's size (in cylinders). For a detailed description of each of these fields, see "Displaying Partition Data," later in this chapter.

After you create the primary partition, press ESC to return to the FDISK Options menu. If you want to create an extended partition, see the instructions found in the following section. Otherwise, you should restart your computer by inserting your MS OS/2 start-up disk in drive A and pressing CTRL+ALT+DEL. This makes the partition information permanent. Before MS OS/2 can use your hard disk, you need to format the disk by typing the following:

format c:

Remember that formatting your disk destroys all data on it. Make backup copies of your disk as necessary.

Creating an Extended Partition

You may choose to create a primary MS OS/2 partition that is smaller than the maximum size and then use the remainder of the disk as an extended MS OS/2 partition.

 To create an extended partition, return to the FDISK Options menu and select option 1.

The Create Partition menu will appear on your screen:

Create Microsoft Operating System/2 Partition

1. Create primary Microsoft Operating System/2 partition
2. Create extended Microsoft Operating System/2 partition

Enter choice: [1]

Press ESC to return to the FDISK Options

Select option 2 to create an extended MS OS/2 partition.

When you select option 2, the **fdisk** utility displays status information about the primary partition and prompts you as follows:

```
Create Extended Microsoft Operating System/2 Partition
```

```
Partition Status Type Start End Size
1: C A PRI DOS 2 601 600
```

```
The maximum capacity of the fixed disk is 732 cylinders.
```

```
Enter partition size..... [ 130]
```

```
Press Esc to return to the FDISK Options
```

The partition size shown in square brackets is the number of cylinders left for your extended partition. In most cases, you'll want to use the maximum value. Press **ENTER** if you want this value; otherwise, type the size (in cylinders) that you want for the partition, then press **ENTER**.

Fdisk then displays status information about the primary partition and the extended partition that you just created. To display the **Create Logical Drive(s)** menu, press **ESC** once; to return to the **FDISK Options** menu, press **ESC** twice.

Creating Logical Drives on the Extended Partitions

After you create an extended partition, you should create logical drives for it. You may designate the entire extended partition as one logical drive, or you may divide it into many logical drives. If you have one physical drive, drive C, the first logical drive you may designate is called drive D, the second is called drive E, and so on. Logical drives can be a good organization tool. You could, for example, have different applications and their data files on separate logical drives.

Tip If you are adding logical drives to an existing partition, select option 1 from the **FDISK Options** menu to display the **Create Partition** menu, then select option 3 to display the **Create Logical Drive(s)** menu. If you are creating a logical drive for a new extended partition, this menu is automatically displayed after you create the new extended partition.

```
Create Logical Drive(s)
```

```
The total partition size is 130 cylinders.
```

```
The maximum contiguous space available for
the logical drive is 130 cylinders.
```

```
Enter the size of the logical drive.....: [ 130]
```

```
Press Esc to return to the FDISK Options.
```

If you are adding logical drives to the extended partition, **fdisk** displays the current drive assignments as well as prompting you for new logical drive information. For example, if logical drive D already exists, you might see the following:

```

Create Logical Drive(s)

Drive   Start   End   Size
D:      602     651   50

The total partition size is 130 cylinders.
The maximum contiguous space available for
the logical drive is 80 cylinders.

Enter the size of the logical drive..... [ 80]

Press Esc to return to FDISK Options.

```

The value in square brackets is the number of unused cylinders in the extended partition. Press **ENTER** to accept the default value listed in the square brackets. Otherwise, type in the number of cylinders for the logical drive and press **ENTER**.

If any cylinders remain in the extended partition, you will be prompted again for the size of the next logical drive. The **fdisk** utility will continue to prompt you until you run out of space in the extended partition or until you press **ESC** to return to the **FDISK** Options menu.

After you create logical drives in the extended partition, you should restart your computer by inserting your MS OS/2 Installation disk in drive A and pressing **CTRL+ALT+DEL**. This makes the logical-drive information permanent. Then, so that MS OS/2 can use your hard disk, format your disk by typing the following:

format drive:

The *drive* argument is the logical drive you just created. Repeat this format operation for every logical drive you have created. (You can create all the logical drives you need, then restart your system and format them all, one after the other.)

Changing the Active Partition

If you choose option 2 on the **FDISK** Options menu, to change the active partition, **fdisk** displays a screen showing the status of each partition on your hard disk. The active partition, indicated in the Status column by the letter A, is the partition from which MS OS/2 starts when you turn on or restart your computer. If you have created a partition on your disk that contains another operating system, this menu allows you to make that partition the active partition. Only one partition can be active at a time.

For example, if you have partitions for both XENIX® and MS OS/2 on your disk, the Change Primary Partition screen might look like this:

```
Change the active partition

Partition  Status  Type  Start  End  Size
1         C        A   PRI  DOS    2   601   600
2         N        N   XENIX    602  731   130

Total disk space is 732 cylinders.

Enter the number of the partition you
want to make active.....: [1]

Press ESC to return to FDISK Options.
```

Type the number of the partition that you want to make active, and press ENTER. The default setting is the number of the currently active partition.

If your hard disk contains only MS OS/2 partitions, `fdisk` displays the following message instead of prompting you for the partition that you want to activate:

```
The only start-up partition on Drive 1
is already marked active.

Press ESC to return to FDISK Options.
```

Note If want to run an operating system other than MS OS/2 from your hard disk, see the other operating system's manual for instructions on how to install and configure that operating system.

Deleting an MS OS/2 Partition

The `fdisk` utility lets you delete a primary partition, extended partition, or logical drive. To delete a primary partition, you must first delete the extended partition. To delete an extended partition, you must first delete any logical drives on it.

The `fdisk` utility doesn't allow you to change the size of a partition. Therefore, if you need to change the size of a partition, you must first delete the partition, then create a new partition that has the new size.

Note Be sure to make backup copies of all files before you delete the drive. When `fdisk` deletes a logical drive or partition, the data on it is destroyed.

Tip If you select option 3 on the FDISK Options menu, to delete an MS OS/2 partition, the `fdisk` utility displays the Delete Partition menu:

```
Delete Microsoft Operating System/2 Partition
```

1. Delete Primary Microsoft Operating System/2 partition
2. Delete Extended Microsoft Operating System/2 partition
3. Delete the logical drive(s)
in the Extended Microsoft Operating System/2 Partition

```
Enter choice: [1]
```

```
Press ESC to return to FDISK Options;
```

Option 3 will not appear if you have not created logical drives.

Type the number of the option you want, and press `ENTER`. If you've chosen to delete a primary or an extended partition, the next menu shows the status of that partition. If you are deleting a logical drive, the drives currently defined are displayed.

Deleting a Logical Drive

Tip To delete a logical drive, select option 3 from the Delete Partition menu. The `fdisk` utility then displays status information about the existing partitions and prompts you as follows:

```
Delete the Logical Drive
```

Drive	Start	End	Size
D:	602	651	50
E:	652	731	80

```
Total partition size is 130 cylinders.
Warning! Data in the logical drive will be lost.
What drive do you want to delete.....? [ ]
```

```
Press ESC to return to FDISK Options
```

Type the letter of the drive you want to delete, and press ENTER. The fdisk utility displays the following message:

```
Are you sure.....? [N]
```

If this logical drive contains valuable data that you have not made backup copies of, press ENTER. This stops fdisk from deleting the logical drive.

To delete the drive, type y for yes. After deleting a drive, fdisk will continue to prompt you for more logical drives to delete, until all drives are deleted or until you press ESC. Once you press ESC, status information for the remaining logical drives is displayed.

If you do not delete logical drives in the reverse order in which they were created, the remaining drives are reordered starting from drive D. So if you had created drives D, E, and F, and you delete drive D first, drives E and F will be reordered and renamed drive D and drive E.

Deleting the Extended Partition

To delete the extended partition, select option 2 from the Delete Partition menu. Partition status information appears on the screen and you are prompted as follows:

```
Delete Extended Microsoft Operating System/2 Partition
```

Partition	Status	Type	Start	End	Size
1	C	A PRI DOS	2	601	600
2		N EXT DOS	602	731	130

```
Warning! Data in the Extended Microsoft Operating  
System/2 partition will be lost. Do you want  
to continue.....? [N]
```

If you want to prevent the partition from being deleted, press ENTER. You will then be returned to the FDISK Options menu.

If you want to delete the partition, type y for yes. A message will appear on the screen, confirming that the partition has been deleted. It will also provide partition status information. Notice that only the primary partition now exists. To return to the FDISK Options menu, press ESC.

Deleting the Primary Partition

To delete the primary partition, select option 1 from the Delete Partition menu. Partition status information appears on the screen and you are prompted as follows:

```
Delete Primary Microsoft Operating System/2 Partition.
```

```
Partition Status Type Start End Size
1 C: A PRI DOS 2 601 600
```

```
Warning! Data in the Primary OS/2 partition
will be lost. Are you sure you want to continue.....? [N]
```

```
Press ESC to return to FDISK Options
```

If you do not want to delete the primary MS OS/2 partition, press ENTER to accept the default value (no).

Displaying Partition Data

If you choose option 4 on the FDISK Options menu, **fdisk** displays a screen that contains information about each of the partitions on your hard disk.

The Display Partition Information screen contains the following information:

```
Display Partition Information
```

```
Partition Status Type Start End Size
1 C: A PRI DOS 2 601 600
2 N EXT DOS 602 731 130
```

```
Total disk space is 732 cylinders.
```

```
The Extended Microsoft Operating System/2 partition
contains logical drives. Do you want to display
the logical drive information?.....? [Y]
```

```
Press ESC to return to FDISK Options.
```

This screen identifies the partitions on your disk. It shows the number of each partition, its status, and its type. The screen also shows each partition's starting and ending cylinder numbers, in addition to its size (in cylinders). The following list explains the fields of partition information that you see:

- The Partition field tells you the partition number and drive name. The primary MS OS/2 partition is drive C.
- The Status field tells you whether the partition is active (A) or not active (N). The primary partition must be active if you want to start MS OS/2 from it.
- The Type field tells you whether this is the primary (PRI DOS) or extended (EXT DOS) partition. If you have installed another operating system, its name will appear in this field.
- The Start and End fields tell you the cylinder numbers where each partition starts and ends, respectively.
- The Size field tells you the total size of the partition (in cylinders).

If you have an extended partition, the `fdisk` utility asks whether you want to see information about that partition's logical drives. Type `y` for yes and press `ENTER` to display a screen similar to the following: following:

Drive	Start	End	Size
D:	602	651	50
E:	652	731	80

Press `ESC` to return to FDISK Options

Press the `ESC` key to return to the FDISK Options menu.

Selecting the Next Hard-Disk Drive

- The fifth option, Select Next Fixed Disk Drive, appears on the FDISK Options menu if you have more than one hard disk attached to your computer. If you choose this option, `fdisk` switches the current disk drive to the next hard-disk drive.

For example, if the current drive is drive C, and if you choose option 5 on the FDISK Options menu, **fdisk** changes the current drive to drive D. You could then choose any of the first four **fdisk** options to prepare the second hard disk for MS OS/2. Or you could select option 5 once again to select the next drive; if there is not a third hard disk, **fdisk** changes the current hard drive from D back to C.

After you have selected the next drive, **fdisk** displays the FDISK Options menu again. This time the information reported is for your second hard disk.

Specifying Device Information

To specify or change the settings for a device in your system, use the **mode** utility. You can change settings for a parallel printer, a display device, or asynchronous communications devices such as modems and terminals.

Before using devices that are set with the **mode** utility, make sure that the proper device drivers and devices are installed. For more information about MS OS/2 device drivers, see Chapter 14, "Using MS OS/2 Device Drivers."

For complete information about the options to the **mode** utility, see the *Microsoft Operating System/2 Desktop Reference*.

Setting Operating Arguments for Devices

The **mode** utility prepares MS OS/2 for communication with devices such as parallel and serial printers, modems, and screens. You can also use it to redirect output.

To use the **mode** utility, you must tell it the name of the device you want to use, followed by a list of operating parameters. MS OS/2 assigns names to devices as follows:

- LPT1, LPT2, and LPT3 are parallel printers attached to your computer's parallel ports. If you don't specify a port, MS OS/2 assumes that you are using only LPT1. PRN can be used in place of LPT1.
- COM1, COM2, and COM3 are serial devices that are attached to your computer's serial communication ports. These could include devices such as modems or serial printers.

Before you can set operating arguments for these devices, the device must be installed correctly and the appropriate device driver must be installed. For instructions on how to install device drivers, see Chapter 14, "Using MS OS/2 Device Drivers."

Setting Parallel-Printer Modes

You can use the **mode** utility to set up characteristics for parallel printers connected to parallel ports LPT1, LPT2, and LPT3. PRN and LPT1 can be used interchangeably.

To set the operating arguments for a parallel port, type **mode** followed by the following parallel-printer options:

Option	Purpose
<i>lptn</i>	Specifies the printer number: 1, 2, or 3. The default value is 1.
<i>chars</i>	Specifies the number of characters per line: 80 or 132. The default value is 80.
<i>lines</i>	Specifies vertical spacing (lines per inch): 6 or 8. The default value is 6.
p	Specifies that the mode utility try continuously to send output to the printer if a time-out error occurs. This option causes part of the mode utility to remain resident in memory. You can break out of a time-out loop by pressing CTRL+C.

As an example, suppose that you want your computer to print to a parallel printer that is connected to your computer's second parallel-printer port (LPT2). If you want to print with 132 characters per line and 8 lines per inch, type the following:

```
mode lpt2: 132,8
```

Setting Asynchronous-Communication Modes

You can use the **mode** utility to configure a specified serial port for communication with an external device such as a printer, terminal, or modem.

To display the status of a serial device, type **mode** followed by the name of the asynchronous port. For example, to see the status of the device that is connected to COM2, type the following:

```
mode com2
```

To set the operating arguments for a serial port, type **mode** followed by a combination of the following options:

Option	Purpose
<i>comn</i>	Specifies the asynchronous-communications (COM) port number. The range of valid values depends on your particular computer. The default value is 1.
<i>baud</i>	Specifies the transmission rate. Valid rates are 110, 150, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600, or 19200. You may use just the first two digits to specify the rate.
<i>parity</i>	Specifies the parity: N (none), O (odd), E (even), M (mark; the parity equals 1), or S (space; the parity equals zero). The default value is E, which denotes even parity.
<i>databits</i>	Specifies the number of data bits: 5, 6, 7, or 8 bits of data. The default value is 7.
<i>stopbits</i>	Specifies the number of stop bits: 1, 1.5, or 2. If <i>baud</i> is 110, the default value is 2; otherwise, the default value is 1. If you specify 1.5 stop bits, <i>databits</i> must be 5.

You must set the *baud* option; all other arguments are optional.

The **to**, **xon**, **idsr**, **odsr**, **octs**, **dtr**, and **rts** options are used only when you use the **mode** utility in a full-screen OS/2 session. These options may be listed in any order following the *stopbits* argument.

Option	Purpose
to=state	Specifies whether infinite time-out processing is enabled (on) or whether normal time-out processing is to be used (off). The default is to=on .
xon=state	Specifies whether automatic transmit-flow control is enabled (on) or disabled (off). The default is xon=off .
idsr=state	Specifies whether the input handshake using DSR (data set ready) is enabled (on) or disabled (off). The default is idsr=on .

odsr=state	Specifies whether the output handshake using DSR (data set ready) is enabled (on) or disabled (off). The default is odsr=on .
octs=state	Specifies whether the output handshake using CTS (clear to send) is enabled (on) or disabled (off). The default is octs=on .
dtr=state	Specifies whether DTR (data terminal ready) is enabled (on) or disabled (off), or whether DTR handshaking is enabled (hs). The default is dtr=on .
rts=state	Specifies whether RTS (request to send) is enabled (on) or disabled (off), or whether RTS handshaking is enabled (hs) or RTS toggling is enabled (tog). The default is rts=on .

You use the **p** option only when you use the **mode** utility in the DOS session. The **p** option follows the *stopbits* argument.

Option	Purpose
p	Specifies that the mode utility is using the COM port for a serial printer and that it is continuously retrying if time-out errors occur (in the DOS session only).

As an example of using **mode** to configure a serial communications port, suppose you want to set up the COM2 port for 9600 baud, with even parity, 7 data bits, and 1 stop bit. To do so, type the following:

mode com2: 9600

In this example, the parity and number of data and stop bits were not specified since the default values were used. If, on the other hand, you want to set up the COM2 port for 1200 baud, odd parity, 7 data bits, and 2 stop bits, type the following:

mode com2: 1200,o,,2

For your device to work, the operating arguments of your serial port must match those of the device with which you want to communicate.

Setting Display Modes

You can use the **mode** utility to select the active graphics adapter and its display mode, or to change the way information is displayed on your screen.

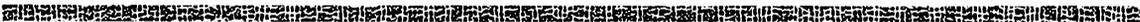
 You can use the following options with the **mode** utility to set the display mode:

Option	Purpose
<i>display</i>	Specifies one of the following values: 40, 80, BW40, BW80, CO40, CO80, or MONO. For each of these values, 40 and 80 indicate the number of characters per line. BW and CO refer to a color graphics adapter with color disabled (BW) or enabled (CO). MONO specifies a monochrome adapter with a constant display width of 80 characters per line.
<i>rows</i>	Specifies the number of rows per screen: 25, 43, or 50. The adapter type determines which of these values are valid. The initial value is 25; the default value is the last value that you set.

When you type the **mode** command with the *display* argument, the command affects the current session only.

Suppose your computer uses an 80-character-per-line color graphics adapter (CO80). To change the number of rows per screen from the default (25) to 43, type the following:

```
mode co80,43
```

12 Using Start-up Files in MS OS/2

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Introduction

Whenever you start or restart your system, MS OS/2 looks for various start-up files for information about how to start your system. There are different start-up files for the different parts of MS OS/2: the AUTOEXEC.BAT batch file provides information for the DOS session and the STARTUP.CMD batch file is for a full-screen OS/2 session, while the CONFIG.SYS file provides information for the entire working environment. You can personalize your MS OS/2 working environment by using these start-up files.

This chapter briefly describes how to use the various start-up files in MS OS/2.

AUTOEXEC.BAT

The AUTOEXEC.BAT batch file is used for customizing the DOS session in MS OS/2. Within this file you can change your DOS command prompt, create your own batch commands, or tell MS OS/2 to automatically run certain commands when you start the DOS session.

AUTOEXEC.BAT is created during MS OS/2 installation, and is located in the root directory of your start-up drive. It is run the first time you start the DOS session.

For more information about how to use AUTOEXEC.BAT and the DOS session, see Chapter 9, "Using the DOS Session."

CONFIG.SYS

When you start or restart your system, MS OS/2 runs the CONFIG.SYS file, an ASCII file that contains start-up information. When CONFIG.SYS is run, MS OS/2 looks in the file for the **protshell** command. The **protshell** command specifies what user interface and initialization file to use, as well as which command interpreter to use in a full-screen session.

A CONFIG.SYS file is created during MS OS/2 installation, and the following **protshell** command is placed there:

```
protshell=c:\os2\pmsshell.exe c:\os2\os2.ini c:\os2\cmd.exe
```

This command specifies PMSHELL.EXE (Presentation Manager) as the user interface, OS2.INI as the initialization file, and **cmd** as the command interpreter to use in a full-screen session.

■ The OS2.INI initialization file (a binary file) contains information that MS OS/2 uses when it starts Presentation Manager, including the program names, group names, and search paths used in Start Programs. Whenever you customize Start Programs or make changes through Control Panel, the new information is saved in the OS2.INI file. If something happens to your OS2.INI file, and you need to replace it, follow these steps:

- 1 Insert MS OS/2 Disk 3 in drive A.
- 2 Turn on your computer. If your computer is already turned on, restart your computer by pressing CTRL+ALT+DEL.
- 3 At the first screen, press ESC. This takes you to the command prompt.
- 4 Type the following:
del c:os2.ini
- 5 Type the following:
copy a:os2.ini c:\os2
- 6 Remove the MS OS/2 disk from drive A, and restart your computer by pressing CTRL+ALT+DEL.

For more information about **cmd**, the OS/2-session command interpreter, see Chapter 7, "Running Cmd."

The CONFIG.SYS file contains other commands that customize your system. For a list of the contents of CONFIG.SYS and for information about how to use configuration commands, see Chapter 13, "Using MS OS/2 Configuration Commands."

Other Start-up Files

The CONFIG.SYS file is the primary start-up file for the Presentation Manager, full-screen OS/2, and DOS sessions. While CONFIG.SYS is usually the only start-up file you will need, you can create other start-up files to further customize the **cmd** working environment. There are two **cmd** start-up files you can create:

- The STARTUP.CMD batch program, which initializes **cmd** the first time it is started
- A separate batch program that can initialize **cmd** when it is started on successive occasions

Both types of batch programs are described in the following sections.

Calling STARTUP.CMD

When you start or restart your system, MS OS/2 searches for the STARTUP.CMD file in the root directory of the start-up drive. If found, STARTUP.CMD starts to run, and it automatically creates the first **cmd** session. As in other batch files, you can place batch commands, **cmd** commands, utilities, and programs in the STARTUP.CMD file.

Remember that STARTUP.CMD is run only when you start or restart your computer. To initialize other **cmd** sessions, you must create a separate batch program that the command interpreter calls to initialize the new **cmd**.

Calling a Batch Program from Cmd

One of the features of the **cmd** program is that it can call another program. By using this feature, you can have **cmd** call an initialization program each time it is run.

 To do this, modify the **protshell** configuration command in the CONFIG.SYS file so that a batch program is run any time you start **cmd**. Do this by specifying the **/k** option followed by the name of the batch program.

For example, suppose that whenever you run **cmd** you want to have your command prompt appear in a special, customized form. You create a batch file that contains the command necessary to set your prompt the way you want it to appear, and specify the name of that batch file on the **protshell** command line in the CONFIG.SYS file.

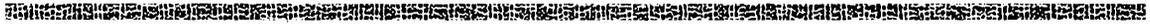
If the batch file in this example is named OS2INIT.CMD, add the following line to your CONFIG.SYS file:

```
protshell=c:\os2\pmshell.exe c:\os2\os2.ini c:\os2\cmd.exe /k  
c:\os2\os2init.cmd
```

(This should all be typed on one line, even though it appears as two lines here.) This example causes the OS2INIT.CMD batch program to run when **cmd** is started. OS2INIT.CMD can contain any combination of batch-program commands. For more information about the **protshell** command, see Chapter 13, "Using MS OS/2 Configuration Commands."

13 Using MS OS/2 Configuration Commands

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Introduction

When you start MS OS/2, your system reads configuration commands from the CONFIG.SYS file on your system disk. These commands give the operating system information about your particular system setup, or configuration. This chapter discusses the MS OS/2 configuration commands. Even though most users will never need to change their CONFIG.SYS file, this chapter describes command form and provides examples of how you might use the commands. For more information about the individual configuration commands, see the *Microsoft Operating System/2 Desktop Reference*.

During installation, MS OS/2 creates the CONFIG.SYS file for you. Also during installation, you are given the opportunity to view the default values assigned to some of the configuration commands, as well as to modify some of those values. Once the installation is completed, the recommended way to change any command values is to run the installation program again or use System Editor or another text editor to edit your CONFIG.SYS file.

If MS OS/2 detects an error in the CONFIG.SYS file, it displays an error message, then pauses until you press ENTER. If you do not want MS OS/2 to pause after displaying a CONFIG.SYS error message, add the following command to your CONFIG.SYS file:

pauseonerror=no

Now, MS OS/2 still displays the error message, but does not pause before processing the CONFIG.SYS file.

Defining the MS OS/2 Configuration

In order to run MS OS/2, there are certain configuration commands that are required in your CONFIG.SYS file. During installation, MS OS/2 adds these required commands to your CONFIG.SYS file. The following list shows you what the CONFIG.SYS file might look like after MS OS/2 installation:

```
protshell=c:\os2\pmsshell.exe c:\os2\os2.ini c:\os2\cmd.exe
set path=c:\os2;c:\os2\system;c:\os2\install;c:\;
set dpath=c:\os2;c:\os2\system;c:\os2\install;c:\;
libpath=c:\os2\dll;c:\;
set comspec=c:\os2\cmd.exe
set prompt=$i[$p]
buffers=30
iop1=no
diskcache=64
maxwait=3
```

```

memman=swap,move
protectonly=no
swappath=c:\os2\system 512
threads=128
shell=c:\os2\command.com /p
break=off
fcbs=16,8
rmsize=640
country=001,c:\os2\system\country.sys
devinfo=kbd,us,c:\os2\keyboard.dcp
codepage=437,850
device=c:\os2\pmdd.sys
devinfo=scr,ega,c:\os2\vio.tbl.dcp
device=c:\os2\ega.sys
device=c:\os2\com01.sys

```

The following list tells you how the various configuration commands in this example work:

Command	Purpose
protshell	Specifies the MS OS/2 user interface (the protected-mode shell) and the MS OS/2 command interpreter.
set path	Specifies a search path for cmd .
set dpath	Specifies a data search path; used by various programs.
libpath	Specifies the location of dynamic-link libraries.
set comspec	Specifies the location of cmd .
set prompt	Determines the appearance of the command prompt.
buffers	Specifies the number of disk buffers in memory.
iopl	Disables input and output privilege levels.
diskcache	Enables disk caching, and specifies the disk-cache size.
maxwait	Specifies the maximum amount of time any active process must wait before being run.
memman	Specifies whether memory swapping and moving is permitted.
protectonly	Determines whether MS OS/2 will run a DOS session as well as a full-screen OS/2 session.
swappath	Specifies the location of the disk-swap file and the minimum free space in kilobytes.
threads	Specifies the number of threads created when you start your system.
shell	Specifies the DOS command interpreter; used in the DOS session.

break	Tells MS OS/2 to check for the key combination CTRL+C during a process; used in the DOS session.
fcbs	Specifies the maximum number of open file-control blocks; used in the DOS session.
rmsize	Determines the amount of memory reserved for DOS (real-mode) applications; used in the DOS session.
country	Defines country-dependent information such as time, date, and currency conventions.
devinfo	Gives a device the information it needs to use a particular code page.
codepage	Specifies which code pages your system is prepared to use.
device	Sets up a device driver.

Modifying Configuration-Command Values

If you modify your CONFIG.SYS file, it's likely that you'll be making additions or substitutions. You can modify the CONFIG.SYS file using your favorite text editor in either the DOS session or a full-screen or Presentation Manager session. Changes take effect after you restart your system. Any time you make changes to the CONFIG.SYS file, you should first make a backup copy of the file.

 The backup copy of the CONFIG.SYS file is useful if you make a change that causes an error and prevents your system from starting correctly. If you create such an error, follow these steps to start your system:

- 1 Insert the MS OS/2 Installation disk in drive A.
- 2 Turn on your computer. If your computer is already turned on, restart your computer by pressing CTRL+ALT+DEL.
- 3 At the first screen, press ESC. This takes you to the command prompt.
- 4 Copy your backup CONFIG.SYS file to CONFIG.SYS.
- 5 Remove the Installation disk from drive A, and restart your computer by pressing CTRL+ALT+DEL.

It is important to note that most users will never need to change the values in the CONFIG.SYS file and that it is recommended that you not do so. However, the information provided in this chapter should help you to understand how the various commands work.

Setting Up the Presentation Manager Session

This section describes the configuration commands that set up the Presentation Manager session. With these commands you set up the MS OS/2 user interface and specify the location of dynamic-link libraries. The following commands are described:

- **libpath**
- **protshell**
- **iopl**

Specifying the Location of .DLL Files

You tell MS OS/2 where the dynamic-link library modules are located by using the **libpath** command. MS OS/2 is, in part, made up of dynamic-link library modules. The filenames of these modules end with the extension **.DLL**, and the files contain functionally-related portions of the operating system. For example, a module named **DISPLAY.DLL** contains an MS OS/2 display driver.

■ Suppose, for example, that you have a new dynamic-link library that you've put into the **LIB** directory on drive **C**. You need to add this information to the **libpath** command in your **CONFIG.SYS** file. Add the following line to your **CONFIG.SYS** file:

```
libpath=c:\os2\dll;c:\c:\lib
```

This example directs MS OS/2 to look for dynamic-link libraries in the root directory, the **C:\OS2\DLL** subdirectory, and the **C:\LIB** directory on your hard-disk drive.

Note There are differences between the **libpath** command and the **set path** command. The **libpath** command lists each of the directories where **.DLL** files are located. The **set path** command specifies an environment variable and a directory search path. Also, with the **libpath** command, the current directory is not searched first, as it is with **set path**.

Changing the User Interface

You use the **protshell** command to specify the user interface (the protected-mode shell) and the MS OS/2 command interpreter. The user interface is the program you see when you start your system.

During installation, MS OS/2 places the following **protshell** command in your CONFIG.SYS file:

```
protshell=c:\os2\pmshell.exe c:\os2\os2.ini c:\os2\cmd.exe
```

In this example, the user interface is PMSHELL.EXE, the Presentation Manager shell. For more information about this command, see Chapter 12, "Using Start-up Files in MS OS/2."

Specifying the Presentation Manager Device Driver

When you specify the Presentation Manager shell, you must also specify the Presentation Manager device driver. You do this by adding the **device=c:\os2\pmdd.sys** command to your CONFIG.SYS file. This command is placed in your CONFIG.SYS file during the installation of MS OS/2. If for some reason this command does not exist in your CONFIG.SYS file, you can add it by following these steps:

- 1 Insert the MS OS/2 Installation disk in drive A.
- 2 Turn on your computer. If your computer is already turned on, restart your computer by pressing CTRL+ALT+DEL.
- 3 At the first screen, press ESC. This takes you to the command prompt.
- 4 Using a text editor, add the following line to your CONFIG.SYS file:

```
device=c:\os2\pmdd.sys
```

- 5 Remove the Installation disk from drive A, and restart your computer by pressing CTRL+ALT+DEL.

Enabling Input and Output Privilege Levels

You enable or disable input and output privilege levels by using the **iopl** configuration command.

The privilege level assigned to a program determines what data segments it can access, as well as which machine instructions it can execute. Applications are usually assigned privilege level 3, which allows them to reference only their own data segments and restricts them from issuing input/output instructions.

Applications that are assigned privilege level 2 can be granted input/output privilege. When you specify **iopl=yes**, a program that has been assigned privilege level 2 is allowed to send or receive the machine instructions necessary to access a particular input/output device.

For example, to grant a program named Payroll access to a particular piece of hardware, add the following command to your CONFIG.SYS file:

iopl=payroll

The **iopl** command does not affect programs that are running in the DOS session.

It is not necessary for you to specify **iopl=no**, since **no** is the default value.

Setting Up the DOS Session

This section describes the configuration commands that customize the DOS session. In most cases, the default initialization values should not be changed. The only times you will need to modify these values are when you want to create a customized work environment, or when an application requires you to so do.

You can further customize the DOS session by adding commands to your AUTOEXEC.BAT file.

Enabling the DOS Session

By default, whenever you start MS OS/2 the DOS session is enabled. This is controlled by the **protectonly** configuration command in your CONFIG.SYS file. The following rules apply to setting up the DOS session:

- If you specify **protectonly=no**, the DOS session can be started. If you do not place a **protectonly** command in your CONFIG.SYS file, MS OS/2 enables the DOS session.
- If you specify **protectonly=yes**, the DOS session cannot be started.

Configuring the DOS Session

While most of the configuration commands apply to all the sessions in MS OS/2, the following configuration commands are specific to the DOS session:

- **shell**
- **rmsize**
- **break**
- **fcbs**

These commands are described in the following sections.

Specifying the DOS Command Interpreter

To specify the DOS command interpreter, use the **shell** configuration command. The **shell** configuration command lets you specify the command interpreter that will be loaded and run in the DOS session.

The default shell for the DOS session is **command**. This means that if you do not include a **shell** configuration command in the CONFIG.SYS file, MS OS/2 searches for **command** in the root directory of your start-up disk and loads it into memory. If you specify another DOS shell to use, MS OS/2 will search for that shell program and load it into memory.

■ You will probably only need to use the **shell** command if **command** is not located in the root directory of the start-up drive. For example, suppose that **command** is not located in the root directory of your start-up drive (drive C), but it is in the OS2 directory. In this case, you would place the following line in your CONFIG.SYS file:

```
shell=c:\os2\command.com /p /e:512
```

This tells MS OS/2 to load **command** from the OS2 directory instead of from the root directory of drive C.

Another reason for using the **shell** configuration command is to specify options to the DOS-session command interpreter. **Command** has options that let you permanently keep a copy of **command** in memory, run a command or program, or specify the size of the command interpreter's environment.

For information about **command** and its options, see the *Microsoft Operating System/2 Desktop Reference*.

Setting the Amount of Memory for DOS Applications

To set the amount of memory reserved for DOS applications, use the **rmsize** configuration command. Up to 640K can be reserved.

The default size depends on the total memory installed in your computer. It is the amount of memory installed below 1024K (either 512K or 640K).

To use this command, type **rmsize=** followed by the number of kilobytes you want to reserve for DOS applications. For example, to reserve 640K of memory for use by processes running in the DOS session, add the following line to your CONFIG.SYS file:

```
rmsize=640
```

Remember that some of the total memory is reserved for MS OS/2 itself.

Setting CTRL+C Checking

To turn CTRL+C checking on or off, use the **break** configuration command. The default setting is **break=off**.

Normally, MS OS/2 only checks to see whether you have pressed CTRL+C while it is reading from your keyboard or sending something to your screen or printer. However, if you turn CTRL+C checking on, MS OS/2 will check to see whether CTRL+C has been pressed whenever it is reading from or writing to a disk.

For example, to turn CTRL+C checking on, add the following line to your CONFIG.SYS file:

```
break=on
```

Suppose you want to stop a file from being sorted. If **break=on** is in your CONFIG.SYS file, you can press CTRL+C to stop the sorting process.

To turn CTRL+C checking off again, change the line to the following:

```
break=off
```

Specifying the Number of Open File-Control Blocks (FCBs)

To specify the number of open file-control blocks (FCBs), use the **fcbs** configuration command.

Although it is recommended that new programs use file handles to access files, some older DOS applications use data structures called file-control blocks (FCBs) to control open files. If your application uses FCBs, you can use the **fcbs** configuration command to specify the

maximum number of files controlled by FCBs that can be opened concurrently. The command will also specify the number of files opened with FCBs that are protected against automatic closure.

By default, up to 16 FCB files can be opened concurrently, and all but eight files can be automatically closed. You should only use the **fcbs** command to change these values if your application requires you do so.

NOTE To use this command, type **fcbs=** followed by the total number of FCBs that can be open concurrently (1-255) and the total number of files that cannot be closed automatically (0-255).

For example, to open as many as four files with FCBs and to protect the first two files from being closed, add the following line to your CONFIG.SYS file:

```
fcbs=4,2
```

The number of files that are protected from closure must be less than or equal to the total number of open files.

Modifying Multitasking Features

MS OS/2 provides several commands that let you modify its multitasking features. Although most users won't need to use these commands at all, there may be times when you are advised to change these features to enhance how applications run under MS OS/2. The following commands let you modify multitasking features of MS OS/2:

- **threads**
- **maxwait**
- **priority**
- **timeslice**

These commands are described in the following sections.

Specifying the Maximum Number of Threads

To specify the maximum number of threads that you can create at a time, use the **thread** configuration command.

MS OS/2 allocates at least one thread for every running program. A program may request additional threads if the program needs to perform tasks simultaneously. Typically, a running MS OS/2 system uses many threads.

There is a system-wide limit on the number of threads that can be created. During installation, MS OS/2 sets the number of threads to 128. About 40 threads are used by MS OS/2, and the remaining threads are available for other programs. If you know that you will be running many programs that have a large number of threads, you might want to increase the number of threads that can be created at one time by using the **threads** configuration command.

********* To use this command, type **threads=** followed by the maximum number of threads you want to create at one time. You can specify any value from 64 to 255.

For example, to increase the number of threads from 128 (the default) to 255, add the following line to your CONFIG.SYS file:

```
threads=255
```

Be aware that as the number of threads is increased, a small amount of memory is also used up.

Specifying the Maximum Process-Waiting Time

To specify the maximum amount of time any active process must wait before being run, use the **maxwait** command. If that time elapses, the waiting process receives a boost in priority for one execution cycle (also called a *time slice*).

In a multitasking environment, each process that runs is assigned a priority level, which determines how often a process can run. If a process has a high priority, it will be granted permission to run more often than a process with a low priority. Thus, a low-priority process might wait a long time before being granted access to the CPU.

********* To use the **maxwait** command, type **maxwait=** followed by the number of seconds a process waits before receiving the priority boost. You can specify any value from 1 to 255 seconds. The default is 3 seconds.

For example, suppose that you want to make background programs, which normally have low priority, run faster. You could specify that you want a process to wait only one second before receiving a priority boost by placing the following line in your CONFIG.SYS file:

```
maxwait=1
```

Note that this will increase the speed of low-priority processes (such as background processes); however, it will also decrease the speed of high-priority processes (such as foreground processes).

Disabling Dynamic Priority Assignments

The **priority** configuration command enables or disables the normal dynamic priority-allocation scheme. Dynamic priority scheduling means that MS OS/2 adjusts priority levels according to changing circumstances.

MS OS/2 threads are classified and run in three categories: general priority, time-critical priority, and low priority. In the general-priority category are the background, foreground, and interactive subcategories. Because MS OS/2 is a multitasking operating system, the priority levels of threads that belong to these subcategories are modified dynamically if they change to a different subcategory (for example, from foreground to interactive). This, in turn, changes how often a thread will run.

 For example, if you type the following, CPU resources are allocated on a first-come, first-served basis:

```
priority=absolute
```

By default, **priority** is set to **dynamic**. Unless you are specifically advised to do so, it should not be necessary to ever change this setting. Note that this command interacts with the **maxwait** command described earlier.

Setting the Time-Slice Values

To identify the minimum and maximum amount of time that MS OS/2 may dedicate to a given process before it must check on other processes, use the **timeslice** command. A time slice is an interval of time used by MS OS/2 to schedule the threads of a process. A process, such as an application, is often made of many threads. Each one of these threads is like a small program that can be scheduled as a separate unit.

 To use this command, type **timeslice=** followed by the minimum and, optionally, the maximum time-slice value (in milliseconds). If you specify only the minimum time-slice value, the **timeslice** command sets maximum time-slice values automatically.

For example, if you are running an application that advises you to change the minimum time-slice value to 64 milliseconds, add the following line to your CONFIG.SYS file:

```
timeslice=64
```

Unless an application specifically requires that the time-slice value be changed, you should not do so.

Managing System Memory

The following MS OS/2 configuration commands help your system manage memory efficiently:

- **diskcache**
- **memman**
- **swappath**
- **buffers**

These commands are described in the following sections.

Setting Up a Disk Cache

You can enable disk caching and specify the number of kilobytes of memory allocated for the disk cache by using the **diskcache** command. Since reading from a disk cache in memory takes less time than reading from storage, using a disk cache makes your system's response much quicker. When disk caching is enabled and a program instructs the system to read from your hard disk, the system stores what it reads in the memory disk cache. When the program instructs the system to read from the hard disk again, the system reads the data in the cache before going out to the hard drive.

 To allocate a 512K disk cache on your system, add the following line to your CONFIG.SYS file:

```
diskcache=512
```

If there is no **diskcache** command entered in your CONFIG.SYS file, MS OS/2 does not enable disk caching, and no cache space is allocated.

Enabling Memory Swapping and Moving

Using the **memman** command, you can tell MS OS/2 whether or not to use the memory-management techniques of swapping and moving.

Swapping is a technique by which some data segments in memory are written to a disk-swap file, allowing the memory that they were using to be reclaimed for another purpose. Later, the swapped data segment is reloaded into memory.

Moving is a technique by which MS OS/2 can move blocks of storage around so that unused areas of storage can be combined into larger areas, as needed by a program or application.

Suppose you are running a telecommunications program that loses its connection if it cannot respond to incoming data within a specified time frame. To prevent MS OS/2 from swapping segments of the program out to the hard disk and possibly preventing a timely response, add the following line to your CONFIG.SYS file:

```
memman=noswap
```

The **memman** command can be used in any one of the following forms:

```
memman=noswap,nomove
```

```
memman=swap
```

```
memman=swap,move
```

```
memman=noswap
```

```
memman=noswap,move
```

If you specify just **swap** or **noswap**, **move** is the default.

Using a Disk-Swap File

You can specify the location of the disk-swap file by using the **swappath** configuration command. A disk-swap file is a file that keeps track of code or data that is temporarily moved out of memory while another program runs. The **swappath** command is used in conjunction with the **memman** command.

Suppose, for example, that you want MS OS/2 to write the swap file to the SWAPFILE directory on your hard disk (drive C). To do this, add the following lines to your CONFIG.SYS file:

```
memman=swap,move
```

```
swappath=c:\swapfile
```

If the **swappath** command is not specified in your CONFIG.SYS file, MS OS/2 writes the disk-swap file to the root directory of the drive from which your system is started.

Note If you are using the **swappath** command, make sure your system has ample space available. The minimum size of a disk-swap file is 512K.

Changing the Number of Disk Buffers

You can change the number of disk buffers (work areas in memory) by using the **buffers** configuration command. MS OS/2 uses disk buffers as a temporary work space while reading and writing data.

Suppose that you want to change the number of buffers to 15. To do this, add the following line to your CONFIG.SYS file:

```
buffers=15
```

Each disk buffer is a 512-byte block of memory. You may specify from 1 to 100 buffers. The default value is 30 buffers.

Setting Up Device Drivers

You can set up a device driver by using the **device** configuration command. A device driver is a program that tells MS OS/2 how to use devices in your system. These devices include items like the keyboard, the monitor, the disk drives, the system clock, and pointing devices such as a mouse. For example, if you are using a Microsoft Serial Mouse with Presentation Manager on an IBM PC/AT or a compatible computer, your CONFIG.SYS file needs to contain the following **device** commands:

```
device=pointdd.sys  
device=mousea02.sys
```

This example directs MS OS/2 to look for the pointer device and mouse drivers. When MS OS/2 loads these drivers, it enables MS OS/2 and DOS programs to use the mouse.

For more information about MS OS/2 device drivers, see Chapter 14, "Using MS OS/2 Device Drivers."

Setting Up Your Environment

One of the steps involved in setting up your system environment is to define the way you want your system to perform. This section describes how to set environment variables, and how to run programs that set up your system.

Environment variables are ASCII strings that can be assigned values of your choice. The collection of these strings is known as the *environment*. A small part of memory is reserved for storing environment variables. When a value is stored as an environment variable, it can be used by any program in the session.

Setting Environment Variables

To assign values to environment variables, use the **set** configuration command. To use this command, specify the environment variable name, followed by the value(s) it will be replaced by. Any changes made with the **set** command affect only the current session.

Environment variables commonly set in your CONFIG.SYS file include PATH (directory search path) and DPATH (data search path). Programmers often set the LIB (library search path), INCLUDE (include-file search path), and TMP (temporary-file search path) environment variables in their CONFIG.SYS file. You can also define and set your own environment variables.

■ For example, to instruct MS OS/2 to search the working directory first, the BIN directory on drive C second, and the OS2 directory on drive C third, add the following line to your CONFIG.SYS file:

```
set path=c:\bin;c:\os2
```

Inheriting Environment Variables

Normally, environment variables such as PATH and DPATH are set up in your CONFIG.SYS file. The first time **cmd** is run, these environment variables are used to set up the initial working environment.

When you start **cmd** from Start Programs, the new session inherits the environment variables found in the CONFIG.SYS file. If you start **cmd** from an existing session, however, the new version of **cmd** inherits the environment variables of the current session. If you have modified any environment variables, the current environment may not be the same as the environment that was set up in the CONFIG.SYS file.

Starting a Program When You Start Your System

You use the **run** configuration command to specify a program that you want started in the background at the time you start or restart your system.

■ Suppose that you would like to start a keyboard speed-up program called Speedkey each time you start MS OS/2, and that this program can be found in the root directory of drive C. To do this, add the following line to your CONFIG.SYS file:

```
run=c:\speedkey.exe
```

Keep the following points in mind when you are using the **run** configuration command:

- You can specify multiple **run** commands in your CONFIG.SYS file.
- You cannot specify a batch program in a **run** command.
- MS OS/2 processes **run** commands in the order in which they appear in the CONFIG.SYS file.
- Before processing **run** commands, MS OS/2 processes all **device** commands.
- Programs specified by the **run** command are started before initialization of the user interface.

Setting Up Code-Page Support

MS OS/2 provides national-language support through the use of *code pages*. A code page is a 256-character set that MS OS/2 recognizes and processes. MS OS/2 supports five code pages: United States (437), Multilingual (850), Portuguese (860), French-Canadian (863), and Nordic (865). New programs, including Presentation Manager, use the multilingual code page. If you have a program written to support one of the older code pages, you will need to set up the code page during installation or by modifying your CONFIG.SYS file.

You can set up one code page for a single country, or you can set up two code pages to enable code-page switching. If you set up two code pages, you can later use the **chcp** command to switch back and forth between the two code pages. This command is described in Chapter 7, "Running Cmd." Along with code-page switching, you can switch between keyboard layouts of two different countries by using the **keyb** utility. This utility is described in Chapter 8, "Using MS OS/2 Utilities."

If you are using the United States version of MS OS/2, the correct code-page information is set up automatically for you during installation. If, however, you want your computer's keyboard, screen, and printer to be customized to support characters and keyboard layouts for countries other than the United States, you must modify the default code-page information.

Normally, you modify code-page information during installation. On-screen messages prompt you for the country you wish to support. This information is written to your CONFIG.SYS file. If you want to change code-page information after installation is complete, follow the instructions in this section to modify your CONFIG.SYS file.

To set up code-page support for a country other than the United States, you must do the following:

- Set the country code for your country by using the **country** configuration command.
- Prepare code page(s) for the system by using the **codepage** configuration command.
- Prepare devices for use with the code page(s) you have prepared by using the **devinfo** configuration command.

The following sections describe how to use each of these commands in your CONFIG.SYS file.

After you have specified the country code and code page(s) to be used, and after you have prepared devices for use with code pages, restart your computer. This causes MS OS/2 to read the information in your CONFIG.SYS file and to load the proper code page(s) in memory.

Supported Countries

The following list shows each country (or language) that is supported by MS OS/2 and its related country code, default code-page assignment, keyboard code, and keyboard subcode. You use the values in this list when you add the **country**, **codepage**, and **devinfo** configuration commands to your CONFIG.SYS file, and when you use the **keyb** utility.

<u>Country</u>	<u>Country code</u>	<u>Code pages</u>	<u>Keyboard code</u>	<u>Keyboard subcode</u>
United States	001	437,850	US	103
Canada (French)	002	863,850	CF	058
Latin America	003	437,850	LA	171
Netherlands	031	437,850	NL	143
Belgium	032	437,850	BE	120
France	033	437,850	FR	189, 120
Spain	034	437,850	SP	172
Italy	039	437,850	IT	141, 142
Switzerland (French)	041	437,850	SF	150F
Switzerland (German)	041	437,850	SG	150G
United Kingdom	044	437,850	UK	166, 168
Denmark	045	865,850	DK	159
Sweden	046	437,850	SV	153
Norway	047	865,850	NO	155
Germany	049	437,850	GR	129
Australia	061	437,850	—	—
Portugal	351	860,850	PO	163
Finland	358	437,850	SU	153

The primary code page is listed first, followed by the secondary code page. Notice that the multilingual code page (850) is supported by almost all countries.

Note Although not shown in the list, the following countries or languages are also available with special versions of MS OS/2: Arabic, Asia, Hebrew, Japan, Korea, and Taiwan.

Setting the Country Code

 To define country-dependent information such as time, date, and currency conventions, use the **country** configuration command. To use this command, type **country=** followed by the country code and the name of the directory that contains the file COUNTRY.SYS. By default, MS OS/2 assumes that this country-dependent information is stored in a file called COUNTRY.SYS, and that this file is located in the root directory on your start-up drive. If your COUNTRY.SYS file is located in a different directory or drive, type the drive, directory path, and filename after the country code.

For example, if your COUNTRY.SYS file is located in the OS2 directory on drive C, you would type the following to specify the country code for France:

```
country=033,c:\os2\country.sys
```

The country code 033 sets country-specific information for France.

Preparing Code Pages

 To select the code page(s) that will be prepared for use, use the **codepage** configuration command. To use this command, type **codepage=** followed by one or two code-page numbers. If you are preparing two code pages, separate the two numbers with a comma.

The following are the valid code-page numbers:

Number	Code Page
437	United States
850	Multilingual
860	Portuguese
863	French-Canadian
865	Nordic

For example, to prepare code pages 437 (U.S.) and 850 (Multilingual), type the following:

```
codepage=437,850
```

If you prepare two code pages, you can later use the **chcp** command to switch back and forth between the two character sets. See the *Microsoft Operating System/2 Desktop Reference* for the character sets for code pages 437, 850, 860, 863, and 865.

Preparing Devices for Use with Code Pages

To prepare your keyboard, display, and printer so that they can use the code pages that you specified in the **codepage** configuration command, use the **devinfo** configuration command. One **devinfo** command is required for each device you are preparing.

 The **devinfo** command for your keyboard specifies your keyboard layout and the file that contains the keyboard translation tables. To set up your keyboard for use with code pages, type **devinfo=kbd** followed by a keyboard code, and the drive, directory path, and filename of the keyboard translation-table file. By default, MS OS/2 supplies these tables in a file called **KEYBOARD.DCP**.

 The **devinfo** command for your display specifies the display name and the file that contains a video-font table for displaying characters in each of the supported code pages. To set up your display for use with code pages, type **devinfo=scr** followed by the type of graphics adapter you have, and the drive, directory path, and filename of the file that contains the system code pages for the display. The file **VIOTBL.DCP** contains the screen translation table.

You can specify one of the following types of graphics adapters:

- EGA
- VGA

중요 The **devinfo** command for your printer specifies the printer type, the printer name, and the file that contains a printer-font table for each code page supported by MS OS/2. To set up your printer for use with code pages, type **devinfo=** followed by the printer type (PRN, LPT1, LPT2, or LPT3), the printer name (4201 or 5202), and the drive, directory path, and filename of the file that contains the printer-font tables (4201.DCP or 5202.DCP).

If your computer includes code-page information in read-only memory (ROM), use the ROM specification after the printer-font-table file to specify the code page and font identification number for each ROM or printer cartridge. If you don't specify multiple fonts or font identification numbers, **devinfo** uses zero as the font identification number.

For example, to prepare an EGA display and a French keyboard for use, and to prepare the LPT1 printer (model 4201) for use with code page 437 contained in ROM, you could add the following lines to your CONFIG.SYS file:

```
devinfo=scr,ega,c:\os2\viotbl.dcp
devinfo=kbd,fr,c:\os2\keyboard.dcp
devinfo=lpt1,4201,c:\os2\4201.dcp,rom=(437,0)
```

Remember that you must have one **devinfo** command for each device on your system that will be using code pages.

Controlling System Tracing

The system trace is a record of actions, such as hardware interrupts or functions, that are taken or processed by the operating system while it runs. Recording these events can be helpful in developing programs for MS OS/2. There are two CONFIG.SYS commands that control system tracing: **tracebuf** and **trace**.

In addition to these commands, see the *Microsoft Operating System/2 Desktop Reference* for information about the **trace** and **tracefmt** utilities.

Setting the Size of the System-Trace Buffer

To set the size of the system-trace buffer, place a **tracebuf** command in your CONFIG.SYS file. The system-trace buffer is where system-trace events are stored. If you enable tracing, but do not specify the size of the trace buffer, a 4K buffer is automatically set up for you.

 To use the **tracebuf** command, type **tracebuf=** followed by the size of the trace buffer (in kilobytes). The size can be from 1 to 63K. For example, to set up a trace buffer of 8K, add the following line to your CONFIG.SYS file:

```
tracebuf=8
```

A trace buffer of between 4K and 8K is usually enough for most trace activities.

Turning Tracing On or Off

To turn tracing on or off for some or all events, use the **trace** configuration command. To use this command, you should specify an event code that corresponds to a type of system activity, such as file-system events. The event code must be a decimal number from 0 to 255.

 To turn tracing on, type **trace on** followed by one or more event codes. Typing **trace on** without an event code records all system trace events. To turn tracing off, type **trace off** followed by one or more event codes. Typing **trace off** without an event code cancels the recording of all system-trace events.

You can selectively turn on only certain event codes. For example, to turn on only the system-trace events 0 and 1, add the following lines to your CONFIG.SYS file:

```
trace=off  
trace=on 0, 1
```

Or, you can selectively turn off certain events. If you want to turn on tracing for all events except 31 through 34, add the following lines to your CONFIG.SYS file:

```
trace=on  
trace=off, 31, 32, 33, 34
```

You can use the **tracefmt** utility to view trace-event records. For more information about using **tracefmt**, see Chapter 8, "Using MS OS/2 Utilities."

14 Using MS OS/2 Device Drivers

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Introduction

A device driver is a program that tells MS OS/2 how to use a device in your system. Devices in your system include the keyboard, monitor, and printer, which are used for input or output.

MS OS/2 contains various device drivers, including device drivers for the keyboard, monitor, printer, floppy-disk drive, hard-disk drive, and clock. MS OS/2 automatically loads these drivers during installation.

MS OS/2 also contains device drivers that you use with optional devices. These include drivers for using a serial communications port, an external floppy-disk drive, and a pointing device such as a mouse. You need to set up these device drivers, since MS OS/2 does not load them automatically.

There are additional MS OS/2 device drivers that work with a device in your system to support or enhance its capabilities. These include drivers for using ANSI escape sequences or virtual disk drives. These drivers also need to be set up.

MS OS/2 has many device drivers, including those for devices mentioned above. However, there are many more, and they are generally provided along with the device.

For more information about using a specific device driver, see the *Microsoft Operating System/2 Desktop Reference*.

Setting Up an MS OS/2 Device Driver

Setting up a device driver consists of telling MS OS/2 the name of the driver to load and where it is located on your system. You do this by using the **device** configuration command, as described in Chapter 13, "Using MS OS/2 Configuration Commands." This chapter describes those device drivers that you need to set up.

In general, if a device driver is not located in the root directory of the disk drive from which you start your system, you need to specify the full path in the **device** command.

 You can set up a device driver on your system without running the installation program again by using the **ddinstal** utility. **Ddinstal** copies device-driver files to your system and adds the appropriate **device** command to your CONFIG.SYS file. To use the **ddinstal** program, do the following:

- ▶ At the OS/2 command prompt, type **ddinstal** and press ENTER.

You are prompted to insert the disk that contains the device driver to be installed and to press ENTER when ready. **Ddinstal** looks for a .DDP (device-driver-profile) file for the information it will need in order to add the appropriate **device** command to the CONFIG.SYS file. You are then prompted to insert the MS OS/2 Installation disk and to restart your system. (You need to use the Installation disk, but you won't go through the complete installation process again.) When the system restarts, the **ddinstal** utility continues the device-driver installation. When the program is complete, restart your system by pressing CTRL+ALT+DEL.

Changing the Display Device Driver

During installation, you tell MS OS/2 what kind of display device you have. MS OS/2 then loads the appropriate display device driver. If you replace your display device with a new display device, you may need to change the display device driver.

 To change the display device driver, follow these steps:

- 1** Insert the MS OS/2 Installation disk in your floppy-disk drive.
- 2** Turn on your computer. If your computer is already on, restart your system by pressing CTRL+ALT+DEL.
- 3** At the first screen, press ESC. This takes you to the command prompt.
- 4** Change to the C:\OS2\DLL directory.
- 5** Copy the new display device driver to DISPLAY.DLL.
- 6** Remove the Installation disk from your floppy-disk drive, and restart your computer by pressing CTRL+ALT+DEL.

Using ANSI Escape Sequences

You can use ANSI escape sequences in a DOS session by setting up the ANSI.SYS device driver. ANSI escape sequences let you move the cursor, set the color for characters, and set the number of character rows and columns for the screen. Many programs use ANSI escape sequences to provide screen output that is clear and easy to read.

 In most cases, the program you're using generates the ANSI escape sequences. For example, terminal-emulation programs often pass ANSI escape sequences from a program on the mainframe computer to your screen. The ANSI escape sequences are correctly displayed only if you have set up the ANSI.SYS device driver. You can direct the system to

load the ANSI.SYS device driver by adding the following line to your CONFIG.SYS file:

```
device=ansi.sys
```

This example directs MS OS/2 to look for the ANSI.SYS driver in the root directory of the drive from which you start your system, and to load the driver if it's found. When MS OS/2 loads the device driver, it enables the ANSI escape sequences for the DOS session, but it does not enable them for full-screen OS/2 sessions. In a full-screen session, use the **ansi** utility to enable ANSI escape sequences for the screen.

If the ANSI.SYS driver is not located in the root directory, you need to specify the complete path, as follows:

```
device=c:\os2\ansi.sys
```

This example directs MS OS/2 to look for the ANSI.SYS driver and load it from the OS2 directory.

If you're programming and designing a display screen, you may want to use ANSI escape sequences. Each escape sequence is a series of characters, beginning with the escape character (ASCII code 27). For a list of the escape sequences and a description of what they do, see Appendix A, "ANSI Escape Sequences."

Using a Serial Communications Port

You can use your system's serial communications port by setting up the appropriate communications-port device driver. A communications port is an adapter to which the cable of a communications device is attached. Devices such as modems and serial printers are connected to this port.

Before you set up a communications-port device driver, you must choose the driver that works with your hardware. See the following list to find the driver that matches your hardware:

Driver	Hardware
COM01.SYS	IBM PC/AT or compatible computer
COM02.SYS	IBM PS/2

To direct MS OS/2 to load the communications-port driver, add the following line to your CONFIG.SYS file:

```
device=c:\os2\com01.sys
```

This example directs MS OS/2 to look for the communications-port driver in the OS2 directory of the start-up drive. When this driver is loaded, it enables MS OS/2 and DOS programs to use the serial communications ports on your IBM PC/AT or a compatible computer.

To use a communications port, you need to set up the port in addition to specifying the device driver. You set up a communications port by using Control Panel or by using the **mode** command.

Note If you want to use a Microsoft Serial Mouse, the command **device=c:\os2\mousea02.sys** must appear before the command **device=c:\os2\com01.sys** in your CONFIG.SYS file.

Using a Logical Drive Letter

You can use a logical drive letter to access a disk by setting up the EXTDSKDD.SYS device driver. A logical drive letter, in this case, is a name for a physical disk drive. (The logical disk drives that you can set up in an extended partition on your hard disk are also parts of a physical disk drive, but they're a little different from the logical drives that you use with EXTDSKDD.SYS.) Using a logical drive letter, you can name an external disk drive, or you can assign a second name (an alias) to a disk drive and copy files to and from that same disk drive.

To direct MS OS/2 to load the EXTDSKDD.SYS device driver, add the following line to your CONFIG.SYS file:

```
device=c:\os2\extdskdd.sys /d:2
```

This example directs MS OS/2 to look for the EXTDSKDD.SYS device driver in the OS2 directory of the start-up drive. When MS OS/2 loads the driver, it allows your MS OS/2 and DOS programs to use an IBM external 720K 3½-inch floppy-disk drive. By default, this drive has 80 tracks, 9 sectors per track, and 2 read/write heads. The next available drive letter is assigned to the logical drive.

If you want to copy from the external disk drive to that same drive, add the following lines to your CONFIG.SYS file:

```
device=extdskdd.sys /d:2  
device=extdskdd.sys /d:2
```

This example directs MS OS/2 to load the EXTDSKDD.SYS device driver. The first line associates a drive letter with the external disk drive. The second line associates an additional drive letter (an alias) with that same external drive. This allows you to copy data from the external disk drive described in the above example, to that same drive. The next available drive letters are assigned to the logical drives.

Using a Mouse

You can use a mouse with your DOS and MS OS/2 programs by setting up a mouse device driver and the device that moves a pointer on the screen. Many programs, especially Presentation Manager applications, use the mouse if it's available. Although a mouse is not required, it makes working with these programs easier and quicker.

Setting Up a Mouse Device Driver

To set up a mouse device driver, you must choose the driver that matches your mouse hardware and your computer. See the following list for a description of mouse drivers that are available with MS OS/2:

Driver	Mouse
MOUSEA00.SYS	Mouse Systems Mouse
MOUSEA01.SYS	Visi-On Mouse
MOUSEA02.SYS	Microsoft Serial Mouse for IBM Personal Computers (models 039-099 and 039-199)
MOUSEA03.SYS	Microsoft Bus (parallel) Mouse for IBM Personal Computers (models 037-099 and 037-199)
MOUSEA04.SYS	Microsoft InPort® (parallel) Mouse for IBM Personal Computers
MOUSEA05.SYS	IBM Personal System/2 Mouse for IBM PC/AT computers and compatible computers
MOUSEB00.SYS	Mouse Systems Mouse
MOUSEB01.SYS	Visi-On Mouse
MOUSEB02.SYS	Microsoft Serial Mouse for IBM Personal Computers (models 039-099 and 039-199)
MOUSEB05.SYS	IBM Personal System/2, Models 50, 60, 70, and 80 Mouse

Note MOUSE $_{xx}$.SYS drivers are used with IBM PC/AT computers or compatible computers. MOUSE $_{xx}$.SYS drivers are used with IBM Personal System/2 computers.

Regardless of which mouse driver you choose, you must always set up the POINTDD.SYS device driver for the mouse pointer. To direct MS OS/2 to load the pointer and mouse device drivers, add the following lines to your CONFIG.SYS file:

```
device=c:\os2\pointdd.sys  
device=c:\os2\mousea04.sys
```

This example directs MS OS/2 to look for the pointer and mouse device drivers in the OS2 directory of the start-up drive. When MS OS/2 loads these drivers, it allows MS OS/2 and DOS programs to use the Microsoft InPort Mouse on an IBM PC/AT or a compatible computer.

Changing the Behavior of the Mouse Device Driver

You can use the **mode**, **serial**, and **qsize** options to change the behavior of the mouse device driver. The **mode** option lets you tell MS OS/2 in which session you'll be using the mouse. (Don't confuse the **mode** option of this command with the **mode** utility.) The **serial** option lets you specify the serial port to which the mouse is connected. The **qsize** option lets you control how much information your program receives from the mouse.

To tell MS OS/2 that you want to use the mouse in all sessions, add the following line to your CONFIG.SYS file:

```
device=c:\os2\mousea04.sys mode=b
```

This example directs MS OS/2 to use the mouse driver in Presentation Manager, full-screen, and DOS sessions. To use the mouse only in Presentation Manager and full-screen sessions, change the value that is specified for the **mode** option to **p** (protected mode). To use the mouse only in the DOS session, change the value that is specified for the **mode** option to **r** (real mode).

To tell MS OS/2 that your mouse is connected to the COM2 serial port, add the following line to your CONFIG.SYS file:

```
device=c:\os2\mousea02.sys serial=com2
```

This example directs MS OS/2 to look for the mouse at your system's COM2 serial port.

■ If you want to use the mouse with DOS applications such as Microsoft Word, then you also need to set up the EGA.SYS device driver. To direct MS OS/2 to load this driver, add the following line to your CONFIG.SYS file:

```
device=c:\os2\ega.sys
```

This example directs MS OS/2 to look for the driver in the OS2 directory of the drive from which you started MS OS/2.

Using a Virtual Disk Drive

You can use a virtual disk drive in full-screen and DOS sessions by setting up the VDISK.SYS device driver. Using a virtual disk drive, your system simulates a disk drive in memory, and provides quick access to files stored there. Because the virtual disk is actually a portion of memory, it's almost as fast as if the data were in memory.

■ You may want to use a virtual disk as a place in which temporary files are stored. Since the temporary file is deleted when it's no longer needed, there is no reason to save it on disk. To direct MS OS/2 to load the VDISK.SYS device driver, add the following line to your CONFIG.SYS file:

```
device=c:\os2\vdisk.sys
```

This example directs MS OS/2 to look for the VDISK.SYS driver in the OS2 directory of the drive from which you started MS OS/2. If the driver is found, MS OS/2 loads the driver and creates a 64K virtual disk with 128-byte sectors, 64 directory entries, and the name of the next available drive letter. (These values are the defaults.)

Any information stored in a virtual disk is lost when you restart your computer or turn off the power to your computer. If you use a virtual disk for temporary files, be sure to specify the appropriate drive letter with the **set temp** configuration command in your CONFIG.SYS file. This command tells MS OS/2 where to place all temporary files.

You can have more than one virtual disk drive; drive letters are assigned by the order in which the **device** commands appear in the CONFIG.SYS file. When you specify memory for a virtual disk, that memory is no longer available for other programs to use.

Since 64K is not very much space, you may want to increase the size of the virtual disk drive. To do this, add the following line to your CONFIG.SYS file:

```
device=c:\os2\vdisk.sys 128
```

This example creates a 128K virtual disk with 128-byte sectors and 64 directory entries.

You may also want to change the number of directory entries for the virtual disk drive. To increase the number of directory entries, add the following line to your CONFIG.SYS file:

```
device=c:\os2\vdisk.sys 256,128
```

This example creates a 256K virtual disk with 128-byte sectors and 128 directory entries. Note that a sector size is not specified; its position is designated by a comma. (If you wanted to specify all three values as something other than the default, you would separate them with spaces.)

When you specify a value for a directory entry, the value is rounded up to the nearest sector-size boundary. For example, if you give a value of 25, and your sector size is 512 bytes, 25 will be rounded up to 32, which is the next multiple of 16. There are 16 32-byte directory entries in 512 bytes.

The maximum size of a virtual disk depends on the amount of available memory in your system, but it cannot be larger than four megabytes. If the virtual disk size that is specified is too large to fit in memory, VDISK.SYS will try to make a virtual disk that is 16K. This may result in a virtual disk with a different number of directory entries than you specified.

When you start or restart your system, MS OS/2 displays information about any virtual disk it creates. The information includes the assigned drive letter, the size of the virtual disk, its sector size, and the number of directory entries. You can also use the **chkdsk** utility to determine the size of a virtual disk.

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A ANSI Escape Sequences

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Introduction

This appendix lists all of the escape sequences that can be used with the ANSI.SYS device driver in the DOS session, or with the `ansi` command in a full-screen OS/2 session or in `cmd` in a window.

ANSI escape sequences affect cursor positioning, erase functions, and screen graphics.

The sequences must be typed exactly as shown. No spaces are allowed.

Cursor Functions

The following functions affect the movement of the cursor.

Cursor Position

`ESC[row;colH`

or

`ESC[row;colf`

These two escape sequences move the cursor to the position specified by the parameters. When no parameters are provided, the cursor moves to the home position (the upper-left corner of the screen).

Cursor Up

`ESC[nA`

This sequence moves the cursor up *n* rows without changing columns. If the cursor is already on the top line, MS OS/2 ignores this sequence.

Cursor Down

`ESC[nB`

This sequence moves the cursor down *n* rows without changing columns. If the cursor is already on the bottom row, MS OS/2 ignores this sequence.

Cursor Forward

ESC[*n*C

This sequence moves the cursor forward *n* columns without changing lines. If the cursor is already in the far-right column, MS OS/2 ignores this sequence.

Cursor Backward

ESC[*n*D

This sequence moves the cursor back *n* columns without changing lines. If the cursor is already in the far-left column, MS OS/2 ignores this sequence.

Save Cursor Position

ESC[s

This sequence saves the current cursor position. This position can be restored with the Restore Cursor Position sequence.

Restore Cursor Position

ESC[u

This sequence restores the cursor position to the Save Cursor Position value.

Erase Functions

The following functions erase the screen.

Erase Display

ESC[2J

This sequence erases the screen and moves the cursor to the home position (the upper-left corner of the screen).

Erase Line

ESC[K

This sequence erases from the cursor to the end of the line (including the cursor position).

Screen Graphics Functions

The following functions affect screen graphics.

Set Graphics Rendition

ESC[g; ... ;gm

This sequence calls the graphics functions specified by the following numeric values. These functions remain until the next occurrence of this sequence. This sequence works only if the screen device supports graphics.

The *g* variable may have any of the following values:

Value	Function
0	All attributes off
1	Bold on
2	Faint on
3	Italic on
5	Blink on
6	Rapid-blink on
7	Reverse video on
8	Concealed on
30	Black foreground
31	Red foreground
32	Green foreground
33	Yellow foreground
34	Blue foreground
35	Magenta foreground
36	Cyan foreground

37	White foreground
40	Black background
41	Red background
42	Green background
43	Yellow background
44	Blue background
45	Magenta background
46	Cyan background
47	White background
48	Subscript
49	Superscript

The values 30 through 47 meet the ISO 6429 standard.

Set Mode

ESC[=sh

This sequence changes the screen width or type. The *s* variable can have one of the following numeric values:

Value	Function
0	40 × 25 black and white
1	40 × 25 color
2	80 × 25 black and white
3	80 × 25 color
4	320 × 200 color
5	320 × 200 black and white
6	640 × 200 black and white
7	Wraps at the end of each line

Reset Mode

ESC[=sl

The values for this escape sequence are the same as for Set Mode, except that the value 7 resets the mode that causes wrapping at the end of each line.

B Running DOS from Your Hard Disk

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Introduction

This appendix describes how to add DOS files to your hard disk and create a DOS start-up disk. This will allow you run DOS on a system with MS OS/2 already installed on it. You may need to run DOS if you have DOS programs that cannot run in the DOS session of MS OS/2.

You can always run DOS on your system by starting your system from the original DOS start-up disk. You can, however, choose to keep most of the DOS files, except for a few start-up files, on your hard disk. You will still have to use a DOS start-up disk, but DOS will run faster if most DOS files are on your hard disk. By modifying the CONFIG.SYS and AUTOEXEC.BAT files on the DOS start-up disk, you can tell the system to look for DOS files on your hard disk instead of on your start-up disk.

Running DOS Programs

Most DOS applications can be run in the DOS session of MS OS/2 without problems. However, programs that have timing dependencies, that access the hardware directly, or that use DOS extended memory may not work correctly in MS OS/2. Here are a few examples of such programs:

- Programs that communicate through local area networks and that make or break connections
- Programs that directly access hardware to back up or restore files
- Block device drivers such as RAM disks
- Programs that use certain key combinations such as CTRL+ESC or ALT+ESC
- Programs that use plotters
- Programs that determine storage sizes by checking hardware RAM
- DOS communications programs

Creating a DOS Directory and Start-up Disk

To add the capability of running DOS, as well as MS OS/2, from your hard disk, you must create a DOS directory on your hard disk and copy the DOS files to it, make a new DOS start-up disk, and edit the CONFIG.SYS and AUTOEXEC.BAT files that are on the new DOS start-up disk. The following sections describe how to do these things.

The instructions in this appendix assume that you have MS OS/2 installed on your hard disk, and have the original DOS system disk and a blank, formatted 1.2-megabyte or 1.44-megabyte floppy disk.

Copying DOS Files to Your Hard Disk

 To copy DOS files to your hard disk, do the following:

- 1 Restart your system by turning on your computer or by pressing CTRL+ALT+DEL. Change to the root directory on drive C and type the following to make a directory to hold DOS files:

```
mkdir \dos
```

(While the directory name DOS is used here, you may choose any valid directory name.)

- 2 Insert the original DOS start-up disk in drive A and type the following to copy the DOS files to your hard disk:

```
copy a:*. * c:\dos
```

Making a DOS Start-up Disk

 To make a new DOS start-up disk, do the following:

- 1 Insert the original DOS start-up disk that contains COMMAND.COM, CONFIG.SYS, and AUTOEXEC.BAT in drive A.
- 2 Make a copy of this disk by typing the following:

```
diskcopy a: a:
```

Diskcopy will prompt you at appropriate times to insert the source disk (the original start-up disk) or destination disk (a blank, formatted disk).

The copy becomes your DOS start-up disk. Before you can use it to start DOS, however, you must edit the DOS CONFIG.SYS and AUTOEXEC.BAT files, as described in the following section.

Editing CONFIG.SYS and AUTOEXEC.BAT

You can use a text editor to modify the CONFIG.SYS and AUTOEXEC.BAT files on the start-up disk.

Note Separate CONFIG.SYS and AUTOEXEC.BAT files exist for DOS and MS OS/2. Be sure to modify only the files on your DOS start-up disk.

 To modify CONFIG.SYS, do the following:

- 1 Insert your new DOS start-up disk in drive A.
- 2 Edit the **shell** configuration command so that it specifies the DOS directory that you have just created:

```
shell=c:\dos\command.com /p
```

- 3 Edit any **device** and **country** configuration commands so that they specify the new DOS directory.

 To modify AUTOEXEC.BAT, do the following:

- 1 Insert your new DOS start-up disk in drive A.
- 2 Edit the **set comspec** configuration command so that it specifies the COMMAND.COM file that is in the new DOS directory:

```
set comspec=c:\dos\command.com
```

- 3 Edit your path so it includes, at a minimum, the following:

```
set path=c:\dos
```

Starting DOS

 To start DOS, do the following:

- 1 Insert the DOS start-up disk in drive A.
- 2 Restart your system by turning on your computer or by pressing CTRL+ALT+DEL.

To return to MS OS/2, remove the start-up disk from drive A and restart your computer.

Terms

A

Action bar See *Menu bar*.

Active Describes a window or icon that is selected in Presentation Manager; the window or icon to which the next keystroke or command will apply. If a window is active, the title bar is a different color. If an icon is active, the System menu appears.

ANSI character set The American National Standards Institute 8-bit character set. It contains 256 characters.

ANSI escape sequence A sequence of ASCII characters, the first two of which must be the escape character and the left-bracket character, used to control the keyboard and computer screen. The ANSI character set was developed by the American National Standards Institute and can be used in a full-screen OS/2 session by using the **ansi** command. This character set can be used in the DOS session by installing the ANSI.SYS device driver by using the **device** command in your CONFIG.SYS file.

Application A program used for a particular kind of work, such as word processing or database management. See also *Presentation Manager application*, *Full-screen OS/2 application*, and *DOS application*.

Application file See *Program file*.

Archive attribute Determines whether a file will be copied when you use the **xcopy**, **backup**, or **restore** utilities. See also *Attribute*.

Argument Refers to switches, options, and/or variables accepted by an MS OS/2 command or other process.

Arrow pointer A small symbol that appears in MS OS/2 and DOS applications if you have installed a mouse, and that indicates which area of the screen will be affected when you click the mouse button. The pointer usually is shaped like an arrow but changes shape during certain tasks.

ASCII character set The American Standard Code for Information Interchange 8-bit character set. The set consists of the first 128 (0-127) characters of the ANSI character set.

Attribute A changeable characteristic of a file; for example, an archive attribute. You use the **attrib** command to display and set file attributes.

AUTOEXEC.BAT A batch file that contains a series of DOS commands, and automatically runs when you start or restart your system. This batch file affects the DOS session only.

B

Background program A program that cannot receive input and does not send output to the screen. See also *Foreground program*.

Batch processor The part of the command interpreter that processes batch-file commands.

Batch program An ASCII file that contains one or more MS OS/2 commands. MS OS/2 batch files have the extension .BAT in the DOS session, and .CMD in a full-screen OS/2 session. When a batch program is run, the commands are processed sequentially by **command** (in the DOS session) or **cmd** (in a full-screen OS/2 session).

Boot See *Start*.

Buffer A place in your computer's memory used to store information temporarily.

Byte A unit of information used by a computer, usually eight consecutive bits that represent one character.

C

Check box A small square box that appears in a Presentation Manager dialog box and that can be turned on or off. When the check box is turned on, an X appears in the box. Check boxes represent multiple options that you can set.

Choose In Presentation Manager, to perform an action that carries out a command in a menu or dialog box. See also *Select*.

Click To press and release a mouse button quickly. When you click a mouse button, you may hear and feel a faint click.

Cmd The MS OS/2 command interpreter. **Cmd** translates what you type at the command prompt into instructions that your computer understands.

Code page Defines a table that is used to set up foreign-language versions of MS OS/2. You can change your system's code page by using the **chcp** command.

Command A word or phrase, usually found in a menu or typed at the command prompt, that you use in order to perform a task.

Command The DOS command interpreter. **Command** translates what you type at the command prompt into instructions that your computer understands.

Command button A large rectangular button that appears in a Presentation Manager dialog box and carries out or cancels an action when chosen. The Cancel button always cancels the command. The Enter button carries out the command. Sometimes, instead of Enter, the button that carries out the action will have a label that describes the action; for example, Delete. At times, choosing the button causes another dialog box to open. For example, if you choose the Help command button, the Help dialog box is displayed for the command.

Command interpreter Provides a command-line interface that lets you run commonly used, "built-in" commands, as well as batch programs and MS OS/2 programs.

Command prompt The character or characters that appear on the screen as part of the command line. The command prompt tells you that the computer is ready to receive input. You can customize the command prompt by using the **prompt** command.

Command-line interface A user interface that allows the user to type commands on the command line.

CONFIG.SYS A start-up file that contains configuration commands. These commands provide the information MS OS/2 needs to start your system.

Configuration How your computer is set up. Configuration commands in the CONFIG.SYS file help you customize the way MS OS/2 runs on your computer.

Control Panel A Presentation Manager application that you use to set up printers, change country settings and screen colors, and adjust other system settings such as the date and the time.

Cursor Usually a blinking line or small box on the computer screen that shows where the next character you type will appear. See also *Selection cursor*.

D

Data file A file made up of ASCII characters.

Data path The place you tell MS OS/2 to look for data files (files with extensions other than .EXE, .COM, .BAT, or .CMD).

Default Describes an option, command, or device that is automatically selected or chosen by the system. For example, in most Presentation Manager dialog boxes that contain command buttons, one of the buttons has a bold border when the dialog box appears, indicating that it is the default and will be chosen automatically if you press the ENTER key. You can override a default by selecting the appropriate option, command, or device.

Device Components of your system's configuration that aren't actually part of the computer. Examples of devices are a modem, a printer, a mouse, and an external disk drive.

Device driver A program that controls how your computer and a device, such as a printer or monitor, interact. A device driver allows you to use devices with your computer. A printer driver is an example of a device driver. A printer driver lets you control printing and set options, such as paper size, for a particular printer.

Dialog box A rectangular box that appears when Presentation Manager needs further information before it can carry out a command or when Presentation Manager is providing you with information. For example, if you choose the Add command from the Program menu in Start Programs, a dialog box appears, asking for the name of the application that you want to add.

Direct-access method A way to choose a command or to select a menu in Presentation Manager by pressing the key that corresponds to the underlined character in the command or menu name.

DIRECTION keys The four arrow keys on your computer's keypad. The names of the individual DIRECTION keys refer to the direction the arrow points: the UP key, the DOWN key, the RIGHT key, and the LEFT key.

Directory Part of a structure for organizing your files into convenient groups. A directory is like a file drawer that holds a particular group of files. A directory can contain both files and other directories. These directories are sometimes called subdirectories. You can see the directories on your system by using File System or by typing the `dir` command at the command prompt.

Disk cache An extra buffer in which MS OS/2 stores information that it has recently read from your hard disk. When an application needs to read information from the hard disk, it looks first in the disk cache to see if the information is there.

DOS application An application designed to run with DOS. A DOS application can run with MS OS/2 only in the DOS session. See also *DOS session*.

DOS session A separate environment created in MS OS/2 in which you can run an application designed to work with DOS. The DOS session is almost like a separate computer, with 640 kilobytes of memory, that runs only DOS. You can run one application at a time in the DOS session. You can switch to other MS OS/2 applications by pressing ALT+ESC or to Task Manager by pressing CTRL+ESC.

Double-click To rapidly press and release a mouse button twice.

Drag To press and hold down the mouse button while moving the mouse. For example, you can move a Presentation Manager window to another location on the screen by dragging its title bar.

Drive icon In Presentation Manager, the small symbol in the Directory Tree window in File System that represents the disk drives on your system.

Dynamic-link library A separate file of MS OS/2 code that, when needed, is brought into memory, or “dynamically linked.”

E

Environment A place in your computer’s memory where environment variables are stored. You define the environment by using the **set** command in the CONFIG.SYS file, in batch files, or from **cmd** or **command**. See also *Environment variable*.

Environment variable Associates a string consisting of a drive, path, filename, or other information with a symbolic name that can be used by MS OS/2. You use the **set** command to define environment variables.

Error message A message that appears on the screen if MS OS/2 detects a problem while processing a command or program. An error message contains a message identification number that consists of three letters followed by a four-digit number. You can get more information about a particular error message by typing **help** at the command prompt, followed by the message number.

Executable file See *Program file*.

Expanded memory Extra memory installed to use with DOS. MS OS/2 does not use expanded memory. If you have installed expanded memory on your computer, you should convert it to extended memory. See your extended-memory-board manual for details.

Extend a selection In Presentation Manager, to select more than one item in a window.

Extended memory Memory beyond the usual 1-megabyte limit of computers such as the IBM PC/AT and compatible models. To use it you must install an extended memory board. Extended memory can be used by MS OS/2.

Extended partition A second, optional partition you may have on your hard-disk drive.

Extension The period and three letters at the end of a filename. An extension identifies what kind of information a file contains. For example, the extensions **.CMD** and **.BAT** indicate that the file contains a batch program. Some applications append an extension to the files that you create with them. For example, files that you create with Bricks have the extension **.BRK**.

F

File control block (FCB) A data structure used to control open files in the DOS session.

File extension See *Extension*.

File handle An identification code for a file, which is assigned when the file is created or opened. An MS OS/2 program uses the file handle whenever it accesses (reads from or writes to) the file.

File System A Presentation Manager application that you use to view and organize your files and directories.

Filename The name of a file. MS OS/2 filenames consist of a base name containing no more than eight characters and a three-character extension. For example, BRICKS.EXE is the name of the file that contains the Bricks application. See also *Extension*.

Filter A term sometimes used to define utilities that take input from a device or file, process or "filter" the input, and then send it to an output device or file.

Foreground program A program that can receive input and send output. See also *Background program*.

Format To prepare a disk so that it can hold information. Formatting a disk erases whatever information was previously on it.

Full-screen OS/2 application Describes an MS OS/2 application that runs in its own full screen rather than as part of the Presentation Manager screen. Some full-screen applications can run in special windows, however, so that you can work with them in Presentation Manager.

Full-screen OS/2 session A separate environment where MS OS/2 applications run in a full screen. You do not see the Presentation Manager screen. You can start multiple full-screen sessions, almost as if you had multiple computers. From a full-screen session, you can switch to other applications by pressing ALT+ESC or to Task Manager by pressing CTRL+ESC.

G

Graphical environment See *Graphical user interface*.

Graphical user interface A user interface such as Presentation Manager, which offers you an environment of windows, menus, and dialog boxes in which you can work.

Grayed In Presentation Manager, describes a command or option that is listed in a menu or dialog box but cannot be chosen or selected. The command or option appears in gray type. For example, after you have enlarged a window to its full size, the Maximize command in the System menu is grayed.

H

Hidden file A system file that cannot be viewed, such as BIOS.

I

Icon In Presentation Manager, a small symbol that represents an application or a session that is running in memory. For example, the DOS icon represents the DOS session.

Icon area The area along the bottom of the Presentation Manager screen where icons for applications or sessions appear. You can move icons from the icon area.

Inactive Describes a window or icon that is not selected in Presentation Manager. See also *Select*.

Initialization The process your computer goes through when it is first started or restarted. This process includes reading MS OS/2 start-up files.

Insertion point The place where text will be inserted when you type. The insertion point usually appears as a flashing vertical line in Presentation Manager dialog boxes. The text you type appears to the left of the insertion point, which moves to the right as you type.

J

Job identifier In Presentation Manager, a number that identifies a file waiting to be printed. You can see the job identifier listed in the work area of the Spooler Queue Manager application.

L

Label Used as a parameter to the **goto** batch command, a label tells the batch program which part of the file to switch to. See also *Volume label*.

List box A box within a Presentation Manager dialog box that lists available choices; for example, the areas of the screen that you can change colors for. The item that is selected in a list box is distinguished by the selection cursor, a dark bar surrounded by a dotted box. If there are more choices than can fit in the list box, the list box will have a scroll bar.

Logical drive A way of naming an extended partition on your hard-disk drive.

Lost cluster A section of a file no longer associated with any other file on a hard-disk drive. When a cluster is lost, MS OS/2 can't read, write to, or modify the data in those clusters. You use the **chkdsk** command to fix lost clusters.

M

Maximize box The small box containing an up arrow that is located at the right of the menu bar in a Presentation Manager window. Mouse users can click the Maximize box to enlarge a window to its maximum size.

Menu A group listing of available commands in a Presentation Manager window. Menu names appear in the menu bar near the top of the window. One menu, the System menu, is common to all Presentation Manager windows and is represented by the System-menu box in the upper-left corner of the window. You use a command from a menu by selecting the menu, then choosing the command.

Menu bar The horizontal bar that lists the names of an application's menus near the top of a Presentation Manager window. The menu bar appears below the title bar of a window. This is sometimes referred to as the action bar in applications.

Message A sentence or short paragraph of information that may appear on your screen, warning you about the consequence of some action you've taken or asking for additional information or verification. For example, when you attempt to shut down MS OS/2, you will see a message, asking if you really want to end all your programs.

Minimize box The small box containing a down arrow that is located at the right of the menu bar in a Presentation Manager window. Mouse users can click the Minimize box to reduce a window to an icon.

Move A technique by which MS OS/2 can move blocks of storage around so that unused areas of storage can be combined into larger areas, as needed by a program or application.

Multitasking A feature of MS OS/2 that lets you run more than one program or process at the same time.

N

NUL An option you have when you are redirecting output. Anything sent to NUL is discarded.

O

Option A command argument that is not required.

Option button A small round button that appears in a Presentation Manager dialog box and selects an option when set. Within a group of related option buttons, you can make only one selection.

P

Partition A hard-disk drive can be organized into separate sections called partitions.

Path A description of the location of a directory within the directory structure of the system. The path consists of one or more directory names. Each directory name is separated from the previous one by a backslash (\).

Pipe The method of redirecting the output from one command and using it as input for the next command.

Point To move the mouse pointer on the Presentation Manager screen until it rests on the item you want to select or choose.

Pointer See *Arrow pointer*.

Port A slot on your computer to which you can connect a printer, a modem, or other input or output device. MS OS/2 recognizes three printer ports (LPT1, LPT2, and LPT3) and three communications ports (COM1, COM2, and COM3).

Presentation Manager The graphical user interface that is part of MS OS/2. See also *Graphical user interface*, *Presentation Manager application*, and *Presentation Manager session*.

Presentation Manager application An application designed for the Presentation Manager graphical environment. These applications run in windows, and their commands are organized into menus. They also take advantage of other features of the Presentation Manager interface such as dialog boxes and icons.

Presentation Manager session The environment that applications designed for Presentation Manager run in. In the Presentation Manager session, all the applications running on your system are represented—either running in windows or as icons. The DOS session and full-screen OS/2 session are represented as icons, as well.

Primary partition The partition on your hard-disk drive that must contain system start-up files.

Print job In Presentation Manager, a file waiting to be printed. You can check the status of print jobs by using the Spooler Queue Manager application.

Print queue In Presentation Manager, a list of files waiting to be printed. You can look at this list by using the Spooler Queue Manager application.

Printer names In Presentation Manager, the names you assign to a printer to identify it. You can create your own printer names. You create and assign the names by using the Control Panel application.

Program A set of instructions, written in a computer language, that tells the computer how to perform a task.

Program file The file that contains a program. These files must have one of the following filename extensions: .CMD, .EXE, COM, or .BAT. In Presentation Manager, you can start an application by opening its program file in File System. Program files are also known as application files and executable files.

Prompt See *Command prompt*.

Q

Queue See *Print queue*.

Queue processor In Presentation Manager, a program that prepares a file to be sent to the printer. A queue-processing program is copied to your hard disk when you set up MS OS/2 on your system.

R

Read-only attribute Determines whether the contents of a file can be modified or not. See also *Attribute*.

Redirection A feature that lets you take the output from one command and send it to a file instead of to the screen.

Replaceable parameter A command option that you can define each time you run a batch program. You use replaceable parameters when you want to create a batch program and run it with different sets of data. A replaceable parameter is represented by a percent sign (%) followed by a digit from 0 through 9.

Restart To press CTRL+ALT+DEL when your computer is already turned on. See also *Start*.

Restore A command that restores files that were backed up by using the **backup** utility. The term "restore" is also used to describe the return of a window to the size and position it had before it was either shrunk to an icon or enlarged to its maximum size.

Restore box The small box in a Presentation Manager window containing a down and up an arrow. It appears at the right of the menu bar after you have enlarged a window to its full size. Mouse users can click the Restore box to return the window to its previous size and position.

Root directory Highest directory on a disk. It is represented by the backslash (\). The root directory is created when you format the disk. From the root directory, you can create other directories.

Run To start an application.

S

Save To store a file, or changes to a file, on a disk.

Scroll In Presentation Manager, to move text or graphics up or down, or left or right, in order to see information that cannot fit on the screen. You usually use the DIRECTION keys or the mouse to scroll.

Scroll bar A bar that appears at the right side and/or bottom of some Presentation Manager windows and in some dialog boxes. The scroll bar contains a scroll arrow at either end and a scroll box that moves within the scroll bar, reflecting your position in a file or a list. Mouse users can click parts of the scroll bar to scroll a file. Keyboard users use the DIRECTION keys to accomplish the same thing.

Scroll box In Presentation Manager, the box within a scroll bar that you move by using either the mouse or the DIRECTION keys. Its position in the scroll bar corresponds to your general location in a file or dialog box (beginning, middle, or end).

Search path The path that tells MS OS/2 where to look for a file or directory.

Sector A place on a disk that contains the smallest amount of information that can be accessed at one time. See also *Track*.

Select In Presentation Manager, to indicate the item that the next command you choose will affect. The way you select varies, depending on the task. See also *Choose*.

Selection cursor In Presentation Manager, the mark, often a dark bar or dotted box, that shows you where you are working in a window or dialog box and what you have selected. The selection cursor varies, depending on where you are working. For example, in File System a dark bar shows you which disk drive or file you have selected. In a dialog box, a dotted box shows you which area of the dialog box you are working in.

Session See *DOS session*, *Full-screen OS/2 session*, and *Presentation Manager session*.

Shortcut key In Presentation Manager, a special key or key sequence, available for some commands, that you can press to carry out the command without first selecting a menu. The shortcut keys for a command are often listed on the menu to the right of the command name.

Spooler Queue Manager A Presentation Manager application that organizes and controls printing. It allows you to print files and to view and control the jobs in the print queue. Spooler Queue Manager is started each time you start MS OS/2 unless you turn it off using Control Panel.

Standard error The destination of error messages sent by your computer. The computer usually sends error messages to the screen, but you can use redirection to send them to another destination.

Standard input The source of input to your computer. The computer usually gets its input from the screen, but you can use redirection to send it input from other sources.

Standard output The destination of output from your computer. The computer usually sends output to the screen, but you can use redirection to send output to other destinations.

Start There are two ways to start MS OS/2. One is to turn on your computer. The other is to press CTRL+ALT+DEL when your computer is already turned on.

Start Programs A Presentation Manager application that you use to start other applications.

Start-up disk The disk where your MS OS/2 start-up files are located. This can be a floppy disk or hard disk.

Start-up drive The drive where your MS OS/2 start-up files are located. This can be a floppy-disk drive or hard-disk drive.

Start-up file Files such as AUTOEXEC.BAT and CONFIG.SYS, which MS OS/2 looks at for information about how to start your system.

String A sequence of related characters.

Subdirectory A directory contained within another directory. All directories are subdirectories of the root directory.

Swap A technique by which some data segments in memory are written to a disk-swap file, allowing the memory that they were using to be reclaimed for another purpose. Later, the swapped data segment is reloaded into memory.

Switch To move from one application to another, or from one session to another. You can switch between applications by using the mouse, the keyboard, or Task Manager.

System menu In Presentation Manager, the menu that appears on every application that runs in a window. Icons, some dialog boxes, and windows within application work-areas also have System menus. For applications running in a window and for icons and dialog boxes, System-menu commands move, change the size of, and close windows. You can also switch to Task Manager by using the System menu. For work-area windows, System-menu commands vary, depending on the application.

System-menu box The small box that is located at the left in a window's title bar. If you have a mouse, you can click this box to display the System menu, or double-click it to close the window.

T

Task Manager A Presentation Manager application that you use to switch among all the applications you have running on your computer.

Text box A box in a Presentation Manager dialog box in which you type information needed to carry out a command. The text box may be blank when the dialog box appears, or may contain text if there is a default option or if you have selected something applicable to that command.

Text file See *Data file*.

Thread Part of an application or other process that can be scheduled by MS OS/2 to run on its own.

Time slice The amount of processing time the MS OS/2 scheduler gives a thread before reassigning the CPU to another thread.

Title bar The horizontal bar across the top of each Presentation Manager window, which contains the name of the application in that window. The title bar also contains the System-menu box and the Maximize and Minimize boxes or the Minimize and Restore boxes.

Track A place on a disk where information is stored. A track is made up of sectors. See also *Sector*.

U

User interface See *Graphical user interface* and *Command-line interface*.

Utility A program provided with MS OS/2 that is designed to perform system-maintenance tasks such as copying files or formatting disks. For example, **backup** is an MS OS/2 utility for creating backup copies of your files.

V

Virtual disk A disk drive simulated in memory, which provides quick access to information stored there.

Volume label An internal name on a disk. You should put a volume label on each of your floppy disks to help you identify them.

W

Wildcard character A character that can be included in a filename to indicate any character or group of characters that might match that position in other filenames. There are two wildcard characters you can use: the question mark (?) and the asterisk (*). The question mark can match one character; the asterisk can match zero or more characters. For example, *.EXE represents all files in the directory that end with the .EXE filename extension.

Window In Presentation Manager, a rectangular area on your screen in which you view an application. Every window has a title bar and may have a menu bar and one or two scroll bars. See also *Work-area window*.

Work area In Presentation Manager, the area of a window where you do your work with the application. For example, the Start Programs work area contains a list of programs that you can start.

Work-area window In Presentation Manager, windows that you can open within an application work area. For example, you can open directory windows within the File System work area.

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3Com Corporation
3165 Kifer Road
Santa Clara, CA 95052-8145