

The Windows Initialization Files

This chapter describes the contents of the key Microsoft Windows initialization files, WIN.INI and SYSTEM.INI, plus other Windows initialization files. This chapter also describes how you can change entries in the files.

Note If you want to reinstall Windows and preserve the settings in the current initialization files on your system, follow the procedures outlined in Flowchart 1.5, “Reinstalling Windows without Losing Settings.”

Related information

- *Windows User’s Guide*: Chapter 5, “Control Panel”; Chapter 15, “Maintaining Windows with Setup”
- *Windows Resource Kit*: Chapter 2, “The Windows Setup Information Files”

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About the Initialization Files

The Windows initialization files contain information that defines your Windows environment. Microsoft Windows and the Windows applications use the information in these files to configure themselves according to your needs and preferences.

The standard Windows initialization files are CONTROL.INI, PROGMAN.INI, SYSTEM.INI, WIN.INI, and WINFILE.INI. Other Windows applications may also add .INI files in the WINDOWS directory.

<i>.INI File</i>	<i>File contents</i>
WIN.INI	Entries that you can set to alter the Windows environment according to your preferences.
SYSTEM.INI	Entries that you can set to customize Windows to meet your system's hardware needs.
CONTROL.INI	Entries that describe the color schemes and patterns used in Windows, and the settings for printers and installable drivers.
PROGMAN.INI	Entries that define content of program groups.
WINFILE.INI	Entries that define the appearance and behavior of items in File Manager.
<i>application.INI</i>	Entries created and maintained by a specific Windows application. The file is created when the application is installed.

Important Errors made by editing initialization files can lead to undesirable results when you run Windows. Before changing any entry, make a backup copy of the file. Read “Changing Entries in .INI Files” later in this chapter for guidelines.

Format of .INI Files

Windows initialization files are broken into logical groups called sections. Each section has this format:

```
[section]  
keyname=value
```

<i>Item</i>	<i>Meaning</i>
[section]	The name of a section. The enclosing brackets ([]) are required, and the left bracket must be in the leftmost column on the screen.
<i>keyname</i>	The name of an entry, which can consist of any combination of letters and digits. For many entries, the <i>keyname</i> must be followed immediately by an equal sign (=).
<i>value</i>	An integer, a string, or a quoted string, depending on the entry.

For many entries, the *value* is shown as *Boolean*. To enable an entry that requires a Boolean value, you can enter **True**, **Yes**, **On**, or **1**. To disable such an entry, you can enter **False**, **No**, **Off**, or **0**. Case doesn't matter.

To include comments in .INI files, begin each line of comment with a semicolon (;).

The order of the sections in an .INI file is not important. Some Windows applications may add or insert other sections. The entries in each section are listed alphabetically in this chapter, but they do not appear in this order in the .INI files. So to change an entry, you must search for it within the section.

In this chapter, the items that appear in bold are actual words included in the entry. Values that must be substituted in the entry are shown in italics. When the value can be one of several choices, the choices are separated with a pipe character (|). For example:

Beep=*Yes* | *No*

Any entry listed here that does not appear in your .INI file has the default value. Default values are shown for all the entries in this chapter.

Changing Entries in .INI Files

Windows creates the initialization files during installation and assigns default values. Some entries are added or changed when you install or configure a Windows application. You can edit these entries to change the appearance or performance of Windows.

There are several ways to change entries in the .INI files:

- Use Control Panel, Program Manager, or File Manager to change many entries with menu commands and dialog box options.
- Run Windows Setup again to change system settings, the keyboard or mouse configuration, or network options, and to add or remove printers and fonts.
- Use a text editor such as Notepad to edit the file directly.
- Choose a command such as Printer Setup from the File menu in Print Manager, and specify new options.

The entries in this chapter show which entries in WIN.INI and SYSTEM.INI you can change with Control Panel or Setup to avoid editing the .INI file directly, where it is easy to make editing mistakes. For the entries you cannot change with Control Panel or Setup, you must edit the .INI file with a text editor.

Important Always back up the .INI file before you open it, and use care when making changes. Incorrect changes can lead to unexpected results when you run Windows. Also, some editors can damage characters with ANSI values of greater than 127. We recommend that you use Control Panel or Setup whenever possible to make changes. If you must edit the file, use a text editor such as Notepad, System Editor, or Edit (the MS-DOS 5.0 text editor).

To change .INI file entries with a text editor:

1. **Important** Create a backup copy of the .INI file you want to edit.
2. Open the .INI file with a text editor such as Notepad.
3. Edit the specific entries and save the file.
4. Restart Windows so the changes will take effect.

You can use the System Editor utility in Windows to edit SYSTEM.INI, WIN.INI, CONFIG.SYS, and AUTOEXEC.BAT at the same time. The System Editor is installed in your WINDOWS directory by Windows Setup.

To edit system files with System Editor:

1. **Important** Create a backup copy of the .INI file you want to edit.
2. Choose Run from the File Menu in Program Manager. Type **sysedit** and press ENTER.
3. Click the window in System Editor that contains the file you want to edit.

Figure 4.1

*The System Editor in
Windows 3.1*

4. Edit the file, using the same text editing techniques as in Notepad.
5. Save the file, and choose Exit from the File menu to close System Editor.
6. Restart Windows so that the changes you made can take effect. If you edit CONFIG.SYS or AUTOEXEC.BAT, you must reboot your system for the changes to take effect.

Editing the .INI Source Files

If you copy the Windows files to a network server using the **setup /a** option (to install a shared copy of Windows), Setup uses WIN.SRC, SYSTEM.SRC, and CONTROL.SRC to build WIN.INI, SYSTEM.INI, and CONTROL.INI when a user installs Windows on a workstation with the **setup /n** option. To create custom initialization files for multiple installations, you can change the .SRC files.

To edit the .SRC files, first save a backup copy of the original file, then make editing changes in the file, following the guidelines in this chapter. Save the file with an .SRC filename extension in the WINDOWS directory on the network server. And, of course, test the new .INI file on a single system before installing Windows on multiple systems.

Windows 3.1 .INI File Changes

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If you update to Windows, Setup automatically updates the .INI files with the following changes. Setup leaves all other sections and entries in your existing WIN.INI and SYSTEM.INI unchanged when you upgrade to Windows 3.1.

For the WIN.INI file:

- In the **[Windows]** section, Setup adds three new entries:

```
KeyboardDelay=
ScreenSaverTimeout=
DosPrint=
```

If the following entries are present in the 3.0 version of WIN.INI, Setup does not change them. If they are not present, Setup adds them:

```
device=
documents=
programs=com exe bat pif
```

- In the **[extensions]** section, Setup adds **bmp=prush.exe ^.bmp**, and also adds **pcx=pbrush.exe ^.pcx** and **rec=recorder.exe ^.rec** if they are not already in WIN.INI:
- In the **[intl]** section, Setup changes **sLanguage=English (American)** to **sLanguage=enu**.
- In the **[ports]** section, Setup adds **LPT1.DOS** and **LPT2.DOS**. If they are not already present in WIN.INI, Setup adds these three entries:

```
file:=
com3:=9600,n,8,1,x
com4:=9600,n,8,1,x
```

- Setup adds **[fontSubstitutes]** and **[TrueType]** to support TrueType fonts. The default **[fontSubstitutes]** entries are:

```
Helv=MS Sans Serif
Tms Rmn=MS Serif
Times=Times New Roman
Helvetica=Arial
```

- Setup adds the **[mci extensions]** section, with these entries to support multimedia:

```
wav=waveaudio
mid=sequenccer
mci=sequencer
```

- Setup adds the **[sound]** section, with these entries to support multimedia:

```
SystemDefault=ding.wav, Default Beep
SystemExclamation=chord.wav, Exclamation
SystemStart=tada.wav, Windows Start
SystemExit=chimes.wav, Windows Exit
SystemHand=chord.wav, Critical Stop
SystemQuestion=chord.wav, Question
SystemAsterisk=chord.wav, Asterisk
```

- Setup adds the **[embedding]** section, with these entries to support Object Linking and Embedding:

```
SoundRec=Sound,Sound,SoundRec.exe,picture
Package=Package,Package,packager.exe,picture
PBrush=Paintbrush Picture,Paintbrush Picture,pbrush.exe,picture
```

For the SYSTEM.INI file:

- In the **[386enh]** section, Setup adds **device=** entries if it encounters Western Digital-compatible protected mode block devices in your system.
- One new section, **[drivers]**, contains a list of aliases for installable drivers, and another new section, **[mci]**, lists the Media Control Interface drivers.
- Many other changes in communications and enhanced mode capabilities for Windows 3.1 have created new entries in the **[386enh]** section.

WIN.INI: The Windows Initialization File

The WIN.INI file contains several sections, each of which consists of a group of related entries that you can use to customize the Windows environment. A specific WIN.INI file might not have all of these sections, or it might have additional sections, depending on your system's hardware and software requirements. For example, many Windows applications add entries in WIN.INI to define user preferences and other items.

For Windows 3.1, the size of WIN.INI is no longer limited to 32K.

These basic sections can appear in WIN.INI after you first install Windows.

<i>Section</i>	<i>Purpose</i>
[Windows]	Affects several elements of the Windows environment.
[desktop]	Controls the appearance of the desktop and the position of windows and icons.
[extensions]	Associates specified types of files with corresponding applications.
[intl]	Describes how to display items for countries other than the United States.
[ports]	Lists all available output ports.
[fonts]	Describes the screen font files that are loaded by Windows.
[fontSubstitutes]	Lists pairs of fonts that are recognized by Windows as interchangeable.
[TrueType]	Describes options for using and displaying TrueType fonts.
[mci extensions]	Associates specified types of files with Media Control Interface devices.
[network]	Describes network settings and previous network connections.
[embedding]	Lists the server objects used in Object Linking and Embedding (OLE).
[Windows Help]	Lists settings used to specify the default size, placement, and text colors of the Help window and dialog boxes.
[sound]	Lists the sound files assigned to each system event.
[printerPorts]	Lists active and inactive output devices to be accessed by Windows.
[devices]	Lists active output devices that provide compatibility with earlier versions of Windows applications.
[programs]	Lists additional paths that Windows will search to find a program file when you try to open an associated data file.
[colors]	Defines colors for the Windows display.

More sections can be inserted in WIN.INI by other Windows applications, although some applications set up their own .INI files. For information about those sections, see the application's documentation.

[Windows] Section

This section contains entries that affect these parts of the Windows environment:

- Applications that start when you start Windows
- Warning beep
- Printing
- Window border width
- Keyboard speed
- Mouse settings
- Definition of files as documents or programs

The **[Windows]** section can contain the following entries:

Beep=XE "Beep="*%Yes | No*

This entry specifies whether Windows sounds a warning beep when you attempt to do something that is not allowed. The default is **Yes**. To change this entry, choose the Sound icon from Control Panel. For entries that control multimedia sound, see the description of **[sound]** section later in this chapter.

BorderWidth=XE "BorderWidth="*%number*

This entry sets the width of the borders around all the windows that have sizeable borders. The possible range is **1** (narrowest) to **49** (widest). The default is **3**. To change this entry, choose the Desktop icon from Control Panel.

CoolSwitch=XE "CoolSwitch="*%0 | 1*

This entry turns fast task switching on or off. The default is **1**. To change this entry, choose the Desktop icon from Control Panel and check or clear the Fast **ALT+TAB** Switching option.

CursorBlinkRate=XE "CursorBlinkRate="*%milliseconds*

This entry indicates how much time elapses between each blink of the selection cursor. The default is **530**. To change this entry, choose the Desktop icon from Control Panel.

DefaultQueueSize=XE "DefaultQueueSize="§*number*

This entry specifies the number of messages an application's message queue can hold. The default is **8**. To change this entry, you must edit WIN.INI. (You should never need to change this entry.)

Device=XE "Device="§*output-device-name, device-driver, port-connection*

This entry defines the default printer. The *output-device-name* can be any device name listed in the **[devices]** section. An explicit port and driver must be assigned to the device. The *device-driver* is the filename (without the extension) of the device driver file. The *port-connection* is any port in the **[ports]** section. The default is none. To change this entry, choose the Printers icon from Control Panel or choose Printer Setup from the Option menu in Print Manager.

DeviceNotSelectedTimeout=XE "DeviceNotSelectedTimeout="§*seconds*

This entry specifies how much time Windows waits for a device to be switched on. An entry is saved for each printer listed in the **[printerPorts]** section. If the device is not switched on during this time, Windows won't print to the device. For some devices, Windows immediately posts an error message if the device is not already switched on. The default is **15**. To change this entry, you must edit WIN.INI. This entry only defines the system default value. To change the value for a particular printer, choose the Printers icon from Control Panel, which changes the corresponding value only in the **[printerPorts]** section.

Documents=XE "Documents="§*extensions*

This entry defines files to be considered "documents" by Windows. Use this entry to define only document file extensions not listed in the **[extensions]** section, because those extensions are automatically considered documents. The extensions listed in this entry are not associated with any application. Separate the filename extensions with a space, and do not include the preceding periods. The default is none. To change this entry, you must edit WIN.INI.

DosPrint=XE "DosPrint="§*Yes | No*

This entry specifies whether Windows should use MS-DOS interrupts when printing. When this entry is **Yes**, MS-DOS interrupts are used; if the value is **No**, printing output is sent directly to the

port that the printer is assigned to. The default is **No**. To change this entry, choose the Printers icon from Control Panel or the Printer Setup command from the Print Manager Options menu, then clear the Fast Printing Direct To Port option in the Connect dialog box.

DoubleClickHeight=XE "DoubleClickHeight="\$pixels

DoubleClickWidth=XE "DoubleClickWidth="\$pixels

These entries specify the height and width (in pixels) that the mouse pointer can move between clicks in a double-click. If the mouse pointer is moved farther up or down (or left or right), the two clicks will be treated as separate single clicks. For example, if **DoubleClickHeight=10**, the mouse pointer cannot move vertically more than 5 pixels between clicks for the two clicks to be recognized as a double-click. If you enter an odd number, it is rounded to the nearest even number. The default is **4** for both entries. To change these entries, you must edit WIN.INI.

DoubleClickSpeed=XE "DoubleClickSpeed="\$milliseconds

This entry sets the maximum time between clicks of the mouse button that the system will permit for one double-click. The lower the value for this entry, the less time you have to click twice to double-click. The default is **452**. To change this entry, choose the Mouse icon from Control Panel.

KeyboardDelay=XE "KeyboardDelay="\$milliseconds

This entry establishes how much time elapses after you hold down a key before the key starts to repeat. The default is **2**. To change this entry, choose the Keyboard icon from Control Panel.

KeyboardSpeed=XE "KeyboardSpeed="\$milliseconds

This entry sets how much time elapses between repetitions of a character on the display when you hold down a keyboard key. This entry does not work for all keyboards. The default is **31**. To change this entry, choose the Keyboard icon from Control Panel. If you delete this entry from WIN.INI, Windows Setup will not reset the speed, but the speed will still be set if you choose the Keyboard icon in Control Panel, even if you cancel the dialog box.

Load=XE "Load="§filename(s)

This entry specifies the applications to be run as icons when Windows is started. This entry is a list of application filenames, or documents associated with an application, with each filename separated by a space. Make sure to specify the path if the file is not located in the WINDOWS directory. The default is none. To change this entry, add the application to the Startup group in Program Manager, then check Minimize On Use in the Properties dialog box.

MenuDropAlignment=XE "MenuDropAlignment="§0 | 1

This entry specifies whether menus open so that they are right aligned or left aligned with the menu title. If this entry is **0**, menus open so that they are left aligned. If it is **1**, menus open so that they are right aligned. The default is **0**. To change this entry, you must edit WIN.INI.

MenuShowDelay=XE "MenuShowDelay="§milliseconds

This entry specifies how long to wait before displaying a cascading menu. The default is **0** for 80386 computers; **400** for 80286 computers. To change this entry, you must edit WIN.INI.

MouseSpeed=XE "MouseSpeed="§0 | 1 | 2

This entry sets the relationship between mouse and cursor movement when the value of either **MouseThreshold1=** or **MouseThreshold2=** is exceeded. When this occurs, Windows causes cursor movement to accelerate according to the value of **MouseSpeed=**. If the value is **0**, there is no acceleration. If the value is **1**, the cursor is moved twice the normal speed when mouse movement exceeds the value of **MouseThreshold1=**. If the value is **2**, the cursor is moved twice the normal speed when the mouse movement exceeds the value of **MouseThreshold1=**, or four times the normal speed if mouse movement exceeds **MouseThreshold2=**. The default is **1**. To change this entry, choose the Mouse icon from Control Panel.

MouseThreshold1=XE "MouseThreshold1="§pixels
MouseThreshold2=XE "MouseThreshold2="§pixels

These entries set the maximum number of pixels that the mouse can move between mouse interrupts before Windows alters the relationship between mouse and cursor movement. If the mouse movement exceeds the threshold defined by **MouseThreshold1=** and if **MouseSpeed=** is greater than **0**, Windows moves the cursor at twice the normal speed. If the mouse movement exceeds the threshold defined by **MouseThreshold2=** and if **MouseSpeed=2**, Windows moves the cursor at four times the normal speed. The defaults are **MouseThreshold1=5** and **MouseThreshold2=10**. To change these entries, choose the Mouse icon from Control Panel.

MouseTrails=XE "MouseTrails="§number

This entry specifies the number of pointers shown on the screen when the MouseTrails option is selected in the Mouse dialog box in Control Panel. You can specify a number between **1** and **7**. This entry is supported only if you are using the EGA, VGA, or SupervGA display driver. The default is none. To change this entry, choose the Mouse icon from Control Panel. If the Mouse dialog box does not include the Mouse Trails option, you need to add this entry to WIN.INI to set mouse trails.

NetWarn=XE "NetWarn="§0 | 1

This entry specifies whether Windows should display a warning

message if the system is configured to run a network and the network is not running or the wrong network is running. All Windows network-related options will be disabled if the network is disabled or incorrect. Setting this value to **0** turns off the warning message. The default is **1**. To change this entry, choose the Network icon from Control Panel.

NullPort=XE "NullPort"=\$string

This entry specifies the name used for a null port. This name appears in the Printers Connect dialog box in Control Panel when a device is installed (that is, the device driver is present) but is not connected to any port. This value also appears for such a device in the **[devices]** section of WIN.INI. The default is **"None"**. To change this entry, you must edit WIN.INI.

Programs=XE "Programs"=\$extensions

This entry defines which files Windows regards as applications. Separate the filename extensions with a space and do not include the preceding periods. The default is **com exe bat pif**. To change this entry, you must edit WIN.INI.

Run=XE "Run"=\$filename(s)

This entry tells Windows to run the specified applications when Windows is started. The value is a list of application filenames or documents associated with applications, with each filename separated by a space. Make sure you specify the complete path if the file is not in the WINDOWS directory. The default is none. To change this entry, add the application to the Startup group in Program Manager.

ScreenSaveActive=XE "ScreenSaveActive"=\$0 | 1

This entry specifies whether a screen saver should be displayed if Windows is not actively being used. Set this value to **1** to use a screen saver; **0** turns off the screen saver. The default is **0**. To change this entry, choose the Desktop icon from Control Panel.

ScreenSaveTimeOut=XE "ScreenSaveTimeOut"=\$seconds

This entry specifies the amount of time that Windows must be idle before the screen saver appears. The default is **120**. To change this entry, choose the Desktop icon from Control Panel.

Spooler=XE "Spooler"=\$Yes | No

This entry specifies whether output to the printer is to be sent through Print Manager. Changing this value to **No** turns off Print Manager. The default is **Yes**. To change this entry, choose the

Printers icon from Control Panel and check or clear the Use Print Manager option.

SwapMouseButtons=XE "SwapMouseButtons=%0 | 1

This entry specifies whether to swap the right and left mouse buttons. If the value is **1**, the buttons are swapped. The default is **0**. To change this entry, choose the Mouse icon from Control Panel.

TransmissionRetryTimeout=XE

"TransmissionRetryTimeout=%seconds

This entry specifies the default amount of time to give Windows for attempted transmission retries. A value is saved for each printer in the **[printerPorts]** section. If a successful transmission does not occur during this time, Print Manager displays a message stating that the printer is not receiving characters. The default is **90** for PostScript printers; **45** for all other printers. To change this entry, you must edit WIN.INI. This setting serves only as the system default value. To change the value for a particular printer, choose the Printers icon from Control Panel or choose Printer Setup from the Options menu in Print Manager. Changing this setting with Control Panel or Print Manager changes the corresponding value only in the **[printerPorts]** section.

[desktop] Section

The **[desktop]** section contains entries that control the appearance of the screen background and the position of windows and icons on the screen. This section can contain the following entries:

GridGranularity=XE "GridGranularity=%number

This entry specifies the size of the grid that Windows uses to position windows on the screen. The possible range is **0** through **49**, in units of 8 pixels. The default is **0**. To change this entry, choose the Desktop icon from Control Panel.

IconSpacing=XE "IconSpacing=%pixels

This entry specifies the number of pixels that appear horizontally between icons. A larger number increases the space between icons. The default is **77**. To change this entry, choose the Desktop icon from Control Panel.

IconTitleFaceName=XE "IconTitleFaceName="§fontname

This entry specifies the font used to display icon titles. Change this value if the icon title is difficult to read. The default is **MS Sans Serif**. To change this entry, you must edit WIN.INI.

IconTitleSize=XE "IconTitleSize="§number

This entry specifies the size of the font used to display icon titles. Change this value if the icon title is difficult to read. The default is **8**. To change this entry, you must edit WIN.INI.

IconTitleWrap=XE "IconTitleWrap="§0 | 1

This entry specifies whether to wrap icon titles. A value of **1** allows icon title wrapping and increases icon vertical spacing by three lines; **0** turns off icon title wrapping. The default is **1**. To change this entry, choose the Desktop icon from Control Panel.

IconVerticalSpacing=XE "IconVerticalSpacing="§pixels

This entry specifies the number of pixels that will appear vertically between icons. Increasing this number increases the amount of vertical space between icons. Windows determines the default value based on the icon title font and the display you are using. To change this entry, you must edit WIN.INI.

Pattern=XE "Pattern="§b1 b2 b3 b4 b5 b6 b7 b8

This entry specifies a pattern for the screen background. The 8 numeric values define a bitmap 8 pixels wide and 8 pixels high. Each decimal value represents a byte, and each byte represents a row of 8 pixels, where **0** sets the corresponding pixel to the background color and **1** sets the corresponding pixel to the foreground color (specified by the **Background=** and **WindowText=** entries in the **[colors]** section, respectively). For example, if you set the *b1* value to the decimal value 175, the top row of pixels in the bitmap appears as the binary equivalent (10101111). The default is **"(None)"** (this string appears when no pattern is specified). To change this entry, choose the Desktop icon from Control Panel.

TileWallpaper=XE "TileWallpaper="§0 | 1

This entry specifies that the desktop wallpaper is tiled across the screen if this value is **1**. The wallpaper is centered if this value is **0**. The default is **0**. To change this entry, choose the Desktop icon from Control Panel.

Wallpaper=XE "Wallpaper="§*bitmap-filename*

This entry supplies the filename for the bitmap on the screen background. Include the path if the file is not in the WINDOWS directory or SYSTEM subdirectory. The default is **"(None)"** (this string appears when no pattern is specified). To change this entry, choose the Desktop icon from Control Panel.

[extensions] Section

The **[extensions]** section contains entries that identify document files with corresponding command lines, so that opening a document file automatically starts the application. The format for each entry is:

extension=command-line

<i>Value</i>	<i>Meaning</i>
<i>extension</i>	A filename extension of one to three characters.
<i>command-line</i>	An ordinary MS-DOS command line. The command line always begins with an application filename (including the .EXE extension). This can be followed by any command parameters the application needs, usually including the document filename. The caret (^) character can be used when the original document filename is needed in the command line; the caret is replaced by the document filename without any extension.

The most typical **[extensions]** entries simply list the application name and the document name; for example:

CAL=CALENDAR.EXE ^CAL

If you run a file called MYFILE.CAL after this association has been made, the Calendar program starts and automatically opens the file MYFILE.CAL.

You can enter only one line per extension (.TXT, .INI, and others), but more than one line for any program (for example, separate lines to indicate that Write should be used for .TXT, .INI, and .WRI files). To change an entry in **[extensions]**, choose Associate from the File menu in File Manager. Windows also updates this entry from any changes made in the Registration Info Editor. If an entry in **[extensions]** duplicates information in the registration database, File Manager uses the information from the database.

[intl] Section

The **[intl]** section describes how to display dates, times, currency amounts, and other items for countries other than the United States. The default values reflect U.S. options. To change any entry in this section, choose the International icon from Control Panel. For details about the specific values for individual entries, see the WININI.WRI file in your WINDOWS directory.

The **[intl]** section can contain the entries shown in the following table. If the keyword begins with an “i” then the value is an integer; if the keyword begins with “s” then the value is a string.

Entry	Value
iCountry=XE "iCountry="	\$country Specifies the country code. This number matches the country's international telephone code, except for Canada, which is 2. The default is 1.
iCurrDigits=XE "iCurrDigits="	\$number Specifies the number of digits to put after the decimal separator in currency. The default is 2.
iCurrency=XE "iCurrency="	\$number Specifies a currency format, where 0 = \$2, 1 = 2\$, 2 = \$ 2, and 3 = 2. The default is 0. The actual currency symbol is specified by the sCurrency= value.
iDate=XE "iDate="	\$number Specifies a numerical date format for compatibility with Windows 2.x, where 0 = 12/31/90, 1 = 31/12/90, and 2 = 90/12/31. The default is 0. The actual date divider is specified by the sShortDate= value.
iDigits=XE "iDigits="	\$number Specifies the number of digits to display after the decimal separator in numbers. The default is 2.
iLZero=XE "iLZero="	\$0 1 Specifies whether to put leading zeros in decimal numbers, where 0 = .7 and 1 = 0.7. The default is 0. The actual decimal separator is specified by the sDecimal= value.
iMeasure=XE "iMeasure="	\$0 1 Specifies the measurement system as metric or English, where 0 = metric and 1 = English. The default is 1.

iNegCurr=XE "iNegCurr="*\$number* Specifies a negative number format, where:

0 = (\$1)	3 = \$1–	6 = 1–\$
	9 = –\$ 1	
1 = –\$1	4 = (1\$)	7 = 1\$–
	0 = \$ 1–	
2 = \$–1	5 = –1\$	8 = –1 \$

The default is **0**. The actual currency symbol is specified by the **sCurrency=** value.

iTime=XE "iTime="*\$number* Specifies whether to format time using a 12-hour or 24-hour clock, where **0** = 1:00 (12-hour clock) and **1** = 13:00 (24-hour clock). The default is **0**. The actual time separator is specified by the **sTime=** value.

iTLZero=XE "iTLZero="*\$number* Specifies whether to put leading zeros in time, where **0** = 9:15 and **1** = 09:15. The default is **0**. The actual time separator is specified by the **sTime=** value.

<i>Entry</i>	<i>Value</i>	<i>(continued)</i>
s1159=XE "s1159="	<i>%string</i>	Specifies the string that follows times before noon in the 12-hour format or times after noon in the 12-hour format or that follows all times in the 24-hour format. The default is PM .
s2359=XE "s2359="	<i>%string</i>	Specifies the string that follows times after noon in the 12-hour format or that follows all times in the 24-hour format. The default is PM .
sCountry=XE "sCountry="	<i>%string</i>	Specifies the name of the country whose standard value you want to use. The default is United States .
sCurrency=XE "sCurrency="	<i>%string</i>	Specifies the currency symbol you want to use. The default is \$.
sDecimal=XE "sDecimal="	<i>%string</i>	Specifies the punctuation used to separate the fractional part of a decimal number from the whole number part. The default is . (a period).
sLanguage=XE "sLanguage="	<i>%string</i>	Specifies the language you want to work in. Windows applications that provide language specific tasks, such as sorting or spell checking, use this entry. The default is enu . Values are: dan = Danish frc = French Canadian deu = German isl = Icelandic eng = International English ita = Italian enu = U.S. English nld = Dutch esn = Modern Spanish nor = Norwegian esp = Castilian Spanish ptg = Portuguese fin = Finnish sve = Swedish fra = French
sLis=XE "sLis="	<i>%string</i>	Specifies the character used to separate items in a list. In U.S. English, the most common separator is a comma. The default is , (a comma).
sLongDate=XE "sLongDate="	<i>%format</i>	Specifies your choices for the long date formats, including abbreviations for the words and separators. Control Panel will accept only certain <i>format</i> combinations. Therefore, you should use Control Panel to change these entries. The

default is **dddd, MMMM dd, yyyy** (that is, Friday, June 1, 1990). Values are:

d = Day (1–31) **MM** = Month (01–12)

dd = Day (01–31) **MMM** = Month (Jan–Dec)

ddd = Day (Mon–Sun) **MMMM** = Month (January–December)

dddd = Day (Monday–Sunday) **yy** = Year (00–99)

M = Month (1–12) **yyyy** = Year (1900–2040)

sShortDate=XE "sShortDate="§format Specifies a choice for the short date format, including abbreviations for the words and separators, according to the list described for **sLongDate=**. Control Panel will accept only certain *format* combinations. Therefore, you should use Control Panel to change this setting. The default is **M/d/yy** (that is, 6/1/90).

sThousand=XE "sThousand="§string Specifies the symbol used to separate thousands. For example, if the value is a comma (,), the number appears as 3,000. The default is , (a comma).

sTime=XE "sTime="§string Specifies the character used to separate the hours, minutes, and seconds in time. For example, if the value is a colon (:), the time appears as 15:29:31. The default is : (a colon).

[ports] Section

This section lists the available communications and printer ports, defines default values, and lists files to which printer output can be sent. You can specify up to 10 ports. This is similar to the **mode** command for MS-DOS.

This section can contain one or more entries in this format:

portname:=baud-rate, parity, word-length, stop-bits [[, p]]

<i>Value</i>	<i>Meaning</i>
<i>portname</i>	The name of an output port as it is recognized by MS-DOS. This can be: COMx:= for a communications port, where <i>x</i> represents the port number. LPTx:= for a parallel port, where <i>x</i> represents the port number. EPT:= for a specific IBM printer. FILE:= for a filename. LPTx.DOS= for a parallel port, where <i>x</i> represents the port number. Connecting to LPT2.DOS can bypass Windows handling or print output. Choose this option if you have trouble printing.
<i>baud-rate</i>	Specifies a COM port's baud rate.
<i>parity</i>	Specifies the parity setting for a COM port.
<i>word-length</i>	Specifies the length of a word (in bits) for a COM port.
<i>stop-bits</i>	Specifies the number of stop bits to be used for a COM port.
[[,p]]	Specifies that hardware handshaking is in effect.

Values for LPT, EPT, FILE, and LPTX.DOS ports do not take any parameters.

Specify a filename for the *portname* value to direct output to that file. A filename, unlike the other port names, must not be followed by a colon (:). If you specify a value for **FILE:=**, Windows will prompt you to specify an output file each time you print.

To change COM port settings, choose the Ports icon from Control Panel. To change or add other ports, you must edit WIN.INI.

LPT1.DOS=*path*

LPT2.DOS=*path*

LPT3.DOS=*path*

LPT4.DOS=*path*

*Flowchart 4.2
Cannot Print
on Network*

These settings are used (instead of the corresponding LPT ports) to specify the path of the printer you are using. This allows you to print directly to a parallel port. Use these settings to bypass Windows special handling for parallel port output. The default is none. To change this entry, you must edit WIN.INI.

[fonts] Section

The **[fonts]** section describes the screen font files that Windows loads at startup. To change this entry, choose the Fonts icon from Control Panel. This section can contain one or more entries in this format:

font-name=font-filename

<i>Value</i>	<i>Meaning</i>
<i>font-name</i>	The descriptive name of a font.
<i>font-filename</i>	The filename of a file that contains font resources.

Note Adding entries to the **[fonts]** section will not install a font. You must choose the Fonts icon in Control Panel to install new fonts.

[fontSubstitutes] Section

The **[fontSubstitutes]** section describes fonts recognized by Windows as identical to another typeface. This is useful if you want to work on documents that include screen fonts that are not supported by Windows 3.1, but were supported by Windows 3.0.

The **[fontSubstitutes]** section contains one or more occurrences of the following entry:

font-name=XE "font-name="§font-name

These entries specify the font that Windows will use in place of another font, only if that font is not installed on your system. For example, if you are viewing a document that is formatted in Helvetica, but Helvetica is not installed on your system, Windows will use Arial to display the document. To change this entry, you must edit WIN.INI. The default entries for this section are:

```
[fontSubstitutes]
Helv=MS Sans Serif
Tms Rmn=MS Serif
Times=Times New Roman
Helvetica=Arial
```


[TrueType] Section

The **[TrueType]** section describes options that affect the use and display of TrueType fonts in your Windows applications. The **[TrueType]** section can contain the following entries:

OutlineThreshold=XE "OutlineThreshold="§number-of-pels-per-em

This entry specifies the number of pels-per-em at which Windows will render TrueType fonts as outline fonts instead of as bitmap fonts. Using bitmap fonts is faster, but requires more memory. If your system is low on memory, decrease this value. Do not specify a value over **300**. If you do, you might encounter problems with TrueType fonts. The default is **256**. To change this entry, you must edit WIN.INI.

TTEnable=XE "TTEnable="§0 | 1

This entry controls whether TrueType fonts are available. Setting this value to **1** makes TrueType fonts available in your Windows applications. Setting this value to **0** turns off TrueType fonts so they are unavailable in applications. The default is **1**. To change this entry, choose the Fonts icon from Control Panel.

TTIfCollisions=XE "TTIfCollisions="§0 | 1

This entry specifies whether to use TrueType fonts in place of other fonts if both types of fonts are installed on your system and have the same font name. If this value is set to **1**, the TrueType font will be used. For example, Windows provides both a bitmap and a TrueType version of the Symbol font. If you set this value to **0**, Windows will use the TrueType version. The default is **0**. To change this entry, you must edit WIN.INI.

TTOnly=XE "TTOnly="§0 | 1

This entry specifies whether to make only TrueType fonts available in Windows applications. If this value is set to **1**, only TrueType fonts are available. If this value is set to **0**, all fonts installed on your system are available. The default is **0**. To change

this entry, choose the Fonts icon from Control Panel.

[mci extensions] Section

W

The **[mci extensions]** section contains entries that associate different types of media files with Media Control Interface drivers. Whenever a media file is selected, Windows will use the associated driver to play it. This section can contain one or more occurrences of the following entry:

extension=mcidevice-type

[network] Section

The **[network]** section describes network settings and previous network connections. The **[network]** section can contain the following entries:

drive=*network-server-and-share*

This entry shows the network connections that are restored each time Windows is started. To change this entry, choose the Network Connections command from the Disk menu in File Manager.

InRestoreNetConnect=XE "InRestoreNetConnect="\$0 | 1

This entry specifies whether to reconnect to the network servers you were connected to in your previous Windows session. This setting works for MS-Net, LAN Manager Basic, and LAN Manager 2.0. If this value is set to **1**, you will be reconnected to the network servers each time you start Windows. If this value is set to **0**, you will not be reconnected. The default is **1**. To change this entry, choose the Networks option from Control Panel, or if the Network dialog box for your network does not include a reconnect option, edit WIN.INI.

port=*network-printer-path*

This entry defines the path for a network printer and the port the printer is assigned to. This connection is restored each time Windows is started. To change this entry, choose the Printers

option from Control Panel, or the Network Connections command from the Options menu in Print Manager.

[embedding] Section

The **[embedding]** section lists the Object Linking and Embedding (OLE) objects, their description, the program that is used to create them, and their file format. This information also appears in the Registration Info Editor. We recommend that you use the Registration Info Editor to register applications or edit application information for OLE. The **[embedding]** section is included in WIN.INI only to maintain compatibility with Windows 3.0 and 3.0 applications. The **[embedding]** section can contain one or more entries in the following format to specify the objects used as servers for OLE:

object=description, description, program file, format

<i>Value</i>	<i>Meaning</i>
<i>object</i>	Specifies the name of the server object.
<i>description</i>	Provides a description of the server object. The second description appears in the list of registered file types in the Registration Info Editor.
<i>program file</i>	Identifies the path and name of the executable file for the application that is used to create the object.
<i>format</i>	Identifies the format of the file. The value for this entry is most often picture , which is the Windows Metafile format. To change this entry, use the Registration Info Editor.

[Windows Help] Section

The **[Windows Help]** section includes settings that specify the size and placement of the Help window and dialog boxes, as well as the color of text that, when chosen, displays a macro, pop-up window, or new panel. The **[Windows Help]** section can include the following entries:

M_WindowPosition=XE "M_WindowPosition="*\$number,number,
 number,number,number*
H_WindowPosition=XE "H_WindowPosition="*\$number,number,
 number,number,number*
A_WindowPosition=XE "A_WindowPosition="*\$number,number,
 number,number,number*
C_WindowPosition=XE "C_WindowPosition="*\$number,number,
 number,number,number*

These entries define the default size and position of the main Help window, and the History, Annotate, and Copy dialog boxes. The first and second *number* values define the *x* and *y* coordinates of the upper-left corner for the default position of the main Help window and the dialog boxes. The third and fourth *number* values define the default width and height (in pixels) of the Help window and dialog boxes. The fifth *number* specifies whether the main Help window is maximized, where **1** is maximized, and **0** is the default height and width of the window. Changing this value has no effect on the size of the dialog boxes, because they cannot be maximized.

To change this entry, move or size the main Help window, or the History, Annotate, or Copy dialog boxes. The values are updated in WIN.INI automatically.

IFJumpColor=XE "IFJumpColor="*\$red-value green-value blue-value*

This entry specifies the color of text that, when chosen, leads to a new panel of information in another help file. To change this entry, you must edit WIN.INI.

IFPopupColor=XE "IFPopupColor="*\$red-value green-value blue-value*

This entry specifies the color of text that, when chosen, displays a pop-up panel (the type of panel used for glossary definitions) located in a different help file. To change this entry, you must edit WIN.INI.

JumpColor=XE "JumpColor="*\$red-value green-value blue-value*

This entry specifies the color of text that leads to a new panel of

help information. For example, entering **000 000 000** as values results in black text on a white background. To change this entry, you must edit WIN.INI.

MacroColor=XE "MacroColor="\$red-value green-value blue-value

This entry specifies the color of text that, when chosen, runs a Help macro. To change this entry, you must edit WIN.INI.

PopupColor=XE "PopupColor="\$red-value green-value blue-value

This entry specifies the color of text that, when chosen, displays a pop-up panel (the type of panel used for glossary definitions). For example, entering **000 000 000** as values results in black text on a white background. To change this entry, you must edit WIN.INI.

[sound] Section

The **[sound]** section lists the system events that support sound and the sound files that are assigned to each event. The **[sound]** section can contain one or more occurrences of the following entry:

system event=filename,description

This entry specifies the sound file assigned to and a description of a *system event*. The *filename* keyname is the name of the sound file. The *description* keyname is a text string that describes the system or application event. To change this entry, choose the Sound icon in Control Panel.

[printerPorts] Section

The **[printerPorts]** section lists the active and inactive printers that can be accessed by Windows device drivers, specifies the communications port or ports to which the devices are connected, and specifies their corresponding timeout values. This section can contain one or more entries in this format:

device=driver, port, DeviceTimeout, RetryTimeout [, other ports . . .]

<i>Value</i>	<i>Meaning</i>
<i>device</i>	The name of the device.
<i>driver</i>	The driver filename, with path if necessary.
<i>port</i>	Specifies the port the device is connected to. If a device is not currently connected, the value is the NullPort= entry of the [Windows] section. There is a set of <i>port</i> , <i>DeviceTimeout</i> , and <i>RetryTimeout</i> values for each port that has a printer of the specified type.
<i>DeviceTimeout</i>	Determines the number of seconds that Print Manager will wait for the device to be switched on.
<i>RetryTimeout</i>	Determines the number of seconds before attempted transmission retries. This value might need to be increased for network printers.

If the timeout values are not specified for a particular port, Windows uses the default values listed in the **[Windows]** section for that port.

To change this entry, choose the Printers icon from Control Panel or choose Printer Setup from the Options menu in Print Manager, then choose Connect.

Important When changing an entry in this section, be sure it does not conflict with a corresponding entry in the **[devices]** section. Problems can occur if a connected device does not appear in the **[printerPorts]** section.

[devices] Section

The **[devices]** section lists the active printers, and is necessary only for compatibility with Windows version 2.x applications. The entries in this section are identical to those in the **[printerPorts]** section, without the timeout values. The **[devices]** section can contain one or more entries in this format:

device=driver, port [, other ports . . .]

The values specified are identical to the first three items in the **[printerPorts]** section. To change this entry, choose the Printers icon from Control Panel.

Important When changing an entry in the **[devices]** section, be sure it does not conflict with a corresponding entry in the **[printerPorts]** section. Problems can occur if a connected device does not appear in the **[printerPorts]** section.

[programs] Section

The **[programs]** section identifies the paths, in addition to those in the AUTOEXEC.BAT file, that Windows will search to start an application. If you try to open a data file associated with an application, and Windows cannot find the program file needed to start the application, Windows will prompt you to supply the path for the program file. The path you specify is automatically added to the **[programs]** section of WIN.INI. Windows will search the path for the program file the next time you want to start an application by opening an associated data file. The **[programs]** section can contain one or more occurrences of the following entries to specify the drive, directory, and executable program file needed to start an application:

program file=drive:directory\program file

<i>Value</i>	<i>Meaning</i>
<i>program file</i>	Specifies the name of the program file that Windows was searching for when you tried to open the associated data file.

<i>drive</i>	Specifies the drive on which the program file is located.
<i>directory</i>	Specifies the directory in which the program file is located. The second <i>program file</i> keyname specifies the name of the executable program file, located in the specified drive and directory, needed to start the associated application.

To change this entry, complete the dialog box in File Manager that prompts you for the path if you try to open an application that it can't find.

[colors] Section

The **[colors]** section defines the colors for components of the Windows display. To change these entries, choose the Color icon from Control Panel. This section can contain entries in this format:

component=red-value green-value blue-value

<i>Value</i>	<i>Meaning</i>
<i>component</i>	Any one of these keynames: ActiveBorder (the border of the active window) ActiveTitle (the title bar of the active window) AppWorkspace (the application workspace for Windows applications) Background (refers to the desktop) ButtonFace ButtonShadow ButtonText GrayText (text that is dimmed, as in an unavailable command name) Hilight (the background of highlighted text) HilightText (the highlighted text itself) InactiveBorder (the border of an inactive window) InactiveTitle (the title bar of an inactive window) InactiveTitleText (text in an inactive title bar) Menu (the background of menus) MenuText Scrollbar TitleText (the text in the title bar) Window (the workspace in a window) WindowFrame WindowText
<i>red-value</i>	Integers that specify the relative intensities of the respective colors.
<i>blue-value</i> <i>green-value</i>	These values can range from 0 (minimum intensity) to 255 (maximum intensity).

SYSTEM.INI: The System Initialization File

When you install Windows, Setup creates the SYSTEM.INI file, which contains global system information that Windows uses when it starts. The following sections can appear in SYSTEM.INI.

<i>Section</i>	<i>Purpose</i>
[boot]	Lists drivers and Windows modules.
[boot.description]	Lists the names of devices you can change using Windows Setup.
[drivers]	Contains a list of aliases (or names) assigned to installable driver files.
[keyboard]	Contains information about the keyboard.
[mci]	Lists Media Control Interface (MCI) drivers.
[NonWindowsApp]	Contains information used by non-Windows applications.
[standard]	Contains information used by Windows in standard mode.
[386enh]	Contains information used by Windows in 386 enhanced mode.

Setup assigns a value to each entry in the **[boot]** and **[keyboard]** sections, and to the **Device=** entry and its synonyms in the **[386enh]** section. These entries must appear in SYSTEM.INI for Windows to function properly. These entries do not have built-in values, but have specific values that Setup assigns when you install Windows.

Many of the other entries described in this chapter are rarely needed and will not appear in the SYSTEM.INI file unless you add them yourself. Most of these entries have built-in values that are present whether the entry appears in SYSTEM.INI. You might need to change one or more of these values to improve the performance of Windows or of a specific application.

The possible methods for changing values are noted for each entry in this chapter. You cannot change most SYSTEM.INI entries through Control Panel, but you can change many settings by running Setup. Other values in SYSTEM.INI can be changed only by opening the file

and editing it with a text editor such as Notepad.

Any changes you make to the SYSTEM.INI file do not take effect until you restart Windows.

Important Always back up the SYSTEM.INI file before you open it. Use extreme care when making changes with a text editor, because you can disable your system if you edit the file incorrectly. If the entry can be changed without editing SYSTEM.INI, use that recommended method.

This section describes the contents of the SYSTEM.INI file and how to change values for entries in the file.

[boot] Section

The **[boot]** section contains a list of the drivers and Windows modules that Windows uses to configure itself each time you start it.

Important All entries in this section are required. If you modify or delete one of these entries, Windows might not start or operate properly. Setup assigns all values based on your system configuration; there are no built-in values for these entries.

The **[boot]** section can contain the following entries:

286grabber=XE "286grabber=%filename

This entry specifies the filename of the grabber, which is the device driver that makes a non-Windows application visible when you run Windows in standard mode. The default is none (blank). To change this entry, choose the Windows Setup icon from the Main Group window and change the Display setting. If you are installing a device driver that is not included with Windows, exit Windows and run Setup from MS-DOS.

386grabber=XE "386grabber=%filename

This entry specifies the filename of the grabber, which is the device driver that makes a non-Windows application visible when you run Windows in 386 enhanced mode. The default is none (blank). To change this entry, choose the Windows Setup icon from the Main Group window and change the Display setting. If you are installing a device driver that is not included with

Windows, exit Windows and run Setup from MS-DOS.

CachedFileHandles=XE "CachedFileHandles="§number

This entry specifies the number of the most recently-used executable files (.EXE) and dynamic-link library files (.DLL) that can remain open. Windows keeps these files open so that they can be accessed quickly, ensuring optimal performance. However, some networks have a limit on the number of files that can be open on a server at a time. If you have problems running Windows from a network server, use a lower number for this value. Valid numbers are **2** through **12**. The default is **12**. To change this entry, you must edit SYSTEM.INI.

comm.drv=XE "comm.drv="§filename

This entry specifies the filename of the serial communications driver you are using. The default is none (blank). To change this entry, you must edit SYSTEM.INI.

display.drv=XE "display.drv=%filename

This entry specifies the filename of the display driver you are using. The default is none (blank). To change this entry, choose the Windows Setup icon from the Main Group window. If you are installing a device driver that is not included with Windows, exit Windows and run Setup from MS-DOS.

drivers=XE "drivers=%filename | aliasname

This entry specifies the filenames or aliases of the installable drivers that load when Windows is started. An installable driver is a dynamic-link library that Windows treats like a device driver. If the drivers you want to use include parameters, you must specify them by alias name as defined in the **[drivers]** section of SYSTEM.INI, where you can list several filenames or aliases. The default is none (blank). Most Setup programs for Windows applications add these settings to the SYSTEM.INI file when installing drivers, so you shouldn't need to change the values. To change this entry, you must edit SYSTEM.INI.

fixedfon.fon=XE "fixedfon.fon=%filename

This entry specifies the filename of the fixed system font used by Windows version 2.x applications. The default is none (blank). To change this entry, choose the Windows Setup icon from the Main Group window. This entry also changes when you change the Display setting in Setup.

fonts.fon=XE "fonts.fon=%filename

This entry specifies the filename of the proportionately spaced system font used by Windows 3.1. The default is none (blank). To change this entry, choose the Windows Setup icon from the Main Group window. This entry also changes when you change the Display setting in Setup.

keyboard.drv=XE "keyboard.drv=%filename

This entry specifies the filename of the keyboard driver you are using. The default is none (blank). To change this entry, choose the Windows Setup icon from the Main Group window and change the setting for the Keyboard option.

language.dll=XE "language.dll"=%library-name

This entry specifies the name of the dynamic-link library that supplies language-specific functions. If no language library is specified, Windows uses the built-in U.S. English library. The default is none (blank). To change this entry, choose the International icon from Control Panel and change the setting for the Language option.

mouse.drv=XE "mouse.drv="%filename

This entry specifies the filename of the mouse driver you are using. The default is none (blank). To change this entry, choose the Windows Setup icon from the Main Group window and change the setting for the Mouse option.

network.drv=XE "network.drv="%filename

This entry specifies the filename of the network driver you are using. The default is none (blank). To change this entry, choose the Windows Setup icon from the Main Group window and change the setting for the Network option.

oemfonts.fon=XE "oemfonts.fon="%filename

This entry supplies the name of the font file for the OEM character set, which is associated with the Display setting. The default is none (blank). To change this entry, exit Windows and run Setup from MS-DOS. This entry also changes when you change the Codepage or Display setting in Setup.

shell=XE "shell="%filename

This entry specifies the Windows shell program that runs when you start Windows. Unless you change this entry, Program Manager will run when you start Windows. The default is none (blank). Setup initializes this value as **progman.exe**. To change this entry, you must edit SYSTEM.INI.

sound.drv=XE "sound.drv="%filename

This entry specifies the filename of the system sound driver you are using. The default is none (blank). To change this entry, you must edit SYSTEM.INI.

system.drv=XE "system.drv="%filename

This entry specifies the filename of the system hardware driver you are using. The default is none (blank). To change this entry, exit Windows and run Setup from MS-DOS, then choose a new System setting.

TaskMan.Exe=XE "TaskMan.Exe="%filename

This entry specifies the task-switching application that appears when you press **CTRL+ESC**. The default is **taskman.exe**. To change this entry, you must edit **SYSTEM.INI**.

[boot.description] Section

The **[boot.description]** section is a list of strings used to describe the devices you can change when you run Setup. There is no reason to change these entries. If you do change values, you cannot use Windows Setup to update drivers to newer versions.

[drivers] Section

This section contains a list of aliases (or names) assigned to installable driver files. The **[drivers]** section can contain this entry:

alias=driver filename[parameters]

This entry assigns an alias name to an installable driver and specifies any parameters used by the driver. This entry is associated with the **drivers=** entry in the **[boot]** section of SYSTEM.INI. If the driver includes parameters, you must assign an alias to it and then specify the driver by alias name in the **[boot]** section. You can define multiple aliases by specifying multiple alias lines in this entry. The default is none. Most Setup programs for Windows applications add these settings to SYSTEM.INI when installing drivers, so you shouldn't need to change the values. To change this entry, choose the Drivers icon in Control Panel or use the installation program provided by the manufacturer.

[keyboard] Section

The **[keyboard]** section provides information about the keyboard.

Important All entries in this section are required. If you modify or delete one of these entries, Windows will not operate properly. There are no built-in default values for these entries; Setup assigns values based on the system configuration.

The **[keyboard]** section can contain the following entries:

keyboard.dll=XE "keyboard.dll=%filename

This entry specifies the name of a dynamic-link library that defines the layout for non-U.S. keyboards and keyboards not compatible

with IBM-compatible systems. This entry is required for all keyboards except these U.S. keyboards: IBM XT, PC/AT, or enhanced; AT&T type 301 or 302; and Olivetti 83-key. To change this entry, choose the Windows Setup icon from the Main Group window or the International icon from Control Panel.

oemansi.bin=XE "oemansi.bin="\$filename

This entry specifies the name of a file that defines OEM/ANSI code-page translation tables for systems not using code page 437 (the U.S. OEM character set). To change this entry, exit Windows and run Setup from MS-DOS. This setting also changes when you change the Codepage or Display settings.

subtype=XE "subtype="\$number

This entry distinguishes, for some drivers, special features for keyboards that otherwise have identical layouts. This value can also be used by other drivers. To change the **subtype=** entry, choose the Windows Setup icon from the Main Group window. See the **type=** entry for information about type values. These values are defined for **subtype=**.

<i>Type value</i>	<i>Subtype value</i>	<i>Meaning</i>
1	2	Olivetti M24 83-key or AT&T 6300 type 301 83-key.
1	4	AT&T type 302 sometimes used on the 6300 Plus.
2	1	Olivetti 102-key ICO used on M24 systems.

type=XE "type="\$number

This entry specifies the keyboard type. It can be any one of these values.

<i>Value</i>	<i>Meaning</i>
1	IBM PC or XT compatible (83 keys)
2	Olivetti 102-key ICO
3	IBM AT compatible (84 or 86 keys)
4	IBM compatible, enhanced (101 or 102 keys)

If this entry is blank or missing, the driver selects a default type. For IBM-compatible keyboards (using the KEYBOARD.DRV driver), the default type is determined by the BIOS. To change this entry,

choose the Windows Setup icon from the Main Group window.

[mci] Section

W

The **[mci]** section contains a list of the drivers that use the Media Control Interface (MCI) to play media files. These drivers are installed automatically when you run Setup. To change these values, choose the Drivers icon in Control Panel.

[NonWindowsApp] Section

The **[NonWindowsApp]** section contains entries that affect the performance of non-Windows applications. This section can contain the following entries:

W

CommandEnvSize=XE "CommandEnvSize="*%bytes*

This entry specifies the size of the COMMAND.COM environment. Since running batch files with the extension .BAT starts COMMAND.COM, this setting also applies to batch files. The value for this setting must be either **0** or between **160** and **32768**. A value of **0** disables this setting. If the value is not valid, it will be rounded up to **160** or down to **32768**. If the value is less than the current size of the actual environment, this setting will be disabled, as if it were set to **0**. If you specified the environment size in a PIF for COMMAND.COM, the PIF setting overrides this setting. The default is **0** with MS-DOS versions earlier than 3.2. Otherwise, the value is the **/e:** parameter in the **shell=** line in CONFIG.SYS. To change this value, you must edit SYSTEM.INI.

W

DisablePositionSave=XE "DisablePositionSave="*%Boolean*

When this entry is **0**, the position and font used in a non-Windows application is saved in the DOSAPP.INI file when you quit the application. If this entry is **1**, any settings that weren't saved previously in DOSAPP.INI will not be saved. If this entry is **1**, the setting can be overridden for each non-Windows application by selecting the Save Settings On Exit checkbox in the Fonts dialog box. The default is **0**. To change this entry, you must edit SYSTEM.INI.

FontChangeEnable=XE "FontChangeEnable="§Boolean

This entry, if **1**, provides the ability to change the fonts when running non-Windows applications in a window on systems that use version 3.0 of the grabbers (usually in version 3.0 display drivers). Windows version 3.1 of the video grabbers (used in version 3.1 display drivers) include built-in support for changing fonts when running non-Windows applications in a window. If you are using a 3.0 grabber that has not been updated to include the ability to change fonts and you want to use this feature, set this value to **1**. However, when this entry is **1**, your screen may lose characters and the cursor may change size and position slightly. The default is **1** on systems that use Windows 3.1 grabbers, and **0** on systems that use Windows 3.0 grabbers. To change this entry, you must edit SYSTEM.INI.

GlobalHeapSize=XE "GlobalHeapSize="§kilobytes

This entry specifies the size of a buffer in conventional memory that Windows allocates when running in standard mode. This buffer can be used to share information among all non-Windows applications that are started from Windows. This setting has no effect when Windows is running in 386 enhanced mode. The default is **0**. To change this entry, you must edit SYSTEM.INI. (You should never need to change this setting.)

W**LocalTSRs=XE "LocalTSRs="§list-of-TSR-applications**

This entry specifies which terminate-and-stay-resident (TSR) programs work properly if they are copied to each instance of a virtual machine. When you start Windows, it detects any TSR programs that are currently running. If the TSR is on the **LocalTSRs=** list, Windows will place a copy of the TSR in each virtual machine you run. Many TSRS will not run properly if they are added to this list. Make sure your TSR is fully compatible with Windows and can be copied to a virtual machine before adding it to the list. The default is **dosedit, pced, ced**. To change this value, you must edit SYSTEM.INI.

MouseInDosBox=XE "MouseInDosBox="§Boolean

This entry specifies whether the mouse is supported when running a non-Windows application in a window. Mouse support for non-Windows applications running in a window is available automatically if you are using a Windows 3.1 version of the grabbers. If you are using a Windows 3.0 version of the grabbers and you want mouse support, enable this setting. If you do not want mouse support, disable this setting. The default is **1** if an MS-DOS mouse driver is loaded that has the extension .COM or .SYS and that supports using a mouse with a non-Windows application. Otherwise, the default is **0**. To change this entry, you must edit SYSTEM.INI.

NetAsynchSwitching=XE "NetAsynchSwitching="§0 | 1

This entry indicates whether you can switch away from an application running in Windows standard mode after it has made an asynchronous network BIOS call. The default value of **0** specifies that such task switching is not possible. Switching away from some applications that make these calls might cause the system to fail. Once Windows detects an asynchronous NetBIOS call, it will not allow switching away from the application even if no more of these calls are made. Set this value to **1** if you are sure the applications you use will not receive network messages while you are switched away from them. To change this entry, you must edit SYSTEM.INI.

ScreenLines=XE "ScreenLines="*\$number*

This entry specifies the number of lines displayed on the screen when a non-Windows application runs. An application that specifies a different screen mode can override this entry. The default is **25**. To change this entry, you must edit SYSTEM.INI.

SwapDisk=XE "SwapDisk="*\$drive:directory*

This entry provides the name of the disk drive and directory to which Windows standard mode swaps non-Windows applications. The default is the directory pointed to by the TEMP environment variable; if there is no TEMP variable, then the default is the boot directory of your first hard disk (usually C:). If your system does not have a hard disk, the default is the root directory on the first floppy drive (usually A:). To change this entry, you must edit SYSTEM.INI.

[standard] Section

The **[standard]** section contains entries that are specific to running Windows in standard mode. This section can contain the following entries:

FasterModeSwitch=XE "FasterModeSwitch="*\$0 | 1*

This entry, if set to **1**, causes Windows standard mode to use a faster method of switching from protected to real mode on many 80286-based computers. When this entry is **1**, Windows responds more quickly to hardware interrupts, allowing better throughput for interrupt-intensive applications, such as communications applications. Also, you should set this entry to **1** if you are using a Zenith Z-248 system and are losing characters while typing, or if you are using an Olivetti M-250-E and lose control of the mouse. The default is **0**. To change this entry, you must edit SYSTEM.INI.

Note

The value for **FasterModeSwitch=** has no effect on 80386-based computers. Some early IBM-AT and compatible computers do not have the BIOS support necessary to use this setting. Setting this entry to **1** on these computers may cause them to hang when starting Windows.

Int28Filter=XE "Int28Filter="%number

This entry specifies the percentage of INT 28h interrupts, generated when the system is idle, that are visible to software loaded before Windows. Windows will reflect every *n*th interrupt, where *n* is the value of this entry. For example, a value of **1** reflects every INT 28h interrupt, a value of **2** reflects every second INT 28h interrupt, a value of **3** reflects every third INT 28h interrupt, and so on.

Increasing this value might improve Windows performance, but may interfere with some memory-resident software such as a network.

Set this value to **0** to prevent INT 28h interrupts. But setting this value too low adds to system overhead that might interfere with communications applications. The default is **10**. To change this entry, you must edit SYSTEM.INI.

W

MouseSyncTime=XE "MouseSyncTime="§milliseconds

This entry specifies the number of milliseconds that can elapse between mouse data bytes before Windows running in standard mode assumes that a mouse data packet is complete. This setting only affects Windows standard mode on computers with an IBM PS/2 mouse interface. The default is **500**. To change this value, you must edit SYSTEM.INI.

NetHeapSize=XE "NetHeapSize="§kilobytes

This entry specifies the size of the data-transfer buffers that Windows standard mode allocates in conventional memory for transferring data over a network. If an application is not running correctly, your network may require a larger buffer than the default. Increasing this value will decrease the amount of memory available to applications. If no network software is running, this entry is ignored and no memory is allocated. The default is **8**. To change this entry, you must edit SYSTEM.INI.

PadCodeSegments=XE "PadCodeSegments="§0 | 1

Setting the value of this entry to **1** causes Windows Kernel to pad code segments with 16 bytes. This prevents the last instruction in the segment from being too close to the segment limit for 80286 C2 stepping. Set this value to **1** only for this 80286 stepping. Unfortunately, there is no easy way of telling what stepping a 80286 chip is. Try setting this value to **1** if your 80286 system hangs in standard mode. The default is **0**. To change this entry, you must edit SYSTEM.INI.

Stacks=XE "Stacks="§number

This entry specifies the number of interrupt reflector stacks used by the standard mode MS-DOS Extender (DOSX) to map an MS-DOS or BIOS API from real mode to protected mode. If you receive a “Standard Mode: Stack Overflow” message, try increasing this

number. You can specify a number between **8** and **64**. The default is **12**. To change this entry, you must edit SYSTEM.INI.

StackSize=XE "StackSize="§kilobytes

This entry specifies the size of the interrupt reflector stacks used by the standard mode MS-DOS Extender. The default is **384**. To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry.)

[386enh] Section

The **[386enh]** section contains information specific to running Windows in 386 enhanced mode, including information used for virtual-memory page swapping.

For entries in this section that specify virtual devices, the value can appear in two ways: either the filename of a specific virtual device driver (with path if necessary), or as an asterisk (*) followed immediately by the device name to refer to a virtual device built into the WIN386.EXE file.

This section can contain the following entries:

W

32BitDiskAccess=XE "32BitDiskAccess=%\$Boolean

This entry turns 32-bit disk access on or off. The default is **Off** if your hard disk is capable of supporting 32-bit disk access. Otherwise, this setting is not present in SYSTEM.INI. To change this entry, choose the 386 Enhanced icon in Control Panel. If this setting is not present in SYSTEM.INI, the 32-Bit Disk Access check box will not appear in Control Panel Virtual Memory dialog box.

A20EnableCount=XE "A20EnableCount=%\$number

This entry specifies the initial A20 enable count, which identifies the A20 handler that HIMEM.SYS uses to access extended memory. (For more information about the A20 enable count, see the documentation for your extended memory manager.) The default is the value computed by the Win386 loader. To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry.)

AlleMSLocked=XE "AlleMSLocked=%\$Boolean

This entry, if **On**, locks the contents of expanded memory used by all Windows and non-Windows applications into memory (instead of swapping it to disk) and overrides PIF settings for EMS Memory Locked. Set this value to **On** if you are using a disk cache program

that uses expanded memory. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

AllVMsExclusive=XE "AllVMsExclusive="§Boolean

This entry, when **On**, forces all applications to run in exclusive full-screen mode, overriding all other settings in the application PIFS. Setting **AllVMsExclusive=on** might help avoid UAES when you are running network or memory-resident software that is not compatible with Windows. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

AllXMSLocked=XE "AllXMSLocked="§Boolean

This entry, if **On**, locks the contents of the extended memory used by all Windows and non-Windows applications into memory (instead of swapping it to disk), and overrides PIF settings for XMS Memory Locked. The default is **Off**. To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry).

AltKeyDelay=XE "AltKeyDelay="§seconds

This entry specifies how much time Windows waits to process a keyboard interrupt after it processes an ALT interrupt. Some applications expect a slower processing rate than Windows 386 enhanced mode usually uses. Increase this value if such an application has trouble handling the ALT key. The default is **.005**. To change this entry, you must edit SYSTEM.INI.

AltPasteDelay=XE "AltPasteDelay="§seconds

This entry specifies how much time Windows waits before pasting any characters after the ALT key has been pasted. Some applications may require more time for recognition of the ALT keystroke. The default is **.025**. To change this entry, you must edit SYSTEM.INI.

AutoRestoreScreen=XE "AutoRestoreScreen="§Boolean

This entry specifies whether the display for non-Windows applications should be restored by Windows or by the applications themselves when they become active. If this entry is **On**, Windows saves the display information for a non-Windows application in memory when you switch away from the application. When you switch back to the application, Windows restores the screen. If this entry is **Off**, the application must restore its own display by repainting the screen. This requires less memory, but can slow down performance since Windows can usually restore the screen faster. This entry only applies to VGA displays and affects only applications that notify Windows that they can update their screens automatically when Windows sends a display update call. The default is **On**. To change this entry, you must edit SYSTEM.INI.

BkGndNotifyAtPFault=XE "BkGndNotifyAtPFault="§Boolean

This entry specifies when a notification should be sent to a non-Windows application or to Windows to prevent the application from attempting to access the display (which might corrupt the display of a different application). This notification can be sent while switching to a different application or when attempting to access the actual display. If this entry is **Off**, Windows sends a notification when switching between applications. Set this entry to **Off** if you are using a display that has special hardware (for example, 8514 and TIGA). If you are using a VGA display, setting this entry to **On** should work in most cases. The default is **On** for VGA displays; **Off** for 8514 displays. To change this entry, you must edit SYSTEM.INI.

CGA40WOA.FON=XE "CGA40WOA.FON="§filename

This entry specifies the filename of the fixed-pitch display font used for non-Windows applications with a display of 40 columns and 25 or fewer lines. The default is none. To change this entry, exit Windows and run Setup from MS-DOS, then change the Codepage or Display setting.

CGA80WOA.FON=XE "CGA80WOA.FON="§filename

This entry specifies the filename of the fixed-pitch display font used for non-Windows applications with a display of 80 columns and 25 or fewer lines. The default is none (blank). To change this entry, exit Windows and run Setup from MS-DOS, then change the Codepage or Display setting.

CGANoSnow=XE "CGANoSnow="§Boolean

This entry, when **On**, causes Windows to do special handling to avoid snow appearing on an IBM CGA display device. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

```
COM1AutoAssign=XE "COM1AutoAssign=%$number |
seconds
COM2AutoAssign=XE "COM2AutoAssign=%$number |
seconds
COM3AutoAssign=XE "COM3AutoAssign=%$number |
seconds
COM4AutoAssign=XE "COM4AutoAssign=%$number |
seconds
```

These entries indicate the contention detection values for each connected communications port. These values are used by Windows to determine how to arbitrate requests for the use of a device by more than one application, at least one of which is a non-Windows application. If the value is **-1**, Windows will display a warning message that asks you which application should be given control of the port. If the value is **0**, any application can use the device at any time. If the value is a positive integer less than 1000, this value represents the number of seconds after an application stops using the device before another application can use the same device. The default is **2**. To change this entry, choose the 386 Enhanced icon from Control Panel.

```
COM1Base=XE "COM1Base=%$address
COM2Base=XE "COM2Base=%$address
COM3Base=XE "COM3Base=%$address
COM4Base=XE "COM4Base=%$address
```

Flowchart 2.2
Serial Port Problems

These entries specify the base (first) port for the serial port adapter you are using for both standard mode and 386 enhanced mode. Check your hardware documentation for the appropriate value. The defaults are **COM3Base=3E8h**, and the port address values in the BIOS data area for COM1, COM2, and COM4. To change this entry, choose the Ports icon in Control Panel, and click the Advanced button for the selected COM port.

```
COMBoostTime=XE "COMBoostTime=%$milliseconds
```

This entry specifies the time to allow a virtual machine to process a COM interrupt. If a communications application is losing keyboard characters on the display, you can try increasing this value. The default is **2**. To change this entry, you must edit SYSTEM.INI.

COM1Buffer=XE "COM1Buffer="*%number*
COM2Buffer=XE "COM2Buffer="*%number*
COM3Buffer=XE "COM3Buffer="*%number*
COM4Buffer=XE "COM4Buffer="*%number*

These entries specify the number of characters that the device will buffer on the corresponding communications port. Before changing one of these entries, make sure the corresponding **COMxProtocol=** entry has the proper value. Buffering may slow down communications on a port, but might be necessary to prevent some communications applications from losing characters at high baud rates. The size of the buffer required will depend on the speed of the machine and the application's needs. The default is **128**. Before increasing this value, see **COMxProtocol=**. To change this entry, you must edit SYSTEM.INI.

COMdrv30=XE "COMdrv30="*%Boolean*

This entry, if **On**, indicates that the Virtual COM Driver (VCD) will use its own copy of the serial communications driver's interrupt handler. This will improve performance of COM ports. Set this entry to **On** if you are using a Windows 3.0 serial communications driver. Set this entry to **Off** if you are using the standard Windows 3.1 serial communications driver. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

COM1FIFO=XE "COM1FIFO="*%Boolean*
COM2FIFO=XE "COM2FIFO="*%Boolean*
COM3FIFO=XE "COM3FIFO="*%Boolean*
COM4FIFO=XE "COM4FIFO="*%Boolean*

These entries specify whether the FIFO buffer of a COM port's 16550 Universal Asynchronous Receiver Transmitter (UART) should be enabled (**On**) or disabled (**Off**). If a serial port does not have a 16550 UART, this setting is ignored. These values are used by Windows for both standard and enhanced modes. The default is **On**.

```
COM1Irq=XE "COM1Irq"=%number  
COM2Irq=XE "COM2Irq"=%number  
COM3Irq=XE "COM3Irq"=%number  
COM4Irq=XE "COM4Irq"=%number
```

These entries specify which interrupt line is used by the device on the specified serial port. Check your hardware documentation for the correct value. If there is a hardware conflict between ports, set a value of **-1** to disable input for that COM port. The defaults for ISA and EISA machines are **COM1Irq=4**, **COM2Irq=3**, **COM3Irq=4**, and **COM4Irq=3**; for MCA machines, the defaults are **COM1Irq=4**, **COM2Irq=3**, **COM3Irq=3**, and **COM4Irq=3**. To change this entry, choose the Ports icon in Control Panel and click the Advanced button.

```
COMIrqSharing=XE "COMIrqSharing"=%Boolean
```

This entry specifies whether COM interrupt lines will be sharable between multiple serial ports or with other devices. Set this switch if your machine uses the same interrupt for COM3 or COM4 as it does for COM1 or COM2. The default is **On** for Micro Channel and EISA machines; **Off** for all other machines. To change this entry, you must edit SYSTEM.INI.

```
COM1Protocol=XE "COM1Protocol"=%XOFF | blank  
COM2Protocol=XE "COM2Protocol"=%XOFF | blank  
COM3Protocol=XE "COM3Protocol"=%XOFF | blank  
COM4Protocol=XE "COM4Protocol"=%XOFF | blank
```

These entries specify whether Windows 386 enhanced mode should stop simulating characters in a virtual machine after the virtual machine sends an *XOFF* character. Set the value for a port to **XOFF** if a communications application using that port is losing characters while doing text transfers at high baud rates. Windows will resume simulating characters when the virtual machine sends another character after the *XOFF* character.

Leave this entry blank if the application does binary data transfers; setting this switch might suspend binary transmissions. The default is no entry, which is the same as any entry other than **XOFF**. Windows will not check for *XOFF* characters if this entry is blank or set to anything other than **XOFF**. If the application continues to lose characters after this entry is set, try increasing the related

COMxBuffer= value. To change this entry, you must edit SYSTEM.INI.

Device=XE "Device="*%filename | *devicename*

This entry specifies which virtual devices are being used with Windows 386 enhanced mode. This value can appear in two ways: either the name of a specific virtual device file (with path if necessary), or an asterisk (*) followed immediately by the device name to refer to a virtual device built into the WIN386.EXE file. Synonyms for **Device=** are **Display=**, **EBIOS=**, **Keyboard=**, **Network=**, and **Mouse=**. Filenames usually include the .386 extension. Multiple device lines are required to run Windows 386 enhanced mode. The default is none. Setup assigns appropriate values based on your system configuration. To change this entry, you must edit SYSTEM.INI.

W

If Setup detects protected mode block devices for Western Digital-compatible controllers, it adds the entries **device=*int13** and **device=*wdctrl** to [386enh]. A block device is a virtual device used in 386 enhanced mode to talk directly to disk drive controllers, bypassing MS-DOS and BIOS. To remove block device support, delete these entries in SYSTEM.INI. You do not need to delete files from your hard disk, as these devices are appended to WIN386.EXE.

Display=XE "Display="*%filename | *devicename*

This entry specifies the display device being used with Windows 386 enhanced mode. This entry is a synonym for **Device=**. The default is none. Setup assigns an appropriate value based on your system configuration. To change this entry, choose the Windows Setup icon from the Main Group window.

DMABufferIn1MB=XE "DMABufferIn1MB="*%Boolean*

This entry, if set to **On**, indicates that the direct memory access (DMA) buffer memory should be in the first 1 MB of memory (above 640K, if possible) to be compatible with 8-bit bus master cards. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

DMABufferSize=XE "DMABufferSize=" \$kilobytes

This entry specifies the amount of memory to be reserved for the DMA buffer. This memory will be allocated above 640K, if possible. Windows 386 enhanced mode will default to a DMA buffer size that will handle disk access. The default is **16**. To change this entry, you must edit SYSTEM.INI.

DOSPromptExitInstruc=XE "DOSPromptExitInstruc=" \$Boolean

This entry, if **On**, causes a message box to appear when you start the MS-DOS Prompt, displaying instructions on how to exit and switch away from the MS-DOS Prompt. Set this entry to **Off** if you do not want to see the message. The default is **On**. To change this entry, you must edit SYSTEM.INI.

DualDisplay=XE "DualDisplay=" \$Boolean

Usually, when Windows is running in 386 enhanced mode, the memory between B000:0000 and B7FF:000F will be used by the general system unless a secondary display is detected. If this entry is **On**, this memory will be left unused and available for display adapters, or if you do not have a monochrome display card installed and want EMM386.EXE to include this address space as an upper memory block (UMB). If this entry is **Off**, the address range will be available on EGA systems but not under VGA systems, because the VGA display device supports monochrome modes, which use this address space. To change this entry, you must edit SYSTEM.INI.

EBIOS=XE "EBIOS=" \$filename | *devicename

This entry specifies the extended BIOS device being used with Windows 386 enhanced mode. This entry is a synonym for **Device=**. The default is the value that Setup assigns, based on your system configuration. To change this entry, you must edit SYSTEM.INI.

EGA40WOA.FON=XE "EGA40WOA.FON=" \$filename

This entry specifies the filename of the fixed-pitch display font used for non-Windows applications with a display of 40 columns and more than 25 lines. The default is none. To change this entry, exit Windows and run Setup from MS-DOS, then change the

Codepage or Display setting.

EGA80WOA.FON=XE "EGA80WOA.FON="\$filename

This entry specifies the filename of the fixed-pitch display font used for non-Windows applications with a display of 80 columns and more than 25 lines. The default is none. To change this entry, exit Windows and run Setup from MS-DOS, then change the Codepage or Display setting.

EISADMA=XE "EISADMA="\$Boolean | channel,size

This entry specifies the mode of operation of an extended DMA channel for Extended Industry Standard Architecture (EISA) machines only. This entry's value can take one of two forms. If you set this entry to **Off**, Windows treats the machine as non-EISA, avoiding all EISA-related logic. Set this value to **Off** if you cannot run Windows 386 enhanced mode on an EISA machine. If you are using an EISA machine, you can specify the default transfer size for one or more DMA channels. The channels can operate in these modes: 8-bit (**8**), 16-bit specified in words (**16w**), 16-bit specified in bytes (**16b**), or 32-bit (**32**). If you are not using an EISA machine, Windows ignores this entry. The default is **0,8; 1,8; 2,8; 3,8; 5,16w; 6,16w; 7,16w**. Each pair goes with its own **EISADMA=** entry. To change this entry, you must edit SYSTEM.INI.

EMMExclude=XE "EMMExclude="\$paragraph-range

Flowchart Series 5
Windows Operation and
Memory Problems

This entry specifies a range of memory that Windows will not scan to find unused address space. This has the side effect of turning off the RAM and ROM search code for the range. The range (two paragraph values separated by a hyphen) must be between A000 and EFFF. This scanning can interfere with some adapters that use the same memory area. The starting value is rounded down and the ending value is rounded up to a multiple of 16K. For example, you could set **EMMExclude=C800-CFFF** to prevent Windows from scanning the addresses C800:0000 through CFFF:000F (the block that some VGA cards use to enhance performance). You can specify more than one range by including more than one **EMMExclude=** entry. The default is none. To change this entry, you must edit SYSTEM.INI.

EMMInclude=XE "EMMInclude="\$paragraph-range

This entry specifies a range of memory that Windows will scan for unused address space regardless of what may be there.

EMMInclude= takes precedence over **EMMExclude=** if you specify ranges that overlap. The range (two values separated by a hyphen) must be between A000 and EFFF. The starting value is rounded down and the ending value is rounded up to a multiple of 16K. For example, you could set **EMMInclude=C800-CFFF** to ensure that Windows scans the addresses C800:0000 through CFFF:000F. You can specify more than one range by including more than one **EMMInclude=** entry. The default is none. To change this entry, you must edit SYSTEM.INI.

EMMPageFrame=XE "EMMPageFrame="\$paragraph

This entry specifies the starting paragraph where the 64K page frame will begin when Windows cannot find a suitable page frame, allowing an EMS page frame in an area containing some unused RAM or ROM. For example, you could set **EMMPageFrame=C400** to start the page frame at C400:0000. The default is none. To change this entry, you must edit SYSTEM.INI.

EMMSize=XE "EMMSize="\$kilobytes

This entry specifies the total amount of memory to be made available for mapping as expanded memory. The default allocates the maximum possible amount of system memory as expanded memory. Specify a value for this entry if you run an application that allocates all of the available expanded memory. This will be apparent if, when you run the application, you can never create any new virtual machine. If this value is **0**, then no expanded memory will be allocated. This entry does not prevent the EMS driver from being loaded; use **NoEMMDriver=on** to turn off EMS. The default is **65,536**. To change this entry, you must edit SYSTEM.INI.

FileSysChange=XE "FileSysChange="\$Boolean

This entry indicates whether File Manager automatically receives messages anytime a non-Windows application creates, renames, or deletes a file. When this entry is **Off**, a virtual machine can be run exclusively even when it modifies files. Setting this entry to **On**

can slow down system performance significantly. The default is **On** for 386 enhanced mode; **Off** in standard mode. To change this entry, you must edit SYSTEM.INI.

Global=XE "Global="§*device-name*

This entry defines MS-DOS devices loaded in CONFIG.SYS that need to be global to the system. The default is that all devices loaded in CONFIG.SYS are global to the system. But certain virtual devices might specify that an MS-DOS device be local (for example, MSSMOUSE). Use this entry to override that local specification. The *device-name* value must exactly match the case of the device name in CONFIG.SYS, or this entry will not work. Most device names are in all capital letters, so this value must usually be in all caps. To change this entry, you must edit SYSTEM.INI.

HardDiskDMABuffer=XE "HardDiskDMABuffer="§*kilobytes*

This entry specifies the amount of memory used for the Direct Memory Access (DMA) buffer. If you are using SMARTDrive and double buffering is turned on, this amount is determined automatically. You may need to change this value if you are using a hard disk that supports DMA and are not using SMARTDrive, or if you do not have double buffering turned on. The default is **0** for AT architecture computers; **64** for Micro Channel computers or computers that use DMA channel 3 (unless you use SMARTDrive with double buffering, in which case the default is **0**). To change this entry, you must edit SYSTEM.INI.

IdleVMWakeUpTime=XE "IdleVMWakeUpTime="§*seconds*

This entry causes timer interrupts to periodically “wake up” idle virtual machines after the specified number of seconds has elapsed. If a virtual machine does not use timer interrupts (INT 8 or INT 1Ch), Windows will not usually force timer interrupts into a virtual machine unless it is active. This entry forces the timer interrupts to occur. The value for this entry is rounded down to the lowest power of 2 (for example, 1, 2, 4, 8, 16, 32, 64). The default is **8**. To change this entry, you must edit SYSTEM.INI.

IgnoreInstalledEMM=XE "IgnoreInstalledEMM="§*Boolean*

This entry, if set to **On**, allows Windows to start in 386 enhanced mode even when there is an unknown expanded memory manager (EMM) running. Starting Windows with an unknown EMM running can cause the system to fail if memory-resident software was using

expanded memory before Windows started. Set this entry only if no such software is installed or you are sure it will not be active when you run Windows. This entry applies only to EMMS servicing physical EMS hardware; Windows will not disable unrecognized 80386 expanded memory emulators. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

InDOSPolling=XE "InDOSPolling=" \$Boolean

This entry, if set to **On**, prevents Windows from running other applications when memory-resident software has the **InDOS** flag set. Setting this entry to **On** is necessary if the memory-resident software needs to be in a critical section to do operations off an INT 21 hook. Setting this entry to **On** will slow down system performance slightly. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

INT28Critical=XE "INT28Critical=" \$Boolean

This entry specifies whether a critical section is needed to handle INT 28h interrupts used by memory-resident software. Some network virtual devices do internal task switching on INT 28h interrupts. These interrupts might hang some network software, indicating the need to add an **INT28hCritical=** entry. If you are not using such software, setting this entry to **Off** might improve Windows task switching. The default is **On**. To change this entry, you must edit SYSTEM.INI.

IRQ9Global=XE "IRQ9Global=" \$Boolean

This entry, if set to **On**, converts IRQ 9 masks to global. Set this entry to **On** if your system hangs when it reads from a floppy drive, or to make sure the system reads the floppy drive before starting Windows. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

Keyboard=XE "Keyboard=" \$filename | *devicename

This entry specifies the keyboard driver for Windows 386 enhanced mode. This entry is a synonym for **Device=**. The default is none. Setup assigns an appropriate value based on your system configuration. To change this entry, choose the Windows Setup icon from the Main Group window.

KeyBoostTime=XE "KeyBoostTime=" \$seconds

This entry specifies how much time an application gets to run with increased priority when it receives a keystroke. Use this entry to increase the response to keystrokes when several background applications are running. The default is **.001**. To change this entry, you must edit SYSTEM.INI.

Flowchart 2.5
Cannot Access
Floppy Drives
in 386 Enhanced Mode

KeyBufferDelay=XE "KeyBufferDelay="§seconds

This entry specifies the time to delay pasting keyboard input after the keyboard buffer is full. Some applications might require more than .2 seconds. The default is .2. To change this entry, you must edit SYSTEM.INI.

KeyIdleDelay=XE "KeyIdleDelay="§seconds

This entry specifies how long Windows ignores idle calls after simulating a keystroke into a virtual machine. You can set this value to **0** to speed up keyboard input, but some applications might respond sluggishly if you do. The default is **.5**. To change this entry, you must edit SYSTEM.INI.

W**KeyPasteCRSkipCount=XE**

"KeyPasteCRSkipCount="§number

This entry specifies the number of times that a read-status INT 16 call should return a status of “empty” for the keyboard buffer after pasting a carriage return and before pasting another character. When Windows pastes data from the Clipboard to a non-Windows application, it must first paste the data to the BIOS keyboard buffer before pasting it into the application. This setting is used to slow down fast pasting from the Clipboard to the keyboard buffer so that the application can handle all incoming characters from the buffer. If you seem to lose characters, or if the screen does not update often enough while pasting information from the Clipboard, increase this value. This setting is related to **KeyPasteSkipCount=**. The default is **10**. To change this entry, you must edit SYSTEM.INI.

KeyPasteDelay=XE "KeyPasteDelay="§seconds

This entry specifies how long to wait before pasting any characters after a key has been pasted. Some applications might require more time than **.003** seconds for recognition of a keystroke. The default is **.003**. To change this entry, you must edit SYSTEM.INI.

W**KeyPasteSkipCount=XE "KeyPasteSkipCount="§number**

This entry specifies the number of times that a read-status INT 16 call should return a status of “empty” for the keyboard buffer before pasting another character. When Windows pastes data from the Clipboard to a non-Windows application, it must first paste the data to the BIOS keyboard buffer before pasting it into the application. This setting is used to slow down fast pasting from the Clipboard to the keyboard buffer so that the application can handle all incoming characters from the buffer.

If you seem to lose characters, or if the screen does not update often enough while pasting information from the Clipboard, increase this value. The default is **2**. This setting is related to **KeyPasteCRSkipCount=**. To change this entry, you must edit SYSTEM.INI.

KeyPasteTimeout=XE "KeyPasteTimeout="§seconds

This entry specifies how much time to allow an application to make the necessary BIOS calls for reading keyboard input before Windows will change from the fast paste (INT 16h) to the slow paste (INT 9h) mechanism. The default is **1**. To change this entry, you must edit SYSTEM.INI.

KybdPasswd=XE "KybdPasswd="§Boolean

This entry specifies whether the Virtual Keyboard Device (VKD) should support PS/2 8042 commands that implement password security. This entry only applies to 8042 keyboard controllers that are compatible with the PS/2 computer. The default is **On** for IBM PS/2 computers; **Off** for all other computers. To change this entry, you must edit SYSTEM.INI.

KybdReboot=XE "KybdReboot="§Boolean

If this entry is **On**, Windows will attempt to reboot the computer using a keyboard controller command. On some computers this method is unreliable. If your computer hangs while rebooting, then set this entry to **Off**, in which case Windows will quit and display a prompt to press CTRL+ALT+DEL a second time if you attempt to reboot from the keyboard while Windows is running. The default is **On**. To change this entry, you must edit SYSTEM.INI.

Local=XE "Local="§device-name

This entry defines MS-DOS device drivers that need to be local to each virtual machine. The *device-name* value must exactly match the case of the device name, or this entry will not work. Most device names are in all capital letters, so this value must usually be in all caps. If a device driver is local, a separate copy of it will exist in each virtual machine, and each will keep different state information. Most device drivers will not function properly when

this entry is used. An exception is CON, the MS-DOS console device, which should be local to avoid filling a buffer with input from multiple virtual machines. The default is none; but in a standard SYSTEM.INI file, Setup will set **Local=CON**. To change this entry, you must edit SYSTEM.INI.

LocalLoadHigh=XE "LocalLoadHigh=%Boolean

This entry determines how the upper memory blocks (UMBs) are used when Windows is running on MS-DOS version 5.0. If this entry is **Off**, Windows uses all of the upper memory area, leaving no extra UMBS available for virtual machines. If this entry is **On**, then Windows does not use all of the upper memory area, so the UMBS are available locally to each virtual machine. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

LocalReboot=XE "LocalReboot=%On | Off

This entry specifies whether you can press CTRL+ALT+DEL to quit applications that cause an unrecoverable error in 386 enhanced mode, without restarting Windows. If this setting is **On**, you can quit the application. If this setting is **Off**, pressing CTRL+ALT+DEL will restart your entire system (as it usually does). To change this entry, you must edit SYSTEM.INI.

LPT1AutoAssign=XE "LPT1AutoAssign="§seconds
LPT2AutoAssign=XE "LPT2AutoAssign="§seconds
LPT3AutoAssign=XE "LPT3AutoAssign="§seconds
LPT4AutoAssign=XE "LPT4AutoAssign="§seconds

These entries apply to Windows version 3.0 only. If you have upgraded to Windows 3.1, these settings may still appear in your SYSTEM.INI file, but will have no effect. The default is **60**.

LRULowRateMult=XE "LRULowRateMult="§number

This entry specifies the value used to determine the Least Recently Used (LRU) low paging rate sweep frequency, which is computed by multiplying the value for **LRUSweepFreq=** by the value specified for **LRULowRateMult=**. Values between **1** and **65535** can be used. The default is **10**. To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry.)

LRURateChngTime=XE "LRURateChngTime="§milliseconds

This entry specifies the length of time that the Virtual Memory Manager (VMM) stays at high rate with no paging before switching to low rate, and the length of time the VMM stays at low rate with no paging before turning the LRU sweep off. The default is **10,000**. To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry.)

LRUSweepFreq=XE "LRUSweepFreq="§milliseconds

This entry specifies the time between LRU sweep passes. This is also the high paging rate sweep frequency. The default is **250**. To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry.)

LRUSweepLen=XE "LRUSweepLen="§length-in-pages

This entry specifies the length in pages of the region swept on each pass. Windows computes this value by dividing the value of **LRUSweepReset=** by the value of **LRUSweepFreq=**. The value must be at least **1**. The default is **1024**. To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry.)

LRUSweepLowWater=XE "LRUSweepLowWater="§*number*

This entry specifies when the LRU sweeper should be turned on. When the number of free pages drops below this value, the sweeper is turned on. The default is **24**. To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry.)

LRUSweepReset=XE "LRUSweepReset=%\$milliseconds

This entry specifies the time desired for an ACC bit reset divided by 4 MB of pages. Therefore, the time to reset all ACC bits is *number of pages in system + 1023 / 1024*, where 1024 pages = 4 MB. The minimum value is **100**. The default is **500**. To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry.)

MapPhysAddress=XE "MapPhysAddress=%\$range

This entry specifies the address range (in megabytes) in which the memory manager will preallocate physical page-table entries and linear address space. Set a value for this entry if you are using an MS-DOS device driver that needs this contiguous memory (such as an older version of RAMDrive that uses extended memory). The default is none. To change this entry, you must edit SYSTEM.INI.

MaxBPs=XE "MaxBPs=%\$number

This entry specifies the maximum number of break points (a method for transferring control to Windows 386 enhanced mode) that can be used by the VMM. You may need to increase this value if you are using a third-party virtual device driver that requires more break points than the default value. The default is **200**. To change this entry, you must edit SYSTEM.INI.

MaxCOMPort=XE "MaxCOMPort=%\$number

This entry specifies the maximum number of COM ports supported in 386 enhanced mode. Change this value if you have more than four COM ports in your system. The default is **4**. To change this entry, you must edit SYSTEM.INI.

MaxDMAPGAddress=XE "MaxDMAPGAddress=%\$address

This entry specifies the maximum physical page address that can be used for DMA. This entry works only with hard drives that support DMA. The default is **0FFFh** for non-EISA computers; **0FFFFFFh** for EISA computers. To change this entry, you must edit SYSTEM.INI.

MaxPagingFileSize=XE "MaxPagingFileSize="§kilobytes

This entry specifies the maximum size for a temporary swap file. The default is 50 percent of the available disk space. To change this entry, choose the 386 Enhanced icon in Control Panel, then choose Virtual Memory to set a value.

MaxPhysPage=XE "MaxPhysPage="§hexadecimal-page-number

This entry specifies the maximum physical page number that the VMM can manage as a useable page, allowing pages to be added at a physical address beyond what the VMM recognized during initialization. If the value specified is less than what the VMM determines, the VMM will ignore several physical pages that it would usually use, preventing the use of memory. This is useful if you are using a hardware device that cannot recognize all of the physical memory in your computer (for example, ISA DMA network cards cannot access physical memory above 16 MB). The default is determined by Windows based on the highest physical page number detected by the VMM during initialization. To change this entry, you must edit SYSTEM.INI.

MCADMA=XE "MCADMA="§Boolean

This entry specifies whether Windows should use the Micro Channel (MCA) extensions to DMA. This entry only applies to MCA computers. Set this entry to **Off** if you are using an MCA computer but the DMA extensions are not implemented. The default is **On** for most MCA computers; **Off** for all other computers. To change this entry, you must edit SYSTEM.INI.

MessageBackColor=XE "MessageBackColor="§vga-color-attribute

This entry specifies the background color of message screens, such as the screen that appears when you press CTRL+ALT+DEL. The default is **1** (for blue). To change this entry, you must edit SYSTEM.INI.

MessageTextColor=XE "MessageTextColor="§vga-color-attribute

This entry specifies the color used to display text in message screens, such as the screen that appears when you press CTRL+ALT+DEL. The default is **F** (for white). To change this entry,

you must edit SYSTEM.INI.

MinTimeSlice=XE "MinTimeSlice="§milliseconds

This entry specifies the minimum time a virtual machine will be allowed to run before other virtual machines can take over. A smaller value (such as 10 milliseconds) will make multitasking appear smoother, but will diminish the overall system performance. The default is **20**. To change this entry, choose the 386 Enhanced icon from Control Panel.

MinUnlockMem=XE "MinUnlockMem="§kilobytes

This entry specifies the amount of memory that must remain unlocked and available for use when resuming a virtual machine if more than one virtual machine is running. The default is **40**. To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry.)

MinUserDiskSpace=XE "MinUserDiskSpace="§kilobytes

This entry tells Windows how much disk space to leave free when creating a temporary swap file. Use this entry if your system's paging drive has less available space than Windows can use for paging. This entry has no effect if a permanent swap file exists. The default is **500**. To change this entry, you must edit SYSTEM.INI.

Mouse=XE "Mouse="*%filename | *devicename*

This entry specifies the virtual device that handles the mouse hardware in 386 enhanced mode. This entry is a synonym for **Device=**. The default is none. Setup assigns an appropriate value based on your system configuration. To change this entry, choose the Windows Setup icon in the Main Group window.

MouseSoftInit=XE "MouseSoftInit="*%Boolean*

This entry specifies whether Windows should convert INT 33h function 0 hard initialization calls to function 33 soft initialization calls, which do not reset the mouse hardware. Set this entry to **On** if you want to use a mouse with a non-Windows application started in a window. Set this entry to **Off** if the cursor and screen information appear distorted when you are using the mouse with an application. If you set this entry to **Off**, you will not be able to use the mouse with a non-Windows application started in a window. The default is **On**. To change this entry, you must edit SYSTEM.INI.

NetAsynchFallback=XE "NetAsynchFallback="*%Boolean*

This entry, if set to **On**, tells Windows to attempt to save a failing NetBIOS request. When an application issues an asynchronous NetBIOS request, Windows will attempt to allocate space in its global network buffer to receive the data. If there is insufficient space in the global buffer, Windows will usually fail the NetBIOS request. If this entry is **On**, Windows will attempt to save such a request by allocating a buffer in local memory and preventing any other virtual machines from running until the data is received and the timeout period specified by **NetAsynchTimeout=** expires. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

NetAsynchTimeout=XE "NetAsynchTimeout="*%seconds*

This entry specifies the timeout period when Windows needs to enter a critical section to service an asynchronous NetBIOS request. This value is used only when **NetAsynchFallback=** is set. This value can include a decimal, such as 0.5. The default is **5.0**. To change this entry, you must edit SYSTEM.INI.

NetDMASize=XE "NetDMASize=%kilobytes

This entry specifies the DMA buffer size for NetBIOS transport software if a network has been installed. In this case, the buffer size is the larger value between this value and the value of **DMABufferSize=**. The default is **32** on Micro Channel machines, and **0** on non-Micro Channel machines. To change this entry, you must edit SYSTEM.INI.

NetHeapSize=XE "NetHeapSize=" \$number

This entry specifies the size, in 4K increments, of the data-transfer buffers that Windows 386 enhanced mode allocates in conventional memory for transferring data over a network. All values are rounded up to the nearest 4K. The default is **12**. To change this entry, you must edit SYSTEM.INI.

Network=XE "Network=" \$filename | *devicename

This entry specifies the type of network used with Windows 386 enhanced mode. This entry is a synonym for **Device=**. The default is none. Setup assigns an appropriate value based on your system configuration. To change this entry, choose the Windows Setup icon from the Main Group window.

NMIReboot=XE "NMIReboot=" \$Boolean

This entry, if set to **On**, causes a reboot to occur when a nonmaskable interrupt is received. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

NoEMMDriver=XE "NoEMMDriver=" \$Boolean

This entry, if set to **On**, prevents Windows 386 enhanced mode from installing the expanded memory driver. This differs from setting **EMMSize=0**, which prevents UMBS from being allocated, but does not prevent the EMS driver from being loaded. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

W**NoWaitNetIO=XE "NoWaitNetIO=" \$On | Off**

This entry specifies whether to convert synchronous NetBIOS commands to asynchronous commands. When this entry is **On**, synchronous NetBIOS commands are converted. This can improve overall system performance when running several applications. The default is **On**. To change this value, you must edit SYSTEM.INI.

OverlappedIO=XE "OverlappedIO=" \$Boolean

This entry, if **On**, allows several virtual machines to make read and write requests to a disk before the first request has been completed. If this entry is **Off**, virtual machines cannot issue a

request to read or write to a disk until any previous read and write requests have been completed. The default is **Off** if **InDOSPolling=on**; otherwise, **On**. To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry.)

W **PageBuffers=XE "PageBuffers="***\$number*

This entry specifies the number of 4K page buffers used to store asynchronous read and write pages. This setting is used only if you are using 32-Bit Disk Access and a permanent swap file. You can specify a value between **0** and **32**.

Increasing this value can improve Windows performance. The default is **4**. To change this entry, you must edit SYSTEM.INI.

PageOverCommit=XE "PageOverCommit="*\$megabytes*

This entry specifies the multiplier that determines the amount of linear address space the VMM will create for the system, which is computed by rounding up the amount of available physical memory to the nearest 4 MB and then multiplying that value by the value specified for **PageOverCommit=**. Increasing this value increases the amount of available linear address space, causing the size of data structures to increase. This also increases paging activity proportionately and can slow down the system. You can specify a value between **1** and **20**. The default is **4**. To change this entry, you must edit SYSTEM.INI.

Paging=XE "Paging="*\$Boolean*

This entry sets demand paging (virtual memory). Set this entry to **Off** only if you need the disk space that would be used for a temporary swap file. The default is **On**. To change this entry, you must edit SYSTEM.INI.

PagingDrive=XE "PagingDrive="*\$drive-letter*

This entry specifies the disk drive where Windows 386 enhanced mode will allocate a temporary swap file. This entry is ignored if you have a permanent swap file. If you don't have a permanent swap file and no drive is specified or the specified drive does not exist, Windows attempts to put the temporary swap file on the drive containing the SYSTEM.INI file. If the specified drive is full, paging will be turned off. The default is none. To change this entry, you must edit SYSTEM.INI.

W

PagingFile=XE "PagingFile="*\$path-and-filename*

This entry specifies the path and filename for the temporary swap file that is created when you start Windows in 386 enhanced mode. This file is deleted when you quit Windows. This setting overrides the **PagingDrive=** setting. The default is **WINDOWS\WIN386.SWP**. To change this entry, you must edit SYSTEM.INI.

PerformBackfill=XE "PerformBackfill="§Boolean

This entry specifies whether to allocate a full 640K of memory to a computer that has less than 640K of base conventional memory. Setting this entry overrides the automatic checking done by Windows. The default is **On** (Windows automatically checks to see if it needs to fill in memory based on how MS-DOS is occupying memory.) To change this entry, you must edit SYSTEM.INI. (You should never need to change this entry, because Windows can automatically detect whether to perform a backfill.)

W**PermSwapDOSDrive=XE "PermSwapDOSDrive="§drive-letter**

This entry specifies the disk drive where Windows in 386 enhanced mode will create a permanent swap file. This setting is ignored if you are using a temporary swap file. The default is none. To change this entry, choose the 386 Enhanced icon from Control Panel.

W**PermSwapSizeK=XE "PermSwapSizeK="§kilobytes**

This entry specifies the desired size of a permanent swap file. The default is none. To change this entry, choose the 386 Enhanced icon from Control Panel.

PerVMFILES=XE "PerVMFILES="§number

This entry specifies the number of private file handles Windows should allocate to each virtual machine. Increase this value if an application does not have enough file handles to run. The total number of file handles, including the global handles specified in the **files=** statement in CONFIG.SYS, cannot exceed 255. If it does exceed 255, this value will be rounded down. Set this value to **0** to prevent the allocation of any private file handles. The default is **10**; if the MS-DOS Share utility is installed, this setting in SYSTEM.INI is ignored. To change this entry, you must edit SYSTEM.INI.

PSPIncrement=XE "PSPIncrement="§number

This entry specifies the amount of additional memory, in 16-byte increments, that Windows should reserve in each successive virtual

machine when **UniqueDosPSP=on**. The value that will work best for your machine might vary depending on the memory configuration and the applications you are running. Valid values are **2** through **64**. The default is **2**. See **UniqueDosPSP=** for more information. To change this entry, you must edit SYSTEM.INI.

ReflectDosInt2A=XE "ReflectDosInt2A=" \$Boolean

This entry indicates whether Windows should consume or reflect MS-DOS INT 2A signals. If the value is **Off**, Windows will consume these signals and therefore run more efficiently. Set this entry to **On** if you are running memory-resident software that relies on detecting INT 2A messages. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

ReservedHighArea=XE "ReservedHighArea=" \$paragraph-range

This entry specifies a range of memory that Windows will not scan to find unused address space. This also turns off the RAM and ROM search code for the range. This scanning can interfere with some adapters that use the same memory area. The range (two paragraph values separated by a hyphen) must be between **A000** and **FFFF**. The starting value is rounded down and the ending value is rounded up to a multiple of 4K. For example, you could set **ReservedHighArea=E100-E3FF** to prevent Windows from scanning the first 12K of memory starting at E100. You can specify more than one range by including more than one **ReservedHighArea=** entry. The default is none. To change this entry, you must edit SYSTEM.INI.

ReservePageFrame=XE "ReservePageFrame=" \$Boolean

This entry tells Windows whether to give preference to EMS page frame space or conventional memory when it has to use one of them to allocate MS-DOS transfer buffers. This choice is necessary when Windows cannot find space between 640K and 1 MB other than EMS page frame space. If set to **On**, this entry will preserve EMS page frame space at the expense of conventional memory. If you are not going to run non-Windows applications that use expanded memory, set this entry to **Off** to give non-Windows applications more conventional memory. The default is **On**. To change this entry, you must edit SYSTEM.INI.

ReserveVideoROM=XE "ReserveVideoROM="§Boolean

This entry, if **On**, tells Windows that video ROM exists in pages C6 and C7. If the text font appears scrambled when you start non-Windows applications, set this entry to **On**. The default is **Off**. To change this entry, you must edit SYSTEM.INI. (You should not need to change this entry, because the default value causes Windows to detect video ROM correctly.)

ROMScanThreshold=XE "ROMScanThreshold="§number

This entry specifies a parameter used to determine whether an area of memory in the adapter area (usually between C000-EFFF) is ROM when the area has no ROM header or incorrect header information. The number for this entry specifies how many transitions (value changes) must occur within the memory area to determine whether it is ROM. If the number of transitions is greater than the value for this entry, Windows recognizes the memory as ROM. If the number of transitions is less than the value, Windows recognizes the memory as usable memory. Specifying **0** causes Windows to recognize the memory area as ROM and then reserve it as unusable. The default is **20**. (You should never need to change this entry.)

W ScrollFrequency=XE "ScrollFrequency" \$number

This entry specifies the number of lines you can scroll in a non-Windows application that is running in Windows before its display is updated. The default is **2**. You should never need to change this setting.

S GrabLPT=XE "SGrabLPT" \$port-number

This entry routes all printer interrupts on the specified port to the system virtual machine rather than to the current virtual machine. The default is none. To change this entry, you must edit SYSTEM.INI.

W SyncTime=XE "SyncTime" \$Boolean

This entry, if **On**, causes Windows to periodically synchronize its time with the computer's CMOS clock. If this entry is **Off**, Windows usually maintains the correct time, unless **TrapTimerPorts=off** when you are running applications that can cause the system time to run faster or slower than the actual time. The default is **On**. To change this entry, you must edit SYSTEM.INI.

S ystemROMBreakPoint=XE "SystemROMBreakPoint" \$Boolean

This entry specifies whether Windows should use ROM address space between F000:0000 and 1 MB for a break point. Windows 386 enhanced mode usually searches this space to find a special instruction that is used as a system break point. If this address space contains something other than permanently available ROM, set this entry to **Off**. The default is **On** if Windows is started in real mode of the 80386/486 CPU. **Off** if Windows is started in virtual mode of the 80386/486 CPU. Most 386 memory managers, such as QEMM and 386MAX, require this value to be set to **Off**. If a 386 memory manager is running, Windows is started in virtual mode. Otherwise, Windows is started in real mode. To change this entry, you must edit SYSTEM.INI.

S ysvMEMSLimit=XE "SysvMEMSLimit" \$number | kilobytes

This entry specifies how many kilobytes of expanded memory

Windows should be permitted to use. Setting this value to **0** prevents Windows from gaining access to any expanded memory. Setting it to **-1** gives Windows all the available expanded memory that it requests. The default is **2048**. To change this entry, you must edit SYSTEM.INI.

SysVMEMLocked=XE "SysVMEMLocked="§Boolean

This entry indicates whether to swap to the hard disk the expanded memory being used by non-Windows applications. Locking expanded memory can improve the performance of a non-Windows application that uses it, but locking it slows down the rest of the system. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

SysVMEMSRequired=XE "SysVMEMSRequired="*\$kilobytes*

This entry specifies how much expanded memory must be free to start Windows. Leave this value at **0** if no non-Windows application running under Windows will require expanded memory. The default is **0**. To change this entry, you must edit SYSTEM.INI.

SysVMV86Locked=XE "SysVMV86Locked="*\$Boolean*

This entry, if set to **On**, causes the virtual-mode memory being used in the system virtual machine to remain locked in memory rather than being swappable out to disk. Because Windows handles this process, there is no known reason to set this entry. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

SysVMXMSLimit=XE "SysVMXMSLimit="*\$number | kilobytes*

This entry specifies the maximum amount of memory the extended memory driver will allocate to MS-DOS device drivers and memory-resident software in the system virtual machine. Set the value to **-1** to give an application all the available extended memory that it requests. The default is **2048**. To change this entry, you must edit SYSTEM.INI.

SysVMXMSRequired=XE "SysVMXMSRequired="*\$kilobytes*

This entry specifies how many kilobytes of extended memory must be reserved by the XMS driver to start Windows. Leave this value at **0** if there are no XMS users in the system virtual machine. The default is **0**. To change this entry, you must edit SYSTEM.INI.

**TimerCriticalSection=XE
"TimerCriticalSection="***\$milliseconds*

This entry instructs Windows to go into a critical section around all timer interrupt code, and specifies a timeout period. Specifying a positive value will ensure that only one virtual machine at a time receives timer interrupts. Some networks and other global memory-resident software may fail unless this entry is used. However, using this entry will slow down performance and can make the system sluggish or seem to stop for short periods of time. The default is **0**. To change this entry, you must edit SYSTEM.INI.

TokenRingSearch=XE "TokenRingSearch="§Boolean

This entry, if **On**, tells Windows whether to search for a token ring network adapter on machines with IBM PC/AT architecture. Set this entry to **Off** if you are not using a token ring card and the search interferes with another device. The default is **On**. To change this entry, you must edit SYSTEM.INI.

TranslateScans=XE "TranslateScans="§Boolean

This entry, if **On**, indicates whether Windows will translate a keyboard's scan codes to make them compatible with standard IBM scan codes. This entry is necessary only for keyboards that generate nonstandard scan codes. This entry is used only for the Switcher Screen and full-screen message boxes. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

TrapTimerPorts=XE "TrapTimerPorts="§Boolean

If this entry is set to **Off**, Windows allows applications to read from and write to the system timer ports. In this case, Windows can usually detect when an application has changed the timer interrupt interval and then make any adjustments to the time. However, some applications may prevent Windows from keeping accurate time. If your system's time appears to be running fast or slow, set this entry to **On**, so that Windows will deny access to the timer ports. This ensures that the system time will be accurate, but may cause applications that frequently access the timer ports to run slowly. If you do not want to set this entry to **On**, set **SyncTime=On**, which causes Windows to restore the correct time periodically regardless of whether applications access the timer ports. The default is **On**. To change this entry, you must edit SYSTEM.INI.

UniqueDOSPPSP=XE "UniqueDOSPPSP="§Boolean

This entry, if set to **On**, tells Windows to start every application at a unique address (PSP). Each time Windows creates a new virtual machine to start a new application, Windows reserves a unique amount of memory (i bytes) below the application. For example, the first application would be loaded at address M , the second at address $M+i$, the third at $M+2i$, and so forth. The amount of memory (i) is determined by **PSPIncrement=**. These entries ensure that applications in different virtual machines all start at different addresses. Some networks use applications' load addresses to identify the different processes using the network. On such networks, setting this entry to **Off** might cause one application to fail when you exit another, because the network interprets them as the same application. However, setting this entry will leave slightly less memory for non-Windows applications.

The default is **On** if you are running a network based on Microsoft Network (MS-Net) or LAN Manager; **Off** for all other networks. See Chapter 12, "Networks and Windows 3.1," to find out if your network is based on MS-Net or LAN Manager. To change this entry, you must edit SYSTEM.INI.

UseableHighArea=XE "UseableHighArea="*\$paragraph-range*

This entry specifies the range of memory that Windows will scan for unused address space regardless of what may be there.

UseableHighArea= takes precedence over **ReservedHighArea=** if you specify ranges that overlap. The range (two values separated by a hyphen) must be between **A000** and **EFFF**. The starting value is rounded down and the ending value is rounded up to a multiple of 4K. For example, you could set **UseableHighArea=E100-E3FF** to ensure that Windows scans the first 12K of memory starting at E100.

You may specify more than one range by including more than one entry for **UseableHighArea=**. The default is none. To change this entry, you must edit SYSTEM.INI.

UseInstFile=XE "UseInstFile="*\$Boolean*

This entry specifies whether Windows should look in the INSTANCE.386 file for information it can use to determine whether data structures within MS-DOS need to be local. Two other methods give Windows this information: internal tables within the device, and an INT 2Fh call documented in the OEM Adaptation Kit. Both methods are preferable to using this setting; this entry is provided only for compatibility with Windows/386 version 2.x. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

UseROMFont=XE "UseROMFont="*\$Boolean*

This entry, if **On**, causes Windows to use the soft font stored in video ROM for displaying messages that appear when non-Windows applications are running in a full screen and for displaying the text that appears when switching away from a non-Windows application. Set this entry to **Off** if the font used to display messages is different from the font used in the application, or if random dots and shapes appear on your screen. The default is

On. To change this entry, you must edit SYSTEM.INI.

VGAMonoText=XE "VGAMonoText="§Boolean

This entry tells Windows to ignore the video memory address space in VGA displays, usually used for monochrome adapters. When this entry is **Off**, Windows can use the B000h through B7FF range in upper memory if no hardware device is using these addresses and other applications do not use the monochrome display mode of the VGA adapter. This entry applies only to VGA displays. The default is **On**. To change this entry, you must edit SYSTEM.INI.

VideoBackgroundMsg=XE "VideoBackgroundMsg="§Boolean

This entry, if **On**, causes Windows to display a message when a background application is suspended, or if its display cannot be updated properly because video memory is low. Setting this entry to **Off** turns off the warning message. This entry affects all non-Windows applications currently running. The default is **On**. To change this entry, you must edit SYSTEM.INI.

VideoSuspendDisable=XE "VideoSuspendDisable="§Boolean

This entry specifies whether to suspend an application running in the background if its display becomes corrupted. If this entry is **On**, the application will continue running. If it is **Off**, applications will be suspended, and a warning message will appear if the **VideoBackgroundMsg=On**. This entry applies only to VGA displays. The default is **Off**. To change this entry, you must edit SYSTEM.INI.

VirtualHDIrq=XE "VirtualHDIrq="§Boolean

Flowcharts 2.5-2.6
Cannot Access
Floppy Drives
or Hard Disk

This entry allows Windows 386 enhanced mode to terminate interrupts from the hard disk controller, bypassing the ROM routine that handles these interrupts. Some hard drives might require that this entry be set to **Off** for interrupts to be processed correctly. If this entry is set to **Off**, the ROM routine handles the interrupts, which slows the system's performance. The default is **On** for AT-compatible computers; **Off** for other computers. To change this entry, you must edit SYSTEM.INI.

WindowKBRequired=XE "WindowKBRequired="§kilobytes

This entry specifies how much conventional memory must be free to start Windows. The default is **256**. To change this entry, you must edit SYSTEM.INI.

WindowMemSize=XE "WindowMemSize="§number | kilobytes

This entry limits the amount of conventional memory Windows can use for itself. The default value indicates that Windows can use as much conventional memory as it needs. Try entering a positive value less than 640 if there is not enough memory to run Windows in 386 enhanced mode. The default is **-1**. To change this entry, you must edit SYSTEM.INI.

WindowUpdateTime=XE

"WindowUpdateTime="§milliseconds

This entry specifies the time Windows takes between updates of the display for a non-Windows application running in a window. The default is **50**. To change this entry, you must edit SYSTEM.INI.

WinExclusive=XE "WinExclusive="§Boolean

This entry, if **On**, indicates whether Windows always gets all of the computer's processing time whenever a Windows application is in the foreground. If this entry is **On** and a Windows application is in the foreground, no non-Windows application will run. The default is **Off**. To change this entry, choose the 386 Enhanced icon from Control Panel.

WinTimeSlice=XE "WinTimeSlice="§number,number

This entry contains two numbers. The first number specifies the relative processing time (based on **MinTimeSlice=**) given to all Windows applications running in the foreground relative to the time allocated to all non-Windows applications running in the background. The second number specifies the relative processing time given to all Windows applications running in the background when a non-Windows application is running in the foreground. The range of numbers that can be entered is **1** through **10000**. The important value is the ratio of these values to the corresponding settings in the PIFS of the active non-Windows applications. The default is **100,50**. To change this entry, choose the 386 Enhanced icon from Control Panel.

WOAFont=XE "WOAFont="§font filename

This entry specifies which font files are loaded into memory when running non-Windows applications. These fonts are also available to Windows applications as long as a non-Windows application is running. If you want to make these fonts always available to Windows applications, add them to your system with the Fonts option in Control Panel. The default is **DOSAPP.FON**. To change this entry, exit Windows and run Setup from MS-DOS, then change the Codepage or Display setting.

XlatBufferSize=XE "XlatBufferSize="§kilobytes

This entry specifies the size of the low-memory buffer used to map MS-DOS calls from protected mode to virtual 386 enhanced mode. Specifying a higher value can improve the performance of protected-mode Windows applications that read or write information in a large number of bytes (for example, some database applications). However, this may decrease the amount of memory available for running non-Windows applications and may cause problems on networks that use named pipes. These networks may require a value of **4**. The value you specify is rounded to the next 4K increment. For example, if you set this value to **5**, Windows rounds it up to **8**. The default is **8**. To change this entry, you must edit SYSTEM.INI.

XMSUMBInitCalls=XE "XMSUMBInitCalls="§*Boolean*

This entry specifies whether Windows should call the extended memory driver's UMB management routines. The default is usually **On**, but may be **Off** depending on the extended memory manager you are using. You should never need to change this entry.

Other Windows Initialization Files

Your WINDOWS directory includes at least three other initialization files: PROGMAN.INI, CONTROL.INI, and WINFILE.INI. These files contain the initial settings for elements defined by Program Manager, Control Panel, and File Manager, respectively.

Many other Windows applications create initialization files to store specific settings for the application. These files also appear in the WINDOWS directory with .INI filename extensions.

PROGMAN.INI: The Program Manager Initialization File

The Program Manager initialization file, PROGMAN.INI, usually has entries for **[settings]** and **[groups]**, which describe what should appear in the Program Manager window when you run Program Manager. To change the appearance and behavior of Program Manager, use the menu commands as described in Chapter 3, “Program Manager,” in the *Windows User’s Guide*.

A system administrator might also choose to add a third section, **[restrictions]**, for custom installations. For more information about creating custom entries for PROGMAN.INI for multiple systems during Windows installation, see “Configuring Program Manager for a Network Workgroup” in Chapter 6, “Tips for Configuring Windows 3.1.”

[settings]

The **[settings]** section usually has these entries:

```
[Settings]
Window=60 28 565 388 1
SaveSettings=1
MinOnRun=0
AutoArrange=1
Startup=
```

<i>Entry</i>	<i>Value</i>
Window=XE "Window="	% Four numbers that indicate the position of the window when Program Manager is opened, followed by a 1 if the window is maximized.
SaveSettings=XE "SaveSettings="	% 1 if the Save Settings On Exit command on the Options menu is checked in Program Manager. In this case, Program Manager will save the current configuration when you close Windows.
MinOnRun=XE "MinOnRun="	% 1 if the Minimize On Use command is checked on the Options menu in Program Manager. In this case, the Program Manager will be iconized when you run another application.
AutoArrange=XE "AutoArrange="	% 1 if the AutoArrange command is checked on the Options menu in Program Manager. In this case, the icons in each group will be automatically arranged when you run Program Manager.
Startup=XE "Startup="	% Name of the group that serves as the “startup” group. If this entry is blank, the Startup group created in Windows Setup is the startup group.

[groups]

The PROGMAN.INI file will also have a section named **[groups]**, which has entries such as these:

```
[Groups]
Group1=C:\WINDOWS\ACCESSOR.GRP
Group2=C:\WINDOWS\GAMES.GRP
Group3=C:\WINDOWS\ALDUS.GRP
Group5=C:\WINDOWS\WORDFORW.GRP
Group6=C:\WINDOWS\MAIN.GRP
Group7=C:\WINDOWS\STARTUP.GRP
Order= 8 7 2 3 5 1 6
Group8=C:\WINDOWS\APPLICAT.GRP
```

<i>Entry</i>	<i>Value</i>
Groupx=XE "Groupx="	% A filename (with full path) for the .GRP file that contains the group created during

Setup, or created when an application was installed, or that you created in Program Manager.

Order=XE "Order="§ A list of numbers separated with spaces, indicating the order in which the groups are drawn in the window.

To change these settings, we recommend that you use the commands on the Program Manager menu.

[restrictions]

For network system administration, you can also add a **[restrictions]** section to PROGMAN.INI to restrict user actions. The **[restrictions]** section can have these entries:

```
[restrictions]
NoRun=
NoClose=
NoSaveSettings=
NoFileMenu=
EditLevel=
```

<i>Entry</i>	<i>Value</i>
NoRun=XE "NoRun="	\$ 1 disables the Run command on the File menu. The Run command will appear dimmed on the File menu and the user will not be able to run applications from Program Manager unless the applications are set up as icons in a group.
NoClose=XE "NoClose="	\$ 1 disables the Exit Windows command on the File menu. Users will not be able to quit Program Manager through the File Menu or the Control menu (the Exit Windows and Close commands will be dimmed), or by using ALT+F4.
NoSaveSettings=XE "NoSaveSettings="	\$ 1 disables the Save Settings on Exit command on the Options menu. The Save Settings command will appear dimmed on the Options menu and any changes that the user makes to the arrangement of windows and icons will not be saved when Windows is restarted. This setting overrides the SaveSettings= entry in the [Settings] section of the PROGMAN.INI file.
NoFileMenu=XE "NoFileMenu="	\$ 1 removes the File menu from Program Manager. All of the commands on that menu will be unavailable. Users can start the applications in groups by selecting them and pressing ENTER, or by double-clicking the icon. Unless you have also disabled the Exit Windows command, users can still quit Windows by using the Control menu or ALT+F4.
EditLevel=XE "EditLevel="	\$n Sets restrictions for what users can modify in Program Manager. You can specify one of the following values for <i>n</i> :

0 allows the user to make any change. (This is the default value.)

1 prevents the user from creating, deleting, or renaming groups. If you specify this value, the New, Move, Copy, and Delete commands on the File menu are not available when a group is selected.

2 sets all restrictions in **EditLevel=1**, plus prevents the user from creating or deleting program items. If you specify this value, the New, Move, Copy, and Delete commands on the File menu are not available at all.

3 sets all restrictions in **EditLevel=2**, plus prevents the user from changing command lines for program items. If you specify this value, the text in the Command Line box in the Properties dialog box cannot be changed.

4 sets all restrictions in **EditLevel=3**, plus prevents the user from changing any program item information. If you specify this value, none of the areas in the Properties dialog box can be modified. The user can view the dialog box, but all of the areas are dimmed.

To enable any of the commands or remove any of the **EditLevel=** restrictions, either remove the entry from the `PROGMAN.INI` file, or set the value to **0**.

CONTROL.INI: Control Panel Initialization File

The `CONTROL.INI` file contains several sections that specify the options you set by choosing icons in Control Panel.

<i>Section</i>	<i>Values specified</i>
[Current]	Specifies the current color scheme.
[Color Schemes]	Defines the colors for each element of specific color schemes, as set by choosing the Color icon.
[Custom Colors]	Defines the custom colors in the color palette, as set by choosing the Color icon.

- [Patterns]** Defines the color values for the bitmap patterns, as set by choosing the Desktop icon.
- [MMCPL]** Specifies values related to the multimedia items in Control Panel.
- [Screen Saver.*]** Specifies the density, warp speed, and password-protection values for the screensaver.
- [Userinstallable.drivers]** Specifies values related to installable drivers used for multimedia.
- [Drivers.Desc]** Specifies the MIDI Mapper and Time, the multimedia control devices.
- [Installed]** Specifies the current version of Microsoft Windows and the installed printers.

To change any of these items, choose the related icons in Control Panel, as described in Chapter 5, “Control Panel,” in the *Windows User’s Guide*.

WINFILE.INI: The File Manager Initialization File

The WINFILE.INI file contains one section, **[settings]**, to specify the options you can set by choosing menu commands in File Manager. For example, these settings might appear in WINFILE.INI:

```
[Settings]
Window=0,6,800,600,,1
dir1=48,7,543,236,-1,-1,3,30,201,1808,150,B:\*.*
Face=Small Fonts
Size=8
LowerCase=1
ConfirmDelete=0
ConfirmSubDel=0
ConfirmReplace=1
ConfirmMouse=1
ConfirmFormat=1
```

<i>Entry</i>	<i>Value</i>
Window=XE "Window="	\$ The size and position of the window and whether it is maximized when opened.
dir1=XE "dir1="	\$ The current directory settings.
Face=XE "Face="	\$ The name of the typeface used for desktop items. The default is Small Fonts .
Size=XE "Size="	\$ The point size for the typeface. The default is 8 .
LowerCase=XE "LowerCase="	\$ 1 if filenames are to appear in lowercase.
ConfirmDelete=XE "ConfirmDelete="	\$ 1 if the user is to be prompted to confirm file deletion requests.
ConfirmSubDel=XE "ConfirmSubDel="	\$ 1 if the user is to be prompted to confirm subdirectory deletion requests.
ConfirmReplace=XE "ConfirmReplace="	\$ 1 if the user is to be prompted to confirm file replacement requests.
ConfirmMouse=XE "ConfirmMouse="	\$ 1 if the user is to be prompted to confirm mouse drag-and-drop requests.
ConfirmFormat=XE "ConfirmFormat="	\$ 1 if the user is to be prompted to confirm formatting requests.

To change values for these settings, use the menu commands in File Manager, as described in Chapter 4, “File Manager,” in the *Windows User’s Guide*.

