
Related information

- *Windows User's Guide: Part 1, "Windows Fundamentals,"* and the *Getting Started* booklet

Chapter

1

Windows 3.1 Installation

This chapter contains an overview of installation for Microsoft Windows 3.1, plus a detailed technical discussion of the Windows Setup program. This chapter concludes with details about setting up Windows 3.1 over a network and creating a custom installation routine for automated Setup.

- *Windows Resource Kit: Chapter 2, "Windows Setup Information Files"; Chapter 4, "The Windows Initialization Files"; Chapter 13, "Troubleshooting Windows 3.1"*

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About Windows Setup

The Windows Setup program is on Disk #1 of the Microsoft Windows disk set. The Setup program guides you through a straightforward series of steps, in two basic stages:

1. In the first stage of installation, called MS-DOS Mode Setup, Setup evaluates the computer system and asks you to verify this information. Then Setup copies the basic Windows files onto the system's hard disk.
2. In the second stage of installation, called Windows Mode Setup, Setup loads Windows and installs the remaining files, then prompts you to make a series of choices about installing printer drivers and other applications.

New in Setup for Windows 3.1

Look for these new features in Windows Setup:

- Setup warns you about the presence of any incompatible drivers known to be incompatible with either Setup or Windows. Setup looks for earlier versions of Windows 3.x and various drivers to update driver files. For details about related changes in SYSTEM.INI and WIN.INI, see Chapter 4, "The Windows Initialization Files."
- Whether you choose Express Setup or Custom Setup, Setup detects the machine for installation, so you seldom have to choose from the list of specific machines and devices. For details about the machines and drivers that Setup detects, see the entries for the **[display]**, **[keyboard.types]**, **[pointing.device]**, and **[machine]** sections in SETUP.INF, as described in Chapter 2, "The Windows Setup Information Files."
- Setup automatically creates a Startup Group in Program Manager, containing all the applications you want to start each time Windows runs.
- You can automate Windows installation by creating a script. For details, see "Using Automated Setup" later in this chapter.

Note In this manual, *WINDOWS directory* refers to the directory where you choose to install Windows, and *SYSTEM subdirectory* refers to the subdirectory where the Windows system files are stored.

- Type **setup** at the command prompt to install and configure Microsoft Windows from floppy disks or from a network drive. Do this to upgrade your Windows installation or to install Windows for the first time on your system.

Running Setup

You can run Windows Setup in two ways, for two different purposes:

- Run Setup from Program Manager after Windows is installed. Do this to change your system configuration or to add or delete files.

Follow these basic steps to install Windows 3.1 from the installation disks.

To install Windows 3.1 from the disk drive:

1. Insert the Windows 3.1 disk #1 into a floppy drive, and change to the drive letter of the floppy drive.

For example, to switch to the A drive, at the command prompt type **A:** and press `ENTER`.

2. At the command prompt, type **setup** and press `ENTER`.

You can include any switches with the **setup** command, as described in “Choosing Setup Options” later in this chapter.

3. Follow the instructions on your screen.

If you have questions about any procedures or options, press `F1` to get online help.

Important Do not use the MS-DOS **copy** command to copy the Windows files from the Setup disks. These files are compressed and cannot be used unless you run the Setup program. Setup renames the compressed files during installation, so if you have files on your system that end with an underscore (`_`), that file is compressed and has not been installed properly.

For details about installing Windows over a network, see “Setting Up Windows for a Network” later in this chapter.

Choosing Setup Options

You can include various switches when you type **setup** at the command prompt, as described in the following table.

	<i>Switch</i>	<i>Purpose</i>
	/i	Ignores automatic hardware detection. The user will have to check settings and possibly make corrections on the System Information screen during Setup.
	/n	Sets up a shared copy of Windows from a network server. For details, see “Setting Up Windows for a Network” later in this chapter.
W	/a	Begins Administrative Setup, by expanding and copying all files from the Windows installation disks onto a network server, and also marking the files as read-only. For details, see “Setting Up Windows for a Network” later in this chapter.
W	/b	Sets up Windows with monochrome display attributes.
W	/t	Searches the drive for incompatible software that should not run at the same time as Setup or Windows 3.1. (For maintenance only.)
W	/h:filename	Runs Batch Mode Setup to install Windows with little or no user interaction. The <i>filename</i> is the name of the system settings file that contains information about the user’s configuration. Include the path if <i>filename</i> is not in the directory that contains the Windows Setup files. For details, see “Using Automated Setup” later in this chapter.
W	/o:filename	Specifies the SETUP.INF file, including the path if necessary.
W	/s:filename	Specifies the SETUP.INF file, including a path for the Windows installation disks.

Tip To see a list of the switches available for Windows Setup, at the command prompt type **setup /?** and press **ENTER**.

You can customize the installation procedure for Windows using the command-line switches. You can also customize the Windows information (.INF) files and the initialization (.INI) files to install a custom version of Windows at your site.

The following decision tree will help you decide how you might want to customize Windows for installation at your site.

Windows Custom Installation Decision Tree for a Single System

- **You want to customize how Windows is installed:**
 - Ⓜ Choose Custom Setup at the first Setup prompt.
- **You want to customize how Windows works after installation:**
 - Ⓜ Use Control Panel, Program Manager, and Windows Setup, as described in Chapter 15 in the *Windows User's Guide*.

Windows Custom Installation Decision Tree for Multiple Systems

- You want to set up Windows on a network:
 - Ⓜ Use **setup /a** to copy files to the network server, then use **setup /n** to install a shared copy of Windows on the workstations.
See “Setting Up Windows for a Network” later in this chapter.
- **You want to automate installation for multiple users:**
 - Ⓜ Create custom system settings files and use **setup /h**.
See “Using Automated Setup” later in this chapter.
- **You want custom choices available in the System Information screen:**
 - Ⓜ Edit device entries in SETUP.INF for hardware, and edit printer entries in CONTROL.INF. See “Removing Hardware Devices from Lists in Setup” in Chapter 2.
- **You want to customize the applications installed with Windows:**
 - Ⓜ Install custom applications, as described in “Modifying .INF Files to Install Custom Applications” in Chapter 2.
 - Ⓜ Customize the Windows applications installed, as described in “Modifying .INF Files to Install Custom Windows” in Chapter 2.
 - Ⓜ Install custom PIFS during installation, as described in

“Adding

Custom PIF Information in APPS.INF” in Chapter 2.

- **You want to customize Program Manager for multiple systems:**

- ⑧ Restrict user capabilities or set up shared Program Manager

groups as described in “Other Windows Initialization Files”

in Chapter 4

- **You want a custom Windows startup environment for multiple systems:**

- ⑧ Edit WIN.SRC and SYSTEM.SRC before installing Windows, as described in “Editing the .INI Source Files” in Chapter 4.

Choosing Express Setup vs. Custom Setup

W At the beginning of Setup, you are prompted to choose Express Setup or Custom Setup. Choose Express Setup for most standard installations. You only have to provide information about the printers and port connections for your system.

Choose Custom Setup for precise control over how Windows is set up. Setup asks you to verify information detected about the hardware and software in your system, such as:

- The directory where you want the Windows files installed.
- The computer system hardware, including the monitor, mouse, and keyboard. Windows Setup detects most kinds of hardware, but with Custom Setup, you can make more detailed choices about your system configuration.
- The preferred language (you can run Windows in several languages, including French, German, and Spanish).
- The network, if any.
- The printers and printer ports for the computer system.
- The other applications you want to run with Windows.
- The Windows applications and supporting files that you want to install.
- The specific Windows components you want to install.

Windows Setup: A Technical Discussion

This section is a step-by-step examination of how the Windows Setup program installs Windows. This information will help you to diagnose and solve problems with Windows installation, and will also help you to make custom modifications. For additional up-to-date information, be sure to review the README file in the WINDOWS directory.

During the installation procedure (if you choose Custom Setup), Setup asks you to confirm that the hardware settings are correct or

Flowchart 1.1
System Requirements

modify the settings if necessary. At a more technical level, Setup continually checks the system along the way to make sure it can complete the installation procedure, and performs several automatic steps to upgrade from a previous version of Windows that may be installed on your system. Setup also installs printer drivers, applications in Program Manager groups, and third-party drivers, and it performs various maintenance functions.

The Setup program has two parts: MS-DOS Mode Setup and Windows Mode Setup.

About the Windows Operating Modes

Windows can run in two different operating modes: standard mode and 386 enhanced mode. For both of these operating modes, the processor runs in protected mode. When you type **win** at the command prompt, Windows automatically runs in the appropriate mode, depending on the computer hardware and the amount of memory the system has:

- **Standard mode** requires a PC with an 80286 processor (or higher) and 256K of free conventional memory and 192K of free extended memory. This mode provides access to extended memory using application swap files. Windows does not use virtual memory. Non-Windows applications run in full screen.

If you have an 80386 or higher processor, you can force Windows to run in standard mode by typing **win /s** at the command prompt.

- **386 enhanced mode** requires a PC with an 80386 processor (or higher) and 2 megabytes or more of memory (256K of free conventional memory and 1024K extended memory).

Windows 386 enhanced mode provides access to the virtual memory capability of the 80386 processor, so that Windows applications can use more memory than is physically available. Windows 386 enhanced mode also allows multitasking of non-Windows applications and allows you to have more control over those applications. For example, you can run a non-Windows application in a window.

For technical details about the Windows operating modes, see Chapter 5, “Windows 3.1 and Memory Management.”

MS-DOS Mode Setup

In the MS-DOS Mode part of Setup, the Setup program:

- Confirms the directory where the Windows files will be stored.
- Identifies the type of hardware installed in the system.
- Installs the Windows files required for Windows Mode Setup.

Note Throughout the Setup procedure, Setup checks that the files it copies are newer than any previous versions on the system. Setup will not copy the version of a file on the installation disks over a newer version of a file that’s already on your system.

Getting Ready for MS-DOS Mode Installation

MS-DOS Mode Setup begins by drawing the Setup welcome screen, then saves for later use any command-line parameters (such as */n*), the type of processor, and the free memory available. Setup also checks to see if it can read the *SETUP.INF* file and that the file is not corrupted, and it checks whether the MS-DOS version is greater than or equal to MS-DOS 3.10. If either the MS-DOS version check or the *SETUP.INF* check fails, Setup displays a message box explaining the failure, and then exits to MS-DOS.

If the MS-DOS version and the *SETUP.INF* are okay, Setup checks the path for a previous version of Windows. If it cannot find Windows on the path, Setup searches every local fixed disk for Windows. If Setup finds that the same version of Windows 3.1 has already been installed on the system, Setup switches to Maintenance Mode and performs updates of the system drivers.

If the same version of Windows is not found, Setup checks that at least 376K of conventional memory is available. If the required memory is not free, Setup fails. If the memory is free, then Setup begins installation.

Setting the Windows Directory and Updating the Version

For Express Setup, if no previous version of Windows is found on the local drives, Setup creates the default directory listed in SETUP.INF (the **defdir=** entry in **[data]**) and begins installation.

For Custom Setup, Setup displays a prompt showing the suggested directory to install Windows (usually either C:\WINDOWS or the directory containing the previous version of Windows). If you modify the directory for installing Windows, Setup checks to make sure that the path is valid and that you're not installing Windows in the same directory as the source files. If you try to do this, a warning prompts you to modify the directory path.

If Windows 3.0 is in the destination directory, Setup asks if you want to upgrade the earlier Windows installation or enter a different destination directory.

If you answer Yes to upgrade an earlier version of Windows, Setup performs this version update:

- The files listed in the **[win.copy]**, **[win.copy.net]**, or **[win.copy.win386]** sections and the **[update.files]** sections of SETUP.INF are copied to the appropriate directories.
- Files listed in the **[delFiles]** section of SETUP.INF are deleted.
- Various entries in WIN.INI and SYSTEM.INI are replaced, based on entries in the **[ini.upd.31]** section of SETUP.INF.
- Program Manager groups are redefined based on entries in the **[new.groups]** section of SETUP.INF.
- The old WINVER.EXE file is deleted and replaced with the current version.
- The closing screen is displayed, asking you to reboot Windows or return to MS-DOS. (If you are installing from a network, Setup will only return to MS-DOS, not reboot.)

If you specify another directory, Setup continues installing Windows 3.1 as though it were a first-time installation.

Identifying Hardware

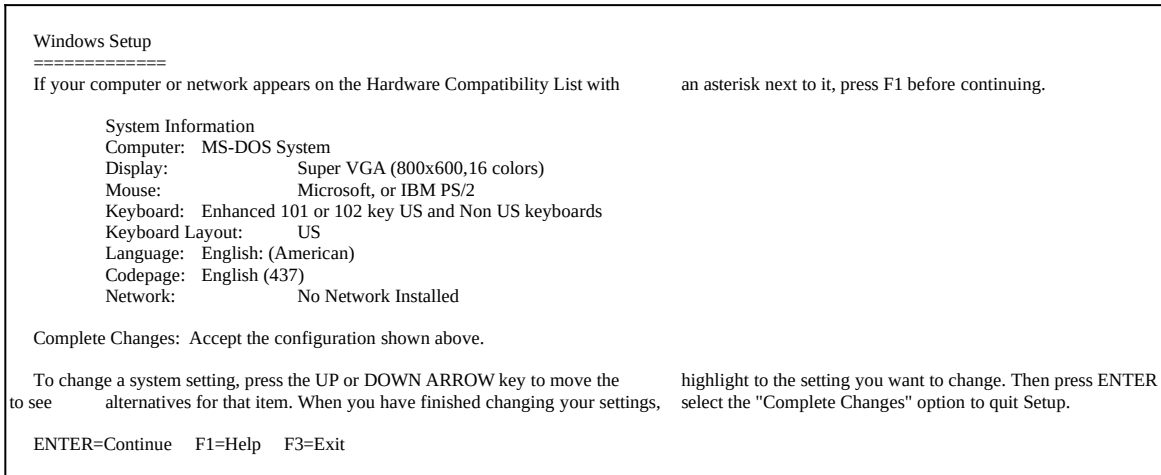
If you run Setup with the **/i** switch (**setup /i**), then Setup displays the System Configuration screen so that you can choose the machine type, display, mouse driver, and network used in your system. For details about making choices in this screen, press F1 during Setup, or see the *Getting Started* booklet.

If Setup is not performing an update and if you did not use the **setup /i** switch, then Setup performs Auto-detection to identify the specific type of machine, display, keyboard, mouse, and network devices. After the detection routines, Setup checks the type of display against the type of processor to make sure the display type is supported for running Windows 386 enhanced mode. (For example, EGABW and EGAMONO are not supported in 386 enhanced mode.)

After the detection routines are completed, Custom Setup displays the configuration information so you can modify the settings if

necessary. For example, you might want to specify a display type that requires an OEM-supplied disk with the necessary drivers.

Figure 1.1

System Configuration screen for
Windows Setup

Setup also searches for TSRs and drivers that are known to interfere with installation. Where possible, Setup automatically removes these drivers. You may see a warning at this point that you must uninstall incompatible drivers or TSRs for Setup to proceed. Setup also checks for disk compression software such as Stacker. For more information, see “Troubleshooting TSRs During Setup” in Chapter 13, “Troubleshooting Windows 3.1.”

When you confirm the system configuration settings, Setup copies the appropriate files required to start Windows in standard mode and prepares a minimum SYSTEM.INI file to start Windows Mode Setup. If you are installing Windows on a local drive, Setup copies SETUP.EXE to the WINDOWS directory and SETUP.INF to the Windows SYSTEM subdirectory. Next, it copies files listed in the **[winexec]**, **[windows]**, and **[windows.system]** sections of SETUP.INF plus the appropriate Windows logo code and the logo data files. Then Setup renames the SYSTEM.SRC file as SYSTEM.INI.

Modifying SYSTEM.INI to Support Your Hardware

To prepare for Windows Mode Setup, two sections in the SYSTEM.INI file are modified to support the hardware configuration:

- The **[boot]** section of SYSTEM.INI is modified to update the following entries: **system.driv=**, **display.driv=**, **keyboard.driv=**, **mouse.driv=**, **fonts.fon=**, **oemfonts.fon=**, **sound.driv=**, **comm.driv=**, **fixedfon.fon=**, **language.dll=**, and **network.driv=**.
- The **[keyboard]** section of SYSTEM.INI is modified, updating the following entries: **keyboard.dll=**, **oemansi.bin=**, **type=**, and **subtype=**. For most U.S. installations, the **type=** entry is the only entry that is modified.

The **shell=** entry in the **[boot]** section of SYSTEM.INI becomes **shell=setup** (which is specified in the **[shell]** section of SETUP.INF). The **[boot.description]** section of SYSTEM.INI is filled with the text strings used by Setup to show the current configuration in a format that can be understood by nontechnical Windows users.

The files listed in the **[boot]** section of SYSTEM.INI are now copied to the Windows SYSTEM subdirectory. The names of the actual drivers will depend on the machine configuration. Usually, the following files are copied: SYSTEM.DRV, DISPLAY.DRV, KEYBOARD.DRV, MOUSE.DRV, FONTS.FON, OEMFONTS.FON, SOUND.DRV, COMM.DRV, and FIXEDFON.FON.

After these system files are copied, the KEYBOARD.DLL file and the OEMANSI.BIN file (if necessary) are copied to the Windows SYSTEM subdirectory.

MS-DOS Mode Setup next modifies SYSTEM.INI for settings to complete installation. The **286grabber=** entry in the **[boot]** section is modified first, and if the system configuration will support 386 enhanced mode, the **386grabber=** entry is modified. For 80386 and higher processors, entries are placed in the **[386enh]** section of SYSTEM.INI to support the virtual display device, EBIOS, and any machine-specific settings such as **emmexclude=** values.

Last Steps for MS-DOS Mode Setup

Before Windows runs, Setup builds WIN.COM in the WINDOWS directory by joining the WIN.CNF file with the correct logo code and logo data files from the Windows installation disks.

The last step before starting the Windows Mode part of Setup is to build the command line to pass to Setup. (The command-line parameters are switches following an executable name that tell a program to execute in a specific way.) First, the name of the application to execute (**win.com**) is read from the **startup=** entry in the **[data]** section of SETUP.INF.

Next, Setup reads the default command line from the **execcmd=** entry in the **[winexec]** section of SETUP.INF, which specifies the Windows kernel to use for Windows Mode Setup.

Flowchart 1.2
Windows Hangs
During Setup

Finally, Setup calls the MS-DOS **exec** command to start WIN.COM using the Setup command-line parameters. At the completion of MS-DOS Mode Setup, WIN.COM loads, first displaying the logo screen and determining whether Windows can run in standard mode to complete Setup. If HIMEM.SYS is present and there is at least 256K of conventional memory and 192K of extended memory, Windows starts in standard mode. If HIMEM.SYS is not present, then XMSMMGR.EXE is also executed, to serve as the extended memory manager for Setup.

If MS-DOS Mode Setup fails, or if Windows Mode Setup hangs, Setup probably failed to detect the correct hardware on your system (or you provided Windows with incorrect hardware settings). For more information about Setup failure, see Chapter 13, “Troubleshooting Windows 3.1.”

Windows Mode Setup

When MS-DOS Mode Setup starts Windows, all of the essential Windows files are loaded, including the core executable files (KRNL286.EXE or KRNL386.EXE, User, and GDI), dynamic-link libraries, the drivers, and the fonts. The Windows background color is drawn on the screen, followed by the hourglass mouse cursor (if a mouse or pointing device is present), and finally by the Windows Setup screen. During Windows Mode Setup, Windows automatically runs in standard mode.

Getting Ready for Windows Mode Installation

While Windows is starting for the first time, Setup is loading SETUP.INF into memory and searching for the **[blowaway]** section. It trims down the file at that section, discarding unnecessary sections to minimize the memory overhead for the file. For more information on **[blowaway]**, see Chapter 2, “The Windows Setup Information Files.”

Setup then checks the **shell=** entry in the **[boot]** section of SYSTEM.INI to make sure that it is the Windows boot shell. If Setup is not the boot shell, then Setup performs a series of maintenance

tasks and prompts you to change the system settings. If Setup is the boot shell, then it gets the path of the WINDOWS directory, reads the command-line parameters from MS-DOS Mode Setup, and sets flags for later use.

After the Windows Setup screen is drawn and if your system has a mouse, you can choose to run a tutorial to practice using a mouse in Windows and to identify key elements of a window.

Next, Setup prompts you for a user name and company name, which is the identifying name that will appear with the registration serial number in the About Program Manager dialog box. If you have previously installed Windows using the same disks, a reminder appears instead of the registration dialog box.

Completing Custom Application Installation

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During Custom Setup, the Add/Remove Files dialog box is displayed at this point, asking if Setup should install printers and optional applications, and if you want to create a swap file. Setup saves the response to these options for later use. In Windows 3.1, the dialog box shows the total amount of disk space required for each option and allows you to further customize each choice.

Figure 1.2

Add/Remove
dialog box
for Windows Setup

This dialog box does not appear if you use **setup /n** for installation

Setup now uses information from the “copy files” sections of SETUP.INF to copy the Windows files and applications to the hard disk. These sections in SETUP.INF list the files to be copied, depending on the system:

- **[win.copy]**, if the system has an 80286 processor
- **[win.copy.net]**, if installing from a network drive
- **[win.copy.win386]**, if the system has an 80386 processor

Updating the System Files

Setup updates the system files at this point. Depending on settings in `SETUP.INF`, Setup will:

- Copy the virtual mouse drivers and update the virtual mouse driver entry in the **[386enh]** section of `SYSTEM.INI`.
- Copy the virtual network drivers and the related help files, plus any optional network files.
- Update system support sections of the `WIN.INI` and `SYSTEM.INI` files.
- Copy the virtual display device files, if required, along with the matching application fonts (such as `EGA80WOA.FON`), and modify `SYSTEM.INI`, if necessary. For more information see “Display Driver Sections” in Chapter 2, “The Windows Setup Information Files.”

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Setup also copies the TrueType fonts and other screen fonts, matching the resolution of the display driver with those of a given font set. The desired font sets are copied to the Windows `SYSTEM` subdirectory, and the `WIN.INI` font entries are updated, if necessary. For details, see “Fonts Files” in Chapter 3, “The Windows Files.” When all other files are copied, Setup installs the specified applications and printers.

After completing these steps, Setup modifies the **shell=** entry in the **[boot]** section of `SYSTEM.INI`, changing it from **setup** to **progman** (the Windows Program Manager). Then Setup starts Program Manager and sends DDE messages to it to create groups and install group items as defined in the **[progman.groups]** and **[new.groups]** sections of `SETUP.INF`.

Checking for SMARTDrive and Incompatible Drivers

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Setup searches `CONFIG.SYS` and removes any incompatible drivers and adds or updates entries for drivers such as `HIMEM.SYS` to load the desired drivers.

If SMARTdrive is not installed in the system, and the system has at least 512K of extended memory, Setup installs SMARTDRV.EXE in the AUTOEXEC.BAT file. If your system requires double buffering, then Setup also installs SMARTDRV.EXE in your CONFIG.SYS file. If RAMDRIVE.SYS is installed in CONFIG.SYS, Setup will update it; but Setup will not install RAMdrive if it isn't already installed.

Setup also checks the list of incompatible drivers in SETUP.INF. If any of these incompatible drivers are listed in CONFIG.SYS or if the MS-DOS **append**, **subst**, or **join** commands are in AUTOEXEC.BAT, Setup displays a message box explaining that incompatible drivers or commands have been found. Also, Setup checks the **files=** entry in CONFIG.SYS to make sure that the number of file handles is at least 30.

After these modifications, Custom Setup displays a dialog box, asking if the changes to CONFIG.SYS and AUTOEXEC.BAT should be made automatically or if you want to review and edit the file. Depending on your response, Setup takes the appropriate action and automatically saves the previous versions in backup files. For Express Setup, the changes are always made automatically.

Updating from Earlier Version of Windows

For updating from Windows 3.0, Setup makes changes to WIN.INI and SYSTEM.INI based on entries in **[ini.upd.31]** and other sections of SETUP.INF. For more information, see “Miscellaneous Sections” in Chapter 2, “The Windows Setup Information Files.”

Completing Setup

To complete the installation of the Windows files, Setup renames WINVER to WINVER.EXE. Windows is now installed on your system.

Setup displays a final message, asking you to reboot Windows or to return to MS-DOS so that all changes can take effect. If you are installing Windows from a network, Setup always returns to MS-DOS rather than rebooting Windows.

Setting Up Windows for a Network

The rest of this chapter describes how to place Windows files on a network server, how to set up workstations to access a shared copy of Windows, and how to use the Automated Setup option to efficiently set up Windows on multiple computers.

If you want to set up Windows over a network, set up shared

copies of Windows, or you are setting up multiple workstations, read these sections.

Note If you want to use the Windows Setup disks to set up Windows on a single workstation's hard disk, you do not need to read these sections.

General Guidelines

You have many options for setting up Windows over a network, depending on your environment:

- Do you want to set up a separate copy of Windows on each workstation? (This requires 8 to 10.5 MB on each hard disk.) Or do you want users to share most of the Windows files on a network server? (This requires 16 MB on shared network server disk and 300K on each workstation hard disk.)
- Do you want to run Setup for each workstation from the Windows setup disks or from a network server?
- How interactive do you want the setup process to be? Do you want the user to configure options, or do you want to automate the process so that all options are predetermined?
- Do you want to set up a customized version of Windows? You can first copy Windows files to the network, then make modifications described in Chapter 2, and finally set up Windows for users' workstations. For details, see "Modifying .INF Files for Custom Installations" in Chapter 2, "The Windows Setup Information Files."

Note You must have a license to use Microsoft Windows on more than one machine.

After deciding the answers to the questions above, you can decide which Setup options to use:

- W**
- **setup /a** (Windows Administrative Setup) copies the Windows files to a network server so that users can run the Setup program from the network. (This option replaces EXPALL.BAT that was used in Windows 3.0.)
 - **setup /n** (Windows Network Setup) sets up a workstation to run a shared

copy of Windows. Only a few Windows files are copied to the workstation's hard disk (or the user's personal network directory) so that the user can customize the Windows environment.

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- **setup /h** (Windows Automated Setup) uses an automated Setup routine for easy installation. For more information, see "Using Automated Setup" later in this chapter.

The rest of this section describes Administrative Setup and Network Setup. The next section in this chapter describes Automated Setup.

Placing Windows Files on a Network Server: Setup /a

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You can use **setup /a** (the Windows Administrative Setup option) to place Windows files on a network server. The administrative option does not set up a usable copy of Windows, but simply transfers the files from the Windows Setup disks to a network drive. The files are automatically expanded, renamed, and marked as read-only when they are copied to the network drive. The shared Windows files must be marked as read-only (even on a read-only network drive) so that they can be used by more than one user or application at a time.

Important Before you run the Setup program, turn off any network messaging services or TSRs that allow the network or another user to send a message to your screen. These popup programs can cause Windows Setup to fail if a message is received while Windows is being installed.

To place Windows files on a network server:

1. From your workstation, connect to the network drive where you want to copy the Windows files. Ensure that you have write access in that directory.
2. Insert the Windows 3.1 disk #1 into a floppy drive, and change to the drive letter of the floppy drive.
3. At the command prompt, type **setup /a** and press **ENTER**.
4. Follow the instructions on your screen.

You are prompted to specify the network drive and directory you want the Windows files copied to (for example, w:\WINSHARE). You're also prompted to specify group registration information (group name and company name), which is stored and used when individual workstations are set up.

5. If your network requires it, make sure that all of the Windows files in this directory are marked as shareable. For more information, see your network documentation.

If you want to copy Windows files to other shared network servers in your organization, run **setup /a** from the shared directory you just copied Windows files to. This will copy files and mark them as read-only in the new directory. You'll be prompted for the company name and group name again, allowing you to specify a different company or group name for each shared WINDOWS directory in your organization.

Note Do not use the MS-DOS **copy *.*** command at the command prompt to copy Windows files to another network server, and do not delete the 8-byte files named **disk1**, **disk2**, **disk3**, and so forth, from the shared network directory. These files are required to run **setup /a** from the network.

After you place the Windows files on a network server, users can connect to this server and run **setup /n** to set up Windows for their workstations.

Before you instruct users to set up Windows, decide whether you want them to share Windows files on the network server or copy all Windows files to their workstations, and whether you want them to use Automated Setup. You may also want to customize Setup to add custom Program Manager groups and applications to the users' Windows environment. Or you might customize Setup to modify the Program Manager capabilities available to users. For more information, see "PROGMAN.INI: The Program Manager Initialization File" in Chapter 4, "The Windows Initialization Files."

*Flowchart 1.3
Setup /n Fails*

Setting Up a Shared Copy of Windows: Setup /n

Users can set up their workstations to access a shared copy of Windows by running **setup /n** (the Network Setup option). **Setup /n** copies some of the Windows files to the user's personal WINDOWS directory. The user can customize Windows according to personal preferences while still sharing most of the Windows files with other users.

To set up a shared copy of Windows on a workstation:

1. From the workstation, connect to the network drive that contains the Windows files.
2. Change to the directory where the Windows files are located.
3. Type **setup /n** at the command prompt and press ENTER.
4. Follow the instructions on the screen.

You are prompted for the directory where you want to place the user files. This directory can either be on the local hard disk (for example, C:\WINDOWS) or on a private network directory (for example, U:\USERNAME). Specify a private directory on a network server if you are setting up a diskless workstation.

Setup copies only the files that are relevant to the user's system and desktop preferences—for example, the group and initialization files (.GRP and .INI files). All other Windows files are found in the shared network directory. Setup adds both the private WINDOWS directory and the shared network directory to the path in the user's AUTOEXEC.BAT file.

Note You cannot run **setup /n** from the installation disks. You can modify Setup so that it always sets up a shared copy of Windows on a workstation, even if a user specifies a different Setup option. To do this, specify **netsetup=true** in the **[data]** section of SETUP.INF. For more information, see "Forcing the Network Setup Option" in Chapter 2, "The Windows Setup Information Files." There are no custom options available to the user when you force Network Setup in this way.

Using Automated Setup: Setup /h

W

The Windows Automated Setup option (also called Batch Mode Setup) uses information defined in a system settings file to install Windows quickly and easily, with little or no user interaction. Automated Setup is useful if you have to set up many workstations, or if you want users to be able to set up on their own workstations without having to make any system configuration choices such as hardware components and printers, or choices about which optional Windows components to install.

Automated Setup can be used for setting up a shared copy of Windows or a nonshared copy, and you can use it if you are setting up Windows from a network drive or from the Windows Setup disks.

Note Before you run the Setup program, turn off any network messaging services or TSRs that allow the network or another user to send a message to your screen. These popup programs can cause Windows Setup to fail if a message is received while Windows is being installed.

To use the Automated Setup option:

1. Create a system settings file for each workstation configuration and place the system settings files in a directory where users have rights to open and read files, or copy it to the workstation disk.

For details, see the following section, "Creating the System Settings File."

2. From the workstation, either you or a user can set up Windows by using the Automated Setup option. If you are setting up Windows from a network, connect to the network drive and change to the directory where the Windows Setup files are located. If you are setting up Windows from the Windows Setup disks, change to the letter of the floppy drive.

3. If you want to run a shared copy of Windows from the network, type **setup /h:[drive:\path]filename /n**

If you want to run a nonshared copy of Windows from a local drive or a network drive, type **setup /h:[drive:\path]filename**

The *filename* is the name of the system settings file that contains details about the system configuration. Include a path if the system settings file is not in the directory from which you are setting up Windows.

For example, you might create a system settings file named **SETUPVGA.SHH** in the same directory as the Setup program. To set up a complete copy of Windows on the workstation, at the command prompt type **setup /h:setupvga.shh** and press **ENTER**.

If you want to run a shared copy of Windows from the network, using this same example, connect to the network drive and directory where the Windows Setup files are located. At the command prompt, type **setup /h:setupvga.shh /n** and press **ENTER**.

Creating the System Settings File

W Windows comes with a system settings template file called **SETUP.SHH**, which you can copy or modify to create a custom system settings file. The **SETUP.SHH** file is located on Microsoft Windows 3.1 disk #1 and is copied to the shared Windows directory when you use **setup /a**. You can modify this file with any text editor that can save unformatted text (ASCII) files.

Note When you create the **.SHH** file, use only ANSI characters. The **.SHH** file will be interpreted as containing characters from the ANSI character set, not from the code page character set currently installed on your system.

The system settings file is summarized in the following table.

<i>Section</i>	<i>Purpose</i>
[sysinfo]	Specifies whether System Configuration screen will appear during Setup.
[configuration]	Specifies the various devices on the user's system.
[windir]	Specifies where to put Windows files.
[userinfo]	Specifies the user and company name.
[dontinstall]	Specifies components that should not be installed.
[options]	Specifies various Setup options such as viewing README files, setting up existing applications, and starting the Windows tutorial.
[printers]	Specifies printers to set up.
[endinstall]	Specifies whether Setup modifies the CONFIG.SYS and AUTOEXEC.BAT files and whether the system is rebooted after Windows is installed.

The entries for these sections are described later in this section. Many of the entries require values from the Windows SETUP.INF, CONTROL.INF, and WIN.INI files. When you use **setup /a** to place Windows files on a network server, these files are copied to the shared WINDOWS directory. The master WIN.INI and SYSTEM.INI files are called WIN.SRC and SYSTEM.SRC in this directory. You can also find SETUP.INF on Microsoft Windows 3.1 disk #1. You can print or view all of these text files with any text editor.

For details about specific items in SETUP.INF, see the related entries in Chapter 2, "The Windows Setup Information Files." For details about specific items in WIN.SRC and SYSTEM.SRC, see the related entries in Chapter 4, "The Windows Initialization Files."

[sysinfo]

This section specifies whether the System Information screen is displayed during MS-DOS Mode Setup, so that the user can confirm or change the settings before continuing with Setup. Specify **showsysinfo=yes** to display the screen, or **showsysinfo=no** if you don't want to display the screen. (The default is **no**.)

For details about the System Information screen, see “MS-DOS Mode Setup” earlier in this chapter.

[configuration]

This section specifies the various devices on the user's system. If an entry for **[configuration]** is not included in the system settings file, the detected or default device will be used.

If you are updating Windows, Setup ignores some of these entries and uses the devices that are already installed. If you want to force the update and override the installed device, precede the **machine=**, **display=**, **mouse=**, and **network=** values with an exclamation point (!), for example, **display=!vga**. Any **keyboard=**, **language=**, or **kblayout=** values specified will automatically override the installed device.

<i>Use</i>	<i>To</i>
machine=	Specify the type of machine, using a profile string from the [machine] section of SETUP.INF. Example: machine=ibm_compatible .
display=	Specify the type of display, using a profile string from the [display] section of SETUP.INF. Example: display=vga .
mouse=	Specify the type of pointing device, using a profile string from the [pointing.device] section of SETUP.INF. Example: mouse=ps2mouse .
network=	Specify the type of network and the version number, using a profile string from the [network] section of SETUP.INF to specify the network. Example: network=lanman sets up the detected version of Microsoft LAN Manager. If there is a [network_version] section in SETUP.INF, for example [lanman.versions] , then use a number from that section to specify the version of network you want to set up. Separate the version number from the network type with a slash (/). Example: network=lanman/01020000 sets up Microsoft LAN Manager version 2.0 Enhanced.
keyboard=	Specify the type of keyboard, using a profile string from the [keyboard.types] section of SETUP.INF. Example: keyboard=t4s0enha .
language=	Specify the language, using a profile string from

the **[language]** section of SETUP.INF. Example:
language=enu.

kblayout= Specify the keyboard layout, using a profile string from the **[keyboard.tables]** section of SETUP.INF. Example: **kblayout=nodll.**

[windir]

This section specifies where to put the user's Windows files. If Windows is already installed in the specified directory, Setup updates it. If you do not specify a directory or if the specified directory is not valid, a dialog box appears during Setup, asking for the directory in which to set up Windows.

For example, if you want to install Windows in the WINDOWS directory on drive C, specify **c:\windows** in this section. This setting overrides the value of **defdir=** in the **[data]** section of SETUP.INF.

[userinfo]

This section specifies the user and company name. The first line specifies the user name. This line is required unless you are setting up a shared copy of Windows (**setup /n**). The second line specifies the company name, and is optional. Both names can be up to 30 characters long and must be enclosed in double quotation marks (" ") if they include blank spaces. For example:

```
"John Smith"  
"My Company"
```

If you do not specify a user name, a dialog box appears during Setup to ask for the name.

If you use **setup /n** to set up a shared copy of Windows, the **[userinfo]** section is ignored because the information was supplied when you used **setup /a** to copy Windows files to the server.

[dontinstall]

This section specifies optional Windows components that you do not want to set up. If this section is not present or is empty, all

optional components are set up. You can choose not to install the components listed in the following table.

<i>Specify</i>	<i>If you do not want to install</i>
readmes	Readme files
accessories	Accessories (However, WRITE.EXE is always installed.)
games	Games
screensavers	Screen savers
bitmaps	Background wallpapers

[options]

This section specifies whether a user can set up applications during Setup and whether to start the Windows Tutorial at the end of Setup. If you don't want any of these options, omit this section. You can specify in this section the entries shown in the following table.

<i>Specify</i>	<i>To</i>
setupapps	Set up applications interactively during Setup. The Add/Remove File dialog box appears during Setup so the user can choose which applications to install.
autosetupapps	Automatically set up all applications found on the user's hard disk.
tutorial	Start the Windows Tutorial at the end of Setup.

You should not specify both **setupapps** and **autosetupapps**, but if you do, all applications on the hard disk will be set up.

[printers]

This section specifies which printers to install during Setup. To install a printer, you specify a printer name and a port. Use one of the descriptive strings found in the **[io.device]** section of the CONTROL.INF file to specify the printer name. The printer name must be enclosed in double quotation marks (" ") if it contains blank spaces. Use one of the values found in the **[ports]** section of WIN.INI to specify the port. The printer name and the port must be separated by a comma. For example, to specify the HP LaserJet III printer connected to port LPT1, include this entry:

```
"HP LaserJet III",LPT1:
```

If you don't want to install any printers during Setup, omit this section.

[endinstall]

This section specifies what should happen after Windows is successfully installed. You can specify whether Setup should modify CONFIG.SYS and AUTOEXEC.BAT and then exit to MS-DOS, restart Windows, or restart the system.

<i>Specify</i>	<i>If you want Setup to</i>
configfiles=modify	Make all changes to CONFIG.SYS and AUTOEXEC.BAT for the user. When Setup changes these files, the previous CONFIG.SYS and AUTOEXEC.BAT files are saved as CONFIG.OLD and AUTOEXEC.OLD in the root directory. (If CONFIG.OLD or AUTOEXEC.OLD are already present, the previous file will be renamed CONFIG.000 or AUTOEXEC.000, or the next number that does not conflict with an existing file.) If you are setting up Windows on a diskless workstation, Setup disregards this entry.
configfiles=save	Save proposed changes to the CONFIG.SYS and AUTOEXEC.BAT files in alternate files (CONFIG.WIN and AUTOEXEC.WIN) stored in the WINDOWS directory. The CONFIG.SYS and AUTOEXEC.BAT files are not changed; you must make these changes later. (If CONFIG.WIN or AUTOEXEC.WIN are already present, the previous file will be renamed CONFIG.000 or AUTOEXEC.000, or the next number that does not conflict with an existing file.)
endopt=exit	Return to MS-DOS on completion of Setup.
endopt=restart	Restart Windows on completion of Setup.
endopt=reboot	Restart the user's system on completion of Setup. If this setting is specified and the user uses setup /n to install Windows, Setup will return to MS-DOS without rebooting after completing the installation.

Sample System Settings File

The following system settings file installs Windows on a PC-compatible computer with these characteristics:

- A VGA display, Microsoft mouse, LAN Manager 2.0 Enhanced network, and 101-key U.S. keyboard.
- The System Information screen is displayed for confirmation, and Windows files are put in the C:\WINDOWS directory.
- The games are not installed.
- An HP LaserJet III printer is installed on LPT1.
- The CONFIG.SYS and AUTOEXEC.BAT files are modified by Setup.
- After Windows is set up, Windows is restarted.

```
[sysinfo]
showsysinfo=yes

[configuration]
machine=ibm_compatible
display=vga
mouse=ps2mouse
network=lanman/01020000
keyboard=t4s0enha
language=enu
kblayout=nodll

[windir]
c:\windows

[userinfo]
"user's name"
"company name"

[dontinstall]
games

[options]

[printers]
"HP LaserJet III",LPT1:

[endinstall]
configfiles=modify
endopt=restart
```

Maintaining Windows with Setup

You can use Setup to maintain Windows after the initial installation. When you run Setup from within Windows, you can

review the same options as during original installation for choosing system settings, installing Windows applications, and adding or removing Windows components. For details about using Setup to make changes or additions, see Chapter 15, “Maintaining Windows with Setup,” in the *Windows User’s Guide*.

To make other changes to a system from within Windows you can:

- Choose the 386 Enhanced icon in Control Panel to define device contention settings, task scheduling for multitasking in 386 enhanced mode, and virtual memory settings.
- Choose the Ports icon or Printers icon in Control Panel to define settings for ports and devices.

Figure 1.3

*Program Manager and
Control Panel*

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- Drag icons to the Startup Group in Program Manager to specify which applications will run whenever you start Windows.
- Use the Program Manager commands to create new groups. For example, use the File Properties command to change icons and specify other elements of an application's appearance on the desktop.

For details about using these Windows components, see the related chapters in the *Windows User's Guide*.

