

Wabi User's Guide

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Preface



The *Wabi User's Guide* provides information about all of the product functions and procedures of Wabi[™] software, and its technology for running Microsoft[®] Windows applications on UNIX[®] operating systems. Topics covered include: starting the Wabi program, configuring your Wabi environment, setting up drives and printers, configuring ports, and installing and running applications.

The manual also provides information for WabiServer[™] users. Some aspects of Wabi differ when you run it in WabiServer.

Do Not Read This Manual

Instead, scan it for exactly the information you need. This guide is organized differently than the documentation you're used to reading. The goal is simple: minimize the amount of material you must wade through in order to get your job done. To accomplish this, each chapter is divided into three sections:

- About
- Instructions
- Reference

The *About* section in each chapter explains the operating concepts of a topic and provides background material related to the tasks described in the chapter. Think of *About* as the place to go to get the “big picture” on a topic or a procedure. Read as much, or as little, of *About* as you need to get the job done. Skip *About* entirely if you grasp a concept and require only step-by-step instructions to complete a task.



The *Instructions* section is the place to turn for mouse clicks and keystrokes. This section takes a no frills approach to instructions, communicating a maximum amount of task-oriented information in a minimum amount of space. Every Wabi task is covered in *Instructions*. Yet when you use the *Instructions* section you won't be distracted from the job at hand by conceptual digressions and long-winded explanations.

A *Reference* section rounds out most chapters. This section contains charts and tables of information related to the topic under discussion. Use the *Reference* section when you encounter a problem completing a task. The problem-and-solution tables included there will help you troubleshoot problems you may encounter with the Wabi program or the applications you are running.

As you scan each chapter, keep an eye on the frequent *margin notes* in the left-hand margin. These notes usually point to a cross-reference in a related section within the same chapter. For example, a concept described in *About* carries a cross-reference to the page in *Instructions* where the steps required to perform the related task appear. (The reverse is also true.) Use margin notes to shorten the distance between where you are and where you want to be.

Who Should Use This Book

If you use the Wabi program to load and run applications, you'll find this manual essential. It describes operating concepts and procedures, and provides step-by-step instructions for completing all Wabi tasks. Similarly, if you are responsible for supporting users, or for installing or configuring the Wabi program, this manual is the place to turn for comprehensive information about concepts, procedures, and system requirements.

WabiServer administrators will find this manual useful for configuring the user environment when creating prototypes.

Before You Use This Book

To use the Wabi program, you must be familiar with the use of a mouse and with graphic user interface techniques, including: pointing, clicking, and choosing options from a menu. If you are not familiar with these operations, refer to your system user's guide or desktop reference manual. They supply information about performing tasks using a mouse. Experienced users will find



that the steps and procedures required to perform a task in the Wabi program are similar to those required to perform a task in any graphical user environment.

The Wabi program is a bridge between your UNIX operating system and a Microsoft Windows-compatible application program. As a result, you need some knowledge of your operating system to fully configure the Wabi program. For example, you'll need to know the operating system files available to you in order to access those files. Similarly, you may need to supply the Wabi program with the locations and names of operating system device drivers, such as diskette device drivers, in order to use devices.

If you use WabiServer, you may not need to know much about the UNIX operating system, provided your WabiServer administrator configures your Wabi environment for you.

What This Guide Contains

This guide presents material as follows:

Chapter 1, “What is Wabi?” presents an overview of the Wabi system and the WabiServer product, provides system hardware and memory requirements, and lists the applications certified to run in the Wabi environment.

Chapter 2, “Starting Wabi,” explains how to start a standalone Wabi session and install Microsoft Windows software, explains how to start WabiServer to configure your WabiServer setup, and describes the Wabi user interface.

Chapter 3, “Configuring Your Wabi Environment,” introduces you to the Wabi Configuration Manager and Microsoft Windows Control Panel, the tools you'll use to configure your Wabi environment.

Chapter 4, “Setting Up Drives,” explains how the Wabi program uses diskette and network drives, and describes in detail how to create and use drives.

Chapter 5, “Printing,” examines how the Wabi program interacts with printers. Here you'll learn how to configure a port for printing and assign a printer to it. You'll also learn how to establish and change the default printing setup.

Chapter 6, “Using Wabi COM Ports,” describes how to set up and connect Wabi COM ports to UNIX device drivers so you can use serial devices such as modems and printers.



Chapter 7, “Wabi International,” describes methods of localizing the Wabi program, and explains how to set up the Wabi program to use your preferences for international settings used by applications.

Chapter 8, “On the Network,” explains the ways the Wabi program uses the network.

Chapter 9, “Installing Microsoft Windows Applications,” details how to install Microsoft Windows applications. It also describes how Windows applications and their document files are integrated into the OpenWindows environment.

Chapter 10, “Using Microsoft Windows Applications,” describes ways to start applications in the Wabi environment, and discusses issues with X window managers that may arise when you use applications. It also describes Wabi support of multimedia features.

Chapter 11, “Setting Up Remote Database Access,” describes how to set up remote database access for supported applications.

Chapter 12, “Using a DOS Emulator in the Wabi Environment,” details how to connect a DOS emulator to the Wabi program, and install and run DOS-based applications.

Appendix A, “Wabi File Layout,” outlines the structure of the directories and files that make up the Wabi software.

Appendix B, “Color From Windows to Wabi,” explains Wabi color handling and describes some variables that affect Wabi color handling.

Appendix C, “Fonts From Windows to Wabi,” discusses methods the Wabi program uses to provide fonts to applications.

Appendix D, “UNIX and DOS File Systems,” describes utilities that help you use DOS and UNIX files in both environments.

Related Books

You may find it helpful to have your operating system user’s guide (from the operating system supplier) and your *Microsoft Windows User’s Guide* on hand when you use the Wabi program. These books provide background information related to Wabi topics and detail the use of the features and functions available in Microsoft Windows software.



If you are a WabiServer administrator, you should use the *WabiServer Administrator's Guide* to help you set up your WabiServer configuration.

Getting Help

There are several sources of help you can turn to with Wabi questions and problems:

- Wabi on-line Help
- Wabi error messages and status panel help
- Wabi customer support

On-Line Help

The Wabi program provides a comprehensive on-line Help system that describes how to use the Wabi Configuration Manager.

To use Wabi on-line Help, press F1 in the Configuration Manager window to view the Help table of contents. Then choose a Help topic to jump to a detailed Help screen. You can also choose the Help button within any Wabi dialog box to view a context-sensitive Help screen.

Error Messages and Status Panel Help

Wabi functions return an error message when a problem occurs that interrupts the completion of a task. Error messages describe the problem and usually suggest a solution that resolves the error condition. Occasionally, you must progress through a series of error messages to fully resolve an error. Follow the instructions provided in each error message box to resolve an error.

The Wabi program also provides status panel help. Status panel help appears in a footer included in each Configuration Manager dialog box. (This panel forms the left half of a dialog box bottom border.) The contents of this panel change as you move the mouse pointer over the dialog box. For example, if you place the pointer over an entry area, status panel help displays a brief description of the type of entry required.



Customer Support

Your operating system vendor provides telephone support for the Wabi program. If you cannot resolve a problem using Wabi documentation, on-line Help, or error messages and status panel help, contact your operating system vendor for additional support.

If you have Mosaic or a similar Internet browser, you can get more information about Wabi software and SunSoft PC Desktop Integration products in general from the World Wide Web at the following location, or URL:



<http://www.sun.com/sunsoft/Products/PC-Integration-products>

Typographic Conventions Used in This Manual

The following table describes the type changes and symbols used in this book.

Typeface, symbol, or term	Meaning	Example
AaBbCc123	The names of commands, files, and directories; on-screen computer output.	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. system% You have mail.
AaBbCc123	What you type, contrasted with on-screen computer output.	machine_name% su Password:
AaBbCc123	Command-line placeholder: replace with a real name or value.	To delete a file, type rm filename .
AaBbCc123	Book titles, new words or terms, or words to be emphasized.	Read Chapter 6 in <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be root to do this.
Key Names Alt,s,d F1	Keys are written as they appear on the keyboard. Keys you press sequentially are separated by a comma. Keys you press simultaneously are joined by a plus sign (+).	Press Alt,s,k to open the Diskette Connections dialog box. Press Alt + F4



Typeface, symbol, or term	Meaning	Example
Type vs. Enter	Type means press only the keys indicated. Enter means to type the indicated keys and press the Enter or Return keys.	Type a device driver name. Enter a device driver name.
Enter vs. Return	These keys are used interchangeably.	
	Information specific to users of WabiServer.	 You can use either your local diskette drive or the server diskette drive.



What is Wabi?

1 

The Wabi™ program is a UNIX® application that enables you to run Microsoft® Windows applications on several UNIX operating environments that use the X Window System™. Wabi acts as an interface between the Windows world and the UNIX world, translating the language of Microsoft Windows applications to the language of UNIX and the X Window System.

Keep an eye out for margin notes that cross-reference instructions and other useful information.

The Wabi program lets you enjoy the benefits of the security, power, and connectivity of your UNIX operating system, and on the same desktop, take advantage of popular Microsoft Windows applications such as spreadsheets, word processors, databases, graphics packages, and more. The best-selling applications have been tested extensively running in the Wabi environment. Applications that have been tested and certified compatible with the Wabi program are listed in “Certified Compatible Applications” on page 6.

The Wabi program can be run locally by individual users on their own systems, or remotely from a server by multiple users. The WabiServer™ product enables multiple users to access a single copy of Wabi software running on a server and simplifies the system administrator’s tasks for supporting those users. See “What is WabiServer?” on page 4 for more information about WabiServer.

How the Wabi Program Works

Wabi software is “middle-ware.” It resides between an application and the UNIX operating system. In general, the Wabi program works by intercepting a Microsoft Windows application’s request, and making an equivalent request in

the UNIX environment to deliver the desired result. The Wabi program carries out requests by translating Windows calls to X Window and UNIX calls, and on RISC platforms, translating Intel[®] x86 instructions to RISC instructions. On x86 UNIX platforms, the x86 instructions are passed directly to the x86 processor.

In slightly more concrete terms, an application uses Windows API calls to open an icon, for example, and Wabi translates the request to equivalent X Windows calls. A print request, and any other request involving a device, is translated and redirected to an appropriate UNIX command or device. Much of an application's "behind the scenes" activity involves x86 instructions, which Wabi translates appropriately for the processor platform on which it's running.

Figure 1-1 depicts the Wabi program's role as translator and redirector.

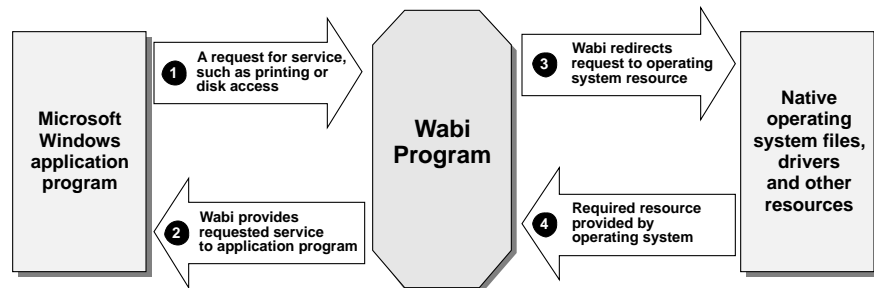


Figure 1-1 Wabi Program as Translator and Redirector

Wabi Capabilities and Functions

Because the Wabi program is an enabler for other applications, it has few visible capabilities and functions of its own. You cannot do much work without applications. The Wabi program's capabilities are based almost entirely on the applications that run within it, and the operating system on which it runs.

Wabi capabilities can be described only in the context of the applications that are certified to run in the Wabi program. Most of the functions of the certified applications are supported in the Wabi program; any exceptions are listed in the *Wabi Release Notes*.

Functions Supported for Certified Applications

In the Wabi environment, certified applications can do most of the same things they do in a Microsoft Windows environment. For example, applications are able to use the following capabilities:

- Cut, copy, and paste between Windows applications
- Access DOS-formatted diskettes
- Run in enhanced mode
- Object linking and embedding (OLE) between Windows applications
- Dynamic data exchange (DDE) between Windows applications
- Network installation and use of applications
- Windows Sockets networking
- Remote database access
- Audio playback and recording (of .WAV files), on computers with audio hardware (except in WabiServer)
- Video playback of .AVI files, if you have installed Microsoft Video for Windows

Additional Functions in the Wabi Environment

Because the Wabi program runs in the UNIX environment, it provides the certified applications with the following additional capabilities:

- Cut, copy, and paste between Microsoft Windows applications and X Window applications
- Transparent access to network file systems
- Use on X terminals
- Run on one system, display on another system
- Run more applications simultaneously on your desktop
- Share serial and parallel ports
- Multiple simultaneous users on one system

Functions Not Supported

Some functions are not supported for any applications. Generally, these functions require Microsoft Windows networking, special device drivers that the Wabi program does not support, or DOS commands. The Wabi program does *not* support the following features for any application:

- MIDI (Musical Instrument Digital Interface), AVI (Audio-Visual Interface) for video laser disks and music compact disks
- NetWare IPX/SPX connectivity
- Shared Wabi Windows directories
- Tutorials requiring VGA display drivers
- DOS diskette formatting
- Features requiring virtual device drivers

Wabi Functions

Functions unique to the Wabi program are those used to make connections to the UNIX operating system. You access these functions through the Wabi Configuration Manager, as Chapter 3, “Configuring Your Wabi Environment” explains.

What is WabiServer?

The WabiServer product provides the Wabi program in a client/server configuration. It enables multiple users on client systems to access a single installation of Wabi software on a server system. WabiServer frees users from the tasks of installing and configuring software, while enabling system administrators to perform tasks once to provide Wabi to many users.

The system administrator installs Wabi and WabiServer software on the server system, and installs Wabi client software on client systems. The administrator also creates Wabi user environments called *prototypes* on the server, and installs Microsoft Windows and Windows applications into the prototypes.

The first time you run WabiServer, a prototype is copied to your home directory to create your Wabi user environment, complete with the Microsoft Windows software and application software installed by the administrator. After the initial startup, using the Wabi program through WabiServer is quite similar to using the standalone Wabi program, with a few exceptions which are noted in this manual as shown below:



This is a WabiServer note. If you use WabiServer, look for this symbol for special information.

New Features in Wabi 2.1

If you have used previous Wabi releases, you should read the list below to see what's new in Wabi 2.1.

- Many of the certified applications have been revised and the newer revisions are now certified to work with the Wabi 2.1 program.
- You can now install and use Microsoft Windows for Workgroups 3.11 in the Wabi environment to satisfy the Windows requirement. However, features that require Windows networking are not yet supported in the Wabi environment.
- The Configuration Manager has been removed from the Wabi Tools group. You should now access it through the Microsoft Windows Control Panel.
- The Configuration Manager is simplified; the icons for Sound, Mouse, Color, and International have been removed because they duplicate functions of the Microsoft Windows Control Panel. Please use the Control Panel to modify these settings.

The Configuration Manager now includes only those icons that you use to connect Wabi components to your UNIX operating system. The Drives, Diskettes, and DOS functions remain unchanged from previous releases.

The Ports and Printer connection dialog boxes have been merged under a single Ports icon. You use Ports to connect COM ports to UNIX serial devices and LPT ports to UNIX printers and print commands. Use the Microsoft Windows Control Panel to change COM port settings such as baud rate and flow control, and to work with printer drivers.

- Several certified applications can access databases on remote DBMS servers.
- Support for playing and recording waveform files (.WAV) and playing of video files in .AVI format.
- Wabi 2.1 font handling has changed significantly. The Wabi font cache is not necessary because the Wabi program no longer uses X Window fonts, relying instead on TrueType, bitmap, and vector fonts supplied with Microsoft Windows and the applications you install.

Certified Compatible Applications

Table 1-1 lists applications that have been tested and certified compatible with the Wabi 2.1 program.

Table 1-1 Applications Certified for the Wabi Program

Certified Application Name	Supported Versions
Aldus® PageMaker®	4.0, 5.0
CorelDRAW!®	3.0, 4.0
Harvard Graphics® for Windows	2.0, 3.0
Intuit™ Quicken®	3.0, 4.0
Lotus® 1-2-3® for Windows	4.0, 5.0
Lotus Ami Pro®	3.01, 3.1
Lotus Approach™	2.1, 3.02
Lotus cc:Mail™ (Client only)	2.0, 2.03
Lotus Freelance Graphics®	2.01, 2.1
Lotus Notes® (Client only)	3.0, 3.3
Lotus Organizer™	1.1, 2.01
Lotus SmartSuite®	2.0, 3.1
Microsoft Access®	2.0
Microsoft Excel	4.0, 5.0
Microsoft Mail (Client only)	3.2
Microsoft Office	4.3
Microsoft PowerPoint®	3.0, 4.0
Microsoft Project	3.0, 4.0
Microsoft Word for Windows	2.0, 6.0
Paradox® for Windows	4.5, 5.0
PROCOMM PLUS® for Windows	1.0, 1.02
Quattro® Pro for Windows	5.0, 6.0
WordPerfect® for Windows	6.0a, 6.1

Note – Applications other than those listed *may* work with the Wabi program if they conform to Microsoft Windows 3.1 application program interface conventions. Lack of inclusion in this list means that an application has not been tested for compatibility with the Wabi program.

System Requirements

This section lists various hardware requirements for running the Wabi program.

Memory and Disk Space Requirements

Table 1-2 lists minimum and optimum memory and disk space configurations for using the Wabi program. See your operating system documentation for specifics on your hardware requirements.

Table 1-2 Wabi Memory and Disk Space Requirements

Item	Minimum	Recommended
Random-access memory (RAM)	24 Mbytes on RISC systems 16 Mbytes on x86 systems	48 Mbytes on RISC (64 Mbytes for power users) 32 Mbytes on x86
Disk space required for Wabi system directory	15 Mbytes	Not applicable
Disk space required for \$HOME/wabi	8 Mbytes for Microsoft Windows 3.1, 3.11 13 Mbytes for Microsoft Windows for Workgroups	Not applicable
Free swap space	20 Mbytes on RISC and x86	60 Mbytes on RISC 40 Mbytes on x86 10 Mbytes more for each application run concurrently



Please see the *WabiServer Administrator's Guide* for the system requirements for WabiServer client and server systems.

Display Requirements

The Wabi program supports displays with 1-bit, 4-bit, and 8-bit pixel depths. The Wabi program also supports 24-bit displays in 8-bit mode, *not* TrueColor mode. The X server for this display must have available an 8-bit PseudoColor visual class in order for Wabi to display correctly. See Appendix B, “Color From Windows to Wabi,” for more information about 24-bit displays.

Requirements for Multimedia Sound Support

The Wabi program provides support for waveform sound on the computers listed in Table 1-3.

Table 1-3 Wabi Sound Requirements

Computer	Sound Card and Audio Driver
SPARCstation TM 4	Separately purchased sound card. The audio driver in Solaris 2.4 needs a patch to make it work correctly. See the <i>Wabi Release Notes</i> .
SPARCstation 5	Sound card included. The audio driver in Solaris 2.4 needs a patch to make it work correctly. See the <i>Wabi Release Notes</i> .
SPARCstation 10	Sound card included. No patch is required for the Solaris 2.4 audio driver.
SPARCstation 20	Sound card included. No patch is required for the Solaris 2.4 audio driver.
386-, 486-, or Pentium TM -based computer	16-bit sound card with appropriate driver. (For example, Creative Labs Sound Blaster [®] 16 audio card with /dev/sbpro audio device driver.)



Sound is not supported with the WabiServer product.

Starting Wabi

2

This chapter explains how to start the Wabi program, describes how your user environment is created the first time you start the Wabi program, and describes the Wabi user interface.

If you have not yet started the Wabi program and want to learn about what happens the first time you start it, read the next section, “Starting Wabi Software the First Time.”



If you are using WabiServer, see the section “Starting WabiServer the First Time” on page 17 for information specifically for WabiServer users.

If you want instructions for specific tasks, use the following table to locate the instructions you need.

Task	Page
<i>Starting the Wabi Program</i>	28
<i>Starting the Remote Wabi Program in WabiServer</i>	28
<i>Installing Microsoft Windows From Diskette</i>	28
<i>Installing Microsoft Windows From Wabi Drive R</i>	29
<i>Exiting the Wabi Program</i>	30
<i>Displaying the Wabi Program on a Remote System</i>	30
<i>Displaying the Wabi Program with Small or Large System Fonts</i>	31
<i>Starting Wabi With or Without the Font Server</i>	31

Task	Page
<i>Setting Up Your WabiServer Configuration</i>	32
<i>Specifying a Different WabiServer System</i>	32
<i>Setting the WABISERVER Variable</i>	33
<i>Selecting a New Prototype for WabiServer</i>	33
<i>Specifying a Different Wabi Directory for WabiServer</i>	33
<i>Viewing the Wabi Man Page</i>	34
<i>Adding the Wabi Man Page to Man Pages Path</i>	34

Starting Wabi Software the First Time

See the section “Starting the Wabi Program” on page 28 for the Wabi start procedure.

Starting the Wabi program is easy, and you can use the same method to start it the first time or the tenth time. However, the first time you start it up, the Wabi program sets up your user environment, which takes a few minutes. If you are a new user, the Wabi program creates your personal wabi directory in your home directory, and then prompts you to install Microsoft Windows. If you do not want your wabi directory in your home directory, you can set the WABIDIR variable before starting the Wabi program the first time. See the section “To Create Your Wabi Directory in Another Location” on page 11 for more information.

If you are upgrading to Wabi 2.1, the Wabi program updates your wabi directory, and then prompts you to reinstall Microsoft Windows. Changes in this release of the Wabi program require additional Windows files that were not installed previously.

Your Personal Wabi Directory

The Wabi startup script creates your personal wabi directory as a subdirectory of your home directory by default. Within that directory, it creates a windows subdirectory. These two directories are analogous to the C:\ and C:\WINDOWS directories in a Microsoft Windows environment on a PC.

The section “Microsoft Windows Installation” on page 12 explains how to instal Microsoft Windows.

After your personal wabi directory is created, the Wabi Windows Install Program prompts you to install Microsoft Windows software. You must do this before you can use the Wabi program.



If you use WabiServer you can specify the location of your wabi directory as described in the following section, or by using the `rwabi_setup` program discussed in “Specifying the WabiServer System and Wabi Directory Location” on page 18.

To Create Your Wabi Directory in Another Location

You can tell the Wabi program to create your personal wabi directory in a location other than your home directory by setting the `WABIDIR` environment variable before you start the Wabi program. You can do this by using the commands below, where *pathname* is the directory path where you want to place your personal wabi directory.

In the C shell:

```
setenv WABIDIR pathname
```

In the Bourne or Korn shell:

```
WABIDIR=pathname; export WABIDIR
```

Include this statement in your `.cshrc` or `.profile` file in order to use this directory each time you start Wabi. If you do not, the next time you start Wabi, another wabi directory will be created in your home directory.

If You Are Upgrading From a Previous Release

The first time you start the Wabi program after the new release is installed, your wabi user directory is updated. All applications you have installed remain, and all changes you have made to your Wabi configuration, such as drive mappings, will be unchanged. See the *Wabi Release Notes* in the Wabi Tools group for more upgrade information.

If you did not install Microsoft Windows previously, the Wabi Windows Install program prompts you to install Microsoft Windows software. You must install Microsoft Windows before you can use the Wabi program.

If you had previously installed Microsoft Windows, you must reinstall it so Wabi has access to some additional Windows files that were not previously installed.



If you use an existing Wabi directory with WabiServer, your Wabi directory will be updated the first time you start WabiServer, just as with standalone Wabi.

Microsoft Windows Installation

The Wabi Microsoft Windows Install program lets you install Microsoft Windows files into your personal `wabi/windows` directory. The program starts automatically the first time you start the Wabi program. You must install Windows before you can use the Wabi program.

You can install Microsoft Windows 3.1 or 3.11, or Microsoft Windows for Workgroups 3.11. However, bear in mind that if you install Microsoft Windows for Workgroups, its functionality is somewhat limited because the Wabi program does not support all its network features. Read “Microsoft Windows for Workgroups 3.11 in the Wabi Environment” on page 38 for details about supported and unsupported features.

The Wabi Microsoft Windows Install program lets you install either from diskettes or from a network drive. You cannot use the program to install Microsoft Windows onto a network server. See the section “Microsoft Windows Installation on a Network Server” on page 16 for more information.

The Wabi Microsoft Windows Install Program's initial dialog box prompts you for the location of the Windows files, as shown in Figure 2-1.

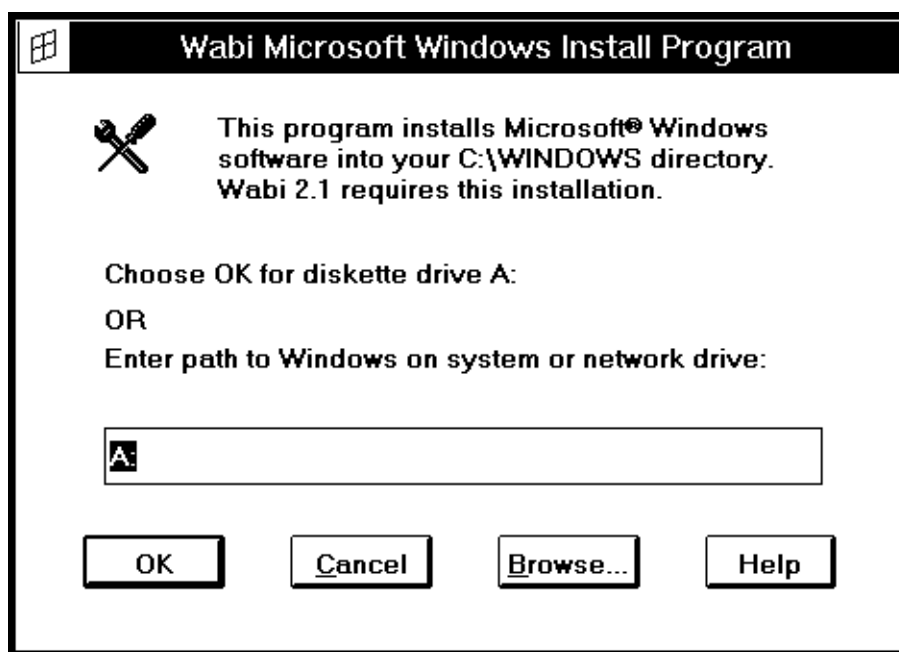


Figure 2-1 Initial Wabi Windows Install Program Dialog Box

Microsoft Windows Installation From Diskette

To install Microsoft Windows from a local diskette drive, enter the letter designation of the diskette drive. The Wabi program supports the connection of two diskette drives: drive A and drive B. The default connection is diskette drive A.

If you are using drive A to install Windows software, choose OK to accept the default designation. If you are using drive B, change the designation from A to B.

"Installing Microsoft Windows From Diskette" on page 28 provides the steps required to perform this task.

Once you enter a drive letter and choose OK, a dialog box opens and prompts you to insert disk 1 into the diskette drive. This dialog box is shown in Figure 2-2.

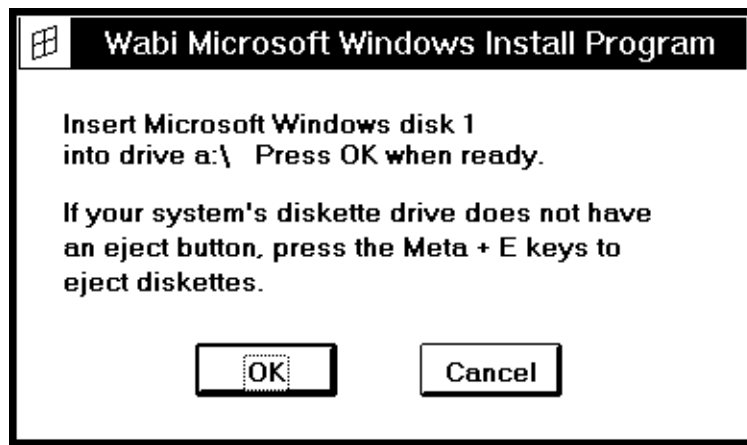




Figure 2-2 Wabi Microsoft Windows Install Program Dialog Box

After you insert the disk and choose OK, the files on disk 1 are installed in your C:\WINDOWS directory, which is mapped to your wabi/windows directory.

Note – The destination directory, C:\WINDOWS, cannot be changed. The Wabi Microsoft Windows Install Program does not support installation of Microsoft Windows to another location. However, you can change the location of your personal wabi directory by setting the WABIDIR variable as explained in “To Create Your Wabi Directory in Another Location” on page 11.

A progress meter in the dialog box increments as files are installed. When disk 1 installation is complete, you are prompted to insert disk 2 and choose OK. When you insert disk 2 and choose OK, the files on diskette number 2 are installed. Repeat this procedure for the remaining disks.

Note – If your diskette drive does not provide an eject button, you can eject diskettes by clicking in the Wabi window and pressing the Meta and E keys:  + 

As installation nears completion, the Wabi Tools group and Microsoft Windows Main, Games, Accessories, and Startup groups open. When installation is complete, the message window shown in Figure 2-3 opens.



Figure 2-3 Microsoft Windows Install Completion Message

When you choose OK, the Wabi program exits and immediately restarts, opening the Windows Program Manager.

For a description of what you see when the Wabi program starts, skip to the section “The Wabi User Interface” on page 21.

Microsoft Windows Installation From Wabi Drive R

“Microsoft Windows Installation on a Network Server” on page 16 explains how to install Microsoft Windows to a server so users can then install it on their workstations.

If the Microsoft Windows software is copied on a hard drive or network directory accessible to your operating system, you can install it into the Wabi program using Wabi drive R, which is assigned to your / (root) directory.

To install the Microsoft Windows software from drive R, you enter R: and the path the Wabi program can use to locate the Windows files. You can also use the Browse button to navigate through the directories accessible to your system and locate the Microsoft Windows files.

For example, if the Microsoft Windows 3.1 diskettes are copied into /usr/apps/install/win31.dsk, you would enter the following in the entry field of the Wabi Microsoft Windows Install Program’s initial dialog box, shown in Figure 2-1:

R:\usr\apps\install\win31.dsk

You can use either a DOS path or a UNIX path. The back slash (\) is used in DOS path names. The forward slash (/) is used in UNIX path names. The Wabi program accepts both types of path names, provided you use one type of slash within a path.

Note – You must have read permission to access the directory containing the Windows files. If you cannot access this directory due to a permission problem, change the permissions using the `chmod` command or see your system administrator.

See “Installing Microsoft Windows From Wabi Drive R” on page 29 to learn how to perform this task.

After you’ve entered the drive letter and path and chosen OK, the Wabi program installs the Windows files in your `$HOME/wabi/windows` directory. A progress meter in the dialog box increments as files are installed.

As installation nears completion, the Wabi Tools group and Microsoft Windows Main, Accessories, Games, and Startup groups open. When installation is complete, the message window shown in Figure 2-3 opens.

When you choose OK, the Wabi program exits and immediately restarts, opening the Windows Program Manager.

Microsoft Windows Installation on a Network Server

The Wabi Windows Install program can only be used to install Microsoft Windows files into a Wabi user environment. If you want to install Microsoft Windows onto a network server so that users can install Windows from the server, you can use the procedure for placing Windows files on a network server that is described in your Microsoft Windows documentation. The documented procedure requires a DOS emulator or DOS computer on your network so you can run the DOS command `setup /a`.

If you do not have a DOS computer on your network, refer to your UNIX documentation for information about accessing DOS file systems. Once you are able to access the DOS diskettes from your operating system, you can use UNIX commands to copy the diskettes to a network server and set read permission on the files.

Once you have installed Microsoft Windows to a network server, Wabi users can use the Wabi Microsoft Windows Install program to install Windows files into their Wabi environments as described in “Microsoft Windows Installation From Wabi Drive R” on page 15.

Note – The Wabi Microsoft Windows Install program does not allow you to set up your system to access a shared copy of Microsoft Windows. Each user must have his or her own copy of Windows in `$HOME/wabi/windows`, and must have a Microsoft Windows software license.

Starting WabiServer the First Time

See “What is WabiServer?” on page 4 for background information on WabiServer.

The initial startup of the remote Wabi program (`rwabi`) using WabiServer is quite different from the initial startup of the standalone Wabi program. When you start WabiServer, you are presented with dialog boxes asking you to:

- Specify the server system to use as your WabiServer system
- Specify where to store your Wabi files (that is, the location of your Wabi user directory)
- Select a prototype user environment to create your Wabi user directory

The following sections describe these dialog boxes.

Note – To access help for any of the WabiServer dialog boxes, place your cursor on the item for which you want help and press the Help key.

Specifying the WabiServer System and Wabi Directory Location

You specify the server system name and Wabi directory location in the `rwabi_setup` dialog, shown in Figure 2-4.

Figure 2-4 The `rwabi_setup` Dialog for Specifying Server and Directory Location

WabiServer Name is the name of the server system you will use to run Wabi. Ask your system administrator for the name of the server you should use. If your site has more than one WabiServer system, the system administrator must balance the user load between the servers, so it's important that the administrator assign you to a server.

Note – You can also set the `WABISERVER` environment variable if you prefer. This setting takes precedence over the server name you specify in the `rwabi_setup` dialog. See “Setting the `WABISERVER` Variable” on page 33 for the command format for setting the variable.

The location for storing your Wabi files is your `$HOME/wabi` directory, by default. If you do not want to create your Wabi user directory in your home directory, you can enter the full path to another directory. The path you enter must be the “network-aware” path, which is the path as seen from the server. If your home directory is located on a file server, the path you normally use to access it is the network-aware path.

However, if you want to create your Wabi user directory in a file system on your local hard drive, you must first share the file system to make it accessible to the WabiServer system. Consult the *Solaris User's Guide* or ask your system administrator for help doing this. Once the file system is shared, you can specify the network-aware path to the directory, which is probably different from the path you normally use. For example, suppose you have a file system called `/files` on your system's internal hard drive. You must share (or export) `/files` before you can create your Wabi user directory there. If your client system's hostname is `menemsha`, the network-aware path to this directory would probably be `/net/menemsha/files`. The path depends on how your network is set up, so consult your system administrator.

Note – If you have set the `WABIDIR` variable, described in “To Create Your Wabi Directory in Another Location” on page 11, the `WABIDIR` setting takes precedence over the directory setting you supply in the `rwabi_setup` dialog. A warning to this effect is displayed when the dialog opens.

If you enter the path to a Wabi directory that exists, `rwabi` is started on the specified server using the specified Wabi directory. If the Wabi directory that you specify does not exist, you must select a prototype to use for your Wabi directory, as explained in the following section.

Selecting a Prototype

When you apply the settings in the `rwabi_setup` dialog, the `rwabi_selproto` dialog opens, as shown in Figure 2-5.

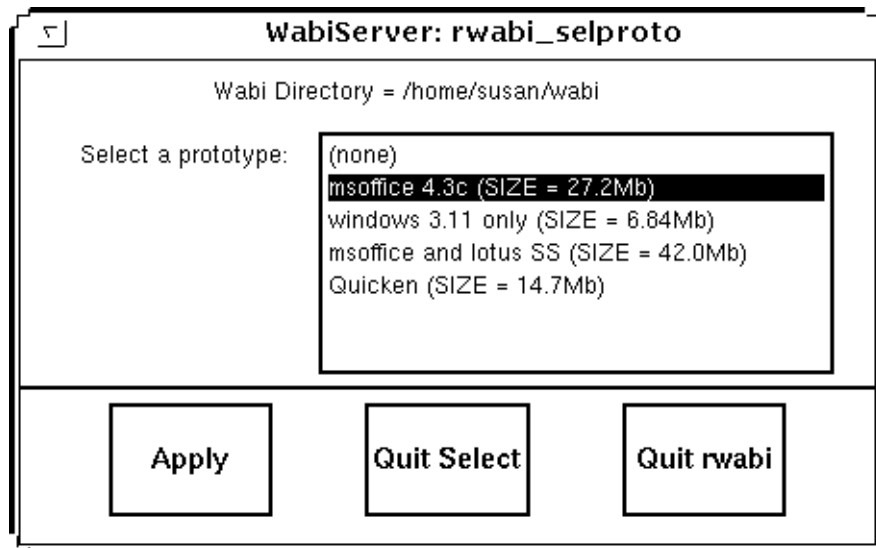


Figure 2-5 The `rwabi_selproto` Dialog for Selecting a Prototype User Environment

The `rwabi_selproto` dialog lists the prototypes defined on the server you specified in the `rwabi_setup` dialog. The prototypes were created by the WabiServer system administrator. The names may indicate which applications (Windows, Office, etc.) are contained in the prototypes, or the users for which they were created (Marketing, Sales), or whatever convention the system administrator decided to use for naming prototypes. At the end of each prototype name is the number of megabytes of disk space required to install the prototype in your Wabi directory. Make sure you have adequate space before selecting a prototype.

When you choose the Apply button, the prototype is used to create your Wabi directory in the location you specified previously. When the process is complete, the Wabi program starts and is displayed on your screen. The applications installed in the prototype are ready to use.

Note – If you exit the dialog by choosing Quit Select, or select <none>, or if no prototypes have been created, the Wabi Windows Install program starts. See “Microsoft Windows Installation” on page 12 for information about installing Microsoft Windows.

The Wabi User Interface

The Wabi program presents the familiar screens, dialog boxes, and menus of a Microsoft Windows graphical user interface (GUI). You make menu selections and choose icons by pointing and clicking with a mouse, or by using keyboard accelerator commands. Accelerator keys, designated by an underlined character in a menu choice, are discussed in Chapter 3, “Configuring Your Wabi Environment.”

The Program Environment

The Wabi program uses the Microsoft Windows Program Manager as its program environment, or shell program. The shell program is specified in the `SHELL=` variable in your `$HOME/wabi/windows/system.ini` file.

The Program Manager works as it does when you run it in Microsoft Windows on a PC. If you are not familiar with the Program Manager, refer to the Microsoft Windows documentation and on-line help.

Wabi Tools Group

The Wabi Tools group contains the Wabi program items shown in Figure 2-6. Each item is a utility program that allows you to perform a Wabi task.

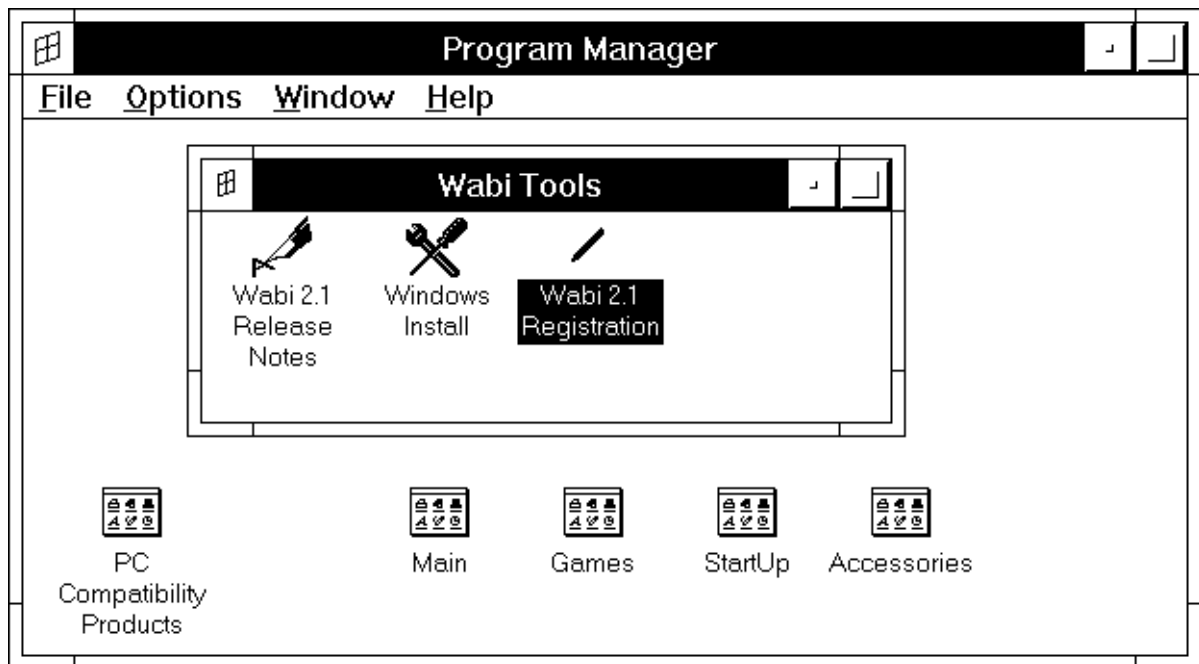


Figure 2-6 Items Within the Wabi Tools Group

Items within the Wabi Tools group include:

- *Wabi 2.1 Release Notes* – A Microsoft Write file containing notes about installing and using particular applications, and notes relevant to your operating system platform.
- *WabiServer Read This First* – A Microsoft Write file containing late-breaking information about WabiServer.
- *Windows Install* – The program you use to install Microsoft Windows software. This program runs automatically the first time you start the Wabi program. If you want to upgrade or reinstall Microsoft Windows in your Wabi environment, you *must* use this tool rather than the `setup` program supplied with Microsoft Windows.



“Microsoft Windows Installation” on page 12 tells you how to use the Windows Install tool.

- *Wabi 2.1 Registration* – The program you use on Solaris platforms for registering with SunSoft.

Microsoft Windows Groups

When you install Microsoft Windows software, you see the Main, Accessories, Games, and Startup groups. In the Main group, the Print Manager and Windows Setup programs are omitted because you cannot use them in the Wabi environment. The Accessories and Games groups contain the same programs as in Microsoft Windows on a PC. The Startup group is empty initially. Any program item placed in the Startup group will be started automatically when you start the Wabi program.

Wabi On-Line Help

The Wabi software includes on-line help for the Configuration Manager. You can view the on-line help through the Configuration Manager's Help menu, by choosing the Help button, or pressing the F1 key in Configuration Manager's dialog boxes. On-line help explains what you can accomplish with the Wabi Configuration Manager.

When you use Configuration Manager, you can view Wabi configuration error message help and status panel help. A configuration error message is displayed when you try to perform an "illegal" procedure or when Wabi software cannot complete a task you ask it to do using Configuration Manager. For example, you'll see an error message if you try to assign a Wabi drive to a file system that you do not have permission to access. Error dialog boxes displayed at these times include a Help button you can choose for information about the error and help in resolving the problem.

Status panel help is available within the Wabi Configuration Manager. Each Configuration Manager dialog box includes a status panel. This panel displays information about the dialog box item that is under the mouse pointer. As you move the pointer around a dialog box, the displayed message changes. Chapter 3, "Configuring Your Wabi Environment," provides more information about using status panel help.

The Wabi Man Page

A manual (man) page of information is available for the Wabi program. This man page describes command-line options, provides examples of various startup modes, and describes Wabi environment variables. Type the command `man wabi` to display the Wabi man page. The man page includes information for the `rwabi` command as well.

See “Adding the Wabi Man Page to Man Pages Path” on page 34 for the steps required to view this man page.

To access the Wabi man page, you must have the Wabi man page directory in your man pages path. The Wabi installation procedure may or may not have taken care of this for you; it varies depending on your native operating system. Some operating systems use a `MANPATH` environment variable in your `.login`, `.cshrc`, or `.profile` file. If you cannot view the Wabi man page, you may have to modify your `MANPATH` environment variable.

Wabi Startup Options

The `wabi` command, which you use to start the Wabi program, provides several switches you can use to specify options Wabi should use when it starts.

Display Wabi on a Remote System or X Terminal

You can direct the Wabi display to a remote system or X terminal. You might do this if you want to view and use the Wabi program on a system that cannot run the Wabi program locally, or if you want to run the Wabi program on a central computer and display it on X terminals.

“Displaying the Wabi Program on a Remote System” on page 30 provides the steps required for this task.

You direct the Wabi display to a remote system that is open to external displays by specifying a display name with the `-display` switch when starting the Wabi program. To direct the display to a remote system every time the Wabi program is started, you can set the `DISPLAY` environment variable. If you do set this variable, be aware that the displays of all other X Window applications you start subsequently may also be sent to this system, depending on where you set the variable. See your UNIX documentation for information about setting the `DISPLAY` variable.



Note – The standalone Wabi program accesses local resources such as the diskette drive on the system where it is running. You cannot access the diskette drive of a remote system on which the Wabi program is being displayed. However, if you are using WabiServer, you may be able to access the diskette drives of the server or your local system, depending how your system administrator has configured the WabiServer system. The system administrator may also deny WabiServer users access to diskette drives altogether.

Display Wabi With Smaller or Larger System Fonts

See “Displaying the Wabi Program with Small or Large System Fonts” on page 31 for the commands used to change the display font size.

The Wabi program adjusts the size of the system fonts it uses in dialog boxes, icon labels, and menus according to the size of the display screen you use. On a large display screen (one with more than 640 horizontal pixels), the Wabi program uses a system font approximately 20 pixels high. On a small display screen (one with 640 or fewer horizontal pixels), it uses a system font approximately 16 pixels high. You can use the `-LF` and `-SF` command-line switches to override the default and have Wabi use larger or smaller system fonts.

Start Wabi With or Without the Font Server

See “Starting Wabi With or Without the Font Server” on page 32 for the command used.

The Wabi program automatically starts its font server, `wabifs`, on platforms whose X servers use the X11R5 or X11R6 Font Service Protocol. The font server speeds up the display of fonts in the Wabi environment.

For the most part, you should let the Wabi program determine whether to use the font server. However, you can disable the font server if you find that Wabi performs slowly or erratically with respect to on-screen fonts.

To start the Wabi program without starting the font server, use the `-fs` command-line switch to disable the font server.

Although it is not likely, it is possible that the Wabi program could falsely identify your X server as one that does not support the X Font Service Protocol. If you know your X server does support the Font Service Protocol, you can use the `+fs` switch to make Wabi start its font server.

WabiServer Startup Options

You use the `rwabi` command to start a remote Wabi session on a server with WabiServer installed. The `rwabi` command works with the same command line options used with the `wabi` command described in “Wabi Startup Options” on page 24.

In addition, the `rwabi` command provides options that let you:

- Run `rwabi_setup` to change your WabiServer configuration (server and Wabi directory location)
- Specify a different server for the current session
- Select a new prototype to create a new Wabi directory
- Specify a different Wabi directory for the current session

These options are described in the following sections.

Run the `rwabi_setup` Program

See the section “Setting Up Your WabiServer Configuration” on page 32 for the command format.

You can run the `rwabi_setup` program to specify a new WabiServer system and Wabi directory location. When you use the `-setup` switch with `rwabi`, you see the dialog described in “Specifying the WabiServer System and Wabi Directory Location” on page 18. You should use this option when you want to change your server or directory for all subsequent `rwabi` sessions. The information you provide is stored in your `.wabiserver` file in your home directory.

If the directory you specify for your Wabi directory does not yet exist, the `rwabi_setup` program starts the `rwabi_selproto` program so you can select a prototype to use to create the Wabi directory.

Specify a Different Server

See the section “Specifying a Different WabiServer System” on page 32 for the command format.

If you want to temporarily run Wabi from a server system other than the one you are configured to use, you can use the `-server` switch to specify the name of the server. This option is useful if your server is down for service, or if you want to use another server for one session.

To specify a different WabiServer system to use for all sessions, you should run `rwabi_setup` as explained in “Run the `rwabi_setup` Program” on page 26, or set your `WABISERVER` environment variable as explained in “Setting the `WABISERVER` Variable” on page 33. The `WABISERVER` environmental variable setting overrides your entry in the `rwabi_setup` dialog.

Note – You cannot run two separate `rwabi` sessions on two different WabiServer systems using the same Wabi directory. However, you can run two `rwabi` sessions on the same server or on different servers if you use a different Wabi directory for each session.

Select a New Prototype to Create a New Wabi Directory

See the section “Selecting a New Prototype for WabiServer” on page 33 for information about using the `rwabi_selproto` dialog.

If you want access to different applications installed in prototypes, you can select a new prototype using the `-select` switch with the `rwabi` command. This opens the `rwabi_selproto` dialog, which you use to select a prototype from a list. If you want to replace your existing Wabi directory, use the same location for the directory. When you select a new prototype, a new directory overwrites the existing one. To create a new directory in a different location and preserve your existing Wabi directory, you must specify a different directory name before starting `rwabi`. You can specify a different directory name using the `rwabi -setup` command or by setting the `WABIDIR` variable.

Specify a Different Wabi Directory

See the section “Specifying a Different Wabi Directory for WabiServer” on page 33 for the command format.

If you want to temporarily use a Wabi directory other than the one currently configured in your `.wabiserver` file, you can use the `-wabidir` switch with the `rwabi` command. If the Wabi directory you specify does not yet exist, the `rwabi_selproto` dialog opens. Select a prototype to use to create your Wabi directory.

If you want to permanently specify a different Wabi directory, you should run `rwabi_setup` as explained in the section, “Run the `rwabi_setup` Program,” or set your `WABIDIR` environment variable as explained in “To Create Your Wabi Directory in Another Location” on page 11.

Instructions for Getting Started

This section provides detailed, step-by-step instructions for performing a variety of tasks related to starting the Wabi program. Margin notes refer to sections of this guide related to the task being described.

▼ Starting the Wabi Program

- ♦ **Choose the Wabi icon in your operating system's file manager.**

or

- ♦ **Place the Wabi executable directory in your path and enter the following at the command line:**

`wabi`

The Windows Program Manager window opens.

See the section "Starting Wabi Software the First Time" on page 10 if you are a new Wabi user.

▼ Starting the Remote Wabi Program in WabiServer

- ♦ **Choose the rwabi icon in your file manager.**

or

- ♦ **Place the rwabi executable directory (/opt/SUNWwclt/bin by default) in your path and enter the following at the command line:**

`rwabi`

The Windows Program Manager window opens.

See the section "Starting WabiServer the First Time" on page 17 if you are a new WabiServer user.

▼ Installing Microsoft Windows From Diskette

1. **Open the Wabi Tools icon.**

The Wabi Tools group displays several icons.

2. **Open the Windows Install icon.**

The Wabi Microsoft Windows Install Program dialog box opens.

See "Microsoft Windows Installation From Diskette" on page 13 for detailed information about Windows installation from diskette.



3. Specify a diskette drive letter.

If you are using diskette drive A for installation, choose OK to accept the default drive designation. If you are using diskette drive B, replace A with B in the entry field and choose OK.

The initial installation dialog box opens.

4. Insert the Windows program disk 1 into the diskette drive and choose OK.

The Wabi program begins to install Windows files into your C:\WINDOWS directory.

Note – If the diskette drive does not provide an eject button, you can eject diskettes by clicking in the Wabi window and pressing the Meta and E keys:  + 

5. Follow the prompts in subsequent dialog boxes to install the files on the remaining Windows program diskettes.

When installation is complete, the Windows program groups open and a message box prompts you to restart the Wabi program.

6. Remove the last disk from the diskette drive.**7. Choose OK in the message box to restart the Wabi program.**

Installation of the Windows software is now complete.

▼ Installing Microsoft Windows From Wabi Drive R

1. Open the Wabi Tools icon.

The Wabi Tools group displays several icons.

2. Open the Windows Install icon.

The Wabi Microsoft Windows Install Program dialog box opens.

3. Specify in the entry field the path to the Windows files.

Enter **R:** and the complete path from the root directory to the Windows files. You can use either DOS or UNIX slashes in the path. You can also use the Browse button to look through the directories available to your system to find the path to the Windows files.

“Microsoft Windows Installation From Wabi Drive R” on page 15 discusses installation from a Wabi drive in more detail.

4. Choose OK.

The Wabi program begins installing files from the directory you specified into your personal `wabi/windows` directory. When installation is complete, windows open, displaying the contents of each Microsoft Windows program group, and a message box prompts you to restart the Wabi program.

5. Choose OK in the dialog to restart the Wabi program.

Installation of Microsoft Windows software is now complete.

▼ Exiting the Wabi Program

1. Save any open files and exit all applications running within the Wabi program.

If you try to exit before saving, the applications prompt you to save each unsaved file.

2. Open the File menu, and choose Exit.

Alternatively, press `Alt+F4`, or double-click the control menu box in the top left corner.

The Exit Windows confirmation window is displayed.

3. Choose OK.

Program Manager closes and the Wabi program terminates.

Alternatively, choose Cancel to exit the confirmation box without ending the Wabi session.

▼ Displaying the Wabi Program on a Remote System

1. Set the remote system to give access to its display.

Enter the following command at the UNIX command line on the remote system:

```
xhost +your-host-name
```

2. Start the Wabi program on your system using the `-display` argument followed by the remote host name and the characters `:0`

For example, to display to a remote system named `eastoshkosh`, enter:

```
wabi -display eastoshkosh:0
```

Screen output is sent to the remote system with the specified host name.

See the section “Display Wabi on a Remote System or X Terminal” on page 24 for reasons you might want to do this.

Note – To send the Wabi display to a remote system every time the Wabi program is started, you can set a `DISPLAY` environment variable. For example, to consistently display to a remote system named `eastoshkosh`, enter one of the following commands.

If you use the C shell:

```
setenv DISPLAY eastoshkosh:0
```

If you use the Bourne or Korn shell:

```
DISPLAY=eastoshkosh:0;export DISPLAY
```

If you do set this variable, be aware that all other X Window applications you start subsequently from the same UNIX command window will be displayed on the remote system.

▼ Displaying the Wabi Program with Small or Large System Fonts

See the section “Display Wabi With Smaller or Larger System Fonts” on page 25 for reasons you might want to do this.

- ♦ **If you have a large screen and want to display Wabi with smaller fonts in dialog boxes and menus, start Wabi by entering the following at the command line:**

```
wabi -SF
```

For WabiServer, enter

```
rwabi -SF
```

- ♦ **If you have a small screen and want to display Wabi with larger fonts in dialog boxes and menus, start Wabi by entering the following at the command line:**

```
wabi -LF
```

For WabiServer, enter

```
rwabi -LF
```

Note – The `-LF` switch has no effect on large screens because large fonts are already being used, and the `-SF` switch has no effect on small screens because small fonts are already being used.

▼ Starting Wabi With or Without the Font Server

See the section “Start Wabi With or Without the Font Server” on page 25 for more information.

- ♦ **If you know your X server supports the Font Service Protocol, but the Wabi program does not start the Wabi font server, enter the following command to start Wabi with the font server:**

```
wabi +fs
```

For WabiServer, enter

```
rwabi +fs
```

- ♦ **Enter the following command to start Wabi without the font server:**

```
wabi -fs
```

For WabiServer, enter

```
rwabi -fs
```

▼ Setting Up Your WabiServer Configuration

- ♦ **Enter the following command to run the setup program to specify your WabiServer system, Wabi directory location, and prototype to use to create your Wabi directory:**

```
rwabi -setup
```

See the sections “Specifying the WabiServer System and Wabi Directory Location” on page 18 and “Selecting a Prototype” on page 20 for descriptions of the dialog boxes.

▼ Specifying a Different WabiServer System

- ♦ **Enter the following command to specify the WabiServer system to use for the current remote Wabi session:**

```
rwabi -server server-name
```

See the section “Specify a Different Server” on page 26 for more information.

▼ Setting the WABISERVER Variable

- ♦ Enter one of the following commands to specify a WabiServer system using the WABISERVER environment variable before starting `rwabi`:

In the C shell:

```
setenv WABISERVER server-name
```

In the Bourne or Korn shell:

```
WABISERVER=server-name; export WABISERVER
```

Include this statement in your `.cshrc` or `.profile` file in order to use this server each time you start WabiServer.

▼ Selecting a New Prototype for WabiServer

1. Enter the following command to select a new prototype to overwrite your current Wabi directory:

```
rwabi -select
```

2. In the `rwabi_selproto` dialog, select the prototype you want to use.

3. Choose the Apply button.

The prototype files are copied to your current Wabi directory.

If you decide not to apply your selection, choose Quit Select to exit the dialog and start remote Wabi using your current Wabi directory. If you do not want to start remote Wabi, choose Quit `rwabi`

See the section “Select a New Prototype to Create a New Wabi Directory” on page 27 for background information on selecting prototypes.

▼ Specifying a Different Wabi Directory for WabiServer

- ♦ Enter the following command to specify a Wabi directory other than that configured, for use in the current session:

```
rwabi -wabidir directory-path
```

Remember that the directory path must be the network-aware path, as seen from the WabiServer system.

See the section “Specify a Different Wabi Directory” on page 27 for more information.

▼ Viewing the Wabi Man Page

- ♦ **Display the Wabi man page by entering the following at the command line:**

```
man wabi
```

The initial screen of Wabi man page information is displayed. Press the spacebar to view additional screens.

If the `man` command indicates there is no Wabi man page, you may have to add it to your man pages path as explained in the next procedure.

▼ Adding the Wabi Man Page to Man Pages Path

1. Open a command window.

2. Locate the `MANPATH` variable.

Examine your `.login` and `.cshrc` (if you use the C shell) or `.profile` (if you use the Bourne or Korn shell) to locate this variable.

3. Set your `MANPATH` variable to include the Wabi man page directory.

If `MANPATH` does not exist in `.login` or `.cshrc` or `.profile`, use a text editor to set the variable in the appropriate file.

If you use the C shell add the following line to either `.login` or `.cshrc`:

```
setenv MANPATH parentdirectory/man
```

If you use the Bourne or Korn shell, add the following line to `.profile`:

```
MANPATH=parentdirectory/man; export MANPATH
```

parentdirectory is the directory where the Wabi system software is located, for example `/usr/wabi`.

If `MANPATH` is set in one of these files already, use a text editor to update your `MANPATH` variable by adding the following at the end of the `setenv MANPATH` or `MANPATH=` statement:

```
parentdirectory/man
```

If the Wabi system software is located in `/usr/wabi`, your `MANPATH` directory is `/usr/wabi/man`.

Be sure to separate this entry from existing `MANPATH` entries with a colon. Save and quit the `.login`, `.cshrc`, or `.profile` file once you've added this statement.

4. Update your operating system to recognize this MANPATH entry.

Enter one of the following commands, depending on the file in which your MANPATH statement is located:

```
source .login
or
source .cshrc
or
. .profile
```

Reference Material for Getting Started

This section provides reference material associated with starting and using the Wabi program.

Troubleshooting Startup Problems

Table 2-1 suggests solutions to problems you might experience when starting the Wabi program and installing Microsoft Windows.

Table 2-1 Startup Problems and Solutions

Symptom	Possible Cause	Solution
Can't start Wabi	Startup command not in path.	Use the full path name for the wabi command. This path is specific to your operating system. Or, edit your user profile for the UNIX shell you use (e.g., .cshrc for the C shell) to include the Wabi bin directory in your search path.
	Not enough swap space or memory.	Make sure you have at least the minimum requirements listed in Table 1-1 on page 6. If you need to run several programs concurrently, you may need more memory and swap space.
	Too many other UNIX programs running.	Quit some of the running programs and start Wabi again.

Table 2-1 Startup Problems and Solutions (Continued)

Symptom	Possible Cause	Solution
Can't start WabiServer	Client software not installed or accessible.	Ask your system administrator to install the WabiServer client package on your system.
Can't access Wabi man page	Wabi man page directory not in MANPATH.	See "Adding the Wabi Man Page to Man Pages Path" on page 34 for more information.
Can't display to a remote system	System not open to external displays or no display identified.	See "Displaying the Wabi Program on a Remote System" on page 30 to make sure you've followed the correct procedure.
Can't install Microsoft Windows program from diskette.	Incorrect diskette drive specified or diskette drive not configured.	See "Troubleshooting Problems With Diskette Drives" on page 78.
Can't install Microsoft Windows program from Wabi drive R.	Drive or path incorrect or inadequate permissions to directory.	Use the Browse button to find the correct path to the Microsoft Windows files. Make sure you have read permission to the directory and files.
Can't access Program Manager.	Windows software incorrectly installed.	You must use the Wabi Microsoft Windows Install Tool to install Microsoft Windows. See page 12 for more information.
Can't change settings from Control Panel.	Some Control Panel functions are not valid under the Wabi program.	Use operating system utilities to perform some functions of Control Panel. See "The Microsoft Windows Control Panel" on page 42 for more information about the Control Panel.
Icons missing from Main group.	Some parts of Windows cannot be used in Wabi so they are not installed.	See "Microsoft Windows Groups" on page 23.

Table 2-1 Startup Problems and Solutions (Continued)

Symptom	Possible Cause	Solution
Can't create Wabi user directory after selecting prototype.	Inadequate permissions for designated directory.	Make sure you are using the network-aware path to the directory. If you do not, WabiServer attempts to create the directory on the server disk, to which you probably do not have write access.
	Insufficient disk space.	See the size requirement for the prototype in the <code>rwabi_selproto</code> dialog and choose a Wabi directory location large enough for the prototype.
Wabi Windows Install program starts when Windows is already installed.	Wabi may be accessing the wrong user directory or creating a new one.	Determine which directory location is in use. First check your <code>WABIDIR</code> setting by entering the command <code>echo \$WABIDIR</code> . If the variable is set, make sure it is set to a network aware path. If the variable is not set, check your <code>\$HOME/.wabiserver</code> file to see which Wabi directory path is in use. If it is not correct, run <code>rwabi_setup</code> to enter the correct path name.

Microsoft Windows for Workgroups 3.11 in the Wabi Environment

Microsoft Windows for Workgroups is supported in the Wabi program, but its functionality is somewhat limited. Table 2-2 lists the added features of Windows for Workgroups (WFW), and describes the degree to which the Wabi program supports them.


Table 2-2 Support for Windows for WorkGroups in the Wabi Environment

WFW Program	Support in the Wabi Environment
Mail	<p>Workgroup Mail is functionally similar to Microsoft Mail and can communicate with existing Microsoft Mail post offices. It works under the Wabi program if you connect a Wabi drive to the post office and then add these lines to your C:\WINDOWS\MSMAIL.INI file:</p> <pre>[Microsoft Mail] ServerPath=postoffice-server-path login=MSMail-username</pre> <p>For example, if you connect drive Z: to the post office, the <i>postoffice-server-path</i> is Z:\maildata. The <i>MSMail-username</i> is the name given to your mail account.</p> <p>Please refer to your Microsoft documentation for information about the differences between Workgroup Mail and Microsoft Mail. (See Windows for Workgroups Resource Kit, Vol 1, page 12-28.)</p>
Schedule +	<p>This program, which replaces the Microsoft Windows Calendar, lets you schedule appointments with other users on a Windows for Workgroups network. It works under the Wabi program. You must set up your Mail before you can use Schedule +.</p>
ClipBook Viewer	<p>This program, which replaces the Microsoft Windows Clipboard Viewer, lets you create multiple pages of clipboard information, so you can work with more than one piece of information at a time. This functionality is supported under the Wabi program.</p> <p>The ClipBook Viewer also lets you share clipboard pages with other users on a Windows for Workgroups network. This sharing is <i>not</i> supported under the Wabi program because it requires Windows networking.</p>
Hearts	<p>This is a networked game that allows you to play with up to three other players over the network. In the Wabi environment, you can use it only as a single player against three computer-generated players.</p>

Table 2-2 Support for Windows for WorkGroups in the Wabi Environment

WFW Program	Support in the Wabi Environment
File Manager	The WFW File Manager can act as a file and print server, and mount file systems from other machines on a Windows for Workgroups network. These features require Windows networking, so they are not supported under the Wabi program. The network features are disabled, so the File Manager is functionally the same as the version in Microsoft Windows.
WINCHAT WINPOPUP NETWATCH WINMETER	These programs depend on the network, so you should not try to use them.

Configuring Your Wabi Environment

3 

This chapter explains how to set up your Wabi environment to suit your preferences and your operating system's configuration. You use the Microsoft Windows Control Panel and Wabi Configuration Manager to configure your Wabi environment.

About Configuring Your Wabi Environment

You can control your Wabi environment in much the same way you control your Microsoft Windows environment. You use the same tool, the Microsoft Windows Control Panel, to change colors, install printer drivers, configure COM ports, and so on. However, some of Control Panel's settings do not apply to the Wabi environment. The Wabi display is governed by your native operating system's X Window System as well as the Wabi window manager, so some settings can only be controlled through your X Window desktop. Some X settings, such as mouse tracking speed, apply to all windows on your desktop, not just Wabi windows. If you change such a setting in the Control Panel, the Wabi program simply ignores the change.

The Wabi program installs an icon for the Wabi Configuration Manager within the Control Panel. The Configuration Manager lets you connect Wabi device names to their UNIX counterparts.



If you are running WabiServer, your environment is preconfigured for you by the system administrator who created the prototypes. You can change many of the settings that affect your user environment, such as Color and International settings, but you cannot change settings controlled by the system administrator, such as the device name for the diskette drive.

The Microsoft Windows Control Panel

You use the Control Panel the same way you use it in Microsoft Windows. It is located in the Main group, as shown in Figure 3-1. If you are not familiar with the Control Panel or need help using it, please refer to the Control Panel help or your *Microsoft Windows User's Guide* for more information.

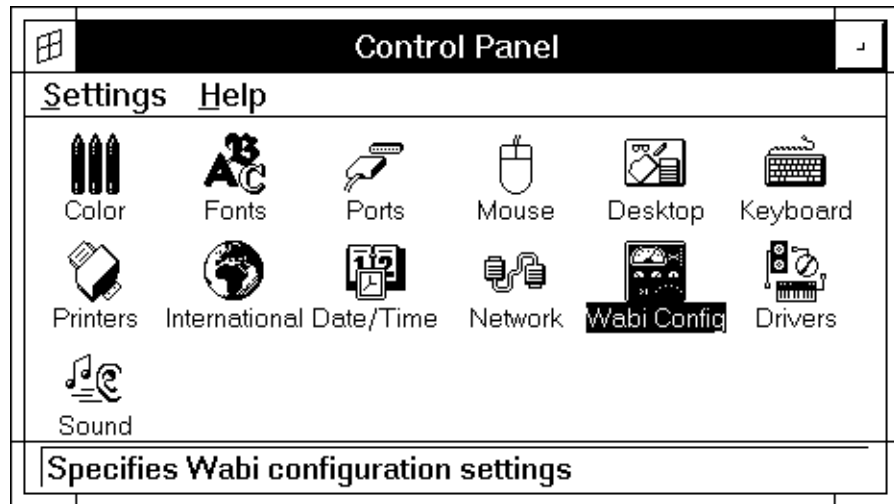


Figure 3-1 Microsoft Windows Control Panel

Table 3-1 lists the Control Panel settings and describes the degree to which you can use them in your Wabi environment.

Table 3-1 Microsoft Windows Control Panel Settings





 Color	<p>You can use the Color icon to change the colors in your Wabi desktop. Colors affect only your Wabi windows. By the same token, colors that you set using your X Window desktop's tools do not affect Wabi windows.</p>
 Fonts	<p>Using the Fonts icon, you can add fonts to your Wabi environment, or remove them. You can also set TrueType options as in the Microsoft Windows environment. Not all applications use the settings, however.</p>
 Ports	<p>You use the Ports icon to change settings such as baud rate, data bits, parity, stop bits, and flow control. However, many applications use their own settings for these port attributes, so your settings may not be used. The Control Panel also includes advanced settings for Base I/O Port Address and Interrupt Request Line, which Wabi ignores. In the Wabi environment, these port attributes are controlled by the UNIX device driver for the port.</p> <p>If you want to use a serial port with an application in the Wabi environment, it must be connected to the appropriate device driver for your operating system. The Wabi program is set up to work with the default drivers on all supported operating systems, so you probably will not have to change the connection unless you use a non-standard driver in your operating system.</p>
 Mouse	<p>The Double Click Speed and Swap Left/Right Buttons settings work in the Mouse dialog box. Mouse Trails is ignored, and Mouse Tracking Speed is controlled through your X Window desktop. The X Window setting for mouse button order/swapping may also affect your Wabi environment, but the Wabi setting will not affect your X desktop. Double-click speed for each environment is independent of the other.</p>

Table 3-1 Microsoft Windows Control Panel Settings (Continued)







 Desktop	<p>Many of the settings in the Desktop dialog box should not be used in the Wabi environment, or cannot be used. The options for decorating the desktop background (Pattern, Wallpaper) do not work because the X Window desktop controls the background, or root, window. You should use your X desktop's settings for colors, patterns, and bitmaps in the root window.</p> <p>The Screen Saver may not work on some platforms, and should <i>not</i> be used even if it does work. Your X desktop has its own screen saver mechanism, which works more efficiently and covers the whole display. Microsoft Windows screen savers use significant CPU time creating activity on only the Wabi portion of your screen display. If you are using the Wabi program on a system you share with other users, the screen saver's CPU usage will slow everyone down.</p>
 Keyboard	<p>The Keyboard repeat settings have no effect in the Wabi environment. You can enable and disable keyboard repeat in your X Window desktop, and some desktops may also be able to set the repeat delay rate.</p>
 Printers	<p>You use the Printers icon to install printer drivers, set your default printer, set up printers, and connect them to ports. The Print Manager and options related to it (Device Not Selected, Transmission Retry) are not used by the Wabi program. You control your UNIX printers using UNIX printer management utilities only.</p>
 International	<p>You use the International dialog just as in Microsoft Windows. The only difference for the Wabi environment is that the Keyboard Layout option has no effect. You must use the <code>WABI_KEYB</code> environment variable to specify a keyboard language, as explained in "Setting the <code>WABI_KEYB</code> Environment Variable" on page 120.</p>
 Date/Time	<p>The Wabi program uses your system clock to determine the time. You cannot change the date and time with the Date/Time dialog.</p>
 Network	<p>The Network icon has no function in the Wabi environment.</p>

Table 3-1 Microsoft Windows Control Panel Settings (Continued)

386 Enhanced The 386 Enhanced icon does not appear in the Control Panel in your Wabi environment because there is no need for the 386 Enhanced settings in a UNIX operating system.



You can use the Drivers icon to install and remove multimedia drivers just as in the Microsoft Windows environment. However, your platform may or may not support the use of multimedia. The Solaris platforms do support multimedia. See “Using Multimedia Features on SPARCstation and x86 Computers” on page 152 for more information.



If your Wabi platform supports playing and recording waveform files, you can use the Sound icon to assign sounds to system events. If your Wabi platform does not support waveform, you can use the icon only to enable and disable system sounds. See “Using Multimedia Features on SPARCstation and x86 Computers” on page 152 to determine if you have the correct hardware for sound in the Wabi environment.

Wabi Configuration Manager

Think of Configuration Manager as the switchboard of the Wabi program. It lets you connect Wabi devices to their UNIX counterparts so you can use the familiar DOS-type device names for printers, COM ports, drives, and diskettes. It also lets you configure a DOS emulator, if you have installed one on your system. This lets you start up a DOS session from the MS-DOS Prompt icon in the Main group.

Connections you make in Configuration Manager apply to all Wabi windows and sessions. Common connections you might make or change include those between a Wabi drive (E:, F:, and so on) and a file system, a Wabi diskette drive (A: or B:) and a diskette device in your operating system, and a Wabi LPT port and a printer. Some Configuration Manager connections require you to supply UNIX device names. In most cases, the Wabi program recognizes your operating system and supplies the appropriate default settings, which are defined in the `wabi/windows/wabi.ini` file in your home directory. Infrequently, you may need to enter a unique or unusual setting in a Configuration Manager dialog box.

You open the Configuration Manager window by double-clicking the Wabi Config icon in the Microsoft Windows Control Panel.

Configuration Manager contains several icons representing Wabi program functions, as shown in Figure 3-2.

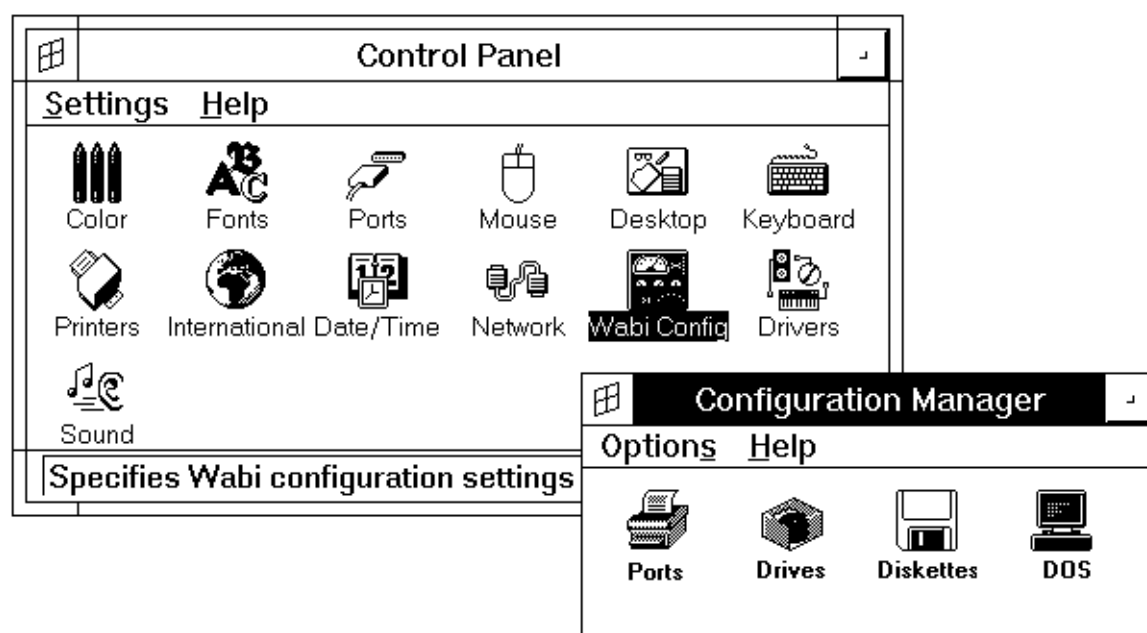


Figure 3-2 Configuration Manager Icon and Window

Configuration Manager Functions

Configuration Manager organizes Wabi connections into several functions. Each function is represented by an icon and by a menu item in the Options menu. Opening an icon or choosing an item from the menu yields the same result: a dialog box associated with the function opens. Within the dialog box, you can change the connections for the function.

The Configuration Manager functions are:



Ports

Connect COM ports and LPT ports to UNIX devices.



Drives

Set up Wabi drives and assign a drive to a file system.



Diskettes

Assign Wabi diskette drives A and B to operating system diskette device drivers.



DOS

Supplies the command required to start a DOS emulator.

Configuration Manager Menus

Configuration Manager provides two menus:

- *Options* – Contains a menu item for each Configuration Manager function represented by an icon. Double-clicking an icon or choosing a function from the menu opens a dialog box associated with the function. An additional menu choice, *Exit*, allows you to exit from Configuration Manager.
- *Help* – Provides several ways for you to access and use the Configuration Manager Help system. From the Help menu, you can view a Help table of contents, locate a specific topic, or view instructions on using Help.

Accelerator Keys

Configuration Manager incorporates accelerator keys to speed operations. Once you are familiar with a menu and its contents, you can access a function directly from the keyboard by sequentially pressing a combination of keys whenever the Configuration Manager window is open. Experienced users may find this technique faster than selecting items by pointing and clicking with the mouse.

Each Configuration Manager menu item includes an underlined letter. This letter represents the accelerator key for that item. Figure 3-3 shows the Options menu and its accelerator keys.

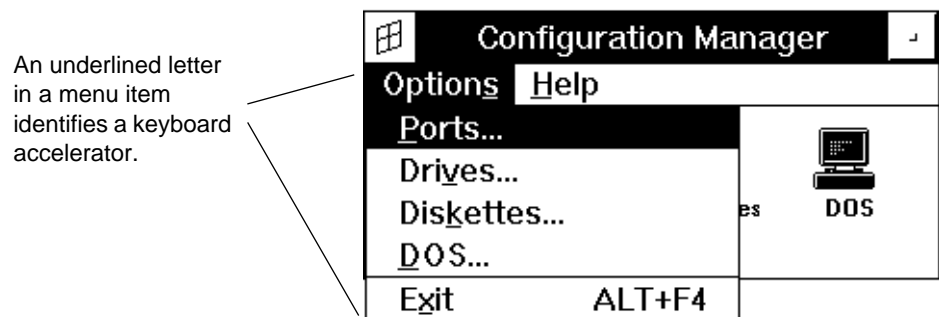


Figure 3-3 Configuration Manager Accelerator Keys

Using an accelerator key is easy. You type the key sequence required to choose a function. For example, when the Configuration Manager window is open, you can choose the Ports function by sequentially pressing Alt, s, p. You press Alt, s to activate the menu bar and open the Options menu. You press p to choose the Ports menu item.

You can also choose menu items by using the arrow keys. In this case, you press Alt to activate the menu bar. Next, use the right- and left-arrow keys to select a menu. When you press Enter, the menu opens. Now you use the up- and down-arrow keys to highlight the item you want, and press Enter to select it.

You can close the Options menu by pressing the Alt key alone. You can exit Configuration Manager by simultaneously pressing Alt and F4.

Configuration Manager Dialog Boxes

You work with all Configuration Manager functions through dialog boxes. Each function has a dialog box or set of boxes. Dialog boxes include one or more of the following elements:

- *Buttons* – You choose to initiate an action.
- *Setting field* – Displays a parameter's current setting.

- *Drop-down lists* – Indicated by an arrow next to an entry field. You open the list, then select an item in the list.
- *Check boxes* – You select to turn a feature on or off.
- *Status panel* – Displays current status for the dialog box element directly under the mouse pointer.
- *Status panel help* – Displays a help tip for the dialog box element directly under the mouse pointer.

Buttons

Most Configuration Manager dialog boxes provide the following four buttons:

- *OK* – Choose this button to accept and save current dialog box settings. In some cases, the Wabi program validates (double-checks) a setting for correctness. A typical example is a device driver name. When you choose OK, a dialog box closes.
- *Cancel* – Choose this button to close a dialog box without changing settings. Use Cancel to close a dialog box when you examine settings, but don't want to change them, or when you make changes but decide not to save them.
- *Defaults* – Choose this button to restore default dialog box settings. Default settings supplied with the Wabi program will work in most situations. The Wabi program's default settings depend on the operating system you use, and are stored in `wabi.ini`.
- *Help* – Choose this button to start the on-line help system and to display a context-sensitive help topic screen. Links to related help topics are included where applicable.

Setting Fields

Most Configuration Manager dialog boxes include setting fields, which display the current setting for an item and allow you to change the setting. For example, the Diskette Connections dialog box contains a setting field, Diskette Drive A Device, which allows you to either enter a diskette device name or select one from a list. You can enter text by clicking on the field to activate it. Once the field is active, a blinking cursor appears within the field. After typing a setting, choose OK or press Enter to store the setting.

Drop-Down Lists

Many Configuration Manager dialog box setting fields incorporate a drop-down list, such as the one shown in Figure 3-4. You open a drop-down list by clicking on the down-arrow to the right of the field, or by activating the list and pressing the down-arrow key.

A drop-down list contains a series of predefined entries from which you can select. In some cases, such as with device names, list items are default settings garnered from your `wabi.ini` file. In other cases, such as with native printer names, list items are obtained from operating system files.

Some drop-down lists also allow you to type an entry directly into the field.

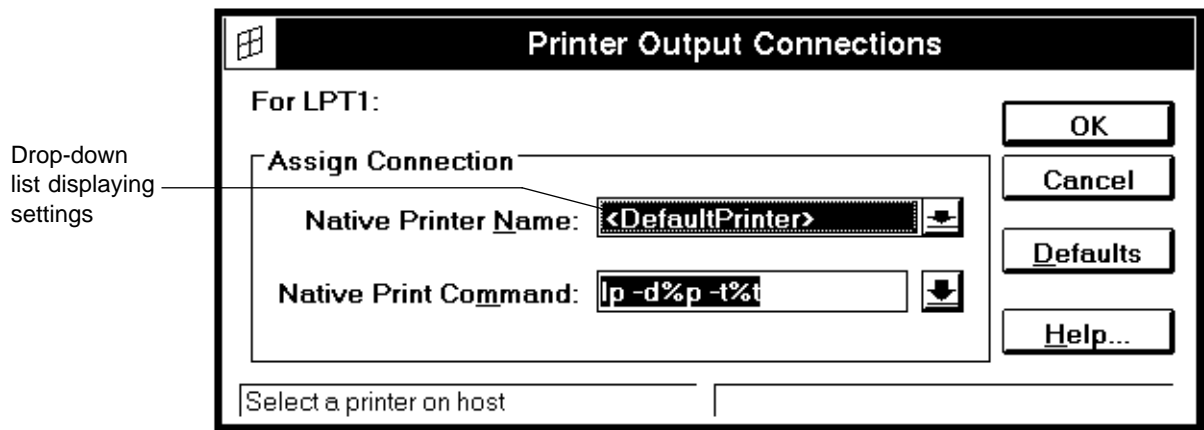


Figure 3-4 Drop-Down List of Available Settings

Check Boxes

Some dialog boxes include a check box. You use a check box to turn a function on or off. You change a check box setting by clicking on the box or on the text adjacent to the box. An “X” appears within a check box when the function is on.

Status Panel Help and Status

As you can see at the bottom of Figure 3-4, Configuration Manager dialog boxes provide two informative panels:

- *Help* is the left panel and it provides short messages related to the feature or function directly under the mouse pointer. The contents of the Help panel change as you move the pointer around a dialog box.
- *Status* is the right panel and it displays a message related to the operation that Configuration Manager is currently performing, or the status of an entry. For example, this panel informs you when default values are selected and when a value has been modified.

Entry Validation

Configuration Manager checks, or “validates,” many of the entries you make in dialog boxes. This is necessary to ensure that your instructions can be carried out. A typical example of entry validation relates to a device name.

For example, to use Wabi diskette drive B, you must connect it to a diskette device in your native operating system. You do so by selecting, in the Diskette Connections dialog box, a diskette device driver path and name.

Once you’ve entered a path and name and chosen the OK button, Configuration Manager examines your entry to determine whether it is valid. If the entry is valid, Wabi software assigns the device driver you’ve specified to Wabi diskette drive B. If the entry is not valid — for example, if the device path or name does not exist — an error message informs you of the problem.

Validation of entries occurs quickly. If a validation error occurs, you can usually recover from it by following the instructions in the resulting error message box. You may occasionally need to progress through a series of error message boxes to fully resolve an error.

Each error message box provides a Help button. Choose the Help button within an error message box to learn about the possible cause of the error and how to clear the error condition.

Configuration Manager Tasks

Configuration Manager tasks are described in individual chapters in this guide. Use the following table to locate detailed information about tasks.

Table 3-2 Additional Configuration Manager Function Information

To find information about...	See...
Wabi Drives	Chapter 4, "Setting Up Drives"
Wabi Diskette Drives	Chapter 4, "Setting Up Drives"
Printing	Chapter 5, "Printing"
COM Ports	Chapter 6, "Using Wabi COM Ports"
DOS Emulator Settings	Chapter 12, "Using a DOS Emulator in the Wabi Environment"

Instructions for Tasks Related to Configuration Manager

▼ Opening Configuration Manager

1. Open the Main group.

2. Open the Control Panel icon.

The Wabi Config icon is displayed among the other Control Panel icons.

3. Open the Wabi Config icon.

The Configuration Manager window opens and displays an icon associated with each function.

Open an icon to select a function and open the related dialog box.

▼ Exiting Configuration Manager

There are several ways to exit Configuration Manager, including the following:

♦ **Open the Options menu and choose Exit.**

♦ **Press Alt+F4.**

♦ **Double-click the top left corner of the Configuration Manager window.**

Setting Up Drives



Drives provide access to your operating system devices, files, and directories. Before you can use a drive, you must configure it. Configuring a drive means telling the Wabi program the type of drive you want, as well as some specifics about the drive. Once you configure a drive, you can access it.

If you are not familiar with drive concepts in the Wabi program and would like to learn more about them, read the next section, “About Drives.”

If you want instructions for specific tasks related to drives, use the following table to locate the instructions you need.

Task	Page
<i>Connecting a Diskette Drive</i>	68
<i>Changing the Diskette Drive Timeout Period</i>	69
<i>Manually Entering a Diskette Device Name</i>	69
<i>Formatting a DOS Diskette</i>	70
<i>Accessing an Alternate Diskette Devices Directory</i>	70
<i>Accessing an Alternate Diskette Device File Pattern</i>	71
<i>Assigning a Drive</i>	72
<i>Editing or Entering a Drive Path Directly</i>	73
<i>Disconnecting a Drive</i>	74

Task	Page
<i>Enabling File Sharing for a Drive</i>	75
<i>Setting a Network Drive</i>	75
<i>Setting a Local Drive</i>	76
<i>Accessing a CD-ROM Drive</i>	76

About Drives

The Wabi program uses two kinds of drives:

- *Diskette drives* – Drives A and B are diskette drives. These drives connect (map) to diskette devices defined in your operating system. Diskette drive A is set up for you and assigned automatically as the default diskette drive. (You can change this assignment.) If your computer has a second diskette drive, use diskette drive B to represent this drive.
- *Wabi drives* – Drives C through Z represent Wabi drives, which are functionally similar to the local disk drives and network drives used on DOS-based systems. A Wabi drive can be assigned to a directory on a drive physically located within your computer, or to a directory that is physically located on a remote system and accessed, or mounted, over the network by your operating system.

The Wabi program does not know if a drive's assigned directory is local or on the network, because it accesses the drive through a directory path. The physical location of the directory is transparent to you and to the Wabi program.

To learn about designating a drive as a network drive, read "Wabi Network Drives" on page 66.

Diskette Drives

To use a diskette drive, you must connect it to an operating system diskette device. A *device* is an operating system file that allows you to access a physical device, such as a diskette drive. Once you make this connection, the Wabi program retains it for all subsequent sessions, or until you change the connection. Most likely, the Wabi program's default connection will work for your operating system, and you can use the diskette drive without changing the diskette connection to the device.



The diskette drive may be on the WabiServer system or on your client system, or diskette access may be disabled altogether. The WabiServer system administrator sets diskette access on the server.

Diskette Connections

Learn how to make a diskette drive connection by reading “Connecting a Diskette Drive” on page 68.

You use the Diskette Connections dialog box shown in Figure 4-1 to make and change diskette drive connections, and to specify a timeout period for the Wabi program’s control of your diskette drive. You open this dialog box from within Configuration Manager by clicking the Diskettes icon, or by choosing Diskettes from the Options menu. As the Diskette Connections dialog box opens, the Wabi program scans your operating system device directories for diskette devices.

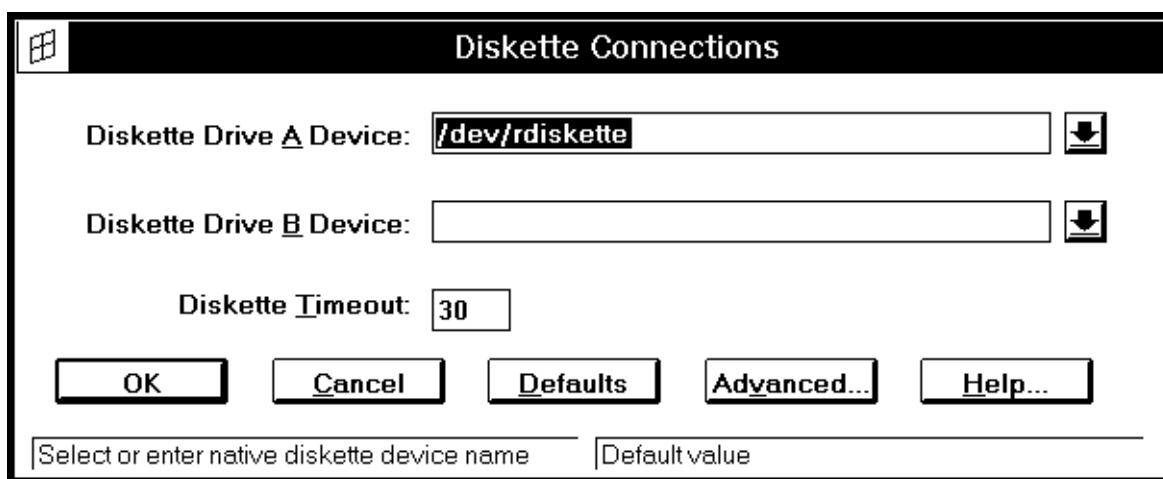


Figure 4-1 Diskette Connections Dialog Box

As device file names are scanned, they are validated. If a device name is valid, the Wabi program adds it to the list of selectable diskette drives that appear in the drop-down list associated with diskette drive A and diskette drive B. Note that the Wabi program uses raw device files. (See your UNIX operating system documentation for information about raw devices.)

In the Diskette Connections dialog box, you select diskette device assignments for drives A and B, and specify a diskette timeout period.

The Wabi program provides a default assignment for drive A, which you can change. No default assignment is provided for drive B. The field to the right of each Diskette Drive name displays the current assignment. If you click the down-arrow to the right of a field, a list opens displaying additional diskette device names. You select a name by clicking it.



If the diskette drive is connected to your client system's diskette device, the device entry is similar to `/dev/rdiskette0:WSRDA@client-name`. If the drive is connected to the WabiServer system's diskette drive, a simple device name such as `/dev/rdiskette0` is displayed.

Diskette Timeout

To learn how to change the diskette timeout, go to "Changing the Diskette Drive Timeout Period" on page 69.

You can also specify a timeout period (in seconds) for the diskette device. The Wabi program gives up control of the diskette drive if the device has not been used after this period of time, allowing other programs to use the diskette drive while the Wabi program is running. Wabi regains control the next time you access the diskette through the Wabi program.

To Use an Unlisted Diskette Device

It's easy to enter a diskette device name. Read "Manually Entering a Diskette Device Name" on page 69 for specifics.

If you prefer, you can connect a diskette drive to a diskette device by typing a device path and name directly in the text box associated with diskette drive A or B. You can use this technique to connect to a diskette device that you know exists, but does not appear in the list.

Advanced Diskette Drive Options

The Wabi program is supplied with default diskette device locations and naming patterns. In most cases, these defaults match those used by your operating system. In some cases, however, they may not. For example, if you relocate diskette devices to a directory not normally used to store them, the Wabi program will not know where to look for these device files. When this is the case, you must tell the Wabi program where the devices are located.

You use the Advanced Diskette Drive Options dialog box to provide the Wabi program with the information it needs to find and use diskette devices that are named or located in a nonstandard manner. You access the Advanced Diskette Drive Options dialog box by choosing the Advanced button in the Diskette Connections dialog box. Figure 4-2 shows the Advanced Diskette Drive Options dialog box.

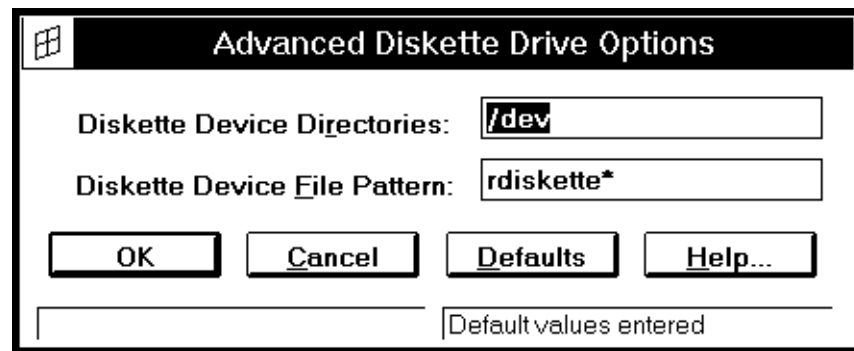


Figure 4-2 Advanced Diskette Drive Options Dialog Box

You can enter two items in this dialog box:

- **Diskette Device Directories** – This is a list of directories that the Wabi program searches for operating system diskette devices. You can include more than one directory in the list, provided you use semicolons to separate directory entries. Do not include spaces in this list.
- **Diskette Device File Pattern** – This is the device file-naming pattern (convention) used in your operating system. You can include more than one pattern in the list, provided you use semicolons to separate file-naming patterns. Do not include spaces in this list.

Wildcard characters are allowed in file pattern entries. An asterisk (*) can replace a group of characters, and a question mark (?) can replace a single character. You can indicate a range of possible values for a single character by using brackets. For example, you can use [0–9] to match a value from 0 through 9. If you enter the pattern rfd[0–9]*, the Wabi program will find file names such as rfd0, rfd1floppy, rfd3c, and rfd9xyz if they exist in the device directories. Remember that Wabi uses raw diskette devices.

To add a device directory to the list of directories searched, see “Accessing an Alternate Diskette Devices Directory” on page 70.

To add a diskette device file pattern to the list of patterns searched, see “Accessing an Alternate Diskette Device File Pattern” on page 71.

Diskettes and DOS

See “Formatting a DOS Diskette” on page 70 for more about diskette formatting procedures.

You cannot format a DOS diskette within the Wabi program. Before you can use a diskette with the Wabi program, it must already have a DOS file format.

Some operating systems provide a command for formatting DOS diskettes. (In the Solaris environment, you can use `fdformat -t dos`.) Please refer to your operating system manuals for information about formatting DOS diskettes. If your operating system is not able to format DOS diskettes, you can use preformatted diskettes, or format diskettes yourself on a PC running DOS.

If you have a DOS emulator installed on your system, you could also start a DOS session and use the DOS `format` command.

Note – You cannot use the Microsoft Windows File Manager’s Disk Format command to format diskettes.

Wabi Drives

To learn more about designating a drive as a network drive, read “Wabi Network Drives” on page 66.

Wabi drives are represented by the letters C through Z. These drives serve as a gateway to the mounted file systems and directories of your operating system. By assigning drives to directories, you can access information on your computer’s local hard disk, or across a network on a remote file server. The Wabi program cannot tell if a drive is local or on the network, because it accesses the drive through a directory path. The physical location of the directory is transparent to you and to the Wabi program. However, when you connect a drive to a directory, you can tell the Wabi program to represent the drive to applications as a network drive, whether the drive is local to your system or on the network. This feature is important to some applications that run in the Wabi program.



In a WabiServer environment, all drives except C, E, and H must be connected using network-aware paths, or the paths as seen from the server system. This means that if you want to map a drive to a file system on your local disk, the file system must be shared on the network before you can access it. See your Solaris documentation or your system administrator for information about sharing or exporting file systems. After the file system is shared, you can access it through WabiServer with a network-aware path.

Drive Connections

You create and change drive assignments in the Drive Connections dialog box as shown in Figure 4-3. When you assign a drive to a directory, the Wabi program retains your drive assignment for all subsequent Wabi sessions, or until you change the assignment.

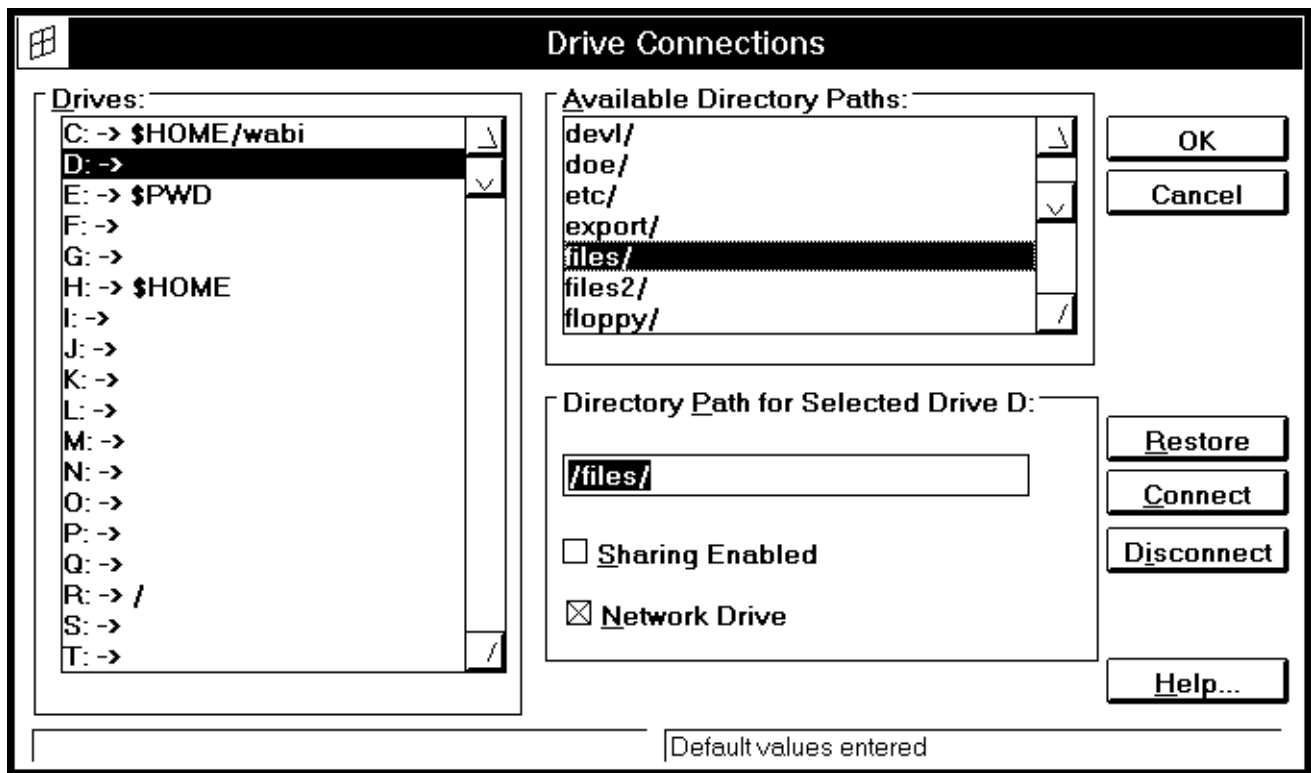


Figure 4-3 Drive Connections Dialog Box

The Drive Connections dialog box includes three panels:

- **Drives** – Presents a list of Wabi drives and their assignments. Drive letters that are not connected to a file system appear with no assignment.
- **Available Directory Paths** – Displays a list of mounted file systems and directories contained within the current directory. The highest level directory available for viewing is the root (/) directory. When you click on a subdirectory within the root directory, the directories within the

Connect a drive to a file system by following the steps in “Assigning a Drive” on page 72.

subdirectory are displayed. Double-click on a directory to see the directories within it, and to add it to the drive path. By double-clicking on subsequent directories, you construct a path that you can assign to a drive. Double-clicking . . / takes you up a level in the directory hierarchy.

- *Directory Path for Selected Drive x:* – Displays a scrolling text-entry field that indicates the path assignment of the selected drive. You can edit the path displayed in this field, or type a path assignment into the field.

Drive Connections Dialog Box Elements

The Drive Connections dialog box contains the following unique buttons and check boxes:

- *Restore* – Returns the selected drive's path to the path assigned when you opened the dialog box. Restore is not the same as Cancel — it resets only the selected drive.
- *Connect* – Assigns the path appearing in the Directory Path for Selected Drive panel to the drive letter selected in the Drives panel. This button is activated when a path is selected.
- *Disconnect* – Removes the path assignment of the drive selected in the Drives panel. This button is activated when a drive letter with an assigned path is selected.
- *Sharing Enabled* – This check box is used to enable file sharing on the selected drive. An "X" indicates file sharing is enabled on the selected drive.
- *Network Drive* – Checking this box makes the drive appear to an application as a network drive, whether the assigned directory is local or on the network. An "X" indicates the selected drive is viewed as a network drive. By default, all drives except C are viewed as network drives.

The section "File Sharing" on page 65 explains when and why you enable file sharing.

The section "Wabi Network Drives" on page 66 explains what this option means to applications.

Default Drive Assignments

When you first open the Drive Connections dialog box, notice that several drives are already assigned. Some of these assignments are permanent and you cannot change them.

The drives you cannot change are:

C: -> \$HOME/wabi	The directory in which your Wabi user files are installed.
R: -> /	The root directory. Drive R serves as a gateway to network file systems and to all directories on your system. Note that when you use WabiServer, drive R is connected to the root directory of the server system, not the client system where Wabi is displayed.
W: -> \$WABIHOME	The directory used to store Wabi program files.

If you select the C, R, or W drive, the Available Directory Paths panel is blank, and the Restore, Connect, and Disconnect buttons are disabled.

The preassigned drives you can change are:

E: -> \$PWD	The directory that was current when the Wabi program was started.
H: -> \$HOME	Your home directory.

New Drive Assignments

Making a new drive connection is a simple process. You must:

- Select a drive letter.
- Specify a drive path.
- Connect them.

Selecting a drive letter is easy: you click on any unassigned letter in the Drives panel. This activates the Available Directory Paths panel which displays a scrolling list of root-level directories. Single-clicking a directory in this list places the directory in the assigned drive path. Double-clicking a directory in this list places the directory in the path and also opens the directory. The

To connect a network drive, follow the steps in "Assigning a Drive" on page 72.

subdirectories available within the first directory are now displayed in the Available Directory Paths panel. By sequentially navigating remaining directories you can construct a path to the desired file system.

When you reach the destination directory, choose the Connect button. The Wabi program assigns the drive letter you selected to the path you constructed. To save assignments you make, choose the OK button.

You need adequate file permissions to access the files and directories you assign to Wabi drives. You will see an error message indicating that a permission problem exists if you attempt to access a file or directory for which you do not have adequate permissions. See your operating system documentation for information about checking and changing file permissions.

Edit the Directory Path

In certain situations, you may want to edit a drive path assignment or enter a drive path directly, rather than define one by sequentially clicking on directories in the Available Directory Paths panel. This might be the case if you know the path, or you want to include a variable such as `$HOME` in the path.

Follow the steps in “Editing or Entering a Drive Path Directly” on page 73 to accomplish this task.

The Directory Path for Selected Drive panel allows you to enter a path directly. To activate this panel, select an assigned or unassigned drive letter. If you select an assigned drive letter, the path assigned to the drive appears in the panel. If you select an unassigned drive letter, the panel is activated but is blank. Once the I-beam cursor appears in the panel, you can edit an existing path or type a new path.

This is particularly useful for automounted file systems. If you want to connect to a directory that does not appear in the Available Paths panel, type the directory path in this panel to automount the file system.

Disconnect a Drive

See “Disconnecting a Drive” on page 74 for the steps required to break a drive connection.

You can remove the connection for an individual Wabi drive, except for drives C, R, and W, by selecting a drive letter and choosing the Disconnect button in the Drive Connections dialog box. Before you disconnect a drive, make sure it is not being used by any running applications.

File Locking and File Sharing

The Wabi program supports both file locking and file sharing. Each is important and is described as follows:

- *File Locking* – Prevents multiple users from accessing a file or a record at the same time.
- *File Sharing* – Enables you to share files and data with others by controlling who can do what with a file at a given time.

File Locking

Wabi file locking depends on the capabilities of the applications you run. If an application requests a file or record to be locked, Wabi locks it. If an application never uses locking because it assumes a single-user environment, Wabi does not lock files or records for the application. You do not have to enable file and record locking because Wabi always does it at the application's request. Wabi clears file locks when you close a file or exit the Wabi program. This includes files that are open when the Wabi program is terminated unexpectedly.

File Sharing

Wabi file sharing allows users and applications to access files simultaneously, yet safely. File sharing occurs only if you enable it. When file sharing is enabled, each file opened can be shared if the application supports file sharing. The ways in which you can share files are determined by the application, not by the Wabi program. For example, while you are using a particular file, an application may allow another user to view that file but not write to it. An application's sharing methods are integral to the application, and cannot be controlled by users.

You enable file sharing drive-by-drive, using the Drive Connections dialog box. The default setting on all Wabi drives is sharing disabled. This is because file sharing can increase file access time on a drive, and also may limit the number of files that all applications running in Wabi can have open at one time. You should enable file sharing only on drives where you really need it.

When file sharing is enabled on a drive, every file that applications open on that drive is shared. This means that for every open file, the Wabi program creates a share lock, which controls what can be done to the file. Share locks are

To set a drive up for file sharing, see "Enabling File Sharing for a Drive" on page 75.

cleared when you close a file or exit the Wabi program. However, unlike file locks, share locks are not automatically removed when the Wabi program terminates unexpectedly on some operating systems. If this happens, you may have to clear share locks manually. On some operating systems, the Wabi program includes a UNIX program that clears all locks. This program, named `clearlocks`, should be used with care.

The `clearlocks` program removes all file, record, and share locks between two machines, regardless of who created or who “owns” the locks. To run `clearlocks` on the machine on which the Wabi program terminated unexpectedly, enter the command `clearlocks` followed by the host name of the system on which the shared files are located.

Wabi Network Drives

In the Wabi environment, the directory to which a drive letter is connected may reside on a local disk or on a remote disk on the network. To the Wabi program, and to UNIX programs in general, it does not matter where a directory path leads; the underlying operating system and network software keep track of file systems.

However, it does matter to some Microsoft Windows applications whether a given drive letter is a local drive, or is located somewhere else on the network. These applications may check to see if a particular drive letter is local or networked, and may behave differently in each case. For example, when you install an application onto a drive, the installation program may try to determine if the drive is networked. If it finds that the drive is networked, the installation program may present you with a number of installation options specific to servers, such as the location of shared program files and user directories. Also, some applications may not use file locking if they detect that the drive is local.

To set up a drive as a network drive, see “Setting a Network Drive” on page 75.

The Wabi program lets you control how the Wabi drives appear to applications. The Drive Connections dialog includes a Network Drive option that, when enabled, specifies that the selected drive is seen by applications as a network drive. When this option is not enabled, the drive appears to be a local hard drive to an application running in the Wabi program.

By default, Wabi makes each drive appear as a network drive. In most cases you should leave the Network Drive option enabled so applications that can use file locking will detect a network environment and lock files as you open them. However, if you install or use an application that requires a local drive, you can disable the Network Drive option.

CD-ROM Drives

“Accessing a CD-ROM Drive” on page 76 provides the general steps required to mount and use a CD-ROM drive.

The Wabi program allows you to access a CD-ROM device, provided the CD-ROM uses a media format the native operating system recognizes. For example, if your operating system can read only CD-ROMs that use the Rock Ridge and High Sierra File System (HSFS) format, the Wabi program has this same limitation.

Connecting to a CD-ROM drive with the Wabi program is much like connecting any Wabi drive. You mount the device on a mount directory in the native operating system, and then assign a drive letter to the mount directory in the Drive Connections dialog in the Wabi Configuration Manager.



WabiServer users can access the CD-ROM drive on the WabiServer system only. Access to the client system's CD-ROM drive is not yet supported.

Note – You cannot use a CD-ROM drive to play music CDs or video laser disks in the Wabi environment, but you may be able to play Microsoft Windows waveform files (.WAV) on some platforms. Please consult the *Wabi Release Notes* for more information. (The Wabi program on Solaris platforms does support playing .WAV and .AVI files, as described in “Using Multimedia Features on SPARCstation and x86 Computers” on page 152.)

Potential CD-ROM Problem

If you install an application that uses Microsoft CD-ROM extensions, and you have purchased the rights to use that application on your local system (not on a network), you may not be able to run your CD-ROM application.

This is due to a protection mechanism that the Microsoft Corporation has incorporated in much of its CD-ROM-based application software. This mechanism ensures that a CD-ROM application purchased for use on a local system is not capable of running on a network. Because the Wabi program

accesses a local CD-ROM drive through a path in your operating system, it appears to a CD-ROM application running under the Wabi program that the application is being used on a network, not on a local CD-ROM drive.

This limitation cannot be overcome by disabling the Network Drive option in the Drive Connections dialog box.

Instructions for Tasks Related to Setting Up Drives

This section provides detailed, step-by-step instructions for performing a variety of tasks related to diskette drives and Wabi drives. For certain tasks, you will see samples of the command input and output associated with the task. Margin notes refer to sections of this manual related to the task described.

▼ Connecting a Diskette Drive

1. Open the Control Panel.

2. Open the Wabi Config icon.

The Configuration Manager opens.

3. Open the Diskettes icon.

Alternatively, choose Diskettes from the Options menu or press Alt, s, k.

The Diskette Connections dialog box opens.

4. Open the Diskette Drive A list or Diskette Drive B list.

A list of prevalidated diskette device names appears.

5. Select a diskette device name in the list.

6. Choose OK to save your choice.

Alternatively, choose Cancel to close the dialog box without making changes.

When you choose OK, the diskette device you've chosen is connected to the diskette drive.

Read "Diskette Drives" on page 56 for background information about how Wabi uses diskette drives.

▼ Changing the Diskette Drive Timeout Period

Read “Diskette Timeout” on page 58 for more about the diskette drive timeout.

1. **Open the Control Panel.**
2. **Open the Wabi Config icon.**
The Configuration Manager opens.
3. **Open the Diskettes icon.**
Alternatively, choose Diskettes from the Options menu or press Alt, s, k.
The Diskette Connections dialog box opens.
4. **Select the Diskette Timeout field and type the number of seconds the diskette should be idle before the Wabi program releases control of the drive.**
5. **Choose OK to save your entry.**
Alternatively, choose Cancel to close the dialog box without making any changes.

▼ Manually Entering a Diskette Device Name

To determine when you might need to do this, see “To Use an Unlisted Diskette Device” on page 58.

1. **Open the Control Panel.**
2. **Open the Wabi Config icon.**
The Configuration Manager opens.
3. **Open the Diskettes icon.**
Alternatively, choose Diskettes from the Options menu or press Alt, s, k.
The Diskette Connections dialog box opens.
4. **Select the Diskette Drive A or B text entry field.**
The entry field becomes active.
5. **Type the path and name of a diskette device file.**

6. Choose OK to save your entry.

Alternatively, choose Cancel to close the dialog box without making changes.

When you choose OK, the Wabi program validates your entry. If the entry is valid (the path and name you typed are correct), the diskette device you entered is connected to the diskette drive. You will see an error message if the entry you typed is not a valid device name. Follow the instructions in the error message to resolve the error condition.

▼ Formatting a DOS Diskette

You must format a diskette outside of the Wabi program. “Diskettes and DOS” on page 60 explains why.

You cannot format diskettes with File Manager in the Wabi environment. However, if your native operating system provides a DOS formatting command, the general procedure to format a DOS diskette is:

- 1. Open an operating system command window.**
- 2. Place a diskette in the diskette drive.**
- 3. Type your operating system diskette format command and press Enter.**
See your operating system user’s guide for more information. In the Solaris environment, the command is `fdformat -t dos`.
- 4. When formatting is complete, eject the diskette.**
Press the Eject button on the drive or enter the command required to remove the diskette from the drive.

Note – If you have a DOS emulator, you can also format a DOS diskette by using the DOS `format` command in the emulator.

▼ Accessing an Alternate Diskette Devices Directory

- 1. Open the Control Panel.**
- 2. Open the Wabi Config icon.**
The Configuration Manager opens.

For background on using an alternate diskette device directory, see “Advanced Diskette Drive Options” on page 58.

3. Open the Diskettes icon.

Alternatively, choose Diskettes from the Options menu or press Alt, s, k.

The Diskette Connections dialog box opens.

4. Choose Advanced.

The Advanced Diskette Drive Options dialog box opens.

5. Select the Diskette Device Directories text entry field.

The field becomes active.

6. Type the directory or directories in which diskette devices are located.

Separate multiple entries with semicolons; do not use spaces.

7. Choose OK to save your entry.

Alternatively, choose Cancel to close the dialog box without making changes.

When you choose OK, the Wabi program validates your entry. If the entry is valid and the directories exist, each time you connect a diskette drive to a diskette device, the Wabi program searches for device files in the directories you entered.

You will see an error message if the entry you typed includes an invalid path name. Follow the directions in the error message to clear the error condition, then enter a valid diskette device directory. Choose the Help button in the error message box if you need more help clearing the error condition.

To reset the diskette device directories to the default:

1. Choose Defaults in the Advanced Diskette Drive Options dialog box.

The default diskette devices directories are restored.

2. Choose OK.

Your change is saved.

▼ Accessing an Alternate Diskette Device File Pattern**1. Open the Control Panel.****2. Open the Wabi Config icon.**

The Configuration Manager opens.

“Advanced Diskette Drive Options” on page 58 provides details on using alternate diskette device file patterns.

3. Open the Diskettes icon.

Alternatively, choose Diskettes from the Options menu or press Alt, s, k.

The Diskette Connections dialog box opens.

4. Choose the Advanced button.

The Advanced Diskette Drive Options dialog box opens.

5. Select the Diskette Device File Pattern text-entry field.

The field becomes active.

6. Type one or more file patterns.

Separate multiple patterns with semicolons; do not use spaces.

7. Choose OK to save your entry.

Alternatively, choose Cancel to close the dialog box without making changes.

When you choose OK, the Wabi program validates your entry. If the entry is valid, each time you connect a diskette drive to a diskette device the Wabi program searches for diskette device files using the naming patterns you entered.

You will see an error message if the entry you typed contains an invalid device file pattern. Follow the instructions included in the error message to clear the error condition and then enter a valid diskette device file pattern. Choose the Help button in the error message box if you need more help clearing the error condition.

To reset the diskette device file pattern to the default:

1. Choose Defaults in the Advanced Diskette Drive Options dialog box.

The default diskette device file pattern is restored.

2. Choose OK.

Your change is saved.

▼ Assigning a Drive

“Wabi Drives” on page 60 provides an overview of Wabi drives.

1. Open the Control Panel.

2. Open the Wabi Config icon.

The Configuration Manager opens.

See page 63 for information about working with Wabi drives.

3. Open the Drives icon.

Alternatively, choose Drives from the Options menu or press Alt, s, v.

The Drive Connections dialog box opens.

4. Select an unassigned drive letter in the Drives panel.

The letter is highlighted.

5. In the Available Directory Paths panel, navigate through the list of directories and files until you reach the file system you want.

Click a directory name to place it in the path. Double-click a directory name to place it in the path and view the directory's contents.

The selected path appears in the Directory Path for Selected Drive panel.

6. Choose Connect.

The path displayed in the Directory Path for Selected Drive panel is assigned to the drive. The connection is displayed in the Drives panel.

7. Choose OK to save your assignment.

Alternatively, choose Cancel to close the dialog box without making changes.

▼ **Editing or Entering a Drive Path Directly**

1. Open the Control Panel.

2. Open the Wabi Config icon.

The Configuration Manager opens.

3. Open the Drives icon.

Alternatively, choose Drives from the Options menu or press Alt, s, v.

The Drive Connections dialog box opens.

4. Select a letter representing the drive assignment you want to edit or enter.

The drive assignment highlights and the path is displayed in the Directory Path for Selected Drive panel.

If you select one of the permanent drives, C, R, or W, no path is displayed in the Directory Path for Selected Drive panel because you cannot change this path.

See "Edit the Directory Path" on page 64 for more about editing and entering drive assignments.

5. Select the Directory Path for Selected Drive panel.

The text entry area becomes active.

6. Edit or enter a directory path.

Alternatively, choose the Restore button to return the path to what it was when you entered the dialog box.

7. Choose Connect.

The path displayed in the Directory Path for Selected Drive panel is assigned to the selected drive. The connection is displayed in the Drives panel.

8. Choose OK to save your entry.

Alternatively, choose Cancel to close the Drive Connections dialog box without making changes.

▼ Disconnecting a Drive**1. Make sure the drive is not being used by any running applications.****2. Open the Control Panel.****3. Open the Wabi Config icon.**

The Configuration Manager opens.

4. Open the Drives icon.

Alternatively, choose Drives from the Options menu or press Alt, s, v.

The Drive Connections dialog box opens.

Before disconnecting a drive, you may want to read "Disconnect a Drive" on page 64.

5. Select the drive letter of the drive you want to disconnect.

The Disconnect button is activated.

If you select one of the permanent drives, C, R, and W, the Disconnect button is not activated because you cannot disconnect these drives.

6. Choose Disconnect.

The path assignment is cleared for the selected drive.

7. Choose OK to save your changes.

Alternatively, choose Cancel to close the dialog box without making changes.

▼ Enabling File Sharing for a Drive

1. Open the Control Panel.

2. Open the Wabi Config icon.

The Configuration Manager opens.

3. Open the Drives icon.

Alternatively, choose Drives from the Options menu or press Alt, s, v.

The Drive Connections dialog box opens.

4. Select the drive letter of the drive on which you want to enable sharing.

The drive path is displayed in the Directory Path panel.

5. Select the Sharing Enabled check box.

An “X” appears in the box.

6. Choose OK to save your changes.

Sharing is enabled for the drive. Drive performance may be reduced.

Alternatively, choose Cancel to exit the dialog box without making changes.

Read “File Sharing” on page 65 for more about the issues involved with shared files.

▼ Setting a Network Drive

1. Open the Control Panel.

2. Open the Wabi Config icon.

The Configuration Manager opens.

3. Open the Drives icon.

Alternatively, choose Drives from the Options menu or press Alt, s, v.

The Drive Connections dialog box opens.

4. Select the drive letter of the drive that you want to appear as a network drive.

The drive path is displayed in the Directory Path for Selected Drive panel.

5. Select the Network Drive check box to enable it.

An “X” appears in the box.

For more about Wabi network drives, read “Wabi Network Drives” on page 66.

6. Choose OK to save your changes.

The drive now appears to applications as a network drive, whether it is connected to a local directory or a remote directory.

Alternatively, choose Cancel to exit the dialog box without making changes.

▼ **Setting a Local Drive**

1. Open the Control Panel.

2. Open the Wabi Config icon.

The Configuration Manager opens.

3. Open the Drives icon.

Alternatively, choose Drives from the Options menu or press Alt, s, v.

The Drive Connections dialog box opens.

4. Select the drive letter of the drive that you want to appear as a local drive.

The drive path is displayed in the Directory Path for Selected Drive panel.

5. Select the Network Drive check box to disable it.

The box is empty.

6. Choose OK to save your changes.

The drive now appears to applications as a local drive, whether it is connected to a local directory or a remote directory.

Alternatively, choose Cancel to exit the dialog box without making changes.

▼ **Accessing a CD-ROM Drive**

“CD-ROM Drives” on page 67 discusses specifics of using these drives in the Wabi program.

Some cautions apply to CD-ROM drives. Learn about them in “Potential CD-ROM Problem” on page 67.

Follow these general steps to access a CD-ROM. The precise commands required vary, depending on your operating system. Some operating systems automatically make a compatible CD-ROM available when you insert the CD-ROM into the drive. If your operating system does this, begin with Step 7.

1. Open an operating system command window.

2. Change to the root (/) directory.

3. Become superuser (su).

4. Create a directory named `cdrom`.

5. Mount the CD-ROM.

Make sure you can read the CD-ROM from the operating system before proceeding. For example, try to do an `ls` command on the `/cdrom` directory.

6. Exit from superuser status.**7. If it is not already running, start the Wabi program.****8. Open Configuration Manager and open the Drives icon (or choose Drives from the Configuration Manager Options menu).****9. In the Drive Connections dialog box, select an unassigned drive letter.****10. In the Directory Path for Selected Drive panel, type `/cdrom` (or whatever directory name the CD-ROM is using).****11. Choose Connect.**

The drive letter is assigned to the CD-ROM directory.

12. If you want the CD-ROM drive to be seen as a network drive, select the Network Drive check box.

See the application's documentation to determine if the CD-ROM can be used on a network.

13. Choose OK to save the drive connection.

The Drive Connections dialog box closes.

Access the CD-ROM through the drive letter you assigned. For example, if you connected F to `/cdrom`, you can run a `setup` program on the CD-ROM with the command `F:\setup`.

Reference Material for Drives

This section presents material you may find useful when you work with diskette drives, Wabi drives, and CD-ROM drives.

Troubleshooting Problems With Diskette Drives

Table 4-1 suggests solutions to problems you might experience when working with diskette drives A and B.

Table 4-1 Diskette Drive Problems and Solutions

Symptom	Possible Cause	Solution
"Device Not Ready (Abort, Retry, or Ignore)" error	Diskette may not be seated properly in the drive.	Remove diskette and reinsert it. Try to access the diskette again.
Can't access drive A or B	Another program is controlling the drive.	Eject the diskette with a command from the other program, reinsert the diskette, and try accessing it through Wabi again.
	Invalid device name specified in Configuration Manager's Diskette Connections dialog box.	Specify a raw diskette device file. See your UNIX documentation for information about diskette (or floppy) devices.
	Inadequate file permissions to device file or directory.	You must have read and write permission to your UNIX system's device files and directories. Use the UNIX <code>chmod</code> command to change permissions if necessary.
	In WabiServer, local diskette access may be disabled by the administrator.	See your WabiServer administrator.

Table 4-1 Diskette Drive Problems and Solutions (Continued)

Symptom	Possible Cause	Solution
Can't locate diskette devices	Wabi is searching the wrong directory for the diskette devices, or using an incorrect file name pattern.	Determine the location and names of the raw diskette device files in your operating system, and then specify the directory and a file naming convention in the Advanced Diskette Drive Options dialog box as explained on page 58.
Diskette will not eject using special keys (e.g., Meta+E)	Wabi window does not have input focus.	Place mouse pointer in Wabi window, click to make it the active window, and then press keys.
Can't format DOS diskette	Not supported under Wabi program.	You can use preformatted diskettes or format them on a PC running DOS. Your operating system may also provide a way to format DOS diskettes, so refer to your operating system user's manual.

Troubleshooting Problems With Wabi Drives

Table 4-2 suggests solutions to problems you might experience when attempting to connect Wabi drives to directories.

Table 4-2 Wabi Drive Problems and Solutions

Symptom	Possible Cause	Solution
Can't connect a drive to a local directory	Inadequate file permissions.	You must have read permission or more to any directory you want to access. Use the UNIX <code>chmod</code> command to change permissions if necessary. If you are using WabiServer, make sure you use a network-aware path for directories on your local system.
	Incorrect path assignment.	If you entered the path name manually, make sure the path is a directory, not a file.
Can't connect a drive to a remote directory	Inadequate file permissions.	You must have read permission or more to any directory you want to access. Contact your system administrator or the owner of the directory. If you are using WabiServer, make sure the remote directory is accessible to the WabiServer system.
Remote directory not in Available Directory Paths	Remote file system not mounted.	You must be able to access the directory from the operating system before you can access it in Wabi. If your UNIX system automatically mounts remote file systems, enter the path directly in the Directory Path to Selected Drives box to automatically mount the file system. If your UNIX system does not automatically mount remote file systems, see your UNIX manuals for procedures to make remote file systems accessible.

Table 4-2 Wabi Drive Problems and Solutions (Continued)

Symptom	Possible Cause	Solution
Can't change connection for drive C, R, or W	Permanent drive connections cannot be changed.	<p>Once the file system is accessible from the operating system, open the Drives icon in Configuration Manager and connect a drive to the directory.</p> <p>There is no way to change the C, R, or W connections. If you want to change the C connection because you do not want your user wabi directory in your home directory, do <i>not</i> simply move or copy your existing wabi directory to another location because the numerous symbolic links will not be preserved. Instead, try the following procedure:</p> <ul style="list-style-type: none">• Exit Wabi• Rename your existing wabi directory to wabi.old• Create a directory named wabi in the desired new location• Create a symbolic link named wabi in your home directory, with the new directory as the target• Restart Wabi <p>The Wabi program creates a new wabi directory, placing it in the new location. If you added any files to your original wabi directory, move them from wabi.old to the new directory, and then delete wabi.old.</p>
Drive errors when using a DOS Emulator	Dissimilar drive mappings.	<p>Assign the same drive letters to the same path names in both the DOS Emulator and Wabi. See <i>page 173</i> for more information.</p>

Troubleshooting Problems With CD-ROM Drives

Table 4-3 suggests solutions to problems you might experience when attempting to access and use a CD-ROM drive.

Table 4-3 CD-ROM Drive Problems and Solutions

Symptom	Possible Cause	Solution
Can't mount CD-ROM	CD-ROM not in format supported by operating system.	The Wabi program can only use CD-ROMs that your operating system can use. See your operating system documentation for information about CD-ROMs.
Can't run application off CD-ROM	Application detects network environment.	Some applications on CD-ROM will not work in Wabi because they determine the drive is a network drive. There is no way to use such applications. See page 67 for more information.

This chapter discusses printing operations and tasks. The Wabi program supports a wide range of printers, including PostScript printers, Epson FX, LX and MX-series printers, Hewlett-Packard LaserJet III series printers, and text-only printers. In a network setting, the Wabi program allows you to direct printed output to a variety of destinations, including local and network printers and files.



WabiServer provides access to printers configured on the WabiServer system and on your local system. Your system administrator determines which system's printers you can access.

If you are unfamiliar with Wabi printing concepts, procedures, or dialog boxes and want to learn more about them, read the next section, "About Printing."

If you want instructions for specific tasks related to printing, use the following table to locate the instructions you need.

Task	Page
<i>Installing Printer Drivers for PostScript, Epson, or HP LaserJet III Printers</i>	95
<i>Defining the Wabi Default Printer</i>	96
<i>Connecting a Wabi Printer Port to a UNIX Printer</i>	97
<i>Restoring Printer Name and Command Defaults</i>	98

About Printing

Wabi print functions bridge the gap between an application's printing method and the printing mechanism of your operating system. Print functions are *transparent*. That means once you establish Wabi printer settings and connections, you can issue a print command from within an application and your document is printed.

When you issue a print command from within an application, the application passes your print request to a printer driver which, in turn, passes the print request to an assigned printer port. Up to this point, the print process is the same as in the Microsoft Windows environment. However, instead of sending the print request to an LPT port, the Wabi program redirects the request to the native print spooling system, along with the name of a printer and a print command.

Your UNIX printing system processes print jobs from all applications you run on your desktop, whether they run in the Wabi program or in your operating system. Printing is done in the background, so you never have to stop your work while a print request is carried out.

You manage printers, print queues, and print jobs with the same UNIX printer management utilities or commands you normally use to manage printing on your UNIX system. You do not need (and cannot use) a separate tool such as the Windows Print Manager to manage printing from the Wabi program.



If your Wabi environment was created from a WabiServer prototype, your system administrator most likely configured printers in the prototype, so you may not need to perform any of the tasks of this chapter.

Supported Printer Types

The Wabi program can print to the following printer types:

- Text-only
- PostScript
- HP LaserJet III series
- Epson FX, LX, and MX series

The Wabi program supplies and installs the printer drivers for the HP LaserJet III and Epson printers. The Wabi program also installs two of the printer drivers supplied with Microsoft Windows: the Generic/Text Only and PostScript Printer drivers. This lets the Wabi program print to most printers right out of the box.

The Wabi program can also use the additional PostScript printer descriptions supplied with Microsoft Windows. You can install them through the Control Panel's Printers dialog just as you would in a Microsoft Windows environment on a PC.

Note that for HP LaserJet III and Epson printers, you can use *only* the Wabi-supplied drivers. The drivers supplied with Microsoft Windows for these printers are not supported in the Wabi program.

Before You Can Print From Wabi

Before you can print from applications running in the Wabi program, you must be able to use a printer from the operating system. You (or your system administrator) must configure your operating system to recognize the printer. If you can print on a printer using a print command (such as `lp` or `lpr`) in your operating system, you will be able to access the printer from the Wabi program.

UNIX Printer Configuration

Normally, you do not need to do anything special to your UNIX printer configuration in order to print from your Wabi environment. However, if you use one printer most often, you should designate it as your UNIX default printer. That way, the Wabi program will automatically send all its print jobs to that printer unless you specify a different printer.

Note – If you want to print to an HP LaserJet III printer on an HP-UX® print server, the printer definition on the server should be set up for a “dumb device” to prevent filtering by the print server.

See your operating system documentation for more information about installing and accessing printers, and designating a default printer.

The Default Wabi Printing Setup

The Wabi program is ready to print in many environments without any action on your part. By default, the Wabi program assigns the PostScript Printer (or Apple LaserWriter) driver to port LPT1, and connects LPT1 to your UNIX default printer. These settings will work for printing to PostScript printers in most situations. However, you can use the Microsoft Windows Control Panel and Wabi Configuration Manager to change the default printing setup if you like. Note that on the Solaris platform, the Apple LaserWriter II NTX description for the PostScript driver is used by default.



When you run WabiServer, the UNIX default printer used depends on whether the WabiServer system allows users to access printers on the server, the client, or both. If users can access only server printers, the default is the server system default printer. If users can access only client printers, the default is the client system default printer. If users can access printers on both systems, the UNIX default printer is the client system default printer.

Changing Print Settings

If the default Wabi printing setup is not appropriate for your environment, you can change the print settings in Microsoft Windows Control Panel and Wabi Configuration Manager, so you can print on any supported printer that you can access from your operating system.

Control Panel's Printers Dialog Box

You use the Control Panel for all print settings except those pertaining to the connection between Wabi LPT ports and UNIX printers.

Figure 5-1 shows the Control Panel's Printers dialog box.

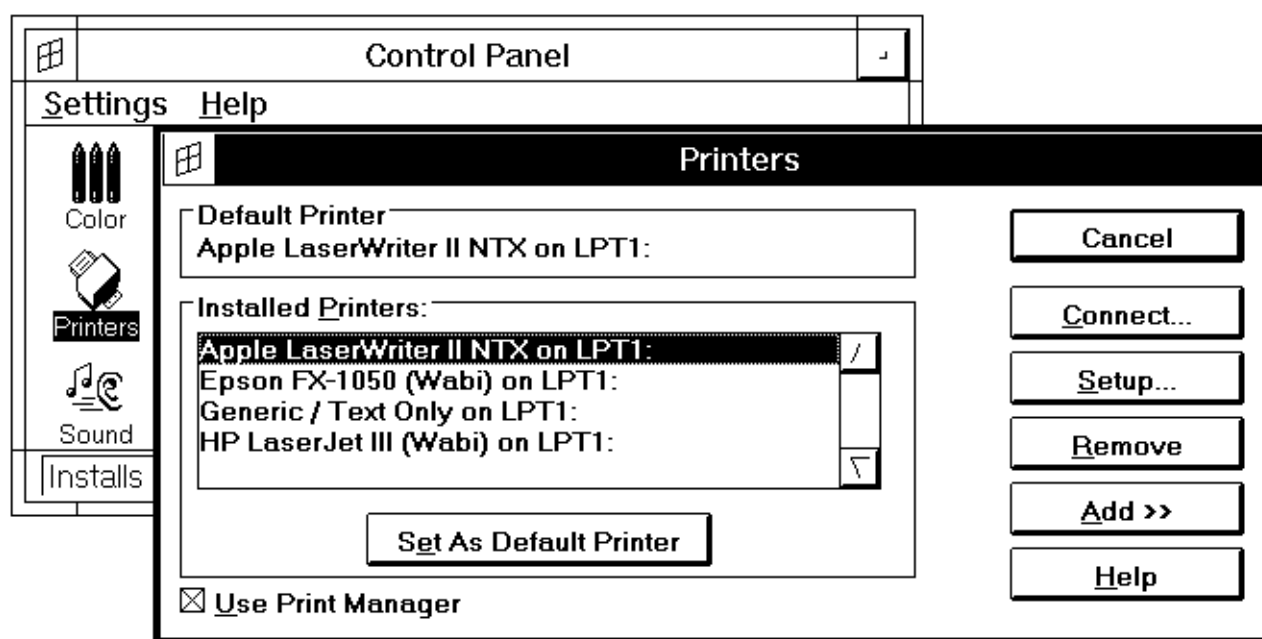


Figure 5-1 Control Panel's Printers Dialog Box

In the Wabi environment, you use Control Panel's Printers dialog box to:

- Install a different printer description for a PostScript, HP LaserJet III, or Epson printer
- Change the printer setup of an installed printer
- Specify a new Wabi default printer
- Set up to print to a file
- Assign a directly-connected serial printer to a COM port
- Assign a printer to a different LPT port

You perform these tasks in the Wabi environment the same way you would in the Microsoft Windows environment. The Printers dialog box and related dialog boxes work as they do in Microsoft Windows, with the following exceptions:

- Microsoft Windows Print Manager, whether enabled or disabled in the dialog box, does not run in the Wabi environment.
- Although you may be able to add an unsupported driver from the List of Printers, the Wabi program will not be able to use it. You can use only those drivers described in “Supported Printer Types” on page 85.
- Several items in the Connect dialog box, which opens when you choose the Connect button, are not applicable in the Wabi environment. The settings are: Device Not Selected, Transmission Retry, and Fast Printing Direct to Port. In the Microsoft Windows environment, these settings affect Print Manager and DOS interrupts.
- The Network button located in the Connect dialog box opens the Port Selection dialog box in Wabi Configuration Manager, which you can use to connect a Wabi LPT port to UNIX printer.

Configuration Manager’s Printer Output Connections Dialog Box

Use Configuration Manager’s Ports icon to access the Printer Output Connections dialog box. This dialog box lets you connect an LPT port to a printer defined in your UNIX environment, and specify the UNIX print command to use for printing to that printer.

When you open the Ports icon, the Port Selection dialog box opens. If you select the LPT port you want to connect and choose the Connect button, the Printer Output Connection dialog box opens, as shown in Figure 5-2.

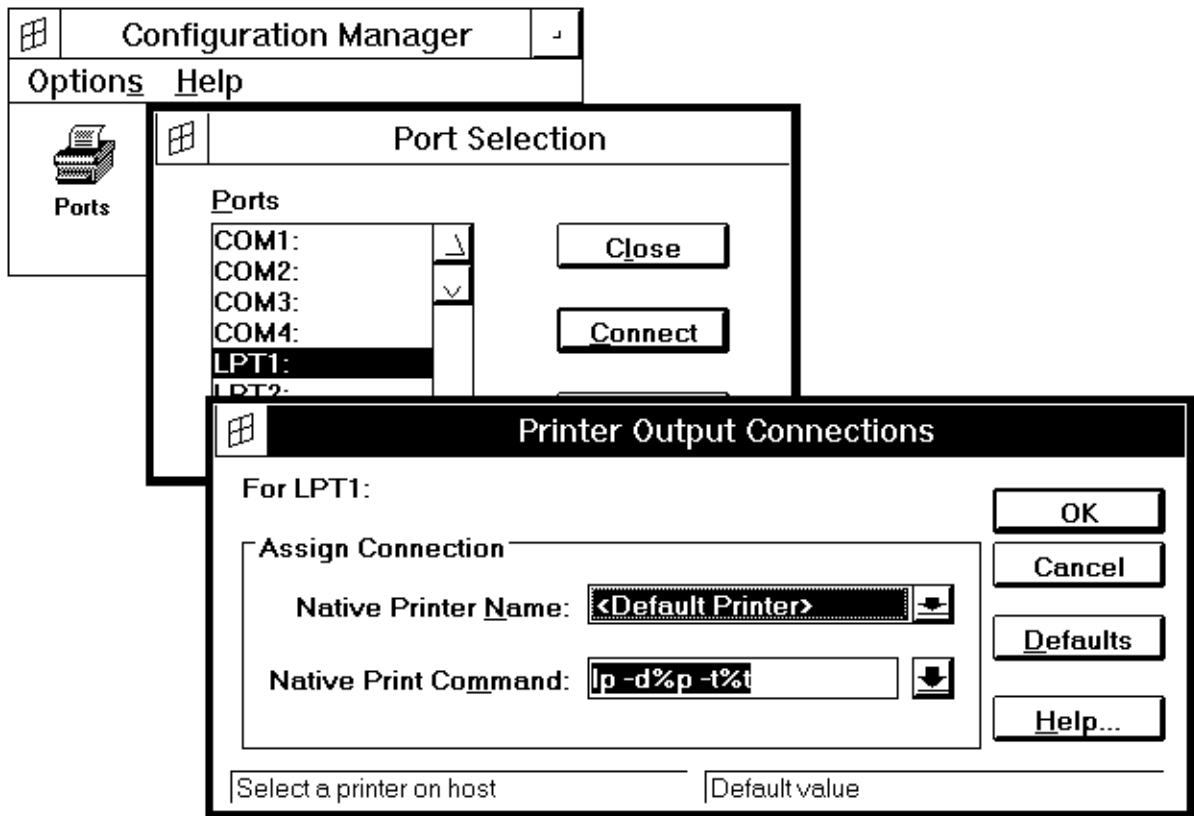


Figure 5-2 Printer Output Connections Dialog Box

“Connecting a Wabi Printer Port to a UNIX Printer” on page 97 provides the steps for assigning a printer to a port.

Your operating system recognizes and addresses printers by their names. That means that every printer you can use has a name. In addition, your operating system uses a specific command to initiate a print job. When you connect a printer to a Wabi LPT port, you indicate the name of the printer you want to assign to the port and the command required to start a print job.

As Figure 5-2 illustrates, the Printer Output Connections dialog box contains a panel labeled Assign Connection. The connection you specify in this panel applies to the port whose name appears in the upper-left corner of the dialog box.

The Assign Connection panel has two entry fields with drop-down lists:

- *Native Printer Name* – Displays a list containing the names of all the printers your system is configured to recognize and which you can access. The first name, <DefaultPrinter>, is a variable that specifies your current system default printer, which is the printer used when you print without specifying a printer name. When you assign a port to <DefaultPrinter>, print jobs sent to that port go to the current system default printer. If you change the default printer on your system, the Wabi program immediately uses the new default printer for <DefaultPrinter>.
- *Native Print Command* – Displays a list of operating system print commands.

Connecting a printer to a Wabi LPT port is as simple as opening the Native Printer Name list and selecting a printer name.

In most cases, you will not have to alter the Native Print Command entry. The default entry supplied with the Wabi program will usually be correct. However, you can select the entry field and type in a command if you want. You can change the native print command to any command line that you know works in your operating system to get the output you want from the printer. See your operating system user manuals for information about commands used for printing.

After you select a printer by name and choose OK in the Printer Output Connections dialog box, the printer name and command is assigned to the selected LPT port.

The Defaults button in the Printer Output Connections dialog box restores the Wabi program default printer connection. This connection assigns the default printer specified in the Printer Settings dialog box to Wabi port LPT1. The default also specifies a generic print command.

The default print command includes two placeholders for parameters used with arguments to the print command:

- %p – The Wabi program replaces %p with a printer name. If the printer name is <DefaultPrinter>, the Wabi program omits the argument using %p when a print command is issued to the operating system. This makes the operating system use its default printer.
- %t – The Wabi program replaces %t with the print job title. Many operating systems require a print job title statement.

Using Other PostScript Printer Descriptions

See “Installing Printer Drivers for PostScript, Epson, or HP LaserJet III Printers” on page 95 for the procedure.

If you find that the printer output is not exactly what you want when you use the PostScript Printer driver, you should install the PostScript printer that matches your PostScript printer model. This lets Windows applications tailor themselves according to your printer’s capabilities for paper size, multiple paper trays, envelopes, and so on. It also gives the application access to all the fonts on the printer. If your PostScript printer is a SPARCprinter, you should install the Apple LaserWriter II NTX printer driver.

Note – In Microsoft Windows and in the Wabi program, all PostScript printers listed in the Control Panel use the same driver program, `pscript.drv`. However, each listed printer has its own printer description, which provides detailed information about the printer’s capabilities. When you select and install a particular model of PostScript printer, you are installing the printer description, not the driver.

Using Epson and HP LaserJet III Printers

If you want to print to an HP LaserJet III or Epson printer, you must use the HP LaserJet III (Wabi) or Epson FX-1050 (Wabi) printer drivers. The Wabi program installs these drivers in your Wabi environment and assigns them to LPT1 the first time you start the Wabi program.

You must use the printers that include (Wabi) in the name in the List of Printers. The Wabi printer descriptions for Epson and HP LaserJet III printers are at the top of the List of Printers in the Control Panel’s Printers dialog, as shown in Figure 5-3. Other drivers in the list use the Microsoft Windows version of the drivers, which are not supported in the Wabi program.

Epson Models — The Epson printer driver provided with Wabi software supports many Epson printer models. If your Epson printer is not an FX-1050, you can install a printer description that matches your particular printer model. The following Epson printers are supported by the Wabi Epson printer driver:

Epson FX-80	Epson FX-80+	Epson FX-85	Epson FX-86e
Epson FX-100	Epson FX-100+	Epson FX-185	Epson FX-286
Epson FX-286e	Epson FX-800	Epson FX-850	Epson FX-1000
Epson FX-1050	Epson FX	Epson LX	Epson MX

If you have an Epson PostScript printer, you should use the appropriate PostScript driver, not the Epson FX-1050 driver.

HP LaserJet Models — The HP LaserJet III printer driver provided with Wabi also supports the LaserJet IIID and LaserJet IIIP models. If you have these models, you can install a printer description that matches them. The HP LaserJet III driver can also be used with LaserJet IV printers, although the driver may not be able to use all the LaserJet IV's capabilities. The driver *cannot* be used with LaserJet II printers. Note that the HP LaserJet III (Wabi) driver does not support font downloading with the HP Font Installer.

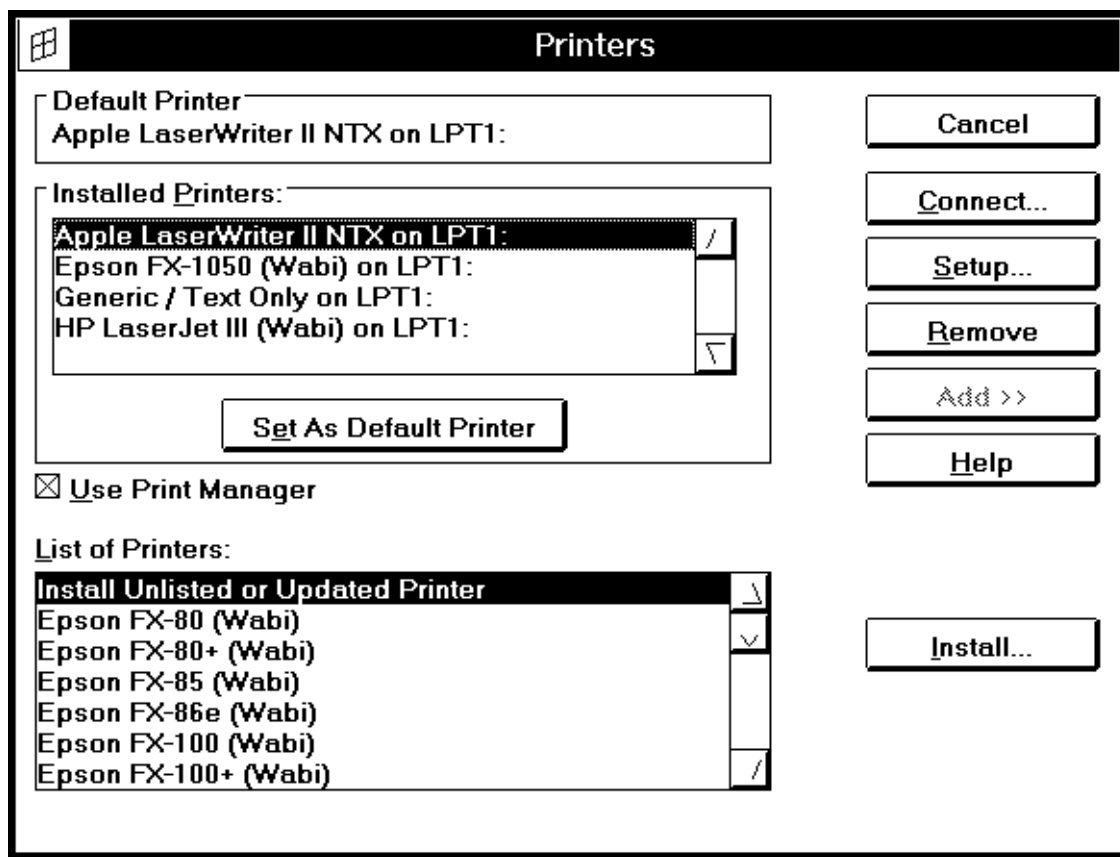


Figure 5-3 Printers Dialog Showing Wabi Printer Descriptions

Epson or LaserJet III System Default Printer

If your system default printer is an HP LaserJet III or Epson printer, before you print the first time, you should use Control Panel to assign the HP LaserJet III (Wabi) or Epson FX-1050 (Wabi) printer as your Wabi default printer. The Wabi program is set up to print to PostScript printers by default.

Using Text-Only Printers

You can print to text-only printers (such as dot-matrix printers) using the Generic/Text Only driver supplied with Microsoft Windows. You can also use this driver to print plain text (not graphics) to most printers. If your printer is not supported in the Wabi environment, you can assign the Generic/Text Only driver to it and print draft-quality documents without graphics.

Note that if your application lets you save a document as an ASCII text file, you probably can print a text file without the generic printer driver. PostScript printers can print text-only documents if they are configured in the operating system to accept simple text input.

Changing the Wabi Default Printer

You set your Wabi default printer the same way you set your Microsoft Windows default printer, using the Control Panel. The Set as Default Printer button in the Printers dialog box sets the selected printer as the default printer.

See “Defining the Wabi Default Printer” on page 96 for the procedure.

Your Wabi default printer should connect to the UNIX printer you use most frequently. For example, if most of your printing is done on an Apple LaserWriter II NTX printer named “speedy” located near your office, attach the Apple LaserWriter II NTX printer driver to a port such as LPT1, and then set this printer as your default. Then use Configuration Manager to connect “Apple LaserWriter II NTX on LPT1” to the “speedy” printer. When you print within an application, the application sends the job to LPT1, and the Wabi program redirects the print job to “speedy.”

Connecting the UNIX Default Printer to the Wabi Default Printer

You may find it convenient to use the same default printer for both your UNIX and Wabi print jobs. The Wabi program is set up this way initially. If you have changed your print setup, do the following to assign both defaults to the same physical printer:

- Assign a system default printer using your operating system's print management methods (UNIX commands or utilities).
- Use Configuration Manager to connect LPT1 to <DefaultPrinter>.
- Use Control Panel to connect a printer to LPT1 and set the printer as your Wabi default printer.

Printing to a File

You can set up a Wabi printer so that all print requests that are sent to the printer go to a file on disk instead of being printed. To do this, you can connect the Wabi printer to the FILE "port" instead of an LPT port. Use the Control Panel to do this.

You will be prompted for a file name whenever you print to this printer from an application.

Some applications allow you to print a single print job to a file using a Print Setup option within the application's menus. If your application has this option and you only occasionally print to a file, it may not be necessary to set up a printer in this way.

Printing Directly to a Serial Printer

Within the UNIX environment, you can configure a serial printer so that you can send print requests through the UNIX print system. You can print from the Wabi environment to a serial printer configured in the UNIX print system, just as with any other printer configured in the operating system — through a Wabi LPT port connected to the UNIX printer.

See “Connecting a COM Port to a Serial Device Name” on page 110 for the steps required to connect a COM port to a UNIX serial device.

However, if you have connected a serial printer to a serial port on your UNIX system, you can also print directly to the printer through the Wabi program. To do this, first use Configuration Manager to make sure a Wabi COM port is connected to the serial device that controls the UNIX serial port. Then use the Control Panel to connect an appropriate printer driver to the COM port.

The printer’s documentation should tell you what to use for COM port settings such as baud rate, flow control, stop bits, etc. You should configure the port through the Control Panel’s Ports dialog boxes.

Printing directly to a serial port generally is not recommended because it bypasses the UNIX print spooling system. This means you cannot use your usual print control commands or utilities to cancel or pause the print request. Also, printing directly to a printer is no faster than printing through the operating system’s print system, and you must wait for the print job to finish before continuing to work in the Wabi program.



If you have a serial printer connected to your system and want to use it through WabiServer, the system administrator must allow users access to local printers.

Instructions for Tasks Related to Printing

This section provides detailed, step-by-step instructions for performing a variety of tasks related to setting up the Wabi program for printing.

Note – For information about tasks related to a specific printer driver, refer to the on-line Help provided in the driver’s Setup dialog box.

▼ Installing Printer Drivers for PostScript, Epson, or HP LaserJet III Printers

- 1. Open the Control Panel.**
- 2. Open the Printers icon.**
The Printers dialog box opens.
- 3. Choose the Add button.**
The dialog box expands to include the List of Printers and an Install button.

Refer to page 91 for information about using other PostScript, Epson, and HP LaserJet printers.

4. Select a printer driver appearing in the List of Printers.

You must choose either a PostScript printer model, or an HP LaserJet or Epson model that includes Wabi in the name. The Wabi HP LaserJet and Epson drivers are at the top of the list of printers, and are not listed alphabetically with the Windows printer drivers.

5. Choose Install.

If you chose a Wabi HP LaserJet III or Wabi Epson driver, the printer is displayed in the list of Installed Printers immediately, and you can close the dialog box.

If you chose a PostScript driver, such as TI microLaser PS17, the Install Driver dialog tells you to insert the diskette containing a file needed for the printer.

6. Insert the requested diskette and choose OK.

If your Microsoft Windows files are on a network drive, use the Browse button to locate the requested file, and choose OK.

When installation is complete, the printer is displayed in the list of Installed Printers.

7. Choose Close to exit the dialog box.

▼ Defining the Wabi Default Printer

“Changing the Wabi Default Printer” on page 93 discusses the default printer.

1. Open the Control Panel.

2. Open the Printers icon.

Alternatively, open the Settings menu and choose Printers or press Alt, s, p.

The Printers dialog box opens.

3. Select a driver/port combination in the Installed Printers list.

The item is highlighted.

4. Choose the Set As Default Printer button.

The selected driver/port combination is assigned as the default, and is displayed in the Default Printer panel.

5. Choose Close to save your selection and exit the dialog box.

Alternatively, choose Cancel to close the dialog box without making changes.

▼ Connecting a Wabi Printer Port to a UNIX Printer

- 1. Open the Control Panel.**
- 2. Open the Wabi Config icon.**
Configuration Manager opens.
- 3. Open the Ports icon.**
Alternatively, open the Options menu and choose Ports or press Alt, s, p.

The Port Selection dialog box opens.
- 4. Select the LPT port you want to connect.**
The port is highlighted.
- 5. Choose the Connect button.**
The Printer Output Connections dialog box opens.
- 6. In the Assign Connection panel, open the Native Printer Name list and select a printer name.**
The name is highlighted.

Select <DefaultPrinter> if you want to connect to your operating system's default printer.

See "Configuration Manager's Printer Output Connections Dialog Box" on page 88 for information about this dialog.

Note – You must designate a default printer at the operating system level before you can use <DefaultPrinter>.

- 7. In the Assign Connection panel, open the Native Print Command list and select a printer command.**
The command is highlighted.

Alternatively, select the entry field and type in a different print command.

If you make no selection, the default print command is used.
- 8. Choose OK.**
The printer name and command you selected are assigned to the Wabi printer and port. The Printer Output Connections dialog box closes.
- 9. Choose Close in the Port Selection dialog box.**
The Port Selection dialog box closes.

▼ Restoring Printer Name and Command Defaults

- 1. Open the Control Panel.**
- 2. Open the Wabi Config icon.**
Configuration Manager opens.
- 3. Open the Ports icon.**
Alternatively, open the Options menu and choose Ports or press Alt, s, p.

The Port Selection dialog box opens.
- 4. Select the LPT port you want to reset to the default values.**
The port is highlighted.
- 5. Choose the Connect button.**
The Printer Output Connections dialog box opens.
- 6. Choose the Defaults button.**
Default Native Printer Name and Native Print Command entries replace existing settings.
- 7. Choose OK to save your selection.**
Alternatively, choose Cancel to exit the dialog box without making changes.

See "Configuration Manager's Printer Output Connections Dialog Box" on page 88 for a description of the dialog box.

Reference Material for Printing

This section provides reference material for tasks related to printing.

Troubleshooting Problems With Printing

Table 5-1 suggests solutions to problems you might experience when working with printers.

Table 5-1 Printing Problems and Solutions

Symptom	Possible Cause	Solution
Can't print	Invalid native printer name or print command.	Make sure you can print to the same printer outside Wabi, using a UNIX print command such as <code>lp</code> or <code>lpr</code> . If you can print in UNIX, try resetting Wabi's printer connection (the UNIX printer name and command) to the default value. See "Restoring Printer Name and Command Defaults" on page 98 for instructions. If you cannot print using these defaults, the problem is probably outside Wabi.
	Printer not configured correctly in operating system.	If the printer is not configured correctly, you cannot print outside Wabi with a UNIX print command. If this is the case, see your system administrator or your UNIX system documentation for help in configuring the printer.
	Printer port connected to wrong printer.	Check the Printer Output Connections to make sure the port is connected to the UNIX printer you want to print on. See page 97 for more information.

Table 5-1 Printing Problems and Solutions (Continued)

Symptom	Possible Cause	Solution
Can't print large graphics files.	Out of space in /tmp.	<p>The /tmp directory could become filled with temporary printing files if it does not have enough free space, so you may have to increase the space allotted /tmp. On some systems, the /tmp directory is simulated inside the system's swap space rather than existing as separate disk space. To find out if your system uses disk or swap space for /tmp, enter the command:</p> <pre>df -k /tmp</pre> <p>If the first word on the output line is swap, the /tmp directory is simulated in swap space. You can increase the space allocated to /tmp by increasing your system's swap space. See your operating system documentation for the procedure to do this.</p>
Desired Windows printer driver not listed in List of Printers.	Printer not officially supported.	<p>If the printer is PostScript, you should be able to use one of the listed printer drivers. The printer's documentation may list other drivers you can use, or tell you what printer is emulated. If it doesn't, contact the printer vendor, who might suggest other drivers to use.</p> <p>You might also contact Adobe Systems, Inc. (the developer of PostScript) for advice, or customer support from your UNIX vendor.</p> <p>If the printer is <i>not</i> PostScript, Epson, HP LaserJet III, or a text-only printer, you cannot use it with Wabi.</p>

Table 5-1 Printing Problems and Solutions (*Continued*)

Symptom	Possible Cause	Solution
Desired UNIX printer not listed in the Native Printer Name list.	Printer not configured in operating system.	See your system administrator or your UNIX system documentation for help in setting up a printer in the operating system.
	If you are running WabiServer, you may not have access to printers on the server or local printers.	See your system administrator.

Using Wabi COM Ports

6

This chapter discusses working with Wabi COM ports, or serial ports. A serial port provides a way to connect your computer to an external device, such as a printer or a modem.

If you are not familiar with Wabi COM ports and would like to learn more about them, read the next section, “About Wabi COM Ports.”

If you want to go directly to instructions for specific tasks related to ports, use the following table to locate the instructions you need.

Task	Page
<i>Changing COM Port Settings</i>	<i>110</i>
<i>Connecting a COM Port to a Serial Device Name</i>	<i>110</i>
<i>Resetting a COM Port Connection to the Default</i>	<i>111</i>
<i>Entering an Alternate COM Device Directory</i>	<i>111</i>
<i>Entering an Alternate COM Device File Pattern</i>	<i>112</i>
<i>Restoring Advanced COM Port Options Defaults</i>	<i>113</i>

About Wabi COM Ports

A COM port is a gateway through which you access the world beyond the Wabi program. For example, you can use a port to connect the Wabi program to an information service located in a distant city, or to a local serial printer. Wabi COM ports connect to a serial device in your native operating system. A serial device is an operating system resource that enables your computer to interact with physically-connected devices such as modems and serial printers. There are four Wabi COM ports available: COM1, COM2, COM3, and COM4. (Your computer probably supports fewer than four COM ports.)



When you use Wabi remotely, you have access only to the WabiServer system's COM ports. You cannot use the COM ports of your local computer.

Note – LPT ports provide a way for you to connect to a system printer. Chapter 5, “Printing,” discusses the use of LPT ports and explains how to connect them to printers in your operating system.

COM Port Configuration

Before you can use a COM port, you must be able to access serial devices located in your native operating system. Your operating system documentation contains instructions for accessing devices. Once you have access to a serial device in your native operating system, you can configure a Wabi COM port to access the device.

Note – If a COM port is being used by a native operating system program, the port is not available for use by the Wabi program. This could occur if your mouse connects through COM1 or if you connect your computer to a remote system using the UNIX `TIP` command.

Configuring a COM port is a two-part process:

- Specify COM port settings through the Control Panel
- Connect the COM port to an operating system serial device through Configuration Manager

COM Port Settings in Control Panel

You'll find the default COM port settings appropriate for most serial communications situations. When using a COM port, try the default settings first. If these settings do not work, change them as necessary to establish and maintain communication. The default settings are:

Baud Rate: 9600
Data Bits: 8
Parity: None
Stop Bits: 1
Flow Control: Xon/Xoff

You might have to change a COM port setting if you connect to an information service through a modem. The baud rate setting of the COM port must match the baud rate (speed) at which the service operates. For example, this might require you to change the baud rate from 9600 baud to 2400 baud.

Note that many applications automatically adjust COM port settings by determining the settings required and overriding the current COM port settings.

For the steps required to make or change port settings, see "Changing COM Port Settings" on page 110.

You change COM port settings through the Control Panel in the Settings for COMx dialog box, shown in Figure 6-1. You access this dialog box by opening the Ports icon and selecting a COM port in the Ports dialog box.



WabiServer users can also change COM port settings in Control Panel; the settings affect use of the WabiServer system's serial port because that is the system on which Wabi is running.

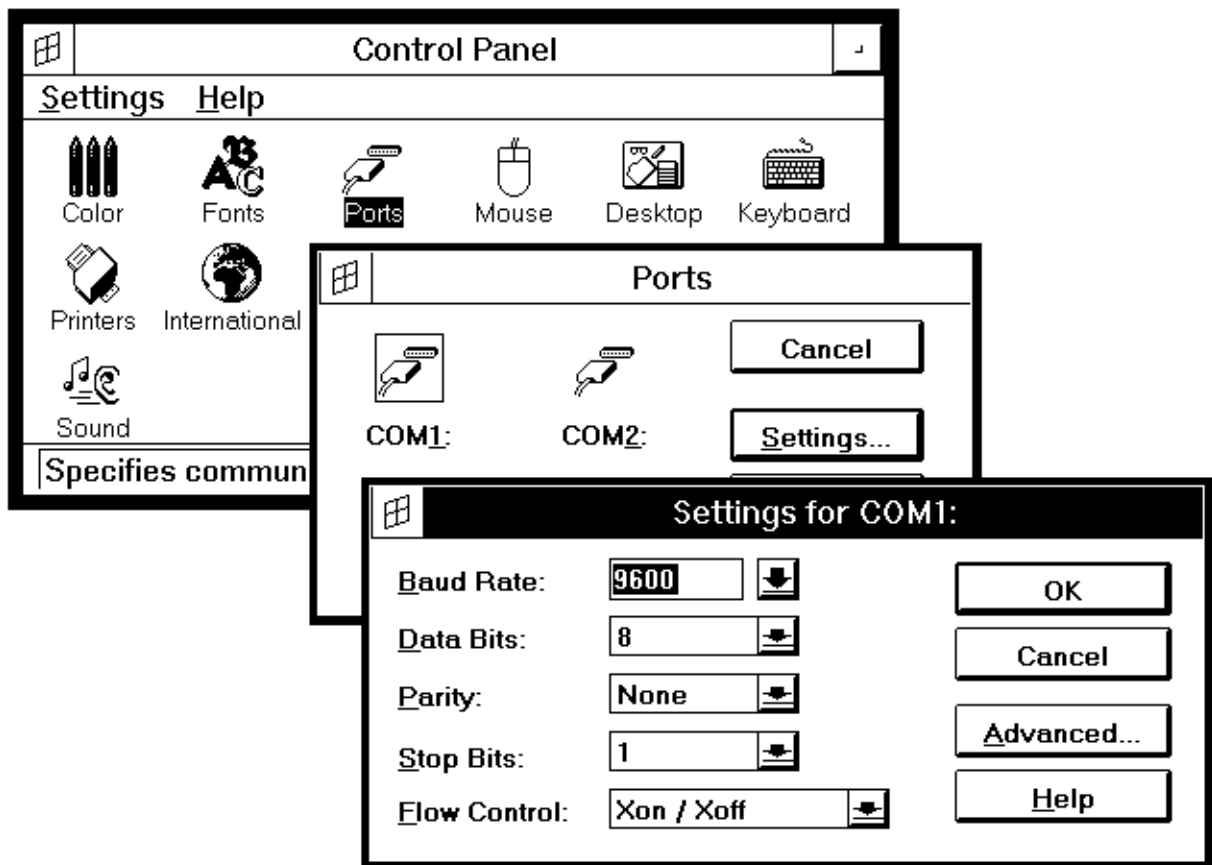


Figure 6-1 Control Panel's Port Settings

You change COM port settings in the Wabi environment the same way you would in the Microsoft Windows environment. The Settings for COMx dialog box works as it does in Microsoft Windows, with the following exceptions:

- Hardware flow control is not supported. You should select either None or Xon/Xoff flow control.
- The Advanced Settings, which you open when you choose the Advanced button, have no meaning in the Wabi environment. The Base I/O Port Address and Interrupt Request Line (IRQ) are controlled by the operating system.

COM Port Connections

To make a COM port connection, see “Connecting a COM Port to a Serial Device Name” on page 110.



The serial communications ports COM1 through COM4 connect to serial device drivers located in your native operating system. You decide which port to connect to which operating system device.

WabiServer users cannot change this connection because it is controlled by the system administrator.

Use the COM Port Connections dialog box, shown in Figure 6-2, to make or change a COM port connection. To access this dialog box, open Configuration Manager's Ports icon, select a port, and choose Connect.

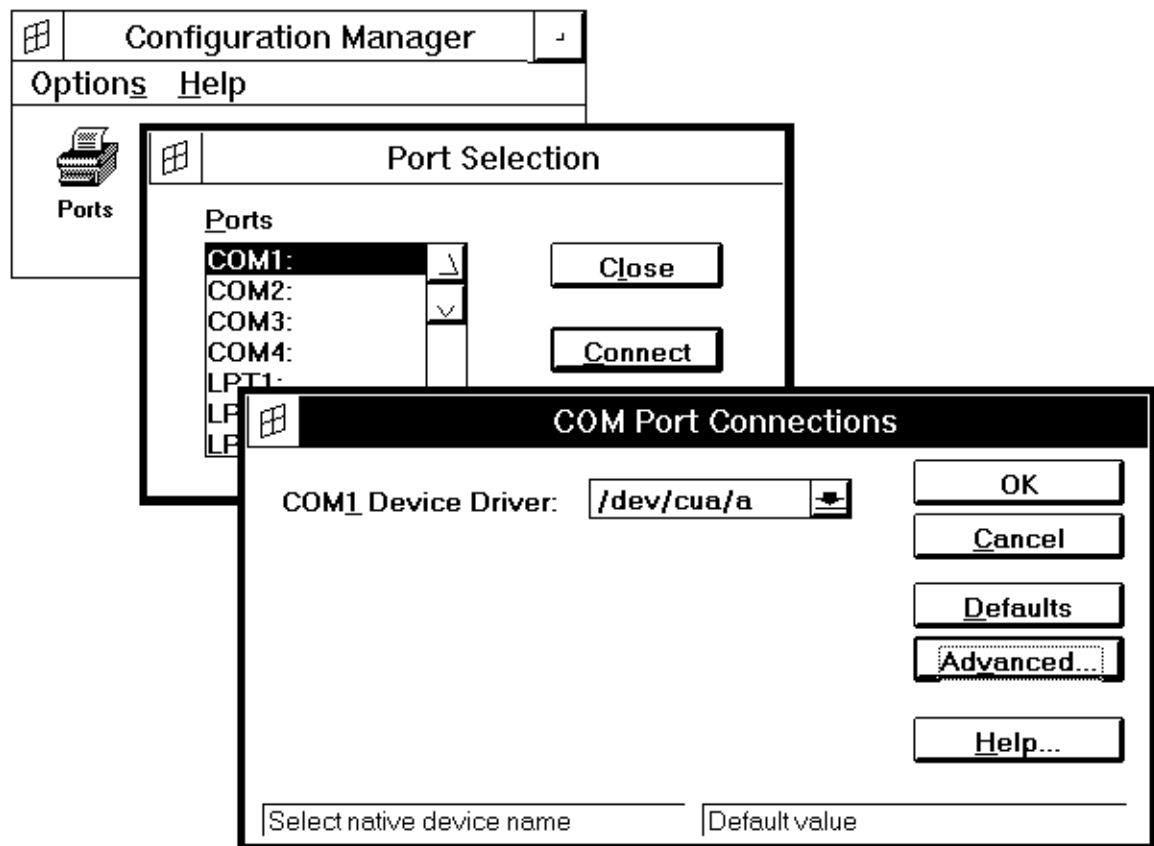


Figure 6-2 COM Port Connections Dialog Box

The Wabi program supplies a default COM Device Driver name for each COM port. You can change this default by selecting another name from the COM Device Driver list. This list displays the available device drivers for the port selected in the Port Selection dialog box. Open the COM Device Driver list to view the device driver names. You change a COM port's connection by selecting a device driver name in the list.

Advanced COM Port Options

The Wabi program searches for serial device directories and files based on default locations and file-naming patterns. In most cases, these defaults match the directories and naming patterns used by your operating system. In some cases, they may not.

For example, if you rename a serial device using a nonstandard naming convention, the Wabi program will not be aware of the naming convention. If you relocate a serial device to a directory not normally used to store it, the Wabi program will not know where to look for the device file.

When these situations occur, you must tell the Wabi program the directories to search and the naming patterns to recognize when searching for serial device drivers. Think of these entries as “search templates” that are used whenever a device driver is called for.

You use the Advanced COM Port Options dialog box, shown in Figure 6-3, to provide the Wabi program with the information it needs to find and use serial devices named or located in a nonstandard manner. You access this dialog box by choosing the Advanced button in the COM Port Connections dialog box.

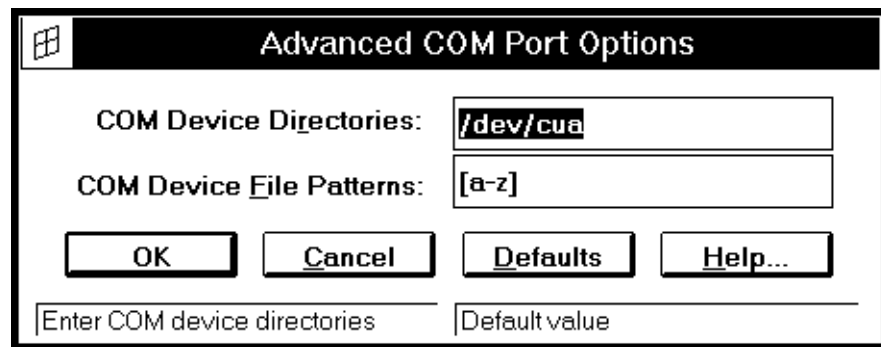


Figure 6-3 Advanced COM Port Options Dialog Box

You enter two pieces of information in this dialog box:

See “Entering an Alternate COM Device Directory” on page 111 for the procedure to change the device directory.

See “Entering an Alternate COM Device File Pattern” on page 112 for the procedure to change the device file pattern.

- **COM Device Directories** – This is the list of directories in the native operating system that the Wabi program searches for serial device drivers. You can include more than one directory in the list, provided you use commas to separate directory names. Do not include spaces.
- **COM Device File Patterns** – This is the serial device driver file-naming pattern used. You can include more than one file pattern in the list, provided you use commas to separate the patterns. Do not include spaces.

Wildcard characters are allowed in file pattern entries. An asterisk (*) can replace a group of characters, and a question mark (?) can replace a single character. You can indicate a range of possible values for a single character by using brackets. For example, you can use [0–9] to match a value from 0 through 9, or [b–g] to match a value from b through g. If you enter the pattern `tty[a-z]*`, the Wabi program finds file names such as `ttya`, `ttyb20`, or `ttyzxt23`, if they exist in the device directories.

COM Ports and Printing

See “Printing Directly to a Serial Printer” on page 94 for more information about printing to a serial printer.

The Wabi program allows you to print to a COM port as well as to an LPT port. When you print to a COM port, you bypass your native operating system’s print facility. This allows you to access a printer directly, rather than through the operating system’s print spooler. Your printer must be physically connected to your workstation’s serial communications port. In general, it’s best to use an LPT port for printing.

Instructions for Tasks Related to COM Ports

This section provides detailed, step-by-step instructions for performing a variety of tasks related to serial ports.

▼ Changing COM Port Settings

See “COM Port Settings in Control Panel” on page 105 for a picture of the dialog box, and a list of the default settings.

- 1. Open the Control Panel.**
- 2. Open the Ports icon.**
The Ports dialog opens.
- 3. Select a COM port and choose Settings.**
The Settings for COMx: dialog opens.
- 4. Open the drop-down list of each setting you want to change and select an item from the list.**
- 5. Choose OK to save your choices.**
The settings you’ve specified apply to the selected port.

Alternatively, choose Cancel to exit the dialog box without changing settings.

▼ Connecting a COM Port to a Serial Device Name

For information about COM port connections to serial devices, read “COM Port Connections” on page 107.

- 1. Open the Control Panel.**
- 2. Open the Wabi Config icon.**
Configuration Manager opens.
- 3. Open the Ports icon.**
The Port Selection dialog box opens.
- 4. Select a COM port.**
The port is highlighted.
- 5. Choose the Connect button.**
The COM Port Connections dialog box opens.
- 6. Open the drop-down list.**
A list of available serial devices for the selected port appears.

7. Select a device name.

8. Choose OK to save your change.

The selected device is connected to the port.

Alternatively, choose Cancel to exit the dialog box without changing settings.

▼ **Resetting a COM Port Connection to the Default**

1. Open the Control Panel.

2. Open the Wabi Config icon.

Configuration Manager opens.

3. Open the Ports icon.

The Port Selection dialog box opens.

4. Select a COM port.

The port is highlighted.

5. Choose the Connect button.

The COM Port Connections dialog box opens.

6. Choose the Defaults button.

The default connection is restored for the port.

7. Choose OK to save your change.

Alternatively, choose Cancel to exit the dialog box without changing settings.

▼ **Entering an Alternate COM Device Directory**

1. Open the Control Panel.

2. Open the Wabi Config icon.

Configuration Manager opens.

3. Open the Ports icon.

Alternatively, select Ports from the Options menu or press Alt, s, p.

The Port Settings dialog box opens.

For information about using an alternate COM devices path, read "Advanced COM Port Options" on page 108.

4. Choose the Connect button.

The COM Port Connections dialog box opens.

5. Choose the Advanced button.

The Advanced COM Port Options dialog box opens.

6. Select the COM Device Directories edit box and type the directory or directories in which COM devices are located.

Separate multiple entries with commas; do not include spaces.

7. Choose OK to save your entry.

Alternatively, choose Cancel to exit the dialog box without changing settings.

When you choose OK, the Wabi program validates your entry. If the entry is correct and all directories are valid, these directories are searched each time you assign a device to a COM Port.

An error message is displayed if you enter an invalid directory. Follow the directions in the error message to clear the error condition, then enter a valid COM device driver directory. If you need more help clearing the error condition, choose the Help button in the error message dialog box.

▼ Entering an Alternate COM Device File Pattern

1. Open the Control Panel.

2. Open the Wabi Config icon.

Configuration Manager opens.

3. Open the Ports icon.

Alternatively, choose Ports from the Options menu or press Alt, s, p.

The Port Settings dialog box opens.

4. Choose the Connect button.

The COM Port Connections dialog box opens.

5. Choose the Advanced button.

The Advanced COM Port Options dialog box opens.

6. Select the COM Device File Patterns edit box and type one or more file patterns (naming conventions).

Separate multiple patterns with commas; do not include space characters.

“Advanced COM Port Options” on page 108 provides details on using alternate COM device file patterns.

7. Choose OK to save your entry.

Alternatively, choose Cancel to exit the dialog box without changing settings.

When you choose OK, the Wabi program validates your entry. If the entry is valid, the Wabi program searches for serial device files using the file-naming patterns you entered.

An error message is displayed if your entry contains an invalid device file pattern. Follow the instructions in the error message to clear the error condition and then enter a valid serial device file pattern. If you need more help clearing the error condition, choose the Help button in the error message dialog box.

▼ Restoring Advanced COM Port Options Defaults**1. Open the Control Panel.****2. Open the Wabi Config icon.**

Configuration Manager opens.

3. Open the Ports icon.

Alternatively, choose Ports from the Options menu or press Alt, s, p.

The Port Settings dialog box opens.

4. Choose the Connect button.

The COM Port Connections dialog box opens.

5. Choose the Advanced button.

The Advanced COM Port Options dialog box opens.

6. Choose the Defaults button.

Default device directory and file pattern settings are restored.

7. Choose OK.

Your change is saved.

Reference Material for Tasks Related to COM Ports

This section provides reference material for various tasks related to configuring and using Wabi COM ports.

Troubleshooting Problems With COM Ports

You may encounter problems when attempting to use a port. Table 6-1 suggests solutions to problems you might experience when working with COM ports.

Table 6-1 Port Problems and Solutions

Symptom	Probable Cause	Solution
Can't assign COM1, device busy	Serial port is being used by another device, such as a mouse or terminal, or by a UNIX TIP connection.	Try using a different COM port, if you have one that is not in use.
Can't access COM2	Serial port not configured at operating system level.	See your operating system documentation for information about configuring serial ports.
	Insufficient permissions on serial device file.	Use the command <code>chmod 666 device</code> to set the permissions so that all users have read and write permission to the device.
Can't connect COM port to serial device	Inadequate permissions to device file or directory.	You must have read and write access to your UNIX system's device files and directories. Change permissions in the operating system using the <code>chmod</code> command.
No devices appear in COM Port Connections device driver list	Invalid device directories or file patterns.	Locate the device files in your operating system. Make sure the COM device directories and COM device file patterns that Wabi uses to find COM devices are set correctly. See page 108 for more information.

This chapter discusses various issues for using Wabi internationally.

The Wabi program can be adapted for international use at several levels in the UNIX environment, and in the Microsoft Windows environment.

If you want to learn more about how the Wabi program uses international settings, read “About Using Wabi Internationally” on page 116. If you want to learn more about how Wabi uses the Control Panel’s international settings, read the section, “Control Panel’s International Settings” on page 117.

If you want instructions for specific tasks related to international settings, use the following table to locate the instructions you need.

Task	Page
<i>Setting the LANG Environment Variable</i>	120
<i>Setting the WABI_KEYB Environment Variable</i>	120
<i>Setting the WABI_CODEPAGE Environment Variable</i>	121
<i>Changing International Settings</i>	122

About Using Wabi Internationally

Because the Wabi environment consists of programs, libraries, and files from the UNIX world, and the Microsoft Windows world, it is affected on several levels by the international settings of both those environments. In UNIX, you can set environment variables. In Microsoft Windows, you can install localized Windows versions, and change International options in Control Panel.

UNIX Environment Variables

On the UNIX side, the Wabi program can be localized through environment variables: `LANG`, `WABI_KEYB`, and `WABI_CODEPAGE`. The `LANG` variable affects your entire X Window desktop, while the `WABI_KEYB` and `WABI_CODEPAGE` variables affect only the Wabi program.



The WabiServer system administrator can set these variables on the server for all WabiServer users. See the *WabiServer Administrator's Guide* for more information. WabiServer users can also set these variables before starting remote Wabi. The user's settings will take precedence over the WabiServer system's settings for these variables.

The `LANG` Variable

If your version of the UNIX operating system contains international language libraries, you can use the UNIX environment variable `LANG` to enable the Wabi program to use a particular language, or *locale*, as it is called in the UNIX world. International versions of the Wabi program will use the locale to determine which language to use to display Wabi error and status messages, Wabi on-line help, and Wabi graphical user interface components, such as the Configuration Manager.

The procedure for setting these variables is on page 120.

Table 7-1 on page 122 lists the locales you can use to set the `LANG` and `WABI_KEYB` variables.

The `WABI_KEYB` Variable

The `LANG` environment variable also sets the keyboard to the locale you specify. The Wabi program supports the `WABI_KEYB` variable to let you specify a keyboard that is different from that specified by the `LANG` variable. The `WABI_KEYB` variable overrides the keyboard specified by the `LANG` variable, but only for the Wabi environment and applications running within it.

The `LANG` and `WABI_KEYB` variables use a two-letter or four-letter abbreviation to identify the locale. Table 7-1 on page 122 lists the locale abbreviations.

The `WABI_CODEPAGE` Variable

The procedure for setting this variable is on page 121.

Table 7-2 on page 123 lists the code pages and the country in which they are commonly used.

The `WABI_CODEPAGE` variable lets you specify which code page Wabi should use for OEM character translation. Microsoft Windows uses the code page set in DOS. Since DOS is not used in the Wabi environment, the Wabi program uses 437 by default. If you want to use a different code page, specify the code page with this environment variable. Possible values are: 437, 850, 860, 861, 863, and 865.

Localized Microsoft Windows Versions

Most of the text you see when you run the Wabi program is provided by Microsoft Windows; the amount of user interface text provided by Wabi software is quite small by comparison. You can install one of several different language versions of Microsoft Windows into your Wabi environment, and this is what determines the language of most of the user interface.

Before you install a localized version of Microsoft Windows, you must first set your `LANG` variable in your UNIX environment to the language of the Windows version you want to install. Do this before starting the Wabi program. In international versions of Wabi software, the Wabi Windows Install program will use the `LANG` setting of the system on which it is running to determine the language to display in its user interface.



When you run remote Wabi through WabiServer, the language of the interface is determined by the language version of Microsoft Windows installed in the prototype you select.

Control Panel's International Settings

Applications running in the Wabi program use the international options set in your `win.ini` file. You can customize these international conventions to your preferences using the Microsoft Windows Control Panel's International dialog box. Some applications have their own menus or commands for setting some formats. An application's settings take precedence over the Control Panel settings.

You use the International dialog box shown in Figure 7-1 to change international settings.

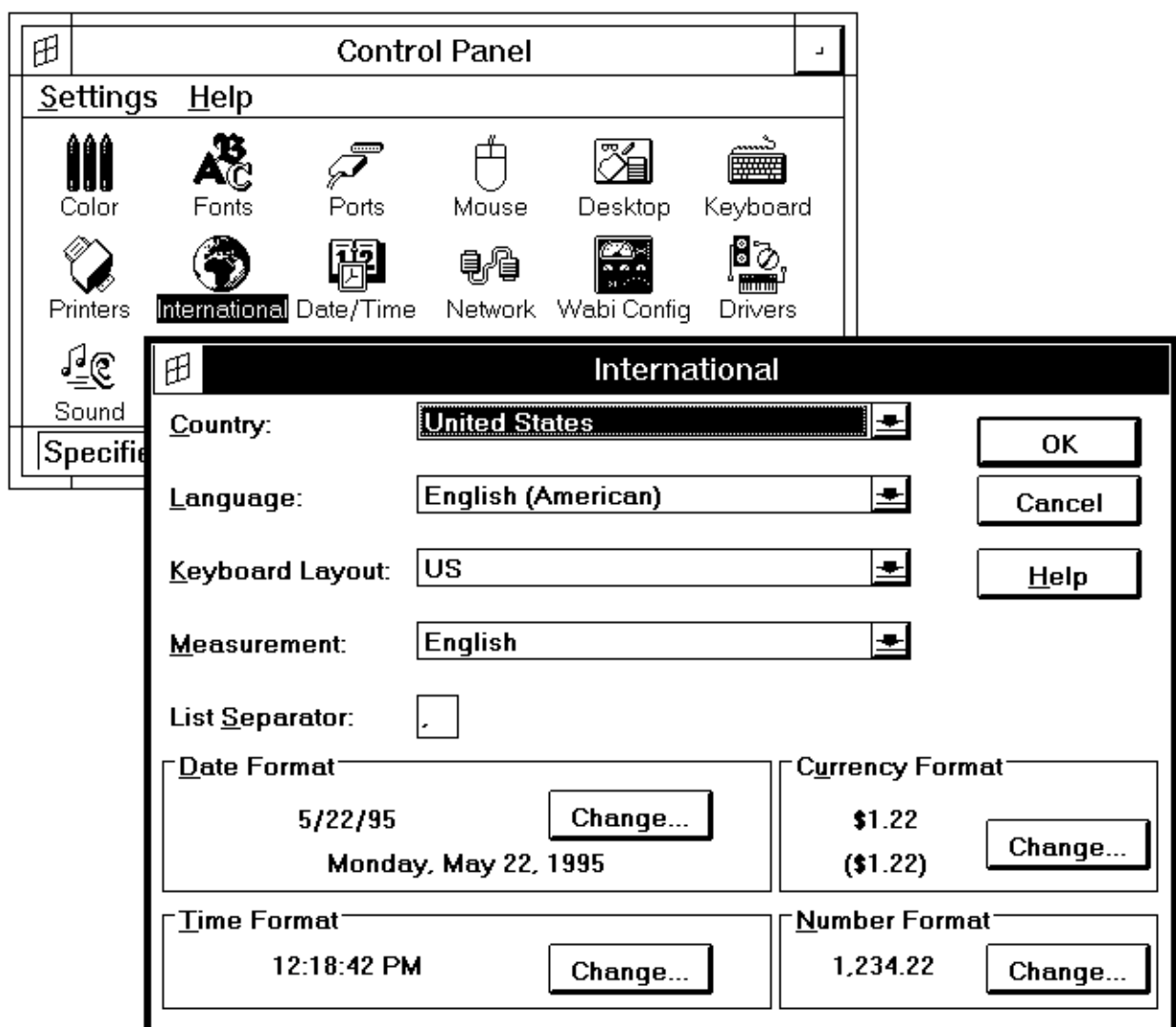


Figure 7-1 Control Panel's International Dialog Box

The International options are used by applications, not by the Wabi program itself. The International dialog box works as it does in the Microsoft Windows environment, except for the Keyboard Layout setting, which Wabi ignores in favor of the `WABI_KEYB` variable. Briefly, the International settings are:

- *Country* — sets the Date, Time, Currency, and Number Formats to the values normally used in the selected country.
- *Language* — used by applications to determine how to sort characters.
- *Keyboard Layout* — Microsoft Windows uses this setting to determine how to interpret your keystrokes on keyboards designed for various languages. In the Wabi environment, the `WABI_KEYB` variable performs this function, so this setting has no affect.
- *Measurement* — specifies English or metric measurement.
- *List Separator* — specifies the character used between list items.
- *Date* — the format used in applications using these formats.
 - Time*
 - Currency*
 - Number*

Compose Key Sequences

The Wabi program supports Compose key sequences. If your keyboard provides a Compose key, you can use it to produce special characters. See your keyboard documentation for details about using the Compose key to make special characters.

Instructions for Tasks Related to International Settings

This section provides detailed, step-by-step instructions for performing a variety of tasks related to international settings for your Wabi environment.

▼ Setting the LANG Environment Variable

1. At the operating system prompt, enter one of the following commands before starting your X Window desktop:

In the C shell:

```
setenv LANG locale
```

In the Bourne or Korn shell:

```
LANG=locale;export LANG
```

For example, to specify French as the locale/keyboard type, enter one of the following commands:

In the C shell:

```
setenv LANG fr
```

In the Bourne or Korn shell:

```
LANG=fr;export LANG
```

2. Start your X Window desktop.

▼ Setting the WABI_KEYB Environment Variable

1. At the operating system prompt, enter one of the following commands before starting the Wabi program:

In the C shell:

```
setenv WABI_KEYB locale
```

In the Bourne or Korn shell:

```
WABI_KEYB=locale;export WABI_KEYB
```

For example, to specify French as the locale for the keyboard in the Wabi program, enter one of the following commands:

In the C shell:

```
setenv WABI_KEYB fr
```

Table 7-1 on page 122 lists the locales you can use to set the LANG and WABI_KEYB variables.

“About Using Wabi Internationally” on page 116 explains why you might set these variables.

In the Bourne or Korn shell:

```
WABI_KEYB=fr;export WABI_KEYB
```

Or, to set the environment variable statements required to establish French international settings with an English-language (U.S.) keyboard, enter the following at the command line:

In the C shell:

```
setenv LANG fr
setenv WABI_KEYB C
```

In the Bourne or Korn shell:

```
LANG=fr;export LANG
WABI_KEYB=C;export WABI_KEYB
```

2. Start the Wabi program.

▼ Setting the WABI_CODEPAGE Environment Variable

1. At the operating system prompt, enter one of the following commands before starting the Wabi programs:

In the C shell:

```
setenv WABI_CODEPAGE nnn
```

In the Bourne or Korn shell:

```
WABI_CODEPAGE=nnn;export WABI_CODEPAGE
```

For example, to specify the 850 code page, enter one of the following commands:

In the C shell:

```
setenv WABI_CODEPAGE 850
```

In the Bourne or Korn shell:

```
WABI_CODEPAGE=850;export WABI_CODEPAGE
```

2. Start the Wabi program.

Table 7-2 on page 123 lists the code pages you can use.

▼ Changing International Settings

Read “Control Panel’s International Settings” on page 117 for more information about International settings.

1. Open the Control Panel.

2. Open the International icon.

The International dialog box opens.

3. Change the settings you want.

4. Choose OK.

The International dialog box closes.

Alternatively, choose Cancel to remove any changes you made in the dialog.

Reference Material for International Settings

This section provides reference material for tasks related to international settings.

Locales For LANG and WABI_KEYB Variables

See page 120 for the procedures to set these variables.

Table 7-1 lists the locale names available for use with the LANG and WABI_KEYB variables and the languages and regions these variables represent. It also includes the equivalent DOS keyboard variables.

Table 7-1 Locales Used for Environment Variables

Language – Country	Locale	Equivalent DOS Variable
English – United States	en_US or C	KEYB_us
English – United Kingdom	en_UK	KEYB_uk
Danish – Denmark	da	KEYB_dk
Dutch – Netherlands	nl	KEYB_nl
Finnish – Finland	fi	KEYB_su
French – Belgium	fr_BE	KEYB_be
French – Canada	fr_CA	KEYB_cf
French – France	fr	KEYB_fr
French – Switzerland	fr_CH	KEYB_sf

Table 7-1 Locales Used for Environment Variables (Continued)

Language – Country	Locale	Equivalent DOS Variable
Spanish - Latin America	es_LA	KEYB_la
Spanish – Spain	es	KEYB_sp
German – Germany	de	KEYB_gr
German – Switzerland	de_CH	KEYB_sg
Italian – Italy	it	KEYB_it
Norwegian – Norway	no	KEYB_no
Portuguese – Portugal	pt	KEYB_po
Swedish – Sweden	sv	KEYB_sv

Code Pages for the WABI_CODEPAGE Environment Variable

“Setting the WABI_CODEPAGE Environment Variable” on page 121 tells how to set the variables.

Table 7-2 lists the valid code pages you can use with the WABI_CODEPAGE variable to change the OEM character translation table used in the Wabi environment. It also lists some of the countries in which the code pages are commonly used.

Table 7-2 Code Pages

Code Page	Countries
437	United States
850	Western Europe
860	Portugal
861	Iceland
863	Canada
865	Denmark

The Wabi program gives Microsoft Windows applications access to your computer's network capabilities and provides some PC network interface support. This chapter explains Wabi network support.

About Wabi Networking

The Wabi program provides a networked environment in ways that combine UNIX networking and PC networking. A computer running UNIX is very likely connected to a TCP/IP network, and probably uses distributed file system software, which allows the computer to access directories on remote computers as if those directories were on a local hard drive. A personal computer running DOS and Microsoft Windows is often connected to a PC network, through one of several PC network products using one of several networking interfaces. The Wabi program uses the TCP/IP network and a distributed file system to provide some of the services of a PC network, such as shared file systems and devices. The Wabi program also supports the Windows Sockets networking interface to allow certified applications, such as Lotus Notes, to communicate through the network directly.

The Invisible UNIX Network

The Wabi program makes abundant use of the UNIX host's TCP/IP network and distributed file system capabilities, but this is mostly transparent to the applications running in Wabi. The printers and drives that you connect through Configuration Manager are often residing on the network. To an

See page 75 for the steps to set up drives as local or remote.

application, the printer seems locally connected to a port on a PC, but in reality, it may be in another wing of the building, connected to a print server on your network. The Wabi program can make any drive, local or remote in reality, appear to an application as either local or remote. You must determine which type of drive an application needs and set the drive accordingly.

You can connect a Wabi drive to any file system that can be accessed through your UNIX operating system. For example, if you can access a NetWare file system from your operating system, you can access it through a Wabi drive.

Windows Sockets Networking

Windows Sockets is a network interface allowing Microsoft Windows applications to exchange data over a network. Windows Sockets, or Winsock, is based on the sockets interface, a network interface used by most UNIX operating systems, and is tailored for the Microsoft Windows environment. In the Wabi environment, Winsock is internal to the Wabi program, so you won't see a `winsock.dll` in your windows directory.

Applications can make Winsock calls, and Wabi carries them out using TCP/IP. The Wabi program's Winsock capability is always available to applications, and no configuration is necessary. Note that the Wabi program runs only the client version of applications that use Winsock.

The Wabi program is not guaranteed to support every application that uses the Winsock network interface. Only certified applications, such as Lotus Notes, are supported for Winsock. See Chapter 11, "Setting Up Remote Database Access," for information about using supported applications featuring remote database connectivity through Winsock.

Networking for E-Mail Applications

Wabi-certified electronic mail applications do not use a PC network interface to exchange messages. When Microsoft Mail and Lotus cc:Mail clients run in Microsoft Windows, they use a distributed file system provided by PC network software. When they run in the Wabi environment, they use the distributed file system provided by your operating system. Therefore, the Configuration Manager does not present any network options that affect electronic mail programs.

Network-Aware Applications

Some applications that run in the Wabi program, while not actually communicating over the network, are “network-aware.” Such applications take steps to prevent problems caused by multiple users having access to the same files: locking files when open, creating temporary files for each user, storing times in Greenwich Time for accurate time stamps across time zones, and so on. Network-aware applications may need to know if they are using a local or network drive. Chapter 4, “Setting Up Drives,” discusses network drives.

Novell NetWare File Systems

The Wabi program does not support the Novell NetWare API. This means you cannot run a NetWare client to use NetWare’s file and print services directly from the Wabi environment. The Microsoft Windows NetWare client requires DOS-based drivers in order to communicate with the NetWare server.

However, you can set up the NetWare server and your operating system to allow the Wabi program to access files on the NetWare server in the same way it accesses UNIX file systems. You can purchase an add-on NetWare Loadable Module (NLM) from Novell, Inc. to provide name space support on your NetWare server for UNIX’s NFS-based distributed file systems. Once the NLM is loaded, you can add an NFS name space to a NetWare volume so that the UNIX operating system can see the files on the volume. Then, in the Wabi environment, you can map a drive letter to the mount directory in the UNIX file system and see the files.

You can also access files on a NetWare server that does not have the NLM for NFS if your operating system is equipped with IPX/SPX streams drivers and a “netware” file system type. If your system has devices named something like `/dev/ipx` and `/dev/spx`, it has IPX/SPX streams drivers. If your system has either additional parameter values on the `mount` command or an entirely new command for mounting NetWare volumes, it has software that provides a NetWare-type file system.

If your operating system does not provide IPX/SPX streams drivers and a NetWare-type file system capability as part of its core, you may be able to obtain the necessary software as an extension to the operating system, possibly as custom software or from a third party vendor.

Installing Microsoft Windows Applications

9

This chapter discusses using the Wabi program to install Microsoft Windows application programs. You cannot install DOS-based applications using the procedures described here. Chapter 12, “Using a DOS Emulator in the Wabi Environment,” discusses DOS-based applications.



WabiServer administrators should read this chapter and also refer to the *WabiServer Administrator's Guide* for information about installing applications to create prototypes.

If you are not familiar with the installation of software under the Wabi program and would like to learn more about it, read the next section, “About Application Installation.”

If you want instructions for specific tasks related to installing applications, use the following table to locate the instructions you need.

Task	Page
<i>Installing a Windows Application From Diskette</i>	138
<i>Installing a Windows Application From CD-ROM</i>	139
<i>Installing an Application on a Network Server</i>	140
<i>Installing an Application to a Workstation From a Network Server</i>	140
<i>Setting Up Print Tool to Print Files of a Windows Application</i>	141
<i>Printing Windows Application Files in Print Tool</i>	142

About Application Installation

Installing an application requires you to place the application in a directory on your system or on a network file server by using the application's `install` or `setup` program through the Microsoft Windows Program Manager.

Before you install an application, consider these important points:

- You are responsible for adhering to the terms of the software license of each application you use under the Wabi program.
- You should use the Run command in the File menu of Program Manager to install applications (except Microsoft Windows).
- Before you begin installing an application, be sure to read the *Wabi Release Notes* or supplementary guide you received with your version of the Wabi program. It may contain important information about installing particular applications.
- Some application installation windows fill the screen, preventing you from using other windows on your desktop. For this reason, you should plan to be unable to use your system for other work while you install an application. See “Troubleshooting General Application Installation Problems” on page 143 about a possible workaround.
- In general, when running standalone Wabi, you should not install applications in drive C, even if the application provides drive C as the default location for installation. Drive C is connected to `$HOME/wabi`, which contains Wabi program files that should be kept separate from application files. You should use drive C only for files of which users must have their own copy, and for applications that must access a simulated hard drive for their copy protection schemes to work.

“Application Installation on a Network Server” on page 133 discusses special considerations for installing to network locations in order to share an application.

You can install an application in any other location you like. The only limitations are that you must have adequate space in the directory in which you install the application, and you must have permission to write to the directory. If you intend to store the files you create with the application in the same directory as the application, make sure the extra space required for these files is available in the directory.

Installing applications on drives other than C gives you the freedom to move the application to other file systems. If you remap the drive to the new location, the application's setup information, such as the command to run it, will remain valid. For example, if you map drive F to `/home/me/myapps`

and install Microsoft Office in `F:\msoffice`, you could later move `msoffice` to `/files/msapps/msoffice` and remap F to `/files/msapps`. The command path to Microsoft Word, for example, would be `F:\msoffice\winword\windword.exe` for both locations.



WabiServer administrators should install applications on a drive to which all users will have access. This can be accomplished by either installing in drive C, or connecting a Wabi drive to a common location on a file server and installing the applications on that drive. The drive connection will be passed to each user's environment as the environment is created from the prototype.



If you are using WabiServer, you should not install additional applications in drive C. If you install additional applications in drive C and later select a new prototype to create a Wabi directory in the same location, your drive C will be overwritten and you will have to reinstall the additional applications. You should choose a drive other than C to avoid this problem.

- Many installation programs tell you to reboot your computer after installing the application. This is not necessary under the Wabi program. You need only exit and restart the Wabi program.
- The Wabi program may provide integration with your X Window desktop. The degree of integration varies with each UNIX platform. See "Application Integration Into the OpenWindows Environment" on page 135 for more information about integration in the OpenWindows environment.



Caution – The Wabi program does not support Adobe Type Manager® (ATM®) fonts. If your application includes a disk containing Adobe Type Manager or ATM fonts, do not install this disk.

The Run Command

You install applications using the Run command. You'll find this command in Program Manager's File menu. To install an application, open the File menu and choose Run. The Run dialog box opens, as shown in Figure 9-1.

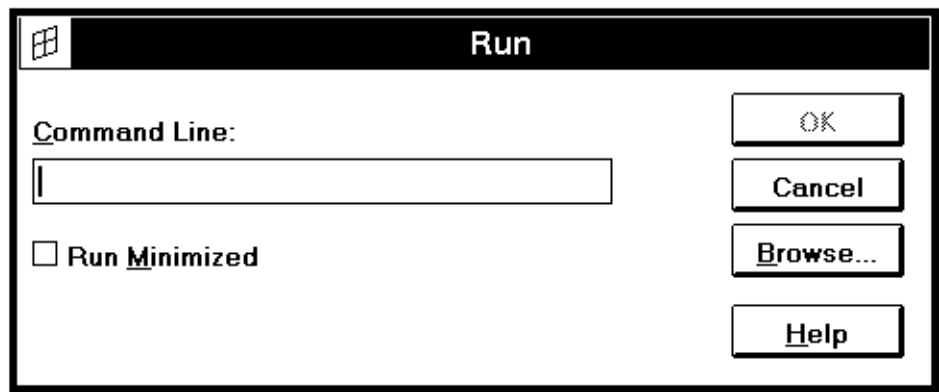


Figure 9-1 Run Dialog Box

The Command Line entry field in the Run dialog box is where you tell the Wabi program the location of the application files, and the name of the application installation program.

The location includes the drive letter, which depends on whether you are installing from diskette, the network, or CD-ROM. It may also include a directory path on the diskette, network, or CD-ROM.

The name of the application's installation program depends on the application you are installing. Many applications use `setup` or `install` as the name of the program that starts the installation process. If the application includes both `setup` and `install` programs, `install` is likely used for DOS systems, and `setup` for Microsoft Windows systems. See the application's documentation for the command to begin installation.

Application Installation From Diskettes

See “Installing a Windows Application From Diskette” on page 138 for step-by-step procedures.

If you are installing an application from diskettes, the drive letter will be A or B, depending on the diskette drive you are using. If there is one diskette drive, it is usually A.

The command that you use to install a typical application from diskette is often:

A:\SETUP

When you type this command in the Run dialog box and choose OK, the Wabi program passes control to the application’s installation program. What you see next depends on the installation program. Follow the instructions presented by the installation program, inserting program disks as required throughout the installation process.

Application Installation from CD-ROM

If you want to install an application from CD-ROM, see “Installing a Windows Application From CD-ROM” on page 139.

If you are installing an application from CD-ROM, you must first make sure the CD-ROM drive is accessible from the operating system. See “CD-ROM Drives” on page 67 for information about using CD-ROM drives in the Wabi program.

When you have assigned a Wabi drive letter to the CD-ROM directory, you can install the application using the Run command in Program Manager, as described in “The Run Command” on page 132.

Application Installation on a Network Server

If you want to install an application on a network server, see “Installing an Application on a Network Server” on page 140.

Because the Wabi program runs in a networked UNIX environment with a distributed file system, it is easy to share applications over the network. You do not need any additional software for file sharing as you would on a PC because your operating system provides that function. You simply connect a Wabi drive to a directory on the network server where you want to install the application, and specify this drive and directory when prompted for the installation location.

Most Wabi-certified applications can be used in both standalone and network environments and provide a way to install to a network file server. The method used for a network installation varies from application to application. Some

installation programs require a switch on the command line, which instructs the installation program to place the files on a network server so that users can then install the application from that location to their own workstations. Other application installation programs offer a server installation option you can select in a dialog box.

Some applications let users run the application from the network server without installing all the application files to their workstations. In this case, the installation program copies the minimum files needed to run the application on to the workstation.

Before you install an application to a shared network location:

- Refer to the application's manuals for specific information about installing on a network. Some applications include on the installation diskettes a Readme file describing network installation.
- Connect a Wabi drive to the network directory, and make sure the Network Drive option is selected on the drive.
- If users will be using the application in a workgroup arrangement (for example, working on shared reports, spreadsheets, and so on), you should probably use file sharing. Look through the application's documentation to see if you should *not* use file sharing. The DOS program `SHARE.EXE` enables file sharing in the Microsoft Windows environment, so look for a discussion about using `SHARE.EXE`. If there are no warnings against using `SHARE.EXE`, select the File Sharing option on the Wabi drive where the shared files are stored.
- Make sure that everyone allowed to install the application has a license to use it. For most applications, this requirement can be fulfilled by purchasing a single-user copy for each user, or by purchasing a "license pack" for multiple users.



Caution – Some Wabi-certified applications are created for single-user, single-tasking, nonprotected environments, and do not function well in a network environment. In addition, sharing may be prohibited by the application's software license agreement. You are responsible for adhering to the terms of the software license of each application you use under the Wabi program.

Application Installation From a Network Server Through a Wabi Drive

Once an application has been installed on a network server, users can install application files to their computers through a Wabi drive.

Note – You are responsible for adhering to the terms of the application's software license. Each user who installs an application, whether from a drive or from diskette, must be licensed to use the software.

If you want to install an application from a network server, see "Installing an Application to a Workstation From a Network Server" on page 140.

The method for installing an application from a Wabi drive is the same as installing from diskette — you use the Run command from the File menu in Program Manager. However, the drive you specify is a Wabi drive through which you access the directory where the application is located.

You can use the preconfigured drive R and specify a complete path name to the directory. You can also use Configuration Manager to connect a different Wabi drive letter to the directory containing the files. In either case, you enter in the Run dialog box (shown in Figure 9-1) the Wabi drive letter and the path to the application files.

For example, if the application files are located in directory path `/usr/apps/install/hg20`, you could enter the following in the entry field of the Run dialog box:

R: `\usr\apps\install\hg20\setup`

You could also assign drive letter F to `/usr/apps/install/hg20` and enter:

F: `\setup`

The type of slash character you use depends on whether a UNIX or a DOS path name is involved. The backslash (\) is used in DOS path names. The forward slash (/) is used in UNIX path names. The Wabi program accepts both types of slash characters, but you should use one type within a command line.

Application Integration Into the OpenWindows Environment

When you install a Microsoft Windows application into your Wabi environment, the Wabi program integrates the application into your OpenWindows environment. This automatic integration lets you double-click on the application's document files in the OpenWindows File Manager and Mail Tool to start the application and open the file. If the Wabi program is not

already running, it starts transparently before it starts the application. If the Wabi program is already running, it simply starts the application and opens the file.

Note – You can drag Windows application document files to your Solaris Print Tool if you set up your desktop as explained in “Setting Up Print Tool to Print Files of a Windows Application” on page 141.

File Manager Integration

After you install an application into the Wabi environment, restart the OpenWindows File Manager. You can then start the application from File Manager by double-clicking the application's icon. You can also double-click the icon of a file created with an application to start the application and open the file.

If you use File Manager's Large Icon View, the icons you see look like the familiar Microsoft Windows icons. However, in OpenWindows, icons can use only two colors, so the icons do not have the same colors as in the Wabi environment. If you use File Manager's Small Icon View, the icons you see are File Manager's small default icons.

Mail Tool Integration

If you restart Mail Tool after you install an application into the Wabi environment, you can double-click attachments in messages to start the application associated with the attachment. For example, if you have installed Microsoft Word in your Wabi environment and you receive a Microsoft Word document as a mail attachment, you can double-click the attachment to start Word and open the document.

How Integration Works

In the OpenWindows environment, you can associate a document file with the application that created it by *binding* the document file name extension to the application's executable file. For example, a file with a `.txt` extension is associated with, or bound to, the OpenWindows Text Editor tool, so when you double-click on a `.txt` file, the `textedit` program starts. This binding is controlled through the OpenWindows Binder application. When you install an

See the *Solaris User's Guide* for information about Binder.

application, the Wabi program creates the bindings to associate the file extensions with the application. The binding also tells OpenWindows to start the Wabi program before starting the application.

Below are some important points about the integration of Windows application files into your OpenWindows environment:

- You can use the Binder program to change any binding that Wabi has made.
- If you remove an application from your Wabi environment, you should manually remove the binding of file types to the application with the Binder program.
- If you move or reinstall an application to a different location, you must manually update the bindings with the new path.
- Wabi does not associate `.txt` files with the Windows Notepad. It is assumed that Solaris users prefer to use Text Editor when reading text files. However, you can bind `.txt` files to Notepad with Binder if you like.
- If you are upgrading from Wabi 1.x, applications that you previously installed will not be integrated into your OpenWindows environment because OpenWindows integration was introduced in Wabi 2.0. If you want to integrate them, you can use the Binder program to bind applications to their associated file extensions, or reinstall the applications and have Wabi create the bindings.
- If you run Wabi from different systems, be sure to install applications in a common Wabi drive and path so that Wabi can access the application with the same path name on all systems. The binding contains drive and path-specific information. If you have two different drive mappings on two different systems, the File Manager and Mail Tool integration will not work on both systems.

Conflicting Bindings

Within the OpenWindows environment, applications create files with unique extensions. However, some Microsoft Windows applications use the same file extensions as some Solaris applications, so there may be conflicts between file types already bound to Solaris applications and the file types that are added when you install Windows applications. For example, the extension `.doc` is used by Microsoft Word and also by the desktop publishing application, FrameMaker®. If you have FrameMaker installed in Solaris and then install

Microsoft Word into your Wabi environment, Wabi changes the binding of .doc from FrameMaker to Word. When you restart File Manager, all .doc files have a Word icon and if you double-click them, Word starts instead of FrameMaker. If you want to use FrameMaker, you must either start it and open FrameMaker .doc files from FrameMaker, or change the binding back to FrameMaker with Binder.

Instructions for Tasks Related to Installing Applications

This section provides detailed, step-by-step instructions for performing a variety of tasks related to the installation of Microsoft Windows applications.



▼ Installing a Windows Application From Diskette

1. **Determine the directory in which you want to install the application.**
If necessary, assign a Wabi drive to the directory.

Note – You should install applications on a drive other than the C drive.

See “About Application Installation” on page 130 for more details about installing applications.

2. **In Program Manager, open the File menu and choose Run.**
The Run dialog box opens.
3. **In the Command Line entry field, enter the diskette drive letter and the name of the installation program.**
For example, to install Microsoft Word for Windows, enter A:\SETUP.
4. **Choose OK.**
An application-specific dialog box opens providing additional instructions.
5. **When prompted for a location in which to install the application, indicate an assigned Wabi drive (and path name, if necessary).**
Most applications provide a default path name on the C drive, so you should not accept the default. Replace it with the drive and directory name you decided on in Step 1. For example, if you connected drive D to \$HOME/winapps, and want to install the application in \$HOME/winapps/mailapps, enter D:\mailapps. The application is placed in your \$HOME/winapps/mailapps directory.
6. **Follow the instructions in the installation dialog box to complete installation.**

Note – If your diskette drive does not provide an eject button, you can eject diskettes by clicking in the Wabi window and pressing the Meta and E keys.  + 

▼ Installing a Windows Application From CD-ROM

1. Determine the directory in which you want to install the application.

If necessary, assign a Wabi drive to the directory.

Note – You should install applications on a drive other than the C drive to separate Wabi files from application files.

See “Accessing a CD-ROM Drive” on page 76 for instructions on assigning a Wabi drive to the CD-ROM.

2. Open Configuration Manager and assign a Wabi drive to the CD-ROM directory.

3. In Program Manager, open the File menu and choose Run.

The Run dialog box opens.

4. In the Command Line entry field, type the CD-ROM drive letter and the name of the installation program.

For example, if you connected drive M to the CD-ROM directory, and the installation program is SETUP, type **M:\setup**.

5. Choose OK.

An application-specific dialog box opens providing additional instructions.

6. When prompted for a location in which to install the application, indicate an assigned Wabi drive (and path name, if necessary).

Most applications provide a default path name on the C drive, so you should not accept the default. Replace it with the drive and directory name you decided on in Step 1. For example, if you connected drive D to \$HOME/winapps, and want to install the application in \$HOME/winapps/mailapps, enter **D:\mailapps**. The application is placed in your \$HOME/winapps/mailapps directory.

7. Follow the instructions in the installation dialog box to complete installation.

▼ Installing an Application on a Network Server

See “Application Installation on a Network Server” on page 133 for more details about installing applications on servers.

See “Assigning a Drive” on page 72 for steps required to connect a drive.

- 1. Refer to the application’s documentation for specific information about installing on a network.**
Some applications include on the installation diskettes a Read Me file describing network installation.
- 2. Start the Wabi program on your computer.**
- 3. Connect a Wabi drive to the server directory where you want to install the application.**
- 4. Select the Network Drive option for the drive.**
- 5. Select the File Sharing option for the drive if users will be working on shared files stored on this drive.**
- 6. Choose the Run command from the File menu in Program Manager.**
- 7. In the Run dialog box, enter the command needed to install the application onto a network server.**
Refer to the application’s documentation for the command you need to run, along with any necessary switches. Enter the drive letter plus the full directory path to the command. If the path is long, or you’re not sure what it is, choose the Browse button and search for the directory and command on the server.
- 8. Choose OK in the Run dialog box.**
The installation or workstation setup program starts.
- 9. Follow the program’s instructions to place the application files on a network server.**

▼ Installing an Application to a Workstation From a Network Server

See “Application Installation From a Network Server Through a Wabi Drive” on page 135 for more details about installing applications from servers.

- 1. Make sure the network server directory where the application is installed is accessible to your operating system.**
- 2. Start the Wabi program on your computer.**
- 3. Choose the Run command from the File menu in Program Manager.**

4. In the Run dialog box, enter the command needed to install the application from the network.

Refer to the application's documentation for the command you need to run, along with any necessary switches. Enter the drive letter plus the full directory path to the command. If the path is long, or you're not sure what it is, choose the Browse button and search for the directory and command on the server.

5. Choose OK in the Run dialog box.

The installation or workstation setup program starts.

6. Follow the program's instructions to set up your computer to run the application.

▼ Setting Up Print Tool to Print Files of a Windows Application

Let's assume you have installed Microsoft Powerpoint to your `h:\apps` directory (your `$HOME/apps` in UNIX). To enable drag and drop printing of Powerpoint files, follow the steps below.

1. Read the application's documentation to find the command line option to print a file.

For example, to print a Powerpoint slide (`slide.ppt`) you would use

```
powerpnt.exe /p slide.ppt
```

Note – Many Windows applications use the `/p` or `-p` option.

2. Start the OpenWindows Binder utility.

You can select Binder from your OpenWindows Workspace menu or enter the following command in a Command Tool or Shell Tool:

```
binder &
```

Binder starts and displays a list of application and file types.

3. Scroll down the list of application and file types and select the file type you want to print.

For example, to print Powerpoint slides, which have the `.ppt` file extension, select the entry `ppt-file`.

4. Open Props and choose Icon.

The Binder: Properties window shows information about that entry, including the icon to display and its foreground and background colors.

5. Choose the [+] button at the bottom of the Properties window.

Additional information about the file type is displayed. The Application field contains a command used to edit files of this type. The Print Method field is blank.

6. Copy the text in the Application field and paste it in the Print Method field.

For example, for Powerpoint, the Application field contains a command similar to the following:

```
wabi -s h:\\apps\\ppt\\powerpnt.exe $FILE
```

7. Edit the Print Method field to insert the command line argument that tells the application to print the file.

For Powerpoint you would change the entry to:

```
wabi -s h:\\apps\\ppt\\powerpnt.exe /p $FILE
```

8. Choose the Apply button in the Binder Properties dialog, and dismiss the window.**9. Choose Save in the Binder main window, then exit Binder.****10. Restart Print Tool.**

See the next section for information about printing files.

▼ Printing Windows Application Files in Print Tool**1. Define the print method in the Binder utility, as explained in the previous section.****2. Open File Manager and find a file with the extension associated with the application, or open Mail Tool and find a message with an attached file with this extension.****3. Drag the file icon and drop it onto the Print Tool icon.**

4. The associated Microsoft Windows application starts and displays its Print dialog.

Some applications display their main window, load the file, and open a Print dialog. Some applications display only the Print dialog. Some applications just print the file to the default printer.

5. Use the Print dialog as you normally would to send the file to print.

The file is printed on the printer that the application is currently set up to use, which is usually either the default printer or the printer last used. This may not be the same printer that is currently selected in Print Tool.

Reference Material for Tasks Related to Installing Applications

This section provides reference material for tasks related to installing Windows-based applications and the Microsoft Windows software.

Troubleshooting General Application Installation Problems

Table 9-1 suggests solutions to common problems you might experience during application installation.

Table 9-1 Windows Application Installation Problems and Solutions

Symptom	Possible Cause	Solution
Application will not fully install.	Not certified to run in Wabi program.	Only certified applications are sure to install correctly. Uncertified applications may use nonstandard installation procedures or data compression methods that Wabi has not been designed to translate.
Application does not install correctly.	Special installation procedures required.	See the Release Notes or supplementary manual you may have received with the Wabi program.

Table 9-1 Windows Application Installation Problems and Solutions (Continued)

Symptom	Possible Cause	Solution
Application installation fails with error "ACMSETUP Caused a General Protection Fault in Module MMSETUP.DLL."	Some Microsoft applications' setup programs alter the system.ini file incorrectly.	With a DOS or UNIX text editor, edit \$HOME/wabi/windows/system.ini and insert a blank line before each section title. Section titles are enclosed in square brackets. (Note that UNIX editors display blank lines in DOS text files as ^M. You do not need to remove them.) Save the file, restart the Wabi program, and reinstall the application.
Application installation program covers the screen, blocking other application windows.	Application was not designed for the X Window desktop.	Some applications do not let you change this, but you can try the following: <ul style="list-style-type: none"> • Try reducing the size of the window by restoring it. To restore, click on the Wabi logo in the upper left corner of the window (if it's visible) and choose Restore in the pull-down menu, or press Alt+Spacebar, R. This does not work for all installation programs. • If your keyboard has a key or key combination that raises windows, such as a Front key, try pressing it once to make the installation window go to the back so you can see other windows. It may take Wabi several seconds to respond to key strokes if the application installation is loading your computer heavily. This technique does not work with all installation programs.

Table 9-1 Windows Application Installation Problems and Solutions (Continued)

Symptom	Possible Cause	Solution
Application installs very slowly	<p>Application uses nonstandard compression routines.</p> <p>.Most files must be decompressed at installation. If an application uses standard Windows routines, it installs quickly because Wabi translates to UNIX routines to decompress. If an application does not use standard routines, Wabi must execute the compression one instruction at a time</p>	<p>If you find an application installation intolerably slow, try some of these ideas:</p> <ul style="list-style-type: none"> • Obtain the application on CD-ROM if possible. CD-ROM files are not compressed, so Wabi does not have to decompress, making installation faster. • Check the application documentation for an installation option to do a partial installation to decompress the files. If there is, do the partial installation, and store the decompressed files in a network directory where other users can use them to do the second half of the installation. • Investigate the possibility of all the users on the network referencing a single copy of the application, so you only have to install the application once. CAUTION: If you share a single copy, remember you <i>must</i> have a license for every user of the application. You are responsible for adhering to the terms of the software license of each application you run in the Wabi program.

Using Microsoft Windows Applications

10 

This chapter discusses starting and using Microsoft Windows applications in the Wabi environment.

If you are not familiar with starting applications under the Wabi program and would like to learn more about it, read the next section, “About Starting Applications.” If you want instructions for specific tasks related to starting applications, use the following table to locate the instructions you need.

Task	Page
<i>Starting an Application From an Icon</i>	155
<i>Starting an Application From a Run Command</i>	155
<i>Starting an Application From a UNIX Command</i>	156
<i>Running an Application Transparently</i>	157
<i>Opening a File When Starting an Application</i>	158
<i>Copying and Pasting From Windows Applications to X Applications</i>	159
<i>Copying and Pasting From X Applications to Windows Applications</i>	159

About Starting Applications

Generally, you can use Microsoft Windows applications in the Wabi environment the same as in the Microsoft Windows environment.

You can start applications several different ways:

- From within Program Manager, by opening an icon or using the Run command
- Using Microsoft Windows File Manager, by using the Run command or by opening an executable file
- Using OpenWindows File Manager, by opening an executable file, or a document file created by the application
- From a UNIX command window, using the `wabi` command along with some parameters

Application Startup From an Icon in Program Manager

When you install a Microsoft Windows application, the Wabi program creates an item representing the application. This item, represented by an icon, is stored in a group. Usually, the application's install program creates its own group.

See "Starting an Application From an Icon" on page 155 for specifics on getting an application to run.

Running an installed application using an icon is straightforward. Open the icon representing the application and the application starts. Once the application starts, a window opens revealing the initial application screen.

You can minimize any application, including the Program Manager. The icons of minimized applications are automatically placed in the upper-left corner of your desktop. You can restore a minimized application by opening its icon. You can also restore a minimized application by single-clicking its icon and selecting Restore from the window control box.

Application Startup With the Run Command in Program Manager

When the Wabi program is already running Program Manager, you can start an application using the Run option from the File menu. The command you enter is the same command you would use to run the application on a PC, except that the drive letter indicates a path on your UNIX system.

Application Startup in Microsoft Windows File Manager

You can use Microsoft Windows File Manager to start applications just as in the Microsoft Windows environment: open a program file or a document file associated with an application. In the Wabi environment, however, you cannot open files with .COM, .PIF, or .BAT extensions because they are not Windows executables. Only Windows executables with .EXE extensions will run in the Wabi environment.

Application Startup in OpenWindows File Manager

When you install applications into a Wabi environment running on an OpenWindows desktop, the Wabi program creates a binding for the application and its associated files. This is similar in concept to the Microsoft Windows File Manager's Associate function, where you create an association between an application and the file types it creates. The OpenWindows binding enables you to open a document file in OpenWindows File Manager and have the Wabi program start the application associated with, or bound to, the document file type. See "Application Integration Into the OpenWindows Environment" on page 135 for more information.

Application Startup at the UNIX Command Line

See "Starting an Application From a UNIX Command" on page 156 or "Running an Application Transparently" on page 157 for the command formats.

You can run an application directly with the `wabi` command by specifying the application startup command as an argument to the `wabi` command. Depending on how you specify the application startup command, you can make the Wabi desktop (the Microsoft Windows Program Manager and Wabi Tools) visible or transparent. If you want to see the Wabi desktop, simply add the application startup command to the `wabi` command.

You can use the `-s` switch plus the application startup command to make the Wabi user interface transparent, so all you see is your application. This is the recommended format to use when including an application in a UNIX desktop menu. Note that you can access Program Manager or Wabi tools such as Configuration Manager by starting them just as you would an application. For example, the command line below starts Configuration Manager:

```
wabi -s w:/wbin/config.exe
```

See “Opening a File When Starting an Application” on page 158 for sample command formats for specifying a data file to open.

Application Startup With an Open File

With any of the application startup methods, you can specify a file name to open with the application, if the application startup command allows it (as most do). Just include the file’s full name as an argument to the startup command. If the directory containing the file is not on your path in your `autoexec.bat` file, you must include the full path to the file.

The `wabi` command supports additional switches allowing you to display Wabi on a remote system, and to display Wabi with smaller or larger system fonts. These switches, which are described in Chapter 2, “Starting Wabi,” must be specified before an application startup command. The application startup command and optional file name must be the last arguments on the `wabi` command line.

Using Microsoft Windows Applications in an X Window Desktop

The Wabi program is an X Window application, but in some ways it behaves like a Microsoft Windows application. Window focus, and cut, copy, and paste methods are areas where Wabi behaves like Microsoft Windows rather than an X application.

Window Focus and Raising

Window managers on X Window desktops often let you choose your window focus policy. You can configure your X desktop so that you must click on a window to activate it, or so that you can move your mouse into a window to activate it. In addition, you can also specify whether you want a window to be raised to the top when activated. Each UNIX vendor’s desktop has its own terminology for these desktop properties and its own utility for changing them.

In Microsoft Windows, you must click in a window before you can type into it. When you do, the window automatically rises to the top, overlaying other windows. Wabi’s behavior matches that of Microsoft Windows.

Wabi windows use the click-to-focus mode even if you set your X Window desktop to use the follow-mouse mode, because it is the only mode Microsoft Windows applications can use. You should configure your X Window desktop to use the click-to-focus mode so that all your windows behave the same way.

Cut, Copy, and Paste

You can cut, copy, and paste text and graphics between applications running in the Wabi environment just as you do in the Microsoft Windows environment. Generally, applications use menu commands (e.g., Edit, Cut) or accelerator keys (e.g., Ctrl+X) to cut, copy, and paste. You should use the same methods when using the applications in the Wabi environment.

See page 159 and page 159 for the copying and pasting procedures.

You can also copy and paste text between Windows applications running in Wabi and X applications running on your X desktop. You should follow each application's normal methods to cut, copy, and paste. For example, some UNIX desktops support the use of keyboard keys and menu commands to cut, copy, and paste. You can use the special keys or commands in the X applications to copy text and then paste it into a Windows application in Wabi using that application's pasting method. You cannot use the UNIX desktop special keys to paste into the Windows application.

Note – You cannot copy and paste graphics from Windows applications to X applications and vice versa because they use incompatible graphics formats.

Virtual Window Managers

In the X Window System, virtual window managers create several logical views of your desktop, and let you designate specific windows to “stick” so that they appear in all logical views. Other windows stay in the logical screen in which you place them. When you run the Wabi program with some virtual window managers, conflicts can occur between the Wabi window manager and the virtual window managers. Two virtual window managers with which Wabi is known to have conflicts are `olvwm` (Open Look Virtual Window Manager) and `tvwm` (Tom's Virtual Window Manager). You can use Wabi with `olvwm` or `tvwm`, but Wabi windows will always follow you to the current view rather than remaining on the logical screen where you've placed them.

When running the Wabi program in the CDE, HP-VUE, or SCO Panorama window environment, any Microsoft Windows application you start is displayed in the workspace where you first started the Wabi program (if it is still running in this workspace).

Key Conflicts Between Applications and Open Look Window Manager

Some Microsoft Windows applications may have conflicts with the Open Look Window Manager (olwm) over some key/mouse combinations. For example, the Alt key + Left mouse button combination is sometimes used by applications for specific functions. The olwm uses the combination for menu selections.

If you are using olwm (as OpenWindows does by default) and you want the application to have control of Alt + LeftMouse, try typing these two commands at your UNIX prompt before you start the Wabi program:

```
echo "olwm.Modifier.WMGrab: " | xrdp -merge
xrdp -edit $HOME/.Xdefaults
```

Using Multimedia Features on SPARCstation and x86 Computers

On newer SPARCstations and x86 computers running the Solaris operating environment, the Wabi program supports the audio and video features of Microsoft Windows and the certified applications. Your computer must include the necessary hardware before you can use these features. SPARCstation 5, SPARCstation 10, and SPARCstation 20 ship with both sound cards and microphones, so they are properly equipped to play and record sound in the Wabi environment. The SPARCstation 4 does not ship with a sound card or microphone, but can be upgraded to include them. A computer based on a 386, 486, or Pentium processor can also use multimedia in the Wabi environment if it is equipped with a 16-bit sound card.

Note – Multimedia features such as MIDI (Musical Instrument Digital Interface), and AVI (Audio-Visual Interface) for video laser disks and music compact disks are not yet supported.



Multimedia sound is not supported for WabiServer.
Video is supported.

Audio Features

You can play, record, and edit waveform (.WAV) files using the Sound Recorder located in the Accessories group or using a sound tool provided by an application you have installed. You can also use the Control Panel's Sound option to assign system events to waveform sounds. Another program in the Accessories group, Media Player, also lets you play waveform files.

You can embed sound objects in documents when you use an application that supports it, as do most of the certified applications.

Note – Audio support is not provided when you use the Wabi program remotely. You can only hear sound on the machine where the Wabi program is running.

Controlling Audio Input/Output

By default, the Wabi program takes input from the microphone and sends output to the speaker. You can change the input and output settings using the Audio Control program in the Solaris environment, or by editing your `wabi/windows/system.ini` file. When you use Audio Control, the change applies only to the current Wabi session. When you edit your `system.ini`, the change applies to each subsequent Wabi session.

Using Audio Control

You can start Audio Control from a Command Tool window by entering the command:

```
/usr/openwin/bin/audiocontrol &
```

You can also start Audio Control from Audio Tool, the Solaris sound recording and editing program. When you choose the Volume control in Audio Tool, the Audio Control window opens.

The play, or output, options you can choose are Speaker, Headphone, or Line Out. The Line Out option sends sound through your workstation's output jack to a device such as a tape recorder.

The record, or input, options you can choose are Microphone and Line In. The Microphone option lets you record through a microphone connected to your workstation's microphone jack. The Line In option lets you record sound from a device (such as a radio or tape player) connected to your workstation's input jack.

Audio Control settings are not saved for subsequent sessions.

Please refer to your *Solaris User's Guide* or the `audiocontrol(1)` man page for a detailed description of Audio Control.

Editing system.ini

When the Wabi program starts, it uses the settings in `system.ini` for its initial audio settings. If you want to specify the input and output settings for Wabi to use each time, edit your `system.ini` file to add the following section to the file:

```
[solarwav]
input=
output=
```

To use the microphone for input, set `input=mike` or `input=microphone`. To use a line in, set `input=line`. This allows you to record sound from a source, such as a tape player, that you have connected to your workstation's input jack.

You can send sound output to speakers, headphones, or to an output jack to another device, using `output=speaker`, `output=headphone`, or `output=line`. You can send output to multiple ports by using the `|` symbol between them. For example, to send sound to speakers, headphones, and line out, use `output=speaker|headphone|line` in your `system.ini`.

If you want to change the settings temporarily while sound is playing, use Audio Control.

Controlling Audio Volume and Balance

You can use the slide controls in Audio Control in your Solaris environment to control the volume and balance of the sound produced by a program running in either your Wabi environment or X Window environment.

Video Features

You can play Audio-Visual Interface (.AVI) files if you have installed the Microsoft Video for Windows driver. Applications that use the driver usually install it when you install the application. To determine if the Video for Windows driver is installed, open Control Panel's Drivers icon. The driver has been installed if you see the entry [MCI] Microsoft Video for Windows.

AVI files can be played with the Microsoft Windows Media Player, located in the Accessories group. Most applications support linked or embedded video objects that are played using Media Player. However, some applications provide their own video players, which should also work in the Wabi environment.

Note – You can play .AVI files when you run the standalone Wabi program remotely, but performance may be degraded, leading to slight pauses between video frames. However, WabiServer systems with adequate system resources should *not* show a performance degradation when playing video files.

Instructions for Tasks Related to Using Applications

This section provides detailed, step-by-step instructions for performing a variety of tasks related to using Microsoft Windows applications.

▼ Starting an Application From an Icon

- 1. Install the application.**
- 2. In Program Manager, locate the icon representing the application.**
- 3. Open the application icon.**

The Wabi program loads the application. When the application is loaded, a window opens, displaying the application.

▼ Starting an Application From a Run Command

- 1. Install the application.**
- 2. In Program Manager, open the File menu and choose Run.**

The Run dialog box opens.

3. In the Command entry field, type the full path name of the application's startup command.

Alternately, choose the Browse button to search your directories for the executable file. When you find the executable, select it. The file name is displayed in the Command entry field.

4. Choose OK to run the command you typed.

The Wabi program loads the application. When the application is loaded, a window opens displaying the application.

▼ Starting an Application From a UNIX Command

If you want to open a data file when starting an application, see "Opening a File When Starting an Application" on page 158.

This method starts your application when the Wabi program starts, with Program Manager and Wabi tools available to you.

♦ **At the system prompt, enter `wabi` followed by the path name of an installed application executable.**

You can use either a DOS path enclosed in quotes, or a UNIX path. If the directory containing the application program is not in the path in your `$HOME/wabi/autoexec.bat`, you must include a full path name.

For example, suppose you have installed Microsoft Excel in your `$HOME/excel` directory. The Wabi drive H is connected to your home directory. To start the Excel program, you could enter any of the following commands:

```
wabi 'h:\excel\excel.exe'
wabi $HOME/excel/excel.exe
wabi h:/excel/excel.exe
```

or if `H:\EXCEL` is in the `PATH` statement of your `autoexec.bat`,

```
wabi excel.exe
```



WabiServer users must use the `rwabi` command with the same arguments:

```
rwabi 'h:\excel\excel.exe'
rwabi $HOME/excel/excel.exe
rwabi h:/excel/excel.exe
rwabi excel.exe
```

Note – The application startup command and optional file name must be the last arguments on the `wabi` command line.

▼ Running an Application Transparently

This method starts your application when the Wabi program starts, without starting Program Manager.

Read “Application Startup at the UNIX Command Line” on page 149 for reasons you might want to do this.

- ♦ **At the system prompt, enter the Wabi startup command followed by -s and the application startup command.**

You can use either a DOS path enclosed in quotes, or a UNIX path. If the directory containing the application program is not in the path in your \$HOME/wabi/autoexec.bat file, you must include a full path name.

For example, suppose you have installed Microsoft Excel in your \$HOME/excel directory. The Wabi drive H is connected to your home directory. To start the Excel program, you could enter any of the following commands:

```
wabi -s 'h:\excel\excel.exe'
wabi -s $HOME/excel/excel.exe
wabi -s h:/excel/excel.exe
```

or if H:\EXCEL is in the PATH statement of your autoexec.bat,

```
wabi -s excel.exe
```



WabiServer users must use the `rwabi` command with the same arguments:

```
rwabi -s 'h:\excel\excel.exe'
rwabi -s $HOME/excel/excel.exe
rwabi -s h:/excel/excel.exe
rwabi -s excel.exe
```

Note – If you want to use Wabi tools, you can start them using this method. For example, to start Configuration Manager, enter:

```
wabi -s w:/wbin/config.exe
```

The Wabi process that is already running will start Configuration Manager.

▼ Opening a File When Starting an Application

- ♦ **With any of the startup methods, add the name of the file as an argument to the application startup command.**

You should always use a complete path for the file name.

If you are starting the application from within Program Manager, add the file name in DOS format, including drive letter, to the command you enter in the Command Line field of the dialog box. For example, the *Wabi Release Notes* program item uses the command:

```
write w:\wbin\readme.wri
```

If you are starting the application from the UNIX command line, and use a DOS path for the file to open, include the drive letter and file name within the quotes along with the startup command. If you use a UNIX path, you can use the drive letter or a full UNIX path, but be sure to use accurate capitalization. If you want, you can use a UNIX path for the command, and enclose a DOS path and drive in quotes for the file name.

For example, to start the Excel program and open your file *sched.xls* in your *h:\excel\files* directory, you could enter any of the following commands:

```
wabi -s 'h:\excel\excel.exe h:\excel\files\sched.xls'
wabi -s $HOME/excel/excel.exe $HOME/excel/files/sched.xls
wabi -s $HOME/excel/excel.exe 'h:\excel\files\sched.xls'
wabi -s h:/excel/excel.exe h:/excel/files/sched.xls
```

When the Excel window opens, it displays the *sched.xls* file.



WabiServer users must use the *rwabi* command with the same arguments:

```
rwabi -s 'h:\excel\excel.exe h:\excel\files\sched.xls'
rwabi -s $HOME/excel/excel.exe $HOME/excel/files/sched.xls
rwabi -s $HOME/excel/excel.exe 'h:\excel\files\sched.xls'
rwabi -s h:/excel/excel.exe h:/excel/files/sched.xls
```

Note – The application startup command and optional file name must be the last arguments on the *wabi* or *rwabi* command line.

▼ Copying and Pasting From Windows Applications to X Applications

1. **Click in the X application window to set the insertion point for pasting.**
2. **Copy the text in the Windows application using the application's normal copying method.**
For example, select the text and press Ctrl+C or choose the Copy command from the Edit menu.
3. **Click the title bar of the X application window to make it the active window.**
In some X applications, if you click in the work area of the window, the copied text is lost because Wabi interprets this as a new text selection and erases the contents of the clipboard.
4. **Paste the text into the X application window using the application's normal pasting method.**
The text is pasted at the insertion point you set in the first step.

▼ Copying and Pasting From X Applications to Windows Applications

1. **Copy the text in the X application using the application's copying method.**
2. **Click the title bar of the Windows application to make it the active window.**
3. **Click in the work area of the Windows application to set the insertion point.**
4. **Paste the text using the application's paste method.**
For example, press Ctrl+V or choose the Paste command from the Edit menu. The text is pasted at the insertion point.

Reference Material for Tasks Related to Using Applications

This section provides reference material for general tasks related to starting and using Microsoft Windows applications. See the *Wabi Release Notes* for information about specific applications.

Table 10-1 Windows Application Problems and Solutions

Symptom	Possible Cause	Solution
Application does not start.	Incorrect executable name or directory path.	Make sure you have entered the correct path name. See page 155.
Application not fully functional.	Application function not compatible with Wabi or X Window System.	See the Release Notes or supplementary manual you may have received with the Wabi program for information about the application.
"Not enough memory" or "Out of memory" message from application.	Application encountered an unrecoverable error.	This error message is often generated when applications cannot perform some function for an unknown reason. Memory shortage is seldom the actual cause. Contact Wabi support.

Setting Up Remote Database Access 11

The chapter describes how to set up remote database access for certified applications. If you want some background information on remote database access in the Wabi environment, read the section “About Remote Database Access” on page 162.

If you want to go directly to instructions for specific tasks related to remote database connectivity, use the following table to locate the instructions you need.

Task	Page
<i>Installing Applications for Remote Database Access</i>	<i>163</i>
<i>Installing Oracle SQL*Net TCP/IP</i>	<i>166</i>
<i>Installing Sybase Open Client Net-Library</i>	<i>166</i>
<i>Installing Intersolv DataDirect ODBC Drivers</i>	<i>167</i>
<i>Configuring Data Sources for Oracle7 and Sybase System 10</i>	<i>168</i>
<i>Verifying Connection to Oracle and Sybase Servers</i>	<i>169</i>

About Remote Database Access

Several certified applications can access databases on remote DBMS servers. The supported DBMS servers are Oracle7 and Sybase SQL Server 10 databases running on Solaris 2 systems in TCP/IP networks.

Applications that can access data from servers are:

Lotus 1-2-3 version 5.0
Lotus Approach 3.02
Microsoft Access 2.0
Microsoft Excel 5.0
Paradox 5.0
Quattro Pro 6.0

These applications connect through the Wabi Winsock interface, using additional specialized software: an ODBC (Open Database Connectivity) driver and data source software.

ODBC drivers enable applications to connect to remote databases. Oracle and Sybase ODBC drivers from Intersolv have been tested with the Wabi program and found to be compatible. You can purchase a driver from Intersolv individually or get Intersolv's complete DataDirect ODBC Driver Pack 2.0 for Windows.

Data source software provides TCP/IP connectivity over Winsock to the DBMS server. You can obtain this software from the DBMS vendors, Oracle and Sybase. Oracle's data source product is SQL*Net[®] TCP/IP 1.1. Sybase's data source product is Open Client Net-Library 10.0.2.

Lotus 1-2-3 also needs a proprietary component, the Lotus DataLens driver (DLODBC), an interface to the ODBC driver. The DataLens driver is available on the Lotus Data Access Tools 2.0 for Windows disks, which you can obtain from Lotus.

For each application, follow these general steps to set up the application to access remote databases:

- Install the application fully or using a custom install option, and be sure to include the options the application needs for remote database connectivity.
- Install the Oracle and/or Sybase data source software.
- Install the Intersolv ODBC drivers for Oracle 7 and Sybase System 10.

- Run the ODBC Administrator utility in Control Panel to configure the data sources for Oracle7 and Sybase System 10.
- Verify the connection to the server.

When you have completed these procedures, you can use the application's database query facilities to access the remote databases.

Instructions for Remote Database Access

This section contains procedures for setting up applications to access remote Oracle 7 and Sybase System 10 databases.

Installing Applications for Remote Database Access

With the exception of Lotus 1-2-3, each application will install the files it needs for remote database access if you do a full installation. Table 11-1 below tells you how to install the additional software that Lotus 1-2-3 needs, and also provides pointers on getting the files you need for the other applications if you do not want to do a full installation of all the application's files.

Table 11-1 Notes About Installing Applications for Remote Database Connectivity

Application	Notes
Lotus 1-2-3, version 5.0	When you install Lotus 1-2-3, choose the Customize Features install option. After you specify the drive and path for the 123r5w directory (and lotusapp directory if you don't already have one), a Customize dialog box opens. Click the Shared Data Access tab and select the database drivers you want to install. Be sure to choose the SQL Server driver. When you continue with the installation, you will be prompted for the name of your SQL server. Next, you must install drivers from the Lotus Data Access Tools disks. Notes on the procedure are included below.
Lotus Data Access Tools 2.0	Insert disk 1 and run the install program. Choose the Customize Features install option. In the Customize dialog box, click the DataLens Drivers tab and select ODBC Data Sources, ORACLE, and SQL Server. Enter the name of your SQL server when prompted. Complete the installation and restart Wabi when prompted.

Table 11-1 Notes About Installing Applications for Remote Database Connectivity

Application	Notes
	<p>After installation is complete, edit the Lotus DataLens Registration File, <code>lotus.bcf</code>, which is located in <code>x:\lotusapps\datalens</code>, where <code>x</code>: is the drive where you installed the DataLens drivers.</p> <p>Insert the following lines into your <code>lotus.bcf</code> file to add driver records for Oracle and Sybase:</p> <pre> DN="ODBC_SYBASE" DL="DLODBC" DD="DataLens Driver for ODBC Data Sources" DB="SYBASE" AC=UI,PW; DN="ODBC_ORACLE" DL="DLODBC" DD="DataLens Driver for ODBC Data Sources" DB="ORACLE7" AC=UI,PW; </pre> <p>Note: When you connect to the remote database servers, you should use these driver records instead of the ones provided by default in <code>lotus.bcf</code>.</p> <p>Next, install the Oracle and/or Sybase software, and Intersolv ODBC drivers.</p>
Lotus Approach 3.02	<p>When you install Lotus Approach, choose the Customize Features install option. After you specify the drive and path for the approach directory (and <code>lotusapp</code> directory if you don't already have one), a Customize dialog box opens. Click the PowerKeys tab and select ODBC, Oracle SQL, and SQL Server. Continue with the installation.</p> <p>Next, install the Oracle and/or Sybase software, and Intersolv ODBC drivers.</p>
Microsoft Excel 5.0	<p>When you install Microsoft Excel, choose the Complete/Custom install option. When selecting which components to install, select Data Access. The Data Access component installs Microsoft Query software and several ODBC drivers, including the SQL Server Driver. Continue with the installation. When installation is complete, you should install Oracle and/or Sybase software and Intersolv ODBC drivers.</p>

Table 11-1 Notes About Installing Applications for Remote Database Connectivity

Application	Notes
Microsoft Access 2.0	When you install Microsoft Access, choose the Complete/Custom install option. When selecting which components to install, select ODBC support. Next, install the Oracle and/or Sybase software, and Intersolv ODBC drivers.
Paradox 5.0	When you install Paradox, install the IDAPI engine. Use the IDAPI Configuration Utility to add new drivers and aliases for Oracle and Sybase. Next, install the Oracle and/or Sybase software, and Intersolv ODBC drivers.
Quattro Pro 6.0	When you install Quattro Pro, install the IDAPI engine and the DataBase Desktop. Use the IDAPI Configuration Utility to add new drivers and aliases for Oracle and Sybase. Next, install the Oracle and/or Sybase software, and Intersolv ODBC drivers.

*Installing Oracle SQL*Net TCP/IP*

The SQL*Net TCP/IP Version 1.1 software for Microsoft Windows includes three diskettes labeled as follows:

Install V3.0.9.4.0
SQL*Net[®] TCP/IP V1.1.7.7B
Required Support Files V7.012.1.0

▼ Installing the Oracle7 Software

1. **Insert the Install diskette and run the `ORAINST.EXE` program from Program Manager to start the Oracle Installer.**
2. **Follow the Oracle Installer's prompts for your language, company, and Oracle home path name.**
Install diskettes as prompted.
3. **In the Vendors dialog box, select Sun PCNFS 5.0 via winsock for the TCP/IP vendor.**

- 4. In the TCP/IP Services dialog box, accept the default path for the NFS services file, which is probably C:\NFS\SERVICES.**

The Oracle Installer expects this file because the Vendor selection was PC-NFS 5.0 via winsock. The SERVICES file does not exist in the Wabi environment. Note that accepting the default causes a temporary error, which the next step works around.

- 5. In the error dialog box that opens when Oracle Installer cannot find the C:\NFS\SERVICES file, choose OK to accept a sample file.**

- 6. Exit Oracle Installer.**

- 7. Edit your AUTOEXEC.BAT file.**

Add the x:\ORAWIN\BIN directory to your PATH statement, where x: is the drive where you installed the Oracle files.

Note – If you need help with the installation, refer to the section “Installing SQL*Net TCP/IP for Windows” in the document *Setting Up SQL*Net TCP/IP for Windows Version 1.1* which you received with the SQL*Net TCP/IP diskettes. The Oracle Installer program also includes on-line help.

Installing Sybase Open Client Net-Library

The Sybase[®] Open Client Net-Library software includes several diskettes, but only the following diskettes are needed for establishing remote database access in the Wabi environment:

Net-Library[™] for PC/MS Windows
Open Client/C Developers Kit for PC/MS Windows (1)
Open Client/C Developers Kit for PC/MS Windows (2)

▼ Installing the Sybase Open Client Software

- 1. Insert the Net-Library disk and run the SETUP_10.EXE program from Program Manager.**

Follow the installation program's prompts. For detailed information, see the *SYBASE Open Client/Server Product Installation Guide for Microsoft Windows* manual.

- 2. In the Net-Library Driver Selection dialog box, select Windows Sockets.**

3. **In the Windows Socket Driver Information dialog, enter the server machine name and port number of the computer running the Sybase database.**

Contact your system administrator for the server machine name and port number.

4. **Specify the server name or accept the default server name, SYBASE.**

5. **When the installation program prompts you to modify the AUTOEXEC.BAT file, select No.**

The CALL command that the installation program would add cannot be executed in the Wabi environment. Later, you must edit your AUTOEXEC.BAT file to include the statements contained in the WSYBSET.BAT file.

6. **When installation is complete, eject the Net-Library diskette.**

7. **Insert disk 1 of the Open Client /C Developers Kit and run the SETUP_10.EXE program from Program Manager.**

Follow the installation program's prompts to complete the installation.

8. **When the installation is complete, edit your AUTOEXEC.BAT file and insert the contents of x:\SQL10\BIN\WSYBSET.BAT.**

The lines should be similar to the following:

```
set PATH=%PATH%; x:\SQL10\BIN; x:\SQL10\DLL
set SYBASE=x:\SQL10
set DSQUERY=SYBASE
set INCLUDE=%INCLUDE%; x:\SQL10\INCLUDE
set LIB=%LIB%; x:\SQL10\LIB
set USER=username
```

x: is the drive where you installed the Sybase SQL10 files, such as G:.

Installing Intersolv DataDirect ODBC Drivers

Even if the application you want to use includes its own ODBC drivers, you should install ODBC drivers from Intersolv. These drivers have been tested in the Wabi environment more extensively than those provided with applications.

The Intersolv driver pack includes three diskettes labelled Intersolv DataDirect ODBC Driver Pack for Windows.

▼ **Installing Intersolv ODBC Drivers**

- 1. Insert disk 1 and run the `SETUP.EXE` program from Program Manager.**
- 2. In the DataDirect ODBC Driver Pack Setup dialog box, specify the directory where you want to install the drivers, and choose the Select button.**
- 3. In the next dialog box, choose the Clear All button, then select INTERSOLV Oracle 7 and INTERSOLV Sybase System 10.**
- 4. Follow the installation program prompts to complete the installation.**
If you are prompted to install files that will overwrite existing ones, choose to install the new ones.
- 5. Read the Driver Pack release notes, and follow any instructions applicable to the Oracle 7 and Sybase System 10 drivers.**
- 6. Configure data sources for the drivers.**
The installation program prompts you to do this. You can either proceed as prompted, or run the ODBC Administrator later from the Control Panel as explained in the next section.

Configuring Data Sources for Oracle7 and Sybase System 10

You must configure data sources using the ODBC Administrator. Before attempting to do so, please see the “Oracle Drivers” and “Sybase System 10 Driver” chapters in the *INTER SOLV DataDirect ODBC Drivers Reference*.

▼ **Configuring a Data Source for Oracle7**

- 1. Start the Control Panel and open the ODBC icon to start the ODBC Administrator.**
- 2. In the Data Source dialog box, enter a data source name, which is a string that identifies the Oracle data source.**
A data source name, Oracle7 tables, may already be entered by default. You can accept this name or enter one of your own.
- 3. Enter a description of the data source.**
For example, you might enter Oracle server.

4. **Enter the Server Name, the SQL*Net connection string designating the server and database to be accessed.**

Refer to the *INTERSOLV DataDirect ODBC Drivers Reference* to determine what this should be. The rest of the entries in the dialog box are optional. Please see the on-line help and reference manual for more information.

▼ **Configuring a Data Source for Sybase System 10**

1. **Start the Control Panel and open the ODBC icon to start the ODBC Administrator.**

2. **In the Data Source dialog box, enter a data source name, which is a string that identifies the Sybase data source.**

A data source name, Sybase System 10, may already be entered by default. You can accept this name or enter one of your own.

3. **Enter a description of the data source.**

For example, you might enter Sybase server.

4. **Enter the Server Name that contains the System 10 tables you want to access.**

This is the server name you entered when installing the Sybase Net-Library software. The rest of the entries in the dialog box are optional. Please see the on-line help and reference manual for more information.

Verifying Connection to Oracle and Sybase Servers

After you install the Oracle and Sybase software and configure your system, verify the connection to the servers using utilities provided with Oracle and Sybase software.

▼ **Verifying Connection to Oracle 7 Servers**

- ♦ **Run the program `x:\ORAWIN\BIN\NETTEST` from Program Manager.**

NETTEST verifies that your SQL*Net software has been installed correctly and that you can connect to the server. NETTEST reports information about both successful and failed connection attempts. If the connection is successful, NETTEST displays a “Logon Successful” message.

▼ Verifying Connection to Sybase Servers

♦ Run the program `x:\SQL10\BIN\WSYBPING` from Program Manager.

WSYBPING verifies that your Net-Library software has been installed correctly and that you can connect to the Sybase server. WSYBPING reports information about both successful and failed connection attempts. If the connection is successful, WSYBPING displays the message “SYBASE *network address* is alive!”

Accessing Remote Databases

Please refer to your application's documentation and on-line help for information about using the application's remote database access facilities.


When you try to connect to a remote database, your application may offer several choices of ODBC drivers and data sources with similar names. You may find it confusing to determine what choice you should make to connect to a remote server. With all the applications, we recommend you use the Oracle7 and Sybase System10 ODBC drivers from Intersolv, even if the application provides others. These recommended data sources and drivers have tested well in the Wabi environment. Other data sources and drivers have not been tested or have not performed reliably.

Notes About Lotus Applications

In Lotus 1-2-3, when you connect to the Oracle7 or Sybase 10 database, you should use the ODBC_ORACLE or ODBC_SYBASE data source names, which you previously added to the `lotus.bcf` file in “Installing Applications for Remote Database Access” on page 163.

In Lotus Approach, you connect to the remote database server by opening a file. In the Open dialog box, select ODBC Data Sources(*) in the List Files of Type list box. This brings up a list of data sources, including those for Oracle7 and Sybase System 10. The data source name matches the name you specified when configuring the data sources in the ODBC Administrator in “Configuring Data Sources for Oracle7 and Sybase System 10” on page 168. Select one of these two data sources.

Using a DOS Emulator in the Wabi Environment

12 

Although the Wabi program is intended primarily for running Microsoft Windows application programs, you can also use it to run DOS applications if you have a DOS emulator installed on your system. This chapter discusses using the Wabi program to install and run DOS applications after you have a DOS emulator installed.

If you are not familiar with the installation and use of DOS emulators and applications under the Wabi program and would like to learn more about it, read the next section, “About DOS Applications.”

If you want instructions for specific tasks related to DOS application installation or use, use the table below to locate the instructions you need.

Task	Page
<i>Entering a DOS Emulator Startup Command</i>	182
<i>Starting a DOS Emulator in the Wabi Environment</i>	182
<i>Installing a DOS Application</i>	183
<i>Creating a DOS Program Group</i>	183
<i>Creating a DOS Program Item</i>	183
<i>Starting a DOS Application</i>	184

About DOS Applications

The Wabi program cannot run DOS-based applications by itself, but it does provide a method for running them that is similar to the method used for running Microsoft Windows applications. However, you must have a DOS emulator installed on your system before you can run DOS applications through the Wabi program. A DOS emulator is a program that simulates a DOS environment while running in another operating system.

The advantage to using the Wabi program to run DOS applications, rather than using a DOS emulator alone, is that the Wabi program lets you group your DOS applications as you do with your Microsoft Windows applications, and start them by opening an icon. You do not have to create a program information file (PIF) to run a DOS application through the Wabi program. Once you have a DOS emulator installed and connected to Wabi, installing and using DOS-based applications is as easy as installing and using Microsoft Windows applications.

Preparation for Using DOS Applications

To use DOS applications with the Wabi program, you must prepare your Wabi environment to be able to use DOS applications. The tasks are divided here into tasks you do one time only, and tasks you do once for each DOS application you want to use through the Wabi program. Instructions for the tasks are included later in the chapter. See the margin notes for references to related information.

One-Time Tasks

To set up the Wabi program for installing and running DOS applications, you must:

- Install a DOS emulator if you do not have one already installed.
- Connect the DOS emulator to the Wabi program through the DOS icon in Configuration Manager.

For information on installing a DOS emulator, read “DOS Emulator Installation” on page 173.

Read “DOS Emulator Connection” on page 174 for detailed information about connecting the DOS emulator.

Tasks Done Once for Each DOS Application

To install a DOS application after you've set up for using DOS applications:

- Start the DOS emulator.
- Install the DOS application from the DOS session, following the DOS application's instructions.
- Create a program item and, optionally, a program group.

"Creating a DOS Program Item" on page 183 gives detailed steps for creating an application icon.

After you have done these tasks, you do not have to start the DOS emulator before starting a DOS application. The Wabi program does it for you.

DOS Emulator Installation

You do not use the Wabi program to install a DOS emulator. You should install the emulator using the instructions provided with it. Make note of the path and command needed to start it, along with any parameters to the command that you might want to use.

Before you use the emulator with the Wabi program, make sure it is correctly installed, and you are able to run it by entering a command in the operating system.



Caution – Drive mappings (for emulated hard drives, or virtual drives) that you use in the DOS emulator must match the drive mappings you use in the Wabi program (except for drive C, and possibly D, which are likely to be permanently assigned by the DOS emulator). If the drive letters do not connect to the same file system or directory on the host computer, the emulator may not work correctly. See Chapter 4, "Setting Up Drives," for more about drive mappings.

As the caution specifies, you must coordinate the drive mappings that you assign in the Wabi program with the drive mappings you assign in your DOS emulator. For example, if you have assigned Wabi drive G to the native operating system directory, `/home/blue/green`, the DOS emulator drive G must also be assigned to `/home/blue/green`. If drive G is not mapped identically in both programs, an error will occur if an application running under the DOS emulator tries to access drive G through the Wabi program.

Before you run a DOS application through the DOS emulator under the Wabi program, check all drive mappings in both the DOS emulator and Wabi to be sure they are consistent.

The DOS Emulator's Drive C

The DOS emulator's drive C cannot be mapped to a Wabi drive because it is likely a special file that the Wabi program cannot access. You should store any files you want to use in both the Wabi program and the DOS emulator in your home directory. Make sure both programs connect the same drive (H, for instance) to your home directory. If you want to use the Wabi program and your DOS emulator to run applications installed in your DOS emulator's drive C, you should:

- Start the DOS emulator.
- Map a DOS emulator drive to your home directory if you don't already have one.
- Copy the application directories and files from drive C to the drive connected to your home directory.
- Start the application from the drive connected to your home directory to make sure the application runs correctly.
- When you are sure the application runs correctly, delete the application files from drive C.

Then, both programs can access the files through the same drive letter.

DOS Emulator Connection

For instructions on connecting a DOS emulator, read "Entering a DOS Emulator Startup Command" on page 182.



The Wabi program must know the UNIX command used to start your DOS emulator. You provide this information by running Configuration Manager and choosing the DOS icon. Indicate in the DOS Emulator Connection dialog box, shown in Figure 12-1, your DOS emulator's UNIX path name, startup command, and startup parameters. Once your DOS emulator is functional under the Wabi program, you can use it to install and run a DOS application.

When you run WabiServer and use SunPC as your DOS emulator, you must use a remote shell command to run SunPC on your local system because SunPC should not be run remotely. Use the DOS emulator command format `rsh client-name /pathname/sunpc`



If you use a DOS emulator that can be run remotely, the emulator's path must be the network-aware path, or the path as seen from the WabiServer system. If the DOS emulator is located on your client system, you must share or export the file system containing the emulator so the WabiServer system can access it. See your Solaris documentation or your system administrator for information about sharing file systems.

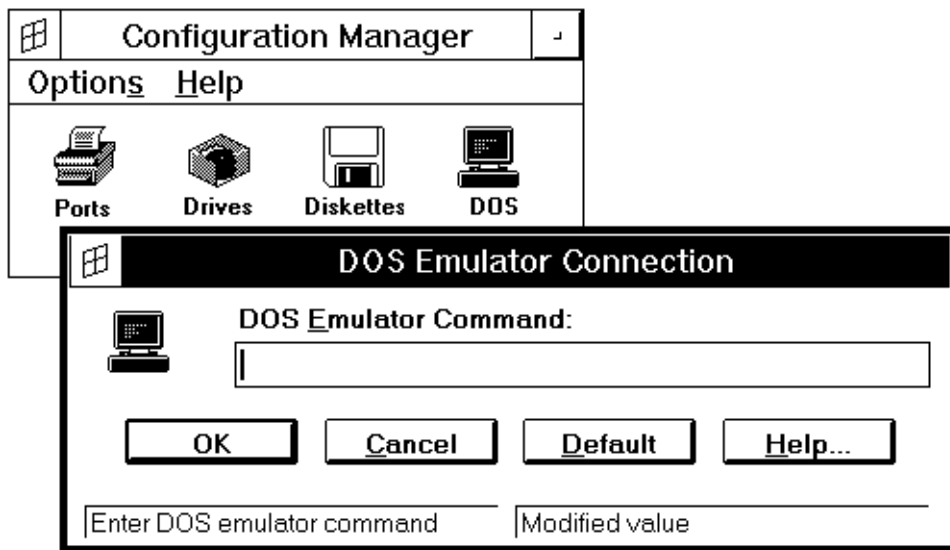


Figure 12-1 DOS Emulator Connection Dialog Box

In the DOS emulator command, you should include three placeholders for parameters that enable the Wabi program to start a DOS application running under the DOS emulator:

- %d – This placeholder is used with the `-display` switch of the emulator command. (The `-display` switch works with most X-based DOS emulators.) Including %d with the `-display` switch makes the DOS session appear on the same display screen as the Wabi window. The Wabi program replaces %d with a display name. If you start the Wabi program with the `-display` switch, the same remote host display name is substituted for %d in the DOS emulator command. If you do not start the Wabi program with the `-display` switch, %d is replaced by the name specified by the `DISPLAY` variable in your UNIX environment.

See “Displaying the Wabi Program on a Remote System” on page 30 for instructions for setting the `DISPLAY` variable.

- `%f` – This placeholder is used as a parameter for a DOS emulator switch that starts a DOS program. Including `%f` with a switch in the command line allows you to start a DOS application through the Wabi program using the Run menu item or by double-clicking the program’s icon. The switch you use with `%f` is specific to the emulator. It is likely to be `-c` or `-s`. The Wabi program replaces `%f` with the name of an executable DOS program. The Wabi program uses the name of the executable file that you supply when you create a program item for the application, or when you run the application through the Run item in Windows Program Manager’s File menu.
- `%c` – This placeholder is used to specify more parameters to the DOS emulator switch that starts a DOS program. Including `%c` allows you to specify an argument such as a file name or some other parameter used in the DOS command line to start the DOS application. You should use `%c` only if you use the `%f` placeholder. The Wabi program replaces `%c` with the remainder of the DOS command line that follows the `.EXE` command.

For example, suppose you want to run a DOS application called `CLEANUP.EXE` on a file called `PRICE.LST`, and you want to send the display to the same system where you are displaying the Wabi program. The DOS command line you normally use to run this program on `PRICE.LST` looks like this:

```
CLEANUP.EXE PRICE.LST /X /Y
```

Your DOS emulator command must include the `%f` and `%c` placeholders so the Wabi program can pass the DOS command line as arguments to the UNIX command that starts the DOS emulator. Wabi uses the `CLEANUP.EXE` file name in the `%f` placeholder, and the `PRICE.LST` file name and `/X` and `/Y` parameters in the `%c` placeholder.

In the example below, the `-c` switch instructs the emulator to execute the command that follows (`CLEANUP.EXE PRICE.LST /X /Y`, for example). If your DOS emulator is called `myemulator`, the DOS emulator command might look like this:

```
/usr/myemulator -display %d -c %f %c
```

The `-c` switch is just an example; your emulator may require a different switch for passing commands. See the emulator’s documentation for information about command-line switches.

Note – If you do not include the complete path name to the emulator's executable file, you must have the DOS emulator directory in your UNIX search path. The default emulator command that the Wabi program provides assumes your path includes the emulator directory.

DOS Sessions

After make your DOS emulator connection, you can run DOS sessions as you would in the Microsoft Windows environment on a PC. The Main group includes an MS-DOS Prompt icon. When you open the icon in the Wabi environment, the DOS emulator starts.

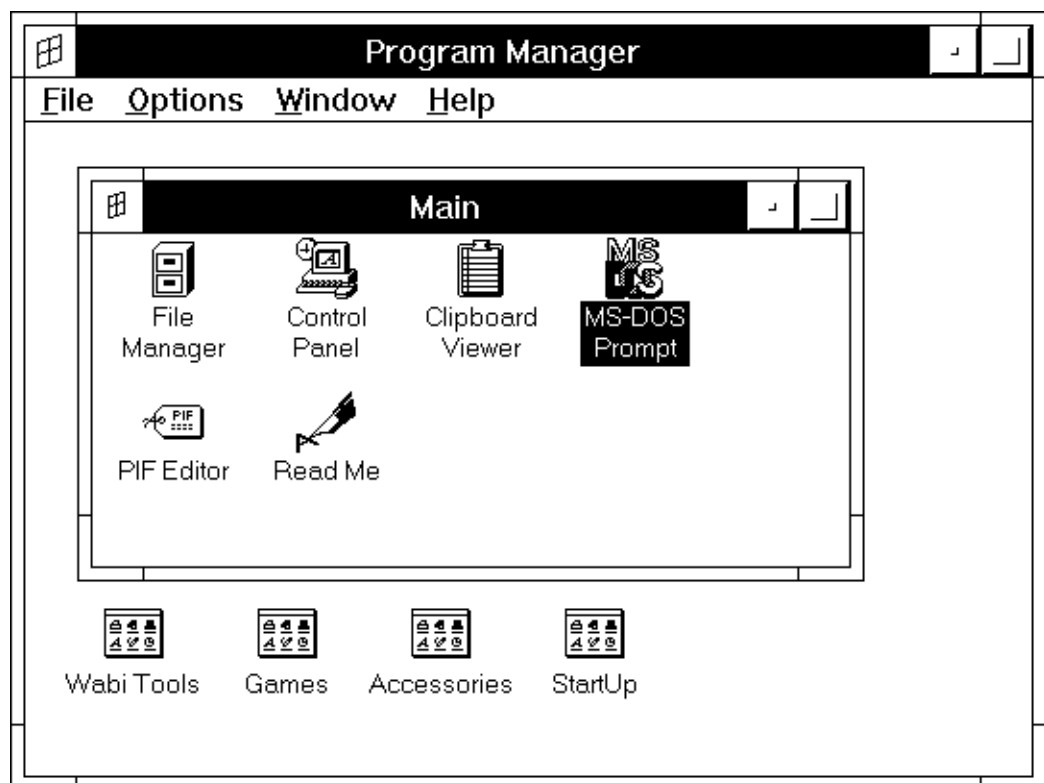


Figure 12-2 MS-DOS Prompt Icon in the Main Group

The DOS emulator starts in its own window, so you still have access to the Wabi window, your Windows applications, and your UNIX desktop applications.

DOS Application Installation

After you install the DOS emulator, you can install DOS applications using the DOS emulator. You can start the emulator from the operating system, or open the MS-DOS Prompt icon in the Main group. Once you are running a DOS session, proceed to install the DOS application as indicated in the application's installation instructions.



Caution – You should not install any applications in the Wabi drive C or the DOS emulator's drive C. You should connect drives for both programs to the same directories in your UNIX file system, and install applications in those drives. If you want the Wabi program to access files already stored in your DOS emulator's drive C, read “The DOS Emulator's Drive C” on page 174.

Create a Program Group and Item for a DOS Application

After the application is installed, you should create a program group and item for the application so you can start it within the Wabi program by opening an icon. Microsoft Windows applications create their own program groups and items when you install them, but DOS applications do not because they are not designed to run in a window environment.

You can create program groups and items for DOS applications the same way you create them for Microsoft Windows applications, using the New option in Program Manager's File menu.

When you choose New in the File menu, the New Program Object dialog box opens as shown in Figure 12-3.

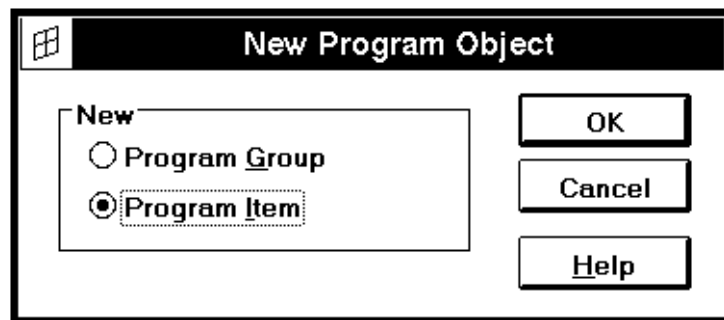


Figure 12-3 New Program Object Dialog Box

See “Creating a DOS Program Group” on page 183 for the steps required.

For the steps to make a program item for a DOS application, see “Creating a DOS Program Item” on page 183.

You use this dialog box to create groups and items. To create a group, select Program Group and enter a Description in the Program Group Properties dialog box that opens.

To create a program item that represents a DOS application, you choose the Program Item button in the New Program Object dialog box. When you do, the Program Item Properties dialog box shown in Figure 12-4 opens.

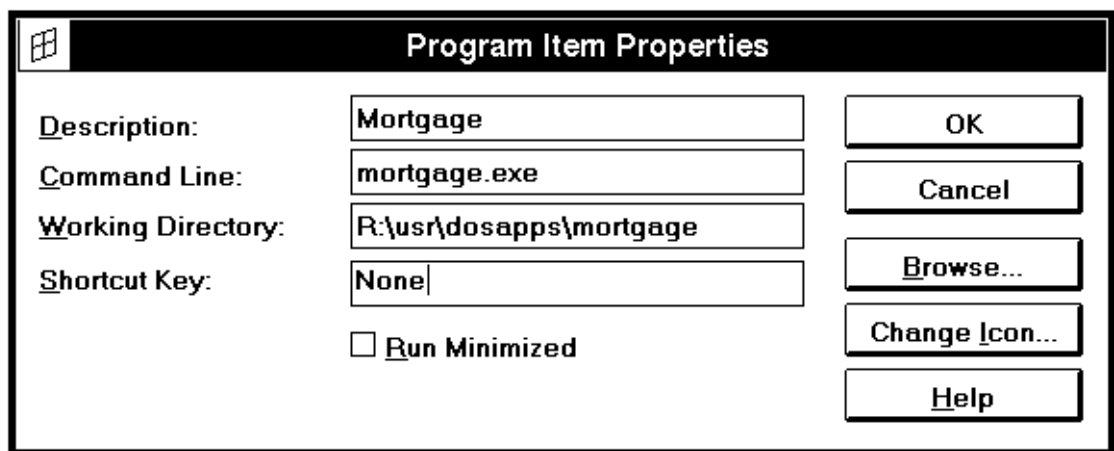


Figure 12-4 Program Item Properties Dialog Box

Note that for a DOS application, the command you enter in the Command Line entry field is the same command you would use to start the application in DOS. It must be in DOS format and include the Wabi drive location, and may include parameters or switches. Do not include the DOS emulator command. When you start the application from the icon, the Wabi program detects that the application requires DOS, starts your DOS emulator, and passes the command you enter here.

Microsoft Windows applications generally have icons associated with the executable files, but DOS executables do not. When you create a program item for a DOS application, the Program Manager uses a generic icon indicating that the program is a DOS program. However, you can use a different icon if you like. The Change Icon button opens a dialog box that lets you select a different icon image to represent the application when it is minimized or displayed in a group window.

Note – DOS applications used with a DOS emulator through the Wabi program do not use a Program Information File (PIF).

To Run a DOS Application

To run an installed DOS-based application, you must have a DOS emulator configured to run with the Wabi program. See “DOS Emulator Connection” on page 174 for more about setting up and using a DOS emulator.

You can use the Wabi program to start DOS applications the same way as Microsoft Windows applications—either through Program Manager’s Run item on the File menu or by opening an icon.

An Application’s Startup Command

See “Starting a DOS Application” on page 184 for the steps required.

You can run a DOS application with the File menu’s Run option in Program Manager by entering in the Run dialog box the command to run the application. This is the same command you would use to run the application on a PC running DOS, except that the drive letter indicates a path in your UNIX file system.

To run a DOS application, open the File menu and choose Run. The Run dialog box opens, as shown in Figure 12-5.

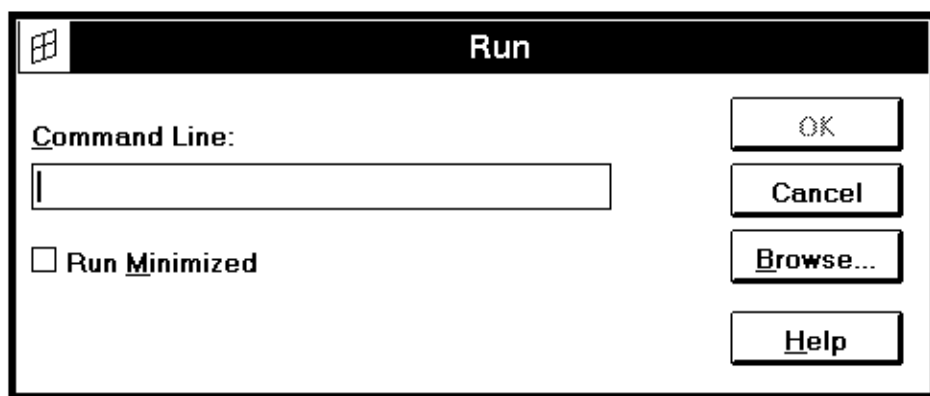


Figure 12-5 Run Dialog Box

The Command Line entry field in the Run dialog box is where you tell the Wabi program the location and name of the application's startup command.

When you choose OK, the Wabi program detects that the application requires DOS, starts your DOS emulator, and loads and runs the DOS application.

A DOS Application's Icon

See "Create a Program Group and Item for a DOS Application" on page 178 if you want to create an icon for a DOS application.

The simplest way to use a DOS application under the Wabi program is by double-clicking an icon representing the application. When you open the icon, the Wabi program detects that the application is a DOS application, starts your DOS emulator program, and the DOS emulator runs the DOS application.

Instructions for Tasks Related to DOS Applications

This section provides detailed, step-by-step instructions for performing a variety of tasks related to the installation and use of DOS-based applications.

▼ Entering a DOS Emulator Startup Command

1. Open the Control Panel.

1. Open the Wabi Config icon.
Configuration Manager opens.

2. Open the DOS icon.
Alternately, open the Options menu and choose DOS or press Alt, s, d.

The DOS Emulator Connection dialog box opens.

3. Enter a path name, startup command, and optional placeholder parameters for your DOS emulator.

This is the command you would use to start the emulator in your native operating system. If you do not include the complete path name to the executable file, you must have the DOS emulator directory in your path in the UNIX environment. Note that the default emulator command the Wabi program provides assumes your path includes the DOS emulator directory.

4. Choose OK to save your settings.

The DOS Emulator Connection dialog box closes and your entry is validated. An error box appears if the entry is invalid. Follow the instructions in the error box or on-line Help to clear the error condition.

Read "DOS Emulator Connection" on page 174 for more information about the startup command and placeholders in the command.

"Entry Validation" on page 52 discusses when and why your entries are validated.

▼ Starting a DOS Emulator in the Wabi Environment

1. Open Program Manager.

2. Open the Main group.

3. Open the MS-DOS Prompt icon.

The Wabi program runs the DOS emulator configured in your Wabi environment.

▼ Installing a DOS Application

Read “DOS Emulator Connection” on page 174 for more about setting up and using a DOS emulator program.

1. **Configure a DOS emulator for use with the Wabi program, as explained in “Entering a DOS Emulator Startup Command” on page 182.**
2. **Start the DOS emulator, and install the DOS application as described in the application’s documentation.**

▼ Creating a DOS Program Group

1. **Open Program Manager.**
2. **Open the File menu and choose New.**
The New Program Object dialog box opens.
3. **Select Program Group and choose OK.**
The Program Group Properties dialog box opens.
4. **Enter a description.**
This text will appear below the group icon. You should enter something that indicates this group is for DOS applications.
5. **Enter a group file name.**
Make this entry only if you want the group file name to be different from the identifier entry.
6. **Choose OK.**
A group window with the name you specified opens. You can now create icons for DOS applications in this group.

▼ Creating a DOS Program Item

“A DOS Application’s Icon” on page 181 provides more information about creating icons for DOS applications.

1. **Open Program Manager.**
2. **Select or create a group in which you want to place a DOS application.**
3. **Open the File menu and choose New.**
The New Program Object dialog box opens.
4. **Select Program Item and choose OK.**
The Program Item Properties dialog box opens.

Figure 12-4 on page 179 shows this dialog box, along with information about completing it.

5. **Enter the appropriate information in the Program Item Properties dialog box.**
The text you enter in the Description field appears under the icon.
6. **Choose OK.**
An icon representing the DOS application appears in the group selected in Step 2.

▼ Starting a DOS Application

- ♦ **Open the icon representing the DOS application.**
The DOS emulator starts and loads the DOS application.
- or
- ♦ **In Program Manager, open the File menu and select Run, then enter the path and DOS command to run the DOS application.**

Reference Material for Tasks Related to Using DOS Applications

This section provides reference material for tasks related to installing and running DOS-based applications.

Troubleshooting DOS Application Problems

Table 12-1 suggests solutions to problems you might experience during DOS application installation and use.

Table 12-1 DOS Application Problems and Solutions

Symptom	Possible Cause	Solution
DOS emulator will not start.	DOS emulator not installed on system.	You must install the DOS emulator onto your UNIX system before you can use it through the Wabi program.
	The Wabi program cannot locate the DOS emulator program.	Specify a full path name in the startup command, even if the emulator's directory is on your UNIX path. See page 174 for more information.

Table 12-1 DOS Application Problems and Solutions (Continued)

Symptom	Possible Cause	Solution
	Improperly configured startup command string.	Make sure you can start the emulator from a UNIX command line first. Use this UNIX command as the basis for your startup command string, with placeholders inserted if necessary. See page 174 for more information.
Installed DOS program does not appear in any group.	No icon created for this application.	You must create a program item for a DOS application. See page 181 for more information.
DOS application won't install or run.	DOS emulator not installed, or not configured correctly.	See the DOS emulator documentation to make sure you have installed and configured the emulator correctly. See page 174 for information about connecting it to the Wabi program.
Can't start DOS application by opening its icon.	Missing placeholders in DOS emulator startup command or DOS emulator not in UNIX path.	Make sure you have inserted the correct placeholders in the DOS emulator connection. Use a full path in the emulator command if the directory is not in your UNIX path. See page 174.
	The path specified in the Command Line, or the Working Directory may no longer be valid.	If the DOS application files have been moved, or if you have changed the Wabi drive connection to the directory, the Program Item Properties must be changed. See page 179 for information about the Program Item Properties dialog.
Application not fully functional.	Application function incompatible with DOS emulator or X Window system.	See documentation for the DOS emulator for known problems. Also see any supplemental documentation included with your Wabi software.

Wabi File Layout



This appendix discusses the structure and file layout of the Wabi software. This hierarchy of directories and files provides the Wabi program with the resources it needs to run your applications. There are two main areas in this file layout:

- **The Wabi system directory** – This area is created when you install the Wabi software from the distribution media. The directories within this directory contain UNIX executable and binary files, many of which are copied into other directories. The default location of the Wabi system directory depends on your operating system. It could be `/usr/wabi`, `/usr/lpp/Wabi`, `/opt/SUNWwabi/wabi`, or some other directory. The installation instructions you received with the Wabi software indicates the location. This appendix describes the file layout at the level of the Wabi system directory and below.
- **The `$HOME/wabi` user directory** – This area is created within your home directory the first time you start the Wabi program. (However, if you set the `WABIDIR` variable, your `wabi` user directory may be located elsewhere.) The directory is expanded and modified as you install applications. The directories located within this directory contain resource, program, and initialization files. Symbolic links in this directory point to other locations.

In addition to these directories, the Wabi program uses initialization (`.ini`) files to provide application compatibility and to control program configuration. Initialization files are located in the `$HOME/wabi/windows` directory. By changing settings in these files, you can change various Wabi configuration items. Initialization files are discussed in “Initialization Files” on page 190.

Wabi System Directories and Files

A system of directories and files is created during the first phase of installation. These directories and files contain UNIX binary programs and other executable files. Table A-1 lists the directories created during the installation process on all operating systems. Do not alter these directories or files within them in any way unless you are following a procedure documented in this manual.

Table A-1 Wabi System Directories and Files

Name of Directory	Directory Contents
bin	The Wabi program's UNIX executable files and scripts, such as wabi (the Wabi startup script), wabiprog (the main Wabi executable), and wabifs (the Wabi font server).
drv	Files related to the Wabi kernel driver, which provides file locking in the Solaris environment. The clearlocks program is located in this directory.
icons	Icon image files used in the Solaris environment.
lib	Internal Wabi scripts and image files, and the locale subdirectory which contains language-specific Wabi files.
man	Text pages displayed when you enter the man wabi command.
printers	Drivers, initialization files, and help files for HP LaserJet III and Epson printers.
wbin	Wabi utility programs, executable files, libraries, and initialization files.

Your Wabi system directory may contain additional directories specific to your operating system.



The *WabiServer Administrator's Guide* includes the file layout for the WabiServer client and server packages.

\$HOME/wabi *Directories and Files*

The first time you start the Wabi program, it creates a system of directories and files within a `wabi` subdirectory in your home directory. Table A-2 lists the directories and files created the first time you start the Wabi program.

Table A-2 \$HOME/wabi Directories and Files

Name of File or Directory	Function
<code>autoexec.bat</code>	This file is required to complete the installation of application programs that modify it automatically. This file may contain PATH statements that Wabi uses to locate installed applications, and SET statements for setting environment variables used by applications. PATH and SET commands are the <i>only</i> commands that Wabi uses in your <code>autoexec.bat</code> file. If you add other commands, Wabi ignores them.
<code>config.sys</code>	This file is required to complete the installation of application programs that modify it automatically. The Wabi program ignores all statements in this file.
<code>fc</code>	In Wabi 2.0 and earlier, this directory contained font information for your display. This information is not needed in Wabi 2.1, so if you have this directory you can safely delete it.
<code>tmp</code>	This directory is required by some application programs. The directory contains no Wabi files, and may contain nothing at all, but you should not delete it.
<code>wabihome</code>	This file is a link to the Wabi system directory.
<code>windows</code>	This directory contains Microsoft Windows files and Wabi program resource and initialization files. The directory also contains links to various executable files residing in the Wabi system directory. Several <code>.ini</code> files are also stored in this directory; they are described in “Initialization Files” on page 190. The directory may also contain initialization files installed by applications.
<code>windows/system</code>	This directory contains font files and dynamic link libraries (<code>.dll</code>) installed with Microsoft Windows, and utilities and files related to installed printer drivers. Some files are links to files in the Wabi system directory. The directory may also contain font files and dynamic link libraries installed by applications.

Initialization Files

Initialization (.ini) files are contained within the \$HOME/wabi/windows directory. These files are used to control certain configuration items for the Wabi program and Microsoft Windows programs. Some of these files are updated automatically by the applications you install. When you install applications, the installation programs may add .ini files for the applications to this directory. Table A-3 lists initialization files and the functions each provides.

Table A-3 Initialization Files

Name of File	Function of File
win.ini	This file provides compatibility with Windows applications (many applications modify it automatically at the time of installation). This file also stores the window color settings you make from Control Panel. You should not edit this file unless instructed to do so.
system.ini	This file provides compatibility with Windows applications.
wabi.ini	This file is used to store Wabi-specific settings that you make through Configuration Manager. This file also stores default system settings for various operating system platforms. In general, you should not edit this file. Make all changes through Configuration Manager.
progman.ini	This file is used by Program Manager. It maintains lists of groups and their contents and other miscellaneous settings. Do not edit this file.
control.ini	This file is used by Control Panel to store your Wabi environment settings.

Color From Windows to Wabi



The subject of color handling in Microsoft Windows and the X Window System is a complicated one. This appendix gives a brief overview of the major features, and some specific information on how to influence color behavior when using the Wabi program.

A good source of detailed information about X Window color handling is the *Xlib Programming Manual* by O'Reilly & Associates, Inc.

Color Palettes and Maps

Many popular color display devices are able to generate thousands or even millions of different colors, but can display only 256 or fewer colors at one time. Because of this, the colors available for display at a given time must be defined and listed, or *allocated*, in a place where the window system can look them up. Colors are identified by *RGB* values, which are numbers that indicate the amounts of red, green, and blue light needed to produce the color. Microsoft Windows and X Windows both use a table of RGB values stored in memory to determine what colors are available for use. Microsoft Windows calls its table of colors a *color palette*, and X Windows calls it a *colormap*. Each entry in the table is called a *color cell*, and specifies the RGB values for a particular color. Each pixel on a display is assigned a number corresponding to a color cell, and the RGB value stored in the color cell determines the color displayed by the pixel.

Microsoft Windows and X Windows each use a color table that is hardware-dependent, so the color tables vary from one display type to another. Both window systems also let applications provide their own color tables, and here is where color handling in the two systems differs markedly.

Microsoft Windows Color Allocation

Microsoft Windows tries to match the colors in an application's color palette, called the *logical palette*, to colors already allocated in the default palette. Windows uses one of two methods for handling this. The method chosen depends on the particular display type.

For some displays, Microsoft Windows uses a single color palette, one that cannot be changed. If an application requests a color that is not in the palette, Windows either uses the closest color it can find in the palette, or approximates the color by making a pattern composed of pixels of different colors. For example, a light yellow might be approximated using a checkerboard pattern of bright yellow and white. This is called *dithering*. Usually, if the color is for a line, Windows uses the closest color. If the color is for filling a shape, Windows dithers the color.

For other displays, Microsoft Windows uses a palette manager, which can change colors in the default palette. If an application requests a color that is not in the palette, and an unallocated color cell exists, the color is added to the palette. If there are no more unallocated color cells, Windows either matches the logical palette color to the closest color it can find in the default palette, or dithers it.

Because all windows running in Microsoft Windows use the default palette, Windows allocates colors for the active window first, to make sure its colors are correct. The inactive windows could potentially show some colors that are not exactly what the application requested. However, for the most part, colors in inactive windows are close to what is intended.

X Windows Color Allocation

X Windows color handling is more complex, and varies with the display type and the capabilities of the X server, a program that controls all aspects of the display for X applications. It usually supports several color handling methods, called *visuals*.

The X server has a default visual, the method used to handle color when an X application does not request a specific visual. The Wabi program uses the X server's default visual whenever possible.

On the most common types of color display, 8-bit or 8-plane, the usual default is a visual called *PseudoColor*, which is therefore the visual that the Wabi program uses most often.

Eight-plane displays generally have one hardware colormap, into which the X server loads a default colormap when it first starts up. The default X colormap is changeable, so X applications can change individual color cells in the default colormap to allocate colors they need.

X applications can also provide their own colormaps, called *virtual colormaps*, which are loaded into the hardware colormap. The X server can maintain more than one virtual colormap at the same time, but only one can be used in the hardware colormap at any given instant. This means that if the active application swaps in its own colormap, all other (inactive) applications' windows must use this same colormap. As a consequence, the color cells assigned to pixels might now contain colors completely different from those intended, resulting in undesirable color schemes for the inactive windows.

As you change focus from one window to another, colors flash as each application's colormap is loaded and used by all running applications.

To minimize color flashing, only color-intensive X applications use virtual colormaps. The Wabi program is a color-intensive X application by virtue of the many color-intensive Windows applications it runs, so color flashing can be a problem, but you can alleviate it by controlling certain aspects of the Wabi colormap.

The Wabi Colormap

When the Wabi program uses *PseudoColor* visuals, it creates a virtual colormap but tries to retain many of the colors already allocated in the default colormap. This reduces the number of colors that might be changed for other X applications that are running.

When the Wabi program starts, it uses the current default colormap as the starting point for creating a virtual colormap. First, the Wabi program changes some of the color cells in the default colormap to provide a range of colors needed for the Windows applications you may subsequently run. It allocates

49 colors — seven shades of each of the seven solid colors (red, green, blue, cyan, magenta, yellow, and gray). In addition, it allocates 15 more colors — five shades of each of the primary colors (red, green, and blue). Some of these additional reds, greens, and blues may be duplicates of the 49 shades of solid colors, so the total number of colors allocated may be something less than 64 colors. On an eight-plane display (which has 256 colors in its colormap), this leaves the majority of colors in the default colormap unchanged. Wabi then copies the changed default map into its own virtual colormap. Finally, the Wabi program frees half of the color cells it allocated in the default colormap so that they can be allocated by other X applications.

Wabi Color Variables

“Where to Set Color Variables” on page 198 explains where to set the variables in `win.ini`.

The Wabi program provides variables that influence how the Wabi colormap is created and how Wabi affects the default X colormap. One variable, `Technicolor`, affects Wabi on all display types. The other variables depend on `Technicolor` being set to 0, and apply only when Wabi is using the 8-bit PseudoColor visual. You set the variables in your `win.ini` file.

Technicolor Variable

The `Technicolor` variable allows you to make a trade-off between color flashing, or “technicolor,” and flexibility in allocating and changing colors in Microsoft Windows applications running in the Wabi program. If you want applications running in the Wabi program to be able to allocate all the colors they want, you can set `Technicolor=1`, and put up with color flashing in inactive X windows. If it does not matter if applications in Wabi get the exact colors they want, you can set `Technicolor=0`, and color flashing is minimized as Wabi tries to share colors with other X applications.

The default value is 0 (color flashing off), unless there is more than one hardware colormap for the display screen. If there is more than one hardware colormap, it is assumed one will be available for Wabi, and the value defaults to 1.

When `Technicolor=0`, Wabi allocates colors from the default X colormap and then copies them to the Wabi colormap, as described in “The Wabi Colormap” on page 193, in an attempt to share as many colors as possible.

When `Technicolor=1`, Wabi uses a standard X colormap as its colormap. This often causes color flashing on 8-bit displays when you switch between Wabi windows and other X windows.

If your X server has more than one hardware colormap, but the colormaps are normally already in use by other X applications when you start Wabi, you can set `Technicolor` to 0 to alleviate color flashing.

If your X server has one colormap, as is the case with most 8-bit displays, you may set `Technicolor` to 1 to give Wabi, and the Windows applications running under it, the most flexibility in allocating and changing color. If you need the color flexibility and find that color flashing is annoying, try maximizing the Wabi window when you use the Windows application. This prevents the mouse pointer from drifting into other X application windows and causing their colormaps to be swapped in.

Other Color Variables

The other Wabi color variables affect Wabi only when it uses 8-bit PseudoColor visuals (on 8-bit and 24-bit displays) and `Technicolor` is set to 0. You can see if Wabi is using 8-bit PseudoColor by running the X program `xwininfo`, which should be present on most UNIX systems with X windows.

In a UNIX window, type the following command:

```
xwininfo
```

and then select the Wabi window when prompted.

Look for the following lines:

```
Depth:8  
Visual Class: PseudoColor
```

If you see these lines, you can use the variables in Table B-1 on page 196.

If `xwininfo` is not available, use the `xdpyinfo` command. This displays information about your X server, including the visuals that are available.

In a UNIX window, type the following command:

```
xdpyinfo | grep class
```

If you see the class `PseudoColor`, you can use the variables in Table B-1 on page 196.

Table B-1 Variables for 8-Bit PseudoColor Visuals

Variable	Description
PercentFree= <i>n</i>	<p>When <code>Technicolor=0</code>, <code>PercentFree</code> specifies how much of the default X colormap Wabi should free up after allocating its colors. The range of acceptable values is 0 through 100, with a default of 50, which means Wabi frees 50% of the color cells.</p> <p>Setting <code>PercentFree</code> higher could reduce color flashing as you activate and deactivate the Wabi window, because the other X windows use most of the colors that were in effect when they started. However, setting <code>PercentFree</code> to 100 means Wabi frees all the color cells it allocated, which leaves the same number of free color cells as there were before Wabi started. This may cause flashing as the default X colormap and the Wabi colormap are swapped in and out.</p> <p>Setting <code>PercentFree</code> lower reduces the chance that other X applications will find insufficient free color entries available. If an X application does not find enough free color cells, it may display incorrect colors, return an error message, or detect that the default X colormap is too full and swap in its own virtual colormap. This causes more color flashing when you move the mouse out of the X application's window.</p>
SolidColorCount= <i>n</i>	<p>When <code>Technicolor=0</code>, this variable defines how many shades of each of the seven colors (red, green, blue, cyan, magenta, yellow, and gray) are allocated. A total of 7 shades x <code>SolidColorCount</code> colors are allocated. The range of acceptable values is 1 through 16, with a default of 7. Set this variable higher to let Wabi allocate more colors so that applications running under Wabi don't find it necessary to allocate new colors.</p> <p>Set this variable lower if most colors have already been defined by X applications before Wabi starts, or if you will be manually defining all your colors anyway (through a "paint" program, for example).</p>

Table B-1 Variables for 8-Bit PseudoColor Visuals (Continued)

Variable	Description
RedCubeCount= <i>n</i>	When Technicolor=0, these three variables define the dimensions of the red, green, and blue components of the color cube. The color cube comprises the additional reds, greens, and blues that Wabi adds to its colormap. These variables allow you to alter the number of reds, greens, and blues, respectively, that will be used in the Wabi colormap. The range is 4 through 9, with a default of 5.
GreenCubeCount= <i>n</i>	
BlueCubeCount= <i>n</i>	
You can adjust these variables if you find that Windows applications you run need more colors of a particular shade. These variables usually do not affect color flashing.	

Variable for a 24-Bit Display

The Wabi program does not support 24-bit TrueColor displays directly. However, some X servers that run on 24-bit displays can simulate an 8-bit PseudoColor device. The Wabi program uses an 8-bit PseudoColor visual on 24-bit displays that support PseudoColor, so all the variables described above apply to such 24-bit displays as well as 8-bit displays.

An additional variable, `UseRootWindow`, may be useful if you find Wabi has problems drawing to your 24-bit display. `UseRootWindow=n` tells whether or not Wabi can draw to and read from the root window (the “background” window of the desktop). The default value is 1 (yes), unless the Wabi colormap and the default colormap are of different sizes, in which case the default is 0 (no).

Most users will never need to set `UseRootWindow`, and should not set it because it may cause problems, especially on 8-bit displays. You should only consider using it if you are using a 24-bit display and Wabi appears to be having problems drawing to the screen (windows and icons do not look right, for example).

If you are experiencing such problems, experiment with `UseRootWindow` to see if it alleviates them. If this does nothing, or makes the drawing worse, remove the variable entirely.

Where to Set Color Variables

To set Wabi color variables, edit your `$HOME/wabi/windows/win.ini` file and add them. None of the variables appear in `win.ini` as shipped in the Wabi program.

If you want the variables to affect your running of Wabi on any display you use, set the variables in the `[ColorMap]` section in `win.ini`. For example, if all displays you use are 8-bit, set the variables in the `[ColorMap]` section.

If you run Wabi on more than one display and you want the variables to affect Wabi only on a particular display, create a section whose title is the display name and set the variables in that section. For example, to apply the variables to Wabi only when you display it on the display `jethro:0.0`, create a section called `[jethro:0.0]`.

The Wabi program reads the `[ColorMap]` section first, and then the `[host:0.0]` sections, so that variables set in `[host:0.0]` sections supercede variables set in the `[ColorMap]` section for the specified displays. If you set the same variables in both sections, the `[host:0.0]` variables are used for those displays. This may be helpful if you use multiple displays and one of them is 24-bit, for example. You could set variables specific to the 24-bit display by creating a `[host:0.0]` section, and set variables for all 8-bit displays in the `[ColorMap]` section.

Fonts From Windows to Wabi



This appendix describes some aspects of font handling in Microsoft Windows and in the Wabi program, so you can better understand how the Wabi program implements fonts used by your applications. It does not fully describe either system's font handling.

Why Does Wabi Convert Fonts?

Fonts used in Microsoft Windows applications are described in font resource files, usually stored in `C:\WINDOWS\SYSTEM` with file name extensions such as `.FON` and `.TTF`. These files contain either the actual images of fonts and detailed numeric information about them, or precise information about how to create the font images.

The X Window System cannot use the Microsoft Windows font images or font information directly because it expects font information in a different form. The Wabi program must convert the font information so that the X server can use it to display the desired fonts.

On X Window systems using the X11R5 protocol (or a more recent version), the Wabi program uses the Wabi font server, which speeds up the conversion process so that the X server can display the fonts faster.

Font Display Types

Three font display types are relevant to applications running in Microsoft Windows and the Wabi program: bitmap fonts, outline fonts, and vector fonts.

Bitmap fonts are stored as graphic images of characters, with each point size of a typeface stored as a separate font. Generally, in Microsoft Windows, the fonts used in dialog boxes and in an application's screen displays are bitmap fonts. Bitmap fonts can be *scaled* (displayed in smaller and larger point sizes) but a scaled bitmap font may display with poor resolution.

A bitmap font displayed on the screen is not the same font used by a printer. Most WYSIWYG ("what you see is what you get") applications running in the Microsoft Windows or Wabi environment only use bitmap fonts that can be matched to a printer font on the printer you are currently set up to use. The font used by the printer, while not the same as the bitmap font shown on the screen, usually looks nearly identical. For example, if you use the font Courier 10 in your document, you see a bitmap Courier 10 on the display. When you print your document, you see the printer's version of Courier 10.

Outline fonts are produced from stored information about the shape, or outline, of the font. Outline fonts scale better because the information about the shape is independent of the size. In both Microsoft Windows and X Window environments, different font sizes are created by calculating the new size and reproducing the exact shape of a character in the new size. TrueType™ fonts and many X Window fonts, including those used by Adobe PostScript, are outline fonts.

Outline fonts can be used both on the screen and on the printer. If you are using a printer that can handle outline fonts in either Microsoft Windows or Wabi environments, the outline information is passed to the printer and the printer creates the raster images. If you are using a printer that cannot handle outline fonts, Microsoft Windows or Wabi creates the raster images and sends them to the printer. In either case, the fonts are the same printed and on the screen.

Vector fonts (or plotter fonts) are stored as lists of vectors to be drawn in sequence to generate each character. Although they are easily scalable, their appearance is poor compared to outline fonts.

Wabi Font Processing

Each time you start the Wabi program, it creates a list of available fonts from the `[fonts]` section of `win.ini`, which includes bitmap fonts shipped with the Wabi program, TrueType, bitmap, and vector fonts installed with Microsoft Windows, and any fonts installed with your applications.

The list of fonts is made available to applications, just as in Microsoft Windows, so the applications can display a list of fonts to the user.

When you select a font name, the Wabi program finds the font information and determines how to display it. The method for displaying the font varies depending on whether the font is a TrueType, bitmap, or vector font, and whether the Wabi font server is running.

Vector fonts are the easiest to display. For each character to be displayed, the Wabi program simply draws the list of vectors, or lines, that make up the character. Because line drawing is fast, Wabi is able to draw these characters itself, without help from the X server. Bitmap and TrueType fonts, however, are more complicated to produce.

If the font server is running and Wabi is asked to display characters using a bitmap or TrueType font, Wabi simply passes the font information to the Wabi font server. Wabi passes the text to be displayed to the X server. The X server obtains any necessary font images or information from the Wabi font server and displays the text.

If the font server is not running and the font requested is TrueType, Wabi creates bitmap images of the TrueType font. The Wabi program can then draw characters by painting these bitmaps onto the screen, using the X server's normal functions.

If the font server is not running, and the requested font is a Microsoft Windows bitmap font, the font's raster images, or bitmaps, are already created, so the Wabi program uses them to draw the characters on the screen.

The Wabi Font Server

The Wabi font server uses the X Font Service Protocol, a method introduced in the X11R5 release of the X Window System for separating font handling from the X server's other duties. (Not all X11R5 servers support the Font Service Protocol however.)

If the X server is the X11R5 release and supports the Font Service Protocol, Wabi starts its font server, `wabifs`, when you start the Wabi program. When Wabi selects a font in the available fonts list, it passes the font information to `wabifs`, which takes over font processing for the request and interacts with the X server.

If the X server is the X11R4 release or does not support the Font Service Protocol, Wabi creates bitmap images of the fonts on the X server, which then displays them.

When the Wabi font server is running, you see two UNIX processes rather than one. The main process is called `wabipro`, and the font server process is called `wabifs`. The processes work together closely.

With the Wabi font server running, the Wabi program can send text rather than bitmapped images to the X server no matter what font you are using. Even if you are using a TrueType font that your X server does not know about, Wabi can act as though the X server knows about the font. The Wabi program passes the Windows font data to the Wabi font server, which converts the font information to a form the X server can use. The font server passes the converted font information to the X server, which then displays the characters on the screen in the specified font.

Font processing is most efficient when the Wabi font server is running. There is no performance difference between TrueType and Microsoft Windows bitmap fonts. If the font server is not running, all fonts take longer to display because the Wabi program must create the font images and pass them to the X server.

If you have a problem with fonts and cannot tell where the problem lies, you can take a step in isolating it by starting Wabi without the font server to see if the symptoms change. See “Starting Wabi With or Without the Font Server” on page 32 for instructions.

UNIX and DOS File Systems



This appendix describes some utilities to help you use DOS files in a UNIX system and vice versa.

Files Created With Applications

The files you create with an application running in the Wabi environment are the same as files created with the same application running in the DOS environment with Microsoft Windows. If you run an application in both environments, you can create a file with an application in one environment, and edit the same file in the other environment.

Text Files

Simple ASCII text files can be used in both the UNIX and DOS worlds, but there are a few slight differences in file format. For example, the UNIX operating system interprets the DOS end-of-line character as a ^M (Ctrl-M), so if you view a DOS ASCII file in a UNIX text editor, it may have a ^M at the end of each line.

Text File Conversion Between UNIX and DOS Systems

On some platforms, the Wabi software includes two UNIX text file conversion utilities. (Some platforms already provide these utilities, so they are not included with the Wabi software.) You can use these utilities to convert simple

ASCII text files created with tools such as a text editor, vi, or the Microsoft Windows Notepad, back and forth between UNIX and DOS formats. This allows you to view and print ASCII text files in either environment. The utilities are:

- `unix2dos` – Converts text files created with UNIX-based tools, such as vi or a text editor, to a common DOS format.
- `dos2unix` – Converts text files created with DOS-based tools, such as the Microsoft Windows Notepad, to a common UNIX format.

You run these utilities from the system prompt within a command window.

▼ Converting a DOS Text File to a UNIX Text File

The `dos2unix` command takes the following form, where *originalfile* is the DOS file and *newfile* is the UNIX file:

```
dos2unix originalfile newfile
```

The original DOS text file is converted from DOS format to UNIX format. The converted file is given the name represented by *newfile*. (The original file still exists.) If the original file and the new file are the same, `dos2unix` will rewrite the original file after converting it.

▼ Converting a UNIX Text File to a DOS Text File

To convert a text file from UNIX format to DOS format, enter:

```
unix2dos originalfile newfile
```

The original UNIX text file is converted from UNIX format to DOS format. The converted file is given the name represented by *newfile*. (The original file still exists.) If the original file and the new file are the same, `unix2dos` will rewrite the original file after converting it.

File Names in UNIX and DOS

The DOS operating system limits file names to a format using 8 characters, a period, and up to 3 characters in a file name extension (commonly known as the 8.3 convention). Also, DOS recognizes only a single case so it doesn't matter whether you type a name in uppercase or lowercase. The UNIX operating system accepts file names up to 128 characters and distinguishes between uppercase and lowercase. The only UNIX file name that matches the DOS file name format is all lowercase and no more than 8 characters plus 3 extension characters.

A file created in the UNIX system and named with a long descriptive file name such as `QuarterlyReport.doc` cannot be handled by DOS. The Wabi program must map UNIX file names that use uppercase or are longer than the DOS 8.3 naming convention to names acceptable in both DOS and UNIX environments because Microsoft Windows applications expect the DOS file name format.

The Wabi program creates names that may be hard to recognize because they may include tildes, and may sometimes not include the DOS file name extension. For example, if you have files named `ORANGE.TXT`, `Red.doc`, and `GREENERY.ZIP` in the directory `$HOME/ColorFiles`, they might be mapped to names like `orang~5z`, `red~~~s2.doc`, and `green~26`. Note that these names follow the 8.3 convention, but not the all-lowercase convention.

This mapping may sometimes cause a problem if the file extension is omitted. For example, if an application you run in the Wabi program looks for files with a particular file extension, it may not be able to find them. If you run into such a problem, you run the `wabimakelower` utility to map mixed-case file names to lowercase names, as described in the next section.

▼ Mapping File Names to Lowercase

If you find the Wabi program's mapping of file names using uppercase to be a problem, you can run the `wabimakelower` program to create symbolic links to file names that include UNIX uppercase characters. This program only works on file names that fit the DOS 8.3 convention but include uppercase characters. To run the program, enter the following command:

```
wabimakelower directory
```

where *directory* is a directory containing files whose names you want to map.

≡ *D*

For the files named `ORANGE.EXE`, `Red.doc`, and `GREENERY.ZIP` in the directory `$HOME/ColorFiles`, use the command:

```
wabimakelower $HOME/ColorFiles
```

The program creates symbolic links `orange.exe`, `red.doc`, and `greenery.zip`, with the original files as their targets. This enables you to see recognizable file names in your applications and when browsing directories in the Wabi program.

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