SunPCi™ II 2.3 User's Guide

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Contents

Figures

Tables

Preface

The *SunPCi II 2.3 User's Guide* provides setup and operation instructions for the
SunPCi™ II software. Use this guide after you have installed your SunPCi II cards
and the SunPCi II 2.3 software into your UltraSPARC™ system.

In addition, this guide explains how to install the following Microsoft Windows
operating systems for use with your SunPCi II cards:

- Microsoft Windows XP Professional (Windows XP Professional)

- Microsoft Windows 2000 Professional (Windows 2000 Professional)

- Microsoft Windows 2000 Server Edition (Windows 2000 Server)

- Microsoft Windows NT 4.0 Workstation (Windows NT4 WS)

- Microsoft Windows NT 4.0 Server (Windows NT4 Server)

- Microsoft Windows NT 4.0 Terminal Server (Windows NT4 TS)

- Microsoft Windows Millennium Edition (Windows ME)

- Microsoft Windows 98 Second Edition (Windows 98 SE)

In order to fully use the information in this document, you should first have
installed the SunPCi II card or cards and the SunPCi 2.3 software package on your
UltraSPARC system. Refer to the *SunPCi II 2.3 Installation Guide* for more
information about installing cards and the SunPCi II 2.3 software.

Who Should Read This Book

This guide is intended for all users of the SunPCi II software. Whether you are a
general user working with SunPCi II regularly or an administrator responsible for
installing and maintaining numerous SunPCi II setups, this guide provides the
information you need to use the SunPCi II software with Microsoft Windows
operating systems.

The topics in this guide are explained with the non-technical user in mind. However, you do need to understand the basics of working with the Solaris™ operating environment, the DOS operating system, and the desired version of Microsoft Windows software. Caldera OpenDOS 7.01, the version of DOS used with SunPCi II, is a superset of MS-DOS 6.22.

Note – Installation of Microsoft Windows on your UltraSPARC system for use with the SunPCi II card differs from installation on a PC. Even though you may have a strong understanding of Microsoft Windows installation instructions, it is critical that you follow the instructions in this guide.

How This Book Is Organized

This guide is organized as follows:

Chapter 1 describes the SunPCi II product and introduces you to its features.

Chapter 2 lists the contents of your SunPCi II package and explains the requirements that your system must meet in order to successfully install and run SunPCi II software.

Chapter 3 explains how to configure and use multiple SunPCi II cards that are installed in your system.

Chapter 4 explains how to configure and use virtual and physical networking for the SunPCi II product.

Chapter 5 describes how to configure and use Microsoft Windows XP Professional software, how to perform a custom installation, and how to upgrade to Windows XP Professional.

Chapter 6 explains how to configure and use Microsoft Windows 2000 Professional and Microsoft Windows 2000 Server Edition software, how to perform a custom installation, and how to upgrade to each of these operating systems.

Chapter 7 describes how to configure and use Microsoft Windows NT 4.0 Workstation and Microsoft Windows NT 4.0 Terminal Server software, and how to perform a custom installation.

Chapter 8 explains how to install, configure, and use Microsoft Windows Millennium Edition software, how to perform a custom installation, and how to upgrade from Microsoft Windows 98 Second Edition to Microsoft Windows Millennium Edition.

Chapter 9 explains how to configure and use Microsoft Windows 98 Second Edition software, and how to perform a custom installation.

Chapter 10 describes how to connect peripheral devices (such as printers, serial devices, and audio devices) to the SunPCi II card. Some of these connections require the optional add-on backplate (included in the SunPCi II package).

Chapter 11 outlines how to use the `sunpci` command and its options, and provides tips that you may find useful while running SunPCi II software.

Appendix A provides explanations of some problems you may encounter and suggests some solutions.

Appendix B describes how to configure SunPCi II to work with international keyboards.

Appendix C includes suggestions on how to improve SunPCi II performance.

Appendix D contains regulatory, safety, and conformity information for the SunPCi II hardware product.

Using UNIX Commands

This document may not contain information about basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

■ *Solaris Handbook for Sun Peripherals*
■ AnswerBook2™ online documentation for the Solaris™ operating environment
■ Other software documentation that you received with your system

Document Conventions

This manual uses certain document conventions. The following sections explain those conventions and how to interpret them.

Solaris Command Windows

In this guide, you are often instructed to open a command window when performing various tasks. In the Solaris Common Desktop Environment (CDE), these command windows are called Console or Terminal windows. In OpenWindows™ environments, you can use either a Solaris Command Tool window or Shell Tool window. Command windows are a standard part of the Solaris operating environment from which you enter UNIX commands.

Typographic Conventions

Typeface	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your.login file. Use ls -a to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% **su** Password:
AaBbCc123	Book titles, new words or terms, words to be emphasized	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type rm *filename*.

Shell Prompts

Shell	Prompt
C shell	*machine_name*%
C shell superuser	*machine_name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

SunPCi II Keyboard Shortcuts

The SunPCi II software provides keyboard shortcuts for many of the functions on the menus at the top of the SunPCi II window. To see the shortcuts you can use for some SunPCi II commands, hold down the left mouse button on the menu until the drop-down menu appears. Next to each command is the equivalent keyboard shortcut.

In CDE and OpenWindows environments, keyboard shortcuts use the Meta key (FIGURE P-1) in combination with another key. The Meta key is located on either side of the spacebar on your keyboard. To use a shortcut, hold down the Meta key and press the second key. For example, the Meta-E key combination means "press both the Meta key and the E key at the same time."

FIGURE P-1   Sun Keyboard Meta Key

Note – The discussion in this section applies only to the keyboard shortcuts in the SunPCi II software. Keyboard shortcuts for each version of Microsoft Windows are described in each operating system's documentation.

When running SunPCi II software and Microsoft Windows, to allow Copy and Paste operations, the Find, Undo, Copy, Paste, and Cut keys on your Sun system keyboard are mapped to the appropriate actions in Microsoft Windows.

Customer Support

If you cannot find the information you need in this guide, call your SunPCi II distributor or your local support center. For assistance outside the United States, contact your Sun sales representative.

Related Documentation

For information and help about the version of Microsoft Windows you are using, consult the related Microsoft Windows documentation or your service provider.

The following tables describe the related Sun documentation for the SunPCi II product.

Application	Title	Part Number
Installation of the SunPCi II hardware and SunPCi II software.	*SunPCi II 2.3 Installation Guide*	806-4788-15
Installation of optional random access memory SODIMMs into the SunPCi II card.	*SunPCi II SODIMM Installation Guide*	806-5765-11
Important last-minute information and notes about the SunPCi II product.	*SunPCi II 2.3 Product Notes*	806-4789-15

The following table is an index of the directories containing the translated documentation in the `Doc` directory on the SunPCi II CD. For information about how to view the documentation on the SunPCi II CD, see "Viewing the Documentation PDF Files" on page 5.

Directory Name	Language	Directory Name	Language
C	English	ja	Japanese
de	German	ko	Korean
es	Spanish	sv	Swedish
fr	French	zh	Simplified Chinese
it	Italian	zh_TW_Big5	Traditional Chinese

Accessing Sun Documentation Online

The `docs.sun.com`^{SM} web site enables you to access a select group of Sun technical documentation on the web. You can browse the `docs.sun.com` archive or search for a specific book title or subject at:

`http://docs.sun.com`

The SunPCi II product web site is another useful resource. It contains the latest information about the SunPCi II product, as well as links to software updates. Be sure to check the product web site regularly for software updates.

The web site is located at the following URL:

`http://www.sun.com/desktop/products/sunpci`

For advanced SunPCi II server configuration and benchmark information, consult the White Papers located at the following URLs:

`http://www.sun.com/blueprints/0601/windows.pdf`
`http://www.sun.com/blueprints/1101/sizesunray.html`

Additional documents about SunPCi are available at the following URL:

`http://www.sun.com/desktop/products/sunpci/articles.html`

Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can email your comments to Sun at:

`docfeedback@sun.com`

Please include the part number (806-4787-14) of your document in the subject line of your email.

Introducing SunPCi II Version 2.3 Hardware and Software

The SunPCi II 2.3 software and hardware create a personal computer (PC) that is integrated into your Peripheral Component Interconnect-based (PCI) UltraSPARC system running a supported Solaris operating environment. You work on the PC either from a Common Desktop Environment (CDE) X Window on the Solaris desktop, or from a separate monitor connected to the card. With the SunPCi II 2.3 product, you can now create emulated disks up to 40 Gbytes in size.

This chapter contains the following major topics:

- "Supported Microsoft Windows Operating Systems" on page 1
- "Supported Citrix MetaFrame Software" on page 4
- "SunPCi II 2.3 Features" on page 2
- "Getting Help for SunPCi II Software" on page 5
- "Getting Help for Microsoft Windows Software" on page 6

Supported Microsoft Windows Operating Systems

The SunPCi II 2.3 product supports the following Microsoft Windows operating systems and Service Packs:

- Microsoft Windows XP Professional (Windows XP Professional)
- Microsoft Windows 2000 Professional (Windows 2000 Professional) Service Pack 2
- Microsoft Windows 2000 Server Edition (Windows 2000 Server) Service Pack 2
- Microsoft Windows NT 4.0 Workstation (Windows NT4 WS) Service Pack 6a
- Microsoft Windows NT 4.0 Server (Windows NT4 Server) Service Pack 6
- Microsoft Windows NT 4.0 Terminal Server (Windows NT4 TS) Service Pack 6
- Microsoft Windows Millennium Edition (Windows ME)
- Microsoft Windows 98 Second Edition (Windows 98 SE)

> **Note –** SunPCi II 2.3 software does not support the original release of the
> Windows 95 operating system.

SunPCi II 2.3 Features

This section describes the features the SunPCi II 2.3 product brings to your Solaris desktop.

- *PCs on your Solaris desktop* – For each SunPCi II card installed in your system, you can use its PC applications in a window on your Solaris desktop.

- *Support for the Microsoft Windows XP Professional operating system* – SunPCi II 2.3 software supports Windows XP Professional.

- *Auto-install of Microsoft Windows operating systems* – The Create a New Emulated Drive dialog box allows you to select and install Windows operating system software more easily. Emulated drive creation also supports NT file system (NTFS) for Windows NT and Windows XP operating systems.

- *Improved emulated drive performance* – Facilitated by streaming writes.

- *High-resolution VGA display for your Microsoft Windows applications* – SunPCi II software includes two Microsoft Windows super-VGA display drivers. One displays the Microsoft Windows desktop in an X window on your screen; the other drives the display on an external VGA monitor. You can choose to install either option.

- *Familiar PC peripherals* – The SunPCi II product provides Microsoft Mouse and IBM PC keyboard emulation, plus access to external peripherals such as printers and modems. The SunPCi II card and its optional add-on backplate (included) contain the physical connectors for PC peripheral devices.

- *Access to network services, files, and printers* – The SunPCi II product enables you to connect to your Ethernet network. It also allows you to access Solaris files and printers on the network through the physical or virtual network connections.

- *Multiple SunPCi II card support* – With multiple cards installed, you can simultaneously access workstation or server PC applications from your Sun UltraSPARC system.

- *Power management support* – SunPCi II 2.3 now supports Automatic Device Power Management when running on the Solaris 8 operating environment or later. This feature allows the SunPCi II card to consume less power when a SunPCi window is not running. It also allows the UltraSPARC system to suspend and resume as long as no SunPCi windows are running. In prior releases, the SunPCi software

would not allow the UltraSPARC system to suspend execution, even if no SunPCi windows were running. For more information about Solaris 8 power management, see the man page for `power.conf`.

- *Large disk support* – SunPCi II 2.3 supports emulated disk drives up to 40 Gbytes in size.

- *Boot@Boot support* – Boot@Boot is a new feature in the SunPCi II 2.3 release that can be configured to automatically start the SunPCi 2.3 software on one or more SunPCi cards when the Solaris server in which they are installed boots. See Chapter 11 of this guide for more information about Boot@Boot.

The SunPCi II software package includes the Caldera OpenDOS 7.01 operating system. You must purchase retail Microsoft Windows operating system software and your PC applications separately.

From the PC User's Perspective

From the perspective of a PC user, SunPCi II hardware and software includes the following PC features:

- Emulated hard drives, which function like local PC hard drives

- Extended drives, which are similar to networked drives on a PC

- IBM PC and PC keyboard emulation

- Access to serial, parallel, and Universal Serial Bus (USB) peripherals, such as printers, scanners, and digital cameras, using the SunPCi optional add-on backplate

- 128 Mbytes of on-board memory (standard in one slot), plus a second slot for additional memory (128- and 512-Mbyte options are also available expanding memory up to a maximum of 1 Gbyte)

- Access to PC-based servers, workstations, and networks, including file and print servers

- Ability to use an optional external VGA monitor

- Physical Ethernet, which uses a separate Ethernet connection; or virtual Ethernet, which uses the UltraSPARC system's networking capabilities (virtual networking is disabled with multiple SunPCi cards)

- PC audio with a stereo speaker or headphone output jack (line-out), and a monaural microphone compatible input jack (line-in)

From the Solaris User's Perspective

From the perspective of an UltraSPARC Solaris system user, SunPCi II hardware and software include the following features:

- Reliable access to thousands of PC applications, including custom internal applications that your company relies on daily
- Ability to display super-VGA graphics with 16-bit and 24-bit color
- Ability to share network resources between the PC and Solaris environments, such as printers and files
- Ability to copy and paste text between DOS or Microsoft Windows and OpenWindows/CDE applications (this feature is disabled for Microsoft Windows server products)
- Access to PC-based networks, including Novell NetWare file and print servers (only physical networking, not virtual networking, is supported with multiple cards)

Supported Citrix MetaFrame Software

Citrix MetaFrame software enables Solaris clients to display and use SunPCi II 2.3 software running the Windows 2000 Server or Windows NT4 TS operating system on a remote host. Citrix server software must be installed on an emulated drive that contains Windows 2000 Server or Windows NT4 TS operating system software attached to a SunPCi II card. The SunPCi II card must be installed on the Sun PCI-based host.

When the server is configured to use Virtual Network Computing (VNC), you can boot SunPCi II software as part of server startup, eliminating the need to specifically start the SunPCi II software before clients can use it.

SunPCi II 2.3 hardware and software support use of the following Citrix MetaFrame products:

- Citrix MetaFrame 1.8 for Microsoft Windows 2000 Servers
- Citrix MetaFrame 1.8 for Microsoft Windows NT 4.0 Servers

See the following web site for information about purchasing and using Citrix MetaFrame software:

```
http://www.citrix.com
```

Getting Help for SunPCi II Software

Help is available online for the SunPCi II commands (`sunpci`, `sunpcid`, `sunpciflash`) from Solaris manual pages (also called man pages), and from the documentation PDF files on the SunPCi II 2.3 product CD.

▼ How to View Solaris Manual Pages

You can use manual pages to obtain information about the Solaris operating system itself, or about the commands associated with Solaris software. To view Solaris online manual pages:

1. **Set your `MANPATH` variable as follows:**

```
$MANPATH:/opt/SUNWspci2/man
```

2. **Type the word `man`, followed by the name of the command in which you are interested.**

For example, to get help on the `sunpci` command, type the following command:

```
% man sunpci
```

The system responds `Reformatting page... wait`, and then displays a section of the manual page in the command window. To scroll through the manual page, press any key. To exit the manual page, press Control-C.

For information about how to add the SunPCi II man page directory to your `MANPATH` environment variable, refer to your Solaris documentation.

Viewing the Documentation PDF Files

English and localized versions of the documentation are in the `Docs` directory on the SunPCi II 2.3 product CD in PDF (Adobe Acrobat) format. See "Related Documentation" on page xxiv in the Preface for more information. The SunPCi II CD-ROM includes the following documentation:

- *SunPCi II 2.3 Installation Guide* in PDF format – Describes how to install one or more SunPCi II cards, and the SunPCi II software in supported UltraSPARC systems

- *SunPCi II 2.2 User's Guide* in PDF format – (This guide) Describes how to configure the SunPCi II software to use one or more SunPCi II cards, and how to install the Microsoft Windows software on a SunPCi II card
- *SunPCi II 2.3 Product Notes* in PDF format – (English only) Describes any late-breaking issues with respect to the SunPCi II product

▼ How to View the Documentation PDF Files

To view the PDF files, perform the following steps:

1. **Insert the SunPCi II CD into the system CD-ROM drive.**

   A CDE File Manager window is displayed.

2. **In the File Manager window, double-click the** `Docs` **subdirectory where the PDF files for your locale are stored on your SunPCi II CD.**

   Refer to "Related Documentation" on page xxiv in the Preface to this book to find directory names for each translation locale.

3. **In a separate Terminal window, type the following command:**

   ```
   % acroread &
   ```

   After a few seconds, the Adobe Acrobat splash screen is displayed, followed by the main program window.

4. **In Adobe Acrobat, choose Open from the File menu, and then double-click the document file name to open the document.**

   You can now use the Page Up and Page Down keys, as well as the commands in Adobe Acrobat, to navigate and print the PDF files.

Getting Help for Microsoft Windows Software

To get help for Microsoft Windows products while you are working in a Microsoft Windows operating system, ensure that any application program is minimized on the tool bar; then press the F1 key. You can also select Help from the Help menu in any Microsoft operating system window. Pressing the F1 key, or selecting Help, brings up the Contents window for Microsoft Windows help.

> **Note –** Microsoft Windows help does not contain help for the SunPCi II application. For help on the SunPCi II application software, use the Solaris manual pages described in the previous section, or consult "Using SunPCi II Software" in Chapter 11 of this guide.

For help in your Microsoft Windows application software, consult the application user interface, the documentation that accompanied the application, or consult Microsoft directly.

Removing Microsoft Windows Software

To remove Microsoft Windows software from an emulated drive, consult your Microsoft Windows documentation.

How to Proceed

> **Note –** Installation of Microsoft Windows on your UltraSPARC system for use with the SunPCi II card differs from installation on a PC. Even though you may have a strong understanding of Microsoft Windows installation instructions, it is critical that you follow the instructions in this guide.

- To get started with the SunPCi II 2.3 software configuration, proceed to Chapter 2.
- To configure and use multiple cards with the SunPCi II 2.3 product, proceed to Chapter 3.
- Before configuring your network connections, read about SunPCi II 2.3 networking options in Chapter 4.

Once you have installed and configured the SunPCi II hardware and software, you can install one or more supported version of Microsoft Windows. The easiest way to do this is to choose an operating system to install when you choose the Create a New Emulated Drive from the SunPCi Options menu. See Chapter 2 for instructions.

See the following chapters for additional information about configuring and using each operating system, and for performing upgrades and custom installations.

- Chapter 5—Windows XP
- Chapter 6—Windows 2000
- Chapter 7—Windows NT
- Chapter 8—Windows ME
- Chapter 9—Windows 98 SE

Getting Started

This chapter assumes you have installed the SunPCi II card or cards into your UltraSPARC system, and have installed the SunPCi II 2.3 software package. If you have not done this, consult the *SunPCi II 2.3 Installation Guide*.

This chapter includes the following major topics:

- "System Requirements" on page 10
- "Configuring Multiple SunPCi II Cards" on page 11
- "Starting and Stopping the SunPCi II Software" on page 11
- "Creating an Emulated Hard Drive" on page 13
- "Installing Service Packs" on page 17

This chapter includes instructions for completing the following tasks:

- "How to Start the SunPCi II Software" on page 11
- "How to Stop the SunPCi II Software" on page 12
- "How to Create a New Emulated Drive" on page 14
- "How to Install a Service Pack From a CD" on page 18
- "How to Download and Install a Service Pack From the Microsoft Web Site" on page 19
- "How to Attach an Existing Emulated Drive as a C: or D: Drive" on page 20

System Requirements

To install and use SunPCi II 2.3 software, you need the following:

- A PCI-based UltraSPARC computer with one or more SunPCi II cards installed. See the *SunPCi II 2.3 Installation Guide* for a complete list of supported systems.
- Solaris 2.6, Solaris 7, or Solaris 8 operating environment.
- Common Desktop Environment (CDE) X-Window manager.
- A CD-ROM drive, either local (attached to your system), or remote (attached to another system on your network).

Note – The SunPCi II product supports only Sun CD-ROM drives. CD-ROM drives from other manufacturers may not function correctly.

- A hard disk; either local or remote (local preferred), with at least 40 Mbytes of available storage space for the SunPCi II package, and additional storage space for the desired operating system:
  - Windows XP Professional—2048 Mbytes
  - Windows 2000 Server—2048 Mbytes
  - Windows 2000 Professional—2048 Mbytes
  - Windows NT4 TS—1024 Mbytes
  - Windows NT4 WS—1024 Mbytes
  - Windows ME—512 Mbytes
  - Windows 98 SE—512 Mbytes
- The SunPCi II card comes with 64 Mbytes of on-board RAM. To use the following Microsoft Windows operating systems with your SunPCi II system, your SunPCi II card should have installed RAM as indicated:
  - Windows XP Professional—128 Mbytes (for best performance, use 256 Mbytes)
  - Windows 2000 Server—128 Mbytes (for best performance, use 256 Mbytes)
  - Windows 2000 Professional—128 Mbytes (for best performance, use 256 Mbytes)
  - Windows NT4 Server—128 Mbytes (for best performance, use 256 Mbytes)
  - Windows NT4 TS—128 Mbytes (for best performance, use 256 Mbytes)
  - Windows NT4 WS—64 Mbytes
  - Windows ME—64 Mbytes
  - Windows 98 SE—64 Mbytes

  Memory requirements for Windows NT4 Server and Windows NT4 TS are based on the number and type of users connecting. See the White Papers referenced in "Accessing Sun Documentation Online" on page xxv.

Configuring Multiple SunPCi II Cards

You can install multiple SunPCi II cards in an UltraSPARC server or workstation. To configure multiple cards, follow this sequence:

1. Remove any SunPCi Version I cards.

2. Remove any previous version of SunPCi software.

3. Install all the SunPCi II cards you plan to use.

4. Install the SunPCi II 2.3 software on your system.

5. Configure one card and its emulated drive software completely.

6. Configure the rest of your SunPCi II cards.

See the *SunPCi II 2.3 Installation Guide* for instructions to complete this sequence.

Starting and Stopping the SunPCi II Software

This section provides instructions for starting and stopping the SunPCi software.

▼ How to Start the SunPCi II Software

● **To start the SunPCi software, open a Terminal window and type the following command at the % prompt:**

```
% /opt/SUNWspci2/bin/sunpci
```

When you start the SunPCi II software for the first time, the software takes a few minutes to create a Solaris directory named ~/pc, into which several SunPCi II files are also installed.

Note – If you do not want to type the full path of the sunpci command every time you want to run the software, you can modify the $path statement in your .login file. For information about how to do this, refer to your Solaris software documentation. If you want to customize text in the title bar of the SunPCi window, use the -title option with the sunpci command. See "The sunpci Command and Its Options" on page 126 for more information. For an example, see "How to Specify a Title Bar for Each Card Window" on page 31.

▼ How to Stop the SunPCi II Software

Before you exit from the SunPCi II software, you should shut down the Microsoft Windows operating system if it is running.

The following steps explain how to shut down the SunPCi II software properly.

1. In Microsoft Windows, click Start, and then choose Shut Down from the Start menu.

Caution – Always shut down Microsoft Windows before exiting from the SunPCi window. Otherwise, your files and applications could become corrupted.

Caution – Do not choose the Suspend option when shutting down Microsoft Windows. SunPCi software does not support the Suspend command.

2. Choose the option to shut down the computer and then click OK or Yes.

After the Windows operating system shuts down, a message appears that says it is now safe to turn off your computer.

3. Choose Exit from the File menu in the SunPCi window.

A confirmation window appears.

4. Click OK to exit from the SunPCi application.

Creating an Emulated Hard Drive

The first time you start SunPCi software, a dialog box appears that asks you to create an emulated C: drive. When you click Create, the Create a New Emulated Drive dialog box appears. This dialog box enables you to:

- Select an operating system to auto-install
- Specify a size for the emulated drive
- Specify whether to attach the emulated drive as a C: drive, as a D: drive, or not to attach it
- Specify the directory and name for the emulated drive

Selecting an operating system to auto-install by using this dialog box greatly simplifies Windows installation. SunPCi software requires customized installation files, and these files are in varying locations for different Windows operating systems. When you specify an operating system to auto-install in the Create a New Emulated Drive dialog box, the software automatically finds and copies setup files, boot files, system files, and drivers appropriate for that operating system and launches Windows setup when SunPCi reboots.

You may also want to create additional hard drives to use as C: or D: drives.

The emulated drive is a single file that SunPCi creates in the Solaris environment. By default the file is named `C.diskimage`, and by default it is located in the `~/pc` subdirectory in your home directory.

Because the emulated drive is just a file in the Solaris environment, this emulated drive or drives—if you create more than one—can be selectively attached to any available SunPCi II card. You can install a different Windows operating system on each drive, then attach it and boot from it to run that operating systems on your SunPCi II card. A SunPCi II card, like a PC, can run only one Windows operating system at a time.

If you have only one SunPCi II card installed, you can simply accept the default file name for the emulated drive in a standard installation. If you have multiple cards installed, consult the section "Configuring Multiple Cards With SunPCi II Software" on page 25. Establishing a naming convention will ease the management of your configuration files, drive names, and their associated card names.

Because of the inherent limitations of DOS, if you create an emulated drive of up to 40 Gbytes that uses the FAT16 file system, that portion above 2 Gbytes in size will be unavailable to DOS. All Microsoft Windows operating systems can use a FAT16 disk, but FAT16 format capacity is restricted to a maximum of 2 Gbytes. You will be able

to reformat, convert, and/or repartition the emulated hard drive to access the disk portion beyond 2 Gbytes after you have installed your Microsoft Windows operating system. See "Emulated Drives and SunPCi II Software" on page 140.

Note – If you have a C: drive file that you created in a version of SunPCi earlier than Version 2.0, you cannot use the drive as a boot drive. However, you can attach the file as a D: drive. Conversely, C: drives that you create using the SunPCi II 2.3 software cannot be used with previous versions of SunPCi software.

▼ How to Create a New Emulated Drive

1. **Start the SunPCi II software by opening a Terminal window and typing the following command at the % prompt:**

   ```
   % /opt/SUNWspci2/bin/sunpci
   ```

   If you have not created an emulated hard drive previously for the SunPCi II card, the Create a New Emulated Drive dialog box appears automatically. Proceed to Step 4.

2. **Choose the Options menu at the top of the SunPCi window.**

   The Options menu is displayed. See FIGURE 2-1.
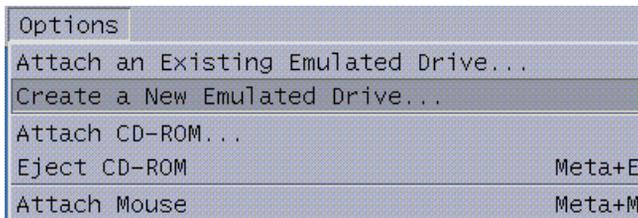
FIGURE 2-1 SunPCi II Options Menu

3. Choose Create a New Emulated Drive from the menu.

The Create a New Emulated Drive dialog box is displayed. See FIGURE 2-2.
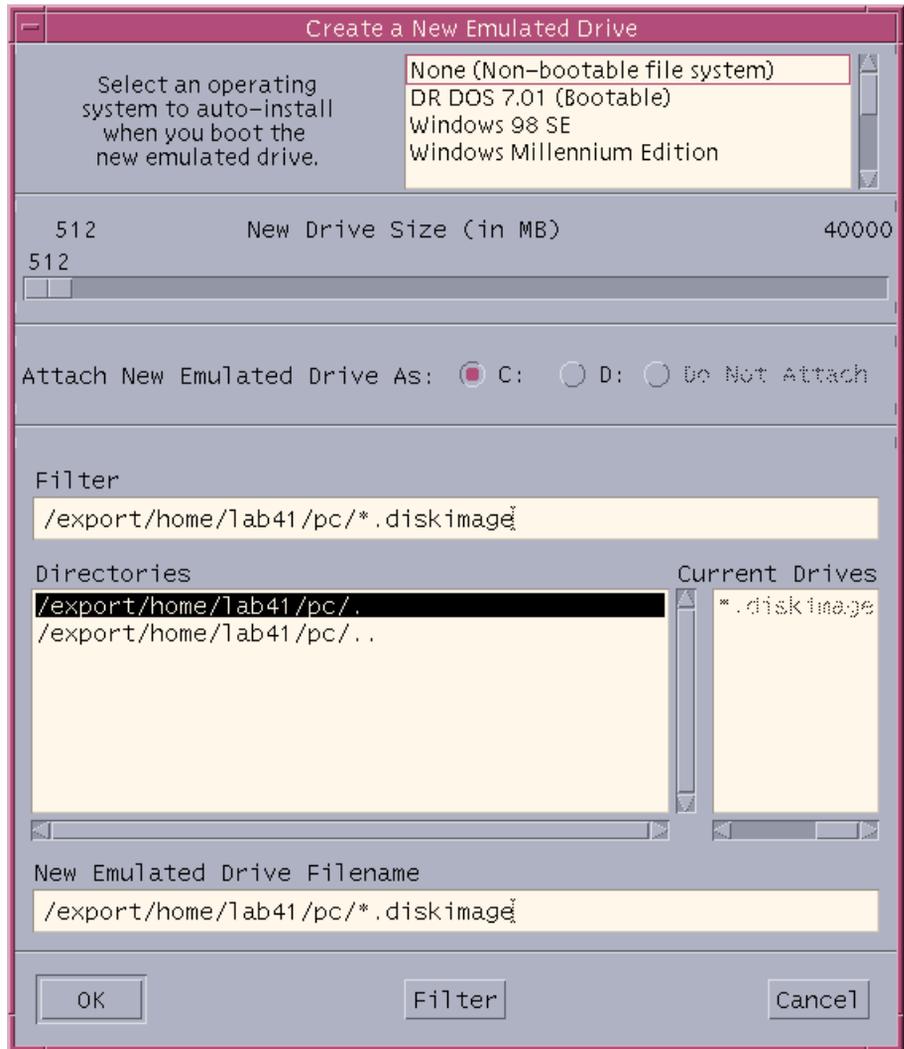
FIGURE 2-2　Create a New Emulated Drive Dialog Box

4. **In the top pane of the dialog box, select an operating system to auto-install when the new drive is booted.**

   ■ Select None (Non-bootable drive) if you want to create a non-bootable drive (a D: drive). Before you can use the drive, you need to format it. See your Microsoft Windows documentation.

   ■ Select DR DOS 7.01 (Bootable) if you plan to do a custom installation of a Windows operating system at a later time. To install the operating system, you need to follow instructions in the corresponding chapter in this guide.

   ■ Select one of the Windows operating systems from the list box to auto-install it. Note, however, that you cannot use the auto-install feature for the Windows ME operating system. To install the Windows ME operating system, follow instructions in Chapter 8.

Caution – When you specify an operating system to auto-install in the Create a New Emulated Drive dialog box and insert the appropriate Microsoft Windows CD in your CD-ROM drive, the software automatically finds and copies setup files, boot files, system files, and drivers appropriate for that operating system and launches Windows setup when SunPCi software reboots. Do not perform a custom installation unless you want to use customized installation scripts.

For most operating systems, you can choose between creating the disk with the FAT16 file system or the NTFS file system. You cannot boot to OpenDOS using a C: drive formatted for the NTFS file system. This is a known restriction. See "FAT16 File System Limitations" on page 141 for more information.

5. **In the second pane of the dialog box, drag the slider to set the size in Mbytes for the new drive.**

   The slider automatically sets to the recommended default size. The left end of the scale is restricted to the required minimum drive size for the operating system you selected.

   Be sure to make the drive large enough to accommodate your needs, since it cannot be expanded once created. Depending on available disk space on your system, an emulated drive can be up to 40-Gbyte capacity.

Note – For best performance, you may want to install some of your Microsoft Windows applications locally on drive C: or D:. Make sure that the drive size you select is large enough to accommodate the applications you want to install.

6. **In the third pane of the dialog box, select how to attach the new drive.**

   If you want to create the drive but not attach it at this time, click the Do Not Attach button. Otherwise, click the radio button next to C: or D:.

7. **In the bottom pane of the dialog box, type the path and file name you want to use for the new drive.**

   Use the Filter field and button to view existing files. You must specify a new name for the emulated drive.

   Note – For best performance, create your emulated drives on a local hard disk on your workstation or server. Your home directory (the default location) may be on a network drive. Performance of Microsoft Windows takes is significantly better on a local hard drive.

   ---

8. **Click OK.**

   A window appears that indicates progress of the disk file creation.

9. *If you chose to auto-install an operating system*, **insert the installation CD for the operating system into your CD-ROM drive and follow the instructions in the SunPCi window.**

   Note – Press Meta-M to attach your mouse to the SunPCi window, and press Meta-M again to use your mouse in other windows.

   Note – If you are installing multiple cards into your system, read Chapter 3, "Using Multiple SunPCi II Cards" on page 23. Read about configuring multiple cards before continuing the installation. There are significant differences between configuring multiple cards and configuring a single card.

Installing Service Packs

After installing Windows operating system software, you may need to install a Microsoft Service Pack. There are two ways to install Service Packs. The Service Pack may be available on the Windows operating system full installation package CD or on another Microsoft CD. You can also find Service Packs on the Microsoft web site. See "How to Download and Install a Service Pack From the Microsoft Web Site" on page 19.

TABLE 2-1 lists the Service Packs SunPCi II 2.3 software requires for supported Windows operating systems. You need to install the indicated Service Pack, or a later version.

TABLE 2-1   Microsoft Service Packs Required by SunPCi II 2.3 Software

Windows Operating System	Minimum Service Pack
Windows XP Professional	None required
Windows 2000 Professional	Service Pack 2
Windows 2000 Server	Service Pack 2
Microsoft Windows NT 4.0 Workstation	Service Pack 6a
Microsoft Windows NT 4.0 Server	Service Pack 6
Microsoft Windows NT 4.0 Terminal Server	Service Pack 6
Windows ME	None required
Windows 98 Second Edition	None required

▼ How to Install a Service Pack From a CD

1. **Start the SunPCi II software by opening a Terminal window and typing the following command at the % prompt：**

```
% /opt/SUNWspci2/bin/sunpci
```

   The login screen is displayed.

2. **Type your user name and password (if required), and then click OK.**

   To install software on some Windows operating systems, you must log in as Administrator.

3. **Click the Start button, and then choose Programs from the pop-up menu. Choose Windows Explorer.**

   The Explorer Window is displayed.

4. **Insert the CD into your CD-ROM drive.**

   The Autorun window is displayed.

5. **In Windows Explorer, double-click the icon for your CD-ROM drive.**

6. **Double-click the appropriate Service Pack file name.**

   The Service Pack program extracts the Service Pack files to `C:\temp` and automatically runs the `update.exe` program when the extraction process is finished.

   The Service Pack Setup dialog box is displayed.

   Note – If `update.exe` does not execute for you automatically, you can double-click the `update.exe` icon in `C:\temp` to start the setup program.

   ---

7. **Read the License Agreement and then click Accept. Click the check box next to the Backup files message to deselect that option, and then click Next.**

   The Service Pack Setup screen is displayed. The installation process takes several minutes. A progress bar in the screen indicates the overall progress of the installation.

8. **When you are finished installing the Service Pack, restart Windows.**

▼ How to Download and Install a Service Pack From the Microsoft Web Site

1. **Download the appropriate Service Pack file from Microsoft's web site, following instructions on the web page.**

   See TABLE 2-1 to determine the Service Pack you need to install. Service packs are available at the following URL:

   `http://support.microsoft.com/`

2. **Start the SunPCi II software by opening a Terminal window and typing the following command at the % prompt:**

   ```
   % /opt/SUNWspci2/bin/sunpci
   ```

   The login screen is displayed.

3. **Type your user name and password (if required), and then click OK.**

   To install software on some Windows operating systems, you must log in as Administrator.

4. **Click the Start button, and then choose Programs from the pop-up menu. Choose Windows Explorer.**

   The Explorer Window is displayed.

5. **Double-click the folder for the directory where you stored the downloaded file (for example, `C:\temp`).**

6. **Double-click the Service Pack file name.**

   The Service Pack program extracts the Service Pack files to `C:\temp` and automatically runs the `update.exe` program when the extraction process is finished.

   The Service Pack Setup dialog box is displayed.

   Note – If `update.exe` does not execute for you automatically, you can double-click the `update.exe` icon in `C:\temp` to start the setup program.

   ---

7. **Read the License Agreement and then click Accept. Click the check box next to the Backup files message to deselect that option, and then click Next.**

   The Service Pack Setup screen is displayed. The installation process takes several minutes. A progress bar in the screen indicates the overall progress of the installation.

8. **When you are finished installing the Service Pack, restart Windows.**

▼ How to Attach an Existing Emulated Drive as a C: or D: Drive

---
Note – If the drive you want to use is already attached, skip this procedure.

If you want to use an emulated drive as a C: or D: drive that is not attached to your SunPCi II card, or if there is no drive attached, you need to attach a drive.

To attach an existing emulated drive, perform the following procedure:

1. **From the Options menu, choose the Attach an Existing Emulated Drive command.**
   The SunPCi Attach an Existing Emulated Drive dialog box is displayed.

2. **Click the radio button next to C: or D: to specify how to attach the drive.**

3. **Type the path and file names of the emulated drive file you created in "How to Create a New Emulated Drive" on page 14.**
   If you forget the name of the drive file, type the path to the location of the drive file and then click Filter. A list of files appears. Select the desired drive file.

4. **Click OK.**

   The drive is now attached as a C: or D: drive.

   A dialog box is displayed with the message `In order for the drive mapping to take place, SunPCi must be rebooted. Reboot now?`

5. **If Microsoft Windows is running, use the Start menu to shut it down. When Microsoft Windows has shut down, click OK in the reboot dialog box.**

6. **Choose Reset PC from the File menu to apply your changes.**

   SunPCi software displays the Reboot dialog box.

7. **Click OK.**

   SunPCi software reboots and uses the newly attached drive.

How to Proceed

- Before configuring additional cards, you may need to return to "Creating an Emulated Hard Drive" on page 13, and read in Chapter 3 about activating and using multiple cards.

- Before configuring your network connections, read in Chapter 4 about SunPCi II 2.3 networking options.

- If you experience problems using your system's diskette drive, CD-ROM drive, or an external monitor, refer to Chapter 10.

- Install Windows application software as you would on a PC.

- For help with using SunPCi II 2.3 software, see Chapter 11.

Using Multiple SunPCi II Cards

This chapter assumes that you have installed the SunPCi II 2.3 software package and all the cards you will be using concurrently in your machine, that you have configured the first card following the procedures in Chapter 2, and that you now want to configure the additional cards.

With SunPCi II 2.3 software, you can install multiple SunPCi II cards into both UltraSPARC servers and workstations. You can install any of the supported Microsoft Windows operating systems for use on SunPCi II cards. For the list of operating systems, see "Supported Microsoft Windows Operating Systems" on page 1.

This chapter includes the following major topics:

- "Before You Begin Configuration" on page 24
- "Configuring Multiple Cards With SunPCi II Software" on page 25
- "Using Cards and Emulated Drives" on page 27
- "Starting Specific Disk Image Files" on page 30
- "Modifying Image File Configurations" on page 32
- "Multiple Card Behavior" on page 33

This chapter includes instructions for completing the following tasks:

- "How to Create a .ini File Using the -new Option" on page 26
- "How to Identify Card Names" on page 28
- "How to Start a Specific .ini File" on page 28
- "How to Start a Specific Card" on page 29
- "How to Start a Specific Image and a Specific Card" on page 30
- "How to Specify a Title Bar for Each Card Window" on page 31
- "How to Update the SunPCi II Card Configuration" on page 31

Before You Begin Configuration

⚠ **Caution –** Remove previous versions of the SunPCi software before halting your system and installing multiple cards (refer to the *SunPCi II 2.3 Installation Guide*). Perform a reconfiguration boot (`halt; reboot -r`), and then install the SunPCi II 2.3 software.

⚠ **Caution –** SunPCi software prior to Version 2.2.1 did not support multiple cards. You must install a later version of SunPCi software before installing additional cards. If you install additional SunPCi cards before upgrading to SunPCi 2.3 software from a version prior to 2.2.1, the system may panic. Conversely, installing earlier SunPCi software after installing the SunPCi II 2.3 version may also panic the system. Removing the added card(s) will prevent the panic if the machine gets into a state where you cannot remove the old software. If you have not installed all the cards, install them after reading this chapter. For instructions on how to install them, see the *SunPCi II 2.3 Installation Guide*.

Before adding cards into an existing installation, ensure that old SunPCi software is removed. You also need to clearly identify configuration files and cards before finalizing your software configuration and starting the software. You should have done this when installing the cards. See the *SunPCi II 2.3 Installation Guide.*

Advanced SunPCi II Multiple-Card Server Configuration

For advanced SunPCi II server support concerning SunPCi II memory, CPUs, and benchmark information, consult the White Papers located at the following URLs:

- `http://www.sun.com/blueprints/0601/windows.pdf`
- `http://www.sun.com/blueprints/1101/sizesunray.html`

Configuring Multiple Cards With SunPCi II Software

With the addition of multiple SunPCi II cards and support for Microsoft Windows server software, a variety of new configurations are available for the SunPCi hardware and software.

The first time the SunPCi II software is started a default *filename*.ini (.ini) configuration file is created as ~/pc/SunPC.ini. This .ini file is specified from the sunpci command line to start the desired emulated C: or D: drive.

In a multiple card system, an emulated drive can be associated with only one card at a time. By default the drive(s) attach to the next available card, although you can specify a particular card if you wish.

Default .ini Configuration File

In order to start an emulated C: or D: drive, that drive's file name must appear in the default .ini file named SunPC.ini. The drive name insertion is done automatically when you create and attach drives using the SunPCi II software.

Also inserted into the SunPC.ini configuration file are the names of PC components and other information. PC components include: the drive image file name or names; the CD-ROM device file name; a diskette device file name; and other devices, for example, printers or other peripherals.

Here is a sample listing of the content of a default SunPC.ini file created in a system with one card installed.

```
[Drives]
A drive=/dev/rdiskette
C drive=/home/user/pc/C.diskimage
CD=/vol/dev/aliases/cdrom0
D drive=/net/host/export/SunPCi_II/D.diskimage
```

Naming .ini Files When Using Multiple Cards

When you install multiple cards in the same system, you need to create multiple .ini files and emulated C: or D: drive images, one for each card. Note, however, that a particular card is not necessarily associated with a particular .ini file name.

It helps to name files and disk images in a way that clearly identifies the `.ini` file and its associated C: and D: drive images. Up to two drive images are permitted in a single `.ini` file.

One solution is to name the `.ini` file and its disk image using some identifying characteristic, such as the Microsoft Windows operating system installed on the disk image. In the TABLE 3-1 example, such a convention is used to name the `.ini` file to match the disk image name for three cards, one per table row. Note that you can include up to two disk drive images in a `.ini` file. You can only run one C: and one D: drive per card at a time.

TABLE 3-1   Sample File Names in a Multiple Card Configuration

`.ini` **File Names**	**Disk Image Names Inside Each** `.ini` **File**
`SunPC.ini` (default)	`C.diskimage` `D.diskimage`
`win2k.ini`	`C.win2k.diskimage`
`ntts4.ini`	`C.ntts4.diskimage`

Unless you specify differently, the following convention is the default SunPCi 2.3 graphical user interface (GUI) behavior when you use the `sunpci` command with the `-new` option. The stem of the specified `.ini` file name, for example `win2k`, is incorporated into the disk image file name as shown in TABLE 3-1. The following procedure illustrates this behavior.

▼ How to Create a `.ini` File Using the `-new` Option

The following procedure assumes that you have installed an additional card or cards into your system. To create a new `.ini` file, follow these steps:

1. At the Solaris prompt, type the following command:

```
% /opt/SUNWspci2/bin/sunpci -new filename.ini
```

By default, the C: emulated drive is automatically assigned the same name as the new *filename*`.ini` file in the format `c.`*filename*`.diskimage`. You can edit the name if you want by using the GUI.

The SunPCi II software Attach an Existing Emulated Drive dialog box is displayed. In the example, the variable *filename* would be replaced by the file name you typed in Step 1.
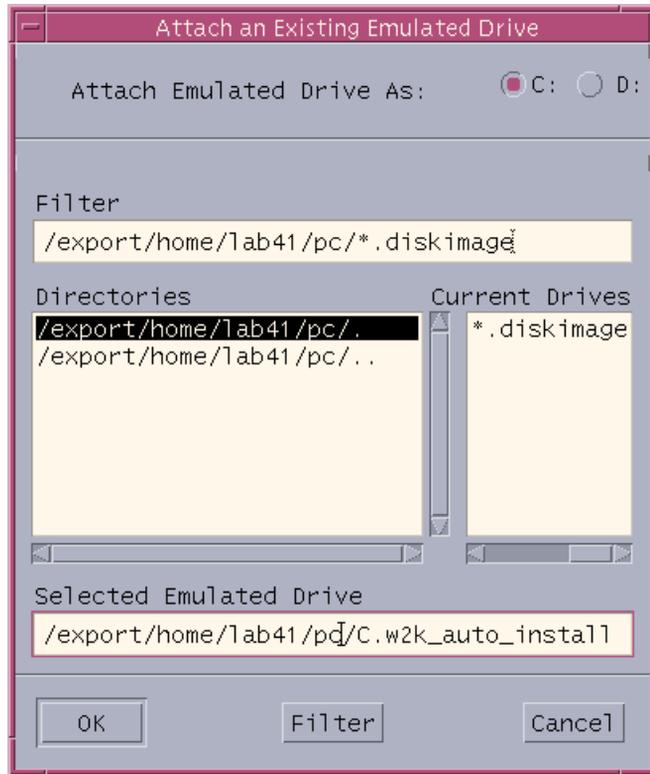
FIGURE 3-1   Attach an Existing Emulated Drive Dialog Box

2. Press Return to accept the default disk image name.

Using Cards and Emulated Drives

Although an emulated drive must run on a SunPCi II card, the SunPCi II emulated drives are not forced to run on any particular card. By default any particular `.ini` file and its associated drive will start on any available card, and it is not possible to predict which card will be used. You can, however, start a drive and a specific card together. To do this, you need to identify the cards that are installed in your system.

▼ How to Identify Card Names

● **To identify each installed card's name, type the following command:**

```
% /opt/SUNWspci2/bin/sunpci -l
```

The system displays the following information: the card's name, for example Card1; the card's device file name in the /dev directory; the card's type; the card's description; and the card's ID or Ethernet (MAC) address.

What follows is sample output from a system with two cards installed.

```
Name = Card1
    Device = /dev/sunpci2drv0
    Type = SunPCi II
    Description = SunPCi II card
    ID = 08:00:20:F9:5F:2C

Name = Card2
    Device = /dev/sunpci2drv3
    Type = SunPCi II
    Description = SunPCi II card
    ID = 08:00:20:E7:9B:06
```

Note – Instead of the ID message you could get a "(Card In Use)" message if one of the cards is already running.

▼ How to Start a Specific .ini File

By default, SunPCi software uses the SunPC.ini file if you issue the sunpci command without options. To start a different emulated drive, which you must do in a multiple card configuration, use the sunpci command with the -p option.

● **To start SunPCi software with a specific file using the -p option, type the following command:**

```
% /opt/SUNWspci2/bin/sunpci -p filename.ini
```

The SunPCi II software starts, using the referenced disk image.

If you start an emulated drive with a card on which that drive was not created, you get a warning dialog box about the Ethernet (MAC) address that reads:

```
This emulated drive image was created on another SunPCi card. This
could cause problems if there was special hardware connected to
that card. It could also cause problems if your installed software
or configuration makes any assumptions about the MAC address.

       Emulated Disk File /pathname/c.diskimage
       was created on the card with the MAC address xx:yy:zz:zz:yy:xx

If you do not wish to see this message in the future, start sunpci
with the -nomac option.
```

If application registration or network configuration setup is affected, you may wish to use the `-nomac` option, or you may wish to bind the particular image and card by remapping the MAC address to the disk image.

If you want to bind the MAC address to the current disk image use the `-bindmac` `sunpci` command option. See "The sunpci Command and Its Options" on page 126 for more details.

▼ How to Start a Specific Card

Sometimes, for configuration reasons, you may need to start a specific card with a specific C: drive. For example, you may want to run on a card with a printer attached to a port, or to run on a card that will better support a memory intensive application.

● **To start the SunPCi II software with a specific card, type the following command:**

```
% /opt/SUNWspci2/bin/sunpci -c cardname -p filename.ini
```

Where *cardname* is one card's name returned by the system, for example, `Card1`, or `Card2`.

Starting Specific Disk Image Files

If you want to use the SunPCi software with different Microsoft Windows operating systems on different disk images, you can create additional C: drive image files for as many operating systems as you need to run. Then install the operating system; refer to the appropriate chapter in this guide.

When you want to run a different Microsoft Windows operating system, select Shut Down from the operating system you are using, and Exit from the SunPCi II GUI. Start the disk image you need using the `sunpci` command line and the `-p` option.

Note – If you attach a disk image file and run it from the SunPCi GUI, the MAC address of the card the image attaches to is overwritten into the header information in the `.ini` file. You will not get a warning dialog box about the Ethernet (MAC) address. See "How to Start a Specific .ini File" on page 28 for more information.

▼ How to Start a Specific Image and a Specific Card

By starting a specific image and a specific card, you can link an image and a card to ensure that a particular image is executing on a specific card.

Note – You can only run one operating system at a time per card.

● **To start SunPCi software with a specific file and a specific card using the `-p` and `-c` options, type the following command:**

```
% /opt/SUNWspci2/bin/sunpci -p filename.ini -c cardname
```

The SunPCi II software starts, using the referenced disk image and card.

If you start an image with a card on which it was not created, you get a warning dialog box about the Ethernet (MAC) address, see "How to Start a Specific .ini File" on page 28.

▼ How to Specify a Title Bar for Each Card Window

When you are running multiple cards in your system, you may find it helpful to identify which operating system and card are running in which Solaris desktop window. You can enter text into the title bar of your SunPCi II window to identify each window.

● **Use the** `sunpci` **command and the** `-title` **option to add a string of text into your SunPCi window title bar.**

For example, to specify a title in a `sunpci` command starting a particular `.ini` with `Card2`, type:

```
% sunpci -title "Win2k Terminal Server on" -c card2 -p
~/pc/win2kts.ini
```

The resulting text line at the title bar of the SunPCi Terminal window will read "Win2k Terminal Server on Card2." For more information about using the `-title` option, see "The sunpci Command and Its Options" on page 126.

▼ How to Update the SunPCi II Card Configuration

Periodically you may need to add, remove, move, or replace a SunPCi II card. After doing this, to update the SunPCi II Solaris drivers on the system, complete the following procedure:

1. **Remove the files** `/etc/Master.ini` **and** `/etc/Master.bak`**, if they exist.**

2. **Become superuser and type the following command:**

```
# /opt/SUNWspci2/drivers/solaris/sunpcload
```

3. **Reconfigure any Boot@Boot support if needed as it will be lost. Add and enable VNC and cards using the** `sunpcid` **command with the** `-a` **and** `-e` **options.**

See "Configuring and Using Boot@Boot Support" on page 132.

4. **Exit the superuser account, and proceed as you would to start the software normally.**

Modifying Image File Configurations

The following are additional issues you may need to consider before you finalize the design of your configuration:

- "Rebinding Images and Cards" on page 32
- "Programming the Card's MAC Address" on page 32
- "Networking With Multiple Cards" on page 33

Rebinding Images and Cards

When a *disk.imagefile* file is created, the MAC address of the card on which the *disk.imagefile* was created is written into its header, binding the card to the *disk.imagefile*. The binding is only informational, and does not interfere with running a C: or a D: drive on a different card. The `sunpci` command `bindmac` option rewrites the MAC address of the current card into the *disk.imagefile* header.

This switch is rarely used. If you are remapping a C: drive in which the MAC address of the original card has been used by installed applications for registration or network purposes, you risk licensing and networking issues.

Before attempting to reconfigure the bindings of any disk images, verify that you have read and understood the `sunpci` and the `sunpciflash` command-line options. For more information, refer to "The sunpci Command and Its Options" on page 126, or TABLE A-5 for `sunpciflash` information.

Programming the Card's MAC Address

There is generally no reason to update or change the MAC address on your SunPCi II card. If your card requires troubleshooting, or if you need to update multiple cards, see "Networking Hardware Problem" on page 168 in Appendix A.

Multiple Card Behavior

The following are limitations or features when running multiple cards installed in the same system.

Networking With Multiple Cards

Virtual networking is automatically disabled in systems with more than one card installed. Use physical networking with multiple card configurations.

Using the Diskette Drive With Multiple Cards

When multiple cards on a system are running, once the diskette drive is being used by a SunPCi II session, it is not available to any other session. When not in use, the diskette drive is locked to the first SunPCi II session started after it becomes available.

Using the CD-ROM Drive With Multiple Cards

When multiple cards on a system are running, they all share the system CD-ROM drive. One unusual, but expected behavior is that when you insert a CD into the drive, Autorun starts on all running SunPCi sessions.

How to Proceed

- Before configuring your network connections, read about the SunPCi networking options in Chapter 4.

Once you have installed and configured the SunPCi II 2.3 hardware and software, you can install one or more supported versions of Microsoft Windows. The easiest way to do this is to choose an operating system to install when you choose the Create a New Emulated Drive from the SunPCi II Options menu. See Chapter 2 for instructions.

See the following chapters for additional information about configuring and using each operating system, and for performing upgrades and custom installations.

- Chapter 5—Windows XP
- Chapter 6—Windows 2000
- Chapter 7—Windows NT
- Chapter 8—Windows ME
- Chapter 9—Windows 98 SE

Networking With SunPCi II Hardware and Software

This chapter assumes that you have installed the SunPCi II card or cards into your UltraSPARC system, that you have installed the SunPCi II 2.3 software, and that you want to understand what networking options are available with the SunPCi II 2.3 product.

This chapter includes the following major topics:

- "Networking With SunPCi II Hardware and Software" on page 35
- "Setting Up Networking With SunPCi II Hardware and Software" on page 36

Networking With SunPCi II Hardware and Software

There are two ways to connect each SunPCi II card to your network:

- *Physical Ethernet* – Use the external Ethernet connector on the back of the SunPCi II card and connect the card to a second physical Ethernet connection.
- *Virtual Ethernet* – Use the internal networking driver (NDIS driver) in the SunPCi II software and connect through your system's Ethernet connection.

Note – When more than one SunPCi II card is installed in a system, virtual networking is disabled by the SunPCi II software.

Physical Ethernet networking is faster than virtual Ethernet, but it requires an additional port to connect to your network. This means that you need to have two separate Ethernet connections: one for your Solaris system, and one for your SunPCi II card.

Physical Ethernet eliminates the need for routing to a third host in order for the Solaris system and the SunPCi II card to communicate with each other over the Transmission Control Protocol/Internet Protocol (TCP/IP). Once physical Ethernet networking is set up, you can "see" both your SunPCi II card and your workstation in the list of network hosts.

Virtual Ethernet networking eliminates the need for a second network port; you share a single Ethernet connection between your system and your SunPCi II card. If you use virtual networking, you will not be able to generate a network path between your SunPCi II card and your host Solaris system until you set up network connections. See "How to Set Up Network Connections: An Example" on page 39.

When you install the SunPCi II software, physical Ethernet networking is turned on by default, and virtual Ethernet networking is turned off. When multiple cards are installed in a system, virtual Ethernet networking is permanently disabled. For specific instructions on the networking drivers for your version of Microsoft Windows, refer to the corresponding installation chapter.

- To install the Windows NT drivers, refer to Chapter 7.
- To install the Windows XP Professional drivers, refer to Chapter 5.
- To install the Windows 2000 drivers, refer to Chapter 6.
- To install the Windows ME drivers, refer to Chapter 8.
- To install the Windows 98 SE drivers, refer to Chapter 9.

Note – With SunPCi II Version 2.3 software and only one SunPCi II card installed in your system, you can use either physical or virtual networking, but not both at once. When multiple cards are installed in your system, virtual networking is automatically disabled, and you need to configure the TCP/IP network protocols for all Microsoft Windows configurations.

Setting Up Networking With SunPCi II Hardware and Software

Setting up networking with SunPCi hardware and software involves setting TCP/IP properties, setting up either physical or virtual Ethernet networking, and setting up network connections between SunPCi II cards and your Solaris system.

▼ How to Set TCP/IP Properties

Before you can configure TCP/IP, you need to obtain certain information from the network administrator at your site.

1. **Obtain the following information before you begin:**

   - Your SunPCi II computer name (the name you enter when you install Microsoft Windows)

   - If you are not using Dynamic Host Configuration Protocol (DHCP) to obtain an IP address, you will also need:

     - The IP address for your SunPCi II card (must be different from your workstation's IP address)

     - The subnet mask for your site's network

     - The IP address for your router/gateway (if used)

   Note – If you are using virtual networking, you cannot use DHCP for both your UltraSPARC system and the SunPCi II card.

   - The host name, domain name, and IP address for each Domain Name Service (DNS) server at your site (if used)

2. **To configure TCP/IP, use the Network utility in Control Panel in Microsoft Windows.**

   Enter the information you obtained in this list in the corresponding fields. For more information about setting up networking with Windows XP Professional, Windows 2000, Windows NT, Windows ME, or Windows 98 SE, refer to the documentation that came with your version of Microsoft Windows.

   Note – Microsoft Windows provides a number of different ways to add new hardware to your configuration. Be sure to follow the procedures described in this chapter, even if you have had success with other methods on another PC.

▼ How to Set Up Physical Ethernet Networking

To configure the physical Ethernet network, perform the following steps:

1. **Connect one end of the Ethernet cable (with an RJ-45 connector on the end) to the Ethernet port on the back of the SunPCi II card.**

2. **Connect the other end of the cable to the network's Ethernet port.**

3. **Restart your version of Microsoft Windows.**

   When Microsoft Windows starts up again, the Add New Hardware Wizard should show the message "Microsoft Windows has detected new hardware." The SiS 900 physical Ethernet drivers are enabled by default in the SunPCi II software.

4. **If you have not already set up TCP/IP, refer to the previous section.**

▼ How to Set Up Virtual Ethernet Networking

Note – When more than one SunPCi II card is installed in a system, virtual networking is disabled by the SunPCi II software.

If you changed networks or network properties, or if you did not set up the network during the installation process, you need to configure TCP/IP to connect to your network. Refer to the documentation that came with your version of Microsoft Windows and to "How to Set TCP/IP Properties" on page 37.

● **To configure virtual networking:**

   ■ In Windows XP Professional, refer to "Configuring Virtual Ethernet Networking on Windows XP Professional" on page 52.

   ■ In Windows 2000, refer to "Configuring Virtual Ethernet Networking on Windows 2000" on page 73.

   ■ In Windows NT, refer to "Configuring Virtual Ethernet Networking in Windows NT" on page 89.

Note – If you are using DHCP with virtual networking, you may observe that the network takes several minutes to start after you configure the network and restart Microsoft Windows. This is normal behavior during the first reboot after you set up the network.

To diagnose problems with your network, refer to Appendix A.

▼ How to Set Up Network Connections: An Example

When you use virtual Ethernet networking, your system and SunPCi II host do not see each other on the network. If they need to communicate with each other using the network, you need to send the information through your network router. To configure your workstation and SunPCi II host, you need to know the IP addresses of your workstation, your SunPCi II card, and the network router. In addition, you need the subnet mask used on your network. If you do not know the IP addresses or do not yet have one assigned to your SunPCi II card, see your network manager.

Note – This procedure will not work if you are using DHCP to obtain IP addresses for either your workstation or for the SunPCi II card.

In this example, the systems have the following addresses and masks:

- SunPCi II card IP address: 192.9.200.1
- Host workstation IP address: 192.9.200.2
- Router IP address: 192.9.200.3
- Subnet mask: 255.255.255.0

Before you start, make sure that you have account access to the system you are using as a network router.

To set up the connections between the systems, perform the following steps:

1. **In Microsoft Windows, click the Start button, then choose Programs and MS-DOS Prompt from the menus.**

2. **Type the following command at the DOS prompt (do not type the `C:\>` prompt):**

```
C:\> cd windows
```

3. **If you want networking to take place every time you start up Microsoft Windows, you need to create a batch file to add to your Microsoft Windows Startup folder (for example, `C:\WINDOWS\Start Menu\Programs\Startup\ADDROUTE.BAT`).**

   The file would contain two lines similar to the following (substituting the IP addresses for your systems). For example:

```
@echo off
route add 192.9.200.2 mask 255.255.255.0 192.9.200.3
```

4. **On the host system, type the following command, substituting the IP addresses of your SunPCi II card and router (proxy system) for the ones used in the example:**

```
% route add 192.9.200.1 192.9.200.3 1
```

The trailing "1" after the second IP address (`192.9.200.3`) indicates the routing metric, or the number of system hops the packet will have to travel to reach its destination. If desired, you can enter this information into an `/etc/rc` script that will run each time you reboot your system.

5. **On the router (which can be another system, a router, or another computer on the same subnet as your system and SunPCi II host), type the following command, substituting the IP addresses of your SunPCi II card and your system for the ones used in the example:**

```
% route add 192.9.200.1 192.9.200.3 0
% route add 192.9.200.2 192.9.200.3 0
```

The trailing "0" indicates the routing metric, or the number of system hops the packet will have to travel to reach its destination. When you are working from a system designated as a router, a network packet travels from one port to another and that is considered a hop count of zero.

You should now be able to use the `ping` command to contact the SunPCi II host from the system, and the system from the SunPCi II host. See "Networking Problems" on page 174 for more information about troubleshooting TCP/IP connections.

How to Proceed

After you install and configure the SunPCi II 2.3 hardware and software, you can install one or more supported versions of Microsoft Windows. The easiest way to do this is to auto-install the operating system when you choose Create a New Emulated Drive from the SunPCi Options menu. See Chapter 2 for instructions. See the following chapters for additional information about configuring and using each operating system, and for performing upgrades and custom installations.

- Chapter 5—Windows XP
- Chapter 6—Windows 2000
- Chapter 7—Windows NT
- Chapter 8—Windows ME
- Chapter 9—Windows 98 SE

Using Windows XP Professional

This chapter describes how to install and configure Microsoft Windows XP Professional on your SunPCi II system. It also describes how to upgrade an existing emulated drive to Windows XP Professional.

This chapter includes the following general topics:

- "Installing Windows XP Professional" on page 42
- "Upgrading to Windows XP Professional" on page 44
- "Upgrading Windows NT4 WS to Windows XP Professional" on page 45
- "Upgrading Windows 2000 Professional to Windows XP Professional" on page 47
- "Upgrading Windows ME to Windows XP Professional" on page 49
- "Upgrading Windows 98 SE to Windows XP Professional" on page 50
- "Configuring Virtual Ethernet Networking on Windows XP Professional" on page 52

This chapter includes instructions for completing the following tasks:

- "How to Perform a Custom Installation" on page 43
- "How to Reinstall Windows XP Professional" on page 44
- "How to Upgrade Windows NT4 WS to Windows XP Professional" on page 46
- "How to Upgrade Windows 2000 Professional to Windows XP Professional" on page 48
- "How to Upgrade Windows ME to Windows XP Professional" on page 49
- "How to Upgrade Windows 98 SE to Windows XP Professional" on page 51
- "How to Remove a Static IP Address" on page 53
- "How to Add a Virtual Network Adapter" on page 53
- "How to Configure the Network in Windows XP Professional" on page 54
- "How to Reconfigure the Network Adapter for Physical Ethernet" on page 55
- "How to Configure External Video for Windows XP Professional" on page 56
- "How to Configure Windows XP Professional Display Properties" on page 58

Throughout this chapter, Microsoft Windows XP Professional is referred to as Windows XP Professional.

Installing Windows XP Professional

You should install operating system software when you create an emulated drive by choosing Create a New Emulated Drive from the SunPCi Options menu. See "Creating an Emulated Hard Drive" on page 13. If you want to perform a custom installation using scripts that are different from the standard Microsoft installation scripts, see "How to Perform a Custom Installation" on page 43.

It is important that you upgrade your SunPCi II card to at least 128 Mbytes of RAM before installing and running Windows XP Professional, and more is suitable—for best performance, use 256 Mbytes or more for running Windows XP Professional software.

Note – This release does not support simultaneous operation of Windows XP Professional on both the system and external monitors.

Installation Notes

Make sure that you have all the following media and information available before you begin installation:

- Windows XP Professional retail installation software CD, or your customized installation scripts
- The network system name for each SunPCi II card installed in your system
- The workgroup or domain name for your Windows XP Professional installation on each SunPCi II card installed in your system

---

Note – When you install or upgrade to Windows XP Professional, a dialog box may appear that contains information about display settings. The mouse is disabled at this point, and you must use the Tab and Enter keys to click buttons in the dialog box and also in the settings confirmation dialog box that may follow. The mouse is enabled after doing this.

▼ How to Perform a Custom Installation

> ⚠ **Caution –** When you specify an operating system to auto-install in the Create a New Emulated Drive dialog box, the software automatically finds and copies setup files, boot files, system files, and drivers that are appropriate for that operating system, and launches Windows Setup when SunPCi 2.3 software reboots. Do not perform a custom installation unless you want to use customized installation scripts.

1. **Create a new emulated hard drive and auto-install the DR DOS 7.01 operating system software.**

   Follow the instructions in "Creating an Emulated Hard Drive" on page 13. Set options in the Create a New Emulated Drive dialog box as follows:

   - Select DR DOS 7.01 as the operating system to auto-install.
   - Be sure to make the drive at least 2 Gbytes in size, since it cannot be expanded once created.
   - Attach the drive as a C: drive.
   - For best performance, create your emulated drives on a local hard disk on your workstation.

2. **Click OK when the dialog box asks you to reboot the SunPCi II software.**

   The SunPCi II software reboots. The OpenDOS prompt (C:\>) is displayed.

3. **Install SunPCi II drivers.**

   The default location for the Windows XP Professional files is r:\cdrom\cdrom0\ i386. However, if your Windows XP Professional files reside at a location other than the default one, you need to use the /s: switch to specify where the files are located. For example, if your Windows XP Professional disk image is located in your Solaris directory at /export/home/winxp/i386, you would access it from the R: drive in OpenDOS. Type the following command all on one line:

   ```
   C:\> f:\drivers\winxp\setupwxp /s:r:\export\home\winxp\i386
   ```

   The setup process takes a few minutes to complete. SunPCi II software responds with the following messages:

   ```
   Copying Setup Files...
   Copying Boot Files...
   Copying System Files...
   Copying Optional Files...
   Copying Assembly Files...
   Copying SunPCi II Installation Files...
   ```

When the `setupwxp` script finishes copying the Windows XP Professional files to your C: drive, it reboots the SunPCi II software. The Windows XP Professional Setup screen is displayed. When Windows XP Professional Setup has finished copying files, it reboots the SunPCi II software again.

4. **After the SunPCi II software reboots, choose Attach Mouse from the Options menu or press Meta-M to attach the mouse.**

   This enables the mouse to work with Windows XP Professional during the installation process. Once the installation is completed, the proper mouse drivers are installed and you will no longer need to attach the mouse manually.

5. **Change directory to the location for your customized installation scripts.**

6. **Complete the installation using your customized installation scripts.**

▼ How to Reinstall Windows XP Professional

● **If you need to reinstall the standard version of Windows XP Professional, use the Add/Remove Software utility in the Control Panel screen or in the Autorun dialog box that appears when you insert the Windows XP Professional CD.**

Caution – Do not use the Windows XP Professional Setup option in the Autorun dialog box to reinstall Windows XP Professional. Using this option will result in a Windows XP Professional "blue screen" error and a message indicating an inaccessible boot device.

Upgrading to Windows XP Professional

In SunPCi II software, you can upgrade emulated drive disk images. You can upgrade an existing C: drive that is configured for any of the following operating systems:

■ Windows 2000 Professional
■ Windows NT4 WS
■ Windows ME
■ Windows 98 SE

Upgrade Notes

Make sure that you have the following software media available before you start an upgrade to Windows XP:

■ The Windows XP Professional retail software installation CD; the installation will *not* work without the CD in your CD-ROM drive

In addition, you must have at least 2 Gbytes of available free space on your emulated C: drive.

Tip – Before you perform the upgrade, make a backup copy of your existing C: emulated drive file.

Upgrading Windows NT4 WS to Windows XP Professional

Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi II program involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows XP Professional CD. If you do use the standard upgrade procedure, the installation will fail, and your emulated C: drive can become corrupted.

Before You Begin the Upgrade

Caution – If you are using an external CD-RW drive with Windows NT4 WS, uninstall the device. The upgrade to Windows XP Professional will fail unless the device is removed and its software uninstalled. Reinstall the device after the upgrade.

Before starting to upgrade a new Windows NT4 WS package to Windows XP Professional, follow the prerequisite steps below:

1. **From the Windows Explorer menu, map a drive to** `\\localhost\opt\`
   `SUNWspci2`.

   This provides access to the patch directory.

2. **Click down the directory tree to** `\drivers\winnt\patch` **and double-click**
   `update.bat`.

   The `update.bat` script updates the necessary drivers so you can proceed with the
   upgrade.

3. **Proceed to Step 1 of the upgrade procedure that follows.**

▼ How to Upgrade Windows NT4 WS to Windows XP Professional

1. **Insert the Windows XP Professional CD into your system's CD-ROM drive.**

2. **Click the Start button, and then choose Programs and Windows Explorer.**

   The Windows Explorer window is displayed.

3. **In Windows Explorer, navigate to the following path:**

   ```
   C:\sun\wxpupg
   ```

   Note – If you cannot find this directory on your C: drive, either you have installed
   the wrong version of the SunPCi II software, or you did not update your SunPCi II
   drivers.

4. **Double-click Upgrade.**

   The upgrade process continues. This program automatically maps a network drive
   for its own use. If you do not have a network drive letter available in Windows
   Explorer, the process fails.

   Note – If you do not have the Windows XP Professional CD in your CD-ROM drive,
   the upgrade process fails at this step.

5. **Follow the prompts on the screen and enter the information that Microsoft**
   Windows requests (for example, the CD key on the back of your CD case, your
   administrator's password, and so on).

   When you are finished entering all the information, the SunPCi II software reboots
   into Windows XP Professional.

Tip – This step can take several minutes to complete.

Upgrading Windows 2000 Professional to Windows XP Professional

Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi II program involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows XP Professional CD. If you do use the standard upgrade procedure, the installation will fail, your Windows XP Professional emulated disk will not run with SunPCi II, and your emulated C: drive will become corrupted.

Before You Begin the Upgrade

Before starting to upgrade Windows 2000 Professional to Windows XP Professional, follow these steps:

1. **Using Windows Explorer, map a drive to** `\\localhost\opt\SUNWspci2`.

   This provides access to the patch directory.

2. **Click down the directory tree to** `\drivers\win2k\patch` **and double-click** `update.bat`.

   The `update.bat` script updates the necessary drivers so that you can proceed with the upgrade.

3. **Disable any anti-virus software that is running.**

   You may re-enable the anti-virus software after completing the installation.

4. **Proceed to Step 1 of the upgrade procedure that follows.**

▼ How to Upgrade Windows 2000 Professional to Windows XP Professional

1. **Insert the Windows XP Professional CD into your system's CD-ROM drive.**

2. **Click the Start button, and then choose Programs and Windows Explorer.**

   The Windows Explorer window is displayed.

3. **Navigate the Windows Explorer window to the following path:**

   ```
   C:\sun\wxpupg\upgrade.bat
   ```

   Note – If you cannot find this directory on your C: drive, either you have installed the wrong version of the SunPCi II software, or you did not update your SunPCi II drivers.

   ---

4. **Double-click Upgrade.**

   The upgrade process continues. This program automatically maps a network drive for its own use. If you do not have a network drive letter available in Windows Explorer, the process fails.

   Note – If you do not have the Windows XP Professional CD in your CD-ROM drive, the upgrade process fails at this step.

   ---

5. **Follow the prompts on the screen and enter the information that Microsoft Windows requests (for example, the CD key on the back of your CD case, your administrator's password, and so on).**

   When you are finished entering all the information, the SunPCi II software reboots again into Windows XP Professional.

   Tip – This step can take several minutes to complete.

Upgrading Windows ME to Windows XP Professional

⚠️

Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi II program involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows XP Professional CD. If you do use the standard upgrade procedure, the installation will fail, your Windows XP Professional emulated disk will not run with SunPCi II, and your emulated C: drive will become corrupted.

Before You Begin the Upgrade

Before starting to upgrade Windows ME to Windows XP Professional, follow these steps:

1. **Using Windows Explorer, map a drive to** `\\localhost\opt\SUNWspci2.`

   This provides access to the patch directory.

2. **Click down the directory tree to** `\drivers\winme\patch` **and double-click** `update.bat` **before proceeding to Step 1 of the upgrading procedure that follows.**

   The `update.bat` script updates the necessary drivers.

3. **Proceed to Step 1 of the upgrade procedure that follows.**

▼ How to Upgrade Windows ME to Windows XP Professional

1. **Insert the Windows XP Professional CD into your system's CD-ROM drive.**

2. **Click the Start button, and then choose Programs and Windows Explorer.**

   The Windows Explorer window is displayed.

3. **Navigate the Windows Explorer window to the following path:**

   drive-letter`:\drivers\winme\wxpupg\upgrade.bat`

4. **Double-click Upgrade.**

   The upgrade process continues. This program automatically maps a network drive for its own use. If you do not have a network drive letter available in Windows Explorer, the process fails.

5. **Follow the prompts on the screen and enter the information that Microsoft Windows requests (for example, the CD key on the back of your CD case, your administrator's password, and so on).**

   When you have finished entering all the information, the SunPCi II software reboots again into Windows XP Professional.

Upgrading Windows 98 SE to Windows XP Professional

Before You Begin the Upgrade

Before starting to upgrade Windows 98 SE to Windows XP Professional, follow these steps:

1. **Using Windows Explorer, map a drive to** `\\localhost\opt\SUNWspci2`.

   This provides access to the patch directory.

2. **Click down the directory tree to** `\drivers\win98\patch` **and double-click** `update.bat`**.**

   The `update.bat` script updates the necessary drivers.

3. **Proceed to Step 1 of the upgrade procedure that follows.**

▼ How to Upgrade Windows 98 SE to Windows XP Professional

1. **Insert the Windows XP Professional CD into your system's CD-ROM drive.**

2. **Click the Start button, and then choose Programs and Windows Explorer.**

   The Windows Explorer window is displayed.

3. **Navigate the Windows Explorer window to the following path:**

   ```
   drive-letter:\drivers\win98\wxpupg\upgrade.bat
   ```

   Note – If you cannot find this directory on your C: drive, either you have installed the wrong version of the SunPCi II software, or you did not update your SunPCi II drivers.

   ---

4. **Double-click Upgrade.**

   The upgrade process continues. This program automatically maps a network drive for its own use. If you do not have a network drive letter available in Windows Explorer, the process fails.

   Note – If you do not have the Windows XP Professional CD in your CD-ROM drive, the upgrade process fails at this step.

   ---

5. **Follow the prompts on the screen and enter the information that Microsoft Windows requests (for example, the CD key on the back of your CD case, your administrator's password, and so on).**

When you are finished entering all the information, the SunPCi II software reboots again into Windows XP Professional.

Tip – This step can take several minutes to complete.

Configuring Virtual Ethernet Networking on Windows XP Professional

---

Note – When more than one SunPCi II card is installed in a system, virtual networking is disabled by the SunPCi II software.

The SunPCi II software comes with *physical* Ethernet networking enabled by default. If you prefer to use *virtual* networking instead of physical networking, you need to disable the physical Ethernet adapter in Microsoft Windows and install the virtual Ethernet adapter. This section explains the steps you need to follow.

Caution – Undesirable interactions can occur if you enable both virtual and physical networking at the same time.

For more information about physical and virtual Ethernet networking, refer to "Setting Up Networking With SunPCi II Hardware and Software" on page 36.

To set up virtual Ethernet networking on Windows XP Professional, follow the steps outlined in the following procedure. This procedure explains how to configure the network adapter.

Note – Microsoft Windows provides a number of different ways to install software. Follow the instructions in this section, even if you have installed Microsoft Windows software before. The SunPCi II 2.3 software does not support other methods of installation.

▼ How to Remove a Static IP Address

If you were using physical networking, and had previously defined a static IP address, follow these steps to remove the address. If not, skip to the next procedure.

1. **On the Windows desktop, right-click My Network Places and choose Properties.**

2. **Right-click Local Area Connections and choose Properties.**

3. **Double-click Internet Protocol (TCP/IP).**

4. **Delete the previous IP address, and select the setting to Obtain an IP Address Automatically.**

5. **Click OK twice to dismiss the two dialog boxes.**

▼ How to Add a Virtual Network Adapter

1. **From the Windows XP Professional Start menu, right-click My Computer and select Properties.**

   The System Properties window is displayed.

2. **Click the Hardware tab.**

3. **Click the Device Manager button to display the Device Manager window.**

   The window lists the installed device drivers.

4. **Double-click Network Adapters.**

5. **Right-click SiS 900 PCI Fast Ethernet Adapter, and click Disable.**

   Choose Yes in the message box that says that disabling this device will cause it to stop functioning.

6. **From the Control Panel, double-click Add/Remove Hardware.**

7. **Click Next at the Welcome to the Add/Remove Hardware Wizard dialog box.**

   The Choose Hardware Task dialog box is displayed.

8. **Select "Yes, I have already connected the hardware," and then click Next.**

9. **Choose Add a New Device, and then click Next.**

   The Find New Hardware dialog box is displayed.

10. **Select "Install the hardware that I manually select from a list [Advanced]," and then click Next.**

    A dialog box appears that asks what type of hardware you are installing.

11. **Select Network Adapters, and then click Next.**

12. **Click Have Disk.**

13. **Click Browse, and navigate to C:\sun\sunnet\winxp\sunndis.**

14. **Click Open, and then click OK in the Install From Disk dialog box.**

    The Select Network Adapter dialog box is displayed.

15. **Click Next.**

    A dialog box appears that lists the SunNDIS Adapter Driver as the new hardware to install.

16. **Click Next**

    Files are copied and the Completing Add Hardware Wizard is displayed.

17. **Click Finish.**

    If you are asked to restart your computer, choose Yes to complete the configuration.

    To make the virtual adapter function in the network, you need to complete the procedure "How to Configure the Network in Windows XP Professional" on page 54.

▼ How to Configure the Network in Windows XP Professional

After you finish configuring the virtual or the physical network adapter and restart Windows XP Professional, you need to configure *one* of the adapters to use TCP/IP. Log in to Windows XP Professional again and follow the steps in this procedure.

> ⚠ **Caution –** Do not activate a virtual and a physical network adapter at the same time. Verify that you have disabled the virtual or physical adapter before performing the following procedure.

1. **From the Start menu, choose Settings, and then choose Network and Dial-Up Connections.**

   The Network and Dial-Up Connections window is displayed. The window contains three icons: Make New Connection, Local Area Connection, and Local Area Connection 2.

2. **Double-click Local Area Connection or Local Area Connection 2.**

   Your choice of Local Area Connection or Local Area Connection 2 depends on *which* Ethernet adapter is enabled. The Status window is displayed.

3. Click Properties.

The Properties window is displayed.

4. Double-click Internet Protocol (TCP/IP).

The Internet Protocol (TCP/IP) Properties window is displayed.

5. Set up TCP/IP for your SunPCi II card as described in "How to Set TCP/IP Properties" on page 37.

Refer to your Windows XP Professional documentation if needed.

6. When you have finished setting up TCP/IP, click OK, and then Click Yes to restart Windows XP Professional.

Note – If you see a dialog box with the message "SunNDIS failed to start," ignore the message and click OK. This message sometimes appears when DHCP networking is disabled.

▼ How to Reconfigure the Network Adapter for Physical Ethernet

If you need to reactivate the physical network adapter, follow these steps.

Caution – Do not activate a virtual and a physical network adapter at the same time. Verify that you have disabled the virtual adapter before performing the following procedure.

---

1. On the Windows desktop, right-click My Computer, and choose Properties.

The System Properties window is displayed.

2. Click the Hardware tab.

3. Click the Device Manager button to display the Device Manager window.

The window lists the computer's installed device drivers.

4. Click the Computer Name.

5. Select Network Adapters and expand the list.

Click the + check box to expand the list.

6. If you configured a static IP address for virtual networking, perform the procedure "How to Remove a Static IP Address" on page 53.

7. **Right-click the SunNDIS Virtual Adapter and select Disable.**

   Choose Yes at the message about Disabling this Device will cause it to stop functioning. This step disables the virtual network.

8. **Right-click the Sis 900 PCI Fast Ethernet Adapter, choose Enable from the menu, and click the selection.**

9. **Close the Device Manager and the System Properties dialog boxes.**

   To enable the physical adapter to use TCP/IP in the network, you need to complete the procedure "How to Configure the Network in Windows XP Professional" on page 54.

▼ How to Configure External Video for Windows XP Professional

To use an external monitor, you need to attach the monitor to the SunPCi II card's add-on backplate and install the external video driver.

> **Caution –** Undesirable interactions can occur if you enable both internal and external monitors at the same time. SunPCi II 2.3 software does not support multi-headed operation.

1. **Attach the monitor to the Video port connector on the SunPCi II add-on backplate.**

   Refer to FIGURE 10-1 to find the location of the video port.

2. **Start the SunPCi II software, if it is not already running.**

3. **On the Windows desktop, right-click My Computer.**

   A drop-down menu is displayed.

4. **Choose Manage, and then choose Device Manager.**

   The Computer Management window is displayed.

5. **Click Display Adapters.**

   A list of the available display adapters is displayed.

6. **Double-click Sun Microsystems NULL SiS VGA Driver.**

   The Properties window is displayed.

7. **Click the Driver tab, and then click the Update Driver button.**

   The Upgrade Device Driver Wizard window is displayed.

8. **Select "Install from a list or specific location [Advanced]," and then click Next.**

   The Choose Your Search and Installation Options dialog box appears.

9. **Select "Don't search, I will choose the driver install," and then click Next.**

   The Select the Device Driver dialog box appears.

10. **Click Have Disk.**

11. **Click Browse in the window, and navigate down to the folder C:\sun\sisvideo\ winxp.**

12. **Double-click the file name** `sis630.inf`**.**

    The file name and path are entered into the dialog box labeled "Copy manufacturer's files from."

13. **Click OK.**

    Two drivers are displayed in the dialog box, Sis630/730 and Sun Microsystem Null Sis VGA driver.

14. **Select Sis 630/730, and then click Next.**

    When the installation is finished, the Completing the Hardware Update Wizard is displayed.

15. **Click Finish to close the Update Wizard window, and then close the Sis630/730 Properties window.**

    A dialog box is displayed that asks whether you want to restart your computer for the hardware changes to take effect.

16. **Choose No, and then close the dialog box.**

17. **Choose Shut Down from the Start menu.**

    A dialog box appears that states "It is now safe to turn off your computer."

18. **Choose Exit SunPCi from the File menu in the SunPCi II window.**

19. **Click Yes when the dialog box asks you if you want to shut down the SunPCi software.**

20. **At the Solaris system prompt, restart the SunPCi II software using the** `-vga` **switch:**

```
% /opt/SUNWspci2/bin/sunpci -vga
```

The SunPCi II software starts, and the Windows XP Professional desktop is displayed to the external monitor. For best performance with Windows XP Professional and an external monitor, attach a serial mouse to the serial port on the SunPCi II card's add-on backplate.

▼ How to Configure Windows XP Professional Display Properties

For more information about configuring the display in Windows XP Professional, refer to your Windows XP Professional documentation.

To reconfigure your Sun display in Windows XP Professional, perform the following procedure.

Note – Perform this procedure only if you want to switch back from the external display to the Sun display. The procedure "How to Configure External Video for Windows XP Professional" on page 56 must be completed prior to this procedure.

1. **Position your mouse cursor on the Windows XP Professional desktop (not on any of the icons), and click the right mouse button.**

   A drop-down menu is displayed.

2. **Choose Properties**

   The Display Properties dialog box is displayed.

3. **Click the Settings tab.**

   Note – There are two displays shown in the window, marked 1 and 2. Video 1 is highlighted, showing that it is the primary display (Plug and Play Monitor for SiS 630/730). Video 2 (Default Monitor on Sun Microsystems SunPCi Video) is dimmed, indicating that it is not the primary display. Below the two video displays, the driver for Video 1 is displayed.

4. **Click Video 2.**

   The driver listed underneath the video changes to Default Monitor on Sun Microsystems SunPCi Video.

5. **Click the check box next to "Extend my windows desktop onto the monitor."**

6. **Click the check box next to "Use this device as the primary monitor."**

7. **Click Video 1.**

   The driver listed underneath the video changes back to Plug and Play Monitor for SiS 630/730.

8. **Deselect the check box next to "Extend my windows desktop onto this monitor."**

   ⚠ **Caution –** Undesirable interactions can occur if you enable both internal and external monitors at the same time. SunPCi II 2.3 software does not support multi-headed operation.

   The icons representing Video 1 and Video 2 change position, so that Video 2 appears first.

9. **Click Apply, and then click OK.**

   The Display returns to the workstation monitor.

10. **Click OK to close the window.**

    ⚠ **Caution –** Undesirable interactions may occur if you enable both internal and external monitors at the same time. SunPCi software does not support multi-headed operation.

How to Proceed

- To connect peripheral devices (such as audio devices and printers) to your SunPCi II card, refer to Chapter 10.
- To learn more about SunPCi II 2.3 software operation, how to start and exit the software, as well as how to use command line options, the SunPCi II 2.3 windows, and other features of the SunPCi II software, refer to Chapter 11.
- Install Windows application software as you would on a PC.
- If you encountered any difficulties while installing or running SunPCi II 2.3 software or Windows XP Professional, refer to Appendix A.

Using Windows 2000 Professional and Windows 2000 Server

This chapter describes how to install and configure Microsoft Windows 2000 Professional and Microsoft Windows 2000 Server Edition operating system software for use with the SunPCi II product. It also describes how to upgrade your operating system from Windows NT to Windows 2000.

This chapter includes the following general topics:

- "Installing Windows 2000" on page 62
- "Upgrading Windows NT to Windows 2000" on page 65
- "Upgrading Windows NT4 WS to Windows 2000 Professional" on page 66
- "Upgrading Windows NT4 TS to Windows 2000 Server" on page 68
- "Server Configuration Notes" on page 70
- "Configuring Virtual Ethernet Networking on Windows 2000" on page 73

This chapter includes instructions for completing the following tasks:

- "How to Perform a Custom Installation" on page 63
- "How to Install a Service Pack" on page 64
- "How to Reinstall Windows 2000" on page 64
- "How to Upgrade to Windows 2000 Professional" on page 67
- "How to Upgrade to Windows 2000 Server" on page 69
- "How to Enable SunFSD Mapping" on page 72
- "How to Disable SunFSD Mapping" on page 72
- "How to Remove a Static IP Address" on page 73
- "How to Add a Virtual Network Adapter" on page 74
- "How to Configure the Network in Windows 2000" on page 75
- "How to Reconfigure the Network Adapter for Physical Ethernet" on page 76
- "How to Configure Windows 2000 Display Properties" on page 79
- "How to Change the Display Back to the System Monitor" on page 81

Throughout this chapter, Microsoft Windows 2000 Professional is referred to as Windows 2000 Professional, and Microsoft Windows 2000 Server Edition is referred to as Windows 2000 Server. In some procedures in this chapter, Windows 2000 refers to both operating systems.

Tip – Throughout this chapter wherever the installation and configuration of the Windows 2000 Server differs from the Windows 2000 Professional installation, a Tip for a server procedure follows the description.

Installing Windows 2000

You should install operating system software when you create an emulated drive by choosing Create a New Emulated Drive from the SunPCi Options menu. See "Creating an Emulated Hard Drive" on page 13. If you want to perform a custom installation using scripts that are different from the standard Microsoft installation scripts, see "How to Perform a Custom Installation" on page 63.

It is important that you upgrade your SunPCi II card to at least 128 Mbytes of RAM before installing and running Windows 2000, and more is suitable—for best performance, use 256 Mbytes of RAM or more for running Windows 2000 software.

SunPCi II 2.3 does not support upgrading from Windows 98 SE or Windows ME to Windows 2000.

Caution – SunPCi II 2.3 also does not support simultaneous operation of Windows 2000 on both the system and external monitors.

Installation Notes

Make sure that you have all the following media and information available before you begin installation:

- Windows 2000 retail installation software CD, or your customized installation scripts
- The network system name for each SunPCi II card installed in your system
- The workgroup or domain name for your Windows 2000 installation on each SunPCi II card installed in your system

▼ How to Perform a Custom Installation

> **Caution –** When you specify an operating system to auto-install in the Create a New Emulated Drive dialog box, the software automatically finds and copies setup files, boot files, system files, and drivers that are appropriate for that operating system, and launches Windows Setup when SunPCi software reboots. Do not perform a custom installation unless you want to use customized installation scripts.

1. **Create a new emulated hard drive and auto-install the DR DOS 7.01 operating system software.**

   Follow the instructions in "Creating an Emulated Hard Drive" on page 13. Set options in the Create a New Emulated Drive dialog box as follows:

   - Select DR DOS 7.01 as the operating system to auto-install.
   - Be sure to make the drive at least 2 Gbytes in size, since it cannot be expanded once created.
   - Attach the drive as a C: drive.
   - For best performance, create your emulated drives on a local hard disk on your workstation or server.

2. **Click OK when the dialog box asks you to reboot the SunPCi II software.**

   The SunPCi II software reboots. The OpenDOS prompt (C:\>) is displayed.

3. **Install SunPCi II drivers.**

   The default location for the Windows 2000 files is r:\cdrom\cdrom0\i386. However, if your Windows 2000 files reside at a location other than the default one, you need to use the /s: switch to specify where the files are located. For example, if your Windows 2000 disk image is located in your Solaris directory at /export/home/win2k/i386, you would access it from the R: drive in OpenDOS. Type the following command all on one line:

   ```
   C:\> f:\drivers\win2k\setupw2k /s:r:\export\home\win2k\i386
   ```

   The setup process takes a few minutes to complete. SunPCi II software responds with the following messages:

   ```
   Copying Setup Files...
   Copying Boot Files...
   Copying System Files...
   Copying Optional Files...
   Copying SunPCi II Installation Files...
   ```

When the `setupw2k` script finishes copying the Windows 2000 files to your C: drive, it reboots the SunPCi II software. The Windows 2000 Setup screen is displayed. When Windows 2000 Setup has finished copying files, it reboots the SunPCi II software again.

Tip – The SunPCi II messages are for the Windows 2000 Professional setup; the Windows 2000 Server messages differ slightly.

Note – Your mouse may not be active during the following installation process. Use the Tab key and the arrow keys to navigate the Windows 2000 Setup screens.

---

4. **After the SunPCi II software reboots, choose Attach Mouse from the Options menu or press Meta-M to attach the mouse.**

   This enables the mouse to work with Windows 2000 during the installation process. Once the process is completed, the proper mouse drivers are installed and you no longer need to attach the mouse manually.

5. **Change directory to the location for your customized installation scripts.**

6. **Complete the installation using your customized installation scripts.**

▼ How to Install a Service Pack

You must install the appropriate Microsoft Windows Service Pack that SunPCi II 2.3 software requires.

● **To identify and install the Service Pack, see "Installing Service Packs" on page 17.**

▼ How to Reinstall Windows 2000

● **If you need to reinstall a standard version of Windows 2000, use the Add/Remove Software utility in the Control Panel screen or in the Autorun dialog box that appears when you insert the Windows 2000 CD.**

Caution – Do not use the Windows 2000 Setup option in the Autorun dialog box to reinstall Windows 2000. Using this option results in a Windows 2000 "blue screen" error and a message indicating an inaccessible boot device.

Upgrading Windows NT to Windows 2000

In SunPCi II 2.3 software, you can upgrade the emulated drive disk images. To upgrade an existing C: drive, perform one of the following upgrades:

- From Windows NT4 WS to Windows 2000 Professional
- From Windows NT4 TS to Windows 2000 Server

Use Service Pack 2 to update either Windows 2000 upgrade.

Note – The SunPCi II 2.3 software release does not support upgrading from the Windows 98 SE or Windows ME to either of the Windows 2000 operating systems.

Upgrade Notes

Before you start an upgrade to Windows 2000 Professional or Windows 2000 Server, make sure that you have the retail Windows 2000 Professional CD or the retail Windows 2000 Server installation CD. The installation will *not* work without the retail installation CD in your CD-ROM drive.

In addition, you must have at least 2 Gbytes of available free space on your emulated C: drive.

Tip – Before you perform the upgrade, make a backup copy of your existing C: emulated drive file.

Upgrading Windows NT4 WS to Windows 2000 Professional

⚠ **Caution –** Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi II program involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows 2000 Professional CD. If you do use the standard upgrade procedure, the installation will fail, and your emulated C: drive can become corrupted.

Before You Begin the Upgrade

⚠ **Caution –** If you are using an external CD-RW drive with Windows NT4 WS, uninstall the device. The upgrade to Windows 2000 Professional will fail unless the device is removed and its software uninstalled. Reinstall the device after the upgrade.

Before starting to upgrade a Windows NT4 WS package to Windows 2000 Professional, follow the prerequisite steps below:

1. **From the Windows Explorer menu, map a drive to** `\\localhost\opt\ SUNWspci2.`

   This provides access to the patch directory.

2. **Click down the directory tree to** `\drivers\winnt\patch` **and double-click** `update.bat.`

   The `update.bat` script updates the necessary drivers so that you can proceed with the upgrade.

3. **Proceed to Step 1 of the upgrade procedure that follows.**

▼ How to Upgrade to Windows 2000 Professional

1. **Insert the Windows 2000 Professional CD into your system's CD-ROM drive.**

2. **Click the Start button, and then choose Programs and Windows Explorer.**

   The Windows Explorer window is displayed.

3. **Using the Windows Explorer window, find the following path:**

   ```
   C:\sun\w2kupg
   ```

   Note – If you cannot find this directory on your C: drive, either you have installed the wrong version of the SunPCi II software, or you did not update your SunPCi II drivers.

   ---

4. **Double-click Upgrade.**

   The upgrade process continues. This program automatically maps a network drive for its own use. If you do not have a network drive letter available in Windows Explorer, the process fails.

   Note – If you do not have the Windows 2000 Professional CD in your CD-ROM drive, the upgrade process fails at this step.

   ---

5. **Follow the prompts on the screen and enter the information that Microsoft Windows requests (for example, the CD key on the back of your CD case, your administrator's password, and so on).**

   When you are finished entering all the information, the SunPCi II software reboots into Windows 2000 Professional.

   Tip – This step can take several minutes to complete.

   ---

6. **Install the Service Pack.**

   To complete the process, you need to install the appropriate Service Pack. See "Installing Service Packs" on page 17.

Upgrading Windows NT4 TS to Windows 2000 Server

Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi II program involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows 2000 Professional CD. If you do use the standard upgrade procedure, the installation will fail, and your emulated C: drive can become corrupted.

Before You Begin the Upgrade

Before starting to upgrade Windows NT4 TS to Windows 2000 Server, follow these steps:

1. **Log off all clients and other processes from the server before upgrading Windows NT4 TS, and before enabling SunFSD mapping in Windows NT4 TS.**

   Enabling SunFSD mapping enables it for *all current users*, creating a potential breach in security, so caution must be employed.

2. **Double-click the** `fsdon.reg` **Registry file located at:**

   ```
   C:\sun\sunfsd\fsdon.reg
   ```

   This enables SunFSD. Leave SunFSD enabled until after the upgrade to Windows 2000 Server.

3. **Using Windows Explorer, map a drive to** `\\localhost\opt\SUNWspci2`.

   This provides access to the patch directory.

4. **Click down the directory tree to** `\drivers\winnt\patch` **and double-click** `update.bat`.

   The `update.bat` script updates the necessary drivers so you can proceed with the upgrade.

5. **Proceed to Step 1 of the upgrade procedure that follows.**

Caution – Do not enable SunFSD, map a drive, disable SunFSD, and then perform the upgrade as there are SunFSD dependencies in the upgrade script.

▼ How to Upgrade to Windows 2000 Server

Caution – Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi II program involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows 2000 Server CD. If you do use the standard upgrade procedure, the installation will fail, your Windows 2000 Server emulated disk will not run with SunPCi II, and your emulated C: drive will become corrupted.

1. **Insert the Windows 2000 Server CD into your system's CD-ROM drive.**

2. **Click the Start button, and then choose Programs and Windows Explorer.**

   The Windows Explorer window is displayed.

3. **Navigate the Windows Explorer window to the following path:**

   ```
   C:\sun\w2kupg\upgrade.bat
   ```

   Note – If you cannot find this directory on your C: drive, either you have installed the wrong version of the SunPCi II software, or you did not update your SunPCi II drivers.

4. **Double-click Upgrade.**

   The upgrade process continues. This program automatically maps a network drive for its own use. If you do not have a network drive letter available in Windows Explorer, the process fails.

   Note – If you do not have the Windows 2000 Server CD in your CD-ROM drive, the upgrade process fails at this step.

5. **Follow the prompts on the screen and enter the information that Microsoft Windows requests (for example, the CD key on the back of your CD case, your administrator's password, and so on).**

When you are finished entering all the information, the SunPCi II software reboots again into Windows 2000 Server.

Tip – This step can take several minutes to complete.

---

6. **Install the Service Pack.**

To complete the process, you need to install the appropriate Service Pack. See "Installing Service Packs" on page 17.

Server Configuration Notes

The following information is for configuring and installing the supported Microsoft Windows server operating systems using the SunPCi II 2.3 software on the Solaris operating environment.

For advanced SunPCi II server support concerning SunPCi II memory, CPUs and benchmark information, consult the White Papers located at the following URLs:

- `http://www.sun.com/blueprints/0601/windows.pdf`
- `http://www.sun.com/blueprints/1101/sizesunray.html`

Due to naming conventions, mounting the CD-ROM drive on SunFSD (`\\localhost\cdrom\cdrom0`) results in files not being found by certain applications.

Using SunFSD for Mapping Between Solaris and Microsoft Windows Operating Systems

The SunPCi II 2.3 software package includes the Sun File System Driver (SunFSD), which maps Microsoft Windows drive letters to Solaris directories allowing access between operating system file systems. The SunFSD mapping is configurable.

For SunPCi II 2.3 installations, the SunFSD mapping function is *disabled* by default for the following Microsoft Windows server software:

- Windows NT4 Server
- Windows NT4 TS

- Windows 2000 Server Edition

Thus, while running the server software, any mapping of the \\localhost
directory by any user (or program), including the administrator, will fail. Further,
any reference or any attempt to access files using a Universal Naming Convention
(UNC) path that includes \\localhost as the UNC prefix will also fail.

The mapping control is imposed for security reasons. In the current release of
SunFSD, any mapping or file access through \\localhost inherits the privileges of
the user or process that launched the SunPCi II software. Therefore, if the SunPCi II
card is running a Microsoft server operating system, and SunPCi software was
launched under the root account, ordinary server users inherit root privileges across
the network.

SunFSD is *enabled* on Windows NT4 WS and Windows 2000 Professional because
there are no multi-client file system security issues when using these operating
systems. You may continue to map SunFSD drives in Windows NT4 WS and
Windows 2000 Professional the same as you did in previous releases.

For server installations that require access to Solaris directories, server
administrators should use a package such as Solaris PC NetLink or Samba that
employs per-client security credential verification, or a Citrix MetaFrame client that
maps Microsoft Windows drive letters as the local user.

For more information about Sun's PC NetLink software, go to the web site
www.sun.com and search for PC NetLink.

Note – Some early generation Microsoft Windows *applications* can fail when
installing Microsoft Windows-compatible applications into directories below
SunFSD mount points. For information about, and solutions to the issue using
SunFSD, see "Application Installation to Solaris File System Troubleshooting" on
page 157.

▼ How to Enable SunFSD Mapping

SunFSD can be enabled in server installations if necessary by the Server Administrator account only. Proceed with great care in doing so, and be sure to disable SunFSD when you are finished performing the maintenance tasks described below.

To enable SunFSD mapping, as the Server Administrator perform this step:

● **Double-click the** `fsdon.reg` **Registry file located at:**

```
C:\sun\sunfsd\fsdon.reg
```

This can only be done using the Server Administrator account. Any server client (or non-privileged program) attempting to modify the Registry is refused.

Once SunFSD is enabled, all subsequent mappings and references using the `\\localhost` prefix will succeed. Additionally, after rebooting the server, SunFSD *remains* enabled. Further, any mappings made after enabling SunFSD, after logging off, or after rebooting the system, are reconnected upon logging on to the system (if configured to be reconnected).

Caution – Once SunFSD is enabled by the administrator, all server clients and programs have the ability to map or to access Solaris directories and files, using the security credentials of the process that spawned the SunPCi software.

The main reason for an administrator to enable SunFSD is that SunFSD functionality is *required* to execute the update drivers script, as well as other SunPCi supplied scripts.

The administrator should disable client logins prior to enabling SunFSD. Additionally, after any update (or other activity) is completed, the administrator should delete or unmap all SunFSD drives, disable mapping in SunFSD, and reboot the system.

▼ How to Disable SunFSD Mapping

To disable SunFSD mapping, as the Server Administrator perform this step:

● **Double-click the** `fsdoff.reg` **Registry file located at:**

```
C:\sun\sunfsd\fsdoff.reg
```

Once SunFSD mapping is disabled, all subsequent mappings and references using the \\localhost prefix will fail. Additionally, after rebooting the server, SunFSD mapping *remains* disabled. So, if for example, there were any successful SunFSD directory mappings prior to disabling SunFSD mapping, after the system is rebooted such mappings are *no longer* available.

Configuring Virtual Ethernet Networking on Windows 2000

Note – When more than one SunPCi II card is installed in a system, virtual networking is disabled by the SunPCi II software.

The SunPCi II software comes with *physical* Ethernet networking enabled by default. If you prefer to use *virtual* networking instead of physical networking, you need to disable the physical Ethernet adapter in Microsoft Windows and install the virtual Ethernet adapter. This section explains the steps you need to follow.

Caution – Undesirable interactions can occur if you enable both virtual and physical networking at the same time.

For more information about physical and virtual Ethernet networking, refer to "Setting Up Networking With SunPCi II Hardware and Software" on page 36.

To set up virtual Ethernet networking on Windows 2000, follow the steps outlined in the following procedure. This procedure explains how to configure the network adapter.

Note – Microsoft Windows provides a number of different ways to install software. Follow the instructions in this section, even if you have installed Microsoft Windows software before. The SunPCi II 2.3 software does not support other methods of installation.

▼ How to Remove a Static IP Address

If you were using physical networking, and had previously defined a static IP address, follow these steps to remove the address. If not, skip to the next procedure.

1. **On the Windows desktop, right-click My Network Places and choose Properties.**

2. **Right-click Local Area Connections and choose Properties.**

3. **Double-click Internet Protocol (TCP/IP).**

4. **Delete the previous IP address, and select the setting to Obtain an IP address Automatically.**

5. **Click OK twice to dismiss the two dialog boxes.**

▼ How to Add a Virtual Network Adapter

1. **From the Windows 2000 Start desktop, right-click My Computer and select Properties.**

   The System Properties window is displayed.

2. **Click the Hardware tab.**

3. **Click the Device Manager button to display the Device Manager window.**

   The window lists the installed device drivers.

4. **Double-click Network Adapters.**

5. **Right-click SiS 900 PCI Fast Ethernet Adapter, and click Disable.**

6. **Respond Yes to the message that says that disabling this device will cause it to stop functioning.**

7. **In the Control Panel, double-click Add/Remove Hardware.**

8. **Click Next at the Welcome to the Add/Remove Hardware Wizard dialog box.**

   The Choose Hardware Task dialog box is displayed.

9. **Choose Add/Troubleshoot a Device and click Next.**

   Microsoft Windows searches for new hardware devices. The Choose Hardware dialog box is displayed.

10. **Choose Add a New Device and click Next.**

    The Find New Hardware dialog box is displayed.

11. **Choose the entry "No, I want to choose the Hardware from a list," and click Next.**

    The Hardware Types dialog box is displayed.

12. **Click Next.**

    The Select Network Adapter dialog box is displayed.

13. **Click Have Disk.**

    Click Browse, and choose c:\sun\sunnet\win2k\sunndis.

14. **Click Open, and then OK at the Install From Disk dialog box.**

    The Select Network Adapter dialog box is displayed.

15. **Click Next.**

    A dialog box is displayed stating that Windows cannot detect the settings of the device.

16. **Click OK.**

    The Add New Hardware Wizard Properties window is displayed.

17. **Double-click the Interrupt Request under the Resource tab.**

    The Edit Interrupt Request dialog box is displayed.

18. **Choose the default value (09), and click OK.**

    The Add New Hardware Wizard Properties dialog box is displayed.

19. **Click OK.**

    The Creating a Forced Configuration dialog box is displayed.

20. **Choose Yes.**

    The Start Hardware Installation dialog box is displayed.

21. **Choose Next.**

    The Completing the Add/Remove Hardware Wizard dialog box is displayed.

22. **Choose Finish.**

    If you are asked to Restart the computer, choose Yes to complete the configuration.

    To make the virtual adapter function in the network, you need to complete the procedure in "How to Configure the Network in Windows 2000" on page 75.

▼ How to Configure the Network in Windows 2000

After you finish configuring the virtual or the physical network adapter and restart Windows 2000, you need to configure *one* of the adapters to use TCP/IP. Log in to Windows 2000 again and follow the steps in this procedure.

> **Caution –** Do not activate a virtual and a physical network adapter at the same time. Verify that you have disabled the virtual or physical adapter before performing the following procedure.

1. **From the Start menu, choose Settings, and then choose Network and Dial-Up Connections.**

   The Network and Dial-Up Connections window is displayed. The window contains three icons: Make New Connection, Local Area Connection, and Local Area Connection 2.

2. **Double-click Local Area Connection or Local Area Connection 2.**

   Your choice of 2 or not depends on *which* Ethernet adapter is enabled. The Status window is displayed.

3. **Click Properties.**

   The Properties window is displayed.

4. **Double-click Internet Protocol (TCP/IP).**

   The Internet Protocol (TCP/IP) Properties window is displayed.

5. **Set up TCP/IP for your SunPCi II card as described in "How to Set TCP/IP Properties" on page 37.**

   Refer to your Windows 2000 documentation if needed.

6. **When you finish setting up TCP/IP, click OK, and then click Yes to restart Microsoft Windows.**

Note – If you see a dialog box with the message "Sunndis failed to start," ignore the message and click OK. This message sometimes appears when DHCP networking is disabled.

▼ How to Reconfigure the Network Adapter for Physical Ethernet

If you need to reactivate the physical network adapter, follow these steps.

Caution – Do not activate a virtual and a physical network adapter at the same time. Verify that you have disabled the virtual adapter before performing the following procedure.

---

1. **From the Windows 2000 Start desktop, right-click My Computer, and choose Properties.**

   The System Properties window is displayed.

2. **Click the Hardware tab.**

3. **Click the Device Manager button to display the Device Manager window.**

   The window lists the computer's installed device drivers.

4. **Click the computer name.**

5. **Select Network Adapters and expand the list.**

   Click the + check box to expand the list.

6. **If you configured a static IP address for virtual networking, perform the procedure "How to Remove a Static IP Address" on page 73.**

7. **Right-click the SunNDIS Virtual Adapter and select Disable.**

   Choose Yes at the message that saysdisabling this device will cause it to stop functioning. This step disables the virtual network.

8. **Right-click the Sis 900 PCI Fast Ethernet Adapter and choose Enable from the menu.**

9. **Close the Device Manager and the System Properties dialog boxes.**

10. **To enable the physical adapter to use TCP/IP in the network, you need to complete the procedure "How to Configure the Network in Windows 2000" on page 75.**

▼ How to Configure External Video for Windows 2000

To use an external monitor, you need to attach the monitor to the SunPCi II add-on backplate and install the external video driver.

Caution – Undesirable interactions can occur if you enable both internal and external monitors at the same time. SunPCi II 2.3 software does not support multi-headed operation.

---

1. **Attach the monitor to the Video port connector on the SunPCi II add-on backplate.**

   Refer to FIGURE 10-1 to find the location of the video port.

2. **Start the SunPCi II software, if it is not already running.**

3. **On the Windows 2000 desktop, right-click My Computer.**

   A drop-down menu is displayed.

4. **Choose Manage, and then choose Device Manager.**

   The Computer Management window is displayed.

5. **Click Display Adapters.**

   A list of the available display adapters appears.

6. **Double-click Sun Microsystems NULL SiS VGA Driver.**

   The Properties window is displayed.

7. **Click the Driver tab, and then click the Update Driver button.**

   The Upgrade Device Driver Wizard window is displayed.

8. **Click Next, select "Search for a suitable driver for my device," and then click Next again.**

   The Locate Driver Files window is displayed.

9. **Uncheck the Floppy disk drives and CD-ROM drives boxes.**

10. **Check the Specify A Location box and click Next.**

    The Upgrade Device Driver Wizard window displays the "Copy manufacturer's files from" dialog box.

11. **Click Browse in the window, and click down to the** `C:\sun\sisvideo\win2k` **folder.**

12. **Double-click the file name** `sis630.INF`**.**

    The file name and path are entered into the "Copy manufacturer's files from" dialog box.

13. **Click OK.**

    The Driver Files Search Results window is displayed.

14. **Check the "Install one of the other drivers" box in the window, and then click Next.**

    The Driver Files Found window is displayed.

15. **Highlight Sis 630/730 in the window, and click Next.**

    When the installation is finished a Completing message is displayed in the window.

16. **Click Finish to close the Update Wizard window and then close the Sis 630/730 Properties window.**

    A dialog box is displayed, asking whether you want to restart your system for the hardware changes to take effect.

17. **Choose No and close the dialog box.**

18. **From the Start menu, choose Shut Down, and then select "Shut down the computer" from the menu.**

    The "It is now safe to turn off your computer" window is displayed.

19. **From the File menu in the SunPCi window, choose Exit SunPCi.**

20. **Click Yes when the dialog box asks you if you want to shut down the SunPCi software.**

21. **At the Solaris system prompt, restart the SunPCi II software using the** `-vga` **switch:**

```
% /opt/SUNWspci2/bin/sunpci -vga
```

    The SunPCi II software starts, and Windows 2000 is displayed first on the external monitor, and then on your workstation monitor in the SunPCi II window. You are now ready to configure the Windows 2000 display as described in the following procedure.

▼ How to Configure Windows 2000 Display Properties

For more information about configuring the display in Windows 2000, refer to your Windows 2000 documentation.

⚠ **Caution –** Undesirable interactions can occur if you enable both internal and external monitors at the same time. SunPCi II 2.3 software does not support multi-headed operation.

To configure your external video display in Windows 2000, perform this procedure:

1. **Position your mouse cursor on the Windows 2000 desktop (not on any of the icons) and click the right mouse button.**

   A drop-down menu is displayed.

2. **Choose Properties.**

   The Display Properties dialog box is displayed.

3. **Click the Settings tab.**

> **Note –** There are two displays shown in the window, marked 1 and 2. Video 1 is highlighted, showing that it (the system monitor) is the primary display. Video 2 is dimmed, indicating that it is not the primary display. Underneath the two video displays, the driver for Video 1 is displayed (SunPCi II Video Driver).

4. **Click Video 2.**

   The driver listed underneath the video changes to Sis630/730.

5. **Click the check box next to "Extend my Windows desktop onto this monitor."**

6. **Click the check box next to "Use this device as the primary monitor."**

7. **Click Video 1.**

   The driver listed underneath the video changes back to SunPCi II Video Driver.

8. **Click the check box next to "Extend my Windows desktop onto this monitor" to deselect it.**

   The icons representing Video 1 and Video 2 change position, so that Video 2 appears first.

9. **Click Apply, and then click OK.**

   Your external monitor is now active in Windows 2000. Your internal monitor shows an empty SunPCi window with `Video routed to external monitor` in the title bar.

10. **Click Yes in the Monitor Settings dialog box.**

11. **Click OK to close the window.**

    You can now use external video with Windows 2000, or you can change the video resolution using the Display Control Panel. Refer to your Windows 2000 documentation for more information.

> **Note –** For best performance with Windows 2000 and an external monitor, attach a serial mouse to the serial port on the SunPCi II card's add-on backplate.

▼ How to Change the Display Back to the System Monitor

● **To change from external video to your system monitor, follow the procedure "How to Configure Windows 2000 Display Properties" on page 79. However, click Video 1 as your primary monitor in Step 4.**

⚠️ **Caution –** Undesirable interactions can occur if you enable both internal and external monitors at the same time. SunPCi software does not support multi-headed operation.

How to Proceed

- To connect peripheral devices (such as audio devices and printers) to your SunPCi II card, refer to Chapter 10.
- To learn more about SunPCi II 2.3 operation, how to start and exit the software, as well as how to use command line options, the SunPCi II 2.3 windows, and other features of the SunPCi II 2.3 software, refer to Chapter 11.
- Install Windows application software as you would on a PC.
- If you encountered any difficulties while installing or running SunPCi II 2.3 software or Windows 2000, refer to Appendix A.

Using Windows NT 4.0 Workstation or Server and Windows NT 4.0 Terminal Server

This chapter describes how to install and configure Microsoft Windows NT 4.0 Workstation, Microsoft Windows NT 4.0 Server, and Microsoft Windows NT 4.0 Terminal Server operating system software for use with the SunPCi II product.

This chapter includes the following general topics:

- "Installing Windows NT" on page 84
- "Server Configuration Notes" on page 87
- "Configuring Virtual Ethernet Networking in Windows NT" on page 89

This chapter includes instructions for completing the following tasks:

- "How to Perform a Custom Installation" on page 85
- "How to Install a Service Pack" on page 86
- "How to Reinstall Windows NT" on page 86
- "How to Enable SunFSD Mapping" on page 88
- "How to Disable SunFSD Mapping" on page 89
- "How to Install the Sun NDIS Adapter" on page 90
- "How to Remove the Sun NDIS Adapter" on page 91
- "How to Configure External Video for Windows NT" on page 92
- "How to Change the Display Back to the System Monitor" on page 94

Throughout this chapter, Microsoft Windows NT 4.0 Workstation is referred to as Windows NT4 WS, Microsoft Windows NT 4.0 Server is referred to as Windows NT4 Server, and Microsoft Windows NT 4.0 Terminal Server is referred to as Windows NT4 TS. In the procedures that follow, Windows NT refers to all three operating systems.

Tip – Throughout this chapter wherever the installation and configuration of the Windows NT4 Server and Windows NT4 TS software differs from the Windows NT4 WS installation, a Tip for a server procedure follows the description.

Installing Windows NT

You should install operating system software when you create an emulated drive by choosing Create a New Emulated Drive from the SunPCi Options menu. See "Creating an Emulated Hard Drive" on page 13. If you want to perform a custom installation using scripts that are different from the standard Microsoft installation scripts, see "How to Perform a Custom Installation" on page 85.

It is important that you upgrade your SunPCi II card to at least 128 Mbytes of RAM before installing and running Windows NT4 Server or Windows NT4 TS, and more is suitable—we recommend 256 Mbytes of RAM or more for running these operating systems. Memory requirements for Windows NT4 Server and Windows NT4 TS are based on the number and type of users connecting. See the White Papers referenced in "Accessing Sun Documentation Online" on page xxv.

Installation Notes

Make sure that you have all of the following media and information available before you begin installation:

- Windows NT retail installation software CD, or your customized installation scripts
- The network system name for each SunPCi II card installed in your system
- The workgroup or domain name for your Windows NT installation on each SunPCi II card installed in your system

▼ How to Perform a Custom Installation

Caution – When you specify an operating system to auto-install in the Create a New Emulated Drive dialog box, the software automatically finds and copies setup files, boot files, system files, and drivers that are appropriate for that operating system, and launches Windows Setup when SunPCi software reboots. Do not perform a custom installation unless you want to use customized installation scripts.

1. **Create a new emulated hard drive and auto-install the DR DOS 7.01 operating system software.**

   Follow the instructions in "Creating an Emulated Hard Drive" on page 13. Set options in the Create a New Emulated Drive dialog box as follows:

   - Select DR DOS 7.01 as the operating system to auto-install.
   - Be sure to make the drive large enough to accomodate your needs, since it cannot be expanded once created.
   - Attach the drive as a C: drive.
   - For best performance, create your emulated drives on a local hard disk on your workstation or server.

2. **Click OK when the dialog box asks you to reboot the SunPCi II software.**

   The SunPCi II software reboots. The OpenDOS prompt (`C:\>`) is displayed.

3. **Install SunPCi II drivers.**

   The default location for the Windows NT files is `r:\cdrom\cdrom0\i386`. To perform a custom installation, you need to use the `/s:` switch to specify where your custom installation files are located. For example, if your Windows NT disk image is located in your Solaris directory on drive R: at `/export/home/winnt/i386`, you would use the following command:

   ```
   C:\> f:\drivers\winnt\setupnt /s:r:\export\home\winnt\i386
   ```

   The setup process takes a few minutes to complete. SunPCi II software responds with the following messages

   ```
   Copying Windows Setup files...
   Copying Windows Boot files...
   Copying Windows System files...
   Copying Optional files...
   Copying SunPCi II Installation files...
   ```

> **Tip –** The Windows NT4 TS messages differ slightly.

When the `setupnt` script finishes copying the Windows NT files to your C: drive, it reboots the SunPCi II software. The Windows NT Setup screen is displayed. When Windows NT Setup has finished copying files, it reboots the SunPCi II software again.

4. **After the SunPCi II software reboots, choose Attach Mouse from the Options menu or press Meta-M to attach the mouse.**

   This enables the mouse to work with Windows NT during the installation process. Once the process is completed, the proper mouse drivers are installed and you no longer need to attach the mouse manually.

5. **Change directory to the location for your customized installation scripts.**

6. **Complete the installation using your customized installation scripts.**

▼ How to Install a Service Pack

You must install the appropriate Microsoft Windows Service Pack that SunPCi II 2.3 software requires.

● **To identify and install the Service Pack, see "Installing Service Packs" on page 17.**

▼ How to Reinstall Windows NT

● **If you need to reinstall a standard version of Windows NT, use the Add/Remove Software utility in the Control Panel screen or in the Autorun dialog box that appears when you insert the Windows NT CD.**

> **Caution –** Do not use the Windows NT Setup option in the Autorun dialog box to reinstall Windows NT. Using this option will result in a Windows NT "blue screen" error and a message indicating an inaccessible boot device.

Server Configuration Notes

The following information is for configuring and installing the supported Windows NT server operating systems using the SunPCi II 2.3 software on the Solaris operating environment. Note that the Copy and Paste functions do not work in Windows NT4 TS.

For advanced SunPCi II server configuration and benchmark information consult the White Papers located at the following URLs:

- `http://www.sun.com/blueprints/0601/windows.pdf`
- `http://www.sun.com/blueprints/1101/sizesunray.html`

Using SunFSD for Mapping Between Solaris and Microsoft Windows Operating Systems

The SunPCi II 2.3 software package includes the Sun File System Driver (SunFSD), which maps Microsoft Windows drive letters to Solaris directories allowing access to Solaris directories and file systems. The SunFSD mapping is configurable.

For SunPCi II 2.3 installations, the SunFSD mapping function is *disabled* by default for the following Microsoft Windows server software:

- Windows 2000 Server
- Windows NT4 Server
- Windows NT4 TS

Thus, while running the server software, any mapping of the \\localhost directory by any user (or program), including the Administrator, will fail. Further, any reference or any attempt to access files using a Universal Naming Convention (UNC) path that includes \\localhost as the UNC prefix will also fail.

The mapping control is imposed for security reasons. In the current release of SunFSD, any mapping or file access through \\localhost inherits the privileges of the user or process that launched the SunPCi II software. Therefore, if the SunPCi II card is running a Microsoft server operating system, and SunPCi software was launched under the root account, ordinary server users inherit root privileges across the network.

SunFSD is *enabled* on Windows XP Professional, Windows 2000 Professional, and Windows NT4 WS, because there are no multi-client file system security issues when using these operating systems. You may continue to map SunFSD drives in Windows XP Professional, Windows 2000 Professional, and Windows NT4 WS the same as you did in previous releases.

For server installations that require access to Solaris directories, server administrators should use an application such as Solaris PC NetLink or Samba that employs per-client security credential verification, or a Citrix MetaFrame client that maps Windows drive letters as the local user.

For more information about Sun's PC NetLink software, access www.sun.com and search for PC NetLink.

Note – Some early generation Microsoft Windows *applications* can fail when installing Microsoft Windows-compatible applications into directories below SunFSD mount points. For information about, and solutions to the issue using SunFSD, see "Application Installation to Solaris File System Troubleshooting" on page 157.

▼ How to Enable SunFSD Mapping

SunFSD can be enabled in server installations if necessary by the Server Administrator account only. Proceed with great care in doing so, and be sure to disable SunFSD when you have finished performing the maintenance tasks described in this section.

To enable SunFSD mapping, as the Server Administrator perform this step:

● **Double-click the** fsdon.reg **Registry file located at:**

```
C:\sun\sunfsd\fsdon.reg
```

This can only be done using the Server Administrator account. Any server client (or non-privileged program) attempting to modify the Registry is refused.

Once SunFSD is enabled, all subsequent mappings and references using the \\localhost prefix will succeed. Additionally, after rebooting the server, SunFSD *remains* enabled. Further, any mappings made after enabling SunFSD, after logging off, or after rebooting the system, are reconnected upon logging on to the system (if configured to be reconnected).

⚠ **Caution –** Once SunFSD is enabled by the administrator, all server clients and programs have the ability to map or to access Solaris directories and files, using the security credentials of the process that spawned the SunPCi II software.

The main reason for an administrator to enable SunFSD is that SunFSD functionality is *required* to execute the update drivers script, as well as other SunPCi supplied scripts.

The administrator should disable client logins prior to enabling SunFSD. Additionally, after any update (or other activity) is completed, the administrator should delete or unmap all SunFSD drives, disable mapping in SunFSD, and reboot the system.

▼ How to Disable SunFSD Mapping

To disable SunFSD mapping, as the Server Administrator perform this step:

● **Double-click the** `fsdoff.reg` **Registry file located at:**

```
C:\sun\sunfsd\fsdoff.reg
```

Once SunFSD mapping is disabled, all subsequent mappings and references using the \ \localhost prefix will fail. Additionally, after rebooting the server, SunFSD mapping *remains* disabled. So, if for example, there were any successful SunFSD directory mappings prior to disabling SunFSD mapping, after the system is rebooted such mappings are *no longer* available.

Configuring Virtual Ethernet Networking in Windows NT

The SunPCi II software comes with *physical* Ethernet networking enabled by default. If you prefer to use *virtual* networking instead of physical networking, you need to disable the physical Ethernet adapter in Microsoft Windows and install the virtual Ethernet adapter. This section explains the steps you need to follow.

⚠ **Caution –** Undesirable interactions can occur if you enable both virtual and physical networking at the same time.

For more information about physical and virtual Ethernet networking, refer to "Setting Up Networking With SunPCi II Hardware and Software" on page 36.

Tip – Virtual Ethernet is not supported with Microsoft Windows NT 4.0 Terminal Server.

Note – When more than one card is installed in a system, virtual networking is disabled by the SunPCi II software.

The SunPCi II software ships with the SiS 900 Fast Ethernet physical Ethernet driver enabled by default (but virtual Ethernet networking is the default Windows NT network setting). To operate virtual networking with Windows NT, you need to disable the SiS driver and enable the Sun NDIS adapter.

▼ How to Install the Sun NDIS Adapter

Note – Microsoft Windows provides a number of different ways to install software. Follow the instructions in this section, even if you have installed Microsoft Windows software before. The SunPCi II software does not support other methods of installation.

1. **From the Windows NT Start menu, choose Settings, and then choose Control Panel.**

   The Control Panel window is displayed.

2. **Double-click the Network icon.**

   The Network Control Panel window is displayed.

3. **Click the Adapters tab.**

   The SiS 900 Fast Ethernet Adapter is highlighted in the window.

4. **Click Remove.**

   A dialog box asks whether you want to permanently remove the driver.

5. **Click Yes.**

   You are returned to the Adapters tab.

6. **Click Add.**

   A dialog box briefly appears with the message "Building network adapter list." When the list is complete, the Select Network Adapter dialog box is displayed.

7. **Click Have Disk.**

   The Insert Disk Directory dialog box is displayed.

8. **Type the following path into the File Location field:**

```
c:\sun\sunnet\winnt
```

9. **Click OK.**

   The Select OEM Option dialog box is displayed. It now shows the Sun NDIS Adapter.

10. **Click OK to install the Sun NDIS Adapter.**

    When the installation is finished, you are returned to the Network Control Panel.

11. **Click Close.**

    The Transmission Control Protocol/Internet Protocol (TCP/IP) Settings dialog box is displayed. Refer to the information in "How to Set TCP/IP Properties" on page 37. When you are finished configuring TCP/IP, a dialog box is displayed asking whether you want to restart Windows NT.

12. **Click Yes.**

    Microsoft Windows restarts with the virtual Ethernet adapter enabled for TCP/IP.

▼ How to Remove the Sun NDIS Adapter

If you want to remove the Sun NDIS driver and restore the SiS 900 Fast Ethernet adapter, use the following procedure.

1. **From the Windows NT Start menu, choose Settings, and then choose Control Panel.**

   The Control Panel window is displayed.

2. **Double-click the Network icon.**

   The Network Control Panel window is displayed.

3. **Click the Adapters tab.**

   The SiS 900 Fast Ethernet Adapter is highlighted in the window.

4. **Click Remove.**

   A dialog box asks whether you want to permanently remove the driver.

5. **Click Yes.**

   You are returned to the Adapters tab.

6. **Click Add.**

   A dialog box briefly appears with the message "Building network adapter list." When the list is complete, the Select Network Adapter dialog box is displayed.

7. **Click Have Disk.**

   The Insert Disk Directory dialog box is displayed.

8. **Type the following path into the File Location field:**

   ```
   c:\sun\sisnet\winnt
   ```

9. **Click OK.**

   The Select OEM Option dialog box is displayed. It now shows the SiS 900 Fast Ethernet Adapter.

10. **Click OK to install the SiS 900 Fast Ethernet Adapter.**

    When the installation is finished, you are returned to the Network Control Panel.

11. **Click Close.**

    The Transmission Control Protocol/Internet Protocol (TCP/IP) Settings dialog box is displayed. Refer to the information in "How to Set TCP/IP Properties" on page 37. When you are finished configuring TCP/IP, a dialog box is displayed asking whether you want to restart Windows NT.

12. **Click Yes.**

    Microsoft Windows restarts with the virtual Ethernet adapter enabled for TCP/IP.

▼ How to Configure External Video for Windows NT

> **Note –** Do not use the OS Loader screen at Windows NT Startup to boot to your VGA display; follow the procedure in this section to set up your external VGA driver.

To use an external monitor, you need to attach the monitor and install the external video driver.

1. **Attach the monitor to the Video port connector on the SunPCi II add-on backplate.**

   Refer to FIGURE 10-1 to find the location of the video port.

2. **Start the SunPCi II software, if it is not already running.**

3. **Click the Start button, choose Settings, and then choose Control Panel.**

   The Control Panel window is displayed.

4. **Double-click the Display icon.**

   The Display Properties window is displayed.

5. **Click the Settings tab, and then click Display Type.**

   The Display Type setup window is displayed.

> ⚠ **Caution –** Do not click the Detect button in the Display Type window. Clicking on Detect causes SunPCi software to reboot.

6. **Click Change.**

   The Change Display setup window is displayed.

7. **Click Have Disk.**

   The Install From Disk dialog box is displayed.

8. **Type the following path into the File Location field:**

   ```
   c:\sun\sisvideo\winnt
   ```

9. **Click OK, then click OK again.**

   A dialog box is displayed with the message `You are about to install a third party driver`.

10. **Click Yes.**

    When the program has installed the driver, a dialog box is displayed with the message `Driver was successfully installed`.

11. **Click OK.**

12. **Click OK, and then click OK again to close the remaining two dialog boxes on the screen.**

    Windows NT asks whether you want to restart your computer.

13. **Click No. Shut down Windows NT.**

14. **Choose Exit from the SunPCi File menu.**

15. **To use external video, start the SunPCi II software from the UNIX command prompt after you have configured external video, using the following command:**

```
% /opt/SUNWspci2/bin/sunpci -vga
```

Windows NT screens are displayed on your external monitor. For more information about monitor resolution and color depth, refer to "Video Display Problems" on page 166.

Note – Every time you change the display mode (from system display to external or back), you need to shut down Windows NT and reset SunPCi software. Restarting SunPCi software loads the correct display driver for your monitor.

▼ How to Change the Display Back to the System Monitor

1. **Start the SunPCi II software, if it is not already running.**

2. **Click the Start button, choose Settings, and then choose Control Panel.**
   The Control Panel window is displayed.

3. **Double-click the Display icon.**
   The Display Properties window is displayed.

4. **Click the Settings tab, and then click Display Type.**
   The Display Type setup window is displayed.

⚠️ **Caution –** Do not click the Detect button in the Display Type window. Clicking on Detect causes SunPCi software to reboot.

---

5. **Click Change.**
   The Change Display setup window is displayed.

6. **Click Have Disk.**
   The Install From Disk dialog box is displayed.

7. **Type in** c:\sun\sunvideo\winnt, **click OK, and then click OK again.**
   When the program has installed the driver, a dialog box is displayed with the message Driver was successfully installed.

8. **Click OK.**

9. **Click OK, and then click OK again to close the remaining two dialog boxes on the screen.**

   Windows NT asks whether you want to restart your computer.

10. **Click No.**

11. **Shut down Windows NT.**

12. **Choose Exit from the SunPCi File menu.**

13. **Restart SunPCi II software without using the** `-vga` **switch.**

    Your system monitor displays the SunPCi window.

Note – Before you change the resolution or display depth of your monitor, be sure to shut down all running applications and save your work. You do not need to test a new setting before applying it.

How to Proceed

- To connect peripheral devices (such as audio devices and printers) to your SunPCi II card, refer to Chapter 10.
- To learn more about SunPCi II 2.3 software operation, how to start and exit the software, as well as how to use command line options, the SunPCi II 2.3 windows, and other features of the SunPCi II 2.3 software, refer to Chapter 11.
- Install Windows application software as you would on a PC.
- If you encountered any difficulties while installing or running SunPCi II 2.3 software or Windows NT, refer to Appendix A.

Installing and Using Microsoft Windows Millennium Edition

This chapter describes how to install and configure Microsoft Windows Millennium Edition operating system software for use with the SunPCi II product.

This chapter includes the following general topics:

- "Installing Windows ME" on page 97
- "Configuring Physical Ethernet Networking in Windows ME" on page 104

This chapter includes instructions for completing the following tasks:

- "How to Install the SunPCi II Drivers" on page 101
- "How to Reinstall Windows ME" on page 102
- "How to Upgrade From Windows 98 SE to Windows ME" on page 102
- "How to Install the Windows ME Drivers" on page 103
- "How to Configure the Network Adapter for Windows ME" on page 105
- "How to Configure External Video for Windows ME" on page 105
- "How to Change the Display Back to the System Monitor" on page 106

Throughout this chapter, this version of Microsoft Windows is referred to as Windows ME.

Installing Windows ME

Normally, you install operating system software when you create an emulated drive by choosing Create a New Emulated Drive from the SunPCi Options menu. However, the SunPCi auto-install procedure does not support the Windows ME operating system.

There are two ways to install Windows ME for use with the SunPCi II product.

- Create a new emulated drive following instructions in "How to Create a New Emulated Drive" on page 14, and then install Windows ME and all of your Microsoft Windows-based applications. "How to Install Windows ME on a New C: Drive" on page 99 describes how to perform this procedure.

- Upgrade a Windows 98 SE emulated drive to Windows ME. This method preserves all of the applications and data you installed on your Windows 98 SE emulated drive. "How to Upgrade From Windows 98 SE to Windows ME" on page 102 describes how to upgrade your drive to Windows ME.

Note – SunPCi II software allows you to create emulated drive files as large as 40 Gbytes. However, because of an inherent limitation in DOS file systems, only the first 2 Gbytes are immediately accessible to DOS after you install the Microsoft Windows operating system. See "Emulated Drives and SunPCi II Software" on page 140 for information about partitioning a large emulated drive file system.

Installation Notes

Make sure that you have all the following media and information available before you begin installation:

- Windows ME retail installation software CD, or your customized installation scripts

- The network system name for each SunPCi II card installed in your system

- The workgroup or domain name for your Windows ME installation on each SunPCi II card installed in your system

Make sure that you are logged in as a regular user, not as superuser, before you perform the procedures in the following sections. If you are logged in as superuser, type `exit` to return to the % prompt.

Note – If you mount the CD-ROM drive on SunFSD (\\cdrom\cdrom0) this may result in files not being found by certain programs.

▼ How to Install Windows ME on a New C: Drive

> **Note –** Microsoft Windows provides a number of different ways to install software. Follow the instructions in this section, even if you have installed Microsoft Windows software before. The SunPCi II 2.3 software does not support other methods of installation.

> **Caution –** Do not use the Windows ME boot diskettes to install Windows ME for use with your SunPCi II 2.3 system. You must perform the procedure outlined in this chapter to ensure that the correct drivers are installed.

1. **Create a new emulated drive following instructions in "How to Create a New Emulated Drive" on page 14.**

   Select Windows ME as the operating system to auto-install. When the create drive procedure finishes, you receive a message that you must install Windows ME manually.

2. **Insert your Windows ME retail CD into the CD-ROM drive.**

   The CD should mount automatically and display its contents in a Solaris window on the screen. If it does not, then Solaris Volume Manager may not be enabled on your system. Refer to "How to Mount a CD-ROM Drive" on page 117.

3. **At the OpenDOS prompt, type the following command, and press Return:**

   ```
   C:\> f:\drivers\winme\cpy_drv.bat
   ```

   The cpy_drv.bat program copies the Windows ME drivers to your C: drive.

4. **In the SunPCi II window, type the following command at the OpenDOS prompt:**

   ```
   C:\> r:\cdrom\cdrom0\setup.exe
   ```

> **Note –** If you needed to mount the CD-ROM drive manually, replace the \\cdrom\cdrom0 path with the path for the location at which the CD-ROM drive is mounted. Refer to "How to Mount a CD-ROM Drive" on page 117 for more information.

The screen responds with the message, "Setup is now going to perform a routine check on your system."

5. **Press Return to continue.**

   The Scandisk utility executes. The Windows ME Setup Wizard window is displayed.

6. **Click Next to continue.**

   The installation program loads some files, and then displays the Windows ME License Agreement.

7. **Click the radio button next to I Accept the Agreement, and then click Next.**

   The Product Key window is displayed.

8. **Type in the product key for your Windows ME CD, and then click OK.**

   For the Windows ME product key and other Microsoft Windows-related information, refer to your Windows ME documentation.

9. **When the Setup Wizard dialog box appears, click Next to continue, and then continue through the Setup Wizard's installation process. When asked to choose options for your installation, choose the type of installation you want to perform (typical, compact, and so on).**

   A series of informational screens is displayed as the installation continues. After the program is finished copying files, a dialog box is displayed asking you whether you want to restart the computer.

10. **Click OK to restart your computer.**

    The installation routine restarts Windows ME, and then continues the setup and hardware configuration tasks.

    After you install Windows ME and restart SunPCi II software, you need to install the SunPCi II drivers. Proceed to the next section.

Note – If two mouse cursors are present, this indicates that you have not installed the SunPCi II drivers.

▼ How to Install the SunPCi II Drivers

The SunPCi II `setup` utility installs the SunPCi II drivers. You execute this utility from within Windows ME.

1. **Click the Start button and choose Run from the pop-up menu.**

   The Run field is displayed.

2. **Type the following command into the Run field, and then click OK.**

   ```
   C:\winme\setup
   ```

   The screen responds with the message, "Setup is preparing the InstallShield Wizard." The InstallShield Wizard window is then displayed, along with a progress bar.

   The Welcome to the SunPCi II Setup Program screen is displayed.

3. **Click Next to continue.**

   The Select Which Monitor To Use screen appears.

4. **Choose Workstation Monitor if you plan to run SunPCi II software from your main workstation monitor, or External Monitor if you want to use a VGA monitor connected to the back of the SunPCi II card.**

5. **Click Next.**

6. **Choose Workstation Adapter [Software Emulation] if you plan to run SunPCi II software from within the workstation's Solaris network (virtual Ethernet), or choose SunPCi Adapter [Hardware] if you plan to run the SunPCi II card on a physical Ethernet connection.**

   You need to have an Ethernet cable connected to the back of the SunPCi II card in order to run physical Ethernet.

7. **Click Next to continue.**

   The installation process continues.

8. **Follow the on-screen instructions and prompts.**

   When the installation is finished, a dialog box is displayed with the message "Setup complete." The dialog box asks you whether you want to restart the computer.

9. **Click the radio button next to "Yes, I want to restart my computer now," and then click Finish.**

   After SunPCi II reboots, a dialog box may be displayed asking you to enter a network password for Microsoft Networking.

   If this dialog box appears, type a user name and password and then click OK. Confirm your password when the program asks you to. The drivers are installed, and you are now ready to use Windows ME with your SunPCi II system.

▼ How to Reinstall Windows ME

● **If you need to reinstall Windows ME, use the Add/Remove Software utility in the Control Panel screen or in the Autorun dialog box that appears when you insert the Windows ME CD.**

⚠ **Caution –** Do not use the Windows ME Setup option in the Autorun dialog box to reinstall Windows ME. Using this option results in a Windows ME "blue screen" error and a message indicating an inaccessible boot device.

▼ How to Upgrade From Windows 98 SE to Windows ME

⚠ **Caution –** Follow the instructions in this section carefully to perform the upgrade. The setup and configuration procedures for the SunPCi II program involve some steps that differ from the Microsoft upgrade steps. Do not use the standard Microsoft upgrade procedure provided on the Windows ME CD. If you do use the standard upgrade procedure, the installation will fail, your Windows ME emulated disk will not run with SunPCi II, and your emulated C: drive will become corrupted.

1. **Insert the Windows ME CD in your CD-ROM drive.**

2. **On the windows desktop, click the Start button, and then choose Programs and Windows Explorer from the pop-up menus.**

   The Windows Explorer window is displayed.

3. **Double-click the icon that corresponds to your CD-ROM drive.**

   The list of files on the CD is displayed in the right side of the window.

4. **Double-click Setup to start the Windows ME Installation Wizard.**

5. **Click Next.**

   The Windows ME Setup window is displayed, along with the message, "Preparing Windows ME Setup Wizard."

6. **Click Next to continue, and then follow the instructions on the screen.**

   The Microsoft Windows installation program loads some files, and then displays the Microsoft Windows ME License Agreement. For the Windows ME product key and other Microsoft Windows-related information, refer to your Windows ME CD case and your documentation.

   A series of informational screens is displayed as the installation continues. Windows ME displays a dialog box with the message, "Save system files?"

7. **If you want to save your Windows 98 SE system files, click Yes and then choose the drive to which you want to save them. If you do not want to save the files, click No to skip this step.**

   When the installation process is finished, a dialog box is displayed with the following message: "Setup is ready to restart your computer. Remove all disks from drives and click OK to restart."

8. **Click OK to restart the SunPCi II software.**

   When the software restarts, the Windows ME Welcome window is displayed. If desired, you can view the Welcome videos before proceeding.

9. **To exit the Welcome window, click Exit in the upper right corner of the window.**

Note – You may notice that drive f: no longer appears in Windows Explorer. The SunPCi II system does not need it in Windows ME and it is available for user mapping.

▼ How to Install the Windows ME Drivers

1. **In Windows ME, click the Start button, and then choose Run from the pop-up menu.**

   The Run window is displayed.

2. **Type the following command into the Run dialog box, and click OK:**

   ```
   C:\winme\setup
   ```

   The SunPCi II Setup window is displayed.

3. **Click the radio button next to Update Existing Drivers, and then click Next.**

   The Setup dialog box is displayed.

4. **Click Next again to proceed with the driver update.**

   When the installation process is finished, a dialog box appears asking whether you want to restart the computer.

5. **Click Yes to restart SunPCi II and Windows ME.**

Configuring Physical Ethernet Networking in Windows ME

The SunPCi II software comes with *virtual* (NDIS) networking enabled by default for Windows 98 SE and Windows ME. If you prefer to use *physical* networking, you need to switch to the physical Ethernet adapter using the SunPCi II Windows ME setup routine. This section explains the steps you need to follow.

For more information about physical and virtual Ethernet networking, refer to "Setting Up Networking With SunPCi II Hardware and Software" on page 36.

Note – When more than one SunPCi II card is installed in a system, virtual networking is disabled by the SunPCi II software.

Before you start, make sure that you have the Windows ME CD in your CD-ROM drive, as Windows ME will require access to some of the files on the CD.

Note – Microsoft Windows provides a number of different ways to install software. Follow the instructions in this section, even if you have installed Microsoft Windows software before. The SunPCi II 2.3 software does not support other methods of installation.

▼ How to Configure the Network Adapter for Windows ME

1. **Choose Run from the Windows ME Start menu.**

   The Run dialog box is displayed.

2. **Type the following path into the Run dialog box, and then click OK:**

   ```
   C:\winme\setup
   ```

   The SunPCi II Setup window is displayed.

3. **Click Change Network Controller Type, and then click Next.**

4. **Select either the Workstation Adapter [Software Emulation] or the SunPCi Adapter [Hardware], and then click Next.**

   The Restarting Windows screen is displayed, and after the restart, you are ready to use Windows ME on the SunPCi II product.

5. **Click the radio button next to "Yes, I want to restart my computer now," and then click OK.**

   The SunPCi II software restarts, and the Windows ME Plug-and-Play dialog box detects the appropriate network controller. After it has finished, a dialog box is displayed with the message "Do you want to restart your computer now?"

6. **Click Yes to restart Windows ME.**

7. **After Windows ME restarts, configure TCP/IP as described in the Windows ME documentation.**

▼ How to Configure External Video for Windows ME

To use an external monitor, you need to attach the monitor to the SunPCi II cards's add-on backplate and install the external video driver.

1. **Attach the monitor to the Video port connector on the SunPCi II add-on backplate.**

   Refer to FIGURE 10-1 to find the location of the video port.

2. **Choose Run from the Windows ME Start menu.**

   The Run dialog box is displayed.

3. **Type the following path into the Run dialog box, and then click OK:**

```
C:\winme\setup
```

The SunPCi II Setup window is displayed.

4. **Click Change Display Type, and then click Next.**

The utility asks you which monitor you would like to use to display your video.

5. **Choose External Monitor and then click Finish.**

6. **Click the radio button next to "No, I will restart my computer later," and click OK.**

7. **From the Windows ME Start menu, choose Shut Down.**

Shut down Windows ME.

8. **In the SunPCi window, choose Exit from the File menu.**

9. **In the SunPCi II dialog box, click OK to shut down the SunPCi II software.**

10. **To start SunPCi from the UNIX command prompt after you have configured external video, use the following command:**

```
% /opt/SUNWspci2/bin/sunpci -vga
```

The video output displays on the external monitor.

▼ How to Change the Display Back to the System Monitor

1. **Start the SunPCi II software, if it is not already running.**

2. **Choose Run from the Windows ME Start menu.**

The Run dialog box is displayed.

3. **Type the following path into the Run dialog box, and then click OK:**

```
C:\winme\setup
```

The SunPCi II Setup window is displayed.

4. **Click Change Display Type, and then click Next.**

   The utility asks you which monitor you would like to use to display your video.

5. **Choose System Monitor, and then click Finish.**

6. **Click the radio button next to "No, I will restart my computer later," and click OK.**

7. **From the Windows ME Start menu, choose Shut Down.**

   Shut down Windows ME.

8. **In the SunPCi window, choose Exit from the File menu.**

9. **In the SunPCi II dialog box, click OK to shut down the SunPCi II software.**

10. **Restart SunPCi II software without using the** `-vga` **switch.**

    Your system monitor displays the SunPCi II window.

Note – Before you change the resolution or display depth of your monitor, be sure to shut down all running applications and save your work. You do not need to test a new setting before applying it.

How to Proceed

- To connect peripheral devices (such as audio devices and printers) to your SunPCi II card, refer to Chapter 10.
- To learn more about SunPCi II 2.3 software operation, how to start and exit the software, as well as how to use command line options, the SunPCi II 2.3 windows, and other features of the SunPCi II 2.3 software, refer to Chapter 11.
- Install Windows application software as you would on a PC.
- If you encountered any difficulties while installing or running SunPCi II 2.3 software, refer to Appendix A.

Using Windows 98 SE

This chapter discusses how to install and configure Microsoft Windows 98 Second Edition operating system software for use with the SunPCi II product.

Note – SunPCi II 2.3 software does not support the original Microsoft Windows 98 release. You must install Microsoft Windows 98 Second Edition to use Windows 98 with the SunPCi II 2.3 product.

This chapter includes the following general topic:

- "Installing Windows 98 SE" on page 110

This chapter includes instructions for completing the following tasks:

- "How to Reinstall Windows 98 SE" on page 110
- "How to Configure Physical Ethernet Networking in Windows 98 SE" on page 111
- "How to Configure External Video for Windows 98 SE" on page 112
- "How to Change the Display Back to the System Monitor" on page 113

Throughout this chapter, Microsoft Windows 98 Second Edition is referred to as Windows 98 SE.

Note – Make sure that you are logged in to the system as a regular user, not as superuser, before you perform the procedures in the following sections. If you are logged in as superuser, type exit to return to the % prompt.

Installing Windows 98 SE

You should install operating system software when you create a new emulated drive by choosing Create a New Emulated Drive from the SunPCi Options menu. See "Creating an Emulated Hard Drive" on page 13.

Installation Notes

Make sure that you have all of the following media and information available before you begin installation:

- Windows 98 SE retail installation software CD

- The network system name for each SunPCi II card installed in your system

- The workgroup or domain name for your Windows 98 SE installation on each SunPCi II card installed in your system

▼ How to Reinstall Windows 98 SE

- **If you need to reinstall Windows 98 SE, use the Add/Remove Software utility in the Control Panel screen or in the Autorun dialog box that appears when you insert the Windows 98 SE CD.**

Caution – Do not use the Windows 98 SE Setup option in the Autorun dialog box to reinstall Windows 98 SE. Using this option will result in a Windows 98 SE "blue screen" error and a message indicating an inaccessible boot device.

Configuring Physical Ethernet Networking in Windows 98 SE

The SunPCi II software comes with *virtual* (NDIS) networking enabled by default for Windows 98 SE and Windows ME. If you prefer to use *physical* networking, you need to disable the virtual Ethernet adapter and enable the physical Ethernet adapter.

Note – When more than one SunPCi II card is installed in a system, virtual networking is disabled by the SunPCi II software.

For more information about physical and virtual Ethernet networking, refer to "Setting Up Networking With SunPCi II Hardware and Software" on page 36.

Note – Microsoft Windows provides a number of different ways to install software. Follow the instructions in this section, even if you have installed Microsoft Windows software before. The SunPCi II 2.3 software does not support other installation methods.

▼ How to Configure Physical Ethernet Networking in Windows 98 SE

1. **Insert your Windows 98 SE CD into the CD-ROM drive.**

   The CD should mount automatically and display a SunPCi II Solaris window. If it does not, then Solaris Volume Manager may not be enabled on your system. Refer to "How to Mount a CD-ROM Drive" on page 117.

2. **Choose Run from the Windows 98 SE Start menu.**

   The Run dialog box is displayed.

3. **Type the following path into the Run dialog box, and then click OK:**

   ```
   f:\drivers\win98\setup
   ```

   The SunPCi II Setup window is displayed.

4. **Click Change Network Controller Type, and then click Next.**

5. **Select either the Workstation Adapter [Software Emulation] or the SunPCi Adapter [Hardware], and then click Next.**

   The Restarting Windows screen is displayed.

6. **Click the radio button next to "Yes, I want to restart my computer now," and then click OK.**

   The SunPCi II software restarts, and the Windows 98 SE Plug-and-Play dialog box detects the appropriate network controller. After it finishes, a dialog box is displayed with the message "Do you want to restart your computer now?"

7. **Click Yes to restart Windows 98 SE.**

8. **After Windows 98 SE restarts, configure TCP/IP as described in the Windows 98 SE documentation.**

   You are now able to use Windows 98 SE with the SunPCi II product.

▼ How to Configure External Video for Windows 98 SE

1. **Attach the monitor to the Video port connector on the SunPCi II add-on backplate.**

   Refer to FIGURE 10-1 to find the location of the video port.

2. **Start the SunPCi II software, if it is not already running.**

3. **Choose Run from the Windows 98 SE Start menu.**

   The Run dialog box is displayed.

4. **Type the following path into the Run dialog box, and then click OK:**

   ```
   f:\drivers\win98\setup
   ```

   The SunPCi II Setup window is displayed.

5. **Click Change Display Type, and then click Next.**

6. **When the utility asks you which monitor you would like to use to display your video, choose External Monitor.**

   The driver installation proceeds, and then a dialog box is displayed with the message, "Do you want to restart your computer now?"

7. **Click the radio button next to "No, I will restart my computer later."**

8. **From the Windows 98 SE Start menu, choose Shut Down.**

   Windows 98 SE shuts down.

9. **In the SunPCi window, choose Exit from the File menu.**

10. **In the SunPCi II dialog box, click OK to shut down the SunPCi II software.**

11. **To use external video, start the SunPCi II software from the UNIX command prompt after you have configured external video, using the following command:**

```
% /opt/SUNWspci2/bin/sunpci -vga
```

Windows 98 SE screens are displayed on your external monitor. For more information about monitor resolution and color depth, refer to "Video Display Problems" on page 166.

▼ How to Change the Display Back to the System Monitor

1. **Start the SunPCi II software, if it is not already running.**

2. **Choose Run from the Windows 98 SE Start menu.**

   The Run dialog box is displayed.

3. **Type the following path into the Run dialog box, and then click OK:**

```
f:\drivers\win98\setup
```

   The SunPCi II Setup window is displayed.

4. **Click Change Display Type, and then click Next.**

5. **When the utility asks you which monitor you would like to use to display your video, choose System Monitor.**

6. **Click the radio button next to "No, I will restart my computer later," and then click OK.**

7. **Shut down Windows 98 SE.**

8. **Choose Exit from the SunPCi File menu.**

9. **Restart SunPCi II software without using the** -vga **switch.**

   Your system monitor displays the SunPCi II window.

How to Proceed

- To connect peripheral devices (such as audio devices and printers) to your SunPCi II card, refer to Chapter 10.
- To learn more about SunPCi II 2.3 software operation, how to start and exit the software, as well as how to use command-line options, the SunPCi II 2.3 windows, and other features of the SunPCi II software, refer to Chapter 11.
- Install Windows application software as you would on a PC.
- If you encountered any difficulties while installing or running SunPCi II 2.3 software or Windows 98 SE, refer to Appendix A.

Using Drives and Configuring Peripheral Devices

This chapter includes the following general topics:

- "Using the System's Diskette Drive With SunPCi II Software" on page 115
- "Using the System's CD-ROM Drive With SunPCi II Software" on page 116
- "Connecting Audio and USB Devices" on page 119
- "Connecting a Parallel Device" on page 121
- "Connecting a Serial Device" on page 122

This chapter includes instructions for completing the following tasks:

- "How to Mount a CD-ROM Drive" on page 117
- "How to Eject a CD From a CD-ROM Drive" on page 118
- "How to Change the Size of the SunPCi II Window" on page 118
- "How to Configure a Serial Mouse for an External Monitor" on page 122

Using the System's Diskette Drive With SunPCi II Software

If the system you are using has an internal diskette drive, it is referred to in Microsoft Windows as drive A:.

Many Sun systems come with one diskette drive; however, there are some UltraSPARC systems that do not have a built-in diskette drive. If you have a UltraSPARC system that does not have a built-in diskette drive, you need to have one installed if you intend to copy data from diskette.

If you are running Solaris Volume Manager (the `vold` process) on your system, you need to disable Volume Manager's control of the diskette drive before it can function with SunPCi II 2.3 software. To disable `vold` and use the diskette drive with

SunPCi II, run the script `/opt/SUNWspci2/bin/vold_floppy_disable` at the Solaris prompt before you start the SunPCi II software. Otherwise, you will not be able to use the diskette drive as drive A:.

Using the System's CD-ROM Drive With SunPCi II Software

SunPCi II software contains a direct CD-ROM driver for Microsoft Windows, so mapping the CD-ROM drive is not necessary. If you have created an emulated D: drive, the CD-ROM drive is automatically mapped to the E: drive in the default configuration. If you have not created a D: drive, the CD-ROM drive is mapped to the D: drive letter.

If you have turned off Solaris Volume Manager (`vold`) on your system, you need to turn it back on to use `vold` with SunPCi II software, or you can manually mount the CD-ROM drive file system instead of using `vold`.

Note – SunPCi II 2.3 software supports DVD data, but not DVD video.

▼ How to Mount a CD-ROM Drive

If you have turned off Solaris Volume Manager (`vold`) on your system, you need to turn it back on to use `vold` with SunPCi II software, or you can manually mount the CD-ROM drive file system instead of using `vold`.

1. **To find out if Volume Manager is enabled, open a Terminal window on your Solaris desktop and type:**

```
% ps -df | grep vold
```

The system returns information about the Volume Manager process (`vold`) if it is enabled.

If your workstation does not have Solaris Volume Manager enabled, you need to become superuser and mount the CD-ROM drive manually as described in the next steps.

If `vold` is not enabled, the system returns only the `grep` process information, and no `vold` process information, similar to the following:

```
username 2698 1934 0 10:34:01 pts/s 0:00 grep vold
```

Because `grep vold` is the only information about `vold` that appears, Volume Manager is not enabled. If Volume Manager were enabled, an additional line and different process ID (shown by `2698` in the above `grep` example) would be displayed.

If your workstation has Solaris Volume Manager enabled, skip the rest of this procedure.

2. *If Solaris Volume Manager is not enabled*, **type the following command and your root password to become superuser on your system:**

```
% su
password
```

3. **Change location into the root directory by typing:**

```
# cd /
```

4. **Type one of the following commands:**

   ■ *If your CD-ROM drive is a SCSI drive*, type the following command in a Terminal window on your workstation to mount the CD-ROM drive:

   ```
   # mount -o ro -F hsfs /dev/dsk/c0t6d0s2 /cdrom
   ```

   Note – Make sure that you type –o with no space between the minus sign and the letter o.

   ■ *If your CD-ROM drive is an IDE drive*, type:

   ```
   # mount -o ro -F hsfs /dev/dsk/c0t2d0s2 /cdrom
   ```

   To find out what type of CD-ROM drive you have, and what file system it supports, consult your hardware platform documentation.

5. **Exit superuser status by typing:**

   ```
   # exit
   ```

▼ How to Eject a CD From a CD-ROM Drive

● **To eject a CD from your CD-ROM drive, choose the Eject CD command from the Options menu or press Meta-E while the mouse pointer is in the SunPCi II window.**

▼ How to Change the Size of the SunPCi II Window

You cannot change the size of the SunPCi II window using Solaris window manager functions. Instead, follow the steps in this procedure.

1. **Right-click on the Microsoft Windows desktop and choose Properties.**

2. **In the Display Properties dialog box, click the Settings tab.**

3. **Adjust the Desktop Area slider to one of the screen resolutions, and then click OK.**

4. Respond to the prompts to set the new display size.

Connecting Audio and USB Devices

The backplate of the SunPCi II card contains two audio ports (Microphone and Line-out), an external video port, and a Universal Serial Bus (USB) port.

Connecting Audio Devices

The SunPCi II audio ports do not route audio through your workstation's speakers. In order to hear the audio, you need to connect a separate set of speakers or headphones to the Line-out stereo port.

FIGURE 10-1 shows the ports on the SunPCi II card's backplate.

Microphone Line-in (monaural)

Line-out (stereo)

USB

Ethernet

External video
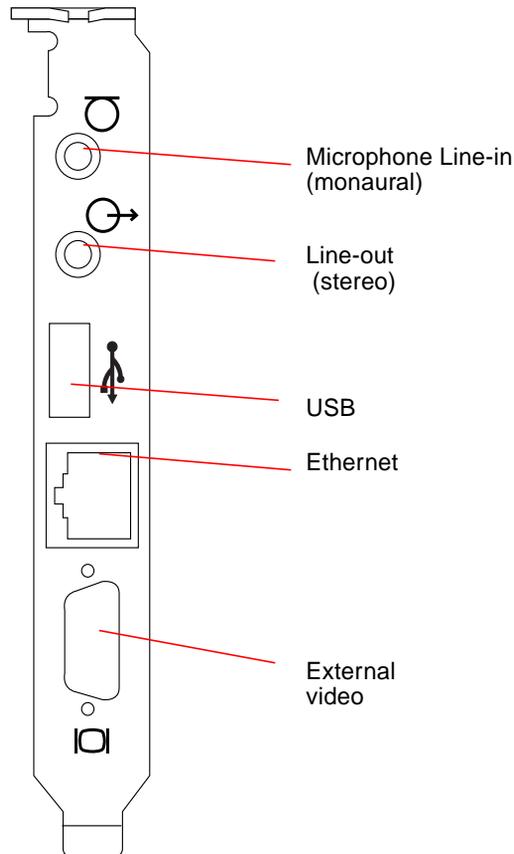
FIGURE 10-1 SunPCi II Card Backplate Connectors

Connecting USB Devices

Windows XP Professional, Windows 2000, Windows ME, and Windows 98 SE support USB connections. However, Windows NT does not support USB devices. Refer to your Microsoft Windows documentation for more information.

The USB port can accommodate any USB device, such as a digital camera or a printer. You need to provide an external powered hub if you are connecting more than one USB device.

To connect a USB device to your SunPCi II card, make any device connections needed. Connect the cable from the device to the USB port on the back of the SunPCi II card (FIGURE 10-1). The USB device should work immediately.

Connecting a Parallel Device

The add-on backplate included with the SunPCi II card features a parallel port that you can use to connect a parallel device, such as a printer, to operate with SunPCi II software. FIGURE 10-2 shows the connectors on the add-on backplate. Installing the backplate is optional.
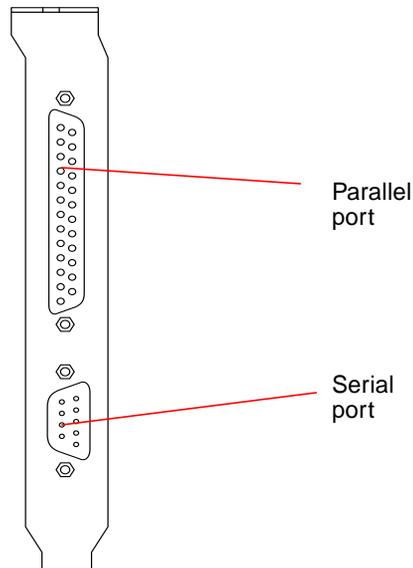
FIGURE 10-2 SunPCi II Card Add-On Backplate Connectors

If you have not already installed the add-on backplate, you need to do so before attaching the printer. Refer to the *SunPCi II 2.3 Installation Guide* for instructions on how to install the backplate.

Once you have installed the add-on backplate, you can attach the parallel cable to the backplate's parallel port. The SunPCi II card's add-on parallel port is assigned to LPT1. You can assign the printer to the printer port by using the corresponding Control Panel in Microsoft Windows. For more information about setting up printing in Windows 98 SE, refer to Chapter 11.

To print to the parallel port with SunPCi II software, simply use the Print command from your PC-based application, just as you would from a PC.

Note – These instructions apply to a local printer that you attach to the parallel port on your SunPCi II card. For information about how to use your Solaris printer with Microsoft Windows operating systems, refer to "Printing From Microsoft Windows Using Solaris Printers" on page 152. For information about using USB printers, refer to "Connecting USB Devices" on page 120.

Connecting a Serial Device

The optional add-on backplate contains a serial port that you can use to connect a modem or serial device to operate with SunPCi II software. This serial port is assigned to COM1. FIGURE 10-2 shows the location of the serial port on the backplate.

To use the serial port, connect the serial cable from your device to the serial port on the add-on backplate. If you need to install any additional drivers for the device you want to use, have the software diskette or CD handy and use the corresponding Control Panel to install the drivers. For more information about connecting and using the serial device, refer to the documentation that came with your serial device.

▼ How to Configure a Serial Mouse for an External Monitor

1. **Attach the mouse connector to the serial connector on the add-on backplate.**

   Ensure that the connector is firmly secured to the backplate.

2. **From the Start menu, in the Control Panel menu choose the Add New Hardware option in the Settings tab.**

   Follow the Wizard instructions to install the serial mouse.

How to Proceed

This completes the information about installing and configuring peripherals for use with the SunPCi II 2.3 product.

- To learn more about SunPCi II 2.3 software operation, how to start and exit the software, as well as how to use command-line options, the SunPCi II 2.3 windows, and other features of the SunPCi II 2.3 software, refer to Chapter 11.

- If you encountered any difficulties while installing or running SunPCi II 2.3 software, refer to Appendix A.

Using SunPCi II Software

This chapter provides detailed information about how to use the `sunpci` command-line options and the SunPCi II 2.3 graphical user interface (GUI) window, menus, and dialog boxes. The chapter also gives instructions for working with SunPCi II drives, including diskette and CD-ROM drives.

In addition, this chapter explains how to use the Copy and Paste commands to copy and paste text between the X Windows on your workstation and Windows XP Professional, Windows 2000, Windows NT, Windows ME, and Windows 98 SE. It also explains how to set up printing for use with the SunPCi II system.

This chapter includes the following general topics:

This chapter includes instructions for completing the following tasks:

- "How to Access Solaris Files and Directories in Windows XP Professional, Windows 2000, or Windows NT" on page 149
- "How to Copy Text From a UNIX Window to Microsoft Windows" on page 151
- "How to Copy Text From Microsoft Windows to a UNIX Window" on page 151
- "How to Configure Japanese Copy and Paste Between Microsoft Windows and Solaris" on page 152
- "How to Set Up a Solaris Printer From Microsoft Windows" on page 153

The `sunpci` Command and Its Options

To use a command-line option with the `sunpci` command, type the command, followed by a dash, followed by the command-line option, followed by any required argument such as a file name, card name, or command.

For example:

```
% /opt/SUNWspci2/bin/sunpci -option  argument
```

Use *option* to specify the command-line option you want to use. Use *filename* to specify the name of the file you want to use with the option. Not all options can accept file names. Note that there is no space between the dash and the option.

For example, to start SunPCi II software and place customized text in the window's title bar, type the following:

```
% /opt/SUNWspci2/bin/sunpci -title "Text string"
```

To start the SunPCi II software with a C: drive other than your default C: drive, type this command and substitute the name of the new C: drive file for `C.`*newdrive*:

```
% /opt/SUNWspci2/bin/sunpci -C C.newdrive
```

TABLE 11-1 lists the available SunPCi II command-line options.

TABLE 11-1 SunPCi II Command-Line Options

Option	Purpose
No option	If no option is used with the sunpci command, by default SunPCi II will open the SunPCi menu.
-bindmac	When used in conjunction with the sunpci -C *disk.image* file name and -c *cardname* options, the bindmac option binds the named *cardname* MAC address to the *disk.image* file name by writing the *cardname* card's MAC address into the *filename*.ini file header. This action overwrites the original MAC address in the file header. A general form of the bindmac option's use is: sunpci -C *disk.image* -c *cardname* -bindmac
-C *disk.image*	Starts the SunPCi II window using the *disk.image* file name as drive C:. This overrides the default drive specified in the default properties file /$HOME/pc/SunPC.ini.
-c *cardname*	Starts the SunPCi II card using *cardname* as drive C:. The *cardname* is a label assigned by the SunPCi II software starting with Card1, Card2 and so on. To obtain a listing of installed card names use the -l option. For more information about multiple card use, see "Using Multiple SunPCi II Cards" on page 23.
-D *disk.image*	Starts the SunPCi II window using the file name *disk.image* as drive D:. This option overrides the default drive specified in the default properties file /$HOME/pc/SunPC.ini.
-display *hostname.domain*:0.0	Displays the SunPCi II window on another workstation *hostname* in *domain*. For example, to open the SunPCi II window on another system named willow in the eastern domain, type the following command on your workstation (where the SunPCi II card is installed): /opt/SUNWspci2/bin/sunpci -display willow.eastern:0.0
-h	Displays SunPCi II command-line help; the option displays a list of all SunPCi II command-line options and formats.
-l	Displays the system's installed and recognized SunPCi cards. The switch returns the Card Name, for example Card1; the device file name in the /dev directory, for example /dev/sunpci2drv0; the card's Type and Description; and the card's standard Ethernet (MAC) address, for example ID = 08:00:20:F9:5F:2C. See "How to Identify Card Names" on page 28 for a complete listing of the output format.
-new *filename*.ini	Creates a new *filename*.ini file and a new disk image name incorporating the file name. The command brings up the SunPCi II Disk Create menu GUI, with the default disk name already created as $HOME/pc/C.*filename*.diskimage. If the file already exists the sunpci command aborts, and no file name is created.

TABLE 11-1   SunPCi II Command-Line Options *(Continued)*

Option	Purpose
-nomac	Stops the verification of card and disk image combination, and stops the display of the warning dialog box, if you start an image with a card on which the image was not created. See "How to Start a Specific .ini File" on page 28 for the full text of the warning. If you wish to rebind the image and current card, see the -bindmac option.
-p *filename*.ini	Starts SunPCi II software with the configuration information in the properties file specified with *filename*. The default properties file for SunPCi II is $HOME/pc/SunPC.ini.
-title "*Text string*"	Writes the title argument into the title bar of the SunPCi II window when the argument *Text string* is a quoted character string including spaces. The quotes are unnecessary if the character string contains no spaces.
-vga	Directs the Microsoft Windows video to the external video connector. Refer to FIGURE 10-1 to find the location of the video port. For information about how to set this for your monitor, consult the section "How to Configure External Video for ..." in the chapter for the operating system you are using.
-xwait [*time*]	Causes SunPCi II 2.3 software to retry failed X server connections, either indefinitely (if no *time* argument follows -xwait), or for *time* seconds. If *time* is specified and SunPCi II 2.3 software has not successfully connected to an X server after *time* seconds, SunPCi II 2.3 software exits.

SunPCi II Menus

The first screen you see when you start SunPCi II software is the SunPCi II window. This window provides the emulated OpenDOS command prompt, from which you execute DOS programs and from which you launch any installed Microsoft Windows operating system.

The following sections describe the File and the Options menus at the top of the SunPCi II window.

File Menu

The SunPCi II File menu contains two commands: Reset PC and Exit.

Resetting a SunPCi II window is the same as pressing the Reset button on a PC (also called a hard reset). There are two primary reasons to reboot a SunPCi II window:

- To attach a different SunPCi II emulated hard drive (see "Emulated Drives and SunPCi II Software" on page 140 for more information about this).
- If either your keyboard or the Microsoft Windows operating system you are running in the SunPCi II window is no longer responding.

When you choose the Reset PC command from the SunPCi II File menu, a dialog box appears asking if you want to reset SunPCi II. Click OK to dismiss the dialog box, and SunPCi II reboots.

The Exit command quits the SunPCi II application and closes the SunPCi II window.

Note – Unless Microsoft Windows stops responding, it is important to close Microsoft Windows by selecting the Shut Down option from the Start menu before selecting the SunPCi II GUI Exit option. Shutting down Microsoft Windows using the Exit option risks losing any open application updates.

Options Menu

The Options menu lets you create and attach emulated hard disk drives (C: and D: drives), and to attach a CD-ROM drive, or eject a CD. The menu also enables you to attach the mouse to SunPCi II, which you will need to do after you have installed your version of Microsoft Windows, but before you install the SunPCi II drivers.

TABLE 11-2 describes the disk-related commands in the Options menu. Complete instructions for choosing emulated drives are provided in "Creating an Emulated Hard Drive" on page 13.

TABLE 11-2   Options Menu Disk-Related Commands

Setting	Purpose
Attach an Existing Emulated Drive	Specify the emulated hard drive (*directory*/*filename*) you want to assign to drive C: or D:.
Create a New Emulated Drive	Create the file you want to use as an emulated drive.

TABLE 11-2 Options Menu Disk-Related Commands *(Continued)*

Setting	Purpose
Attach CD-ROM	Attaches a CD-ROM drive to SunPCi II.
Eject CD	Ejects the CD from the CD-ROM drive. The keyboard shortcut is Meta-E.
Attach Mouse	Allows you to attach the mouse to the SunPCi II window when you are in SMI mode. The keyboard shortcut is Meta-M.

Boot@Boot Support

Boot@Boot is a new feature in the SunPCi II 2.3 release that you can configure to automatically start the SunPCi II 2.3 software on one or more SunPCi II cards when the Solaris server in which they are installed boots. Also included in this support is the ability to automatically restart SunPCi sessions if it should fail for any reason, and the ability to gracefully shut down SunPCi sessions, including performing an orderly shutdown of the Microsoft Windows operating system. This support is specifically designed to support the following versions of Windows, and is not supported for other Windows operating systems:

- Windows 2000 Server
- Windows NT4 Server
- Windows NT4 TS

The following SunPCi II 2.3 software components support Boot@Boot:

- SunPCi daemon—This is a required component.
- Virtual Network Computing[1] (VNC)—This is an optional component.

SunPCi Daemon

The SunPCi daemon (`sunpcid`) is a dual-function application that implements the daemon functionality of Boot@Boot support, and includes such features as automatically starting SunPCi sessions at boot time and shutting down SunPCi sessions at system shutdown time. It also implements control functionality through

---

1. Virtual Network Computing (VNC) software is copyright 1993 by X Consortium and copyright 1999 by AT&T Laboratories, Cambridge. All rights reserved. The SunPCi implementation of VNC supports the SunPCi product only. Other versions of VNC will not interoperate with this version of VNC. VNC source code is included on the SunPCi II CD in the directory `/Source`. See legal notices in the source code for information about using, modifying, or redistributing VNC source code.

command-line arguments that enable Solaris server administrators to configure the SunPCi daemon process to work as needed. For example, the `sunpcid` command can be used to add Boot@Boot support for a SunPCi II card into the `/etc/Master.ini` file, which has been expanded to contain the configuration information for the `sunpcid` daemon.

You can also use the `sunpcid` command to enable and disable autorestart functionality, and to start and stop the SunPCi software on one or more cards. When changes are made to the SunPCi daemon configuration by the `sunpcid` command with command-line arguments, the controlling `sunpcid` daemon sends a signal to the SunPCi daemon process, informing it of the changes, and the daemon process reconfigures itself.

For complete information about the `sunpcid` command and its options, see the `sunpcid` man page. Make sure that your MANPATH variable is set as follows:

`$MANPATH:/opt/SUNWspci2/man`

Then, type the following command:

```
% man sunpcid
```

Virtual Network Computing (VNC)

VNC is a customized version of a GNU public-licensed (GPL) software product from AT&T Laboratories that allows remote administration of the SunPCi II product, and that enables SunPCi II software to run on a server that may either have no display hardware connected (headless) or have no normal X11 display available (for example, before a user logs in to the system).

The version of VNC shipped with the SunPCi II 2.3 release contains two components:

- Xvnc—A modified X11 server that renders data into a virtual frame buffer
- vncviewer—An X11 client that enables the contents of the Xvnc virtual frame buffer to be displayed on another X11 display

The Xvnc server allows SunPCi sessions to display to what appears to the software as a normal X11 display. Xvnc is ordinarily started by the SunPCi daemon before starting the SunPCi sessions.

The vncviewer enables system administrators to interact with the SunPCi cards, either locally on the server where the cards are installed (assuming that the server has a display attached), or remotely on any Sun machine (including a SunRay display) that is running a Sun X server. With the combination of the vncviewer and SunPCi displaying to the Xvnc server, it is possible to attach "on the fly" to a

currently running VNC session from any Sun machine on the network, and to interact with SunPCi sessions running on a remote server. The VNC session can be detached and later reattached from a totally different machine. The SunPCi sessions continue running even though no one is interacting with them.

Note that VNC is intended to be used only for SunPCi administration purposes, and is not a supported mechanism for remote display of SunPCi sessions for normal day-to-day Microsoft Windows interaction. Under normal circumstances (single-user workstation usage), you should use X11 remote display functionality for remote display of SunPCi sessions. Multiuser server situations should use Citrix or NT terminal server functionality for remote display.

Note – The SunPCi II 2.3 version of Xvnc and vncviewer are modified and work only with each other. They are not compatible with any other versions of VNC software.

Configuring and Using Boot@Boot Support

To use SunPCi Boot@Boot support, you must configure the SunPCi daemon so that the daemon knows what to run. You must log in as root to configure Boot@Boot support, because the SunPCi daemon runs under the root account.

The following sections describe how to configure Boot@Boot support. For complete information about the `sunpcid` command and its options, see the `sunpcid` man page. Make sure that your MANPATH variable is set as follows:

`$MANPATH:/opt/SUNWspci2/man`

Then, type the following command:

```
% man sunpcid
```

Configuring Boot@Boot Support for VNC

The first task you must complete to configure Boot@Boot is to configure VNC support so that the SunPCi II cards have an X server available that is guaranteed to be running and accepting connections when the cards boot. If you want to use

another X server to display your SunPCi consoles, and the X server is guaranteed to be available for connections at all times, you can choose not to use VNC support. See "Using an X Server Other Than Xvnc" on page 139.

To configure VNC support, you must first add VNC support to the file /etc/Master.ini by using the following command:

```
# sunpcid -a VNC
```

This adds the necessary configuration information that the daemon needs to start the Xvnc server.

Note – The sunpcid command is case insensitive when referring to VNC or to cards, so that the commands sunpcid -a vnc, sunpcid -a VNC, and sunpcid -a VnC are all handled the same.

When you initially add the VNC configuration information to the file /etc/Master.ini, VNC is configured as disabled by default. This is so that you can customize the configuration information before Xvnc starts.

For example, if you want to run VNC and the SunPCi sessions under an account other than the root account, you can modify the user ID, group ID, and home directory for the user. Note that if you change the username for VNC, the vncviewer application will expect you to type the password for that username when connecting to the Xvnc server, rather than the root password.

In this way, you can give administrators for the SunPCi cards full access to them without having to give them the root password to the machine in which they are installed. If the accounts you specify are not NIS or NIS+ accounts but rather *local* accounts, the accounts must have read access to the /etc/shadow password file.

To configure VNC to run under the sunpciadmin account, in the group sunpcigroup, with the home directory /home/sunpciadmin, you would modify the following VNC section into the /etc/Master.ini file as follows:

```
[VNC]
CmdLineArgs=-geometry "1152x900" -depth 24
DisplayNum=10
StartupScript=/opt/SUNWspci2/bin/VNCStartup
UID=sunpciadmin                 ;User ID
GID=sunpcigroup                 ;Group ID
HomeDir=/home/sunpciadmin       ;Home directory
AutoStart=Disabled
```

This configuration information would set the SunPCi daemon to start up the Xvnc server running at 1152 x 900 pixel resolution, with a pixel depth of 24 bits per pixel. The server would accept connections for display number 10 (DISPLAY= hostname:10). The process would run under the sunpciadmin account, in the group sunpcigroup, with the home directory /home/sunpciadmin, and the daemon would also run the /opt/SUNWspci2/bin/VNCStartup script to start up the CDE window manager and an xterm terminal emulator.

You can add other entries for the Xvnc server, for example, one that tells Xvnc to use a foreign language keyboard key table. For example, if the person who will be administering the SunPCi cards has a Sun German Type 5 keyboard, you would modify the CmdLineArgs entry as follows:

CmdLineArgs=-geometry "1152x900" –depth 24 –keytable Germany5

The X11 key table files are located in the /usr/openwin/share/etc/keytables directory. See the Xvnc man page for other Xvnc command options.

After you have configured VNC , you must enable it, which will cause the SunPCi daemon to start running the Xvnc server. To enable VNC for Boot@Boot use the following command:

```
# /opt/SUNWspci2/bin/sunpcid -e VNC
```

This changes the AutoStart line in the /etc/Master.ini file to Enabled, and instructs the SunPCi daemon to reprocess the file and spawn the Xvnc server process with the configuration specified in the file. Once this is done, you can run the vncviewer to interact with any X applications that are displaying to the Xvnc server.

Preparing SunPCi II Cards for Boot@Boot Support

Each card that you want to configure for Boot@Boot support must have an existing and unique .ini file and a matching C: drive (and optionally a D: drive). By convention, the .ini file for Card*n* is named card*n*.ini, and is located in the ~/pc directory for the username under which the SunPCi session or sessions will run.

For example, if the SunPCi sessions will run under the root account, the .ini file for Card1 will be /pc/card1.ini. The C: drive that is referenced by the card1.ini file can be anywhere on an accessible file system, but for best performance, the file system should be physically connected to the machine in which the cards are installed.

For example, the path to a C: drive with the Windows 2000 operating system installed on it for Card1 might be /files/drives/C.Win2K.diskimage, and the /pc/card1.ini file would contain the following entry:

```
[Drives]
C drive = /files/drives/C.Win2K.diskimage
```

After you have created the appropriate card*n*.ini file or files, installed Microsoft Windows operating systems, and so forth, you can configure the cards for Boot@Boot support. See "Configuring Multiple Cards With SunPCi II Software" on page 25.

Configuring SunPCi II Cards for Boot@Boot Support

As with VNC support, you must add each card individually and then enable it to run. To add Boot@Boot support for a card, you use the sunpcid command with the -a option.

For example, to add Boot@Boot support for Card1, use the following command:

```
# sunpcid -a card1
```

This adds the following information to the already existing configuration information for card1 in the /etc/Master.ini file:

```
[Card1]
CmdLineArgs=-p /pc/card1.ini -c card1 -xwait
AutoStart=Disabled
UID=root          ;User ID
GID=root          ;Group ID
HomeDir=/         ;Home directory
```

This information instructs the SunPCi daemon that Card1 is to be added to its internal list of things to handle. As with VNC, when you add Boot@Boot support for a card, the card is configured with AutoStart disabled. Again, this is to give the person who will configure the card the opportunity to customize the way the SunPCi software will run on the card, before starting the SunPCi software.

The information shown above, which was added to the Card1 section of the /etc/Master.ini file, contains many of the same items that are in the VNC section. The UID, GID and HomeDir entries, as well as the CmdLineArgs and AutoStart options, are all common to both, and act similarly.

For example, under normal circumstances, if you change the UID, GID, or HomeDir entries in the VNC section, you should make the same changes for each card that is configured for Boot@Boot.

After you have configured one or more cards properly, you can enable them using the sunpcid command with the -e option. Unlike the -a option, which you can use to add only one card at a time, you can use the -e option to enable multiple cards at once.

For example, if two cards, Card1 and Card2, are configured for Boot@Boot support, you can enable both at the same time by using the following command:

```
# sunpcid -e card1 card2
```

After you issue this command, the SunPCi daemon will start SunPCi sessions on both cards.

Note – If the card has AutoStart enabled in the /etc/Master.ini file, be sure that the SunPCi software *is not* running on the card when you use the sunpcid -e option to enable the card. If AutoStart is enabled on a card that is running, the daemon will fail to start the SunPCi software on that card.

Listing Boot@Boot Sessions

If you want to see what SunPCi sessions are running, along with the process IDs of the sessions, use the following command:

```
# sunpcid -l
```

The system returns a listing similar to the following:

```
sunpcid:          pid = 1131
VNC:              pid = 1134
Card1:            pid = 1135
Card2:            pid = 1136
#
```

Disabling Boot@Boot Support for VNC or for SunPCi II cards

If it is necessary to shut down one or more SunPCi sessions (for example, to make a copy of C: drives for backup purposes), the SunPCi daemon must be set to disable the AutoStart capability. Otherwise, if a SunPCi session is shut down the SunPCi daemon will attempt to restart it automatically. To disable AutoStart capability for a SunPCi card or for the Xvnc server, use the sunpcid command with the -d option. You can use the -d option to disable multiple cards at a time.

For example, to disable Card1 and Card2, you would use the following command:

```
# sunpcid -d card1 card2
```

This command modifies the AutoStart entries in the Card1 and Card2 sections to be Disabled. Note that the SunPCi sessions for each card continue to run, and will continue to run until they are shut down by some other means.

Shutting Down a VNC or SunPCi II Session

At times, you may need to shut down a VNC or SunPCi II session. There are several ways to do this, depending on your needs.

To shut down a SunPCi or VNC session without interacting with SunPCi software or VNC directly through vncviewer, use the sunpcid command with the -D option. This marks the session as Disabled in the /etc/Master.ini file, and also requests that the SunPCi daemon perform an orderly shutdown procedure on the session.

To shut down a session on Card*n*, use the following command:

```
# sunpcid -D cardn
```

Note that this disables AutoStart on Card*n*, so to restart the session on Card*n*, or have it booted automatically on the next reboot, you must re-enable Card*n* using the sunpcid -e command.

To shut down down VNC, use the following command:

```
# sunpcid -D VNC
```

If you shut down VNC in this manner, all current SunPCi sessions are also shut down in an orderly manner.

Shutting Down the SunPCi Daemon Process

If it is necessary to shut down the SunPCi daemon process (for example, to upgrade the SunPCi software to a new release), either use the sunpcid command directly, with the -t or -T option, or indirectly, by using the -stop option with the /etc/init.d/sunpci.server script.

The -t and -T options to the sunpcid command instruct the SunPCi daemon process to perform orderly shutdowns on all running SunPCi sessions, and then terminate itself. The difference between the two options is that -t waits for all sessions to terminate before returning to the calling shell, whereas the -T option instructs the daemon to terminate all sessions and return to the calling shell immediately.

Terminating the SunPCi daemon process does not modify the Boot@Boot configuration information in the /etc/Master.ini file. If you restart the SunPCi daemon by using the sunpcid command with no options and put it in the background, or by invoking the /etc/init.d/sunpci.server script with the -start option, any Enabled sessions will be restarted. This is the mechanism that is used to shut down SunPCi sessions during a normal Solaris system shutdown.

Making Manual Changes to the Boot@Boot Configuration

You may want to edit the /etc/Master.ini file in order to modify the following:

■ The DisplayNum for Xvnc to use if there is already an existing display using that number (for instance, on a SunRay server)

■ The StartupScript to use (the default is /opt/SUNWspci2/bin/VNCStartup)

■ The command-line arguments for starting SunPCi (for example, to add the -title title_string option for the window manager decorations or to use a different .ini file with the -p switch)

■ The command-line arguments for VNC (for example, to make VNC display at a different resolution, such as 1280 x 1024)

If it is necessary to make changes manually to the Boot@Boot configuration information in the /etc/Master.ini file, for example, to change the configuration file that is to be used by Card1 from /pc/card1.ini to /pc/Win2K.ini, the SunPCi daemon will not immediately process those changes, as it has no knowledge that the changes have taken place.

To inform the SunPCi software process that these changes have occurred, you must use the sunpcid command with the -r option. This tells the SunPCi daemon that it must reread the /etc/Master.ini file and reconfigure itself appropriately. Note that any change does not take place until the modified sessions are restarted, so to use the new /pc/Win2K.ini file, you must shut down and restart the SunPCi session for Card1 using either the SunPCi graphical user interface or the sunpcid command with the -D option.

Using an X Server Other Than Xvnc

To use an X server other than Xvnc for a SunPCi card, you must add a line such as the following to the section for that card in the /etc/Master.ini file:

DisplayName=hostname:displaynum

For example, to configure Card1 to display on the X server running on the console of the host named xyzzy you would add an entry to the [Card1] section of the /etc/Master.ini file that would read DisplayName=xyzzy:0.

▼ How to Interact With VNC From a Remote Client

1. **Install the** `SUNWspvnc` **package on the remote client.**

   The client system need not contain any SunPCi II cards, but may.

2. **Enter the following command:**

   ```
   # vncviewer
   ```

   A dialog box appears that asks for the Xvnc server name, and for the password of the user under whose account the Xvnc server is running on the server.

   To supply this information directly on the command line, use a command similar to the following:

   ```
   # vncviewer vncserverhostname:displaynum
   ```

   Replace *vncserverhostname* with the name of the server running VNC, and replace *displaynum* with the number of the display to use. For example:

   ```
   # vncviewer xyz:10
   ```

Emulated Drives and SunPCi II Software

In order to emulate a PC, SunPCi II software creates a file in Solaris and configures it so that OpenDOS and Microsoft Windows see the file as a physical hard drive. This type of file is a SunPCi II emulated hard drive.

After you install the SunPCi II software, you create a default C: drive and assign it to an emulated drive file. By default, all SunPCi II windows are booted from this drive C: and use the startup files located on the drive.

Note – You can create several C: and D: drive files, each with different applications and configurations, and attach a drive as needed. Only one C: drive and one D: drive can be active at any one time, and a file cannot function as a C: drive and a D: drive at the same time.

"Creating an Emulated Hard Drive" on page 13 contains information about how to create and configure these drives.

FAT16 File System Limitations

SunPCi II 2.3 software enables you to create emulated drive files as large as 40 Gbytes. However, if the emulated drive uses the FAT16 file system, an inherent limitation in the FAT16 file systems makes only the first 2 Gbytes of disk space accessible.

After installing and booting a Microsoft Windows operating system, you can reformat, convert, and/or repartition the emulated disk to another file system such as the FAT32 or NT File System (NTFS). You can also create new partitions, or resize or reformat existing partitions. You can do this by using by third-party packages such as PowerQuest's PartitionMagic or ServerMagic, or by using facilities present in some Microsoft operating systems, such as Disk Management in Windows XP Professional, Windows 2000, and Windows NT.

File System Compatibility

After you partition or convert the disk space to a different file system, some operating systems can view the converted file systems, some cannot. The following table denotes accessibility to the converted disk space among SunPCi 2.3 software-supported operating systems. A check in a column indicates common accessibility to file system formats among different operating systems.

TABLE 11-3   Common Accessibility Among Converted File Systems

File System Formats	Operating Systems							
	[1]Windows XP Professional	[1]Windows 2000 Server	[1]Windows 2000 Professional	[1]Windows NT4 TS	[1]Windows NT4 WS	[1]Windows ME	[1]Windows 98 SE	[2]Caldera OpenDOS
FAT16	✔	✔	✔	✔	✔	✔	✔	✔
FAT32	✔	✔	✔	✔	✔	✔	✔	
NTFS 4	✔	✔	✔	✔	✔			
NTFS 5[3]	✔	✔	✔					

[1] To partition or convert a drive, you can use the Microsoft Windows NTFS, FAT32, or PartitionMagic utilities. In addition, SunPCi II 2.3 software has been tested with the third-party tools ServerMagic for supported server operating systems, and PartitionMagic for supported non-server file systems.

[2] If you convert to FAT32, NTFS 4, or NTFS 5 formats you can no longer boot an emulated drive and view it with OpenDOS.

[3] NTFS 5, which runs on Windows 2000, is *not* compatible with NTFS 4, which runs on Windows NT 4, although both products are often referred to by the common designation NTFS. Verify the version you wish to use before converting or partitioning.

Use the third-party PowerQuest tool ServerMagic for managing file systems on server installations. Use PowerQuest's PartitionMagic tool for managing file systems on non-server installations. These tools are available from PowerQuest at the following URL: www.powerquest.com.

For more information about partitions, bootable partitions, and file system limitations, refer to the *ServerMagic User Guide* and ServerMagic online Help, or to the *PartitionMagic User Guide* and PartitionMagic online Help.

Partitioning a Large Emulated Drive File System for Windows NT4 TS

After a custom installation of Windows NT4 TS, there are some unique file system configuration issues. When you first try to expand a drive in Microsoft Windows using PowerQuest's ServerMagic 4.0 software, you get the following error message:

```
init failed Error 117 partition drive letter can't be identified
```

In order to extend the drive beyond 2 Gbytes using PowerQuest's ServerMagic 4.0, use the two rescue boot diskettes that were created when you installed ServerMagic. After inserting the second rescue diskette, ServerMagic starts. To extend the

partition beyond 2 Gbytes, go to the Operation menu in ServerMagic and delete the first partition following the 2-Gbyte one. Then highlight the first partition, and from the Operation menu choose Resize/Move to expand the partition to the full size you defined in the SunPCi Create a New Emulated Drive dialog box.

Once the boot partition is converted to the NTFS or FAT32 file formats, you cannot boot to OpenDOS. This is a known restriction. See "FAT16 File System Limitations" on page 141 for more information.

After converting the file system, the Microsoft Windows operating system you have installed can access the entire disk space. Before you start this conversion however, consult "File System Compatibility" on page 141.

Emulated Drives and Windows XP Professional, Windows 2000, Windows NT and SunPCi II Software

This section discusses some of the file system format properties of emulated hard drives running under Windows XP Professional, Windows 2000, or Windows NT. Also see the section "Emulated Drives and SunPCi II Software" on page 140 for additional information.

FAT (also known as FAT16 and FAT32) and NTFS (NT File System) are file system formats used with Microsoft Windows hard disks. The NTFS file system has more error recovery mechanisms and therefore better stability than the FAT file system, at the cost of sacrificing a small amount of performance.

The Microsoft Windows documentation included in your Microsoft Windows installation package describes the differences between FAT and NTFS file systems.

▼ How to Back Up an Emulated C: Drive

After you install Microsoft Windows, you should periodically make a copy of the disk image of your C: drive. This allows you to keep a backup copy of the drive in case you need to recover the contents of your drive at any time.

1. Locate the disk image of your C: drive.

It should be located in the directory named `pc` within your home directory on your workstation. To view the contents of the directory, type the following commands:

```
% cd ~/pc
% ls
```

A listing of files is displayed, including the name you assigned to your C: drive during installation (for example, `C.diskimage`).

2. Make a copy of the file.

Type the following command, substituting the name of your hard disk and the name you want to assign to the copy:

```
% cp C.diskimage C.diskimage.copy
```

Using Older Emulated Drives With SunPCi II Software

If you have an emulated drive that you created with a version of SunPCi software earlier than Version 2.0, you will not be able to use your older C: drive as a boot drive. You will be able to attach it as drive D:, however.

Caution – If you created a drive with a version of SunPCi software earlier than Version 2.0, do not resize or partition the drive file or try to resize a partition, or SunPCi will return a `Cannot attach drive` error message and you will not be able to use the emulated disk.

Using Multiple Microsoft Windows Operating Systems

If you want to use multiple versions of Microsoft Windows with SunPCi, the best method is to install each operating system on a separate emulated drive file. Loading multiple operating systems on a single drive is not recommended. Whenever you want to change operating systems, use the Attach a Hard Drive command in the Options menu to change emulated drives.

For example, if you want to "dual-boot" SunPCi II software with Windows XP Professional, Windows 2000, Windows NT, Windows ME, or Windows 98 SE, simply create another C: drive. When you want to run one of these operating systems, use the Attach Hard Drive command under the Options menu to choose the C: drive file that has the corresponding operating system installed on it, and then reset the SunPCi II software.

Note – In order to use the multiple versions of Microsoft Windows installed onto separate partitions, you need to install a boot drive partitioning utility. BootMagic, which is packaged with PartitionMagic, and ServerMagic have been tested on SunPCi II software.

Creating Bootable Partitions

A bootable partition is a disk partition on which you have installed an operating system (such as Windows XP Professional, Windows 2000, Windows NT, Windows ME, or Windows 98 SE). Each version of Microsoft Windows has its own requirements for bootable partitions. Windows operating system documentation and the *PartitionMagic User Guide* contain detailed information about the requirements of each operating system. If you are using PartitionMagic for your disk utility, consult the User Guide and the Help function in the application for more information about bootable partitions.

Troubleshooting Emulated Disk Problems

Appendix A contains information about how to solve some problems with SunPCi II emulated drives and Windows XP, Windows 2000, or Windows NT. Refer to "Emulated Hard Drive Problems" on page 172.

Extended Drives and SunPCi II Software

An extended drive is actually a mapping in SunPCi II software to a directory in the Solaris file system. With extended drives, you can share applications and data files between the Solaris operating environment and Microsoft Windows operating systems. The SunPCi II program permits up to 22 extended drives for storing applications and files.

There are two kinds of extended drives: file system drives and network drives. This section describes both types of drives. Both are mapped using Windows Explorer.

File System Drives

A file system drive is an extended drive that maps to directories on any Solaris file system mounted on the local host.

To map a file system drive in Windows ME or Windows 98 SE, refer to "How to Access Solaris Files and Directories in Windows ME or Windows 98 SE" on page 147.

To map a file system drive in Windows XP Professional, Windows 2000, or Windows NT, refer to "How to Access Solaris Files and Directories in Windows XP Professional, Windows 2000, or Windows NT" on page 149.

Network Drives

A network drive is an extended drive that maps to a SunPCi II PC (emulated PC) or real PC directory. To access Solaris files and the CD-ROM drive from Windows 98 SE or Windows ME, you need to map them as network drives as described in "How to Access Solaris Files and Directories in Windows ME or Windows 98 SE" on page 147.

If you are using Windows XP Professional, Windows NT, or Windows 2000, the procedure for mapping file system drives is different from that used in Windows 98 SE or Windows ME. Refer to "How to Access Solaris Files and Directories in Windows XP Professional, Windows 2000, or Windows NT" on page 149.

▼ How to Access Solaris Files and Directories in Windows ME or Windows 98 SE

This section explains how to assign and use Solaris extended drives with SunPCi II software and Microsoft Windows using the Windows Explorer. The syntax is the same for both extended and network drives.

To map a Solaris drive or directory to work with Microsoft Windows, perform the following procedure.

1. **Click Start and choose Programs and Windows Explorer from the pop-up menus.**

   The Windows Explorer screen is displayed.

2. **From the Tools menu, choose Map Network Drive.**

   The Map Network Drive dialog box is displayed.

3. **Click the arrow to the right of the Drive field.**

   A list of unassigned drive letters is displayed in the menu.

   Note – In Windows 98 SE only, if you attempt to remap drive f:, the system will return the error, "Device not connected." Select a different drive letter.

   ---

4. **Scroll down until you find the drive letter you want, and then click to choose it.**

   The drive letter is displayed in the Drive field.

5. **Type the following path into the Path field, substituting the names of your directory and subdirectory:**

   ```
   \\directory\subdirectory

   OR

   \\directory\.
   ```

   A mapped path requires two components, so if you want to map a drive to a UNIX subdirectory component that has only one element, you need to use a period (.) as the second element. For example:

   ```
   \\home\.
   ```

   Do not use an asterisk in the mapping path, or Microsoft Windows will return the error, "Device not connected."

6. **If you want this extended drive to map automatically whenever you start up SunPCi II software, click the check box next to "Reconnect at logon."**

7. **Click OK.**

   The new extended drive appears in the Windows Explorer window.

▼ How to Map a Drive Letter to a Directory With a Long Path in Windows ME or Windows 98

If you need to map a drive to a UNIX directory that contains more than two path elements (*/directory/subdirectory/subdir2*), you need to use UNIX symbolic links. Perform the following procedure.

1. **Create a link from your root file system, substituting your path for the one shown in the following example. Type the following command:**

   ```
   % ln -s /net/typicalmachine/files1/anydir  /anydir
   ```

2. **Click Start and choose Programs and Windows Explorer from the pop-up menus.**

   The Windows Explorer screen is displayed.

3. **From the Tools menu, choose Connect Network Drive.**

   The Map Network Drive dialog box is displayed.

4. **Click on the arrow to the right of the Drive field.**

   A list of unassigned drive letters is displayed in the menu.

5. **Scroll down until you find the drive letter you want, and then click to choose it.**

   The drive letter is displayed in the Drive field.

6. **Type the following path into the Path field, substituting the name of your directory for *anydir*:**

   ```
   \\anydir\.
   ```

7. **If you want this extended drive to map automatically whenever you start up SunPCi II software, click the check box next to "Reconnect at logon."**

8. **Click OK.**

   The new extended drive appears in the Windows Explorer window.

   Your network drive now maps to */anydir*, which is a symbolic link to the destination directory */net/typicalmachine/files1/anydir*.

Installing Windows ME and Windows 98 SE Applications on Extended Drives

You can install Windows 98 SE and Windows ME applications on either of your emulated drives (C: and D:), or on any of the drives that you create using Windows Explorer.

Note – In Windows 98 SE only, there is a legacy default extended drive (f:) that is used by SunPCi II software. It is best to map a different drive letter for installing Microsoft Windows applications.

Refer to "Extended Drives and SunPCi II Software" on page 146 for more information about the extended drives.

▼ How to Access Solaris Files and Directories in Windows XP Professional, Windows 2000, or Windows NT

In Windows XP Professional, Windows NT, and Windows 2000, you need to specify that a file system drive is mounted on your Solaris system. This is done by specifying `localhost` as the device-node in the UNC path specification.

To map a file system drive in Windows XP, Windows 2000, or Windows NT, perform the following procedure.

1. **Click Start and choose Programs and Windows Explorer from the pop-up menus.**

   The Windows Explorer screen is displayed.

2. **From the Tools menu, choose Map Network Drive.**

   The Map Network Drive dialog box is displayed.

3. **Click on the arrow to the right of the Drive field.**

   A list of unassigned drive letters is displayed in the menu.

4. **Scroll down until you find the drive letter you want, and then click to choose it.**

   The drive letter is displayed in the Drive field.

5. **Type the following path into the Path field, substituting the names of your directory and subdirectory:**

   ```
   \\localhost\directory\subdirectory
   ```

   For example, to map a drive to /home/*joeuser* on your Solaris workstation, use this path:

   ```
   \\localhost\home\joeuser
   ```

6. **If you want this drive to map automatically whenever you start SunPCi II software, click the check box next to "Reconnect at logon."**

7. **Click OK.**

   The new file system drive appears in the Windows Explorer window the next time you open Windows Explorer.

Note – You can map long directory paths (that is, paths with more than two elements) in Windows XP Professional, Windows NT, and Windows 2000. For example, you can map the path \\localhost\usr\local\bin without using a symbolic link, but you would need to use the link to map the same directory path in Windows ME and Windows 98 SE.

Using the Copy and Paste Commands

The SunPCi II 2.3 software enables you to copy text between UNIX windows on your workstation and Windows XP Professional, Windows 2000, Windows NT, Windows ME, and Windows 98 SE. This section describes how to use your workstation keyboard keys to copy and paste data. It also describes how to configure copy and paste for the Japanese locale on Windows XP Professional, Windows 2000, and Windows NT.

Note – Font information is not passed along in copy and paste operations. Special characters and fonts may produce unexpected results when copied and pasted between UNIX and Microsoft Windows. For best results, use plain text.

▼ How to Copy Text From a UNIX Window to Microsoft Windows

To copy text from a UNIX window and paste it into Microsoft Windows, perform the following procedure.

1. **Use the mouse to highlight the text you want to copy, and then press the Copy key.**

2. **To paste the text into a Microsoft Windows document, position the cursor where you want the text to appear and use the standard Microsoft Windows Paste command, Ctrl-V.**

Note – Both the Sun keyboard shortcut keys (Copy, Paste, and Cut) and the Microsoft Windows shortcut keys work with SunPCi II 2.3 software.

▼ How to Copy Text From Microsoft Windows to a UNIX Window

To copy text from Microsoft Windows and paste it into a UNIX window, perform the following procedure.

1. **Use the mouse to highlight the text you want to copy, and then use the standard Microsoft Windows Copy command, Ctrl-C.**

2. **To paste the text into the UNIX window, position the cursor where you want the text to appear, and then press the Paste key.**

▼ How to Configure Japanese Copy and Paste Between Microsoft Windows and Solaris

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Note – The current release of the SunPCi II software supports copy and paste functions for the Japanese version only in Windows XP Professional, Windows 2000, and Windows NT.

To configure Japanese copy and paste functions, perform the following procedure.

1. **Exit SunPCi II software, if you have not already done so.**

2. **Using the text editor of your choice, open the** `$HOME/pc/SunPC.ini` **file.**

3. **Add the following lines to the end of the file:**

```
[CopyAndPaste]
CodeSet=eucJP
```

4. **Save your changes and close the file.**

   The next time you start the SunPCi 2.3 software, the Japanese copy and paste functions should work.

Note – Make sure that the `CodeSet` line specifies `eucJP`, as shown in Step 3. If you try to substitute a different code or mistype the characters, Microsoft Windows returns the following message: `Warning, bad clipboard translation codeset specified in SunPC.ini file: codeset. Ignoring.` If you see this message, click OK to continue. Microsoft Windows continues to work, but Japanese copy and paste support is not enabled.

Printing From Microsoft Windows Using Solaris Printers

This section explains how to configure your Microsoft Windows settings with SunPCi II 2.3 software so that you can print using your workstation's network printer.

> **Note –** SunPCi II 2.3 software does not support printing from DOS to a UNIX printer. It is possible to choose that option during the setup process, but it will not function.

▼ How to Set Up a Solaris Printer From Microsoft Windows

1. **From the Start menu, choose Settings, and then choose Printers.**

   The Printers window is displayed.

2. **Double-click the Add New Printer icon.**

   The Printer Wizard dialog box is displayed.

3. **Use Step a for Windows 98 SE or Windows ME, or use Step b for Windows XP Professional, Windows 2000, or Windows NT.**

   a. **In Windows 98 SE or Windows ME: Click Next, select Network Printer, and then click the Browse button.**

      The Browse for a Printer window is displayed.

   b. **In Windows XP Professional, Windows 2000, or Windows NT: Select Network Printer, click Next, select Browse for a Printer, and then click Next.**

      The Connect to Printer window is displayed.

4. **Double-click Entire Network to display all of the domains connected to your network.**

5. **Locate Sunpci Host in the list of domains. Click the plus sign (+) next to the name Sunpci Host to show the list of systems in the domain.**

6. **Locate the name of the system (print server) that corresponds to the printer you want to use.**

7. **Double-click that system name to show the printer connected to the machine.**

   Make sure that you know the model of the printer you are using so that you can choose the correct printer driver.

8. **Click the system name and then click OK, and then follow the instructions described in the Printer Wizard dialog boxes.**

   You are now ready to use your workstation's network printer as a Microsoft Windows printer. For more information about how to print from Microsoft Windows applications, refer to the documentation that came with your copy of Microsoft Windows.

Use of Screen Savers

Avoid using a Microsoft Windows screen saver program in a SunPCi II window that you iconify (minimize). When the window is not displayed, the screen saver program continues to consume system resources unnecessarily.

How to Proceed

This completes the information about using the SunPCi II 2.3 software menu and software commands.

■ If you encountered any difficulties while installing or running SunPCi II 2.3 software, refer to Appendix A.

■ To learn more about International Support, refer to Appendix B.

■ To learn how to fine-tune your SunPCi II 2.3 software installation for optimum performance, refer to Appendix C.

Troubleshooting

The sections in this appendix describe known problems with the SunPCi II 2.3 software release. This appendix provides tips for rectifying some of the problems you may encounter while using this release of SunPCi II software.

The following topics are included in this appendix:

- "Support for Problems" on page 155
- "SunPCi II Known Problems" on page 157
- "SunPCi II Hardware Problems" on page 161
- "SunPCi II Software Problems" on page 170
- "Networking Problems" on page 174
- "Windows XP Professional Issues" on page 175
- "Windows 2000 Issues" on page 178
- "Windows NT Issues" on page 181
- "Windows 98 SE Issue" on page 185

Support for Problems

If you have a question or encounter a problem with the SunPCi II 2.3 product (such as a Windows NT "blue screen"), please contact your support provider. It is most helpful if you include the following information in your email:

- What you observed, including any error messages that were displayed
- The application you were using (including the application version number)
- What you were doing in the application at the time the problem occurred
- Steps to re-create the problem (very important)
- The log file for the SunPCi session

SunPCi II 2.3 software creates a separate log file for each card installed in your system. By default, logging is enabled, log files are named Card*n*.log (where *n* is the number of the SunPCi II card), and log files are placed in the directory /var/preserve/sunpcilogs. If a fatal problem occurs, a message should be posted to the log file, the Console window, and the Launch window. In such a case, please attach the *entire* log file to your email message or bug report.

The logging configuration file is /etc/opt/SUNWspci2/log.conf, and has the following default contents:

```
; This file controls the SunPCi logging feature. It allows logging to
; be enabled (the default) or disabled. In the LogConfig section below,
; uncomment the Status = Disabled line to disable all SunPCi logging.
;
; The log file destination can also be changed. Uncomment the Directory
; entry below and change the directory to any directory with world read
; and write permissions. Log files will be created in the specified
; directory. The default directory is /var/preserve/sunpcilogs/

[LogConfig]
; Status = Disabled
; Directory = /var/preserve/sunpcilogs/
```

Follow the directions in the file to disable logging or to change the log file destination.

SunPCi II Product Home Page

Updates to the information in this release and workarounds (if available) are posted to the SunPCi II product home page at the following URL:

http://www.sun.com/desktop/products/sunpci

Note – The SunPCi II software home page contains software updates, patches, and other information about the SunPCi II product. Visit the home page frequently for the latest information.

SunPCi II Known Problems

This section includes the following topics:

- "Installing Microsoft Windows From CD-ROM" on page 157
- "Application Installation to Solaris File System Troubleshooting" on page 157
- "Displaying Shortname Tails" on page 159
- "Network Neighborhood Issue" on page 159
- "SunPCi II Software Appears to Hang When Browsing Network Drives" on page 160

The following are constraints or known application issues with workarounds.

Installing Microsoft Windows From CD-ROM

Microsoft Windows cannot be installed with the "Run From CD-ROM" option into the SunPCi II product. Use any of the other options.

Application Installation to Solaris File System Troubleshooting

On Windows XP Professional, Windows 2000, and Windows NT, the Sun File System Driver (SunFSD) does not support the DOS file name SFN conversion convention. SFN is also known as the 8.3 DOS file name conversion format. When installing some Microsoft Windows applications, the installation may fail because of the DOS file name conversion convention named Short File Names (SFN).

Note – Whenever you install new applications on the SunPCi II platform, make sure that you have your Microsoft Windows CD available. The installation program may require files from the Microsoft Windows CD.

The SFN convention converts long file names and directory names with a file name stem longer than eight characters to six characters followed by a tilde (~) and a number. For example, a file name such as `THIS_IS_A_LONG_FILE_NAME.DAT` could be converted to the file name `THIS_I~1.DAT` (8.3 SFN convention).

Because SunFSD does not support the SFN convention, some older Microsoft Windows applications that employ this convention sometimes fail to install correctly. Many recent applications do not rely on 8.3 file name conversion support in their file systems, and thus no problems arise.

Installing Applications From a SunFSD Source Directory

If an application's installation into a SunFSD-mapped drive fails, make sure that the mapped directory path names in which the installation software resides all have names that do not exceed eight characters.

For example, suppose the drive letter Q: is mapped to `\\localhost\WatchGuard\AntiVirusSoftware`.

In the `AntiVirusSoftware` directory are the following subdirectories named `AntiVirusFOREMM` and `AV4KADY`.

If the software located in `AntiVirusFOREMM` fails to install, it may be due to the fact that the subdirectory used by the installation program has a file name longer than eight characters. If this is so, rename the subdirectory to a name less than nine characters, for example, `AV4EMM`, and attempt the installation again.

Because the directory `AV4KADY` already is less than eight characters, the installation of the application from that subdirectory should succeed.

Note – Even though the path that is mapped, for example `WatchGuard\AntiVirusSoftware`, contains names that are more than eight characters, this does not matter to the installation program. Only file names below the drive letter mapping encounter the restriction.

Installing Applications to a SunFSD Target Directory

If an application's installation program fails to install to a SunFSD-mapped drive with warnings about a `Path Not Found` or `File Not Found`, this may be because the installation program is relying upon the destination file system to support 8.3 file names. This is specifically the case where there are embedded file names in any of the destination installation paths.

For example, Corel WordPerfect Office 2000 uses a default destination directory of `WordPerfect Office 2000`. If this destination directory resides on a SunFSD drive, there is a portion of the installation program that attempts to use 8.3 file names. Thus, there is a resulting dialog box that states that the file `Q:WordPerfect` cannot be found. The embedded space, combined with the fact that SunFSD does not support 8.3 file names, confuses the installation program.

However, if the destination directory is changed so that there are no embedded spaces, for example change `WordPerfect Office 2000` to `WordPerfect_Office_2000`, the installation would proceed normally.

Displaying Shortname Tails

On older Microsoft applications (such as the DOS Command Prompt window), if file names are longer than eight characters, the file name may be truncated into the 8.3 DOS file name format and a number added to the file name (such as ~1). This number is called a *shortname tail*. When reading long file names on extended drives in the Windows 98 SE or Windows ME window, DOS window, or the Windows NT or Windows 2000 Command Prompt window, the window can only display shortname tails ending in the number 1. It cannot display ~2, ~3, and so on.

Note – The term "DOS session" refers to the DOS shell window that you access from Windows 98 SE or Windows ME (called the Command Prompt window in Windows NT and Windows 2000). It does not refer to OpenDOS windows running under OpenDOS 7.01.

Network Neighborhood Issue

Note – This section refers to virtual Ethernet networking only. It does not apply to physical Ethernet connections.

When you open the Network Neighborhood on the Microsoft Windows desktop, the Network Neighborhood window does not show My Workstation. The workstation and the SunPCi II card share the same network interface, so they do not "see" each other on the network. Both can communicate with the network, however.

For more information about networking your workstation with your SunPCi II host using virtual networking, refer to "How to Set Up Network Connections: An Example" on page 39.

SunPCi II Software Appears to Hang When Browsing Network Drives

You may observe a very long time lag when browsing network drives. SunPCi II software may even appear to hang as it searches the contents of the drives. This is because Solaris software contains a "browsing" feature that allows you to automatically view all automount points on your workstation.

This may cause Microsoft Windows applications to slow down considerably when browsing for files on your workstation, and it can also cause problems when viewing very large directories with Windows Explorer, or saving to a subdirectory in one of these large directories.

You can fix this problem by editing the Solaris auto_master file to turn off this feature. To edit this file, perform the following steps:

1. **Use a text editor to open the file** /etc/auto_master**.**

   The file should look similar to the following:

   ```
   # Master map for automounter
   #
   +auto_master
   /net            -hosts          -nosuid,nobrowse
   /home           auto_home       -nobrowse
   /xfn            -xfn
   ```

2. **Move the** +auto_master **line in the file to the bottom of the list.**

   If the -nosuid, nobrowse and -nobrowse keywords are not present in the file, add them before the +auto_master line. The result should look similar to the following:

   ```
   # Master map for automounter
   #
   /net            -hosts          -nosuid,nobrowse
   /home           auto_home       -nobrowse
   /xfn            -xfn
   +auto_master
   ```

3. **Save the file and exit the text editor.**

4. **Reboot your system.**

   The "browsing" feature should be turned off.

SunPCi II Hardware Problems

This section includes the following topics:

Hardware Error Messages

The following table shows some error messages that result from hardware problems, possible causes of those problems, and solutions.

TABLE A-1 SunPCi II Error Messages

Error Message	Possible Cause	Solution
`Driver not found. Can't attach to device. Devlinks not created.`	Your system cannot identify the PCI device. This can be due to the following reasons: • One or more of your SunPCi II card(s) is not installed securely in the PCI slot. • Your /etc/devlink.tab file was not updated correctly when you installed SunPCi II software.	Remove and reinstall your SunPCi II card as described in the *SunPCi II 2.3 Installation Guide*.
`The SunPCi II drivers could not be loaded. Is another session running?`	This message may appear for one of the following reasons: • You already have a SunPCi II session running. • You removed the SunPCi II card and then reinstalled it in a different PCI slot in your system. • You started SunPCi II software without first restarting your system after you installed the card.	Perform a corresponding action: • Quit the other session before running SunPCi II software again. • If possible, remove the card and install it into the PCI slot it first occupied. • Log in as superuser, type in halt at the # prompt to halt your system again, and restart at the ok prompt using boot -r.
`Driver couldn't be loaded. SunPCi II cannot open the device.`	Your SunPCi II card may not be properly seated in the PCI slot.	Make sure that the card is securely seated in the PCI slot.
`System could not transfer file data from buffers.`	You have run out of disk space on your host file system.	Make more space on your host file system.
`SunPCi.VXD: Can't dvma_alloc XXX bytes. The system is low on memory.`	You allocated too much video RAM to your external VGA driver.	Change the video RAM value to a lower number. Refer to "Running Game Software on the SunPCi II Platform" on page 199.

Mouse Problems

TABLE A-2 shows some common mouse problems and possible solutions.

TABLE A-2   Mouse Problems

Problem	Possible Cause	Solution
Two mouse cursors appear on the SunPCi II desktop (Windows 98 SE or Windows ME).	You may not yet have installed the SunPCi II software drivers for Microsoft Windows, or you have not yet attached the mouse.	To use the mouse before you install the drivers, choose Attach Mouse from the Options menu, or press Meta-M. After you finish installing the drivers, the mouse will operate normally.
Windows 2000, pointer moves slowly.	Pointer moves slowly if the display is set to 16-bit or 24-bit mode.	Refer to "Double Mouse Pointer" on page 178.
Mouse pointer movements appear jerky after SunPCi II installation.	You may not yet have installed the SunPCi II software drivers for Microsoft Windows when performing an upgrade or custom installation, or when installing Windows ME.	Refer to the chapter about using the operating system for information about how to install the drivers. After you finish installing the drivers, you will notice that the mouse pointer movement appears much smoother.

Diskette Drive Problem

SunPCi II software and the Solaris Volume Manager program (`vold`) tend to conflict with each other for control of the diskette drive. Volume Manager provides automatic mounting services for peripheral devices attached to your system, such as diskette drives.

The conflict arises when Volume Manager support is enabled on your system and you attempt to access a diskette drive through a SunPCi II window. In such instances, an error message is displayed and the diskette access fails.

By default, when SunPCi II software is installed, Volume Manager support is disabled for diskette drives, and so most users will not encounter a problem. However, it is possible to reenable Volume Manager on your system, and thus encounter the problem at a later time.

If Volume Manager support for diskette drives is reenabled on your system, and you encounter problems accessing diskette drives through SunPCi II software, try disabling Volume Manager and restarting the SunPCi II window. If the problem persists, try disabling Volume Manager and rebooting your system.

To disable the Solaris Volume Manager, perform the following steps:

1. **Make sure that SunPCi II software is not running.**

2. **Become superuser.**

3. **Disable Volume Manager by entering the following command:**

```
# /opt/SUNWspci2/bin/vold_floppy_disable
```

4. **Exit superuser.**

5. **Restart all SunPCi II software windows.**

Keyboard Problem

The Backspace key does not work in DOS (Windows 98 Only). Do not map the Delete key to the Backspace key. If you do this, you will not have a Backspace key available when you are working with DOS applications. When you press the Backspace key, it will not backspace, but will instead delete the character at the current cursor location. If you have mapped these two keys by modifying your `.xinitrc` file, there will be a line in the file that reads:

```
xmodmap -e keycode 50 = delete
```

Use a text editor to edit `.xinitrc`. Remove this line to restore the original key assignments.

CD-ROM Drive Problems

TABLE A-3 describes some problems you might encounter with CD-ROM drives, possible causes, and solutions.

TABLE A-3   CD-ROM Drive Problems

Problem	Possible Cause	Solution
When you insert or eject a CD in one CD-ROM drive, the other CD-ROM drive becomes unreachable.	You have two SCSI CD-ROM drives in your system.	You need to select which CD-ROM drive to use with SunPCi II software.
When you double-click the CD-ROM drive in Windows NT Explorer, you get the following error message: `Drive not ready. Abort/Retry/Fail?`	Your CD-ROM drive may not be a Sun-supplied drive.	SunPCi II software only supports Sun-supplied CD-ROM drives. Replace the CD-ROM drive in your system with a Sun-supplied drive.
Playing an audio CD using the Solaris `workman` utility causes Windows NT to hang. Starting Windows NT while an audio CD is playing pauses the audio CD.	Your CD-ROM drive is being shared by both Solaris and Microsoft Windows. As soon as Microsoft Windows detects the presence of the CD, it pauses the CD.	Disable CD detection in either Solaris or Microsoft Windows. The CD cannot be shared by both operating systems. Note that once you disable CD detection in one operating system, you need to mount the CD manually in that operating system.
When you insert a DVD disc into the CD-ROM drive, it does not work.	SunPCi II software only supports DVD data discs.	Use only data formatted DVD discs.

Setting Up Your CD-ROM Drive

If you have more than one SCSI CD-ROM drive installed in your workstation, you have to specify which drive you want to use with SunPCi II software. To set up your CD-ROM drive, perform the following procedure:

1. **Start SunPCi II software, if it is not already running.**

   The Console window from which you start the application displays the following message:

   ```
   sunpci2: Your sunpci.ini file does not specify a CD device
            assuming /vol/dev/aliases/cdrom0
   ```

2. **From the Options menu, choose Attach CD-ROM.**

   The Specify CD-ROM Device File dialog box is displayed.

3. **Type the path to the CD-ROM device you want to use (for example,**
   `/vol/dev/aliases/cdrom0`**).**

   When you finish typing in the path, click OK.

4. **Exit all Microsoft Windows operating systems and use the Reset PC option in the
   SunPCi II window.**

   When SunPCi II software restarts, it uses the CD-ROM drive device that you
   specified.

Video Display Problems

24-Bit Display on Sun Blade 100

On a SunBlade 100 workstation with an M64 frame buffer, follow this procedure to
display 24-bit color in the SunPCi II window.

1. **Open a Terminal window and log in as root.**

2. **Open the file** `/usr/dt/config/Xservers` **in a text editor and edit the last line of
   the file so that it appears as follows:**

   ```
   :0 Local local_uid@console root /usr/openwin/bin/Xsun :0
   -nobanner -dev /dev/fb defdepth 24
   ```

3. **Save and close the file.**

4. **Type the following commandto find out the current resolution setting:**

   ```
   # m64config -prconf
   ```

5. **Type the following command to set the display to 24-bit color:**

   ```
   # m64config -depth 24 -res currentresolutionsetting
   ```

   Use the resolution setting that was returned by the command `m64config -prconf`.
   For example, type: `m64config -depth 24 -res 1152x900x76`.

6. 5. **Type the following command to confirm that the depth of the root window has changed to 24 planes:**

```
# xdpyinfo
```

7. 6. **Restart the system**

External Video Resolutions

TABLE A-4 shows the external VGA display resolutions that SunPCi II software supports. For best results, you may want to increase the amount of available video RAM from 2 Mbytes (the default) to 64 Mbytes and reset the VGA memory clock to 70 MHz. To make these changes, refer to "Running Game Software on the SunPCi II Platform" on page 199.

Note – Remember that increasing your video memory decreases the amount of available system memory. Refer to "Increasing System Memory" on page 197 for more information.

Before you change the resolution or display depth of your monitor, be sure to shut down all running applications and save your work. You do not need to test a new setting before applying it. The following table shows the available resolutions.

TABLE A-4   SunPCi II Software External Video Resolutions (SiS 630 Driver)

Resolution (Pixels)	Color Depth (Number of Colors)	Maximum Refresh Frequency (Hz) (Non-interlaced)
640 x 480	16, 256, 32K, 64K, 16M	120
800 x 600	16, 256, 32K, 64K, 16M	120
1024 x 768	256, 32K, 64K, 16M	120
1280 x 1024	256, 32K, 64K, 16M	120
1600 x 1200	256, 32K, 64K, 16M	100
1920 x 1200	256, 32K, 64K, 16M	80

External Monitors and 1600 X 1200 Resolution

For Sis monitors to display with 1600 x 1200 pixel resolution, you need to dedicate 8 Mbytes of shared memory from system memory. See "How to Increase Video Memory" on page 199 for more information.

External Monitors and Windows NT

If you select a video resolution value for your external monitor that exceeds the monitor's actual maximum resolution, Windows NT may freeze. If this happens, choose the Reset PC command from the SunPCi File menu to restart Windows NT. Select the VGA option for Windows NT when prompted. Windows NT starts up and displays a 640 x 480 desktop, which you can change using the Control Panel.

Networking Hardware Problem

If you have problems setting up and running the physical Ethernet connection on the SunPCi II card, you may need to program (flash update) the card's Ethernet (MAC—machine) address into its PROM.

The SunPCi II card's MAC address appears on a yellow label on the card. You recorded the address in the *SunPCi II 2.3 Installation Guide* before you installed the card into your system. Refer to the *SunPCi II 2.3 Installation Guide* for more information.

The following table describes how to flash update the MAC address and what to do if you have a problem.

Some procedures described in the table use the `sunpciflash` utility command. The command is fully documented in the man(0) page.

TABLE A-5 Using `sunpciflash` With MAC Address Problems

Question	Answer
How do I list multiple cards and their MAC addresses.	To display a list of all the installed cards in your system, type the following command:
	`/opt/SUNWspci2/bin/sunpci –l`
	The system displays the following information: the card's Name, for example `card1`; the card's Device file name in the `/dev` directory; the card's Type; the card's Description; and the card's ID or Ethernet (MAC) address. See "How to Identify Card Names" on page 28 for an example of the output.
How do I find out the MAC address of a particular card?	Type the following command on one line:
	`sunpciflash –f /opt/SUNWspci2/bios/bios.bin –c 1 –m`
How do I program a MAC address into a SunPCi II card?	Find the label on the SunPCi II card; it is on the component side of the card, near the connectors. The MAC address looks similar to the following example: E00B00.
	To program the MAC address, update your BIOS, type the following command (both parts) on one line:
	`/opt/SUNWspci2/bin/sunpciflash –f /opt/SUNWspci2/bios/bios.bin –e XX:YY:ZZ:00:01:02`
	Note: Substitute your MAC address for `XX:YY:ZZ:00:01:02`.
When I have more than one card installed, how do I program a MAC address into a particular card?	List and identify the cards using the `sunpciflash –l` option. Use the `sunpciflash` command –c (card number) and –e (Ethernet) options to program the MAC address. To set the MAC address of card #1 to be XX:YY:ZZ:00:01:02 type the following command (both parts) on one line:
	`/opt/SUNWspci2/bin/sunpciflash /opt/SUNWspci2/bios/bios.bin –c 1 –e XX:YY:ZZ:00:01:02`
What happens if I make a mistake while typing in the command?	Nothing serious; just type the command again.

Question	Answer
Do I have to reprogram the MAC address every time I update the BIOS?	No.
I forgot to write down the MAC address before updating the BIOS. Will I need that information again?	No. Once you have flashed the MAC address into the BIOS, you should never have to specify it again. You should be able to flash new BIOS revisions and the MAC address will be preserved.
How can I print out the MAC address currently flashed into the BIOS?	Type the following command (both parts) on one line:

```
/opt/SUNWspci2/bin/sunpciflash -f
/opt/SUNWspci2/bios/bios.bin -m
```

The output should appear similar to the following:
```
Current Ethernet Address: 00:A0:C0:B0:00:C0
```

SunPCi II Software Problems

This section includes the following topics:

Software Startup Problems

When starting SunPCi II 2.3 software, you may encounter one of the following error messages.

TABLE A-6   Software Startup Error Messages

Message	Explanation
`Command not found`	Make sure that the SunPCi II program directory—by default, `/opt/SUNWspci2/bin`—is in your environment `$PATH`. Refer to your Solaris documentation to set up your `$PATH` variable.
`Correct Solaris Installation Required`	If you do not have the correct Solaris installation on your system, you will encounter problems when attempting to start SunPCi II software. SunPCi II software requires at least the End User System, Developer System, or Entire Distribution installation of Solaris. SunPCi II software will not run if you only have the Core System installed. Ask your system administrator for assistance in determining which system is installed on your workstation.

Emulated Hard Drive Problems

The following table describes some common questions about large emulated disks and the answers to those questions.

TABLE A-7   Emulated Hard Drive Problems

Problem Description	Reason	Solution
I just created a new 8-Gbyte emulated disk, but I can only see 2 Gbytes. Why?	DOS can only recognize file sizes of up to 2 Gbytes.	Refer to "FAT16 File System Limitations" on page 141. You need to partition your emulated disk. The remaining 6 Gbytes in your emulated disk file are available to create additional partitions.
I just created a new 8-Gbyte emulated disk and installed Microsoft Windows. Now my OS partition won't boot. Why?	When you create the new emulated disk file, SunPCi automatically creates a 2-Gbyte partition, using the first 2 Gbytes of the new disk. If you installed Microsoft Windows on the other partition (the remaining 6-Gbyte portion), DOS does not recognize it, and the SunPCi II software does not boot from that partition.	You need to create a new 2-Gbyte partition for your version of Microsoft Windows. Refer to "FAT16 File System Limitations" on page 141.
I created a partition and installed Windows NT on it. Why won't it boot?	If the partition you created is located at greater than 4 Gbytes after the start of your emulated disk, that partition does not boot.	You must install Windows NT on the first partition on your emulated drive. Refer to "FAT16 File System Limitations" on page 141.
Is there a limit to the number of partitions on a single emulated drive?	No, there is no limit to the number of partitions, but there are other limitations.	If you want to create multiple partitions on an emulated drive, you need to use PartitionMagic. Remember that Microsoft Windows and DOS only recognize the 26 drive letters, and that some are already mapped by default (such as A:, C:, D: or E:, and f: in Windows 98 SE). Refer to the *PartitionMagic User's Guide* for more information.

Attaching Drive C:

To be sure that you are always able to attach drive C:, you can change the permissions on the drive. Changing the permissions keeps other users from being able to attach drive C: even when you are not using the SunPCi II program. To change permissions on drive C:, type the following in a command window:

```
% chmod 600 ~/pc/C.diskimage
```

This makes the drive inaccessible to other users.

Disk Error Messages

If your SunPCi II window shows the message Non-system disk or disk error at startup, your C: drive may be corrupted, or you have a non-bootable diskette in drive A:. If you do not have a diskette in drive A:, delete the default C: drive file in $HOME/pc (~/pc/sunpc.ini) and then restart the SunPCi II software.

You may want to make periodic backup copies of your C: drive. Refer to "How to Back Up an Emulated C: Drive" on page 144 for more information.

Extended Drive Problem

If you cannot mount network drives with Windows Explorer, networking may not be installed on the SunPCi II platform.

Try to log in to the network first. If you can reach the network from the UNIX side, then go to the Start menu in the SunPCi II software and select Control Panel, then double-click Network. Set up your SunPCi II installation on the network. Refer to your Microsoft Windows documentation for more information.

If you still cannot connect to the network after logging in, you need to reinstall your version of Microsoft Windows.

To log in to the network, follow this procedure:

● **Start the SunPCi II software and enter your user name and password when the dialog box prompts you to log in to Microsoft Networking.**

To log in to the network if you are already running SunPCi II software, follow these steps:

1. **Click the Start button and then choose Exit.**

2. **When the dialog box asks you whether you want to shut down or restart the computer, click Restart.**

3. **When the Microsoft Networking dialog box appears, type your user name and password.**

   You are now able to mount network drives. Refer to "Extended Drives and SunPCi II Software" on page 146 for instructions on how to use Windows Explorer to map network drives.

Networking Problems

This section includes the following topics:

- "Network Startup Is Slow After Configuration" on page 174
- "Cannot Connect to Other Systems" on page 174

Network Startup Is Slow After Configuration

After you configure your network and restart Microsoft Windows for the first time, the network may take several minutes to start. This is especially true if you are using DHCP with your SunPCi II card. This is normal behavior for first-time startup.

Cannot Connect to Other Systems

Note – This section applies only to virtual networking configurations. If you are using the physical Ethernet connection, skip this section.

Before you start to diagnose problems with using SunPCi II software to connect to other systems on the network, make sure that you have configured SunPCi II software and your system as follows:

- Your system and SunPCi II software host must have different IP addresses.
- Both the SunPCi II software host and the workstation should be located on the same physical subnetwork, although they may be on different virtual subnetworks.
- Your workstation and SunPCi II software must have the same network mask. The value of the network mask depends on the type of network you are using; contact your network administrator for more information.

> **Note –** You need to know the names and IP addresses of another system on the same subnet as your workstation, and of a system not on the same subnetwork. Contact your network administrator if you do not have this information.

Windows XP Professional Issues

This section lists known problems with Windows XP Professional in this release of SunPCi II software.

- "Double Mouse Pointer" on page 175
- "File System Drive Issues" on page 176
- "Japanese Copy and Paste Issue" on page 176
- "Troubleshooting Windows 2000 Issues" on page 180
- "Running Multiple Microsoft Windows Versions" on page 177

Double Mouse Pointer

If you see double mouse pointers while running Windows XP Professional, disable the pointer Shadows setting as described in the following procedure.

1. **From the Start menu, choose Settings, and then choose Control Panel.**

   The Control Panel window is displayed.

2. **Double-click the Mouse Control Panel.**

   The Mouse Properties window is displayed.

3. **Click the Pointers tab, and then uncheck the box next to Enable Pointer Shadow.**

4. **Click Apply, then click OK to close the window.**

   The pointer shadow is now disabled. You should see only one pointer on your Windows XP Professional desktop.

File System Drive Issues

You may observe the following problems when using file system drives:

- File attributes (such as read-only and write-only) may not work correctly.

- File links do not work on file system drives. If you need to link to a file that is located on a file system drive, move the file to your C: or D: drive and then create the link.

- If you create a desktop shortcut to a file on a file system drive, that shortcut does not update automatically if you change the file's location on the drive. You need to delete the existing shortcut and create a new one.

- If you insert an object (such as a clip art file) into a Microsoft Office XP application, and the original object is stored on a file system drive or a drive mapped using \\localhost*path*, the insertion will not work correctly. You need to move or copy the object to your C: or D: drive, and then insert it into your document.

- Using Universal Naming Convention (UNC) path names to locate Office 97, Office 2000, or Office XP files, such as \\localhost\export\home\ myfiles.doc, does not work in this version of the software. This is a known problem and is being investigated.

For more information about file system drives, refer to "File System Drives" on page 146.

Japanese Copy and Paste Issue

If you edited your $HOME/pc/SunPCi.ini file to support Japanese copy and paste functions, you may see the following error message: Warning, bad clipboard translation codeset specified in SunPC.ini file: codeset. Ignoring.

This message indicates that there may be an error in the file that you edited. Refer to "How to Configure Japanese Copy and Paste Between Microsoft Windows and Solaris" on page 152 for more information.

Troubleshooting Windows XP Professional Issues

The following table lists some possible problems with Windows XP Professional, their causes, and recommended solutions.

TABLE A-8   Windows XP Professional Problems

Problem	Cause	Solution
Upgrading to Windows XP Professional results in a "blue screen" with the error message `INACCESSIBLE_BOOT_DEVICE`.	You used the standard Microsoft upgrade on the Windows XP Professional CD instead of the recommended procedure in "Upgrading to Windows XP Professional" on page 44.	Use the backup copy of your C: drive and restore the drive. Refer to "Upgrading to Windows XP Professional" on page 44. If you did not create a backup C: drive, create a new C: drive and install Windows XP Professional as described in this document. You have to reinstall all of your applications.
Inserting a file into Microsoft Office XP does not work.	The object file (such as clip art or an Excel spreadsheet) is located on a file system drive or on a drive mapped using `\\localhost\` *path*.	Copy or move the object file to your C: or D: drive and then insert it again.
The mouse no longer works when I click the Start button. (16-bit and 24-bit displays only).	There is a software conflict with the screen fade effect in the Display Control Panel.	Turn off the fade effect by choosing the Display Control Panel. Deselect the first check box under Visual Effects. Click OK. The mouse should work again.

Running Multiple Microsoft Windows Versions

This version of the software does not support dual-boot emulated drives. If you want to run multiple versions of Microsoft Windows on the SunPCi II platform, create an emulated drive for each operating system and install the operating system and applications onto it. Use the Attach Drive command under the SunPCi II Options menu to switch among the different operating systems.

Windows 2000 Issues

This section lists known problems with Windows 2000 in this release of SunPCi II software.

- "Double Mouse Pointer" on page 178
- "File System Drive Issues" on page 178
- "CD-ROM Drive Issues" on page 179
- "Japanese Copy and Paste Issue" on page 179
- "Troubleshooting Windows 2000 Issues" on page 180
- "Running Multiple Microsoft Windows Versions" on page 180

Double Mouse Pointer

If you see double mouse pointers while running Windows 2000, disable the pointer Shadows setting as described in the following procedure.

1. **From the Start menu, choose Settings, and then choose Control Panel.**

   The Control Panel window is displayed.

2. **Double-click the Mouse Control Panel.**

   The Mouse Properties window is displayed.

3. **Click the Pointers tab, and then uncheck the box next to Enable Pointer Shadow.**

4. **Click Apply, then click OK to close the window.**

   The pointer shadow is now disabled. You should see only one pointer on your Windows 2000 desktop.

File System Drive Issues

You may observe the following problems when using file system drives:

- File attributes (such as read-only and write-only) may not work correctly.
- File links do not work on file system drives. If you need to link to a file that is located on a file system drive, move the file to your C: or D: drive and then create the link.
- If you create a desktop shortcut to a file on a file system drive, that shortcut does not update automatically if you change the file's location on the drive. You need to delete the existing shortcut and create a new one.

- If you insert an object (such as a clip art file) into a Microsoft Office 2000 application, and the original object is stored on a file system drive or a drive mapped using `\\localhost\`*path*, the insertion will not work correctly. You need to move or copy the object to your C: or D: drive, and then insert it into your document.

- Using Universal Naming Convention (UNC) path names to locate Office 97 or Office 2000 files, such as `\\localhost\export\home\myfiles.doc`, does not work in this version of the software. This is a known problem and is being investigated.

For more information about file system drives, refer to "File System Drives" on page 146.

CD-ROM Drive Issues

Your CD-ROM drive may be slow to display, or will not update at all. This includes the system information about the CD, and the title of the CD when viewed in Windows Explorer. This is a known problem that is being investigated.

Japanese Copy and Paste Issue

If you edited your `$HOME/pc/SunPCi.ini` file to support Japanese copy and paste functions, you may see the following error message: `Warning, bad clipboard translation codeset specified in SunPC.ini file: codeset. Ignoring.`

This message indicates that there may be an error in the file that you edited. Refer to "How to Configure Japanese Copy and Paste Between Microsoft Windows and Solaris" on page 152 for more information.

Troubleshooting Windows 2000 Issues

The following table lists some possible problems with Windows 2000, their causes, and recommended solutions.

TABLE A-9   Windows 2000 Problems

Problem	Cause	Solution
Upgrading Windows NT to Windows 2000 results in a "blue screen" with the error message `INACCESSIBLE_BOOT_DEVICE`.	You used the standard Microsoft upgrade on the Windows 2000 CD instead of the recommended procedure in "Upgrading Windows NT to Windows 2000" on page 65.	Use the backup copy of your C: drive and restore the drive. Refer to "Upgrading Windows NT to Windows 2000" on page 65. If you did not create a backup C: drive, create a new C: drive and install Windows 2000 as described in this document. You have to reinstall all of your applications.
Inserting a file into Microsoft Office 2000 does not work.	The object file (such as clip art or an Excel spreadsheet) is located on a file system drive or on a drive mapped using \\localhost\ *path*.	Copy or move the object file to your C: or D: drive and then insert it again.
The mouse no longer works when I click the Start button (16-bit and 24-bit displays only).	There is a software conflict with the screen fade effect in the Display Control Panel.	Turn off the fade effect by choosing the Display Control Panel. Deselect the first check box under Visual Effects. Click OK. The mouse should work again.

Running Multiple Microsoft Windows Versions

This version of the software does not support dual-boot emulated drives. If you want to run multiple versions of Microsoft Windows on the SunPCi II platform, create an emulated drive for each operating system and install the operating system and applications onto it. Use the Attach an Existing Drive command under the SunPCi II Options menu to switch among the different operating systems.

Windows NT Issues

This section describes the following problems you may encounter while using Windows NT:

- "External Video Problems" on page 181
- "Problems Installing to Network Drives" on page 181
- "Recovering From the Windows NT Autorun Option" on page 181
- "File System Drive Issues" on page 182
- "Creating Windows NT Repair Disks" on page 182
- "Using the Windows NT Repair Disks" on page 184
- "Japanese Copy and Paste Issue" on page 184

External Video Problems

If you try to set a resolution value for external video that exceeds the monitor's actual resolution, Windows NT may freeze. Refer to "External Monitors and Windows NT" on page 168 for more information.

Problems Installing to Network Drives

If you have problems installing Windows NT applications to network drives, try installing the applications to your C: or D: drives. The applications should then install correctly.

Recovering From the Windows NT Autorun Option

After you are finished installing and configuring Windows NT, you may want to use the Microsoft Windows operating system CD again at another time (for example, to view the documentation on the disk). If you insert the Microsoft Windows CD into your CD-ROM drive, an Autorun dialog box is displayed. This dialog box includes the Microsoft Windows Setup option. *Do not* use this option.

If you did choose the Windows NT Setup option by mistake, choose a different operating system in the OS Loader screen after SunPCi II software reboots. For example, choose Last Operating System on C:.

File System Drive Issues

You may observe the following problems when using file system drives:

- If you create a desktop shortcut to a file on a file system drive, that shortcut does not update automatically if you change the file's location on the drive. You need to delete the existing shortcut and create a new one.

- If you insert an object (such as a clip art file) into a Microsoft Office 2000 application, and the original object is stored on a file system drive or a drive mapped using
  \\localhost*path*, the insertion will not work correctly. You need to move or copy the object to your C: or D: drive, and then insert it into your document.

- Using Universal Naming Convention (UNC) path names to locate Office 97 or Office 2000 files, such as \\localhost\\export\\home\\myfiles.doc, does not work in this version of the software. This is a known problem and is being investigated.

Creating Windows NT Repair Disks

The boot diskettes that come with the Windows NT Workstation package do not contain the SunPCi II software drivers. If you use these repair disks to recover from a Microsoft Windows problem, the SunPCi II software drivers will not be installed and the software will not work correctly.

If you want to create a repair disk for your SunPCi II 2.3 software installation of Microsoft Windows, perform the following procedure:

1. **From the Start menu, choose Shut Down, and then choose Restart the Computer.**

   In Windows NT, the choice appears as a radio button.

2. **Click OK.**

   Windows NT shuts down and restarts.

3. **At the OS Loader screen, use the down arrow key to select Previous Operating System on C:. Press Return.**

   The SunPCi II software then boots into DOS. When it has finished booting, the DOS prompt (C:\>) is displayed.

4. **Back up the following files to another area on your workstation's hard disk or to a diskette.**

   These files are needed to initialize the DOS environment.

   ```
   C:\winnt\system32\Autoexec.nt
   C:\winnt\system32\Config.nt
   ```

5. **Copy the following files to a diskette.**

   If Windows NT Workstation 4.0 does not start up, you need this diskette in order to boot Windows NT.

   ```
   C:\Ntldr
   C:\Boot.ini
   C:\Ntdetect.com
   C:\bootsect.dos
   C:\Hal.dll
   ```

   You might want to make more than one copy of this diskette, in case one copy is damaged or lost.

6. **Copy these Registry files to a directory on your workstation's hard disk (such as** `$HOME/temp`**).**

   You need these files to restore the Windows NT Registry.

   ```
   C:\System32\config\Sam
   C:\System32\config\Sam.log
   C:\System32\config\Sam.sav
   C:\System32\config\Security
   C:\System32\config\Security.log
   C:\System32\config\Security.sav
   C:\System32\config\Software
   C:\System32\config\Software.log
   C:\System32\config\Software.sav
   C:\System32\config\System
   C:\System32\config\System.alt
   C:\System32\config\System.sav
   C:\System32\config\System.log
   C:\System32\config\Default
   C:\System32\config\Default.log
   C:\System32\config\Default.sav
   C:\System32\config\Userdiff
   C:\System32\config\Userdiff.log
   ```

   Note – You may not have `.sav` files in your directory. This is normal. However, if you do have `.sav` files, it is a good idea to back them up.

   ---

7. **Copy these files to a diskette to restore the default user profile.**

   ```
   C:\winnt\profiles\Default User\Ntuser.dat
   C:\winnt\profiles\Default User\NTuserdat.log
   ```

   Note – In DOS, the directory will appear as `C:\winnt\profiles\Defaul~1\`.

Using the Windows NT Repair Disks

When you need to recover Windows NT, follow this procedure:

1. **Insert the diskette with the DOS files you copied into your diskette drive and then start SunPCi II software.**

   Your SunPCi II software window boots to the DOS prompt.

   Note – If you have trouble booting to the DOS prompt and you have the DOS 6.22 diskette available, insert the DOS diskette into your diskette drive and restart the SunPCi II software again.

   ---

2. **At the DOS prompt, copy the files from the other diskettes back into the directory paths specified in each of the steps.**

3. **Copy the files you stored on your workstation's hard disk into the specified directories.**

4. **When you have finished copying all of the saved files into their respective directories, choose File and Reset PC to restart the SunPCi II software.**

   The SunPCi II software boots into Windows NT.

5. **If you have trouble booting into Windows NT, insert the diskette with the Windows NT boot files and restart SunPCi II software again.**

   Windows NT should boot from the diskette; press F3 to boot to the DOS prompt. You can now recopy the Windows NT boot files from the diskette onto your C: drive.

   Note – If you need to restore the Windows NT system password files only, restore the following files:

   ```
   C:\System32\config\Sam
   C:\System32\config\Sam.log
   C:\System32\config\Sam.sav
   ```

Japanese Copy and Paste Issue

If you edited your $HOME/pc/SunPCi.ini file to support Japanese copy and paste functions, you may see the following error message: `Warning, bad clipboard translation codeset specified in SunPC.ini file: codeset. Ignoring.`

This message indicates that there may be an error in the file that you edited. Refer to "How to Configure Japanese Copy and Paste Between Microsoft Windows and Solaris" on page 152 for more information.

Windows 98 SE Issue

When you shut down Windows 98 SE from the Microsoft Windows Start menu, a dialog box is displayed showing a number of options (such as Shut Down, Restart, and so on). Do not use the Standby option with Windows 98 SE. The Standby option does not work with SunPCi II 2.3 software.

SunPCi II International Support

This appendix includes the following general topics related to international support:

- "International Support" on page 187
- "Using the Keyboard Environment Variables" on page 188
- "How an International Keyboard Works Under DOS" on page 191
- "Code Pages and SunPCi II Software" on page 192

This appendix includes instructions for completing the following procedures:

- "How to Set an Environment Variable" on page 190
- "How to Turn Off an Environment Variable" on page 190
- "How to Set Up the Keyboard for Microsoft Windows" on page 190

International Support

The SunPCi II software gives you the national language support you need to run your applications using an international keyboard. The first time you started the SunPCi II program, you were presented with a list of regional languages and countries from which to choose. You entered the number that corresponded to the language or country your keyboard supports. These regional languages and country names represent code pages in PC terminology. If you want to change your code pages and keyboard language tables, use the instructions in this appendix.

To set up international keyboard support for SunPCi II 2.3 software, use the KBTYPE and KBCP environment variables to select the correct keyboard language table and code page for your installation. Refer to "Using the Keyboard Environment Variables" on page 188 for more information, and a procedure to use with Windows XP Professional, Windows 2000, Windows NT, or Windows 98 SE.

Note – To configure Windows NT, Windows XP, or Windows 2000 to work with Japanese copy and paste functions, refer to "How to Configure Japanese Copy and Paste Between Microsoft Windows and Solaris" on page 152.

Using the Keyboard Environment Variables

This section describes the following topics:

- "Setting the KBTYPE Environment Variable" on page 188
- "Setting the KBCP Environment Variable" on page 189
- "How to Set an Environment Variable" on page 190
- "How to Turn Off an Environment Variable" on page 190

Setting the KBTYPE Environment Variable

The KBTYPE environment variable specifies the keyboard language table to use with the SunPCi II software. To set KBTYPE, refer to "How to Set an Environment Variable" on page 190. TABLE B-1 lists the values for KBTYPE and the corresponding languages.

TABLE B-1   KBTYPE Values

KBTYPE Value	Keyboard Language
be	Belgium
cf	Canadian French
dk	Danish
fr	French
gf	Swiss German
gr	German
it	Italian
la	Latin American Spanish
nl	Dutch (Netherlands)

TABLE B-1 KBTYPE Values *(Continued)*

KBTYPE Value	Keyboard Language
no	Norwegian
po	Portuguese
sf	Swiss French
sg	Swiss German
sp	Spanish
su	Finnish
sv	Swedish
uk	U.K. English
us	U.S. English

Setting the KBCP Environment Variable

The KBCP environment variable specifies the keyboard code page. The code page specifies the characters set (accents, currency symbols, and so on) to be used with a keyboard. TABLE B-2 lists the possible values for the KBCP environment variable.

TABLE B-2 KBCP Values

Value	Description
437	United States code page
850	Multilingual code page, including all characters for most languages of European, North American, and South American countries
860	Portuguese code page
863	Canadian French code page
865	Nordic code page, including all characters for the Norwegian and Danish languages

To set KBCP, refer to "How to Set an Environment Variable" on page 190. For more information about code pages and their functions, refer to "What Is a Code Page?" on page 192.

▼ How to Set an Environment Variable

To set an environment variable, follow these steps:

1. **Make sure that the SunPCi II software is not running, or exit SunPCi II if it is running.**

2. **Open a Terminal window on your desktop.**

3. **To set an environment variable, type the following command at the % prompt (do not type the %). Substitute the name of the environment variable for** *VARIABLE_NAME***, and the value for the variable (if required) for** *value***.**

   C Shell:

   ```
   % setenv VARIABLE_NAME value
   ```

   Bourne Shell:

   ```
   % VARIABLE_NAME=value
   % export VARIABLE_NAME
   ```

4. **Start the SunPCi II software.**

▼ How to Turn Off an Environment Variable

To turn off an environment variable, follow this step:

● **Type the following command and substitute the name of the environment variable for** *VARIABLE_NAME***.**

   ```
   % unsetenv VARIABLE_NAME
   ```

▼ How to Set Up the Keyboard for Microsoft Windows

In order for your keyboard layout to function correctly for your language, you also need to configure the keyboard for your version of Microsoft Windows. To set up the keyboard, perform the following steps:

1. **Check that the Solaris** KBCP **and** KBTYPE **environment variables are set to use the same language (for example, us, gr, and so on).**

   If the environment variables are not set, refer to "Setting the KBTYPE Environment Variable" on page 188 to set KBTYPE, and to "Setting the KBCP Environment Variable" on page 189 to set KBCP.

2. **From the Microsoft Windows Start menu, choose Settings, and then choose Control Panel.**

   The Control Panel window is displayed.

3. **Set the default keyboard layout in Microsoft Windows to the same value as you set in** KBTYPE.

How an International Keyboard Works Under DOS

Your Sun international keyboard fully emulates the local-language DOS AT/102 keyboard. Each keyboard offers all the characters in the US-ASCII and the local AT/102 character set, plus any other characters routinely used within that country.

Using an International Keyboard

In general, there is nothing unusual about the way this keyboard works for most characters. You press the key and the character appears on the screen. To get an uppercase character, you either hold the Shift key or set the Caps Lock. If there are three characters shown on the key, you hold the Alt-Graph key while pressing the key to get the third character. However, there are a few special ways in which the keyboard operates under DOS:

■ The keyboard provides access to more characters than are available on the local-language DOS keyboard.

■ Under both DOS and Solaris operating systems, some characters are used both as accents and as separate characters, such as the carat (^) and the tilde (~). Under the Solaris system, these characters have separate keys—one for use as a floating accent and one for the separate character. Under DOS, there is one key that provides both functions. To use the key to enter a floating accent, press the key. To use the key to enter a separate character, simultaneously press the key and the space bar.

■ Characters that are not available on the local DOS keyboard may be ignored when you attempt to use them.

DOS Character Set

Whenever you, or a program you are using, creates a file under DOS, the DOS character set is used. Whenever you create a file under the Solaris system, the ISO 8859 Latin 1 character set is used. You do not need to be aware of this unless you want to use a DOS file in the Solaris environment, or a Solaris file in the DOS environment. To convert files from one format to the other, two conversion utilities are provided—dos2unix and unix2dos. Only characters that are available in both the DOS character set and the ISO 8859 Latin 1 character set can be converted between formats. Fortunately, most commonly used characters are available in both character sets.

However, if you have a text file that contains special characters, these characters may not be convertible. Most word processors and text-processing programs use special codes in their files to indicate character style or page layout. Most of these programs, however, have options to store the file as "text only" or to "print to a file," which eliminates the special codes and allows you to convert the file using the dos2unix and unix2dos commands.

Code Pages and SunPCi II Software

DOS provides national language support through the use of language-specific code pages.

If you want to change code pages at some time, use the KBCP environment variable as described in "Setting the KBCP Environment Variable" on page 189.

What Is a Code Page?

A *code page* is a table that defines the character set you are using. Each *character set* contains 256 entries that are specific to a country or language. The characters are translated from the code page table and used by your keyboard, screen, and printer. An example is the set of letters, numbers, and symbols (such as accent marks) used by French Canadians. When the character set is put into a table for use by DOS, it becomes the Canadian French code page.

There are two types of code pages, *hardware* and *prepared*. A *hardware* code page is built into a device. For example, a printer manufactured for use in Portugal has a Portuguese hardware code page in it. Many devices can use only their own hardware code page.

Prepared code pages are provided in code-page information (`.CPI`) files in your software. OpenDOS includes the following prepared code pages:

- 437 – United States code page
- 850 – Multilingual code page, including all characters for most languages of European, North American, and South American countries
- 860 – Portuguese code page
- 863 – Canadian French code page
- 865 – Nordic code page, including all characters for the Norwegian and Danish languages

National Language Support Codes

Both Swiss French and Swiss German use country code 041. Country codes 358 and 972 assume United States code page 437, but include country-specific date and time conventions. For example, if you use country code 351 (Portugal), you can use prepared code pages 860 and 850 and the po (Portugal) keyboard code. You could not use the us (United States) keyboard code.

TABLE B-3 National Language Support

Country, Region, or Language	Country Code	Prepared Code Pages	Key Code
United States	001	437, 850	us
Canadian French	002	863, 850	cf
Latin America	003	437, 850	la
Netherlands	031	437, 850	nl
Belgium	032	437, 850	be
France	033	437, 850	fr
Spain	034	437, 850	sp
Italy	039	437, 850	it
Switzerland	041	437, 850	sf, sg
United Kingdom	044	437, 850	uk
Denmark	045	865, 850	dk
Sweden	046	437, 850	sv
Norway	047	865, 850	no
Germany	049	437, 850	gr

TABLE B-3 National Language Support *(Continued)*

Country, Region, or Language	Country Code	Prepared Code Pages	Key Code
English (International)	061	437, 850	-
Portugal	351	860, 850	po
Finland	358	437, 850	su
Israel	972	437	-
Japan	081		ja
Korea	082		ko
Peoples Republic of China	086		ch
Taiwan	088		tn

The $LANG Variable

There are two Solaris commands—`/usr/bin/dos2unix` and
`/usr/bin/unix2dos`—that enable you to specify code pages. For example, to
convert the `task_list` file, created with code page 850, from a DOS to a Solaris
format, use the `dos2unix` command, and enter the following:

```
C:\> dos2unix –850 task_list task_list
```

If the code page is not specified on the command line, `dos2unix` and `unix2dos`
will check the $LANG environment variable to determine which code page to use. To
check whether your $LANG variable is set, enter the following in a Solaris command
window:

```
% env | grep LANG
```

If you do not have the $LANG variable set, or if it is set to anything but the settings listed in TABLE B-4, SunPCi II software uses the default US code page 437 and the en_US (English-US) $LANG setting.

TABLE B-4 $LANG Variable Settings

$LANG **Variable Setting**	**Language/Territory**
C	Default "C" locale
es_AR	Arabic
da	Danish
de	German
de_AT	Austrian German
de_CH	Swiss German
el	Greek
en_AU	Australian English
en_IE	Irish English
en_NZ	New Zealand English
en_UK	U.K. English
en_US	U.S. English
es	Spanish
es_BO	Bolivian Spanish
es_CL	Chilean Spanish
es_CO	Colombian Spanish
es_CR	Costa Rican Spanish
es_EC	Ecuadorian Spanish
es_GT	Guatemalan Spanish
es_MX	Mexican Spanish
es_NI	Nicaraguan Spanish
es_PA	Panamanian Spanish
es_PE	Peruvian Spanish
es_PY	Paraguayan Spanish
es_SV	Salvadoran Spanish
es_UY	Uruguayan Spanish
es_VE	Venezuelan Spanish

TABLE B-4 $LANG Variable Settings *(Continued)*

$LANG **Variable Setting**	**Language/Territory**
fr	French
fr_BE	Belgian French
fr_CA	Canadian French
fr_CH	Swiss French
it	Italian
ja	Japanese
ko	Korean
sv	Swedish
zh	Chinese
zh_TW	Chinese Taiwan

Note that the settings listed in the table are the ones that SunPCi II supports; it does not list all the languages Solaris supports.

For more information about using Solaris environment variables, refer to your Solaris documentation.

SunPCi II Performance Tips

This appendix provides various ways to improve the performance of your SunPCi II system and the performance of your Microsoft Windows applications. This appendix includes the following topics:

Fine-Tuning the SunPCi II Configuration

The following sections describe some aspects of SunPCi II configuration that you can change to improve performance of the SunPCi II software.

Increasing System Memory

The more system memory you have, the better the performance of the SunPCi II program. A minimum of 64 Mbytes on the SunPCi II card is suggested for running SunPCi II software; a 64-Mbyte memory module comes installed on the SunPCi II card by default. If you are running Windows XP Professional, Windows 2000, Windows NT4 Server, or Windows NT4 TS, you should have a minimum of 128 Mbytes installed, but for best performance, use 256 Mbytes.

If you want to increase the amount of RAM allocated to the SunPCi II platform, you may want to purchase the optional 128- or 256-Mbyte memory module. You can purchase two of the 256-Mbyte SODIMMs and replace, for example, a 64-Mbyte memory module, for a total of 512 Mbytes. Refer to the *SunPCi II SODIMM Installation Guide* for installation information, or for purchasing information contact your Sun reseller.

Caution – Take care not to allocate too much RAM to the VGA driver; every Mbyte allocated to video means that there is one less Mbyte allocated to Microsoft Windows. If Microsoft Windows system memory is set too low, the SunPCi II software will show the Microsoft Windows "blue screen" and the following error message: `SunPCi.VXD: Can't dvma_alloc xxx bytes. The system is low on memory.`

Specifying Emulated Drives

You should specify as large a drive size as possible when creating a new C: or D: drive. (Depending on the available space on your hard disk, you can specify up to 8 Gbytes.)

For more information about using emulated hard disk drives, see the section "Emulated Drives and SunPCi II Software" on page 140. For information about using extended drives, see "Extended Drives and SunPCi II Software" on page 146.

Improving Video Performance

If your workstation video display is running in 8-bit mode, you can improve video performance by selecting a simple pattern or None for your desktop wallpaper. A complicated wallpaper pattern causes the screen to repaint more often while you work, thus slowing down video performance.

Note – Changing your desktop wallpaper does not affect performance for 24-bit video.

Improving Emulated Drive Performance

By default, SunPCi II software creates your C: drive (a large UNIX file) in a ~/pc directory within your home directory. If your home directory is not located on your workstation's hard drive, but instead on the network, the performance of your C: drive may be affected. To improve performance, you may want to move your C: drive to your local workstation's hard drive.

Running Game Software on the SunPCi II Platform

Note – This procedure applies *only* if you are using an external VGA monitor with your SunPCi II card. For more information about how to install and configure an external VGA monitor, refer to Chapter 10.

This section is designed to help you fine-tune game performance on the SunPCi II platform. Although the default VGA memory setting of 2 Mbytes on your SunPCi II card should provide enough VGA memory for most games, you may want to increase the amount of VGA memory for more graphics-intensive games.

Note – Remember that increasing your video memory decreases the amount of available system memory. Refer to "Increasing System Memory" on page 197 for more information.

▼ How to Increase Video Memory

To increase the amount of VGA memory available to SunPCi II, perform the following procedure:

1. **Start the SunPCi II software. If SunPCi II software is already running, exit Microsoft Windows and then choose Reset PC from the File menu.**

   You will see the Startup screen and the RAM check routine.

2. **While the RAM check routine is proceeding, press the Del (Delete) key on your keyboard.**

   The Startup routine stops, and the Setup screen is displayed.

3. **Select Integrated Peripherals.**

4. **Change the System Shared Memory Size parameter to a larger value.**

   The default is 2 Mbytes. This parameter accepts values between 2 Mbytes and 64 Mbytes in increments of .5 Mbyte.

5. **Exit the Setup window.**

   The SunPCi II Startup routine starts over, using the new VGA memory settings.

Caution – Do not set the video memory to too high a value (for example, setting shared memory to 32 Mbytes when your SunPCi II card contains only 64 Mbytes). If you set this value too high, Microsoft Windows fails and displays the following error message: `SunPCi.VXD: Can't dvma_alloc XXX bytes. The system is low on memory.`

Video Display Routing

The following table describes some video output routing in SunPCi II software.

TABLE C-1 describes the type of video output that occurs for the operating system you want to use, the video driver you installed, and whether you typed `sunpci -vga` at the prompt.

TABLE C-1   Video Options Matrix

PC Operating System	With VGA Monitor Connected	Without VGA Monitor Connected
DOS (-vga switch used)	Video is routed to VGA monitor.	Video is discarded; SunPCi II window displays `Video routed` message.
DOS (-vga switch not used)	Video is routed to SunPCi II X-window on workstation screen.	Video is routed to SunPCi II window on workstation screen.
Windows 98 (VGA driver used)	Video is routed to VGA monitor.	Video is discarded.
Windows 98 (SunPCi II drivers installed)	Video is routed to SunPCi II X-window on workstation screen.	Video is routed to SunPCi II window on workstation screen.
Windows XP/NT/2000 (SunPCi II drivers installed automatically)	Video is routed to SunPCi II X-window on workstation screen; to use external monitor, install the `sis630` driver.	Video is routed to SunPCi II window on workstation screen.

Using a Palm Pilot With SunPCi II Software

The SunPCi II software supports the "hotsync" function with the Palm Pilot. For best results, especially with Windows 98 SE, select a specific hotsync speed on the Palm Pilot, rather than As Fast As Possible.

Regulatory, Safety, and Conformity Information

This appendix includes the following sections regarding SunPCi II product regulatory, safety, and product declaration of conformity information.

- "Regulatory Compliance Statements" on page 204
- "Safety Agency Compliance Statements" on page 207
- "Declaration of Conformity" on page 217

Regulatory Compliance Statements

Your Sun product is marked to indicate its compliance class:

- Federal Communications Commission (FCC) — USA
- Industry Canada Equipment Standard for Digital Equipment (ICES-003) — Canada
- Voluntary Control Council for Interference (VCCI) — Japan
- Bureau of Standards Metrology and Inspection (BSMI) — Taiwan

Please read the appropriate section that corresponds to the marking on your Sun product before attempting to install the product.

FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables to comply with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted-pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

FCC Class B Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted pair (UTP) cables.

Modifications: Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

ICES-003 Class A Notice - Avis NMB-003, Classe A

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

ICES-003 Class B Notice - Avis NMB-003, Classe B

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

VCCI 基準について

クラス A VCCI 基準について

クラス A VCCIの表示があるワークステーションおよびオプション製品は、クラスA情報技術装置です。これらの製品には、下記の項目が該当します。

> この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラス A情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

クラス B VCCI 基準について

クラス B VCCI の表示 ⟦VCI⟧ があるワークステーションおよびオプション製品は、クラス B情報技術装置です。これらの製品には、下記の項目が該当します。

> この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラス B情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱説明書に従って正しい取り扱いをしてください。

BSMI Class A Notice

The following statement is applicable to products shipped to Taiwan and marked as Class A on the product compliance
label.

警告使用者：
這是甲類的資訊產品，在居住的環境中使用
時，可能會造成射頻 干擾，在這種情況下，
使用者會被要求採取某些適當的對策。

Safety Agency Compliance Statements

Read this section before beginning any procedure. The following text provides safety precautions to follow when installing a Sun Microsystems product.

Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock, or damage to your equipment.

Symbols

The following symbols may appear in this book:

Caution – There is risk of personal injury and equipment damage. Follow the instructions.

Caution – Hot surface. Avoid contact. Surfaces are hot and may cause personal injury if touched.

Caution – Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

On – Applies AC power to the system.

Depending on the type of power switch your device has, one of the following symbols may be used:

Off - Removes AC power from the system.

Standby – The On/Standby switch is in the standby position.

Modifications to Equipment

Do not make mechanical or electrical modifications to the equipment. Sun Microsystems is not responsible for regulatory compliance of a modified Sun product.

Placement of a Sun Product

Caution – Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.

Caution – The workplace-dependent noise level defined in DIN 45 635 Part 1000 must be 70Db(A) or less.

SELV Compliance

Safety status of I/O connections comply to SELV requirements.

Power Cord Connection

Caution – Sun products are designed to work with single-phase power systems having a grounded neutral conductor. To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.

Caution – Not all power cords have the same current ratings. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension cords with your Sun product.

Caution – Your Sun product is shipped with a grounding type (three-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded power outlet.

The following caution applies only to devices with a Standby power switch:

Caution – The power switch of this product functions as a standby type device only. The power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

Lithium Battery

Caution – On Sun CPU boards, there is a lithium battery molded into the real-time clock, SGS No. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, or MK48T08. Batteries are not customer replaceable parts. They may explode if mishandled. Do not dispose of the battery in fire. Do not disassemble it or attempt to recharge it.

Battery Pack

Caution – There is a sealed lead acid battery in SunPCi II units. Portable Energy Products No. TLC02V50. There is danger of explosion if the battery pack is mishandled or incorrectly replaced. Replace only with the same type of Sun Microsystems battery pack. Do not disassemble it or attempt to recharge it outside the system. Do not dispose of the battery in fire. Dispose of the battery properly in accordance with local regulations.

System Unit Cover

You must remove the cover of your Sun computer system unit to add cards, memory, or internal storage devices. Be sure to replace the top cover before powering on your computer system.

Caution – Do not operate Sun products without the top cover in place. Failure to take this precaution may result in personal injury and system damage.

Laser Compliance Notice

Sun products that use laser technology comply with Class 1 laser requirements.

```
Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1
```
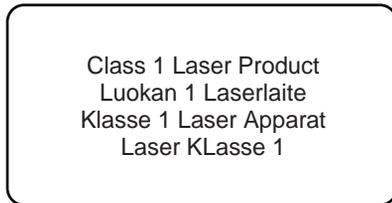
CD-ROM

 Caution – Use of controls, adjustments, or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

Einhaltung sicherheitsbehördlicher Vorschriften

Auf dieser Seite werden Sicherheitsrichtlinien beschrieben, die bei der Installation von Sun-Produkten zu beachten sind.

Sicherheitsvorkehrungen

Treffen Sie zu Ihrem eigenen Schutz die folgenden Sicherheitsvorkehrungen, wenn Sie Ihr Gerät installieren:

- Beachten Sie alle auf den Geräten angebrachten Warnhinweise und Anweisungen.
- Vergewissern Sie sich, daß Spannung und Frequenz Ihrer Stromquelle mit der Spannung und Frequenz übereinstimmen, die auf dem Etikett mit den elektrischen Nennwerten des Geräts angegeben sind.
- Stecken Sie auf keinen Fall irgendwelche Gegenstände in Öffnungen in den Geräten. Leitfähige Gegenstände könnten aufgrund der möglicherweise vorliegenden gefährlichen Spannungen einen Kurzschluß verursachen, der einen Brand, Stromschlag oder Geräteschaden herbeiführen kann.

Symbole

Die Symbole in diesem Handbuch haben folgende Bedeutung:

 Achtung – Gefahr von Verletzung und Geräteschaden. Befolgen Sie die Anweisungen.

 Achtung – Hohe Temperatur. Nicht berühren, da Verletzungsgefahr durch heiße Oberfläche besteht.

 Achtung – Gefährliche Spannungen. Anweisungen befolgen, um Stromschläge und Verletzungen zu vermeiden.

 Ein – Setzt das System unter Wechselstrom.

Je nach Netzschaltertyp an Ihrem Gerät kann eines der folgenden Symbole benutzt werden:

 Aus – Unterbricht die Wechselstromzufuhr zum Gerät.

 Wartezustand (Stand-by-Position) - Der Ein-/ Wartezustand-Schalter steht auf Wartezustand. Änderungen an Sun-Geräten.

Nehmen Sie keine mechanischen oder elektrischen Änderungen an den Geräten vor. Sun Microsystems, übernimmt bei einem Sun-Produkt, das geändert wurde, keine Verantwortung für die Einhaltung behördlicher Vorschriften

Aufstellung von Sun-Geräten

Achtung – Um den zuverlässigen Betrieb Ihres Sun-Geräts zu gewährleisten und es vor Überhitzung zu schützen, dürfen die Öffnungen im Gerät nicht blockiert oder verdeckt werden. Sun-Produkte sollten niemals in der Nähe von Heizkörpern oder Heizluftklappen aufgestellt werden.

Achtung – Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70Db(A) oder weniger.

Einhaltung der SELV-Richtlinien

Die Sicherung der I/O-Verbindungen entspricht den Anforderungen der SELV-Spezifikation.

Anschluß des Netzkabels

Achtung – Sun-Produkte sind für den Betrieb an Einphasen-Stromnetzen mit geerdetem Nulleiter vorgesehen. Um die Stromschlaggefahr zu reduzieren, schließen Sie Sun-Produkte nicht an andere Stromquellen an. Ihr Betriebsleiter oder ein qualifizierter Elektriker kann Ihnen die Daten zur Stromversorgung in Ihrem Gebäude geben.

Achtung – Nicht alle Netzkabel haben die gleichen Nennwerte. Herkömmliche, im Haushalt verwendete Verlängerungskabel besitzen keinen Überlastungsschutz und sind daher für Computersysteme nicht geeignet.

Achtung – Ihr Sun-Gerät wird mit einem dreiadrigen Netzkabel für geerdete Netzsteckdosen geliefert. Um die Gefahr eines Stromschlags zu reduzieren, schließen Sie das Kabel nur an eine fachgerecht verlegte, geerdete Steckdose an.

Die folgende Warnung gilt nur für Geräte mit Wartezustand-Netzschalter:

Achtung – Der Ein/Aus-Schalter dieses Geräts schaltet nur auf Wartezustand (Stand-By-Modus). Um die Stromzufuhr zum Gerät vollständig zu unterbrechen, müssen Sie das Netzkabel von der Steckdose abziehen. Schließen Sie den Stecker des Netzkabels an eine in der Nähe befindliche, frei zugängliche, geerdete Netzsteckdose an. Schließen Sie das Netzkabel nicht an, wenn das Netzteil aus der Systemeinheit entfernt wurde.

Lithiumbatterie

Achtung – CPU-Karten von Sun verfügen über eine Echtzeituhr mit integrierter Lithiumbatterie (Teile-Nr. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, oder MK48T08). Diese Batterie darf nur von einem qualifizierten Servicetechniker ausgewechselt werden, da sie bei falscher Handhabung explodieren kann. Werfen Sie die Batterie nicht ins Feuer. Versuchen Sie auf keinen Fall, die Batterie auszubauen oder wiederaufzuladen.

Batterien

Achtung – Die Geräte SunPCi II enthalten auslaufsichere Bleiakkumulatoren. Produkt-Nr. TLC02V50 für portable Stromversorgung. Werden bei der Behandlung oder beim Austausch der Batterie Fehler gemacht, besteht Explosionsgefahr. Batterie nur gegen Batterien gleichen Typs von Sun Microsystems austauschen. Nicht demontieren und nicht versuchen, die Batterie außerhalb des Geräts zu laden. Batterie nicht ins Feuer werfen. Ordnungsgemäß entsprechend den vor Ort geltenden Vorschriften entsorgen.

Gehäuseabdeckung

Sie müssen die obere Abdeckung Ihres Sun-Systems entfernen, um interne Komponenten wie Karten, Speicherchips oder Massenspeicher hinzuzufügen. Bringen Sie die obere Gehäuseabdeckung wieder an, bevor Sie Ihr System einschalten.

 Achtung – Bei Betrieb des Systems ohne obere Abdeckung besteht die Gefahr von Stromschlag und Systemschäden.

Einhaltung der Richtlinien für Laser

Sun-Produkte, die mit Laser-Technologie arbeiten, entsprechen den Anforderungen der Laser Klasse 1.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1
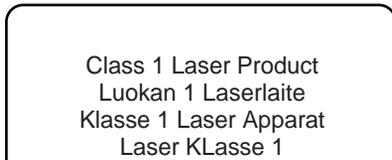
CD-ROM

 Warnung – Die Verwendung von anderen Steuerungen und Einstellungen oder die Durchfhrung von Prozeduren, die von den hier beschriebenen abweichen, knnen gefhrliche Strahlungen zur Folge haben.

Conformité aux normes de sécurité

Ce texte traite des mesures de sécurité qu'il convient de prendre pour l'installation d'un produit Sun Microsystems.

Mesures de sécurité

Pour votre protection, veuillez prendre les précautions suivantes pendant l'installation du matériel :

■ Suivre tous les avertissements et toutes les instructions inscrites sur le matériel.

■ Vérifier que la tension et la fréquence de la source d'alimentation électrique correspondent à la tension et à la fréquence indiquées sur l'étiquette de classification de l'appareil.

■ Ne jamais introduire d'objets quels qu'ils soient dans une des ouvertures de l'appareil. Vous pourriez vous trouver en présence de hautes tensions dangereuses. Tout objet conducteur introduit de la sorte pourrait produire un court-circuit qui entraînerait des flammes, des risques d'électrocution ou des dégâts matériels.

Symboles

Vous trouverez ci-dessous la signification des différents symboles utilisés :

 Attention: – risques de blessures corporelles et de dégâts matériels. Veuillez suivre les instructions.

 Attention: – surface à température élevée. Evitez le contact. La température des surfaces est élevée et leur contact peut provoquer des blessures corporelles.

 Attention: – présence de tensions dangereuses. Pour éviter les risques d'électrocution et de danger pour la santé physique, veuillez suivre les instructions.

 MARCHE – Votre système est sous tension (courant alternatif).

Un des symboles suivants sera peut-être utilisé en fonction du type d'interrupteur de votre système:

 ARRET - Votre système est hors tension (courant alternatif).

 VEILLEUSE – L'interrupteur Marche/ Veilleuse est en position « Veilleuse ».

Modification du matériel

Ne pas apporter de modification mécanique ou électrique au matériel. Sun Microsystems n'est pas responsable de la conformité réglementaire d'un produit Sun qui a été modifié.

Positionnement d'un produit Sun

⚠ **Attention:** – pour assurer le bon fonctionnement de votre produit Sun et pour l'empêcher de surchauffer, il convient de ne pas obstruer ni recouvrir les ouvertures prévues dans l'appareil. Un produit Sun ne doit jamais être placé à proximité d'un radiateur ou d'une source de chaleur.

⚠ **Attention:** – Le niveau de pression acoustique au poste de travail s'élève selon la norme DIN 45 635 section 1000, à 70 dB (A) ou moins.

Conformité SELV

Sécurité : les raccordements E/S sont conformes aux normes SELV.

Connexion du cordon d'alimentation

⚡ **Attention:** – les produits Sun sont conçus pour fonctionner avec des alimentations monophasées munies d'un conducteur neutre mis à la terre. Pour écarter les risques d'électrocution, ne pas brancher de produit Sun dans un autre type d'alimentation secteur. En cas de doute quant au type d'alimentation électrique du local, veuillez vous adresser au directeur de l'exploitation ou à un électricien qualifié.

⚡ **Attention:** – tous les cordons d'alimentation n'ont pas forcément la même puissance nominale en matière de courant. Les rallonges d'usage domestique n'offrent pas de protection contre les surcharges et ne sont pas prévues pour les systèmes d'ordinateurs. Ne pas utiliser de rallonge d'usage domestique avec votre produit Sun.

⚡ **Attention:** – votre produit Sun a été livré équipé d'un cordon d'alimentation à trois fils (avec prise de terre). Pour écarter tout risque d'électrocution, branchez toujours ce cordon dans une prise mise à la terre.

L'avertissement suivant s'applique uniquement aux systèmes équipés d'un interrupteur VEILLEUSE:

⚡ **Attention:** – le commutateur d'alimentation de ce produit fonctionne comme un dispositif de mise en veille uniquement. C'est la prise d'alimentation qui sert à mettre le produit hors tension. Veillez donc à installer le produit à proximité d'une prise murale facilement accessible. Ne connectez pas la prise d'alimentation lorsque le châssis du système n'est plus alimenté.

Batterie au lithium

⚠ **Attention:** – sur les cartes CPU Sun, une batterie au lithium (référence MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, ou MK48T08.) a été moulée dans l'horloge temps réel SGS. Les batteries ne sont pas des pièces remplaçables par le client. Elles risquent d'exploser en cas de mauvais traitement. Ne pas jeter la batterie au feu. Ne pas la démonter ni tenter de la recharger.

Bloc-batterie

⚠ **Attention:** – Les unités SunPCi II contiennent une batterie étanche au plomb (produits énergétiques portatifs n°TLC02V50). Il existe un risque d'explosion si ce bloc-batterie est manipulé de façon erronée ou mal mis en place. Ne remplacez ce bloc que par un bloc-batterie Sun Microsystems du même type. Ne le démontez pas et n'essayez pas de le recharger hors du système. Ne faites pas brûler la batterie mais mettez-la au rebut conformément aux réglementations locales en vigueur.

Couvercle

Pour ajouter des cartes, de la mémoire, ou des unités de stockage internes, vous devrez démonter le couvercle de l'unité système Sun. Ne pas oublier de remettre ce couvercle en place avant de mettre le système sous tension.

⚠ **Attention:** – il est dangereux de faire fonctionner un produit Sun sans le couvercle en place. Si l'on néglige cette précaution, on encourt des risques de blessures corporelles et de dégâts matériels.

Conformité aux certifications Laser

Les produits Sun qui font appel aux technologies lasers sont conformes aux normes de la classe 1 en la matière.

```
Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1
```

CD-ROM

⚠ **Attention:** – L'utilisation de contrôles, de réglages ou de performances de procédures autre que celle spécifiée dans le présent document peut provoquer une exposition à des radiations dangereuses.

Normativas de seguridad

El siguiente texto incluye las medidas de seguridad que se deben seguir cuando se instale algún producto de Sun Microsystems.

Precauciones de seguridad

Para su protección observe las siguientes medidas de seguridad cuando manipule su equipo:

- Siga todas los avisos e instrucciones marcados en el equipo.
- Asegúrese de que el voltaje y la frecuencia de la red eléctrica concuerdan con las descritas en las etiquetas de especificaciones eléctricas del equipo.
- No introduzca nunca objetos de ningún tipo a través de los orificios del equipo. Pueden haber voltajes peligrosos. Los objetos extraños conductores de la electricidad pueden producir cortocircuitos que provoquen un incendio, descargas eléctricas o daños en el equipo.

Símbolos

En este libro aparecen los siguientes símbolos:

⚠ **Precaución** – Existe el riesgo de lesiones personales y daños al equipo. Siga las instrucciones.

⚠ **Precaución** – Superficie caliente. Evite el contacto. Las superficies están calientes y pueden causar daños personales si se tocan.

Precaución – Voltaje peligroso presente. Para reducir el riesgo de descarga y daños para la salud siga las instrucciones.

Encendido – Aplica la alimentación de CA al sistema.

Según el tipo de interruptor de encendido que su equipo tenga, es posible que se utilice uno de los siguientes símbolos:

Apagado - Elimina la alimentación de CA del sistema.

En espera – El interruptor de Encendido/En espera se ha colocado en la posición de En espera.

Modificaciones en el equipo

No realice modificaciones de tipo mecánico o eléctrico en el equipo. Sun Microsystems no se hace responsable del cumplimiento de las normativas de seguridad en los equipos Sun modificados.

Ubicación de un producto Sun

Precaución – Para asegurar la fiabilidad de funcionamiento de su producto Sun y para protegerlo de sobrecalentamien-tos no deben obstruirse o taparse las rejillas del equipo. Los productos Sun nunca deben situarse cerca de radiadores o de fuentes de calor.

Precaución – De acuerdo con la norma DIN 45 635, Parte 1000, se admite un nivel de presión acústica para puestos de trabajo máximo de 70Db(A).

Cumplimiento de la normativa SELV

El estado de la seguridad de las conexiones de entrada/salida cumple los requisitos de la normativa SELV.

Conexión del cable de alimentación eléctrica

Precaución – Los productos Sun están diseñados para trabajar en una red eléctrica monofásica con toma de tierra. Para reducir el riesgo de descarga eléctrica, no conecte los productos Sun a otro tipo de sistema de alimentación eléctrica. Póngase en contacto con el responsable de mantenimiento o con un electricista cualificado si no está seguro del sistema de alimentación eléctrica del que se dispone en su edificio.

Precaución – No todos los cables de alimentación eléctrica tienen la misma capacidad. Los cables de tipo doméstico no están provistos de protecciones contra sobrecargas y por tanto no son apropiados para su uso con computadores. No utilice alargadores de tipo doméstico para conectar sus productos Sun.

Precaución – Con el producto Sun se proporciona un cable de alimentación con toma de tierra. Para reducir el riesgo de descargas eléctricas conéctelo siempre a un enchufe con toma de tierra.

La siguiente advertencia se aplica solamente a equipos con un interruptor de encendido que tenga una posición "En espera":

Precaución – El interruptor de encendido de este producto funciona exclusivamente como un dispositivo de puesta en espera. El enchufe de la fuente de alimentación está diseñado para ser el elemento primario de desconexión del equipo. El equipo debe instalarse cerca del enchufe de forma que este último pueda ser fácil y rápidamente accesible. No conecte el cable de alimentación cuando se ha retirado la fuente de alimentación del chasis del sistema.

Batería de litio

Precaución – En las placas de CPU Sun hay una batería de litio insertada en el reloj de tiempo real, tipo SGS Núm. MK48T59Y, MK48TXXB-XX, MK48T18-XXXPCZ, M48T59W-XXXPCZ, o MK48T08. Las baterías no son elementos reemplazables por el propio cliente. Pueden explotar si se manipulan de forma errónea. No arroje las baterías al fuego. No las abra o intente recargarlas.

Paquete de pilas

Precaución – Las unidades SunPCi II contienen una pila de plomo sellada, Productos de energía portátil nº TLC02V50. Existe riesgo de estallido si el paquete de pilas se maneja sin cuidado o se sustituye de manera indebida. Las pilas sólo deben sustituirse por el mismo tipo de paquete de pilas de Sun Microsystems. No las desmonte ni intente recargarlas fuera del sistema. No arroje las pilas al fuego. Deséchelas siguiendo el método indicado por las disposiciones vigentes.

Tapa de la unidad del sistema

Debe quitar la tapa del sistema cuando sea necesario añadir tarjetas, memoria o dispositivos de almacenamiento internos. Asegúrese de cerrar la tapa superior antes de volver a encender el equipo.

Precaución – Es peligroso hacer funcionar los productos Sun sin la tapa superior colocada. El hecho de no tener en cuenta esta precaución puede ocasionar daños personales o perjudicar el funcionamiento del equipo.

Aviso de cumplimiento con requisitos de láser

Los productos Sun que utilizan la tecnología de láser cumplen con los requisitos de láser de Clase 1.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser KLasse 1

CD-ROM

Precaución – El manejo de los controles, los ajustes o la ejecución de procedimientos distintos a los aquí especificados pueden exponer al usuario a radiaciones peligrosas.

GOST-R Certification Mark
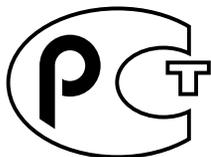
Nordic Lithium Battery Cautions

Norge

⚠ **ADVARSEL** – Litiumbatteri — Eksplosjonsfare.Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

Sverige

⚠ **VARNING** – Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

Danmark

⚠ **ADVARSEL!** – Litiumbatteri — Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

Suomi

⚠ **VAROITUS** – Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

Declaration of Conformity

Compliance Model Number: Chimera
Product Name: SunPCi II

EMC

USA—FCC Class B

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This equipment may not cause harmful interference.
2. This equipment must accept any interference received, including interference that may cause undesired operation..

European Union

This equipment complies with the following requirements of the EMC Directive 89/336/EEC:

EN55022:1998/CISPR22:1997		Class B
EN55024:1998	EN61000-4-2	4 kV (Direct), 8 kV (Air)
	EN61000-4-3	3 V/m
	EN61000-4-4	1.0 kV AC Power Lines, 0.5 kV Signal and DC Power Lines
	EN61000-4-5	1 kV AC Line-Line and Outdoor Signal Lines
		2 kV AC Line-Gnd, 0.5 kV DC Power Lines
	EN61000-4-6	3 V
	EN61000-4-8	1 A/m
	EN61000-4-11	Pass
EN61000-3-2:1995 w/Amendments 1, 2		Pass
EN61000-3-3:1995		Pass

Safety

This equipment complies with the following requirements of the Low Voltage Directive 73/23/EEC:

EC Type Examination Certificates:

   EN60950:1992, 2nd Edition, Amendments 1, 2, 3, 4, 11   IEC 950:1991, 2nd Edition, Amendments 1, 2, 3, 4
   Evaluated to all CB Countries

Supplementary Information

This product was tested and complies with all the requirements for the CE Mark.

/S/   /S/

Dennis P. Symanski   DATE: 10/30/2000   Peter Arkless   DATE: 11/02/2000
Manager, Compliance Engineering   Quality Manager
Sun Microsystems, Inc.   Sun Microsystems Scotland, Limited
901 San Antonio Road, MPK15-102   Springfield, Linlithgow
Palo Alto, CA 94303-4900 U.S.A   West Lothian, EH49 7LR
Tel: 650-786-3255   Scotland, United Kingdom
Fax: 650-786-3723   Tel: 0506-670000
                                                 Fax: 0506-760011

Index