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## SunPCi User's Guide

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Business  
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# Preface

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The *SunPCi User's Guide* provides installation and operation instructions for the SunPCi<sup>™</sup> software. In addition, this guide explains how to install Windows 95 on your UltraSPARC<sup>™</sup> workstation.

In order to fully use the information in this document, you should first have installed the SunPCi card in your system. The SunPCi software will not run properly without the card installed.

Refer to the *SunPCi Installation Guide* for more information.

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## Who Should Read This Book

This guide is intended for all users of the SunPCi software. Whether you are a general user working with SunPCi regularly or an administrator responsible for installing and maintaining numerous SunPCi setups, this guide provides the information you need to install and use the SunPCi software and Windows 95.

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<sup>™</sup> operating environment, the OpenDOS<sup>™</sup> operating system, and the desired version of Windows software. OpenDOS 7.01 is a superset of MS-DOS 6.22.

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## How This Book Is Organized

This guide is divided into five chapters and five appendixes, as follows:

Chapter 1," describes SunPCi and introduces you to its features.

Chapter 2, "Getting Started," lists the contents of your SunPCi package and explains the system requirements that your workstation must meet in order to successfully install and run SunPCi.

Chapter 3," describes how to install the SunPCi software. This chapter also contains instructions for installing Windows 95.

Chapter 4," describes how to connect peripheral devices (such as printers, serial devices, and audio devices) to the SunPCi card. Some of these connections require the optional add-on backplate (included in the SunPCi package).

Chapter 5," outlines some helpful hints that you may find useful while running SunPCi.

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

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

Appendix C," includes some suggestions on how to improve SunPCi performance.

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## Document Conventions

This manual uses certain standard 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. Depending on your choice, you can use either a Solaris Command Tool window or Shell Tool window in OpenWindows. These two types of command windows are a standard part of the Solaris operating environment. In CDE, these command windows are called Console and Terminal windows.

### Typographic Changes and Symbols

TABLE P-1 Typographic Conventions

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

## SunPCi Keyboard Accelerators

The SunPCi software provides keyboard accelerators for many of the functions on the menus at the top of the SunPCi window. To see the available accelerators, hold down the left mouse button on the menu until the drop-down menu appears. Next to each command is the equivalent keyboard accelerator.

In CDE and OpenWindows, these accelerators use the Meta key () in combination with another key. The Meta key is located on either side of the spacebar on your keyboard. To use any of the keyboard accelerators, 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.”



Sun Keyboard Meta Key

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# Customer Support

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

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## Related Documentation

The complete documentation set for the OpenDOS operating system can be found on the World Wide Web at <http://www.caldera.com>. For information on the version of Windows you are using, consult the related Windows documentation.

The following table describes the related Sun documentation for SunPCi.

TABLE P-2 Related Documentation

Application	Title	Part Number
Installation, hardware and SunPCi software	<i>SunPCi Installation Guide</i>	805-6055-10
Installation (X-Option), optional 128 Mbyte RAM DIMM	SunPCi DIMM Installation Guide	805-7205-10

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## Sun Documentation on the Web

The [docs.sun.com](http://docs.sun.com) web site enables you to access Sun technical documentation on the World Wide Web. You can browse the [docs.sun.com](http://docs.sun.com) archive or search for a specific book title or subject at:

<http://docs.sun.com>

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Please include the part number of the document for which you are sending comments in the subject line of your email.



## What Is SunPCi?

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SunPCi software and hardware provide a complete PC hardware environment on your PCI-based SPARC™ workstation or server running the Solaris operating environment. With SunPCi, you can run Windows 95 applications on your workstation, alongside your Solaris applications.

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## SunPCi Features

The following list describes some of the PC features that SunPCi brings to your Solaris desktop:

An Intel-compatible PC on your Solaris desktop

With the SunPCi card installed in your workstation or server, SunPCi contains an Intel-compatible PC processor on the board.

High-resolution VGA display for your Microsoft Windows applications

SunPCi includes two Windows super-VGA display drivers. One displays the Windows desktop in an X window on your screen; the other displays on an external VGA monitor. You can choose to install either option.

Your familiar PC peripherals

SunPCi provides Microsoft Mouse and IBM PC keyboard emulation, plus access to external peripherals such as printers and modems. The SunPCi accelerator card and optional add-on backplate contain the physical connections for PC peripheral devices.

Access to network services, files, and printers

SunPCi enables you to connect to your Ethernet network. It also allows you to access Solaris files and printers on the network through the physical connections on the accelerator card and backplate.

The software package includes the Caldera OpenDOS 7.01 operating system. You must purchase Windows 95 and your Windows applications separately.

## From the PC User's Perspective

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

- Emulated hard drives, which function like local PC hard drives
- Extended drives, similar to networked drives on a PC
- IBM PC and PC keyboard emulation
- Access to serial, parallel, and USB peripherals, such as printers
- 64 Mbytes of on-board memory (standard), plus a second slot for additional memory (64 and 128 Mbyte options are available; you can install two 128 MByte modules for a maximum 256 MBytes)
- Access to PC-based networks, including file and print servers
- Ability to use an optional VGA monitor

## From the Workstation User's Perspective

From the perspective of a SPARC Solaris workstation user, SunPCi software provides advantages, such as:

- Reliable access to thousands of PC applications, including custom internal applications that your company relies on daily
- Ability to display super-VGA graphics with 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 OpenDOS or Windows and OpenWindows/CDE applications
- Access to PC-based networks, including Novell NetWare file and print servers



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## How to Proceed

To install the SunPCi software, proceed to Chapter 3. Once you have installed and configured the SunPCi software, you can install Windows 95 and the SunPCi drivers.

Chapter 4 contains information on how to install and configure peripheral devices with SunPCi.

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## Getting Help for SunPCi

You can turn to the following additional sources for help with SunPCi software:

- SunPCi Help menu
- Solaris online manual pages
- DOS-related manual pages
- Customer Support

The following sections explain these sources.

### SunPCi Help Menu

Help for SunPCi is available through the Help menu at the top of the SunPCi window.

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**Note** - The F1 key does not provide help for SunPCi windows.

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### Solaris Online Manual Pages

You may occasionally have questions regarding the Solaris operating system itself. For such information, try using the Solaris online manual pages (also called `man` pages).

To use Solaris online manual pages, perform the following procedure:

1. **Type the word `man`, followed by the name of the command in which you are interested, and then press Return.**

For example, to get help on the `sunpci` command, type the following command and then press Return:

```
% 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 on how to add the SunPCi man page directory to your `MANPATH` environment variable, refer to your Solaris documentation.

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## Getting Help for Windows 95

To get help for Windows 95 while you are working in the SunPCi window and Windows is running, press F1 or select Help from the Help menu in any window. This brings up the Contents window for Windows 95 help.

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**Note** - Windows 95 help does not contain help for the SunPCi application.

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## Getting Started

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This chapter lists the contents of your SunPCi installation package, describes the SunPCi system requirements, and provides basic information about SunPCi installation. The following list describes the topics included in this chapter.

- “SunPCi Installation Package Contents” on page 5 “SunPCi Installation Package Contents” on page 5
- “System Requirements” on page 5 “System Requirements” on page 5
- “SunPCi Card” on page 6 “SunPCi Card” on page 6

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## SunPCi Installation Package Contents

Verify that your SunPCi installation package includes the following items:

- SunPCi CD-ROM — This includes the SunPCi software and this manual in AnswerBook2™ format
- The SunPCi Installation Guide — This manual includes information on installing the SunPCi card, the AnswerBook2 utility, and the SunPCi software

If any of these items is missing, contact your Sun service representative.

---

## System Requirements

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

- PCI-based UltraSPARC computer.

- Solaris 2.5.1, 2.6, or Solaris 7 operating environment.
- CD-ROM drive; either local (attached to your system), or remote (attached to another system on your network).
- Hard disk; either local or remote, with at least 40 Mbytes of available storage space for the SunPCi package. More storage will be required for Windows 95 (at least 128 MB).
- At least 64 Mbytes of random-access memory (RAM); more is preferred.

---

## SunPCi Card

You must have a SunPCi card installed in your PCI-based system if you want to run SunPCi. SunPCi does not support “software-only” operation, and it does not run on SBus-based systems. Refer to the SunPCi Installation Guide for more information.

## Starting SunPCi Software for the First Time

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This chapter discusses the following topics:

- “Starting Up SunPCi” on page 7 “Starting Up SunPCi” on page 7
- “Installing Windows 95 Software” on page 8 “Installing Windows 95 Software” on page 8
- “Creating and Configuring a New C: or D: Drive” on page 12 “Creating and Configuring a New C: or D: Drive” on page 12
- “Exiting SunPCi” on page 15 “Exiting SunPCi” on page 15

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**Note** - 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.

---

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### Starting Up SunPCi

To start the SunPCi program, type the following command at the `%` prompt and press Return:

```
% /opt/SUNWspci/bin/sunpci
```

The SunPCi program starts, and a SunPCi window is displayed. When you start SunPCi software for the first time after installation, the program takes a few minutes to create a directory named `~/pc`, in which several SunPCi files are also created.

When you subsequently restart SunPCi software, the SunPCi window will come up more quickly, because these files and directories do not need to be created again.

When the SunPCi software has finished starting up, the screen displays the DOS prompt (C:\>). You can use OpenDOS with your DOS applications, or you can install Windows 95. The following sections describe how to install Windows 95 and the SunPCi drivers.

---

**Note** - If you do not want to type the full path of SunPCi every time you want to run the software, you can modify the `$path` statement in your `.login` or `.cshrc` file. For information on how to do this, refer to your Solaris documentation.

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## Installing Windows 95 Software

In order to install Windows 95 on SunPCi, you will need one of the following:

- Windows 95 full installation CD, or
- Windows 3.x diskettes and a Windows 95 upgrade CD

This section explains how to install Windows 95 and how to install the SunPCi drivers. Before you start the installation, make sure your home directory contains sufficient disk space. Windows 95 requires a minimum of 128 Mbytes of free hard disk space.

To install Windows 95 on SunPCi, follow this procedure:

- 1. If the SunPCi CD is still in your CD-ROM drive, type `eject` in a terminal window and then remove the CD. Insert your Windows 95 CD into the CD-ROM drive.**

The CD should mount automatically and display its contents in a window on the screen. If it does not, then Solaris Volume Manager may not be enabled on your system.

- 2. To find out if Volume Manager is enabled, open a terminal window on your workstation desktop and type `ps -df | grep vold`.**

The system returns information on the Volume Manager process (`vold`) if it is enabled. If it is enabled, skip steps 3 and 4 and proceed to step 5.

If your workstation does not have Solaris Volume Manager enabled, you will need to become superuser and mount the CD-ROM drive manually as described in the next step.

---

**Note** - If you want to use your workstation's floppy drive as drive A:, you will need to run the `vold_floppy_disable` script. Refer to "Diskette Drives" on page 33 for more information.

---

- 3. If Solaris Volume Manager is not enabled, become superuser and then type `cd /` to change to the root partition. If your workstation has Solaris Volume Manager enabled, skip this step.**

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 you type `-o` with no space between the minus sign and the letter o.

---

If your workstation (Ultra 5 or Ultra 10) has an IDE drive, the device will be `/dev/dsk/c0t2d0s2`.

- 4. Exit superuser status. If you are not logged in as superuser, skip this step.**
- 5. In the SunPCi window, type the following command at the DOS prompt and press Return:**

```
C:\> r:\cdrom\cdrom0\setup.exe
```

- 6. Press Return to start the setup routine.**

Follow the instructions on the screen. During the installation process, select the options that are appropriate to your installation (typical, compact, and so on).

---

**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.

---

The screen responds with the message  
Setup is now going to perform a routine check on your system.  
The Scandisk utility executes.

After the Scandisk utility has completed, the screen displays the message  
Please wait while Setup initializes. The Welcome to Windows Setup window is displayed.

- 7. You will notice that the SunPCi window shows two mouse cursors. Click on the SunPCi window, and then select the Options menu at the top of the window. Choose Attach Mouse from the drop-down menu.**

You should now see a single mouse cursor. The top of the SunPCi window reads (Mouse Attached). You may notice that the mouse movement is somewhat jerky. This will be fixed when you install the SunPCi drivers.

- 8. Click Continue.**

The Windows 95 Setup Window is displayed, along with the message Preparing Windows 95 Setup Wizard.

The Windows installation program loads some files, and then displays the Windows 95 License Agreement.

- 9. Click Yes to continue, and then follow the instructions on the screen.**

- 10. When the Setup Wizard dialog box appears, click Next to continue, and then continue through the Setup Wizard's installation process. When asked to select options for your installation, choose the type of installation you want to perform (typical, compact, and so on).**

For the Windows 95 serial number and other Windows-related information, refer to your Windows 95 documentation.

A series of informational screens is displayed as the installation continues. When the installation is finished, the setup program will automatically reboot SunPCi. After the setup process is complete, a Welcome to Windows 95 dialog box is displayed.

---

**Note** - When the Analyzing Your Computer screen appears, do not check any of the devices it has listed (for example, CD-ROM drives). Just click Next and continue through the installation process. You will install SunPCi-specific drivers for these devices later on in this procedure.

---

- 1. Click Close to close this dialog box.**

The Windows 95 installation proceeds. Follow the instructions on the screen.

After you finish installing Windows 95, you will need to install the SunPCi drivers. Proceed to the following section.



# Installing the SunPCi Drivers

The `setup` utility installs the SunPCi drivers. You execute this utility from within Windows 95.

1. **Click the Start button and select Run from the pop-up menu.**

A dialog box is displayed.

2. **Type the following path into the dialog box and click OK:**

```
f:\drivers\win95\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 Setup Program screen is displayed.

---

**Note** - Depending on your installation, you may be asked to provide your user name and password for Microsoft Networking. Follow the instructions in Step 1 on page 8, and then continue with drivers setup.

---

3. **Click Next to continue.**

The SunPCi Drivers Setup screen appears.

4. **Choose Workstation Monitor if you plan to run SunPCi from your main workstation monitor, or External Monitor if you have connected a VGA monitor to the back of the SunPCi card.**

Click Next. The installation proceeds automatically. When the installation has finished, a dialog box is displayed with the message

The installation of the SunPCi drivers has finished. The dialog box asks you to exit all applications and reboot Windows 95.

5. **Click OK to close the dialog box.**

6. **Click Start and select Shut Down from the pop-up menu.**

A dialog box is displayed; select Restart the Computer and click Yes.

7. **Once SunPCi reboots, a dialog box is displayed asking you to enter a network password for Microsoft Networking.**

Type your UNIX workstation user name and password and press Return. Confirm your password when the program asks you to.

Note that after SunPCi reboots, the top of the SunPCi window no longer reads (Mouse Attached) and you will see only one mouse cursor. Now that the drivers are installed, you do not need to attach the mouse.

---

**Note** - You need to log on to Microsoft Networking each time Windows 95 starts up. If you do not log on, you will not be able to gain access to your extended (network) drives. Extended drives are the drives you set up using Windows Explorer.

---

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## Creating and Configuring a New C: or D: Drive

When you first install the SunPCi software and start the application for the first time, SunPCi automatically creates a new C: drive for you, called `C.diskimage`. This file resides in the `/pc` subdirectory in your home directory.

If you want to create and attach a hard drive file for drive D:, or attach a different file to drive C:, follow the procedures in this section.

---

**Note** - When you installed Windows 95 in the previous procedure, you installed it on the C: drive file `C.diskimage`. If you create a new drive and attach that new drive as drive C:, you will need to install Windows 95 on that drive as well.

---

### Creating a Hard Drive File

To create a new hard drive file, follow these steps:

1. **Start SunPCi, if it is not already running.**
2. **Choose the Options menu at the top of the SunPCi window.**  
The Options drop-down menu is displayed. Figure 3-1 shows the Options menu.

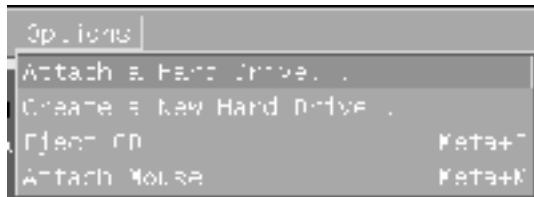


Figure 3-1 SunPCi Options Menu

**3. Select the Create New Drive command from the drop-down menu.**

The Create New Hard Drive dialog box is displayed. Figure 3-2 shows the Create New Hard Drive dialog box.



Figure 3-2 Create New Hard Drive Dialog Box

**4. If you want to attach the disk drive as drive C:, click the button next to Attach New Hard Drive As C:. If you want to attach the new drive as drive D:, click the button next to D:. If you want to create the drive file but not attach is, click the Do Not Attach button.**

**5. Drag the slider to the desired drive size in MB (megabytes).**

Make sure that your disk size is at least 60 Mbytes; the maximum of 500 Mbytes is preferred, depending on the available disk space on your workstation.

---

**Note** - An emulated drive is actually a large file, and SunPCi allocates disk space for emulated drives in a dynamic manner rather than in a static one. This means that although you can allocate a maximum of 500 Mbytes for a hard disk, the actual size of the disk depends on the amount of data that is stored in it at a given point in time. As the amount of data increases, the size of the emulated hard disk increases. Make sure that you have enough hard disk space on your workstation to accommodate a C: or D: drive of the size you specify.

---

**6. Click in the Selection field at the bottom of the dialog box. Type in the file name you want to use for the new drive (for example, C:newdisk).**

**7. Click on OK to create the disk file.**

SunPCi prompts you to shut down Windows and reboot. Click on OK.

**8. Click on the Start button, then Shut Down to shut down Windows 95.**

**9. From the File menu, choose Reset PC to reboot SunPCi.**

You are now ready to install other Windows programs on your new disk drives.

## Attaching a Drive File to C: or D:

If you have already attached the drive file in the previous step, skip this procedure.

After you have created a drive file, you need to attach it to one of your emulated hard drives. You can either do this in the Create New Hard Drive dialog box, as explained in the previous section, or you can attach the drive file in a separate step. (For example, if you clicked the Do Not Attach button in the Create New Hard Disk dialog box, you would need to attach the drive file before using it.)

To attach the file, perform the following procedure:

**1. From the Options menu, choose the Hard Disk Selection command.**

The SunPCi Drive Attach dialog box is displayed.

**2. Type in the path and file name of the file you created in “Creating a Hard Drive File” on page 12.**

If you want to make this file a new C: drive, type it into the C: Drive field. If you want the file to attach to a D: drive, type the path and file name into the D: Drive field.

**3. Click OK.**

The file is now attached to C: or D:.

**4. From the File menu, choose Reboot to apply your changes.**

SunPCi displays the Reboot dialog box.

**5. Click OK.**

SunPCi reboots and uses the new attached drives.

---

## How to Proceed

- Refer to Chapter 4 if you want to connect peripheral devices (such as audio devices and printers) to SunPCi.
- Refer to Chapter 5 if you want to learn the basics of SunPCi operation. This chapter explains how to start and exit the software, as well as how to use command line options, the SunPCi windows, and other features of the SunPCi software.
- Refer to Appendix A if you encountered any difficulties while installing or running SunPCi software or Windows 95.
- If you want to exit SunPCi, proceed to the following section.

---

## Exiting SunPCi

To exit SunPCi, you need to perform two steps:

- Exit Windows 95
- Exit the SunPCi window

---

**Note** - Always shut down Windows 95 from the Start menu before exiting the SunPCi window. Otherwise, your files and applications could become corrupted.

---

The following steps explain how to shut down SunPCi properly.

**1. In Windows 95, click on Start, and then choose Shut down the computer.**

Windows 95 closes and displays a message that it is now safe to turn off your computer.

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

## Configuring Peripheral Devices

---

You can attach a number of peripheral devices to the SunPCi card and optional add-on backplate and operate them as if they were connected to a PC. This chapter contains instructions for installing and configuring the following peripherals:

- Audio, video, and USB connections
- Connecting a local printer or other parallel device
- Connecting a serial device
- Networking with SunPCi
- Using a different SPARC keyboard, or any additional information concerning foreign language keyboards

---

### Audio, Video, and USB Connections

The backplate of the SunPCi card contains three audio ports (Line In, Line Out, and Microphone), an external video port, and a USB (Universal System Bus) port. The USB port can accommodate any USB device, such as a digital camera or a printer.

---

**Note** - The SunPCi audio ports do not route audio through your workstation's speakers. In order to hear the audio, you will need to connect a separate set of speakers or headphones to the Line Out port.

---

If you are connecting external devices to the USB connector, you will need to provide an external powered hub for your USB devices. If you do not use an external hub, your USB devices may fail to power up.

Figure 4-1 shows the ports on the SunPCi card's add-on backplate.

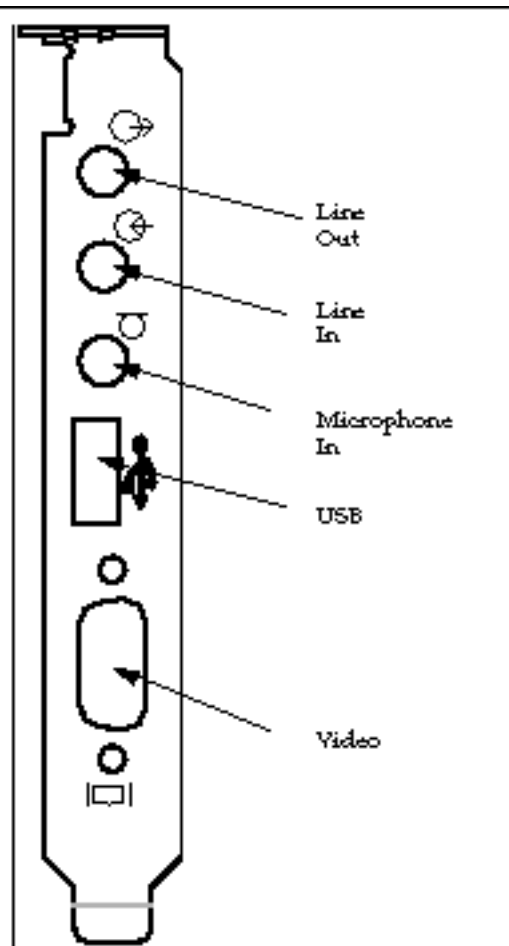


Figure 4-1 SunPCi Cable Connections

## Connecting an External Monitor to SunPCi

You can connect an external VGA monitor to the video output on the SunPCi card. This enables you to run PC applications on a different monitor, thus saving space on your workstation monitor. You may also want to use an external monitor for applications using direct VGA control, DirectX, animation, or high-performance video.

To connect the external monitor to SunPCi, attach the monitor cable to the video port on the SunPCi card.



---

**Note** - For more information on how to fine-tune external VGA performance for use with PC-based game software, refer to “Fine-Tuning Your SunPCi Configuration” on page 65.

---

## Selecting and Installing the Video Drivers

After you connect the VGA monitor to SunPCi, you need to install the correct video drivers for your configuration. When you installed the SunPCi software as described in Chapter 3, you installed the SunPCi drivers by default using the `setup` utility. If you always plan to use SunPCi on your workstation’s desktop, you do not need to install another driver.

In order to configure the video correctly, you need to install the proper drivers for your hardware setup and operating system. There are two types of drivers available: the SunPCi drivers for the on-board (workstation) video, and SMI for the external VGA video. After you install the drivers, you choose the video you want to use with the VGA command switch.

To install the external video driver after you have installed the SunPCi drivers, run the `setup` utility again. When the utility asks you which monitor you would like to use to display your video, choose External Monitor. For instructions on how to run the utility, refer to “Installing the SunPCi Drivers” on page 11.

For the workstation video, SMI mode refers to the way that SunPCi runs DOS, Windows installation programs, Windows Safe Mode, and full-screen DOS in Windows. This is the video display you see before you install the SunPCi drivers. SMI also controls VGA mode for the external video.

## Using the Driver Switches With SunPCi

To use external VGA with SunPCi, type the following command at the system prompt:

```
% sunpci -vga
```

To use SunPCi with the on-board (workstation) video, just type the standard `sunpci` command at the system prompt. Table 4-1 describes the type of video output that occurs for the operating system you want to use, the video driver you have installed, and whether or not you typed `sunpci -vga` at the prompt.

TABLE 4-1 Video Options Matrix

PC Operating System	VGA Monitor Connected	VGA Monitor Not Connected
DOS (-vga switch used)	Video is routed to VGA monitor	Video discarded; SunPCi window displays "Video routed" message
DOS (-vga switch not used)	Video is routed to SunPCi window on workstation screen	Video is routed to SunPCi window on workstation screen
Windows 95 VGA driver used	Video is routed to VGA monitor	Video discarded
Windows 95 SunPCi drivers installed	Video is routed to SunPCi window on workstation screen	Video is routed to SunPCi window on workstation screen

---

**Note** - If you have the VGA driver installed but do not have an external VGA monitor attached, and you want to install the SunPCi drivers, you can follow the instructions in Chapter 3 for installing the SunPCi drivers.

---

## Connecting a Local Printer or Parallel Device

The optional add-on backplate (included with the SunPCi card) features a parallel port that you can use to connect a printer (or other parallel device) to SunPCi. Figure 4-2 shows the connectors on the add-on backplate.

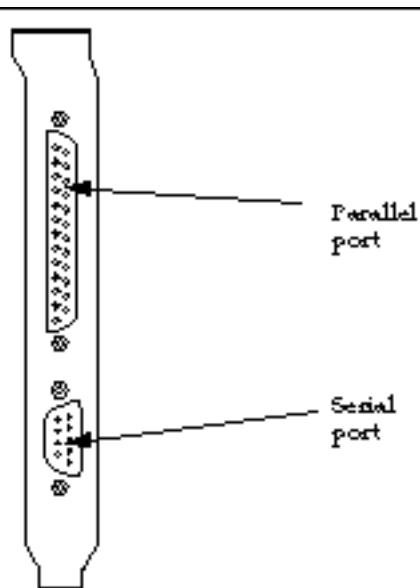


Figure 4-2 Add-On Backplate Connections

If you have not already installed the add-on backplate, you will need to do so before attaching the printer. Refer to the *SunPCi 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. SunPCi's parallel port is assigned to LPT1. You can assign the printer to the printer port by using the corresponding Control Panel in Windows 95. For more information on setting up printing in Windows 95, refer to Chapter 5.

To print to the parallel port with SunPCi, 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 would attach to your SunPCi card. For information on how to use your Solaris printer with Windows 95, refer to "Printing from Windows 95 Using Solaris Printers" on page 36.

---

---

## 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 SunPCi. This serial port is assigned to COM1. Figure 4-2 shows the location of the serial port on the backplate.

To use the serial port, connect the serial cable from your device to the COM 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 on connecting and using the serial device, refer to the documentation that came with your serial device.

---

## Networking With SunPCi

SunPCi includes a new NDIS driver; this driver allows you to connect your SunPCi host to an Ethernet network. The new driver supports is designed for use with Windows 95.

### Configuring the Network Protocols in Windows 95

You usually configure the network protocols as part of the Windows 95 installation procedure. If you changed networks or network properties, or if you did not set up the network during the installation process, use the procedures in this section to connect to your network.

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

#### Setting TCP/IP Properties

Before you can configure TCP/IP, you will need to obtain certain information from the network administrator at your site. Make sure you have the following information before you begin:

- Your SunPCi computer name (the one you entered when you installed Windows 95). This name also appears on the Identification tab of the Network Control Panel. (The Network Control Panel is explained in the following procedure.)
- The IP address for your SunPCi computer (must be different from your workstation's IP address).
- The subnet mask for your site's network.
- The IP address for your gateway (if used).
- The host name, domain name, and IP address for each DNS (Domain Name Service) server at your site (if used).

To configure TCP/IP, use the Network Control Panel in Windows 95. Enter the information you obtained in this list in the corresponding fields. For more information on setting up networking with Windows 95, refer to the documentation that came with your copy of Windows 95.





## Using SunPCi Software

---

This chapter explains how to use the SunPCi window, command line, menus, and dialog boxes. The chapter also provides instructions for working with SunPCi 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 95, as well as how to set up printing on SunPCi.

The following list describes the topics covered in this chapter:

- “The SunPCi Command Line” on page 25 “The SunPCi Command Line” on page 25
- “The SunPCi Window” on page 27 “The SunPCi Window” on page 27
- “SunPCi Drives” on page 28 “SunPCi Drives” on page 28
- Using the Copy and Paste Commands “Using the Copy and Paste Commands” on page 35
- “Printing from Windows 95 Using Solaris Printers” on page 36 “Printing from Windows 95 Using Solaris Printers” on page 36

---

### The SunPCi Command Line

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 file name or command (if needed).

For example:

```
% sunpci -option  
filename
```

*option* is the command-line option you want to use. *filename* is 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 software and route the Windows 95 screen to an external VGA monitor, type the following:

```
% sunpci -vga
```

To start up SunPCi 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:

```
% sunpci -C C.newdrive
```

Table 5-1 lists the available SunPCi command-line options.

**TABLE 5-1** SunPCi Command-Line Options

<b>Option</b>	<b>Purpose</b>
-vga	Routes the Windows 95 screen to an external VGA monitor. For more information on how this option works, refer to "Connecting an External Monitor to SunPCi" on page 18.
-C <i>filename</i>	Boots the SunPCi window using <i>filename</i> as drive C:. This overrides the default drive specified in the default properties file /\$HOME/pc/SunPCi.ini.
-D <i>filename</i>	Boots the SunPCi window using <i>filename</i> as drive D:. This overrides the default drive specified in the default properties file /\$HOME/pc/SunPC.ini.
-h	SunPCi command-line help; displays a list of all SunPCi command-line options.
-p <i>filename</i>	Starts SunPCi with the configuration information in the properties file specified with <i>filename</i> . The default properties file for SunPCi is \$HOME/pc/SunPC.ini.



## Exiting SunPCi

To exit SunPCi, you need to perform two steps:

- Exit Windows 95
- Exit the SunPCi window

---

**Note** - Always shut down Windows 95 from the Start menu before exiting the SunPCi window. Otherwise, your files and applications could become corrupted.

---

The following steps explain how to shut down SunPCi properly.

**1. In Windows 95, click on Start, and then choose Shut down the computer.**

Windows 95 closes and displays the following message:

It is now safe to turn off your computer.

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

---

## The SunPCi Window

The first thing you see when you start SunPCi software is the SunPCi window. This window provides the emulated DR-DOS command prompt, from which you run your DOS programs. If you have installed Windows 95, you will see the DOS prompt displayed for a few seconds before your Windows program starts in the SunPCi window.

The following sections describe the menus at the top of the SunPCi window.

### File Menu

The SunPCi File menu contains two commands: Reset PC and Exit.

Resetting a SunPCi window is the same as pressing Ctrl+Alt+Delete on a PC (also called a *warm boot*). There are three primary reasons to reboot a SunPCi window:

- To enable changes made to your system as a result of installing certain software packages, or modifying DOS files like `AUTOEXEC.BAT` or `CONFIG.SYS`.
- To enable a different SunPCi emulated hard drive (see “Emulated Hard Drives” on page 29 for more information about this).
- If either your keyboard or the application you are running in the SunPCi window is no longer responding.

The Exit command quits the SunPCi application and closes the SunPCi window.

When you choose the Reset PC command from SunPCi, a dialog box appears asking if you want to reset SunPCi. Click OK to dismiss the dialog box, and SunPCi reboots.

## Options Menu

The Options menu lets you create and choose emulated hard disk drives (C: and D: drives). It also enables you to attach the mouse to SunPCi, which you will need to do after you have installed Windows 95, but before you install the SunPCi drivers.

Table 5-2 describes the disk-related commands in the Options menu. Complete instructions for choosing emulated drives is provided in “Creating and Configuring a New C: or D: Drive” on page 12.

TABLE 5-2 Options Menu Disk-Related Commands

Setting	Purpose
Attach a Hard Drive	Specify the emulated hard drive ( <i>directory/file name</i> ) you want to assign to drive C: or D:.
Create a New Hard Drive	Create the file you want to use as an emulated drive.
Eject CD	Ejects the CD from the CD-ROM drive. The keyboard shortcut is Meta-E.
Attach Mouse	Works the same as Meta-M; allows you to attach the mouse to the SunPCi window when you are in SMI mode. (This happens automatically after you install the SunPCi drivers.)

---

## SunPCi Drives

SunPCi software uses three different kinds of disk drives:

- Emulated hard drives (C: and D:)
- Extended (network) hard drives, including the CD-ROM drive
- Diskette drives (A:)

# Emulated Hard Drives

When you install the SunPCi software, it creates a default C: drive and assigns it to an emulated drive file named `C.diskimage`, which resides in your `~/pc` directory. By default, all SunPCi windows are booted from this drive C: and use the `COMMAND.COM`, `AUTOEXEC.BAT`, and `CONFIG.SYS` files located on this drive.

---

**Note** - You can create several C: and D: drive files, all 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. They may not be the same file; that is, do not attach a file as drive C: and then attach the same file as drive D:.

---

“Creating and Configuring a New C: or D: Drive” on page 12 contains information on how to create and configure these drives.

## Backing Up Your C: Drive

Once you have successfully installed Windows 95, you can 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.

---

**Note** - We strongly recommend that once you have installed and configured SunPCi and your Windows applications, that you make a backup copy of your C: drive.

---

Your C: drive is actually a large file stored on the hard disk of your workstation. You use the SunPCi `cphd` (copy hard disk) command to make a copy of the file.

To back up your C: drive, follow these steps:

### 1. Locate the disk image of your C: drive.

It should be located in the directory called `pc` within your home directory on your workstation. To view the contents of the directory, type the following commands and press Enter after each:

```
% cd ~/pc
% ls
```

You should see a listing of files, 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. Press Return.

```
% /opt/SUNWspci/bin/cphd C.diskimage C.diskimage.copy
```

## Extended Drives

An *extended drive* is a directory that gives you access to the Solaris file system from the SunPCi program. They can be accessed on your local system, or remotely across the network. With extended drives you can share applications and data files. The SunPCi program permits up to 22 extended drives for storing applications and files.

There are three different kinds of extended drives:

- redirected drives
- file system drives
- network drives

### Redirected Drives

A *redirected drive* is a drive that is mapped for you in DOS. The default extended drives F:, H:, and R: are redirected drives. These drives are automatically set up for you during SunPCi installation, and are named in your `AUTOEXEC.BAT` file. This means that you do not have to access drive F: manually in order to use the DOS commands it contains.

By default, SunPCi assigns the following extended drives:

- F: /opt/SUNWspci
- H: \$HOME (your home directory)
- R: / (the root filesystem)

---

**Note** - The default extended drives F:, H:, and R: support only the DOS-based short file names (8.3 file names) and not the Windows 95 long file names. Do not use the default drives to install Windows 95 software; instead, map a new extended drive (or drives) and use them to install the software. To map an extended drive, refer to “Accessing Solaris Files and CD-ROMs From Windows 95” on page 31.

---

If desired, you can use `rem` (remark) statements to remove the default drive mappings for H: and R: from your `C:\autoexec.bat` file and use them to mount other extended drives.

---



---

**Caution** - Do not remove or remap drive F:, or SunPCi will not run.

---

### File System Drives

A *file system drive* is an extended drive that you map using Windows Explorer to directories on your Solaris file system. Unlike the redirected drives, file system drives can make full use of long file names in Windows 95.

## Network Drives

A *network drive* is also mapped through Windows Explorer, but it maps to locations on your network. To access Solaris files and CD-ROMs from Windows 95, you will need to map them as network drives as described in the following procedure.

### Accessing Solaris Files and CD-ROMs From Windows 95

This section explains how to assign and use Solaris extended drives (network drives) with SunPCi and Windows 95 using the Windows Explorer.

To map a Solaris drive or directory to work with Windows 95, perform the following procedure:

- 1. Click Start and select Programs and Windows Explorer from the pop-up menus.**  
The Exploring screen is displayed.
- 2. From the Tools menu, select Map Network Drive.**  
The Map Network Drive dialog box is displayed.
- 3. Click on the drop-down arrow to the right of the Drive: field.**  
A list of unassigned drive letters is displayed on the drop-down menu.

---

**Note** - Any extended drive that is already mapped in the `autoexec.bat` file (such as the default drives F:, H:, and R:) will appear on the list, but you cannot use them for mapping. If you attempt to re-map these drives, the system will return a `Device not connected` error.

---

- 4. Scroll downward until you find the drive letter you want, and then click to select 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\.
```

For example, to map a Solaris CD-ROM to work with Windows, use this path:

```
\\cdrom\cdrom0
```

---

**Note** - 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 will need to use a period (.) as the second element. For example:

```
\\home\.
```

---

**Note** - Do not use an asterisk in the mapping path, or Windows 95 will return a Device not connected error.

---

6. **If you want this extended drive to map automatically whenever you start up SunPCi, click the checkbox next to Reconnect at logon.**  
Click OK. The new extended drive appears in the Exploring window.

## Mapping a Drive Letter to a Directory with a Long Path

If you need to map a drive to a UNIX directory that contains more than two path elements (/directory/subdirectory/subdir2), you will need to use UNIX symbolic links. For example:

1. **Become root on your machine.**
2. **Create a link from your root filesystem, substituting your path for the one shown in the following example. Type the following command and press Return:**

```
# ln -s /net/typicalmachine/files1/anydir /anydir
```

3. **Click Start and select Programs and Windows Explorer from the pop-up menus.**  
The Exploring screen is displayed.
4. **From the Tools menu, select Connect Network Drive.**  
The Map Network Drive dialog box is displayed.
5. **Click on the drop-down arrow to the right of the Drive: field.**  
A list of unassigned drive letters is displayed on the drop-down menu.
6. **Scroll downward until you find the drive letter you want, and then click to select it.**

The drive letter is displayed in the Drive: field.

7. Type the following path into the Path: field, substituting the names of your directory for `anydir`:

```
\\anydir\.
```

8. If you want this extended drive to map automatically whenever you start up SunPCi, click the checkbox next to `Reconnect at logon`.

9. Click OK.

The new extended drive appears in the Exploring window.

Your network drive now maps to `/anydir`, which is a symbolic link to the destination directory `/net/typicalmachine/files1/anydir`.

## Installing Windows 95 Applications on Extended Drives

You can install Windows 95 applications on either of your emulated drives (C: and D:), or on any of the drives that you create using Windows Explorer. Because of the DOS file name limitations on the default extended drives (F:, H:, and R:), you should avoid installing Windows 95 applications on the default extended drives. Refer to "Extended Drives" on page 30 for more information on the default extended drives.

## Diskette Drives

If the workstation you are using has an internal diskette drive, it is referred to in Windows as drive A:.

---

**Note** - If you are running Volume manager (`vold`) on your workstation, you will need to disable Volume Manager's control of the floppy drive before the floppy will function under SunPCi. The script `vold_floppy_disable`, located in the `/opt/SUNWspci/bin` directory, disables `vold` control of the floppy. To use the script, run it before you start up SunPCi. Otherwise, you will not be able to use the floppy drive as drive A:.

---

Most workstations come with one diskette drive; however, there are some SPARCstation systems that do not have a built-in diskette drive. If you have a SPARCstation system that does not have a built-in diskette drive, you will need to have one installed if you intend to install software or copy data from diskette.

## Ejecting Diskettes

To eject the diskette from the drive, first use the following command in a UNIX window:

```
% eject floppy
```

The system returns the following message:

```
/dev/rdiskette can now be manually ejected
```

Press the manual eject button on your workstation's floppy drive to eject the diskette.

## Using Low-Density Diskettes

Under the SunPCi program, just as on a PC, low-density diskettes must be formatted, read, or written as low-density diskettes. To format low-density diskettes, you must explicitly specify the diskette parameters while formatting.

To format a low-density DOS diskette, perform the following step:

1. **At the DOS prompt, enter the DOS `format` command with `/t` and `/n` options.**

For example, enter the following command at the DOS prompt:

```
C:\> format a: /t:80 /n:9
```

For more information about the `format` command, enter `HELP FORMAT` at the DOS prompt.

## CD-ROM Drives

You can connect to CD-ROM drives from within the SunPCi program to access DOS and Windows software. The CD-ROM must be in the High Sierra File System (HSFS) format (which includes most, but not all, commercially sold CDs), and it can only be accessed by creating a SunPCi extended drive. The SunPCi software does not support Microsoft CD-ROM extensions.

This default drive mapping does not support long file names for use with Windows 95. To install software from a CD that requires long file names, map your CD-ROM drive to another drive letter, such as Z:, using Windows Explorer. For instructions on how to do this, refer to "Accessing Solaris Files and CD-ROMs From Windows 95" on page 31.



---

**Note** - If you have Solaris Volume Manager enabled, the default drive mapping for your CD-ROM drive is `R:\cdrom\cdrom0`.

---

To eject the CD from your CD-ROM drive, use the Eject CD command under the Options menu or press Meta-E.

---

## Using the Copy and Paste Commands

The SunPCi software allows you to copy text between UNIX windows on your workstation and Windows 95. This section explains how to use your workstation keyboard keys to copy and paste.

---

**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 Windows. For best results, use plain text.

---

### Copying Text From a UNIX Window To Windows 95

To copy text from a UNIX Window and paste it into Windows 95, perform these steps:

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 Windows document, position the cursor where you want the text to appear and use the standard Windows Paste command, Ctrl+V.**

### Copying Text From Windows 95 To a UNIX Window

To copy text from Windows 95 and paste it into a UNIX Window, follow this procedure:

1. **Use the mouse to highlight the text you want to copy, and then use the Standard 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.**

---

# Printing from Windows 95 Using Solaris Printers

This section explains how to configure your Windows 95 settings on SunPCi so that you can print using your workstation's network printer.

---

**Note** - SunPCi does not support printing as a DOS printer. It is possible to select that option during the setup process, but it will not function.

---

To set up the printer from Windows 95, follow this procedure:

- 1. From the Start menu, choose Settings, and then choose Printers.**  
The Printers window is displayed.
- 2. Double-click on the Add New Printer icon.**  
The Printer Wizard dialog box is displayed.
- 3. Click on Next. Select Network Printer, and then click the Browse button.**  
The Browse for Printer window is displayed.
- 4. Double-click on Entire Network to display all of the domains connected to your network.**
- 5. Locate SunPCi Host in the list of domains. Click on the plus sign (+) next to the name "SunPCi Host" to show the list of workstations in the domain.**
- 6. Locate the name of the system (print server) that corresponds to the printer you want to use.**
- 7. Double-click on that machine name to show the printer connected to the machine.**  
Make sure you know the model of the printer you are using so that you can select the correct printer driver. For most PostScript printers, the Apple LaserWriter IINTX driver works best.
- 8. Click on the printer 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 Windows 95 printer. For more information on how to print from Windows 95 applications, refer to the documentation that came with your copy of Windows.

# Troubleshooting

---

This appendix provides tips for rectifying problems you may encounter while using SunPCi software. The following list describes the troubleshooting topics included in this appendix.

---

## Known Problems With SunPCi

This section describes some known problems with this release of SunPCi. Updates to this information and workarounds (if available) will be posted to the SunPCi home page at <http://www.sun.com/>.

### Running Microsoft Windows 95 Applications

#### Running Windows 95 From CD-ROM

Windows 95 cannot be installed with the “Run From CD-ROM” option. Use any of the other options.

#### SunPCi Appears to Hang When Browsing Network Drives

If you are running Solaris 2.6 on your workstation, you may observe a very long time lag when browsing network drives. SunPCi may even appear to hang as it searches the contents of the drives. This is a feature of Solaris 2.6 and Solaris 7.

Solaris 2.6 contains a “browsing” feature that allows you to automatically view all automount points on your workstation. In Solaris 2.5.1 and earlier versions, automounted directories are not visible until they have been mounted.

This may cause Windows 95 applications to slow down considerably when browsing for files on your workstation (especially on your R: drive, which is /), and may cause problems when viewing very large directories with Windows Explorer or saving to a subdirectory in one of these directories.

You can turn off this problem by editing the Solaris 2.6 `auto_master` file. 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 /xfr -xfr
```

1. **Move the `+auto_master` line in the file to the bottom of the list, after `-nobrowse`. If the `-nosuid`, `nobrowse` and `-nobrowse` keywords are not present in the file, add them.**

The result should look similar to the following:

```
# Master map for automounter # /net -hosts -nosuid,nobrowse /home
auto_home -nobrowse/xfr -xfr +auto_master
```

1. **Save the file and exit the text editor.**

2. **Reboot your system.**

The “browsing” feature should be turned off.

## Directory Operations From the DOS Window

The problems listed in this section refer to the DOS window that you access from Windows 95. They do not refer to DOS windows running under OpenDOS 7.01.

### Displaying Shortname Tails

When the DOS window reads a Windows 95-style long file name, it truncates the long name into DOS format (that is, an eight-character file name followed by a three-character extension) and adds a number to the file (such as `~1`); this number is called a *shortname tail*. When reading long file names on extended drives in the Windows 95 DOS window, the window can only display shortname tails ending in the number 1; it cannot display `~2`, `~3`, and so on.

## Reading Windows Formatted CDs

Some versions of Solaris (Solaris 2.5.1 and 2.6) are unable to read some Windows formatted CDs, such as the RockRidge format. If SunPCi cannot read a CD you are trying to use, check the contents of the CD as described in the following procedure.

### 1. Open a Command Tool window on the Solaris desktop.

Enter the following commands:

```
% cd /cdrom/cdrom0
% ls -lR
```

If the system responds with a message similar to the following, it is unable to read the setup file from your CD:

```
./setup.exe: No such file or directory

total 170

-r-xr-xr-x 1 root  sys  45 Aug 21 1996 autorun.inf*
dr-xr-xr-x 2 root  sys 2048 Nov 26 11:46 doc/
-r-xr-xr-x 1 root  sys 11171 Nov 25 10:01 readme.txt
dr-xr-xr-x 2 root  sys 2048 Nov 26 11:46 setup/
```

If this happens, you will need to download and install a Solaris patch. Instructions for installation are included with the patch. You can find the patches at <http://access1.sun.com>.

- Download patch 104560 for Solaris 2.5.1.
- Download patch 105486 for Solaris 2.6.

The *SunPCi Installation Guide* contains instructions on how to install the patches, which are also included on the SunPCi software CD.

## Network Neighborhood

When you open the Network Neighborhood on the Windows 95 desktop, the Network Neighborhood window does not show My Workstation. The workstation and the SunPCi card share the same network interface, so they do not “see” each other on the network. Both can communicate with the network, however.

# International Keyboard Support

DOS uses the file `C:\dos\keyb.com` as its keyboard driver. However, Windows 95 uses the file `C:\windows\keyb.com`. This results in the loss of support for international keyboards when you use Windows 95.

The following procedure explains how to modify your `autoexec.bat` and `config.sys` files to use the DOS keyboard driver for international support.

For more information on international support, refer to Appendix B.

To restore support for international keyboards, follow this procedure:

**1. In the SunPCi window, click the Start button, and then select Programs and then Accessories from the pop-up menus.**

**2. Select Notepad, and then open your `C:\autoexec.bat` file.**

**3. Add the following line to the file:**

```
C:\dos\keyb.com
```

**4. Save the file and close it.**

**5. Open your `C:\config.sys` file.**

The following line may appear:

```
rem DEVICE=C:\DOS\SETVER.EXE
```

If it does appear, remove the `rem` (remark) statement and save the file.

If it does not appear, add the line `DEVICE=C:\DOS\SETVER.EXE` to the file and then save it.

**6. Exit Notepad.**

**7. Click the Start button and then select Shut Down from the pop-up menu.**

The Shut Down Windows dialog box appears.

**8. Select Restart the computer in MS-DOS mode and then click Yes to reboot SunPCi.**

When SunPCi has finished rebooting, the MS-DOS prompt appears in the SunPCi window.

**9. Enter the following commands at the DOS prompt:**

```
C:\> CD DOS
C:\> SETVER keyb.com 7.01
```

```
C:\> win
```

This sets the keyboard driver to the proper version and starts Windows 95.

You will need to enter the `CD DOS` and `SETVER` commands every time you start SunPCi. You may want to configure your SunPCi system to automatically boot to the DOS prompt each time. Refer to Appendix C for instructions on how to configure your system.

---

## Troubleshooting SunPCi Hardware

Table A-1 contains some basic information on possible problems you might encounter with the SunPCi card and how to fix them.

TABLE A-1 SunPCi Error Messages

Error Message	Description
The SunPCi drivers could not be loaded. Is another session running?	This message may have appeared for one of the following reasons: <ul style="list-style-type: none"><li>■ You already have a SunPCi session running. Quit the other session before running SunPCi again.</li><li>■ You removed the SunPCi card and then reinstalled it in a different PCI slot in your workstation. If possible, remove the card and install it into the PCI slot it first occupied.</li><li>■ You started up SunPCi without first restarting your workstation after you installed the card. Log in as superuser, type in <code>halt</code> at the <code>#</code> prompt to halt your system again, and restart at the <code>ok</code> prompt using <code>boot -r</code>.</li></ul>
Driver couldn't be loaded. SunPCi cannot open the device.	Make sure that the board is securely seated in the PCI slot.
Your BIOS may be out of date.	You need to update your BIOS. Refer to the <i>SunPCi Installation Guide</i> for information on how to flash the BIOS.

---

## Problems Installing the SunPCi Package

This section lists some possible problems with SunPCi installation.

### Cannot Install SunPCi Software

When installing SunPCi software, you may receive one of the error messages in this section.

Not enough disk space to install SunPCi.

Delete unnecessary files, applications, or both to make more disk space available. If necessary, ask your system administrator for assistance. When you have created or obtained more disk space, start the SunPCi installation again. Alternatively, you can install SunPCi on a different disk or system.

You need additional swap space to install and run the SunPCi software.

SunPCi software requires a minimum of 12 Mbytes of swap space. Increase the amount of swap space on your system and then try installing SunPCi software again.

---

## Problems Installing Windows 95 or Windows 95 Applications

### Installing Applications

Whenever you install new applications on SunPCi, make sure you have your Windows 95 CD available. The installation program may require files from the Windows 95 CD.



---

## Mouse

### Two Mouse Cursors Appear On Screen

If you see two mouse cursors on your SunPCi screen, then you may not yet have installed the SunPCi drivers. To use the mouse before you install the drivers, choose Attach Mouse from the Options menu, or press Meta-M. After you have finished installing the drivers, the mouse will operate normally.

### Mouse Movements Appear Jerky After SunPCi Installation

If you notice that the mouse movements are jerky in SunPCi, you may not yet have installed the SunPCi drivers. Refer to Chapter 3 for information on how to install the drivers. After you have finished installing, you will notice that the mouse movement appears much more smooth.

---

## Diskette Drives

### Cannot Access Diskette in Diskette Drive

SunPCi 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 window. In such instances, an error message is displayed and the diskette access fails.

By default, when SunPCi 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 re-enable Volume Manager on your system, and thus encounter the problem at a later time.

If Volume Manager support for diskette drives has been re-enabled on your system, and you encounter problems accessing diskette drives through SunPCi, try disabling Volume Manager and restarting the SunPCi 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 is not running. Become superuser.
2. Disable Volume Manager by entering the following command:  

```
# /opt/SUNWspci/bin/vold_floppy_disable
```
3. Exit superuser.
4. Restart all SunPCi windows.

## Cannot Eject a Diskette From a Solaris Command Window

If the message `eject: open failed on /dev/rdiskette.Device busy` is displayed, then another Solaris command window may have control of the diskette drive. Refer to “Ejecting Diskettes” on page 34 for more information.

## Cannot Use Low-Density Diskettes

The diskette is probably not formatted correctly. Refer to “Using Low-Density Diskettes” on page 34 for more information.

---

## Emulated Hard Drives

### Attaching Drive C:

To be sure that you will always be able to attach drive C:, you can change the permissions on the drive. Changing the permissions will keep other users from being able to attach drive C: even when you are not using the SunPCi 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 window shows the message `Non-system disk or disk error` at startup, your C: drive may have been corrupted, or you have a non-bootable floppy disk in drive A:. If you do not have a floppy disk in drive A:, delete the default C: drive file in `$HOME/pc` and then restart SunPCi.

You may want to make periodic backup copies of your C: drive. Refer to “Backing Up Your C: Drive” on page 29 for more information.

---

## CD-ROM Drives

### Cannot Map a Solaris CD-ROM Drive in Windows Explorer

If you are trying to access Solaris files and CD-ROMs drives from Windows 95 and you are unable to use the Map Network Drive command in Windows Explorer to set up the drive, be sure to check the following:

- Make sure you have the CD in the CD-ROM drive. This is the most likely reason that a drive mapping may not work.
- Make sure you entered the path for the CD-ROM drive as `\\cdrom\cdrom0`, with two backslashes at the beginning.

---

## Extended Drives

### Cannot Mount Extended Drives With Windows Explorer

If you cannot mount extended drives, networking may not be installed on SunPCi. 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 SunPCi and select Control Panel, then double-click on Network. Set up your SunPCi installation on the network. Refer to your Windows documentation for more information. If you still cannot connect to the network after logging in, you will need to reinstall Windows 95.

To log in to the network, start up SunPCi 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, follow this procedure:

1. Click the Start button and then select Exit.
2. When the dialog box asks you whether you want to shut down or restart the computer, click on Restart.
3. When the Microsoft Networking dialog box appears, type in your user name and password and press Return.

You will then be able to mount extended drives. Refer to “Extended Drives” on page 30 for instructions on how to use Windows Explorer to map network drives.

---

## Keyboard

### Backspace Key Does Not Work in DOS

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.` You should remove this line to restore the original key assignments.

---

## Networking

### Cannot Connect to Other Systems

Before you start to diagnose problems using SunPCi to connect to other systems on the network, make sure that you have configured SunPCi and your workstation as follows:

- Your workstation and SunPCi host must have different IP addresses.
- Both the SunPCi host and the workstation should be located on the same physical subnet, although they may be on different virtual subnets.
- Your workstation and SunPCi must have the same netmask. The value of the netmask depends on the type of network you are using; contact your network administrator for more information.

If you are having trouble using SunPCi with TCP/IP, perform the following steps to determine the cause of the problem.

---

**Note** - You will 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 subnet. Contact your network manager if you do not have this information.

---

## Diagnosing TCP/IP problems

1. **In the SunPCi window, open a DOS window. In Windows 95, choose the Start button and then select Applications and MS-DOS Prompt from the pop-up menus.**

The DOS Prompt window is displayed.

2. **Enter the `ping` command, followed by the IP address of a system on your subnet (not your workstation). For example:**

```
C:\> ping 206.4.151.254
```

If this `ping` command succeeds, proceed to Step 1 on page 38. If it returns an error such as `Host not found`, your SunPCi card may be using the wrong subnet, or your netmask may be incorrect. Contact your network manager to make sure you have the correct information.

3. **Enter the `ping` command, followed by the name of the system you pinged in Step 1 on page 38. For example:**

```
C:\> ping bobswk
```

If this `ping` command succeeds, proceed to Step 1 on page 38. If it returns an error, your DNS (Domain Name Service) needs to be reconfigured. Contact your network manager for the host name, domain name, and IP address of each DNS server on your network.

4. **Enter the `ping` command, followed by the IP address of a system not on your subnet. For example:**

```
C:\> ping 199.172.10.2
```

If this `ping` command succeeds, proceed to Step 1 on page 38. If it does not succeed, make sure that you have specified the correct network router. Contact your network manager.

5. Enter the `ping` command, followed by the name of a system not on your subnet. For example:

```
C:\> ping maryswk
```

If this `ping` command succeeds, then TCP/IP is set up correctly. If it returns an error, contact your network manager and double-check the information you set up for the DNS servers as described in Step 1 on page 38.

---

## Printers

This section describes some problems you may encounter when printing from applications running under SunPCi software.

### Problems Printing to a PostScript Printer

If you are having problems printing from an application to a PostScript printer, try the following:

- Print to a file and print the file from a command window using `lp filename`. If this does not work, it may be an indication that your printer is not configured correctly. Make sure your default printer and any other printer you are trying to access is set up in your `/etc/lp/printers` directory.
- Make sure the setting in your application matches the setting for the default printer in your Windows 95 Network Control Panel. The Setup Wizard will have already installed and configured the PostScript printer for you, if you performed these steps during installation.
- Print to a file. View the file from a Solaris command window using `od -a`. If you see the letters `eot` anywhere in the file, it is an indication that there are `^D` characters present in the file. The PostScript printer will not recognize these characters.

---

# Starting SunPCi Software

## Error Messages Encountered When Starting SunPCi

When starting SunPCi software, you may encounter one of the following error messages.

Command not found

Make sure that the SunPCi program directory—by default, `/opt/SUNWspci/bin`—is in your environment `PATH`. Refer to Chapter 3 for instructions.

## 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 software. SunPCi software requires at least the End User System, Developer System, or Entire Distribution installations of Solaris versions 2.5.1 and 2.6 and Solaris 7. SunPCi 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.





## SunPCi International Support

---

SunPCi and DOS software give you the national language support you need to run your applications on an international keyboard. The first time you started the SunPCi program, as described in Chapter 3, 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, use the instructions in this appendix.

This appendix discusses the following topics:

- “Using an International Keyboard” on page 51 “Using an International Keyboard” on page 51
- “DOS Character Set” on page 52 “DOS Character Set” on page 52
- “Code Pages and SunPCi Software” on page 53 “Code Pages and SunPCi Software” on page 53

---

### Using an International Keyboard

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.

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.

## Windows 95 Support for International Keyboards

Windows 95 uses a different keyboard driver than does DOS. To support international keyboards under Windows 95, you will need to load the DOS keyboard driver. “International Keyboard Support” on page 40 explains how to perform this procedure.

---

## 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 Software

DOS provides national language support through the use of language-specific code pages. The first time you start the SunPCi program, code pages are set for you when you are presented with a screen that instructs you to enter the number of the country matching your keyboard.

If you want to change code pages at some time, follow the instructions in the section “Using Code Pages” on page 55.

## 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 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

## Devices Supporting Multiple Languages

The following devices can use prepared code pages to switch from one language to another:

- EGA and VGA displays or compatible
- IBM Proprinter model 4201 or compatible

- IBM Proprinter model 4208 or compatible
- IBM Quietwriter III printer model 5202 or compatible
- Epson FX850 and FX1050 printers
- Printers compatible with the above printers

For example, you have EGA support with the SunPCi program that allows you to switch between the United States code page and the Multilingual code page by entering the appropriate DOS commands. With prepared code pages, a single system can support multiple national languages.

## National Language Support Codes

When you use commands to set up your system for a national language, DOS makes sure the screen, printer, and keyboard codes you request work together. The valid combinations of prepared code pages, country codes, and keyboard codes are defined in the `COUNTRY.SYS` and `KEYBOARD.SYS` files. The supported combinations are listed in Table B-1.

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. If you enter a country code 002 with a `us` keyboard code, DOS displays an error message when you restart the system.

TABLE B-1 National Language Support

Country, Region, or Language	Country Code	Prepared Code Pages	Key Code
United States	001	437, 850	<code>us</code>
Canadian-French	002	863, 850	<code>cf</code>
Latin America	003	437, 850	<code>la</code>
Netherlands	031	437, 850	<code>nl</code>
Belgium	032	437, 850	<code>be</code>
France	033	437, 850	<code>fr</code>
Spain	034	437, 850	<code>sp</code>
Italy	039	437, 850	<code>it</code>

**TABLE B-1** National Language Support *(continued)*

<b>Country, Region, or Language</b>	<b>Country Code</b>	<b>Prepared Code Pages</b>	<b>Key Code</b>
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
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

## Using Code Pages

The following sections explain the basics of using code pages, including how to set up your system to support a particular character set. Also, several examples, using different hardware and prepared code pages, are provided. The examples show you how to set up your system to support national languages. It is assumed that all DOS files are in the directory `\dos` on drive C:.

## Setting the System Code Page

DOS uses the `AUTOEXEC.BAT` and `CONFIG.SYS` files to set up system code pages to support a national language. Examples of `CONFIG.SYS` commands are shown later in this chapter. Remember, when you change your `CONFIG.SYS` file, you must reboot the SunPCi window to enable the new settings.

To set up your system to support a character set, follow these procedures.

Edit your `CONFIG.SYS` file by performing the following steps:

1. Use the `country` configuration command to control country-specific characteristics such as the time format, date format, currency symbol, and character-sorting sequence.
2. Use a `device` configuration command to tell DOS the hardware code page is a device and to allocate buffers for prepared code pages.
3. Use an `nlsfunc` command to load the memory-resident national support functions. If you forget to issue the `nlsfunc` command, DOS will not allow you to specify code pages or keyboard codes.

In your `AUTOEXEC.BAT` file, use the following commands:

1. Use a `mode cp prepare` command to prepare code pages for each device that supports code-page switching.
2. Use a `keyb` command to select the keyboard layout.
3. Use a `chcp` command to select the code pages for all prepared devices. DOS automatically prepares two system code pages and selects the primary code page for your country. If you want to use the other code page prepared for your country, you can use the `chcp` command again.

After you have finished setting the system code page by editing your `CONFIG.SYS` and `AUTOEXEC.BAT` files, you can proceed to setting your country and keyboard codes

## Setting Country and Keyboard Codes

The first example uses only a hardware code page; code-page switching is not used. The commands tell DOS to accept the country information for France and load the French keyboard program. This example is similar in most European countries.

To the end of your `CONFIG.SYS` file, add the following line:

```
country=033, ,c:\dos\country.sys
```

To the AUTOEXEC.BAT file, add the following line:

```
keyb fr,,c:\dos\keyboard.sys
```

---

**Note** - The default AUTOEXEC.BAT file contains two lines at the end of the file that invoke AUTOEXEC.BAT files on the E: or H: drive. If your AUTOEXEC.BAT file still contains these lines, place the international command lines before them.

---

## Using Hardware and Prepared Code Pages

The next example uses two code pages—one hardware and one prepared. In this instance, the system you are setting up uses the German code page provided in the EGA and the United States code page provided by DOS.

To the end of your CONFIG.SYS file, add the following on separate lines:

```
country=049,,c:\dos\country.sys  
device=c:\dos\display.sys con:=(ega,437,1)  
install=c:\dos\nlsfunc.exe c:\dos\country.sys
```

These CONFIG.SYS statements tell DOS that the hardware code page (437) in the Enhanced Graphics Adapter should be used, and that you are allocating space for one prepared code page. Also, they load memory-resident, national support functions.

To the end of your AUTOEXEC.BAT file, add the following exactly as shown (on separate lines):

```
mode con cp prep=((437)c:\dos\ega.cpi)  
keyb gr,,c:\dos\keyboard.sys  
chcp 437
```

These AUTOEXEC.BAT commands do the following:

- Load prepared code page 850 into memory—they get the code page from the EGA.CPI file.
- Load the German (gr) keyboard program.
- Start the system with the United States (437) code page.

# Setting Device Code Pages

The following two sections describe two methods for setting a code page for a specific device, including a console screen and a printer.

## Setting Screen Code Pages

This example uses two prepared code pages—no hardware code pages are used—to set up the system to support Denmark/Norway and the Multilingual national languages.

To the end of your `CONFIG.SYS` file, add the following on separate lines:

```
country=045,,c:\dos\country.sys
device=c:\dos\display.sys con:=(ega,,2)
install=c:\dos\nlsfunc.exe c:\dos\country.sys
```

These `CONFIG.SYS` commands tell DOS that the EGA's hardware code page is not used, and that you are allocating space for two prepared code pages. Also, they load memory-resident, national support functions.

To the `AUTOEXEC.BAT` file, add the following exactly as shown (on separate lines):

```
mode con cp prep=((865,850) c:\dos\ega.cpi)
keyb dk,,c:\dos\keyboard.sys
chcp 865
```

---

**Note** - If the `AUTOEXEC.BAT` file contains two lines at the end of the file that invoke `AUTOEXEC.BAT` files on the E: or H: drive, place the international command lines before these lines.

---

These `AUTOEXEC.BAT` commands do the following:

- They load prepared code pages 865 and 850 into memory—they get the code pages from the `EGA.CPI` file.
- They load the Denmark (dk) keyboard program.
- They start the system with the Denmark/Norway (865) code page.

---

**Note** - Refer to your DOS manual for information on the `PRINTER.SYS` file and the types of printers it supports for code-page switching.

---



## Setting Parallel Printer Code Pages

The second example also uses two prepared code pages. It assumes you have an IBM Proprinter model 4201 connected to LPT1. The system is set up to support Denmark/Norway and the Multilingual national languages.

To the end of your CONFIG.SYS file, add the following on separate lines:

```
country=045,,c:\dos\country.sys
device=c:\dos\display.sys con:=ega,,2
device=c:\dos\printer.sys lpt1:=4201,,2
install=c:\dos\nlsfunc.exe c:\dos\country.sys
```

These CONFIG.SYS commands tell OpenDOS that the hardware code page is not used, and that you are allocating space for two prepared code pages in each device. Also, they load memory-resident, national support functions.

To the AUTOEXEC.BAT file, add the following on separate lines:

```
mode con cp prep=((865,850)c:\dos\ega.cpi)
mode lpt1 cp prep=((865,850)c:\dos\4201.cpi)
keyb dk,,c:\dos\keyboard.sys
chcp 865
```

---

**Note** - If the AUTOEXEC.BAT file contains two lines at the end of the file that invoke AUTOEXEC.BAT files on the E: or H: drive, place the international command lines before these lines.

---

These AUTOEXEC.BAT commands do the following:

- They load prepared code pages 865 and 850 into memory. For the EGA, they get the code pages from the EGA.CPI file. For the printer, they get the code pages from the 4201.CPI file.
- They load the Denmark (dk) keyboard program.
- They start both devices with the Denmark/Norway (865) code page.

## Switching Between Code Pages

After using the CONFIG.SYS and AUTOEXEC.BAT file commands to set up your system for multiple national languages, use the following command to change to a different code page on all devices or for a single prepared device:

```
C:\> chcp code page
```

*or*

```
C:\> mode device cp select=code page
```

where:

*code page* is one of the pages set up in AUTOEXEC.BAT and *device* is CON or LPT1.

## Listing Current Code Pages

You can list the current prepared and selected code pages for your console screen or a parallel printer by using the `mode` command in the following form:

```
C:\> mode device cp
```

## Displaying Current Device Code Pages

To display the current code pages for your console screen device, enter the following:

```
C:\> mode con cp
```

OpenDOS displays a message similar to this one:

```
Active code page for device CON is 437 hardware code pages: Code page 850 prepared co
```

## Refreshing Lost Code Pages

It is possible for prepared code pages to be lost due to hardware errors. For example, suppose you had selected the Canadian-French code page (863) as the active code page for your console screen (CON). But, because of a hardware error, the active code page was lost. You can use the `refresh` keyword with the `mode` command to restore the lost code page for your screen, by entering the following:

```
C:\> mode con cp refresh
```

## The \$LANG Variable

There are two Solaris commands—`dos2unix` and `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 `$LANG` variable set, or if it is set to anything but the settings listed in the following table, SunPCi software uses the default US code page 437 and the `en_US` (English-US) `$LANG` setting.

**TABLE B-2** \$LANG Variable Settings

<code>\$LANG</code> Variable Setting	Language/Territory
<code>c</code>	Default “C” locale
<code>ar</code>	Arabic
<code>bg</code>	Bulgarian
<code>ca</code>	Catalan
<code>co</code>	Corsican
<code>cs</code>	Czech
<code>cy</code>	Welsh
<code>da</code>	Danish
<code>de</code>	German
<code>de_CH</code>	Swiss German
<code>el</code>	Greek

**TABLE B-2** \$LANG Variable Settings *(continued)*

---

<b>\$LANG Variable Setting</b>	<b>Language/Territory</b>
en	English
en_UK	UK English
en_US	US English
eo	Esperanto
es	Spanish
eu	Basque
fa	Persian
fi	Finnish
fr	French
fr_BE	Belgian French
fr_CA	Canadian French
fr_CH	Swiss French
fy	Frisian
ga	Irish
gd	Scots Gaelic
hu	Hungarian
is	Icelandic
it	Italian
iw	Hebrew
ja	Japanese
ji	Yiddish
kl	Greenlandic
ko	Korean

---

**TABLE B-2** \$LANG Variable Settings *(continued)*

<b>\$LANG Variable Setting</b>	<b>Language/Territory</b>
lv	Latvian
nl	Dutch
no	Norwegian
pl	Polish
pt	Portuguese
ro	Romanian
ru	Russian
sh	Serbo-Croatian
sk	Slovak
sr	Serbian
sv	Swedish
tr	Turkish
zh	Chinese
zh_TW	Chinese Taiwan



## SunPCi Performance Tips

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This appendix suggests various ways to improve the performance of the SunPCi program and the performance of your Windows 95 applications. The following list describes the topics in this appendix.

- “Fine-Tuning Your SunPCi Configuration” on page 65 “Fine-Tuning Your SunPCi Configuration” on page 65
- “Windows 95 Specific Tips” on page 66 “Windows 95 Specific Tips” on page 66
- “Running Game Software on SunPCi” on page 68 “Running Game Software on SunPCi” on page 68

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## Fine-Tuning Your SunPCi Configuration

The following sections describe some aspects of SunPCi configuration that you can change to improve performance of the SunPCi software.

### Memory

The more system memory you have, the better the performance of the SunPCi program. A minimum of 64 Mbytes on the SunPCi card is suggested for running SunPCi software; a 64-Mbyte memory module comes installed on the SunPCi card by default. Windows software runs best with at least 48 Mbytes of RAM.

If you want to increase the amount of RAM allocated to SunPCi, you may want to purchase the optional 128 Mbyte memory module. You can purchase two of them and replace the 64 Mbytes memory module, for a total of 256 Mbytes. Refer to the *SunPCi Installation Guide* for more information, or contact your Sun reseller.

## Emulated versus Extended 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 500 Mbytes.) Remember that the actual file size of your emulated drives varies, depending on the applications and data you store on them.

For more information about using emulated hard disk drives, see the section “Emulated Hard Drives” on page 29. For information about using extended drives, see “Extended Drives” on page 30.

---

## Windows 95 Specific Tips

This section contains hints and tips that you may find helpful if you are running Windows 95.

### Configuring Boot Options

This section contains two tips for configuring your boot options:

- Choosing your boot options from the Microsoft Windows 95 Startup menu
- Automatically booting to the DOS prompt

The Microsoft Windows 95 Startup menu contains options that you can choose when you start SunPCi. You can choose to boot directly into DOS or start Windows in Safe Mode.

Choices you make in the Startup menu affect only the current session of SunPCi. The next time you reboot, the startup mode returns to the default (start Windows 95 automatically).

### Accessing the Startup Menu

1. **Start SunPCi and press F8 as soon as you see the Starting Windows 95 message.**  
The Microsoft Windows 95 Startup Menu appears.
  
1. **Enter the number that corresponds to the option you want to use. SunPCi will start in the mode you selected.**  
Table C-1 explains the options available in the Startup menu.



TABLE C-1 Startup Menu Options

Option	Description
1	Normal Windows 95 startup.
2	Normal startup. The file <code>BOOTLOG.TXT</code> contains a log of the results of the startup process, including any system messages or errors.
3	Safe Mode starts your computer with default settings (VGA monitor, no network, Microsoft mouse driver, and the minimum device drivers required to start Windows).
4	Starts the computer in Safe Mode, but allows the computer to connect to the network.
5	Requests a Yes or No confirmation for each step in the startup process. The system displays each line in the <code>CONFIG.SYS</code> and <code>AUTOEXEC.BAT</code> files and asks you to confirm each one. Press Enter for Yes or Esc for No.
6	Boots the system to the MS-DOS prompt.
7	Boots the system to the MS-DOS prompt in Safe Mode.
8	Boots the system to a previous version of MS-DOS (if you have one installed).

## Automatically Booting to the DOS Prompt

You can create an empty batch file called `WIN.BAT` that enables you to boot directly into the DOS prompt every time you start SunPCi. This allows you to start Windows 95 whenever you choose, but allows you to work from the DOS prompt rather than from the DOS shell.

1. To start Windows 95 from the DOS prompt, type the following command and press Return:

```
C:\> windows\win
```

---

# Running Game Software on SunPCi

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**Note** - This procedure applies *only* if you are using an external VGA monitor with your SunPCi card. For more information on how to install and configure an external VGA monitor, refer to Chapter 4.

---

This section is designed to help you fine-tune game performance on SunPCi. Although the default VGA memory setting of 1 Mbyte on your SunPCi 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.

---

To increase the amount of VGA memory available to SunPCi, perform the following procedure:

- 1. Start up SunPCi. If SunPCi is already running, exit Windows 95 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 is stopped and the Setup screen is displayed.
- 3. Select Chipset Features Setup.**
- 4. Change the VGA Shared Memory Size parameter to a larger value.**  
The default is 1 Mbyte. This parameter accepts values between 0.5 Mbytes and 4 Mbytes in increments of .5 Mbytes.
- 5. Exit Setup.**  
The SunPCi startup routine starts over, using your new VGA memory settings.