Understanding Why a PC Slows Down

When you begin using a brand-new computer, Web pages pop up on the screen, documents open in a snap, games respond to every twitch of your finger, and every command you enter executes immediately. Over the course of several months of moderate use, however, the computer begins to slow down.

Most people do not notice a gradual decrease in performance, but one day, while browsing the Web, you begin to realize just how slow your computer has become; it seems tired and unmotivated. Your Windows desktop takes more time to appear when you first turn on your PC. Web pages that used to appear immediately now take several seconds. When you open a document, you have to wait before you can begin working on it. You purchased the best PC you could afford, so what happened?

What happened is that your high-performance computer has finally accumulated enough digital junk to make it run like an old jalopy.

Disk Drive Clutter

On most PCs, the hard drive acts like a digital landfill. It stores important program files and your valuable documents, but it also stores copies of Web pages you recently visited and may never visit again, old e-mails you will probably never read, temporary files that your PC software never bothered to delete, backup copies of files you deleted, and other files you never knew you had.

Disk clutter affects PC performance in two ways. First, it adds to the time it takes a program to load a file. As your disk fills up, free space is harder to come by, so when you save a file, the PC stores parts of the file in any available areas it can find. The file becomes *fragmented* and the drive takes more time to load the scattered parts. Just think how much extra time you spend looking for information if you scatter papers around your office instead of filing them in folders.

Second, a cluttered disk is much less efficient at providing your PC with the *virtual memory* it needs. Your computer uses the hard drive as virtual memory when it runs out of *physical memory* — the electronic form of memory provided by memory chips. When you run a program or open a file, your PC stores the data in physical memory, so it can process it more quickly. If your computer needs more memory than is currently available, it uses an open area of the hard drive to swap data in and out of its physical memory. If your computer does not have a large area of free space to use as virtual memory, it may have trouble running a program or running multiple programs.

Memory Overload

Five primary factors contribute to determining the overall performance of your PC: the *processor* type and speed, the *cache* size and speed, the *bus* type and speed, the size and speed of the *hard drive*, and the amount and speed of the *memory*. These components comprise the engine that drives your PC. Unless you perform hardware upgrades to install a faster processor, motherboard, or hard drive, you can do little to increase the potential top speed of your PC.

However, you can do a great deal to reclaim and optimize your computer's memory without installing an expensive upgrade. This alone can increase the speed of your PC, bringing it into a range that is acceptable to you.

As soon as you start your computer, its memory becomes cluttered with unnecessary data — startup information and programs that you may not even use. Each program you run, every document you open, every task you perform packs more into your computer's memory until it has to begin using the hard drive for additional storage. Even if you close a program to free up some memory, the program may not remove itself entirely.

Chapters 11 and 13 show you how to check available memory, reclaim memory, and optimize its use.

Unsolicited Advertising

Most PCs connected to the Internet act like magnets for unsolicited advertising. E-mail accounts attract junk mail, commonly referred to as *spam*. Web sites use *pop-up ads* to turn your PC's monitor into a miniature billboard. And Web sites and shareware commonly install advertising software, called *adware*, and monitoring software, called *spyware*, right on your computer. All of these unsolicited items consume system resources that your PC could use to run your programs and manage your files. They also reduce your personal productivity by making you delete extra e-mail and close windows that pop up uninvited on your screen.

You may not completely purge your system of these annoyances, but you can significantly reduce them, as explained in Part V.

Windows Registry Bloat

The Windows registry keeps track of Windows and application settings, hardware configurations, and everything else that enables Windows to run and to communicate with the programs and hardware that comprise your system.

The Windows registry quickly becomes bloated, because Windows does a poor job of keeping it trim. When you remove a program from your system, for example, the utility in charge of removing the program is supposed to remove all registry entries that refer to it. In practice, this rarely happens. Over time, the registry collects numerous entries that point to programs, files, and resources that no longer exist. Yet Windows continues to load the entire registry whenever you start your computer.

Fortunately, utilities are available that can safely remove unused entries and streamline the registry, as explained in Part VI.

Test PC Performance Online at PC Pitstop

Before you begin optimizing your PC, you can test its performance and identify any problems online at PC Pitstop for free. PC Pitstop features automated utilities that perform a battery of tests to analyze your PC's processor, memory, hard drives, video, and Internet connection speed. The tests do not change any settings; they simply run on your PC to identify any problems or performance issues. As PC Pitstop performs the tests, you can expect to hear your PC's hard drive run and see the monitor flash various colors and patterns. This is all part of the process.

When you connect to PC Pitstop, you can run the tests anonymously or you can provide your name and e-mail address to have PC Pitstop store the results of your tests for future reference. In either case, PC Pitstop promises to keep any information it obtains about your system confidential. None of the tests accesses documents or other data files on your PC.

PC Pitstop's tests were designed to run exclusively through Internet Explorer. If you are using a Web browser other than Internet Explorer, when you click the link for performing the tests, instructions appear on how to proceed.

Test PC Performance Online at PC Pitstop

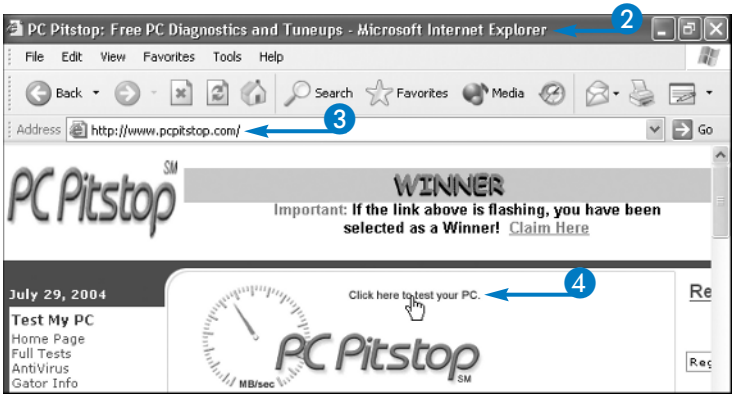
1. Close any programs that are currently running.
2. Launch your Web browser.

Note: *This example uses Internet Explorer.*

3. In the address bar type **www.pcpitstop.com** and press Enter.

   PC Pitstop's home page appears.

4. Click the Click here to test your PC link.

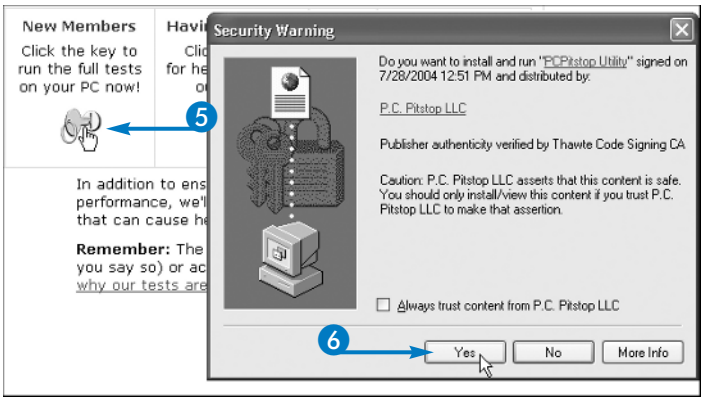


   PC Pitstop's test page appears.

5. Click the link for running the tests.

   The Security Warning dialog box appears, indicating that the authenticity of the PC Pitstop utility has been verified.

6. Click Yes.



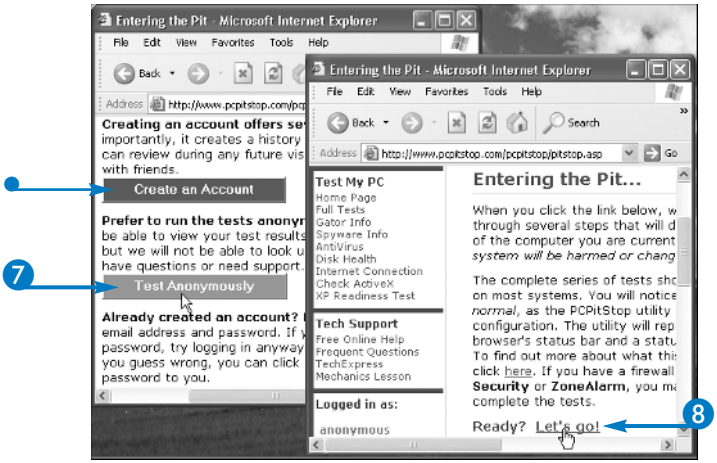
A screen appears prompting you to create an account.

- You can click here and type your name and e-mail address to have PC Pitstop store the test results.

7 Click Test Anonymously.

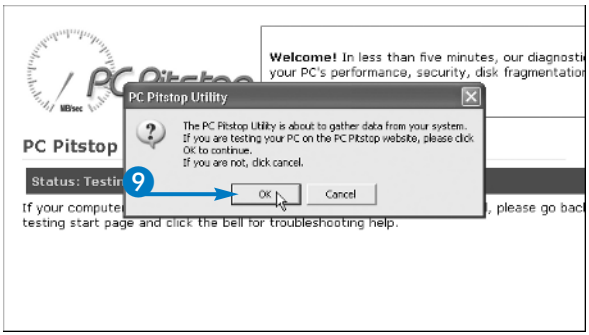
A screen appears indicating that the tests are ready to begin.

8 Click the link for starting the tests.



The PC Pitstop Utility dialog box appears prompting you to confirm that you are using the PC Pitstop Web site.

9 Click OK.



MASTER IT

What are the benefits of creating an account at PC Pitstop?

When you create an account, PC Pitstop can identify your computer the next time you connect. If PC Pitstop has any information from manufacturers about possible problems with your PC or any of its devices, it can notify you via e-mail. In addition, if PC Pitstop installs new features to test and improve your PC's performance, it can notify you of these updates. You can perform the tests anonymously and then create an account after you see the results. The screen that displays the results includes a link you can click to type your name and e-mail address and a password for accessing the service.

How can PC Pitstop remain a free service? What's the catch?

PC Pitstop can remain free to users, because it licenses its technology to other companies, including computer manufacturers, technical support services, and Web sites. It also earns money by referring users to software companies that develop PC troubleshooting, maintenance, and security software. You may notice that PC Pitstop's opening page features recommended products. If you click a link and purchase one of these products, PC Pitstop receives a small commission. You can click the Support PC Pitstop link at the bottom of the home page to learn other ways to support PC Pitstop.

continued

Test PC Performance Online at PC Pitstop *(Continued)*

When the tests are complete, PC Pitstop issues a grade card that rates your computer's performance, provides suggestions, and sometimes even supplies a utility that you can download and run to repair a specific problem.

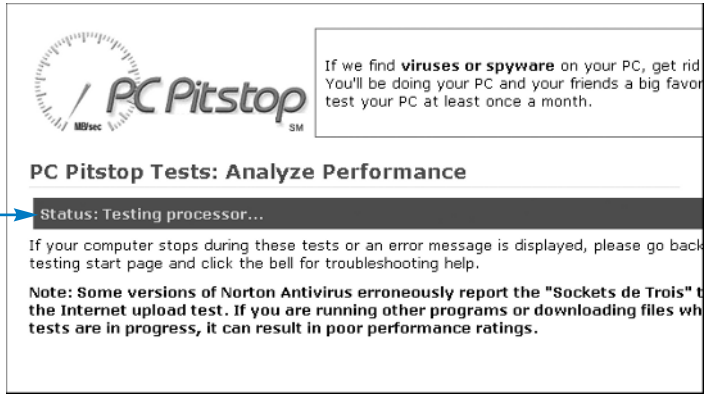
At the top of the results page, PC Pitstop displays an overall description of your PC's performance to indicate whether it is operating on par with other systems of its kind. Below the description is a list of Customized Tune-up Tips, which are links to specific suggestions for optimizing the overall system performance.

Following the Customized Tune-up Tips is a Configuration Summary that highlights the performance of each component. To stay true to its car analogy, PC Pitstop uses auto racing flags and color codes to indicate performance levels. A checkered flag indicates that a component has passed all tests and is running at peak performance. A yellow flag highlights possible problems or performance issues that you have the option of correcting. A red flag indicates a serious problem or security issue that you must address immediately. In addition, PC Pitstop displays a blue dot to indicate any additional suggestions for optimizing performance.

Test PC Performance Online at PC Pitstop *(continued)*

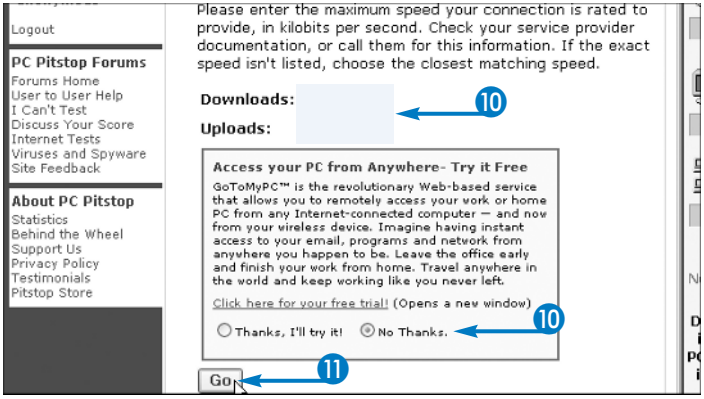
- PC Pitstop starts checking your system and displays messages about the tests it is currently performing.

When testing your monitor and video card, PC Pitstop flashes colors, patterns, and jumbled text on the monitor.



PC Pitstop displays a screen, prompting you to enter information about your system and Internet connection.

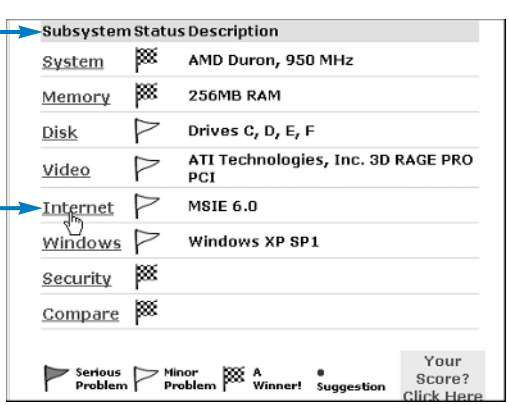
10. Type or select the requested information.
11. Click GO.



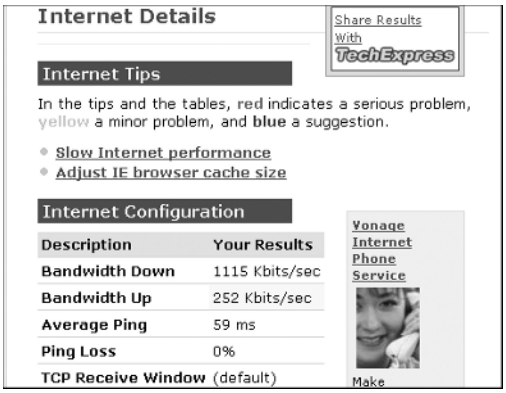
PC Pitstop displays a summary of the test results.

12 Scroll down the page to the list of components tested.

13 Click a component's link for more information about how to correct a problem or optimize performance.



PC Pitstop's recommendations appear.



Do these performance tests look for viruses, spyware, and other problems?

No. PC Pitstop's tests focus on your PC's hardware and how it performs. However, PC Pitstop does feature other tests that check your system for viruses and spyware, analyze the health of your hard drive, test your PC's Internet connection speed more thoroughly, and provide additional information on how to optimize your PC. To access these tests and additional information, go to PC Pitstop's home page at www.pcpitstop.com, and click the link for the test or information you want under Test My PC. Many of the links lead to a page that describes a problem and provides a link to a utility that can correct the problem.

PC Pitstop identified some problems, but I still do not know what to do. Can I obtain some additional help?

Yes. This book provides detailed, illustrated instructions to help you identify and correct many of the problems that negatively affect PC performance. If PC Pitstop identifies Windows registry errors, for example, you can skip ahead to Part VI of this book for more on backing up and cleaning the registry safely. PC Pitstop also hosts several technical support forums where you can go for more about PC performance issues, PC Pitstop test results, and ways to configure and customize your PC for optimum performance. Check out the links under PC Pitstop Forums on PC Pitstop's home page.

Download, Install, and Run Sandra Diagnostics

Before you optimize your PC, you should test its components to determine if they are operating correctly. A malfunction on a disk drive or in a memory chip can cause a PC to slow down and crash intermittently or lose important data. More serious problems may indicate that a particular component is bad and in need of replacement. A performance test of your computer may not reveal these problems, but by running a diagnostic utility you can often identify them.

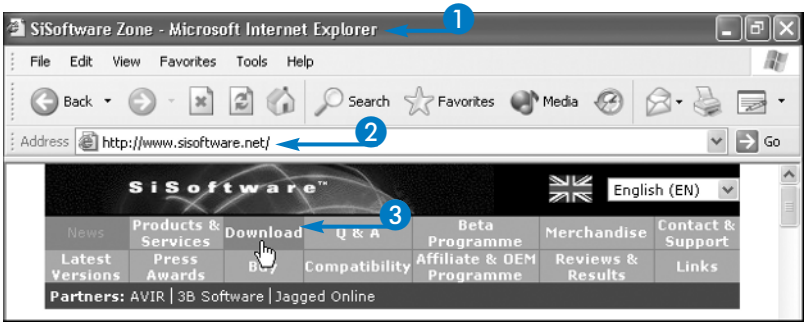
Many PCs come with a CD that includes diagnostic utilities for testing the memory, disk drives, video card, monitor, motherboard, processor, and other key components. If your PC includes such a CD, you can insert it and run the diagnostics from the CD as explained in the manufacturer's instructions. These diagnostic utilities are generally preferred because the manufacturer customizes them for the system you have.

If you do not have a diagnostic utility developed for your system, you can download, install, and run an excellent utility from SiSoftware called Sandra (System ANalyzer, Diagnostic and Reporting Assistant). You can use the utility for free for 30 days, but must pay $34.95 after that time. Although this section shows how to download, install, and run Sandra Diagnostics, you can use the basic steps to run other diagnostic utilities.

Download, Install, and Run Sandra Diagnostics

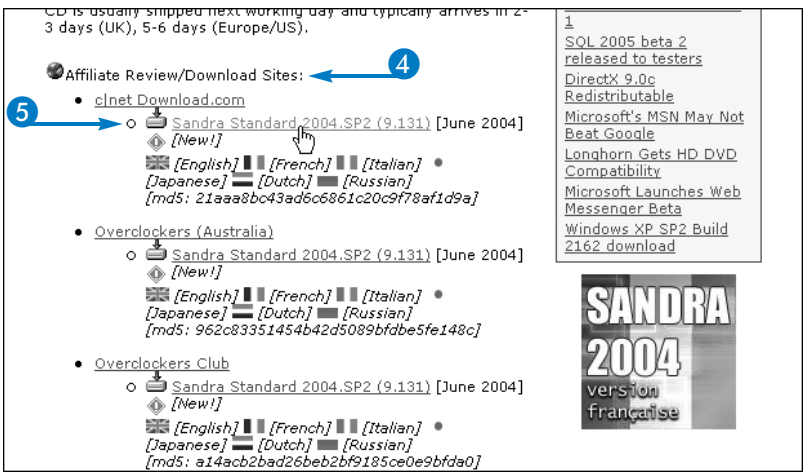
Download and Install Sandra Diagnostics

1. Launch your Web browser.
2. In the address bar, type **www.sisoftware.net** and press Enter.
3. Click Download.



The download page appears.

4. Scroll down to the Affiliate Review/Download Sites list.
5. Click one of the links for downloading the Sandra software.

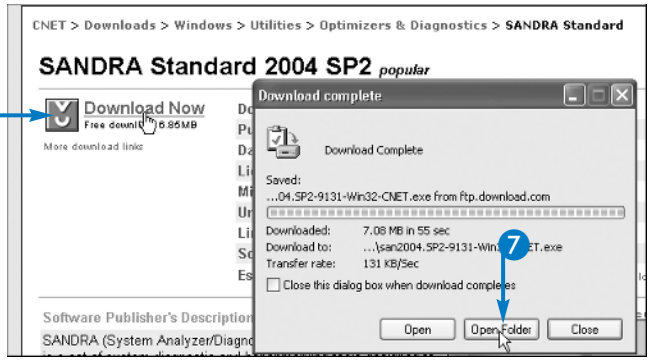


Note: *Although this example shows the Sandra software being downloaded from Download.com, you can download other diagnostic utilities.*

6 Follow the on-screen instructions.

Note: *The steps vary depending on the site from which you are downloading the file.*

7 When the download is complete, click Open Folder to open the file you just downloaded.

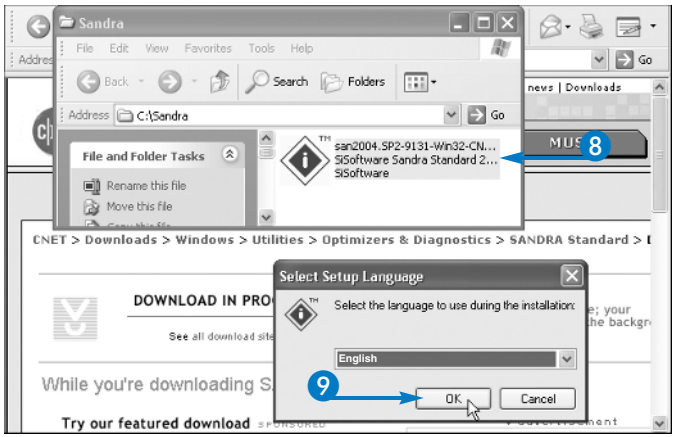


8 Double-click the Sandra installation file.

The installation routine starts.

9 Follow the on-screen instructions to complete the installation.

The installation routine installs Sandra on your PC and displays an icon to run it on the desktop and on the Start ➪ All Programs menu.



MASTER IT

Can I purchase the product now so I do not need to worry about it later?

▼ Yes. On SiSoftware's home page, click the Buy link. A page appears that enables you to purchase a copy of the Sandra software for one or more PCs; you can purchase a copy with multiple licenses at a discount. You can also purchase a copy on CD, so you can reinstall the software if your computer's hard drive fails. If you do not want to order the CD, you can make your own backup CD, as shown in Chapter 4. If you choose to order the CD, you can still download the shareware version and use it until your CD arrives.

Are any other PC diagnostics tools available?

▼ In addition to Sandra and the diagnostic utilities that come bundled with many PCs, there are serveral excellent diagnostic utilities. American MegaTrends at www.amidiag.com features a collection of diagnostic utilities called AMIDiag Suite that you can run in Windows or DOS. It does a thorough system check of all components and provides detailed reports on any errors or problem areas it identifies. AMIDiag Suite is fairly expensive at $250, but you can download a demo version of it to try it for free. BCM Diagnostics, which you can check out at www.bcmdiagnostics.com, is another fine product that retails for less than $30. You can find links to additional diagnostic utilities at dmoz.org/Computers/Software/Diagnostics/.

continued

Download, Install, and Run Sandra Diagnostics *(Continued)*

Sandra functions as both an information tool and a diagnostic utility. As an information tool, it can reveal specifications about your PC that you may not know, such as the processor type and speed, the amount of memory installed, and the hard drive speed. As a diagnostic utility, it can inform you of any malfunctions and potential performance issues so you can repair or replace malfunctioning components or identify settings that you need to change.

Unlike some diagnostic utilities that manufacturers bundle with their PCs, you do not need to boot your computer using a special CD or run Sandra from the DOS prompt, which is very inconvenient. You can run Sandra just as you run your other Windows programs — by selecting it from the Start, All Programs, SiSoftware Utilities menu or by double-clicking its icon on the Windows desktop.

When you launch Sandra, it displays icons for its many tests, grouped by module: Wizard Modules, Information Modules, Benchmarking Modules, Testing Modules, and Listing Modules. When you run a module, a window appears displaying messages that indicate what the module is currently doing. When the module has completed its work, the window displays the results.

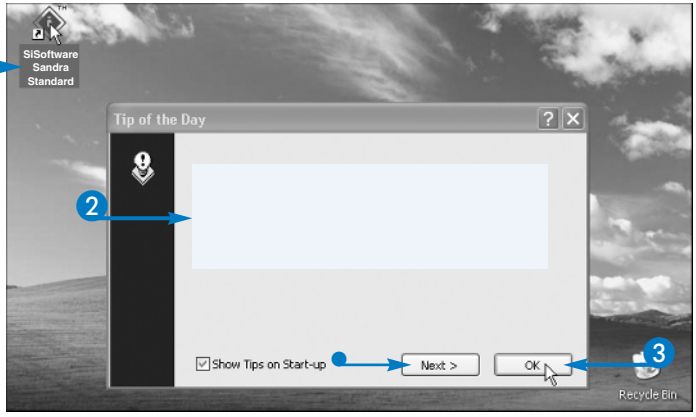
Download, Install, and Run Sandra Diagnostics *(continued)*

Run Sandra Diagnostics

1. Double-click the SiSoftware Sandra Standard icon on the Windows desktop.

   The Tip of the Day dialog box appears.

2. Read the tip.
   - You can click Next to display another tip.
3. Click OK.

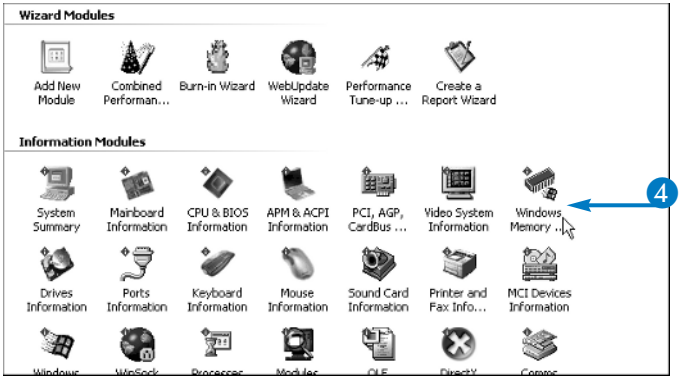


The SiSoftware Standard window appears, displaying icons for its many modules.

4. Double-click the module you want to run.

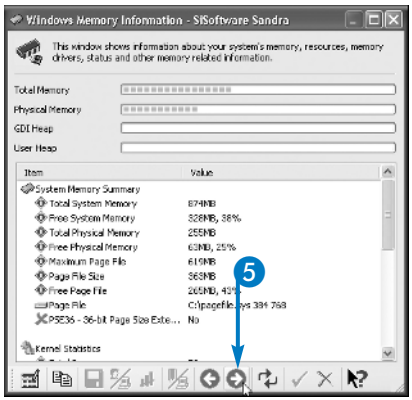
   This example shows the Windows Memory module.

   If you choose a Wizard Module, follow the on-screen instructions that the Wizard provides.

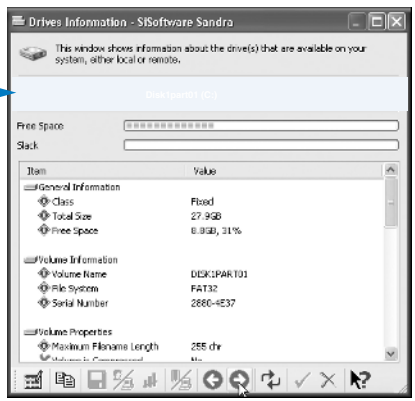


A window appears displaying information about a component or the results of a test or comparison.

5. Click the Next button ( ) to view information reported by the next Module.



- The Module displays information about the next component, in this example, the hard drives.



Sandra reports a great deal of information. Do I need to know all of this?

▼ No. Sandra is designed for a wide range of users, from beginners to computer technicians. Each module displays very specific information about your system and its components that you may or may not need right now. For the purposes of tuning the performance of your PC, focus on the Performance Tune-up Wizard, the System Summary Information Module, the Windows Memory Information Module, and the Drives Information Module. These modules provide important information about your PC's system resources that can help you optimize its performance. Feel free to explore other modules.

Some of the information that Sandra reports about my system is incorrect. Is this normal?

▼ Yes. Sandra runs on many different PCs configured in many different ways. Most PCs have software that contains bugs and often does not provide the information that Sandra needs or presents it in a way that Sandra misinterprets. Sandra may, for example, fail to identify a hard drive that you know is installed on your PC. You can ignore the information or obtain additional information to clear up the discrepancy. For general information, click the What's This button ( ) and click the item about which you want to know more. For detailed information, go to www.sisoftware.net and click Q&A.