

Fix Your Own PC



What To Do When . . .

- Your PC Shuts Down Slowly
- Or Won't Shut Down At All
- Your PC Runs Slowly Or Erratically
- Your PC Internet Connection Is Slow
- You Can't Open Email Attachments
- You Accidentally Deleted Something
- Your Printer Won't Print
- Your System Restore Won't Work
- You Have Wireless Access Problems
- Your Browser Has Been "Hijacked"
- You're Pestered By Popup Ads
- You Can't Send Or Receive Email
- You're Having Video Problems
- You're Having Audio Problems
- You Can't Install Something
- You Can't Delete Something
- You Have Network Problems
- Your PC Has A Virus
- Your PC Won't Start
- Your PC Starts Slowly
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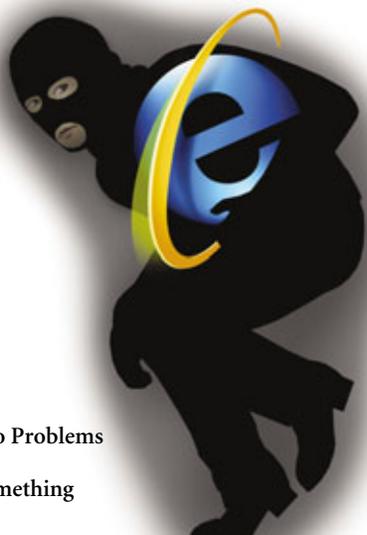
Computers are wonderful tools that occasionally refuse to work the way they should. When something does go wrong, you can avoid frustrating (and costly) downtime by learning to fix your own PC. Use the basic troubleshooting techniques and step-by-step instructions in this issue to solve hundreds of common hardware and software problems.

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The Tao Of Troubleshooting

Pinpoint The Source Of Your Computer Problem

As time goes on, PCs continue to increase in complexity and our reliance upon them continues to grow. More often than not, both increases are perfectly complementary, as millions of people across the globe turn their computers on each day to use them for research, leisure, entertainment, or learning. But that paired reliance—us relying on our PCs and our PCs relying on us for maintenance—isn't always a happy fairy tale; sometimes the experience breeds frustration, especially when the PC just doesn't work, and we don't know why.

Thankfully, however, troubleshooting a PC is largely an exercise in the process of elimination; following a standardized procedure with the right tools can go a long way toward diagnosing your computer's ailment and getting you back on the right track. Knowing *what* is broken is the cornerstone of

knowing how to fix it, so read on to become a pro at investigating your problem and discovering that crucial cornerstone.

Before You Dive In

Although it's tempting to start troubleshooting your PC as soon as it displays symptoms, you'll save yourself a potential headache if you back up your digital valuables first (assuming that your PC's problem doesn't prevent you from doing so). Sure, the average software conflict, driver reinstallation, or loose monitor cord isn't much of a threat to your files, but we've seen seemingly small problems turn into PC-crippling disasters before.

If you're in the "better safe than sorry" camp, jot down a quick list of the files you want to protect: documents, music or video files, emails, and maybe that list of Internet Explorer Favorites you've built up over the years (in Internet Explorer, click File, Import And Export to start the wizard that lets you

back up Favorites). Move them to removable media or (if you don't suspect that your PC has a virus) to another PC on your network. Now you can tackle your PC's problem without worrying about losing your data.

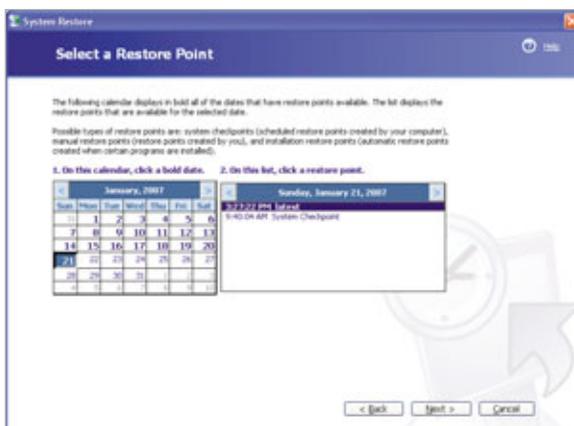
Hardware Or Software?

It's not always easy to determine whether your hardware or software is to blame, but it's a good place to start troubleshooting: If you're fairly confident that the problem is one or the other, you've eliminated several troubleshooting steps.



Ruling out causes is the best path to troubleshooting success.

Look for common hardware symptoms. Hardware problems, such as damaged components or loose cables, generally cause obvious, dramatic problems. For example, if your computer won't power on at all, you're looking at a hardware problem, rather than software. You should also suspect a hardware problem if your computer powers on, but no images appear on your monitor. If you can't



Windows' System Restore lets you revert your PC to an earlier condition without losing your important files. You can use this feature to undo bad hardware and software installations.

access any software (even the BIOS [Basic Input/Output System]), you're not looking at a software issue.

Of course, not all hardware issues display such obvious symptoms, and some hardware problems exhibit symptoms similar to those caused by software problems. For example, if your PC runs slowly, it may have too many unnecessary programs running at once, or a virus or adware may be crippling your system; obviously, these are software problems. On the other hand, these same symptoms can be caused by an overheated processor, something that's just as obviously a hardware issue.

Look for common software symptoms. Whereas hardware problems often reduce your computer to an oversized paperweight, software issues

are often more subtle, and usually let you access most parts of your computer. A conflict between two programs, for example, may prevent you from accessing certain applications, but may not crash Windows itself.

In many cases, the software that's experiencing trouble will display an error message. Unfortunately, many error messages don't offer much immediate help: The message will likely display a cryptic warning or a bunch of numbers and letters that

don't mean anything to anyone other than a programmer. Unless you receive an error message saying that hardware is to blame, the error message is a good indicator that you're facing a software problem.

If your problem doesn't prevent you from accessing the Internet, try looking up the error message at *Smart Computing's* Tech Support Center. The site offers an online database of error messages for hundreds

of programs, including the Windows OS (operating system). To learn more about an error message, visit www.smartcomputing.com/techsupport and then click Browse Error Messages Alphabetically or Search By Error Message Text. If you choose the Search feature, enter the text of the error message word-for-word to get the best results. Each error message in the database includes an explanation of the message's meaning and at least one potential solution.

Consider recent events. If you call a tech support service, one of the first questions the tech will ask is, "What were the last things you did before the problem occurred?" Remembering any actions you've taken over the past few days may help you narrow down the problem. If you moved your computer

to a different room and now find that it won't power on, for example, you should kick off the troubleshooting by identifying the components that may have changed during the move. Check the wall outlet to make sure it is functioning properly, and check the power cord to make sure it is plugged firmly into the outlet and the PC's PSU (power supply unit). (Don't forget that transporting a computer any significant distance can result in video cards and other devices vibrating loose.)

This approach will also help you determine whether you have a software problem. If you installed a new program last night and now your Desktop doesn't display the family photo you were using as a Desktop background, you're probably not facing a hardware issue. The longer you own a PC, the more often you'll find that the simplest explanation for the problem is often the right one.

Find The Source Of The Problem

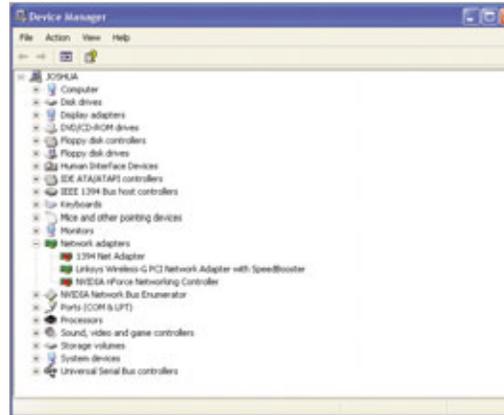
Once you know (or think you know) whether you're dealing with a hardware or software problem, you can really dig into the next question: Which hardware component or program is the source of the trouble? If you can answer this question, you won't have any trouble finding an article in this issue that addresses your problem. Here are some tips for narrowing the troubleshooting field.

Hardware problems. Once you suspect a hardware problem, list the components (internal or external) that might be the cause of the problem and then check each component, one at a time. In some cases, this may mean checking external and internal hardware. For example, if your print documents don't reach the printer or you see error messages that say your printer isn't connected to the computer, you'll want to check the USB cable that runs from your computer to the printer to make sure neither of the connections is loose. You'll also want to be sure that your computer's

USB port is functioning. (You can test this by plugging another USB device, such as a USB flash drive, mouse, or external hard drive into that port.)

In some cases, you may suspect that an internal component is damaged, but not be in a position to confirm the defect. If you think that your computer's lost network connection is due to a damaged or incorrectly configured Ethernet NIC (Network Interface Card), you probably don't have an extra Ethernet card that you can swap out. This is where the Device Manager, a built-in Windows tool, can help you identify problems without opening your PC or bumming spare parts from your friends.

To open the Device Manager, right-click the My Computer icon on the Desktop, and then click Properties. When the System Properties window appears, select the Hardware tab and then click the Device Manager button. The Device Manager displays a list of your PC's components by category, such as Disk Drives (hard drives),



The Device Manager lets you quickly determine whether your PC's components are working properly. A red X indicates a problem.

Processors, DVD/CD-ROM Drive, and Display Adapters.

By default, the list shows only the component *categories*, rather than the components themselves. If you want to see the names of your specific CD-RW and DVD-RW drives, for example, you'll need to click the plus (+) sign next to DVD/CD-ROM Drives. The list will then expand to reveal all of the components in that category.

The exception to this rule, however, is the component that is damaged. If Windows knows your NIC isn't working, it will automatically expand the Network Adapters category to display any networking components in your PC. You'll see a red X next to the damaged NIC. To learn more about the NIC's problem, right-click it and then select Properties. The General tab of the NIC's Properties window includes a Device Status section that offers a brief explanation of the problem.

You can also pinpoint certain problems, such as excessive heat, by checking the PC's BIOS. All PCs have a BIOS, which is a very basic operating system that allows your system's components to communicate. Most BIOSes have a PC Health or Status page that lists system fan speeds and system and processor temperatures. To learn more about entering the BIOS, see "Basic Troubleshooting: Processors," on page 96.

Software problems. If you're fairly certain you're facing a software problem, but you haven't been able to identify the offending program, your best bet may be to use Windows XP's System Restore. This feature is especially useful if you've installed multiple programs recently. System Restore reverts your computer to the condition it was in few days or even a few weeks ago, without destroying any of the documents, emails, music, or video files you've created.

Thanks to System Restore, any programs you installed after the Restore Point (the date in the past to which you restore Windows) won't appear on your PC. Once you complete the restore, you can reinstall the applications one at a time and check your PC for problems after each installation.

System Restore is enabled by default in Windows XP, which means that System Restore has already created Restore Points automatically, even if you've never used the System Restore feature before. To access

Things To Check First

Although a list of things to check won't catch every PC problem you encounter, you'll be surprised at how often the simple steps below can lead to troubleshooting success. Whether you're kicking off a troubleshooting session or at your wits' end after hours of fruitless research, here are some good tips to try.

Is the PC's power supply switch turned on? Some PCs have a power switch at the back. Make sure it hasn't been switched off.

Are all cables connected? Loose connections regularly cause headaches. Remove and reconnect each plug firmly, even if you're sure it's connected.

Are all peripherals turned on? Make sure a powered-off print server isn't preventing your printer from working.

Does the Device Manager display any problems? Check this tool for red Xs, which indicate a malfunctioning or disabled device.

Is there a new driver? Updated drivers often fix hardware problems. If you can't find new drivers (check the manufacturer's Web site), try reinstalling your existing driver.

Have you installed software updates? Software publishers sometimes release patches via their Web sites. Also, check to see if your software recently installed updates automatically. In rare cases, a software update may introduce problems.

Drivers

Because hardware uses special software (known as drivers) to communicate with your PC, a hardware problem sometimes is a software problem. Your PC manufacturer installed the driver when it first added the device to the PC, but the device's manufacturer may have released new drivers since then. New drivers often contain fixes for bugs, which means that a new driver may cure your device.

To check for new drivers, make sure you know the device's model number and its current driver version (you can usually find this information in Windows' Device Manager or by using third-party software), and then visit the manufacturer's Web site. In most cases, you'll find drivers in the site's Support or Downloads section.

System Restore, click Start, All Programs, Accessories, System Tools, and System Restore.

Once you click the Restore My Computer To An Earlier Time radio button and click Next, System Restore will display a small calendar with several of the dates in bold. All bold dates have at least one Restore Point. (Note that Windows refers to automatically-created Restore Points as System

Checkpoints; you can create your own labels for Restore Points that you create yourself.) Select the Restore Point and then follow System Restore's instructions to restore your system to this earlier date. Finally, make sure your PC is operating without trouble. If it is, you've narrowed the problem to one of the programs that System Restore just uninstalled (or to another program on your PC that conflicted with one of these programs). Now you're ready to hunt for the problem program.

Troubleshooting 101

As we mentioned earlier, troubleshooting is largely a matter of eliminating parts or programs that are working until you find the part that causes the problem. Consider this scenario: You pressed your PC's power button this morning only to find that it didn't start. The PC worked just fine last night, and you haven't recently performed any maintenance on the system's interior.

If you start by making sure your PC truly isn't powered on, you'll save yourself several troubleshooting steps. Check the monitor's light: Is the monitor on? If not, you'll want to check its power cords. Once the monitor is on, take a second look at your PC. Do any lights appear when you try to power on the system? If you see lights, or if you can see or hear running fans at the back of the computer, the system doesn't have a power problem. Instead, the PC may be having trouble sending an image to your monitor, which

could indicate a problem with your motherboard, video card, or memory.

If the PC doesn't power on at all, check the power cord and the surge protector. Many surge protectors have switches that let you kill power to any of the devices that plug into them: Check to make sure your pet didn't accidentally trip that switch.

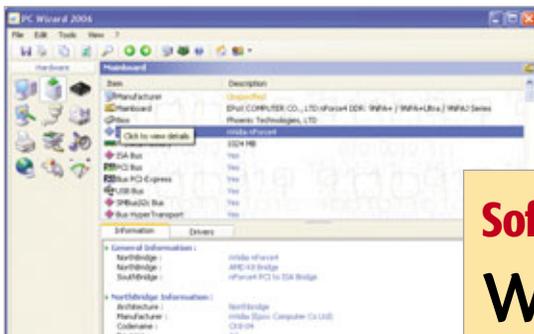
Next, check the wall outlet by plugging a different device into the socket your PC's power cord occupied. If you're certain that power is flowing to the PC, you've ruled out the most basic problems and can focus on more advanced troubleshooting tips, such as those discussed in "What To Do When: Your PC Won't Start" on page 10.

When All Else Fails

If you exhaust this issue's troubleshooting tips without finding a solution, it's time to turn to the Web or to contact tech support. You'll find a searchable database of thousands of articles at *Smart Computing's* online Tech Support Center. *Smart Computing* also operates a free tech support hotline: Call (800) 368-8304, Monday through Friday, from 8 a.m. to 8 p.m., CST.

If you call your PC manufacturer's tech support line, be sure to have some basic information about your system handy, including the model number and serial number. Many PCs display the model name and number on the front panel, whereas the serial number often resides on a side panel or the back of the computer. **RS**

BY JOSHUA GULICK & ROBERT HALLOCK



Some third-party system applications, such as CPUID's free PC Wizard 2006, offer detailed information about your hardware, including your motherboard's chipset.

Software To The Rescue

Whether you're planning to download drivers for a device or simply want to search for information about it online, you'll need its model number. In many cases, you can find this info via the Device Manager, but if you're looking for your motherboard's model number or the name of the motherboard's chipset, you'll probably need to download a third-party system information program, such as CPUID's free PC Wizard 2006 (www.cpubid.com). Such programs scan your system and then display model numbers, chipset names, and other info.

How To Handle Error Messages

Computers Say The Darnedest Things



When we were kids, we imagined that the future held flying cars and moon bases. Technology and humanity would be in perfect sync. Our machines would anticipate our needs, leaving us to pursue only the most relevant, important work.

Well, it hasn't happened yet; we're still very much slaves to our machines instead of the other way around. It sometimes seems we can't go an hour without intercepting some bad news from our computers: missing drivers, no paper in the printer, an exception at memory address 32xxff00. . . . Can't we just get our work done?

Don't go back to pen and paper just yet. We've got some tips to help

you deal with the different kinds of errors you run into while working with your PC.

An Error For Every Season

Error messages are communications from the PC to you. To create one, a programmer must anticipate an action you might take with which the system will disagree or by which the system will become confused. Depending on how well the software is designed, these messages may either be informative or—so it sometimes seems—deliberately obtuse.

For Ben Ezzell, error messages are too often the result of lazy programming. He's the author of "Developing

Windows Error Messages," published in 1998 by O'Reilly. Nowadays, Ezzell is the director of software development for IDComm, a California-based developer of RFID (Radio Frequency Identification) products. He's seen a lot of error messages in his time and has little patience for them. We asked him what kinds of error messages users run into, and he was pretty blunt about it: "There's stupid, misleading, and erroneous," he said.

Okay, seriously: There are hardware errors, software errors, and user errors. "Most errors fit in these categories," says Ezzell, "and while the least [common] errors are hardware errors, the problem is that most [of what the software calls] user errors should actually be software [error] messages."

If you think about your working relationship with your computer, or with any technology, you'll get the idea pretty quickly. Ezzell uses an example with which most people are intimately familiar: "Think of the phone company. You must first dial a one before dialing a long-distance number. They already know what you're doing, but they just don't want to accept it." Instead, you receive an over-the-phone "error message" that forces you to hang up and redial, this time entering the number one. The phone company already *knows* that you're dialing long-distance, so they could just put you through; this is a prime example of a software error being turned into a user error.

In his book, Mr. Ezzell provides advice to programmers who want to communicate problems to their users. He even has a recipe for the perfect error message. It has three "ingredients," in the form of answers to these questions:

1. What is the problem?
2. Why is it a problem?
3. What can I do to solve the problem?

For a good example, consider a common type of user error: those related to printing. A good error message would inform you that your printer is out of paper, that you won't be able to print unless you load more

paper into the tray, and that you should click Print after you have loaded it.

If you're a user who often feels a victim of your computer, you can rest assured that if you see an error message that doesn't meet these criteria, the programmer is almost certainly the one at fault, not you.



Ben Ezzell is the author of O'Reilly's "Developing Windows Error Messages."

But It's Your Problem

Unfortunately, the programmer is not usually available to take to task for a poorly written error message. So what can you do to solve it? There are more resources than ever to help you out.

The first step is to read the error message. We know, we know: It seems obvious. But many users have so little faith in their ability to understand these messages that they don't bother reading them. While the programmer may not have written a particularly useful error message, there may be just enough information to help you troubleshoot the problem, especially if it reminds you of something you just did.

For example, here's one of our favorite error messages, from Outlook Express: "Some errors occurred while processing the requested tasks." This message may appear after attempting to log in to your email account; if you enter the information incorrectly, you might see this message. The error message itself is quite cryptic: How many errors are "some" errors? Which errors are they? Which tasks are we talking about? Fortunately, the context is fairly clear—the error occurs whenever you attempt to sign on, and the solution is simple enough: Just re-enter your credentials, this time correctly.

In some cases, though, the context of your actions won't give you a clue as to what to do. That's where the Internet comes in. You can try

entering the text of the message into Google's search engine, or you can check out *Smart Computing's* online error message database at tinyurl.com/yx67td. The database allows you to either view all error messages alphabetically or search for the text of your error message in particular.

The results of your search will not only yield what caused the error but

may also suggest actions you can take to work around it. Some solutions also include links to articles for further information. With thousands of error messages in the SmartComputing.com database and hundreds of thousands accessible via Google, chances are good you'll find your answer at one place or the other.

But sometimes you won't be able to find a solution, or else implementing

that solution may be beyond your comfort level. Even worse, your error may be preventing you from accessing the Internet in the first place, which eliminates your best hope of tracking down and correcting such problems. (This is most common when attempting to deal with hardware driver problems or application reinstallation.) In these cases, you might consider calling in some expert assistance. That doesn't have to mean shelling out cash: Free support exists for many people in the form of friends or family. (And, naturally, you can call *Smart Computing's* free tech support line: (800) 368-8304.)

However, if you do know a computer expert, be sure to employ his services judiciously; after all, he can't spend all of his time being your personal tech support line. Be prepared before calling for help: Write down your *exact* error message and provide a detailed account of the actions that led to the error. Also, regardless of whether you're speaking to a friend or to a company tech support rep, be sure

The Lighter Side Of Error Messages

Error messages enjoy an amusing spot in the popular consciousness. After all, these are the only means a computer has of talking to us, and let's face it, computers say the darnedest things. Here are a couple of our favorite online spots for the error aficionado:

Ben Ezzell's Error Message Contest. Ranging from the baffling to the hilarious, author/developer Ben Ezzell has collected dozens of error messages, featuring screen shots and commentary. Our favorite is the windows dialog box that announces, "An unnamed file was not found."

See www.ezzell.org/Error%20Messages/Error_Frame.html

Atom Smasher's Error Message Gallery. Some users have enjoyed creating their own error messages. If you don't find a favorite here, follow the links to assemble your own.

See atom.smasher.org/error/gallery/

404 Research Lab. The Page Not Found (or error 404) error may be the most commonly seen error message. They're usually pretty boring, but here is a gallery of 404 pages that are much more interesting than most.

See www.plinko.net/404/

BSoD Gallery. Featuring images of Windows crashing everywhere. You'll learn much about what devices around us run Windows, and you'll get a kick out of seeing them inoperable.

See daimyo.org/bsod/

to have on hand information that will enable him to help you. This includes such things as your operating system (including any installed updates or service packs), the model (and in some cases, the serial number) of your computer, and a list of hardware and software you've added. This will help you avoid wasting your tech's time, which makes it much more likely that you'll receive the help you're seeking.

User forums are another free resource for technical assistance. These are online communities at which users post questions and receive help from other users. One example comes from Annoyances.org, named after the popular O'Reilly series of *Annoyances* books. Here you can search for posts in which people have asked about the same problem with which you're currently dealing, or you can enter a question yourself and probably receive a useful reply.

Help Is Coming

Error messages are getting better. By author Ben Ezzell's lights, "Things have improved dramatically. I like to think I've had an influence, but there are other factors." In the early days of computing, Ezzell notes, resources were so scarce that programmers had to be terse with their language, which led to

cryptic or obscure error messages. This is no longer the case, however, and developers are starting to catch up. "In a way," says Ezzell, "they've gone overboard, because they want to link you to the Web for more information. They assume you have a high-speed connection, and this is not [necessarily] valid."

There are also troubleshooters and step-by-step wizards built into recent

versions of Microsoft Windows that will walk you through possible causes for a range of issues.

So, while we will definitely not be holding our breath waiting for flying cars, we can look forward to a day when our computers will at least speak to us more clearly. **RS**

BY AARON VEGH

The Blue Screen Of Death

The most infamous error message is the Blue Screen Of Death. It's so well-known that it has crept into the vernacular: "Aw, man! I was almost finished with my term paper when I got blue-screened!" The phenomenon is also known by its acronym, BSOD.

The conditions that cause a blue screen have changed since the days of Windows 95/98, as has what it means. In either case, chances are pretty good that, if you get blue-screened, any unsaved work will be lost, as either Windows (in NT/2000/XP) or your application (in 95/98) has been shut down.

The BSOD is perhaps the most despised error not only because it has wiped away countless hours of work over the years, but because of the obtuse way in which it does so. The messages delivered in the typical blue screen are meant for developers more than end users. For example, a blue screen delivered

by Windows may deliver a message such as the following: "0x0000001E, KMODE_EXCEPTION_NOT_HANDLED."

And if you don't find that sufficiently informative, you'll see four variables in parentheses to help developers figure out what's happening. Again, none of this will mean much to most of us, but a support rep or developer can often learn a great deal from such cryptic messages.

Fortunately, blue screens are rare in recent versions of Windows and may disappear after a reboot. But if the problem recurs, you could have a real problem. Here are some troubleshooting steps to follow if you encounter a BSOD:

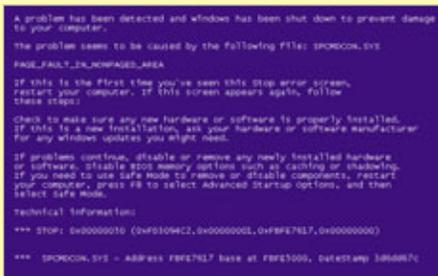
While your system is booting, press F8 and select Safe Boot Mode, which loads a subset of Windows with minimal drivers. If things run smoothly in Safe Mode, you likely have a software problem with a recently installed application. Try to decipher the error message to see if you can trace it to a specific program. If all else fails, uninstall your most recently-installed application.

If you still see blue screen errors in Safe Mode, restart again and use F8 to get to the advanced options. This time, choose Restore Last Known Good Configuration, which is a snapshot of your system as it existed before you last installed any drivers or other software. You will lose any system changes you've made since that point, but your documents will normally remain untouched by this process.

If you're still having problems, you are likely suffering from a hardware problem or a corruption of vital system files. Again, any hints that you can glean from the error message could help you (or a tech support rep) trace the source of the problem. Remove any recently installed hardware and try booting again.

In the worst case, it's not uncommon to have to resort to reinstalling device drivers or even the whole operating system.

Ultimately, the best cure for the BSOD is prevention: Save often, create frequent backups, and burn a little incense to curry favor with capricious PC spirits. **I**



Possibly Windows' most reviled error message, the Blue Screen Of Death provides information that can help developers track the cause of an error.

What To Do When . . .

Your PC Won't Start

We build our lives on expectations. When we flip on a light switch, we expect the room to get bright. When we turn the key in the ignition, we expect the motor will roar to life. When we press the power button on a computer, we expect that the operating system will appear on-screen. And when the expected does not happen, we . . . well, some of us freeze, some of us panic, and some of us gather our wits and prepare to fix the problem.

The first step in restoring an expectation is to figure out specifically what went wrong. It's not enough to say the lights won't work or the car won't start or the computer is on the blink. We have to determine whether a light bulb has burned out or a fuse is blown, whether we're out of gas or the battery is dead, whether a cord is unplugged or the hard drive has crashed. Fortunately, making this kind of determination is rather simple, even when it involves a PC.

Finding the specific cause of a failed boot involves some detective work. Take note of everything that

happens during the failed boot from the moment you press the power button to the moment the boot routine grinds to a sudden halt. Write these details, including the full text of any error messages you see, on a piece of paper so that you can refer to them later.

No Power At All

As grave as this may seem at first blush, a computer that refuses to start isn't usually all that serious.

Oftentimes, something outside the computer itself is to blame for a powerless computer.

Power cord. A loose power cord is usually the problem that prevents your computer from starting. Check each end of the cord to make sure it's firmly in place. Also be sure to check the cables that run to your monitor.

Power supply switch. See if your computer's power supply has an on/off switch that lets you kill power to the PC without removing the cable. This button, located on the back of your computer, can get accidentally bumped.

Surge protectors, outlets, and fuses. Make sure the surge protector is firmly plugged into the wall outlet and that the power button on the surge protector is in the on position. If that checks out, see if the devices plugged into other outlets on the power strip are functioning. If not, the surge protector might be to blame.

Another likely culprit is a faulty wall outlet. Plug your computer directly into the outlet, sans surge protector. Ensure that the GFCI (ground fault circuit interrupter) hasn't been tripped. If your PC still won't turn on, plug something else, such as a lamp, into the socket to see if it works. Finally, check your fuse box or circuit breaker to make sure there isn't a blown fuse or tripped circuit.

There are also a number of factors inside the computer that could prevent it from starting.



Motherboards and power supplies.

Most motherboards have a tiny light on them that lights up when the power supply is connected, even if the PC is off. If this LED (light-emitting diode) is lit, your PC is getting power, and your problem lies elsewhere.

Power supplies can sometimes go bad, and if you've followed our troubleshooting steps to this point, you may have a dead PSU (power supply unit). To figure out whether this is the case, use a power supply tester. Follow the manufacturer's instructions to check the well-being of your PSU.

Power button cables. If you've recently performed any repairs to your system, it's quite possible that you accidentally pulled the power button cable free from the motherboard. If you spot an unplugged cable, check your motherboard for labels that indicate the prongs that support the power switch. In the event there are no such labels, check your motherboard's users manual (which are usually available online).

Error Messages Prior To Windows

Dealing with a PC that seems to be starting up but stops and coughs up an error message before it can load Windows is one of the more frustrating situations a computer user can experience. Fortunately, these messages do have a rhyme and reason. Often (but not always), they indicate a minor problem.

Easy fixes. If an error message offers Last Known Good Configuration or Safe Mode, the error has something to do with Windows' startup. Selecting the former option can solve a world of unknown ills. The latter is a good choice if you've recently added new hardware.

Make sure there isn't any removable media, including floppy diskettes, CDs, and thumb drives, in any drive.

If you see an error message regarding keyboards, it's most likely the



Some power supplies have switches that let you cut power to your system. Make sure you haven't turned off your power supply.

cable has come loose. Barring that, make sure none of the keys are stuck and that all of the pins in the connectors are straight. If it's still malfunctioning, try a new keyboard—most models are quite inexpensive.

Memory and parity errors. These error messages indicate problems with your PC's memory modules. Remove memory modules and carefully reseat them in another slot. If the computer restarts properly, the slot is likely to blame; if it doesn't, it's likely the memory itself is the problem.

Unexpected Interrupt In Protected Mode. This is indicative of an incompatible change to your BIOS (Basic Input/Output System). Enter your BIOS setup menu and look for an option to reset the BIOS to its defaults.

NTLDR missing. NTLDR (think NT Loader) is the first file that executes during the boot process; it can get moved, accidentally deleted, or corrupted. Restore NTLDR from the Windows XP Setup CD via the Recovery Console. At the command prompt, type `cd ..` and press ENTER. Enter the letter of your CD-ROM drive (probably D:, unless you have multiple drives) and press ENTER. Type `cd i386` and press ENTER. Type `copy ntldr c:` and press ENTER. Type `copy ntldetect.com c:` and press

ENTER. (Ntldetect.com is another boot file that, when missing, can generate the NTLDR error.)

After the copy process completes, type Exit and press ENTER. Your computer will restart.

A Beeping Computer

Should something go wrong during the boot process that prevents the computer from even sending data to the monitor or starting the computer, you need some way to identify the problem. When something goes wrong that causes the BIOS to be unable to start the computer properly, it uses specific patterns of beeps to give you clues to what the underlying problem is.

New hardware. It's easy to accidentally bump something while working inside a computer. Retrace your steps and ensure everything is firmly in place. Reboot your computer. If the beeping continues, remove the new hardware and see if the beeping goes away.

Beep codes. There aren't any standard beep patterns. To make sense of the beeps, you first need to identify your BIOS. The documentation for your motherboard likely contains this information. With this data in hand, search online for the meanings

behind the beeps. Many sites offer such information.

Defective components. If your problem persists, it's time to look at replacing the troublesome component. If your beep codes indicate that the RAM is failing, you might need to first figure out which module in particular is the problem, because most computers have more than one memory module installed. Depending on how old the computer is, you should be able to take out the memory modules one at a time and reboot the computer to see if the problem goes away; doing so will identify the problematic stick of RAM.

If your video card is the problem, swap it out with a new one and see if the problem continues. Make sure that the video card you choose to troubleshoot or replace yours with is compatible with your motherboard and your operating system—otherwise, you will only create new problems.

For troubleshooting purposes, it is helpful to have another computer you can borrow parts from. It is best to work through the troubleshooting and be fairly confident of your diagnosis before you run down to the local computer retailer and start buying replacements. If the new parts don't fix the problem, you may be stuck with parts you can't return.

Error Messages After Windows Starts

When Windows launches but won't go any further without locking up or spewing forth error messages, check out the following options.

Windows utilities. Repeatedly press F8 (check your PC's documentation for another option if this key doesn't work) during startup to launch the Windows Advanced Options menu. Select Enable Boot Logging. When Windows starts, go to C:\WINDOWS, open Ntbtlog.txt,

and browse for error messages. Work from Safe Mode to repair any errors you find.

Safe Mode. Select Safe Mode from the Windows Advanced Options menu. Safe Mode loads Windows with a minimal set of drives and processes for more effective troubleshooting. Perform some basic system maintenance, such as an antivirus scan and Chkdsk. Reboot your computer. If this fails to solve the problem, go back to Safe Mode and use Add/Remove Programs to uninstall anything you recently added to your system. Also try a System



The Windows XP Recovery Console is your key to recovering from many errors.

Restore, which will roll the OS (operating system) back to its state at an earlier date. Go to Start, All Programs, and Accessories. Select System Restore from the System tools submenu and follow the prompts.

Last Known Good Configuration. If you can't perform a System Restore from Safe Mode, select Last Known Good Configuration from the Advanced Options menu. Last Known Good Configuration rolls back your Registry and device drivers to the last setting under which your computer shut down successfully.

Windows CD. Use your Windows installation disc or system recovery CD. Insert the disc and boot up. You need to press any key in order to boot from the disc. If not, you'll have to enter the BIOS and set your optical drive as the primary boot option. After setting the optical drive as the primary boot drive, restart your system and try booting into

Windows. There's a difference between a true Windows OS disc and the image restoration discs many manufacturers ship with PCs. If you only have the latter, the following tips may not work.

Windows' repair option attempts to re-create the Registry and restore settings without removing or altering user data. When a repair is available and works as planned, it's a great way to get a troubled system running again without starting from scratch. Boot into your Windows installation disc or system recovery CD. When prompted to choose between setting up Windows, accessing the Recovery Console, or quitting Setup, press ENTER to enter Windows Setup. Press F8 to accept Microsoft's license agreements and then press R to Repair the selected Windows installation when prompted.

Recovery console. If you have any way to back up your data, do so. Boot from your Windows installation CD (a manufacturer's restoration CD won't work). Press R from the Welcome screen. Select your Windows installation if prompted and enter your administrator password. At the command line, delete your existing Registry files by typing `delete c:\windows\system32\config\system`. Repeat four times, substituting `software`, `sam`, `security`, and `default` for `system`, each in turn. Now copy pristine versions of those files by entering `copy c:\windows\repair\system c:\windows\system 32\config\system`. Repeat four times replacing `system` in both portions of the command with the words `software`, `sam`, `security`, and `default`. Type `exit`, press ENTER, and reboot.

A Continually Restarting PC

The continuous reboot problem can have a variety of causes, including faulty or unseated memory

modules; out-of-date, corrupt, or missing drivers; software conflicts; overheating components; virus or malware; bad software; or bad hardware.

Hardware. Your computer may immediately fail to boot if one of your memory modules is unseated. The memory modules are long, narrow sticks that attach to the motherboard located near the processor and have clips at either end. If one or both of the clips is not closed or laying flat against the edges of the module, press down on the edge of the nearest to the clip. You may have to remove the memory module and reseat it. Restart the computer.

Your computer may also immediately reboot if another piece of hardware fails, has a loose connection, or becomes disconnected. Check that power plugs from your power supply are connected to the appropriate components and that those connections are secure. Listen for your hard drive to start spinning. If it is silent, then it may be faulty or disconnected from the motherboard. Also, be sure the fans on your motherboard or graphics card start spinning. If any component seems unresponsive, replace it.

BIOS. If the settings in the BIOS have changed or become unstable, you may need to reset the settings to get your system to boot again. Restart your computer and access the BIOS setup utility. When you have access to the BIOS setup utility, you should



If you can boot into Safe Mode, disable unnecessary startup programs that may be breaking Windows' bootup.

see options to Load Defaults, Load Optimized Defaults, Load Fail-Safe Defaults, or something similar. First, try loading the Optimized Defaults. If your computer still fails, re-enter the BIOS and load the Fail-Safe Defaults. If you don't have a choice, simply load the default settings as described in your computer or motherboard manual. Confirm your choice and allow the system to reboot. You may have to select the Save And Exit option to restart your system. Sometimes, your computer won't even let you access the BIOS. In these instances, you may have to reset the BIOS using a more hands-on approach. The CMOS (complementary metal-oxide semiconductor) memory retains your computer's BIOS settings but can be reset by moving a jumper on a three-pin header on the motherboard and then moving it back to its original position after a short wait. You'll have to consult your computer or motherboard

manual for specific instructions on how to perform this operation. Restart the computer.

Restarting sans error message. If your system is infected with a virus or malware or experiencing system-crippling errors, you may never see error messages that can provide clues as to why your computer continuously reboots. Windows is set to reboot when it encounters a critical error. Disabling this can let you view error messages and on-screen prompts.

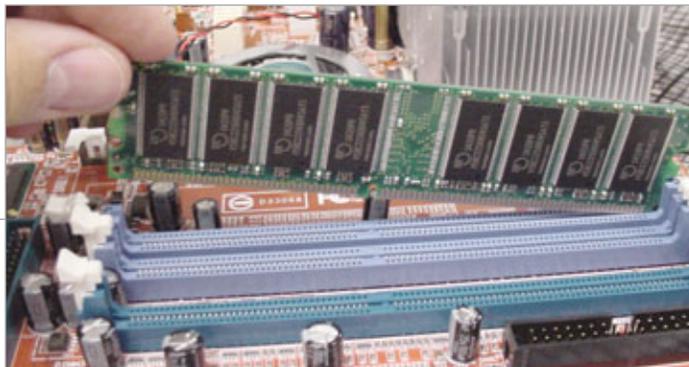
To change the setting in WinXP, boot into Safe Mode and access the Control Panel. If you're using Win2000/XP with the Control Panel displayed in Classic View, simply double-click the System icon. If you're a WinXP user viewing the Control Panel in Category View, click Performance And Maintenance and click System from the bottom of the dialog box. Click the Advanced tab and then click the Settings button from the Startup And Recovery section of the System Properties dialog box. Next, deselect the checkbox in front of Automatically Restart in the System Failure portion of the dialog box. Click OK and click OK again. Close the Control Panel and restart the computer. Now, when your system encounters an error, it will remain on-screen.

The Path To PC Well-being

Whatever the circumstances surrounding a particular boot failure, the important thing is to address the issue immediately. Follow the steps we've described here, refer to the product documentation that came with your computer, and contact the computer manufacturer's support resources for step-by-step guidance in resolving the problem. And take heart: You will get your PC up and running again. **RS**

COMPILED BY SALLY CURRAN

Reseat your memory modules one side at a time.



What To Do When . . .

Your Printer Won't Print



can resolve a surprising number of printing problems and help to define others. (NOTE: Throughout this article, “open the Print display” means to open the document you want to print and press CTRL-P, or you can open the File menu and select Print.)

First, ensure the printer is turned on and securely connected to the PC.

Check the lights and displays on the printer to ensure it is in an online (connected and ready) state. Some printers have an indicator light; others

have a text display. If necessary, check your documentation to see how your printer signals you. If it is not ready or online, look for hints as to the problem, which may be a paper jam, an out-of-paper, or low-ink condition. If nothing appears to be wrong with the paper or ink, turn the printer off, wait a few seconds, and turn it back on.

If you are printing from a removable medium, such as a Zip or USB drive or a CD or DVD, copy the file to your hard drive. Make sure you have enough free drive space (three to five times the size of the file) for Windows to spool (process to the hard drive) the document and then attempt to reprint it.

If your printer's connection runs through a

specialized connector, such as a USB hub, disconnect the printer, connect it directly to your PC, and attempt to reprint the document. If this resolves the problem, you may need to replace the hub, or your printer may not be able to operate through one.

Print A Test Page

Open the Start menu and select Printers And Faxes. Locate your printer's icon and double-click it. In the resulting display (print queue window), look for your document in the list. See if there are other jobs ahead of the job you are printing. If so, select Cancel All Documents from the Printer menu and try to print the job again. If there are no jobs ahead of the one in question, check the status. If it is Paused, click the listing, and from the Document menu, select Resume.

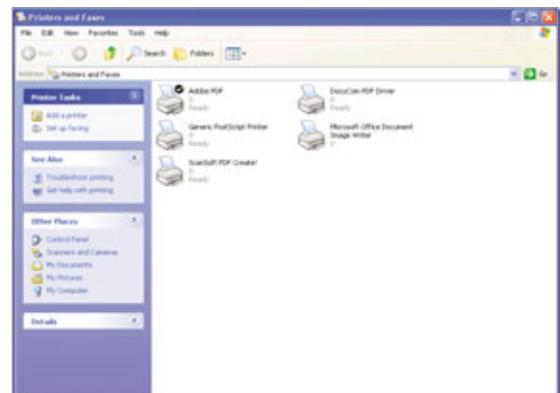
If you do not see your document listed in the print queue, print it again. Watch your printer for changes in status lights (flashing is common) or the message display, noting changes or messages you see. If you see changes in the printer's status lights or message indicator, it generally means Windows is communicating with the printer.

If Windows issues an error message (other than the standard “This Document Failed To Print” balloon) when

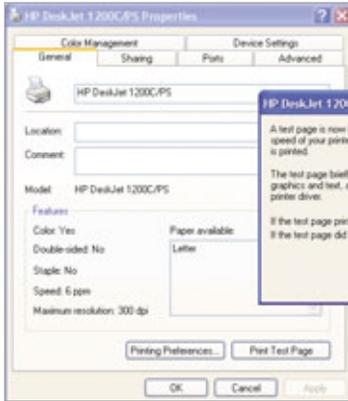
Today's printers are wonderful devices. They're inexpensive, easy to install and use, and can produce pages—and even color prints—that faithfully reproduce the originals. Nevertheless, when they do fail, deciphering the problem can be frustrating. Fortunately, a host of basic troubleshooting routines can help you resolve 95% of all printing issues. The solutions in this article are generic to all types of printers running Windows XP Home, and with a few minor modifications, many of these solutions will work with other versions of Windows, as well.

A Failure To Communicate

If your document will not print or the printed page contains garbage characters, such as symbols and meaningless text, the problem may be that the PC and printer are not communicating efficiently or at all. A few basic steps



The Printers And Faxes display in Windows will show you which printers your system has installed and is your gateway to further problem solving.



Sending a test page to the printer will determine whether the printer and PC are communicating effectively.

you print, write it down and skip to the Error Messages section of this article. If there is no error message but the document does not print, check the status in the print queue window again. If there is no status, or it shows as Spooling or Printing, the file may be very complex and may need more time to process, so wait a few more minutes before you cancel the job.

If the status is Error – Printing, the document has failed to print. Select the job in the print queue window and select Cancel from the Document menu. Check your printer's documentation to identify and resolve problems signaled by the lights or messages you recorded, such as a paper jam, an out-of-paper, or ink condition or some other printer-based problem.

If you see no printer status changes or error messages and the document does not print, cancel the print job, right-click your printer's icon, and select Properties. On the General tab, click Print Test Page. Test Pages check the ability of the printer to reproduce basic text and graphics and provide information on the printer's driver (a program that acts as a translator between the PC and the printer).

Test Page Won't Print

If a test page will not print, the PC and printer are not communicating. First, check the printer's documentation for instructions on printing a self-test page. If this will not print, the problem lies with the printer and

you should contact the manufacturer. If the self-test page prints, you have a problem with the PC or its connections.

Open Printers And Faxes, right-click your printer's icon, and select Properties. Click the Ports tab and look for your printer. Parallel printers (which have a large connector about 2 inches wide) should be set to LPT1. USB printers (which have a small connector about half an inch wide) should be set to a USB port. Change the port settings if necessary.

If you have a USB printer and cannot change it from LPT1 (common with printers offering both parallel and USB connections), delete and reinstall the printer (as described beginning with the second paragraph of the Printer Is Not Available section below). When Windows recommends a port to use, select USB. If USB is not an option, connect the printer through another USB port on your PC and/or replace the printer's USB cable. If that doesn't work and you know the USB ports on your PC are good, contact the printer's manufacturer for assistance. You can also install the printer via the parallel cable if your PC has a matching port.

If port settings are correct but the printer still can't print, contact the printer's manufacturer for the latest driver and then return to the Printers And Faxes window. Right-click your printer's icon and select Properties

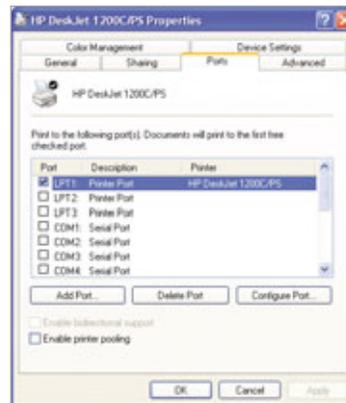
from the drop-down menu. Select the Advanced tab and click the New Driver button. Follow the prompts to update the printer driver.

If this does not work, your port may be corrupt. Return to the Ports display, select the port, click Delete Port, and then restart Windows. The system should detect the printer and reinstall the port. If it does not, your PC may be damaged and you should contact the manufacturer for further assistance. If Windows detects the port but still cannot print, delete and reinstall the printer.

Test Pages Print, But Not Documents

If you can print a test page, the PC and your printer are communicating and the problem lies with the program or your file. Open the Print display and make sure you chose the right printer (refer to The Printer Is Not Available section in this article for instructions). Make sure the Print To File checkbox is not selected.

With the settings correct, create and attempt to print a simple document—one page, no or very simple graphics, only system (native to Windows) fonts such as Times Roman or Arial. If it prints, the original document is likely either too complex or contains corrupt data. Open Printers And Faxes and right-click the icon for your printer. Click the Advanced tab and change the spool settings to



If your printer is not associated with the correct port or the port is not selected, you will not be able to print.

Spool Print Documents So Program Finishes Printing Faster and, under that setting, select Start Printing After Last Page Is Spooled. If this doesn't work, change the spool setting to Print Directly To The Printer. (Also, try closing other open programs before you

reprint.) Experiment with these settings to see if any spool setting works.

If adjusting the spool settings doesn't help, reprint the original document one page at a time to see if a particular page is causing problems. Once you isolate the problematic page, or if the document is only one page or still won't print at all, examine your fonts and graphics.

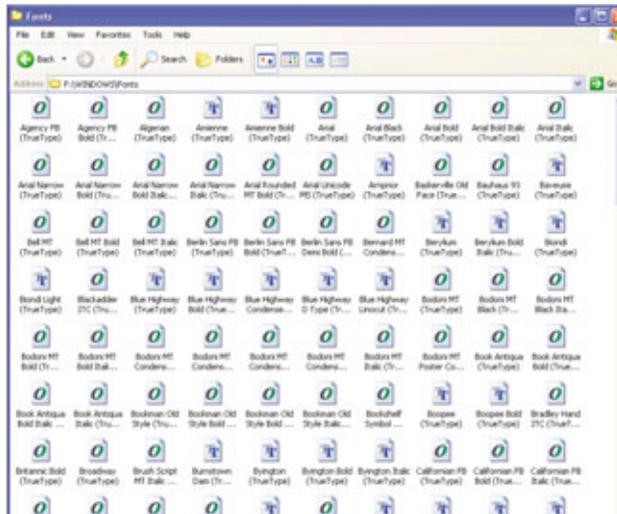
TrueType fonts are the most universally accepted fonts; check the font menu in your program to see if the fonts you are using are TrueType. To do so, open the Format menu and select Font. If there is no indication, note the fonts used in the document and check the Fonts folder (X:\Windows\Fonts, with X being the drive on which you installed Windows). TrueType fonts are noted in parentheses after the font name. Exchange non-TrueType fonts for TrueType and try to print again. Also, Font Explorer, a free utility available at www.karenware.com, can tell you which specific fonts your printer supports.

If you are using TrueType fonts (or no fonts), your graphics may be too complex or corrupt. If you reduced a large graphic *after* you placed it in the file, reduce it to the correct size in a graphics-editing program and then reimport it. If no particular graphic seems suspect, delete and reimport all graphics in the document and reprint.

If none of these solutions helps and you have a program that creates Adobe PDF (Portable Document Format) files, save the file as a PDF and try printing that.

Document Prints, But Not As Expected

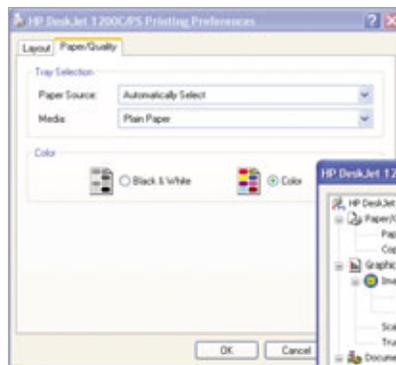
If your document does print, but the quality or colors are off or the text



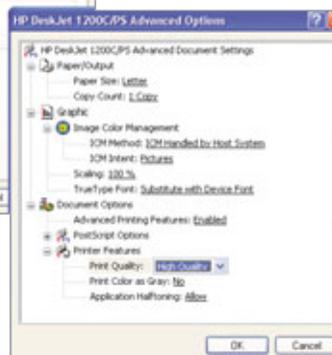
The Fonts folder in Windows XP Home will show you whether the fonts in your document are TrueType (highly compatible) fonts or some other type of fonts.

and graphics are improperly positioned on the page, it may be a problem with your printer. However, first check the printer settings in Windows. From the program in which you are trying to print, open the Print display and click Properties. Note that if you want to change these settings on a global rather than a document level, open Printers And Faxes, right-click your printer's icon, and select Printing Preferences. (NOTE: The following options listed may vary depending on printer type.)

For problems with color or print quality, click the Paper/Quality tab



The Advanced printing settings in Printers And Faxes may help you eliminate a plethora of color and print quality problems.



and make sure the color setting is correct. Use the drop-down menu to ensure the media type is correct. Click the Advanced tab. Look for choices relating to print quality (choose High Quality or Fine if print quality is poor), font substitution (don't allow substitution with device fonts if text is not printing in the right typeface), and other options. Your printer's manual may help you sort through these options.

If your pages are printing but appear cut off, click the Layout tab and check the paper orientation. You also may have created a page

larger than your printer can reproduce. In the main Print display, under Zoom, set Scale To Paper Size to match the size of your printer sheet.

If the settings are correct, check your printer to see if it needs maintenance. You may need to replace exhausted print cartridges, clean or align the printer heads, and perform other tasks. (Refer to your printer's documentation for help with this.) If your printer offers the option to print a test page from the controls on the printer, do so and check the color quality and alignment. Finally, using low-quality paper can reduce print quality. Use high-quality printing paper, not copy paper.

The Printer Is Not Available

Open the Print display, and if your printer does not appear in the Name field, click the drop-down arrow to the right. Look for it there. Another program may have installed a printer driver that moved your



Most printers have one or more test pages (pictured is a color alignment test page) they can print to determine if things are working properly on their ends.

printer down the list. If you see it, select it. If you do not see your printer listed, it may not be installed properly or you may have accidentally deleted it.

Open the Printers And Faxes window. If you see your printer listed, right-click its icon and select Delete. Select Server Properties from the File menu, click the Drivers tab, and select your printer. Click Remove and confirm your decision (this forces Windows to extract a clean driver file). Shut down Windows and turn off the printer. Make sure your printer and PC are securely connected and then turn the printer back on and wait until it indicates a state of readiness. Restart Windows. Windows should locate and install the printer automatically.

If not, check with the printer's manufacturer for updated installation or driver files. If there is an updated executable (containing the .EXE file extension) installation program, download it to your PC, click the Start menu, select Run, and navigate to the file to install it. If not, check the printer's documentation to see if there are special installation instructions (if so, follow them). Otherwise, return to the Printers And Faxes window and click Add Printer (under Printer Tasks in the left pane). Follow the instructions to

add the printer, allowing Windows to detect the printer automatically. Provide either the updated driver files or the files you originally installed if Windows prompts you to do so.

After installation, locate the printer in the Printers And Faxes window, right-click it, and select Set As Default Printer. Your printer should now appear in all Print dialog boxes and function correctly.

Error Messages

Printing error messages fall into two categories: generic and model-specific. If you do not see your error message listed here, it is likely specific to your printer. Query the Microsoft Knowledge Base (support.microsoft.com) using the exact error message as your search string, or contact the printer's manufacturer for further assistance. Generic printing messages in WinXP Home are fairly unusual, but you may encounter the ones listed below.

Device Is Not Ready. This message indicates that Windows does not recognize the printer as being ready to accept data. Check the printer power and cable and make sure it is turned on and online. If you are using a network printer, make sure the network is up and you have the appropriate print permissions. (NOTE: There are other, similar variants to this message, as well.)

Incompatible Print Driver. You'll see this error if you upgrade to WinXP and the existing printer driver is not compatible. Contact the manufacturer for an updated driver, delete the printer as described above, reinstall it,



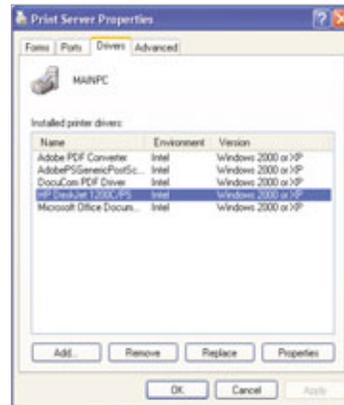
If Windows does not locate and install your printer automatically, try using the Add Printer Wizard to install it manually.

and then provide the new driver during installation.

Out Of Resources. This message indicates you have insufficient memory or hard drive space. Close programs, free some drive space, and try to print again.

Final Thoughts

The suggestions we have offered here should resolve 95% of printer woes. If not, try using the printer with another PC. If it doesn't work, contact the printer's manufacturer for further assistance. If it does work, then consider reinstalling Windows. If you think your problem may be specifically related to inkjet printers, laser printers, or MFDs (multifunction devices), other articles in this issue may help, as well. See "Basic Troubleshooting: Inkjet

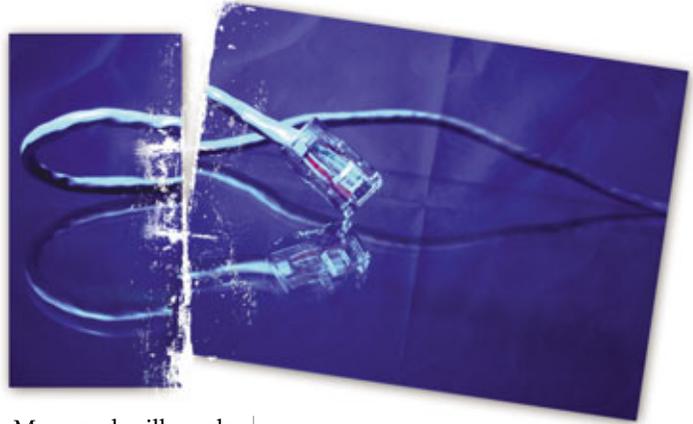


When you delete and reinstall your printer, delete your printer's driver, as well, to force Windows to replace the driver file.

Printers" on page 122; see "Basic Troubleshooting: Laser Printers" on page 128; and see "Basic Troubleshooting: MFDs" on page 132. **RS**

BY JENNIFER FARWELL

What To Do When ... You Can't Get Online



Getting online is fast becoming the main reason people use computers these days. Sure, we still do our taxes, write letters to loved ones in Microsoft Word, and play computer games occasionally. Still, perhaps the most interesting activity on a PC is browsing the Web, finding unusual news stories, chatting over instant messaging, or just checking our email. Perhaps that's what makes a dead connection so frustrating. You double-click your browser's icon on your Desktop, wait a few seconds, and nothing. For some unknown reason, you can't tap into your favorite shopping Web site or search Google.com. What do you do when you can't get online?

Often, the easiest fix involves rebooting your hardware. You may also have to reboot your PC. Resetting these hardware devices works in many cases because in most cases the Internet connection has a conflict on your network or with your PC, and resetting your equipment can resolve these issues.

Of course, this solution doesn't always work. In this problem-solving guide, we'll cover some of the common problems that prevent you from getting online, including how to reset hardware. Most of these instructions apply to Windows XP, but the concept can

apply broadly to Macs and will work with most makes and models of modems and routers, such as those from Belkin, Netgear, and Linksys.

Hardware Trouble

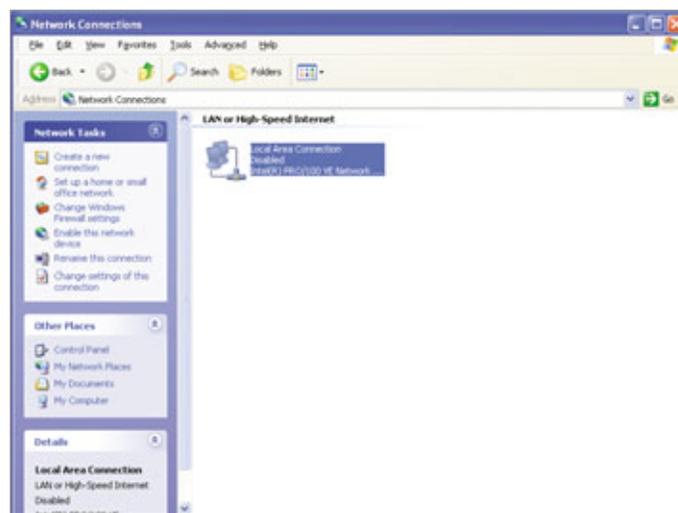
If a problem with your system's hardware prevents you from accessing the Internet, rebooting hardware will reset the device and may correct any problems.

Modem and router fixes. Whether you have a cable or DSL (Digital Subscriber Line) modem or a home router, you'll want to unplug the power cable, wait at least 15 seconds or up to a minute, and then reinsert the cable. The device will refresh itself and the IP (Internet Protocol) address (a unique number the device

uses for the Internet) will reset. An IP address is almost like a home mailing address or telephone number; the hardware might get occasionally confused about which address to use. Some hardware, such as the Belkin Pre-N Wireless Router, requires that you leave the device unplugged for as much as a minute for the refresh.

If you are having trouble accessing the Internet and you recently configured your home router, you may need to perform a hard reset, which returns the router back to its factory default state. For many models, this means unplugging the power cable from the router, holding down the reset button (located on the back of the router), and plugging in the power cable as you hold down and release the reset button. Consult your router manual for the specific steps because some routers require that you press the reset button for a few seconds to perform a reset. Also, some cable modems, such as those made by Belkin, come with a button on the modem that disables Internet access; make sure that button is not activated so you can get online.

If you tried resetting your hardware and the device is still not working, you may need to call technical support and send the unit in for



Sometimes your computer's LAN (local-area network) card becomes disabled when you switch to a wireless connection or if you install a program on your laptop that automatically disables the card.

Often, the easiest fix involves **rebooting** your hardware.

repairs. It's a good idea to inquire about warranties (many routers have a two- or three-year warranty) or repair costs, especially because you may be able to spend less on a new model than to pay for shipping and repair.

Cable issues. Another common reason you may not be able to make an Internet connection is because your network cable is unplugged or it isn't firmly seated in the LAN (local-area network) port. Check the back of your desktop or the LAN port on your laptop and make sure the cable is connected. On most computers, if the network cable is inserted correctly, you will see a green light indicating an active connection. After you confirm the cable is secure and that you have an active connection, try your browser again.

Issues Specific To The Internet

If your troubles stem from the Internet or specific Web sites, read on for possible explanations and fixes that will have you surfing again in no time.

Unavailable Web site. Occasionally, you may be unable to access a Web site that you visited previously without any troubles. This can happen if the Web site's ISP (Internet service provider) temporarily disabled the site, if the administrator failed to renew the Web registry data, or if too many people try accessing the site at the same time. Often when a site you access is unavailable, you will receive the "HTTP 404 Not Found" error message.

One way to know if a site is temporarily down is to check another commercial site to see if your Internet

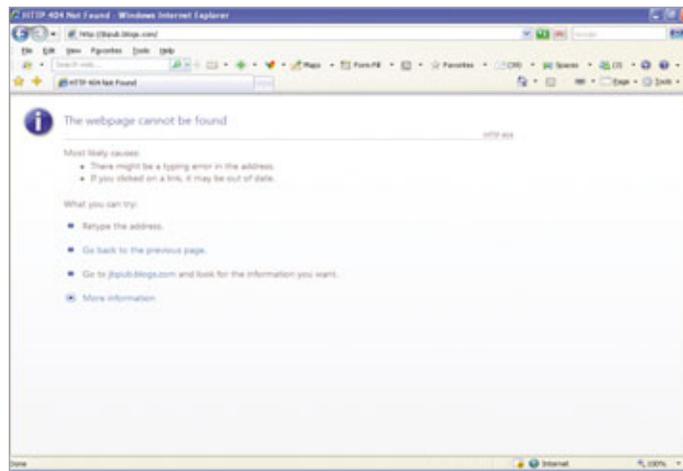
connection is active. If you can access some sites but not one particular site, you may simply need to try accessing the site at a later time. You can also try deleting your Internet temporary files. To do this in Internet Explorer 7, for instance, open the Tools menu and select Internet Options. Next, click the Delete button under the Browsing History section and click Delete All. When you delete these temporary files, IE can access Web sites instead of using possibly outdated local files on your computer for a particular site.

Contact your ISP. If you checked the common causes of Internet connection problems, such as a loose

the ISP, your provider may need to send out a technician to inspect the line. Before you request a technician, be sure to turn off the modem and wait a few minutes to refresh the settings and then turn the modem on again to see if you still experience problems. Also, try rebooting your computer and router (if you are using one).

Trouble with IE and Firefox. If you experience frequent system crashes while surfing the Internet using IE or Mozilla Firefox, it is possible that the person responsible for designing the site didn't use the correct coding when building the site. This also may be the cause if you only see a few graphics

load, before your browser closes suddenly or displays an error message. The solution: Either avoid the site or try using a different browser. If you are using IE, for example, try downloading and running Firefox instead. A second common reason for crashes has to do with Windows XP. If other programs you use, such as Microsoft Word or Adobe Photoshop, also tend to crash, you may have spyware or a virus loaded on your PC. It is also possible that your system has become un-



If you see "HTTP 404" in your browser, it's likely a sign that your computer can't connect to a specific Web site because the site is temporarily unavailable.

network cable or a disabled LAN card, consider contacting your ISP for technical support and ask about possible outages. Some ISPs experience occasional problems in certain areas. In fact, when you call for technical support, you may hear a recording that will list the affected cities and estimate timeframes for when the ISP will have the problem resolved. If there is a connection problem between your modem and

stable due to corrupted files or memory problems. If programs you use frequently tend to crash just as often as a Web browser, consider rebuilding the system by reinstalling WinXP or upgrading to Windows Vista. If your troubles are primarily with your browser crashing, you may need to reinstall IE. (You can download IE from Microsoft [www.microsoft.com/windows/ie] and download Firefox from Mozilla [www.mozilla.com].)

Web site comes up blank. When you visit a Web site that appears to be working but only shows minimal text and no graphics, it's possible that the entire site runs as a pop-up. If your browser automatically blocks pop-ups, then you won't see the Web site. To disable pop-ups in Internet Explorer, just type the URL, hold down the CTRL and ALT keys, and press ENTER. For Firefox, type the URL, hold down CTRL and press ENTER. Holding down the CTRL key will temporarily disable pop-up blocking. Of course, you can disable pop-up blocking for most Web sites (which will also display banner ads) permanently. In IE 7, open the Tools menu, select Internet Options, and click the Privacy tab. Under Pop-up Blocker, click Settings and change the Filter Level to Low. Then click OK twice. In Firefox, go to the Tools menu, select Options, and click the Content tab. Deselect the Block Pop-up Windows checkbox and click OK. Now, all pop-ups will appear for most sites.

A site takes an inordinate amount of time to display. If you get online and the Internet is running slow, your surfing experience might not be enjoyable. Sometimes all the connections, cables, and hardware work properly, but there are other reasons for the slowdown. One reason may be that you are accessing a popular Web site that may be experiencing high traffic at the time you visit.

Another cause for a slower Internet could be because many people in your neighborhood are accessing the Internet at the same time. A cable modem, for example, will run slower if numerous visitors connect at the same time.

To resolve these issues, you can choose to access popular Web sites or browse the Web at different times of the day (such as late at night) or call your ISP and request a faster throughput speed. If you upgrade from 3Mbps (megabits per second) to 5Mbps, you'll notice that even



A firewall can sometimes become too aggressive in blocking ports on your computer, especially if you select the Don't Allow Exceptions option in Windows XP.



A pop-up blocker is remarkably effective at blocking banner ads and other annoying Web intrusions, but it can also block legitimate Web sites. Disable a pop-up blocker by using CTRL-ALT in Internet Explorer 7.

popular sites load faster. Using a Web accelerator can also help. Google offers a free Web accelerator at webaccelerator.google.com. However, accelerators are known to cause

problems with some Web sites and can actually cause slowdowns. You can easily check the speed of your connection by visiting a site such as www.testmy.net. Click the Download Test link to perform the test.

A plug-in is necessary. Some sites won't load because they use a plug-in, such as Adobe Flash or Adobe PDF (Portable Document Format), or because they require ActiveX (a Microsoft add-on for application-rich Web sites).

Often the best solution for loading plug-ins is to just let your browser download the plug-in and follow the on-screen prompts. For example, Firefox will prompt you to download Adobe Flash when it visits a site that uses Flash. You can also install plug-ins manually. For example, if you visit Adobe.com, you will see a link for Flash.

Other Adjustments

If you ruled out hardware issues and still have problems connecting to the Internet, don't despair. There are a few more things you can check.

Check firewall settings. A firewall is useful for making sure a virus or a spyware client doesn't invade your computer while you're online. However, sometimes a firewall can also prevent you from accessing the Internet. A firewall blocks Internet ports that control the flow of information from your PC to the Internet.

Some firewalls might be too aggressive in blocking ports, especially if you decide to use a file-transfer program or swap photos over an instant messaging client. In WinXP, a common firewall problem is that the

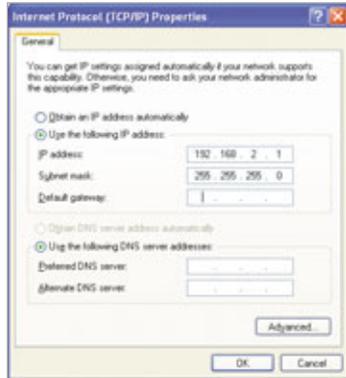
Often the best solution for loading plug-ins is to just let your browser download the plug-in and follow the on-screen prompts.

system is configured to not allow firewall exceptions.

To change this, right-click the Local Area Connection icon in the System Tray and select Change Windows Firewall Settings. Deselect the Don't Allow Exceptions checkbox and click OK. Try accessing the Web again. If you use a different firewall, such as Zone Alarm or the Symantec Internet Security Suite 2007, consult the manual for advanced firewall options that might block unknown sites.

Check the IP address. It is possible that your computer is set to use a static IP address. For example, if you bought a Web cam that runs on a wireless or wired network, the setup may have instructed you to configure a static IP address. Most computers are configured to use a dynamic IP address, but a static IP forms a direct connection between your PC and another device for installation purposes. To see whether your system is using a static or dynamic IP address, begin by opening the Control Panel and double-clicking Network Connections. Next,

right-click Local Area Connection and click Status. In the resulting dialog box, double-click Internet Protocol (TCP/IP), select the Obtain an IP Address Automatically radio button, and click OK. Click OK again and then reboot your PC.



Some Internet products, such as Web cams and network storage drivers, will configure your LAN card with a static IP (Internet Protocol) address; use a dynamic IP to resolve the issue.

Your computer LAN adapter is disabled. A common issue that prevents some people from connecting to the Internet is a disabled LAN. In some instances, if you or another user decided to use a wireless connection, someone may have disabled the LAN card. Another reason

your LAN card may be disabled is because your laptop may be configured to save power by disabling devices that use extra power. To enable the LAN card, open the Control Panel, double-click Network Connections, right-click Local Area Connection, and select Enable. If the card fails to enable, there may be a physical problem with the card or the network cable may be disconnected. Check the cable connection. If you continue to have trouble with your LAN card, contact technical support.

The wireless connection on your laptop is not configured properly. You may have trouble connecting to the Internet because your system isn't connected wirelessly to a router.

In this situation, your laptop connects to the router, which itself connects to a cable or DSL modem and then connects to the Internet. So, if your laptop can't make the connection, the Internet will be unavailable to you. Often, a wireless connection configured incorrectly is the cause of this type of problem. For example, you may be connecting to the wrong SSID (Service Set Identifier; the wireless network name that the router uses) or attempting to connect to an 802.11g network with an 802.11b client adapter.

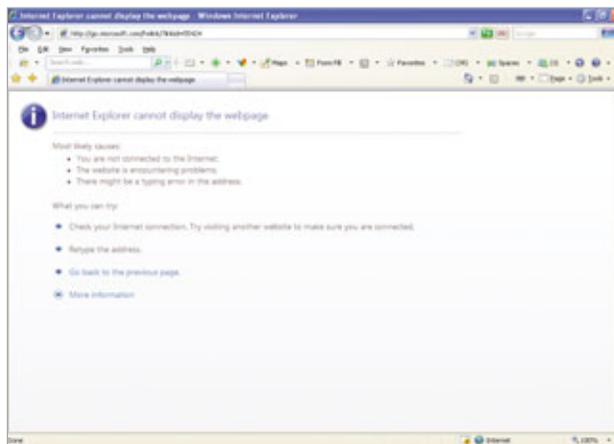
The solutions: Connect to a wireless router that provides Internet access or configure the router to allow clients to connect over 802.11b. Router configuration is an advanced process but usually involves enabling or disabling options. You can access your router by typing its IP address into Internet Explorer. To find the router's IP address, consult the router's manual.

For more information regarding wireless network troubleshooting, including how to check for Internet-related problems, see "You Can't Access A WLAN" on page 33.

Get Back Online

For many of us, getting online is something we do every day without any trouble. When problems do arise, such as a loose cable or a Web site that is temporarily unavailable, the fix is usually quick and solves the problem completely. Some pesky problems do persist, but you can resolve those issues with a repair or by replacing the device. And then it's back to Web surfing, instant messaging, and all the other activities we rely on during our online escapades. **RS**

If you can't access every site you visit, first check the network cable on the back of your desktop or laptop to make sure the cable is secure.



BY JOHN BRANDON

What To Do When . . .

Your Browser Has Been Hijacked

You open up your Web browser, just like any other day, but something's not right. The page that always loads when the browser starts is different. There are shortcuts in your Favorites folder that you can't recall putting there, and other abnormal things happen when you browse. Worst of all, even though you manually switch everything back to the original settings, the changes don't stick. Or maybe the options to revert to the old settings aren't even there at all.

Your browser has been hijacked, and although most hijackers are not interested in destroying files or doing the malicious things associated with other attacks, such as that of viruses, a hijacked browser is still a major problem that must be handled immediately. Hijackers are designed to redirect your Web browser to Web sites of the hijacker's choosing to direct more traffic to specific sites so that they can generate more advertising revenue.

Hijack Basics

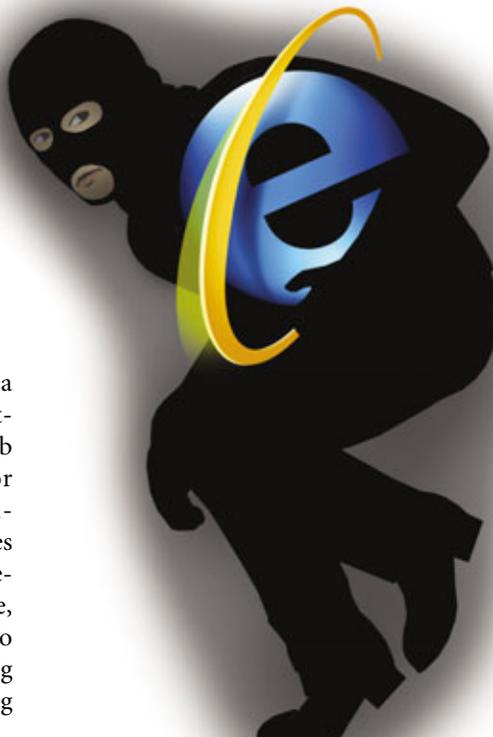
Browsers may be hijacked in a number of ways. The most basic attack is triggered when you view a Web page and code within that page (or code that is automatically downloaded when the page is viewed) uses a security loophole to change your default home page, default search page, and browser settings. It doesn't do anything other than that, meaning you can fix the problem by changing

those entries back to their original settings (which we'll discuss later).

Many hijackers rely on users installing software, either inadvertently or on purpose, that gives them broader access to the system. Some of these hijackers prevent you from changing your home page or search engine back to what you want by completely disabling those settings in Internet Explorer. Others do even worse things, for instance, causing pop-up advertisements to appear even when you aren't browsing the Web.

An Ounce Of Prevention

One of the easiest ways to practically eliminate the potential



for being hijacked is to switch from Internet Explorer to an alternative Web browser such as Firefox 2 (free; www.mozilla.com/en-US/firefox) or Opera 9 (free; www.opera.com). Hijackers focus their efforts on IE because so many people use it, and programs designed to exploit flaws in IE won't work when applied to other browsers. Firefox and Opera continue to gain in popularity, and this may increase to a point where those browsers become targets, as well. But for now, if you currently use IE, switching over to a different browser comes with immense security benefits.

If you use IE, make sure to keep it as up-to-date as possible because Microsoft constantly identifies and fixes security holes. To do so, open IE, expand the Tools menu, and click Windows Update. Click either Express or Custom (or update the Windows Update software, if necessary) and install all of the patches that are available for Internet Explorer.

No matter what Web browser you use, it is extremely important to install multiple antispyware applications on your computer and regularly update them. These programs scan for current problems, and many of them also lock down the computer so hijackers can't easily use the most common routes of entry. You can use as many antispyware applications on the same computer that you want to (unlike antivirus software, where you must stick to a single program). We recommend Windows Defender (free; www.microsoft.com/athome/security/spyware/software/default.mspx), Spybot Search & Destroy (free; www.safer-networking.org), Ad-Aware (free; www.lavasoftusa.com), and SpywareBlaster (free; www.javacoolsoftware.com/spywareblaster.html). Update these programs at least once per month if they don't come with the ability to do so automatically.

Also, we recommend downloading and running BugOff (free; www.spywareinfo.com/~merijn/programs.php), which fixes a lot of exploits commonly



Be very careful when using BugOff, or you may accidentally disable a legitimate program.



Use Windows Update to keep Windows XP and your Web browser as up-to-date as possible.

used by hijackers. BugOff is trickier to use than the other programs mentioned because you must enable or disable entries manually and doing so can have impact on programs you actually want to use. When running BugOff, the goal is to click Disable for as many entries as possible but check the Side Effects text closely to make sure doing so won't interfere with your applications. For example, disabling the Microsoft.XMLHTTP Object closes a hole that a hijacker can use, but it also prevents Windows Update and Gmail from working properly, so leaving it enabled is probably worth the risk. Clicking the Disable button instantly makes the change, so simply close the program when you are finished.

Finally, always be on your guard when browsing or clicking links in emails or other documents that open

Web pages in your browser. The worst hijackers gain access to the computer because people unknowingly install them on their computers by clicking a button or link in a pop-up window that appears while browsing or by installing downloaded software that lets the hijacker get a piggyback ride onto the hard drive. Don't blindly click links included in emails and never click anywhere in a pop-up advertisement (you can press CTRL-W to close an IE window without having to click to close it). Also, be on the lookout for pop-ups that look like alerts from Windows but are actually disguises designed to get you to click a button, inadvertently giving your permission to download whatever the hijacker wants to install.

A Pound Of Cure

Heading off the hijackers doesn't take a lot of work, but you have real problems if the browser has already been infiltrated. Before getting into specific fixes, it is important to note that the steps provided in this article apply to the latest version of Internet Explorer 7. If you use an earlier version of IE, you should upgrade to the latest version or use an alternative browser for security reasons.

If you're lucky and the hijacker simply changed your IE settings without installing any other software on your computer, you can easily revert to the settings you want to use. To establish the default home page, open IE, navigate to the page you want to use for a home page, expand the Tools menu, click Internet Options, and select the General tab. Click Use Current, and the page you

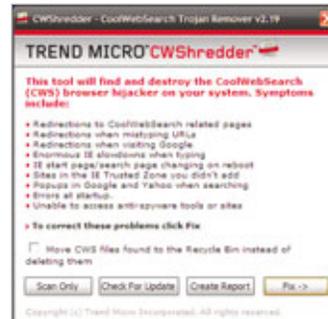
navigated to becomes the default home page, or you can enter it manually (such as entering www.google.com if you want to use Google as your home page). Click Apply when you're finished.

Click the Settings button in the Search section to re-establish your default search settings. Click to highlight the incorrect search entry, click Remove, and then highlight the entry you want to use and click Set Default. Click OK. If the search service you want to use doesn't appear on the list, click Find More Providers, click the entry for the service you want to add, follow any prompts that are provided (if any), and the service should now be available when you establish default settings. There is also a Create Your Own option on this page that lets you add any search service that isn't represented on Microsoft's master list.

If you think your browser has been hijacked, checking to see if the culprit is the oft-used CoolWebSearch hijacker or one of its myriad offshoots should be your first priority. These hijackers are designed to drive Web traffic to www.coolwebsearch.com (don't

type that address into your Web browser!) or other advertising sites. They accomplish this using many means, ranging from making the computer think that popular sites such as Yahoo! Search don't exist (and instead redirecting you to an ad site) to making IE think that restricted Web sites should be trusted.

Fortunately, there is a free tool called CWShtredder that will detect and remove all known versions of this annoying hijacker. To use the tool, download it from www.intermute.com/spysubtract/cwshredder_download.html, double-click the file's



CWShtredder detects and removes all known versions of the annoying CoolWebSearch hijacker from your computer.

icon, and click I Agree. Click Check For Update, click Fix, and then click OK to scan the computer for the CoolWebSearch software and eradicate it if it is discovered.

Sometimes hijack attempts aren't reversed this easily, and you'll need specialized tools and a lot of help to complete the job. The best tool by far is HijackThis (free; www.tomcoyote.org/hjt), which thoroughly scans the computer to find everything that is taking advantage of a known security loophole in Internet Explorer and Windows. HijackThis is an extremely powerful tool, which is its biggest drawback. Scans return information on legitimate programs, as well as hijackers, and there's no way for a novice to know what to fix and what to leave alone. Fortunately, there are loads of experts ready to offer free help, day



Update your antispyware software, such as SpywareBlaster shown here, regularly to ensure the best possible protection.

or night, at the TomCoyote.com Web forums.

If you've just performed a spyware scan using any antispyware tool, reboot the computer before using HijackThis. To download the software, go to the aforementioned Web site and click the HijackThis download button. The software is stored in a compressed ZIP file, so you'll need to use a utility such as IZArc (free; www.izarc.org) or the built-in ZIP utility included with Windows Me/XP to extract it. Once the HighjackThis.exe file is moved

from the ZIP archive to the Desktop (or any other folder you like), double-click HighjackThis.exe and click Do A System Scan And Save A Log File. Wait for the scan to complete, and a new file should appear on the Desktop (or in the folder where you ran HijackThis) that is labeled Hijackthis.log. This is the magic data you need to get help at the forums.

To use the forums, go to www.tomcoyote.org and click the Forums link near the top of the page. Look for a Register link in the Welcome screen, click it, and sign up for a free user account (you can't post about your problem unless you register). Be sure to enter a valid email address when signing up because a confirmation email is sent to make sure your registration is legitimate. When the email arrives, open it, click the activation link, and sign in using the information you entered during the registration process. Scroll down to the Computer Help section and click the HijackThis Logs And Spyware/Malware Removal link. Be sure to read the Welcome New Members post in the Important Topics section before proceeding.

To post your specific log, click the New Topic button. Enter a brief description of your problem in the Topic Title box and then provide more detailed information in the white text box. You now need to copy and paste the contents of the log file you just generated, so double-click it (it should open in Notepad), open the Edit menu, click Select All, open the Edit menu again, and click Copy. Switch back to your forum post, click in the white text box where you want the log file to be

inserted, open the Edit menu, and click Paste. Click Post New Topic when you are finished.

Be extremely patient and courteous when waiting for a response. The forums are run by volunteer experts and are extremely busy, and it may take days for them to get back to you, so check the forums every so often to see if your topic has any new posts. When you do get a response, follow the instructions the expert provides to the letter, and they'll let you know if they need any additional information or logs to get to the bottom of the problem.

Once you know what to disable, fixing things using HijackThis is very easy. Run the program, perform another scan, and select the checkboxes next to any entries you want to remove. Click Fix Checked, click Yes to delete the items, and then click Yes again to reboot the computer and see if the problem is fixed. If it isn't, you can always head back to the forums.

Bottom Line

Avoiding a hijacked browser is not impossible if you take preventative steps and use caution while browsing the Web. The bottom line is that you don't want to let your browser be hijacked, and if it does happen, you want to fix the problem as soon as possible. We're confident that our provided suggestions will work, but if you're still having problems, be sure to read "Basic Troubleshooting: Browsers" on page 149 to see if your browser woes aren't related to hijackers at all. 

BY TRACY BAKER

What To Do When . . .

You're Pestered By Pop-up Ads

Pop-up ads are intrusive, bothersome, and annoying. Given that many pop-up ads contain scams, it's no wonder we don't like these unfriendly windows. Whether your computer displays large quantities of pop-up ads incessantly or you see one pop-up ad while browsing the Web, all of us want to eliminate pop-ups so we can use our computer in peace. Fortunately, you can remove and prevent pop-ups. Let's explore some of the things we can do to eliminate and guard from pop-up ads.

If you've ever tried to close persistent pop-up ads, you know it can be a futile effort. Instead of clicking the red X located in the upper-right corner of most windows, press ALT and F4 on your keyboard to close a pop-up ad. Alternatively, you can use the Windows Task Manager to close pop-up ads, but be careful not to close critical Windows processes or legitimate applications that are currently in use.

Play I Spy

Many persistent pop-up ads are the result of spyware or adware on your computer. In addition to displaying pop-up ads, these malicious programs can wreak havoc on your machine. They can slow down your computer, change your home page settings, and report activity from your computer, including

username and password information, to the writers of the spyware or adware. Spyware and adware are serious threats to your computer and to your personal identity.

To check your computer for spyware or adware, download and install an antispyspyware program. There are a number of free antispyspyware programs, including Lavasoft's Ad-Aware SE Personal Edition (www.lavasoftusa.com) and Javacool's Spyware-Blaster (www.javacoolsoftware.com). You may also want to install an antispyspyware program that can guard your computer from spyware before it is downloaded to your system, such as Spybot - Search & Destroy (free; www.safer-networking.org) or CounterSpy (\$19.95; www.sunbeltsoftware.com).



Unlike antivirus programs, you can have more than one antispyspyware program installed on your computer at the same time. Although it doesn't hurt to have more than one antispyspyware program, there's no reason to go overboard and install countless antispyspyware programs, either. Before running a scan using your antispyspyware program, update the program with the latest malware definitions.

Most antispyspyware programs will examine all running processes on your computer. If you're curious as to what programs and processes are running on your computer, use the Windows Task Manager to find out. Open the Windows Task Manager in Windows XP by right-clicking the Taskbar and then selecting Task Manager. The Applications tab will list all running programs. On the Processes tab, you'll see all of the processes running on your computer. Because many of these processes have vague names, do not end a process unless you're sure you know what it does.

Stay Healthy

In addition to adware and spyware protection, you'll need an antivirus program that will check to see if there are any viruses, worms, or Trojan horses on your computer. Viruses, worms, or Trojan horses can cause pop-up ads and can prevent your system from functioning. Just as a cold can pass from one member of your family to another, a virus can transfer from your computer to other computers on the network or to your friends via email or IM (instant messaging) programs. Pop-up ads caused by viruses can be more harmful than other pop-up ads because of a virus' ability to

spread and cause additional damage.

If you don't already have one, install a reliable antivirus program, such as Norton AntiVirus 2007

(\$39.99; www.symantec.com), McAfee VirusScan Plus (\$39.99; us.mcafee.com), or AVG Anti-Virus Free Edition (free; www3.grisoft.com). In addition to virus protection, McAfee VirusScan Plus includes firewall and antispyware protection.

In order to be effective, you must update an antivirus program on a regular basis. Because most antivirus programs conflict with one another, never install more than one antivirus program at a given time. If you choose to switch from one antivirus program to another, first uninstall the existing program and then install the new program.

A Toolbar With Protection

Another way to shield from pop-ups is to install a toolbar that has built-in pop-up protection. The Google Toolbar (free; toolbar.google.com) and the Yahoo! Toolbar (free; toolbar.yahoo.com) have built-in pop-up blockers. These toolbars will automatically block pop-ups. When necessary,



The Google Toolbar keeps a running total of all pop-ups it has blocked.

you can allow individual sites to display pop-ups. This allows you to see pop-ups when necessary, and avoid them otherwise.

Built-in Protection

Many Web browsers now protect against pop-up ads. The Microsoft pop-up blocker for Internet Explorer comes with Windows XP Service Pack



The Internet Explorer pop-up blocker lets you choose to allow pop-ups from specific sites.

2. Microsoft claims the Internet Explorer Pop-up Blocker is smart enough to know not to block pop-up windows that you have opened intentionally by clicking a link. For example, if you are on a shopping site and click a link to open a pop-up window containing your receipt, the pop-up window will open because you opened it on purpose.

When Internet Explorer blocks a pop-up ad, you'll see a notification in the Information Bar located below the Address Bar. If you want to allow a pop-up for a particular site, you can click the Information Bar and choose whether to allow pop-ups from that site on a temporary or permanent basis. You can also access other settings for the pop-up blocker through this Information Bar.

Stop Immediate Loading

Some spyware and virus programs will run automatically when you boot your computer. In addition to anti-spyware and antivirus programs,

advanced users may want to look at the number of programs that start up automatically when you boot your computer. Click Start and then select Run. In the Run dialog box, type `msconfig` and click the OK button. The System Configuration Utility will appear. You can prevent certain programs from starting up automatically using the Startup tab. When you're finished making changes, click Apply

and then click Close. Next, close any other open programs and files. When the System Configuration dialog box appears and asks you to restart the computer, click the Restart button.

Add-ons Can Cause Problems

Add-ons are special programs that work inside of Internet Explorer and other browsers. Add-ons can include search toolbars, games, and programs that let you view Web sites offline. However, add-ons can also invade your privacy, especially when spyware or adware installs them without your knowledge or permission.

The Internet Explorer Add-on Manager lists all add-ons installed on your computer that are used by Internet Explorer. You can use the Internet Explorer Add-on Manager to enable or disable each add-on individually. To access the Internet Explorer Add-on Manager in Internet Explorer 7, click Tools, Manage Add-ons and then select Enable Or Disable Add-ons. If you want to disable an add-on, click to select it and then click the radio button next to Disable in the Settings area of the Manage Add-ons window. When you're finished changing the add-on settings, click OK. You may need to restart Internet Explorer in order for the changes to take effect.

Pop-up Free

Although everyone is likely to see a pop-up ad from time to time, pop-up ads should not overrun your computer. By removing adware, spyware, viruses, and other malicious software from your machine, you can decrease the amount of pop-up ads you see. With fewer pop-ups, you can use your computer and surf the Web without interruption. **RS**

BY JENNIFER JOHNSON

What To Do When . . .

Your PC Has A Virus

Whether you suspect that a virus is causing your PC to behave oddly or your antivirus software finds a bug lurking on your computer, it's hard to think about anything else until you've removed the virus. Because your computer isn't healthy, your valuable documents, music and video files, and email are at risk.

In theory, removing a virus should be easy: Run your antivirus software's virus scanner until it locates the bug and then zap it. Although antivirus programs can indeed catch and kill many of the viruses that find their way to your PC from the Web, there are plenty of elusive bugs that can evade your antivirus software for one reason or another. We'll show you how to use two popular antivirus applications to catch and kill viruses, and we'll also provide tips for removing the bugs that refuse to budge.

Step 1 **Back Up, Back Up, Back Up**

If your PC has any files you don't want to lose, resist the temptation to hunt for that virus right away. Although your antivirus software may be able to remove the problem without disturbing your OS (operating system), you can't predict the sorts of trouble you may run into. This is an especially important step if you haven't yet installed antivirus software. Although most program installations go smoothly, we've experienced more than our fair share of software and hardware installations that crippled our test PCs' operating systems.

Back up your files to a CD, DVD, or other removable media—not to another PC. Some viruses infect documents and other popular file types, which means that your own files may carry the virus to the removable media. You'll need to scan your backup media with an antivirus program before you return the files to your computer or move them to another PC.

Step 2 **Update Your Virus Definitions**

Antivirus software publishers create massive databases of virus definitions that help your software identify the bugs. Because malicious users regularly create new viruses (and publishers regularly create new virus definitions to catch them), your antivirus software is out of date as soon as you install it. You'll need to download the latest definitions from the software publisher before you run your antivirus scan—otherwise, the program may miss a new virus. Many antivirus applications include a 12-month subscription to the publisher's antivirus definitions; if your subscription has expired, the software may instruct you to pay for a new subscription.

McAfee VirusScan Plus. VirusScan updates definitions automatically, but you can check to make sure you have the latest updates. The McAfee SecurityCenter, which is the software's main window, lets you know whether your system's virus definitions and other components are up-to-date. To download virus definitions and any other updates, click the Update button. A small icon that has an



arrow will appear in the System Tray while McAfee searches for updates. The process won't take long (about 15 seconds, in our experience) over a broadband connection. Once the definition update completes, you are ready to scan your computer for viruses.

Symantec Norton AntiVirus 2007. Norton automatically updates its definitions, as well. If your virus definitions are out of date, The Norton Protection Center will display a red X next to Protection Updates (which includes the virus definitions). To download the Protection Updates, click Run LiveUpdate in the Quick Tasks menu on the left side of the Norton Protection Center.

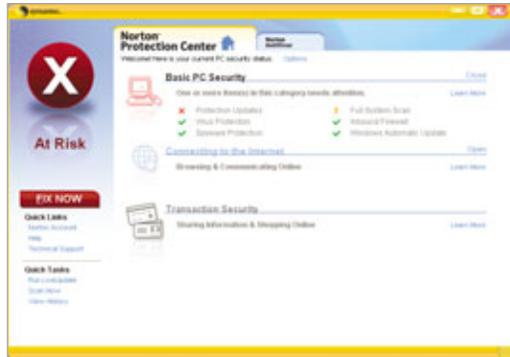
When the LiveUpdate tool opens, click the Next button and then wait for the tool to check Symantec's servers. The tool will display all of the components it can update, including

your virus definitions. When you click Next again, the tool will automatically download and install all of the definitions. Once you click the Finish button, Norton AntiVirus may restart your computer. You are now ready to scan your computer for viruses.

Step 3 Scan Your Computer

When you run a virus scan, your antivirus software scours your computer in search of files that match its virus definitions. You don't need to sit by your computer as it scans: It will identify viruses and display a report once it completes the scan.

McAfee VirusScan Plus. To scan your computer for viruses, click the Scan link, which appears on the left side of the SecurityCenter (if you're using SecurityCenter's Advanced interface, the Scan link is under Home). Once the Scan page opens, you can configure your scan. Check the My



Norton Antivirus 2007's Norton Protection Center tells you which security features need your attention. You can look at this window to quickly determine whether you have the latest Protection Updates.

Computer box in the Locations To Scan area if you want to ensure that the entire system, including any removable media in your optical and floppy drives, is included in the scan. The Options section lets you fine-tune the scan. If you want to run a full-system scan, check all of the boxes in this section. However, if you're searching only for viruses,

uncheck the Scan And Remove Tracking Cookies box. Once you've configured the scan options, click Scan Now.

You can work on other programs while your virus scan runs in the background. Simply click the Minimize icon in the upper-right corner of the window. If you need to devote your PC's resources to a particularly resource-intensive application, click the scan's Pause button. Click the Resume button to start the scan where it stopped.

Symantec Norton AntiVirus 2007. Norton Antivirus offers two types of scans: a Quick Scan, which checks commonly infected files, and Full System Scan, which offers a thorough scan of your entire PC. To run a Quick Scan, click the Scan Now link, which appears under Quick Tasks in the Norton Protection Center. To run a Full System Scan, click the Norton AntiVirus tab (next to the Protection Center tab) and then click Tasks & Scans. Next, click Run A Scan and then click Run Full System Scan.

Scan times vary from one PC to the next—the scan may finish in a minute, or it may take several minutes. If you want to work while the scan runs in the background, click the Minimize icon at the top of the scan window. When the Perform Background Scan? Window appears, check the Do Not Ask Me Again box and then click the Yes button. Now you can minimize the scan at any time and focus on your other tasks while the scan runs. The scan's window will pop up again when the scan completes.

The Results Summary page appears in the scan's window when the scan finishes. If the scan finds viruses, you'll see a number in the pink Total Items That Require Attention bar. Click the Attention Required tab at



Once your scan completes, Norton Antivirus 2007 displays a report that identifies threats. Click the Attention Required tab to learn more about the malicious files and determine how to remove them.

the top of the window. You're ready to remove the virus.

Step 4 Remove The Virus

Today's software makes removing most threats a breeze. Many applications can automatically remove minor threats or suggest removal actions.

McAfee VirusScan Plus. Once the virus scan completes, an alert will appear and the SecurityCenter will display basic information about the threats the scan found and actions it took. To view the individual threats and specify actions, click View Details. This page names each threat, displays its category (such as Potentially Unwanted Program) and displays the file path so you can see where the threat sat on your computer. VirusScan Plus can automatically fix some problems (including unwanted tracking cookies), but if you want to take a particular action, you can use the I Want To section.

VirusScan automatically removes some unwanted threats. Rather than deleting these files, it moves them to the Quarantined Programs And Tracking Cookies section. To view the files and delete them (or restore them, if you decided you want certain cookies, for example), click the Advanced Menu link at the bottom of the SecurityCenter and then click the

Restore button. You can now view information about quarantined items without harming your PC.

Symantec Norton AntiVirus 2007. The Attention Required tab in the scan's Results Summary window lists each threat (including nonvirus threats, such as cookies) and suggests an action in the Action column. You can use the drop-down menu to select an action (such as Fix, Ignore, or Exclude), or you can leave the suggested action in place. When you're ready to remove the threats, click the Apply Actions button.

In some cases, Norton AntiVirus may not be able to automatically fix the problems it finds. If it finds virus infections in system files, for example, it may recommend that you use your OS installation CD to replace a damaged file. You'll find information about the problem in the Attention Required tab.

If you think that a particular file is infected, but Norton doesn't flag it as suspicious, you can move it to the Quarantine, which is a protected environment that won't let the file do any further damage. Click the Norton AntiVirus tab and then click Tasks & Scans. Click Manage Quarantined Items and click Go To Quarantine. When the Security History: Quarantine window appears, you can click Add Item To Quarantine to use the Manual Quarantine tool, which lets you browse for the suspicious file.

Online Resources

Don't panic if you think you have a virus but don't already have antivirus software. Some antivirus software publishers offer free online scanning tools that can search your computer in minutes. McAfee, for example, offers

McAfee FreeScan (us.mcafee.com/root/mfs/default.asp) and Symantec also has a Spyware & Viruses scan (www.symantec.com/home_home/office/support/index_virus.jsp). You can also use these tools if you think your existing antivirus software hasn't caught a virus on your PC.

Some lesser-known publishers also offer online scanners. If you choose to use a scanner you don't recognize, search the Web for other users' opinions. Malicious users can create legitimate-looking security programs that "find" phantom viruses and ask you to pay for the software to remove it.

Once you know the name of your PC's virus, you can search for information about removing it. Some software publishers offer special, downloadable tools for nasty viruses. In some cases, you'll need to install a full antivirus program to destroy the virus.

Viruses vs. Adware & Spyware

Many antivirus applications don't search for adware and spyware. If you've run antivirus scanners without any luck, the program that's causing your computer to behave oddly may fall into the adware or spyware category. Several security publishers offer free anti-spyware/adware programs such as Lavasoft's

Ad-Aware SE Personal (www.lavasoftusa.com) and Grisoft's AVG Anti-Virus Free (free.grisoft.com).

When All Else Fails

If your antivirus and other apps fail to remove your PC of its malady, it may be time to wipe the system clean and re-install your OS. Be sure that once your fresh OS is installed, you update Windows completely and install your antivirus software before you reintroduce your backed up files to your PC. After all, they may still carry viruses. **RS**

BY JOSHUA GULICK

Protect Your PC

Several security software publishers offer free or trial versions of their antivirus and anti-spyware/adware applications. Here are some popular programs that can help rid your system of unwanted bugs.

Comodo

www.comodogroup.com
Comodo AntiVirus (Free)

Grisoft

www.grisoft.com
free.grisoft.com
AVG Internet Security 7.5 (30-day trial)
AVG Anti-Malware 7.5 (30-day trial)
AVG Anti-Spyware 7.5 (30-day trial)
AVG Anti-Virus Free (Free)
AVG Anti-Spyware Free (Free)

Lavasoft

www.lavasoftusa.com
Ad-Aware SE Personal (Free)

McAfee

us.mcafee.com
McAfee Internet Security Suite 2007 (30-day trial)
McAfee VirusScan Plus (30-day trial)

Symantec

www.symantec.com
Norton Internet Security 2007 (15-day trial)
Norton AntiVirus 2007 (15-day trial)
Norton AntiSpam 2005 (15-day trial)

One At A Time

Although it's certainly tempting to load your PC with all of the best antivirus programs you can find, you're much better off with a single program. As with firewall software, multiple antivirus programs may cause conflicts that create more trouble—on top of the problems your virus stirred up. **I**

What To Do When . . .

Your LAN Isn't Working

If you asked somebody how to successfully do a jigsaw puzzle, they'd probably tell you match whatever you can, and good luck. Think that's a good analogy to troubleshooting LANs (local-area networks)? We'd need to throw in half a dozen or more puzzles, together. The field is filled with software and hardware designed to build and maintain networks, similar in generalities but often very unlike in detail. This makes offering problem-solving advice that's applicable to all LANs very challenging.

But there are some difficulties that repeat between networks, and some conditions that hold true for all because they involve Windows XP or good basic maintenance practices. So while we can't guarantee that this article will make your network problem-free, we think it provides a good chance of fixing things before you get into the rocket science of unique network complexities.

Problem: I've got a wireless network, and my connection is spotty at best.

Solution: Wireless connections can be tricky. Sometimes they can work over relatively long distances but fail across the room. If your clients are within signal range of your router, begin by looking for other electronic devices that can generate electronic interference. Microwaves are frequent culprits; others are additional wireless units, such as wireless speakers,



Bluetooth devices, and cordless phones. Even wireless mice, garage door remotes, and brick walls have been known to cause problems. In short, overlook nothing and test everything if your wireless LAN experiences periodic performance drops.

Found the problem? Just because interference is present, that doesn't mean it's omnipresent. Try moving your router. Raise it several feet, or put it in an area away from other electronic gear. Even a difference of a few inches may make the difference between a good, solid connection and a poor, spotty one. Or lacking that, try moving your wireless clients away from interference-causing devices.

Another solution is to upgrade the antenna on your router, or add a range extender. Some antennas are removable, and you can purchase more powerful models.

Problem: We had a brief blackout, and I had to reset my main computer. When it came back up, though, I was unable to access the Web, and my personal LAN can't, either.

Solution: It sounds as though your computer has temporarily lost its IP (Internet Protocol) address and can't identify itself to your ISP (Internet service provider). Several conditions can cause this problem.

The first thing to try is a normal Windows reboot, as the OS (operating system) doesn't respond well to sudden interruptions in service and may not have come back correctly. Shut down your PC and manually turn off your cable/DSL (Digital Subscriber Line) modem and router. Wait about a minute, then start up your computer and turn those devices back on. Wait a couple minutes and see if the restart was sufficient to reset your IP address. If not, click Start and Run, then type `ipconfig / release` in the Open field of the Run dialog box and press ENTER or click OK. This sends a request to your provider's DHCP (Dynamic Host Configuration Protocol) server to blank or unconfigure your IP address. Wait a few seconds and then click Start and Run again, only this time type `ipconfig / renew` and click OK.

The DHCP server will now attempt to establish a new IP address for your computer. You may need to reboot at the end of this process, but either way you should once more be able to communicate with your provider.

Problem: My networked computers have suddenly stopped communicating with one another. Are there any possibilities I can look into before getting help from someone more technically savvy than myself?

Solution: Sometimes the most straightforward solution is the right one, and because it's so obvious it goes overlooked. So start by doing the obvious: Check the cables that connect

your router or hub with your PCs. While unconnected cables should show up in your Network Communications window or as a faulty device in your Device Manager, a partially seated or damaged cable may not. Don't just check visually. Make sure the cables are well-seated by hand. If you feel a lot of give, the plug or its corresponding port may be poorly secured. Try reconnecting to a different port, then try using a different network cable.

Make sure that all devices are properly powered up. It's not unheard of for power cords to come loose as a result of movement or the addition or subtraction of other power cords to or from an outlet, or perhaps someone "borrowed" the power outlet your small network depends upon. If this reveals nothing, check out the status of all your devices' LEDs. Green is usually good, but orange, red, or anything that flickers between orange or red and another color isn't.

Problem: I'm trying to print a document from a computer on my network other than the one it's connected to and it won't work. Everything else works fine.

Solution: This sounds like an issue with a Windows networking component called File And Printer Sharing For Microsoft Networks. Is it installed and enabled? Some people deliberately leave it disabled because of fears that it permits breaches to security. This is inaccurate, because you'd have to fulfill a number of other important conditions to leave your computer open to general access.

Make sure that the files you want to print can be shared; use Windows Explorer to locate them, then right-click each one and select Properties in the pop-up menu that appears. In each file's Properties dialog box, click the Sharing tab and make sure the Local Sharing And Security option isn't checked. Instead, select the Network Sharing And Security

checkbox. Finally, note at the bottom of the Sharing tab whether your firewall is configured to permit network sharing of that file or folder. Windows Firewall has an option to disallow this because it assumes you might be accessing your computer at times in less secure locations, such as airports, offices, and cars. If you're using a third-party firewall, you'll want to make sure it's set to allow network sharing, as well.



Check Windows' Device Manager to find your network adapter's driver versions and manufacturing dates.

Also note that some files and folders, such as program files and Windows system folders, cannot be shared.

Problem: One of the computers on my network repeatedly gets the message "The list of servers for this workgroup is not currently available" when I attempt to open its Network Neighborhood window.

Solution: It sounds like your Computer Browser service is disabled. Click Start, right-click My Computer, then click Manage in the context menu. In the Computer Management window that appears, click the plus sign (+) next to Services And Applications in the left pane, and then double-click Services. Scan the list of services in the right pane to find Computer Browser. If it lists Stopped in the status field, double-click the Computer Browser

entry and click the Start button in the Service Status portion of the General tab in the dialog box that appears. You'll also want to make sure Automatic is selected in the Startup Type drop-down menu and click OK.

Some users who want more memory for applications disable these types of services because they tie up system memory whether they're currently in use or not. If you share the system in question with other users, you might want to see if one of them has stored a profile that automatically disables Computer Browser upon startup. Click Start, Shut Down, and Restart, then watch to see if Windows offers you a choice of user profiles instead of simply starting up.

Problem: When I try renewing a DHCP lease it fails. I get this message: "An error occurred while renewing interface [NAME]. The system cannot find the file specified."

Solution: This can happen when the DHCP Client service has been stopped and your IP address is showing up as 0.0.0.0. To fix this, click Start and right-click My Computer, then click Manage. In the Computer Management window, click the plus sign next to Services And Applications in the left pane, then double-click Services. Double-click DHCP Client in the right pane, then click the Start button in the General tab if the Service Status shows that it's Stopped. Next, make sure Automatic is selected in the Startup Type drop-down menu rather than Manual or Disabled, and click OK.

Problem: How can I tell if my network card is working properly, or was installed correctly?

Solution: The easiest way is to use the PING (Packet Internet Groper) utility. Click Start, All Programs, Accessories, and Command Prompt. Then in the Command Prompt window that appears, type `ping 127.0.0.1` and press ENTER.

The numbers 127.0.0.1 constitute the standard IP address for producing a loopback network connection (though you can substitute `ping localhost`, as well). It should produce a listing of several lines as replies, along with a few concluding lines of statistics. If you receive a message that transmission failed or an error occurred, you probably have network card problems.

Problem: I've tried using PING, but nothing happens at all.

Solution: Sounds like you don't have your TCP/IP (Transmission Control Protocol/Internet Protocol) installed. These protocols facilitate network and Internet communication, so you'll need to install them. Click Start and Control Panel, then double-click Network Connections. Right-click the connection to your network and click Properties, then check the list of items in the This Connection Uses The Following Items field for an Internet Protocol (TCP/IP) entry. If it's not there, click the Install button below, then double-click Protocol. Now find TCP/IP (may appear as Microsoft TCP/IP version 6) in the Network Protocol field of the Select Network Protocol dialog, click to select it, and click OK.

If after installing TCP/IP you're still not getting a response from PING, check your physical connections (make sure your network cable plugs are properly seated in their ports) and then check to see if you have a firewall running that isn't allowing your system to access the Web. Many firewalls can be configured to refuse access without inquiring of the user whether they desire it. If that's the case, scan the program's interface or check its Help files for the menus and commands you can use to configure your firewall to allow outbound access. (These vary from program to program.)

Problem: I can PING a computer by using its IP address. But if I use its

name, I get the following message: "Ping request could not find host [NAME]. Please check the name and try again."

Solution: This is probably a case of not having enabled NetBIOS Over TCP/IP. As a result, your client only makes sense of IP addresses, and doesn't know what to make of names given to computers. To fix this, click Start and Control Panel, then double-click Network Connections. Right-click your local area network connection listing and click Properties in the pop-up menu, then double-click the Internet Protocol



Make sure your DHCP Client service is set to automatic, or your IP address lease may not renew itself properly.

(TCP/IP) entry in the list of items installed for your connection on the General tab. Click the Advanced button in the resulting dialog's General tab, click the WINS tab in the next dialog, and if the Disable NetBIOS Over TCP/IP radio button is selected near the bottom of the tab, select instead the Enable NetBIOS Over TCP/IP option. Click the OK button on each of the three dialog boxes to close them.

Problem: I can PING computer B from computer A on my LAN, but not the other way around.

Solution: The most usual cause of this is a firewall that's incorrectly configured. Check computer A's firewall

and see if it's set to allow access to computer B.

Problem: I can use my network to directly browse Web pages, but when I run a program that goes out to the Web, instead, such as Windows Media Player, Norton Internet Security's LiveUpdate, and so on, Windows prompts me to create an Internet connection.

Solution: This can occur if you use WinXP's New Connection Wizard to create a broadband connection. The problem is that the Wizard doesn't enable proxy automatic detection for broadband connections requiring authentication. To solve this, launch Internet Explorer, click the Tools menu and Internet Options, and click the Connections tab in the Internet Options dialog box. Click your broadband connection's listing in the Dial-Up And Virtual Private Network Settings field, then click the Settings button to the right and select the Automatically Detect Settings checkbox under Automatic Configuration. Click OK to close both dialogs, and you should be in business.

Problem: I connect to a networked PC using my WinXP Remote Desktop Connection, then try to copy and paste data from one system to another. Either it doesn't work or I get a message stating, "Cannot copy file: Cannot read from the source file or disk."

Solution: This can occur if drive redirection isn't enabled. Click Start, All Programs, Accessories, Communications, and Remote Desktop Connection. Click the Options button at the bottom of the dialog that appears, then click the Local Resources tab. Click to select the Disk Drives checkbox in the Local Devices portion of the tab, then click Connect. **RS**

BY BARRY BRENESAL

What To Do When . . .

You Can't Access A WLAN

Having a wireless connection to access your home network or a public network at an airport or other hotspot is a wondrous capability. Not being able to get your wireless connection up and running, or having your functioning network suddenly stop working, can be a thunderous inconvenience. The complex workings of WLAN (wireless local-area network) connections sometimes break. But there are some basic fixes you can try to get your network humming again.

For the purposes of this article, we're assuming you have Windows XP on your computer. We will walk

you through steps to solve the three basic wireless connection problems you may experience: no connectivity, chronic dropped connections, and slow speeds.

No Connectivity

Connectivity problems can afflict your computer when you're first installing your network. They can also occur after your network has been running perfectly for months and you've long forgotten how to access the network interface on both your remote PC and your wireless router. Perhaps it wasn't even you who set up

the network, further adding to the challenge of solving the problem.

In most cases, you'll begin your troubleshooting efforts by checking the configuration on your remote PC. Note that it is the frustrating nature of wireless connections that any one of the suggestions below or a combination of them may work, or not. In many cases, there is no definite "this solution fixes that problem," only a series of "things to try." You have to keep trying fixes until the network works.

Open Network Connections by clicking Start, My Network Places, and View Network Connections. In the right pane in the window that opens you'll see a list of all the possible ways you can connect to the network and the Internet based on the networking hardware your system is currently set up to work with.

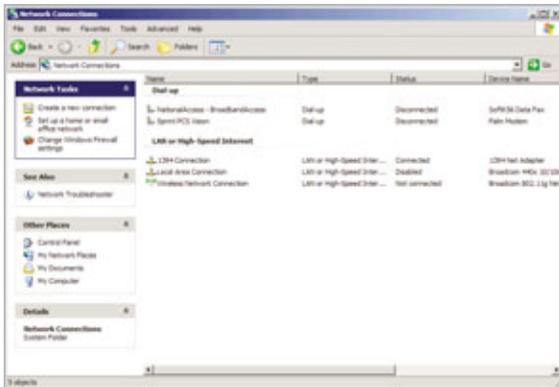
Our computer, for example, shows four types of connections: a dial-up connection via modem, a 1394 FireWire connection, a 10/100BaseT Ethernet LAN connection, and a wireless 802.11g radio connection. The Status column shows whether the connection is enabled or disabled. If it's disabled, it will say so in the Status column. If it is enabled, the status will be Connected, Not Connected, or Disconnected. When the system is working, the status of your connection of choice will be Connected. Unfortunately, just because it says it's connected doesn't mean you'll actually have network access.

If your Wireless Network Connection status is Disabled, you or another user (say, a co-worker if you're using a laptop that co-workers share) has manually disabled it. To enable the connection, right-click Wireless Network Connection in the Name column and select Enable. The menu will close and a status box will show that "Enabling" is in progress. In a few seconds the status of the device should change to Connected, Not Connected, or Disconnected and the status box should disappear. If the status has changed to Connected, try



opening your browser. You should be connected and running.

If the status changes to Disconnected, right-click Wireless Network Connection again and choose Connect. In a moment or two the status should change to Connected. If it does, try accessing a Web site with your browser.



The Network Connections window shows all of the possible ways you can connect to the network and the Internet.

Under most circumstances you should be on the 'Net. If there's still no Internet connectivity, you'll have to dig deeper.

If the status is Not Connected, the problem may be as simple as the wireless radio being off. Check the physical switch (if there is one) on your notebook or type the appropriate key combination (for example, FN-F2) for turning on the radio. The status should change to Connected. If it does, open your browser. You should be connected and online.

If, when checking the radio, you find that it's already on, right-click Wireless Network Connection and choose View Available Wireless Networks. A new window, Wireless Network Connection, opens. This window offers a list of all the available wireless networks within range and prompts you to Choose A Wireless Network from the list and click Connect. You should recognize which network is yours. If the window doesn't indicate any network as connected, you should first try your

own network. If your network is not listed, the trouble could be that your router or modem is not working properly. Check them to make sure that all the indicator lights are on as they should be. If necessary, check the manuals for those devices to get them in working order.

If your network is on the list, double-click it. A status box will appear showing the attempt to connect. After a few seconds the network chosen will give the message, "Acquiring Network Address." If everything goes well, a Connected message will appear. Open your browser and you should have access to the Web.

If both the Wireless Network Connection and Network Connection windows show your network as Connected but you still can't access the network or the Internet, your problems run deeper.

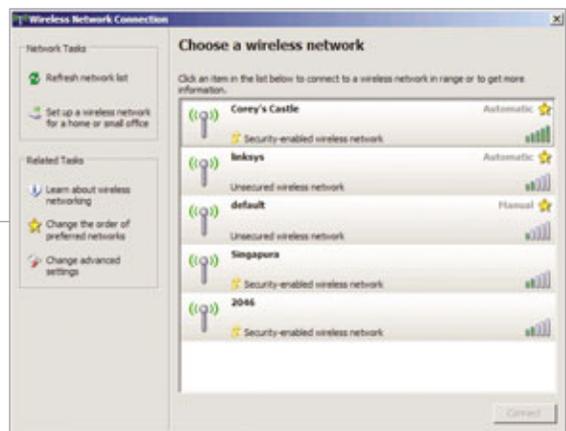
The list of available networks will indicate which networks are secured and which ones are open. If you can't get online using your own network, you can try connecting to one of the other open networks. Try to only connect to networks you know, however, because connecting to unknown and/or unsecured networks can open your computer to potential security hazards. In the list of networks, double-click the open network with the best connection (that is, the one with the most green bars). A status box shows that

The Wireless Network Connection window offers a list of available wireless networks within range and prompts you to Choose A Wireless Network from the list.

your computer is attempting to log onto the chosen network. This attempt can take some time, so be patient. When the connection completes, try accessing the Internet. If you are successful, you know that the problem with your network is probably at the router, not the remote PC. If the attempt fails, the problem could be with your PC or with the network you tried to access. If there are other open networks available, try accessing them. If you can't log on to any, the problem is likely the configuration of your remote computer.

If your Wireless Network Connection reads Connected and the available network list also shows it as Connected, the problem could be with your broadband modem or your router's connection to it. If the modem's indicator lights all read OK, try replacing the cable between the router and the modem and try connecting. If you still have no Internet access, you'll have to dig deeper into the Windows Network Connections interface.

To go to the next level of troubleshooting, right-click Wireless Network Connection in the Network Connections window and select Properties. In the Wireless Network Connection Properties dialog box the General tab displays a list of items your wireless connection uses. In fact, depending on what's listed and checked, your system may not be using all of the services, and one or



two could be causing your headaches. On our computer the items listed include Client For Microsoft Networks and File And Printer Sharing For Microsoft Networks. Both of these services can be disabled, and in simple wireless networks where you mainly just want to share an Internet connection these services should be disabled. If they are listed and active in your network and you're sure you don't need them, uncheck them. Another item that you can uncheck, if listed, is Client Service For Netware.

There can be other unnecessary items in this list to uncheck. The three basic services you want to have active at all times are QoS Packet Scheduler, Network Monitor Driver, and Internet Protocol (TCP/IP) or Microsoft TCP/IP Version 6 (both may be listed; keep only one active).

Click the Wireless Networks tab to get a list of available networks. You should see an antenna symbol next to the network name. If you see a red X, the configuration has problems. In this event check the router for possible problems and/or try moving the remote PC closer to the router.

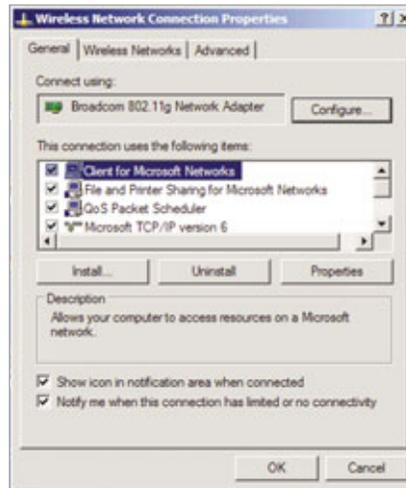
Click your network and click the Properties button under the network list. The resulting dialog box will show the encryption standard in use and include a box in which you can enter your WEP (Wired Equivalent Privacy) key. Windows can occasionally lose this key. Try typing in your WEP key. While you're here, click the Authentication tab and make sure that authentication for the network is enabled. In most cases it should be, and when used it must be activated on the router, too. Check the router configuration to be sure. Click OK to close each of the open dialog boxes.

Chronic Dropped Connections

Everyone who's ever used a radio has experienced periods of static, white noise, and, depending on the location, other stations coming through on the current frequency. Common



A status box graphically indicates your attempt to connect to a wireless network.



The General tab in the Wireless Network Connection Properties dialog box lets you identify and change the items your wireless connection uses.

(802.11b/g, but not 802.11a) wireless networks use the 2.4GHz band of radio frequency, as do many other radio-wave producing devices, including wireless phones, microwaves, various household wireless devices, and some toys. If your work area is several rooms away from the router or on a different floor, wave interference can disrupt the signal enough to keep it from passing cleanly through walls and floor.

There are a few things you can do to improve reception and keep the signal clear. The easiest, but not necessarily the most convenient, thing to do is to shorten the distance between the router and the receiver. You can, for instance, move the computer to a spot near the router. This is easily done if your receiver is in a laptop, but although your signal may improve your computer may no longer

be in an environment conducive to getting your work done efficiently.

The next best thing to moving the computer is moving the source of the signal. Moving the router or installing an access point or range extender can move the wireless signal's origination point to a direct line of sight to the receiver and dramatically shorten the distance the signal has to travel to reach the receiver. This requires an additional outlay of money (although neither piece of equipment is very expensive, and well worth the cost if they fix the problem) and some additional wiring (which is what wireless networks are supposed to help you avoid). You can get wireless range extenders or signal boosters, but you need to power these devices. So wherever you place them you'll need an outlet nearby.

Before you invest in additional equipment, check that the channel in your router's setup utility is set for automatically finding the clearest channel. If the channel is assigned, the default channel is usually channel 11, and that channel often ends up being the most heavily trafficked. There should be a radio button or other selection method to choose the automatic channel selection option. Choose that and be sure to apply the change or click OK if your router software requires it. Then close the setup utility and try your connection again.

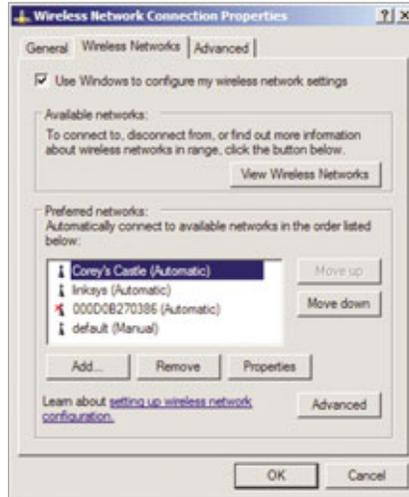
If you want an assigned channel, try one that's used less frequently than channel 11. Channels 1, 6, and 11 are normally used for public 802.11b WLANs and by many home networks. Optimally you want your channel to be as far away as possible from the others. If there are only a few other competing networks, try channel 1; the logic here is based on the probability that the others are set to the default channel 11.

One of the utilities built into Windows, WZC (Wireless Zero Configuration), is smart enough to recognize when the access point you're using may not be pumping out the strongest signal within range of your

computer. Its job is to switch your laptop to the available access point with the same SSID (service set identifier) issuing the strongest available signal, all without any user intervention. That's a great idea when all the access points are hooked into the same network. If, however, the new access point is on a different network, which in the case of a home network it will be, your connection to the network with the weaker access point gets broken. For a home network, all it takes is for your neighbor to have an access point in range to prompt the WZC to attempt to switch you to the access point with the strongest signal. This cuts you off from your own network and connects you to your neighbor's. You can disable this service, but your best bet is to simply reassign your network a unique SSID, which is recommended in any case.

You might also encounter a problem after installing WinXP Service Pack 2 or a Windows Update, in which your connection hangs when acquiring a network address or your connection becomes limited or nonexistent even if your radio is on. Microsoft offers a patch to fix these problems. It's called the Update For Windows XP Service Pack 2 (KB884020) and is available for free from its download center. To find the patch visit www.microsoft.com/downloads, enter 884020 in the search box, and click Go.

If none of the above suggestions fix your WLAN's chronically dropped connections, try resetting the router, which will restore all its settings to the factory defaults. You'll then have to set up the network as if it were new, including choosing a personal SSID, WEP encryption key, and other



The Wireless Networks tab in the Wireless Network Connection Properties dialog box displays a list of available networks.

settings. Be sure you are familiar with all the terms and functions and closely follow the steps in the router's documentation if you try this tactic. Resetting the router means that you also have to put the required settings in place in Windows, too, as we've seen throughout this article.

Slow Speeds

Speed is a relative issue. In WLANs your actual wireless transmission speed rarely reaches the rated speed. Even so, when your wireless network has been tooling along at speed X and it suddenly slows to speed Y, you'll find you're waiting for Web pages to load and files to download longer than before. At that point it doesn't matter what speed X is; you're at speed Y and not happy. Unfortunately, if you're getting the signal but the signal is not strong or clear, it's

more likely about airwaves than about anything else.

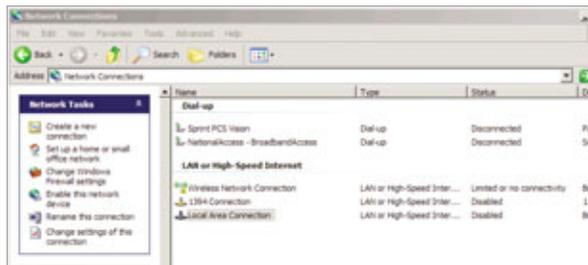
If all has been well and now isn't, the most probable cause is signal interference. There are some questions you can ask yourself to help determine possible problems and solutions. Have you moved the position of your remote PC? If you're working on a laptop, are you in your usual workspace or have you set up in a different location? If you've moved, try going to your regular location and see if things are back to normal. If you are in your normal spot and you've notice the slowdown for a while, check the list of available networks in your area. If there are some new ones, they may be causing interference. Try not broadcasting your SSID. (You set this in your router's interface.)

Have you bought any new radio-wave emitting devices recently? They may be wreaking havoc on your signal. Have you bought any new heavy pieces of furniture that happen now to be standing between the receiver and the router? Have you spoken with your neighbors? Perhaps one of them has a new wireless phone. Try changing channels on your router as described above. If that doesn't work, try talking your neighbor into exchanging the phone for a router-friendly one. Move the router and receiver close together.

Further Support

With most WLAN problems have to do with settings rather than equipment. If the solutions in this article don't fix your WLAN problems, use a computer with working Internet access to visit *Smart Computing's* Tech Support Center. Go to www.smartcomputing.com, click the Tech Support Center link, and under the Basic Troubleshooting Articles heading click the View ALL Basic Troubleshooting Articles link. You'll find further information under the Networking – Wired & Wireless heading. **RS**

Wireless network problems, such as the "Limited or no connectivity" message displayed here, can occur after installing Windows XP Service Pack 2 or a Windows Update. Microsoft has a fix for this problem.



BY DAVID A. FINCK



What To Do When . . .

You Can't Send Or Receive Email

Sending and receiving email is one of the fundamental expectations of any connected PC. It should be as easy to do as turning on your computer—but sometimes it isn't. Simple as it seems, emailing is actually a complicated procedure that has many possible points of error. When your email client starts delivering arcane error codes, a simple process gets complicated quickly. For these troubleshooting situations, we will be using the most common email client, Microsoft's Office Outlook 2003. Many of the principles and fundamental fixes for these programs work similarly in other clients such as Outlook Express, Mozilla Thunderbird, and Eudora.

Email Just Won't Start

You can't get your mail if you double-click your Outlook icon and

nothing happens. The most common cause of this problem is that Outlook didn't close properly or entirely the last time you used it. A piece of the program may still be in your computer's memory, so Windows may believe the program is already running. To fix this, just wait; Windows XP often cleans its own memory of remnant program code on its own, but this can take a while. Another fix is to reboot your PC, which restarts Windows with a clean memory slate.

The shortcut fix to this problem is to end the Outlook "process" that's still operating in the background. Press CTRL-ALT-DELETE to bring up the Windows Security window and click the Task Manager button. In the Task Manager, click the Applications tab and look to see if Outlook is listed under the Task column. If it's listed and the status is

"Running," this means the program is active but for some reason it isn't visible to you. Click your email program to highlight it and click the Switch To button to see if that opens the program. If that doesn't work or if the program isn't visible in the Applications tab, click the Processes tab and look for Outlook.exe, which should be listed under the Image Name column. Click your email program and then click the End Process button. A Task Manager Warning box will warn you that you'll lose any unsaved data if you click the Yes button. Click the Yes button to end the process and then close the Task Manager window. There are times when Task Manager will list Outlook.exe several times; eliminate all of these listings in order to clear your PC's memory. You should be able to open Outlook now.

Email Is Not Talking

One of the most common error messages you may get from the Outlook email client is Outlook Is Unable To Connect To Your Incoming POP3 E-mail Server. The first thing to do in this instance is to check your Internet connection. Open a Web browser window and try to navigate to a Web site. If the browser also is unable to connect to the Internet, then your problem is with your network connection or the connection to your ISP (Internet service provider), not with your email client. We won't get into general troubleshooting of a bad

network connection here, but you should first check your network cables, any router you may have, and your cable or DSL (Digital Subscriber Line) modem to make sure that they are plugged in and connected properly.

Before tinkering with your email client settings, you should also check your security software and firewall settings. It is possible that one of these programs is interfering with how your email client communicates with the Internet. Every security program works differently, but to check if this is the trouble, try temporarily disabling your firewall or security protection. Security suites such as Norton and McAfee have quick disable buttons, which will come up if you right-click their icons in the System Tray or click the first window of the program. If you do this and your email client works properly, then the issue involves your security suite and you need to consult its documentation for the fix.

Send & Receive Errors

If you succeed in isolating the problem in your email client, then you need to check out its configuration settings. In Outlook, click the Tools menu and E-mail Accounts to open up the E-mail Account wizard. Under E-mail, click View Or Change Existing E-mail Accounts and click the Next button. In the E-mail Accounts window under Name, click to highlight your default email account and then click the Change button, which brings you to the email program's settings screen.

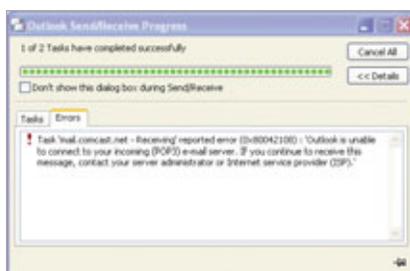
In Outlook you need to confirm that the client is reaching out to the correct server addresses at your ISP. Every ISP will be different, so you need to get the right email setup instructions from your provider. In most cases, however, your Incoming Mail Server (POP3) listing should read something like *mail.yourISPname.com* and your

Outgoing Mail Server (SMTP) should look something like *smtp.yourISPname.com*. Your ISP may have changed these settings because of an email client upgrade or a system change, so be sure to double-check them.

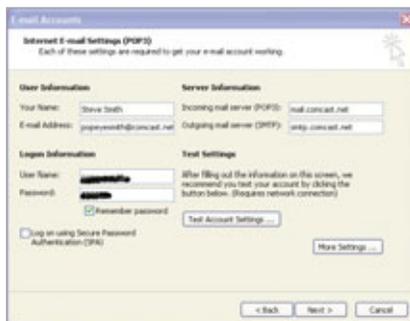
If the settings look correct and the program still isn't sending or receiving

email, try deleting the Incoming Mail Server (POP3) and Outgoing Mail Server (SMTP) entries and retyping the correct addresses.

Another possibility is that your ISP's email server isn't responding because it needs you to use SPA (Secure Password Authentication). If there isn't a check mark in the Log On Using Secure Password Authentication (SPA) box, check it and then click Next and Finish. In other cases, you may get error messages from the server such as, SSL Negotiation Failed. In that case, uncheck the Log On Using Secure Password Authentication (SPA) box because the servers are incompatible with it.



The most common error message from an email client indicates that your network connection is out.



The heart of your email client is the configuration settings pages, which tell the programs how and where to communicate with your ISP's (Internet service providers') mail servers.

The Settings Are Correct

If you're certain your email client is properly configured and network and Internet connections are working properly, but your Send/Receive process still fails, then try rebuilding your email account. Sometimes you have to delete and re-establish your email settings for them to work properly.

First, make sure you have all of the necessary information for your account and ISP: username, password, outgoing/incoming server names, and any other settings the ISP requires.

In Outlook, click Tools and E-mail Accounts to open up the E-mail Account wizard. Under E-mail, click View Or Change Existing E-mail Accounts and click the Next button. Highlight your default email account and click the Remove button. (This will not delete your old email messages.) Next, click the Add button. Most user email accounts use a POP3 email server (unless your ISP tells you otherwise), so select the POP3 radio button and click Next. In the next window, fill in your User Information (name and email address) and Logon Information (the username for the account and the password). On the right side of the window, fill in the

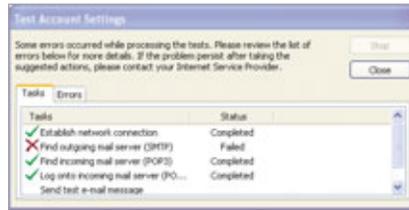
Server Information we outlined earlier (incoming mail is mail.yourISPname.com and outgoing mail is smtp.yourISPname.com). In Outlook you can test your settings by clicking the Test Account Settings button. The next screen tests all of your settings and reports where exactly the problem may be. If Outlook can't find the network connection, then the problem lies with the ISP. If it can't find the SMTP (Simple Mail Transfer Protocol) or POP3 (Post Office Protocol 3) server, then the outgoing or incoming mail servers are probably mislabeled. Once your settings pass all of the tests, click Next and Finish to return to the client. If your account settings are working properly, you should receive a test message in your Inbox from Outlook the next time you click Send/Receive.

But I Put In My Password!

A common email frustration occurs when your client repeatedly asks you to enter your password and fails to make contact with the server. In many cases you already have your password embedded in the program's configuration but the password window keeps popping up. In our experience, this has usually indicated a temporary problem with our ISP's email servers and not a problem with our local email client. To fix this problem, close out of Outlook and try again later. If the problem persists, then use the steps we outlined earlier to search the client's configuration settings and check to see that it still has your password entered properly. Otherwise, email or call your ISP to inquire about the status of its email servers.

Bad Host

Some email messages you try to send will return an error message indicating Host Unknown. Usually, it is most likely that the recipient's email address is incomplete



Outlook has a self-test routine that can test your email client configuration and help pinpoint the source of the errors.

or wrong. If you're certain the address is correct, then the message means there is a problem with the recipient's email server. Later, try re-sending the email again.

Is It Better To Give Than To Receive?

Sending email often is more error-prone than the retrieval process. You may get error messages from your email client that it Cannot Contact The SMTP Server or that The Server Connection Timed Out when trying to send a message. Sometimes, the client will alert you that it was trying to contact the outgoing server for one minute and asks whether it should continue.

In some cases, this message is a result of your email client losing contact with the correct outgoing port on your computer or the SMTP server. The most common fix for this is to close down and restart your email client. The program may issue an alert and ask whether to send the unsent messages before shutting down; tell it not to send anything and close the client. Wait about 30 seconds to let any remnants of the program clear out of the memory and then restart and send the message again.

Shrink Your File

Your email may "time out" or return an error message from the server related to "attachment size." Many ISPs put an upper limit on the file size you can attach to an outgoing message: sometimes 2MB,

3MB, or more. A large attachment can also produce an error message because the upload takes so long that the client drops the connection. To determine whether the attachment is the cause, try sending the same message after removing the attachment. You can also use Window XP's native file compression program to stuff the file into a smaller package. To do this, right-click the file you want to attach to your email, select Send To from the drop-down menu, and click Compressed (Zipped) Folder. This process creates a new ZIP file that should be smaller and easier to send.

Another workaround for sending huge attachments is to use a Web-based email service such as Google's Gmail, MSN's Hotmail, or Yahoo! Mail. Sign up for an account with these free services and you can send enormous file attachments that would otherwise choke your POP3 account.

Am I A Spammer?

When you send a single email to a large list of people, your ISP may return an error message such as The Message Could Not Be Sent Because One Of The Recipients Was Rejected By The Server. In order to block spammers, most ISPs limit the number of people to whom you can send the same message to—usually between 25 and 50 recipients. With mass mailings, try sending multiple instances of the same message to only 20 recipients at a time.

You can solve many of the most common email problems with one of the fixes we discussed in this section. However, you will need to keep in mind that the background processes for email can involve complex exchanges between your PC and the servers at your ISP. When all else fails, you may want to call your ISP's tech support. **RS**

BY STEVE SMITH

What To Do When . . .

You Can't Open Email Attachments

Maybe you're expecting a photo of your newest grandbaby, waiting for a cute forward from a friend, or looking for an important business contract. Regardless of the contents, when an email message arrives, you want to open it. Unfortunately, that's not always easy; attachments that accompany many emails can be difficult to open. To help, we've rounded up some tips and tricks to assist you in opening troublesome email attachments.

Safe & Saved

Because email attachments can contain viruses and other harmful files, the software installed on our computers often tries to protect us from attachments. In doing so, this software prevents us from opening those attachments, even if the attachment and email is legitimate. There are ways around this, but it's best to proceed with caution. Because of the damage viruses can cause, it's always a good idea to make sure that the attachment you are trying to open is legitimate and safe before opening it.

Although most trustworthy antivirus programs scan your email and attachments, it never hurts to save an attachment to your hard drive and let the antivirus program scan it there. Never assume that an attachment is safe until it has been scanned; even friends may unknowingly send you an infected file. Use your email program to save the attachment to a location on your hard drive. Then,

open your antivirus program and scan the file you just saved. If it's too late, and you suspect you may have opened an infected attachment, see "What To Do When... Your PC Has A Virus" on page 27.

Some files are difficult to open as an attachment. In this case, you'll want to save the file to your hard drive and open it from there. If you still have difficulties opening the file, right-click it and choose Properties. On the General tab, look for an option to Unblock the file. If available, click the checkbox next to Unblock and then click OK. Now, try to open the file again.

Rather than trying to open a saved attachment directly, you may also try loading the program first, then clicking File and Open. Some users prefer this method to other methods of opening files. Use the method you feel most comfortable with.

An Overzealous Antivirus

Although we highly recommend having an antivirus program installed, updated, and running on your computer, especially when using email, some antivirus programs will stop you from opening certain types of attachments. When you can't open a legitimate file, check your antivirus' security settings. You may have to go as far as



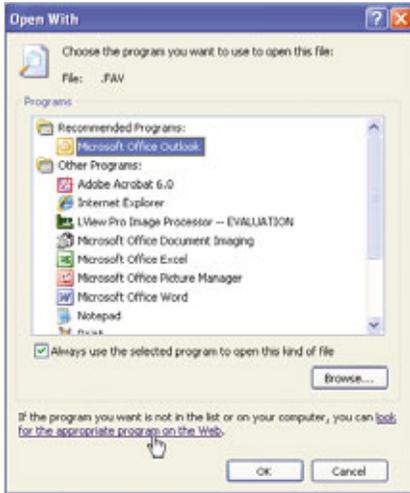
disabling the program temporarily. When you're finished viewing the attachment, make sure you re-enable the antivirus program and restore any security settings you may have changed. For more information on working with antivirus programs, see page 145.

Email Settings

Some email programs, such as Outlook Express, block potentially unsafe attachments. To open attachments that are blocked by Outlook Express, you'll need to change your security settings. In Outlook Express, click Tools, Options, and navigate to the Security tab. Uncheck the box next to Do Not Allow Attachments To Be Saved Or Opened That Could Potentially Be A Virus. Click Apply and OK, then try to open the attachment again. After viewing the attachment, close it, and then re-apply the security setting in Outlook Express for best protection.

The Right Software

Sometimes, the lack of a software program stops your computer from opening an email attachment. When



Use the Open With dialog box to select a compatible program to open an email attachment, or look for an appropriate application on the Web.

your email program can't find an appropriate application to use in opening the attachment, you may get an error similar to the following: This File Does Not Have A Program Associated With It For Performing This Action. If this happens, you may also see the Open With dialog box that lets you choose a program from a list. If your computer has a program you know will open the file, select it from the list, and click OK. Assuming the file is compatible with the program you chose, the attachment should open successfully. If you're



Sometimes, you'll need to change security settings, such as this setting in Outlook Express, in order to view attachments.

unable to find a compatible program from the Open With dialog box, click the link for If The Program You Want Is Not In The List Or On Your Computer, You Can Look For The Appropriate Program On The Web to find a suitable program.

For example, if someone sends you an image file in .EPS (Encapsulated PostScript) format, and your computer doesn't have a program that will read EPS files, you won't be able to open the attachment. In this case, you have two options: you can ask the sender to re-send the document in a different format that is compatible with the programs on your computer, or you can install software that will read the file in its current format. Using the aforementioned link to search for a program that will open EPS files, we found a couple of applications that will let us view the file, including IrfanView (free; www.irfanview.com).

If you don't know if your computer has the required software to open the attached file, look for the file's extension, denoted by a period and three or four letters that follow the file name. A file's extension will tell you what type of file you're dealing with. You can then check to see if your computer has a program associated with that file type by clicking Start, My Computer, Tools, and Folder Options. Look for the file's extension in the File Types tab. If you find the file format you're trying to open in the list, but the program associated with that file type is incorrect or different from what you would prefer, click the Change button to select a different program to use in opening all files with that extension.

Missing Messages

Some ISPs (Internet service providers) limit the size of emails you can receive. If you're expecting an email with a large attachment from someone



Some Web-based email programs, such as MSN Hotmail (www.hotmail.com), scan all attached files to ensure there are no viruses in the attachment.

and never receive the message, check with your ISP to see if it limits the size of messages you can receive. If your friend sent an email with a 5MB attachment, but your ISP limits email sizes to 2MB, you may never receive the message. Some ISPs will send a message to the sender to let him know that you never received his message. This isn't always the case, though, and some messages are lost forever.

Ask For Help

When you're unsure as to why your computer won't open a particular attachment file, ask the sender of the message what program she used to create and view the file. If you have the same program, double-check to make sure it's the most recent version and the program functions without errors.

Occasionally, files can become corrupted during the transport process. If you receive an attachment in a format your computer can read, but the file won't open, ask the sender to resend it.

Be Persistent

Email attachments aren't always easy to open. Because email attachments come in many different formats and sizes, no single solution will open every attachment. With a little persistence and these tips, you should be able to open the majority of email attachments. **RS**

BY JENNIFER JOHNSON

What To Do When . . .

You're Having Video Problems



It's not uncommon to feel completely in the dark when your computer's video or display seems to be acting up. Often, video problems prevent you from following the normal troubleshooting routines and lack error messages that hint at the real problem. The following are some common problems you may encounter and solutions to help you back into the light.

If Your Monitor Is Blank . . .

Check the computer. The first step is to make sure your computer is connected to a working outlet. Press the power button. Commonly, you can

determine if the computer is running by listening for fan noise and looking for lit LEDs (light-emitting diodes) on the front of the PC. Sometimes you'll hear a beep from the internal speaker as the computer boots. If your PC won't boot, then refer to "Your PC Won't Start" on page 10.

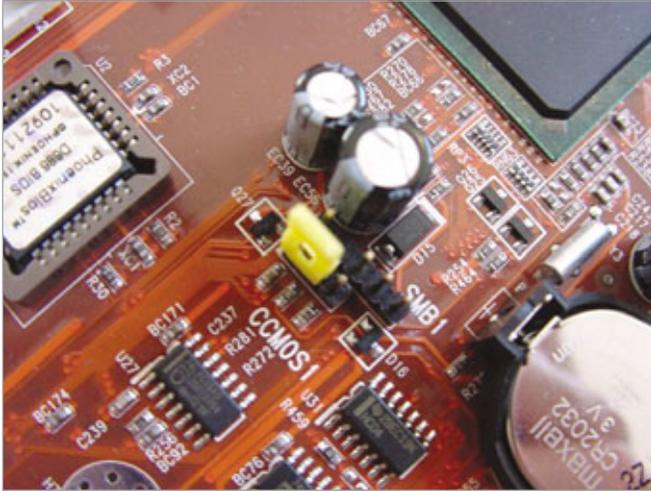
Check the monitor. If your monitor is blank, make sure its power cable is connected to a working outlet and fully inserted into the monitor itself. Also make sure the video cable is connected to the appropriate VGA (Video Graphics Array) or DVI (Digital Visual Interface) port on the graphics card or motherboard.

Tighten the screws on the video cable connector to make sure you're getting the best connection possible. Inspect both cables for exposed wires and kinks. If these exist, or if the video cable connector has some bent pins, you may need to replace the cable or monitor. Press the power button on the monitor. If you see a light, then you know the monitor is receiving power. If your monitor has physical brightness and contrast knobs or buttons on the unit, try adjusting these to make sure they were not accidentally turned to low or high.

If all else fails and you have a spare monitor handy, try plugging it into your computer. If the alternate monitor works, then you'll need to troubleshoot the former monitor itself. For more information on specifically troubleshooting monitors, refer to "Basic Troubleshooting: Screens & Monitors" on page 100. If both monitors fail to display video, then you may need to dig a bit deeper.

Check the graphics card. Your graphics adapter is responsible for everything that you see, so video problems commonly relate to graphics adapter issues. PCs typically come with one of two types of graphics adapters: the standalone variety, called graphics cards, or the built-in variety, which we'll refer to as graphics adapters. Built-in graphics adapters are actually a component of the motherboard, so refer to "Basic Troubleshooting: Motherboards" on page 88 for more information.

To inspect a standalone graphics card, shut down the computer and open the case. While the computer is still plugged in and before touching any internal components, touch a metal part of the case to discharge static electricity. Next, unplug the power cable, unplug the video cable, and examine the graphics card. If it looks like it is not fully inserted, or if the card is dusty or difficult to fully inspect, then you'll have to remove the power supply connectors (if applicable); unscrew the rear bracket screw;



The CMOS (complimentary metal-oxide semiconductor) jumper, which appears in the middle of the image, lets you reset your BIOS (Basic Input/Output System) to its default settings.

and unlatch the card by sliding, pushing, or pulling the latch that holds the card into the slot (usually found on AGP [Accelerated Graphics Port] and PCI [Peripheral Component Interconnect] Express slots). You may need to bend a tab to free the card from the slot. Gently ease the card out of the slot. Now inspect the card for obvious problems, wipe away dust with a clean, dry cloth, and also wipe the slot on the motherboard. Reinsert the graphics card, making sure the metal contacts on the graphics card are aligned with the slot. Screw the bracket into place, slide the latch on the port (if applicable), and reconnect the power connectors (if applicable). Connect the video cable to the back of the card and replace the case cover. Restart the computer.

If you have another graphics card, try installing it in the current graphics card's place. If this doesn't solve the

problem, you may need to troubleshoot your graphics card. Refer to "Basic Troubleshooting: Graphics Cards" on page 82.

Check other internal components. Sometimes, components besides the monitor and graphics card can cause video problems. One common culprit is RAM. If the RAM modules in your system are improperly seated or have failed, your display won't initialize and your computer will fail to boot. Shut down your computer, open the case, touch a metal part of the case to dissipate static electricity, and unplug the computer. The RAM modules are commonly located to the right of the processor. To remove the modules, press the clips at either end of each module down. The module should pop out of the slot. Examine the modules for visible damage, remove dust with a clean, dry cloth, and reinsert them if they appear undamaged. Make sure the modules are oriented in the slot correctly (the slots are keyed to prevent improper orientation) and then press the modules

firmly into the slots and allow the clips to snap into place. Close the case, plug in the PC, and restart it. If the problem persists, you may need to troubleshoot your RAM. Refer to "Basic Troubleshooting: RAM" on page 98.

firmly into the slots and allow the clips to snap into place. Close the case, plug in the PC, and restart it. If the problem persists, you may need to troubleshoot your RAM. Refer to "Basic Troubleshooting: RAM" on page 98.

If you've attempted all the above but still don't see anything on the display, any number of your PC's components may be causing your computer to fail to boot. Turn to the PC Components section of this issue to begin troubleshooting other possibilities, such as your PC's ports (see "Basic Troubleshooting: Ports" on page 91), power supply (see "Basic Troubleshooting: Power Supplies" on page 93), or processor (see "Basic Troubleshooting: Processors" on page 96).

Clear the CMOS. The CMOS (complimentary metal-oxide semiconductor) keeps track of your computer's internal clock and basic system settings. If the BIOS (Basic Input/Output System) settings have been improperly configured and your computer won't boot, then you may need to clear the CMOS memory and restore your PC to its factory default settings.

Don't attempt to clear the CMOS unless you feel comfortable doing so. This procedure involves opening your case, so exercise caution. Shut the computer down, open the case, discharge static electricity as described above, and unplug the computer. Next, locate the button battery that powers the CMOS. This battery is like a smooth nickel. Near this battery you'll find the CMOS jumper, which consists of three jumpers, or pins, on the motherboard. To clear the CMOS, remove the jumper cap and move it so that it caps the middle pin and the pin that was previously exposed. Leave the cap here for approximately 10 seconds. Next, move the jumper cap back to its original position. It's very important that you return the jumper cap to its original position, otherwise the computer won't boot. Now that the CMOS has been cleared,



You might be able to access Windows by highlighting the Last Known Good Configuration (Your Most Recent Settings That Worked) and pressing ENTER.



When you see this pop-up, click No to launch System Restore from Safe Mode.

close the case, plug in the PC, and restart. You may need to press a key while the computer boots to acknowledge that the settings have been reset to the factory defaults.

Windows Won't Boot

Use the last known good configuration. Sometimes, after installing a graphics card driver, you'll be unable to boot into Windows. Restart your computer and, as the computer boots, repeatedly press the F8 key until you see the Windows Advanced Options Menu. Use the arrow key to highlight the Last Known Good Configuration option and then press ENTER.

Use a system restore point. Restart your computer and, as the computer boots, repeatedly press the F8 key until you see the Windows Advanced Options Menu. Use the arrow key to highlight the Safe Mode option and then press ENTER. Log on to your computer as you normally would. Before you see the Windows Desktop, you'll see the Windows Is Running In Safe Mode pop-up. Click No. In the System Restore dialog box,

make sure the Restore My Computer To An Earlier Time radio button is enabled and click Next. Select a Restore Point from the calendar on the left, particularly one that was saved prior to when you first encountered the problem, and then click Next. Click Next to restore your computer.

Trouble With New Video Cards

Reboot your computer. If you recently installed a new video card and driver, then your computer will rely on the generic VGA driver until you reboot the system. To start using your new card to its full potential, reboot the system.

Uninstall the current graphics card driver and install an updated driver. If you didn't uninstall the previous driver, then your system probably opted to use the generic VGA driver when it determined that the current graphics card wasn't designed to run with the installed driver. Even if you installed the graphics driver from the disc that accompanied your new graphics card,

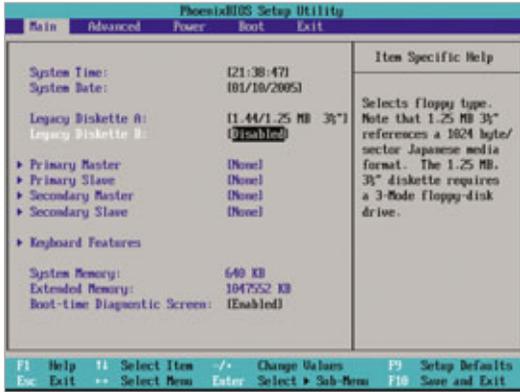
it may not have been the most up-to-date version available.

Any time you upgrade hardware, it's a good idea to download the latest driver from the manufacturer's Web site (if you haven't already done so) and save it to your Desktop. Top graphics card manufacturers Nvidia (www.nvidia.com) and ATI (ati.amd.com) make finding the right graphics card driver easy. From Nvidia's site, click the Download Drivers link at the top of the page and follow the on-screen instructions for downloading the appropriate driver. From ATI's site, click the Drivers & Software icon, click Find A Driver, and then click the appropriate options to download the latest driver for your video card.

Next, uninstall the existing driver, as well as any related graphics configuration software, using the Add Or Remove Programs utility. In WinXP, click Start and Control Panel and then click (double-click in Classic View) Add Or Remove Programs. If you're using Win98/2000, click Start, Settings, Control Panel and then double-click the Add Or Remove Programs icon. Scan the Currently Installed Programs list for the graphics card's manufacturer and then click the Remove or Change /Remove button on all items that pertain to the graphics card.

Restart the computer and double-click the executable files for the new graphics card drivers you previously downloaded. Follow the on-screen instructions to install the driver and restart the computer.

Check the BIOS. Sometimes, improper BIOS settings can result in a conflict between AGP and PCI graphics cards. To make sure your BIOS is properly configured, restart your PC and immediately begin pressing the designated key that grants you access to the BIOS. This key varies from system to system, so check your computer or motherboard manual for information about which key to press. You may also see instructions for accessing the BIOS appear on-screen as



Instructions for navigating and changing settings in the BIOS (Basic Input/Output System) typically appear at the bottom or on the right side of the screen.

the computer boots. Some common keys are DELETE, ESC, F1, or F2. If you're required to press a function key, make sure you don't have F-LOCK enabled on your keyboard. Press the key repeatedly until you enter the BIOS.

Changing BIOS settings can cause your computer to fail to boot, so exercise caution. If you're using an AGP or PCI graphics card, make sure the BIOS is configured to initialize the display with whichever type of card you use. Some older PCs are set by default to recognize PCI graphics cards before AGP graphics cards. Examine the BIOS menus for an option that lets you change this to the appropriate setting for your graphics card. Individual menu and options names

vary greatly by PC, so consult the documentation that came with your computer or motherboard.

Once you've changed the settings, press the Save And Exit key, typically F10. If at any point you made a change to the BIOS that you want to undo, you can reset the BIOS by pressing the designated Load Defaults key. The Save And Exit and Load Defaults keys usually appear on the main BIOS options screen. For more information on troubleshooting BIOS issues, refer to "Basic Troubleshooting: BIOS" at SmartComputing.com.

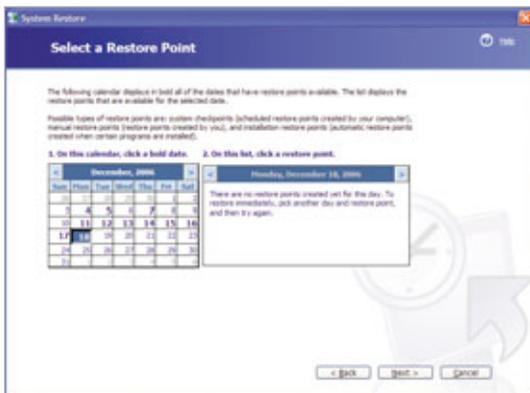
Roll back your driver. Sometimes, installing an updated graphics driver will actually cause more problems than it solves. Although this is a rare occurrence, it may force you to use an older graphics driver until a fixed one becomes available. To perform this step, you'll need to be able to access your Windows Desktop. Click Start, right-click My Computer, click Manage, click Device Manager from the left pane of the Computer Management window, and then click the plus (+) symbol in front of Display Adapters in the right pane. Right-click the graphics adapter, click Properties, click the Driver tab, and then click the Roll Back Driver button. Click Yes to continue on the Are You Sure You Would Like To Roll Back To The Previous Driver window. If at one time you installed an older driver, the Roll Back procedure will restore it as the main graphics adapter driver. If not, Roll Back will remove the current driver and begin using the generic VGA driver. Click Close to complete the process. Click OK in the System Properties dialog box and then close the Device Manager window.

The Desktop Doesn't Look Right

Adjust the display settings. If you can see your Windows Desktop when you boot the PC, then open the display properties and adjust the settings. Right-click anywhere on the Desktop, click Properties, and click the Settings tab. Here you'll find the Display, Screen Resolution, and Color Quality settings. If your computer is configured to use multiple monitors, make sure you select the appropriate one from the Display drop box. Adjust the Screen Resolution and Color Quality settings to the highest settings that your monitor supports. You may need to consult the documentation or manufacturer's Web site to determine these settings for your monitor. Click Apply and then click Yes if the Desktop looks satisfactory. If the icons and text appear too small, move the Screen Resolution slider to the left one increment, click Apply, and then click Yes if you prefer the new setting. If not, click No, and move the slider an additional increment. Continue this trial and error process until you find a setting that works. Common resolutions supported by most 17-inch or larger monitors include 800 x 600, 1,024 x 768, and 1,280 x 1,024.

Occasionally, the Screen Resolutions on the Display Properties box don't match those supported by your monitor. If you choose a setting that isn't supported, and the monitor goes blank, wait 14 seconds to allow the system to reset your monitor to the previous setting. Often the monitor will display a message such as No Connection, No Input, or No Signal during this short interval.

Typically, you'll want to set the Color Quality to the highest available setting, which is usually Highest (32-bit). Some software applications require lower Color Quality settings, so if you see errors pertaining to Color Quality when running a given application, adjust the setting accordingly. **RS**



Select a bolded date from the calendar on the left and click Next to use a Restore Point to restore your computer.

Click OK in the System Properties dialog box and then close the Device Manager window.

BY ANDREW LEIBMAN

What To Do When . . .

You're Having Audio Problems

As computers and notebooks evolve into multimedia playback centers, reliable, quality sound becomes ever more important. Alas, many problems with your computer's audio can arise at any moment. Audio troubles can originate from hardware and software sources,

and you can even track these issues back into your computer's most basic operating code, the BIOS (Basic Input/Output System). If your computer's audio doesn't sound quite right or isn't making any sounds at all, try walking through these audio troubleshooting basics.

When Silence Is Not Golden

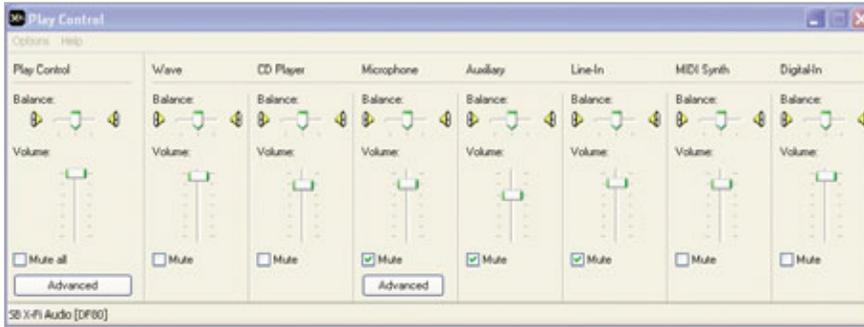
The most common audio frustration seems to be not being able to get any audio at all. Unfortunately, there are many sources of this problem, from the embarrassingly obvious to the most technically daunting.

First, check your hardware: Make sure that you've correctly connected the speakers to the audio outputs of the computer and that you properly power up the entire set. Most external PC speakers require their own power source that you need to plug in and turn on. After power outages, for instance, when you turn your computer back on, your speakers may not power back up unless you do so manually. Also, make sure that you turn the speaker volume back up to audible levels. These may seem like painfully obvious solutions, but in our experiences we can trace back many "no sound" problems to the simplest oversights.

Next, check to make sure that Windows recognizes your audio hardware. Click the Start menu, select Settings, and click Control Panel. In the Control Panel window, double-click the System icon. In the System Properties window, click the Hardware tab and then under Device Manager, click the Device Manager button. This window shows an outline of your hardware and the software drivers that make them work properly with Windows. Double-click Sound, Video And Game Controllers to check to make sure none of your audio devices has a red X on it. If you see a red X, this means that your computer recognizes the audio hardware, but the drivers are not properly installed. In this case, you'll need to reinstall your audio controller drivers. To do this, please see "Basic Troubleshooting: Audio Cards" on page 75.

If all of the hardware is operating correctly and you still can't hear anything, then you need to check the volume settings in Windows XP. First, open up Windows Media Player (or a music player of your choice) and





It all sounds like one output channel, but PC audio is made up of many audio channels where things can go wrong.

start playing a song so you have a constant audio stream for testing. Click the Start menu, select Settings, and then click Control Panel. In the Control Panel window, double-click Sounds And Audio Devices. In the Sounds And Audio Devices Properties window under Device Volume, look to see if there's a check mark in the Mute box; if there is, click the box to uncheck it. In this same area, move the Device Volume setting to High. If this doesn't work, then click the Advanced button in this area. In the Play Control window, you'll see different sliders that control the various channels of your audio. The Play Control slider (far left) is for overall output level, but other sliders regulate the output for specific audio types. Most of your Windows sound effects and media playback come through the Wave channel, and some CDs play through the CD Player channel. Make sure there are *not* check marks in these channels' Mute boxes and set the sliders to about 70% (a line or two away from the top).

If this doesn't work, you will have to make sure that the PC knows you have speakers connected. In the Sounds And Audio Devices Properties window, click the Advanced button in the Speaker Settings box. In the Speaker tab, if the Speaker Setup field says No Speakers, then your PC may not be driving any sound to the output channels. Click the drop-down arrow to select the setup that

matches your speaker configuration and then click OK.

Can You Hear Me Now?

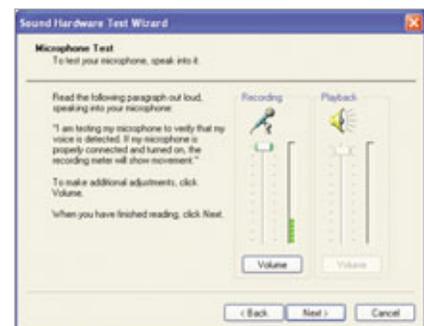
Getting a microphone to work properly on a PC can be a daunting task in itself. For starters, the microphone signal may be coming into your PC across one of several channels. To ensure that all of them are open, go back into the Sound And Audio Devices Properties menu via the Control Panel (see directions above). Click the Volume tab and the Advanced button in the Device Volume area. In the Play Control window, click the Options menu and make sure Advanced Controls has a check mark next to it so that you can see all of the available channels. With the same Options menu open, click Properties. In the Properties window under Adjust Volume For, select Recording. Under Show The Following Volume Controls, put check marks in all of the available boxes and click OK. You should now see all of the possible recording channels from your hardware. It's most likely that the microphone or headset is using the Microphone or Line-In channel, so make sure the volume levels on each of these is at 70%. Again, in the Play Control Window click Options, Properties, and this time select Playback and place check marks in all of the boxes under Show The Following Volume Controls.

Click OK to see the full range of playback channels available to you. Be sure to set the volume levels for all channels at about 70%. In some configurations you may have trouble recording from a microphone or using a headset for voice chatting if the Line-In or Microphone channels are set to Mute. If they are, simply uncheck the Mute boxes in each of these channels and test the audio recording again.

The most effective way to set your audio input is through the well-hidden Sound Hardware Test Wizard in WinXP. First, connect your microphone or headset to your line-in or microphone input on your PC. Go into the Sound And Audio Properties window and click the Voice tab. Under Voice Recording, click the Test Hardware button, and Windows will start a wizard that helps troubleshoot voice input channel problems and then sets the right levels for acceptable playback.

Isn't This Supposed To Be A CD Player?

Yes, your PC is supposed to play CDs at least as well as most dedicated CD players, but it doesn't always work out that way. If you want your music CDs to start right away and use the media player software of your choice, then double-click the My Computer icon on your Desktop. Right-click your optical disc drive and select Properties from the



Windows includes a Sound Hardware Test Wizard that helps you pinpoint recording problems.

drop-down menu. In the drive's window, click the AutoPlay tab and the drop-down menu arrow to choose Music CD. Under Actions, click the Select An Action To Perform radio button. The list below will show you all the possible actions Windows can perform whenever you put in a CD. Highlight your choice and click OK to activate it.

If your CD is already playing but you don't hear any sound, then open the Sounds And Audio Device Properties window from the Control Panel. Click the Advanced button under Device Volume and check to make sure that CD Player volume slider is set to 70% and that the Mute box does not have a check in it.

Another final fix to try on an older computer is to see if the CD drive itself has a volume knob below the disc tray. If it does, turn the volume up to just below maximum and see if that brings your CD sound back.

I Have 5.1 Speakers & 2.1 Sound

Just because you have a fancy surround sound speaker kit doesn't mean that your Windows computer knows how to use all six channels. Very often, software upgrades and audio settings from other programs will reset your audio output for standard two- or three-speaker arrangements even if you have full surround sound. If you aren't getting audio from all of the speakers attached to your computer, then go into the Sound And Audio Devices Properties window (see above for directions). Click the Volume tab and the Advanced button under Speaker Settings. In the Speakers tab, under Speaker Setup, click the drop-down menu to select the appropriate speaker setup. Surround sound games and DVDs will only take advantage of all of your speakers if the basic speaker setup is correct in this window.

Keep in mind that only some audio sources will take advantage of all six speakers in a 5.1 audio setup. In many



You can automate Windows XP to play your CDs with any player installed on your computer.

cases, MP3 music and basic sound effects will only play back in stereo (two speakers) unless you've specifically instructed your audio hardware to "expand" all audio to your full four- or five-speaker set. To expand all audio, you must find your audio hardware's control software. (Please see "Basic Troubleshooting: Audio Cards" on page 75 for more information.)

The Twisted Chain Of Audio Settings

In many PCs, two sources control your audio input/output: WinXP and software associated with an audio add-on card or the built-in audio chipset for your motherboard. This can make the process of troubleshooting audio problems frustrating because your settings may be proper in the WinXP control boxes, yet the audio hardware's drivers and software may be overriding the system settings. Most of the tips in this article deal with WinXP settings because the software for your audio hardware is particular to that hardware. As a general rule, however, you should locate that software. If it is an add-in card, one of the most likely manufacturers is Creative Labs, so look for that listing in Programs

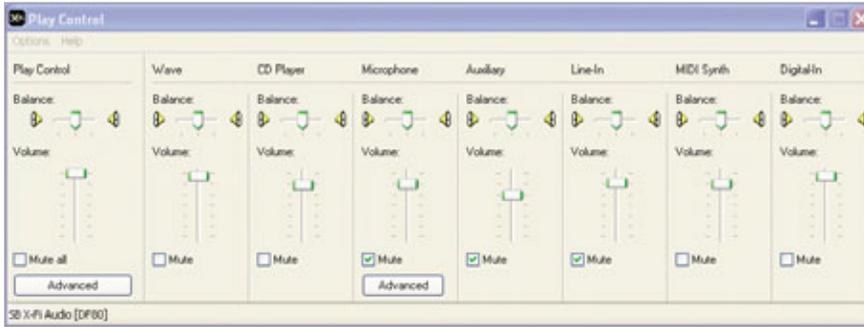
(Click Start and select Programs from the menu). If your audio functions come straight from your motherboard, then you may be looking for control software from Realtek, Nvidia, ESS, C-Media, AD SoundMAX, or Via/IC Ensemble, to name some of the most likely providers.

Weird Noises In The Attic

The source of audio distortion can be just as elusive as "no sound" problems. Again, the first response is to check the hardware. If your audio comes through an add-in card, you may be suffering interference from the many radio-emitting parts within a computer. For instance, if you hear chirping or buzzing when your hard drive is active, then your audio card may be picking up "noise" inside the computer case. One common cure is to move the audio card into the slot furthest from the hard drive and from any network interface card. Before moving the card, uninstall the audio drivers so you can reinstall them fresh after moving the audio card. (Please see "Basic Troubleshooting: Audio Cards" on page 75 on how to do this.)

No Fun

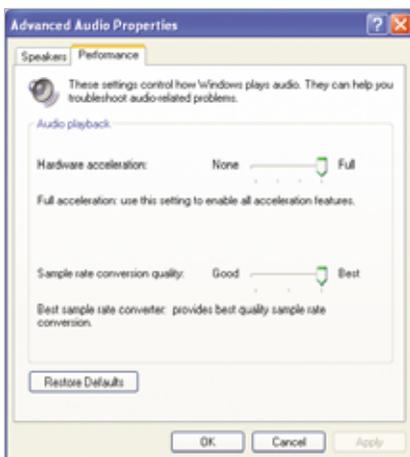
Some of the most vexing audio problems arise when playing computer games, DVD movies, or MP3 audio files. Audio and video often interact with one another, and each can undermine the other's performance. Entertainment software that uses 3D graphics or 5.1 audio tends to push your system to its limits and expose underlying weaknesses that can affect sound quality. For instance, video performance in 3D games can affect the audio, and you may get audio pauses or "hiccups" in the audio tracks during gameplay. In this case, your first line of defense is to address the video. Try to update the drivers for your graphics card because the card processes the images and sends that information across the motherboard, which can impact



Got hissing or buzzing? The most likely culprit on many PCs is the Line-In channel on your audio card.

the audio track, as well. Of course, update your sound card or audio chipset drivers, too. (Please see “Basic Troubleshooting: Graphics Cards” on page 82 for more information.)

Audio “burps” may also come from a setting buried deep within your Sound And Audio Devices Properties window. Access those controls through the Control Panel (see previous directions) and click the Audio Tab. Under Sound Playback, click the Advanced button. The Advanced Audio Properties window controls the quality and range of audio features Windows uses. If you’re experiencing persistent audio distortion in games or even in music, click the Performance tab in this window and move the Hardware Acceleration slider to



Pulling back on the Hardware Acceleration slider can disable some of the most advanced audio features in your sound chipset but also eliminate conflicts and distortion.

one notch below the Full setting. This disables some of the most advanced audio features and may produce cleaner multimedia sound. Click OK to activate the setting.

In games or other multimedia such as DVD and MP3 playback, audio burps can also come from a badly fragmented hard drive. Over time, pieces of saved files are stored in different places on your hard drive, which makes your computer strain harder when accessing data and interrupts the audio flow. If your audio problems occur when you can see the hard drive access light flicker on your PC or hear the drive loading data, then you may need to defragment the drive. Double-click My Computer, right-click the drive letter where your computer stores Windows (usually the C: drive), and select Properties from the drop-down menu. Click the Tools tab and under Defragmentation, click the Defragment Now button. The process could take up to an hour or more to complete, but it creates a cleaner pathway for your data, including audio files.

Hiss

The interior of a computer can produce electrical “noise” that results in background hissing through your speakers or headphones. The first cure is letting your speaker system do the amplification rather than your audio card or motherboard. As in the examples above, go into the Sounds And

Audio Properties window via the Control Panel. Click the Volume tab and the Advanced button under Device Volume. In the Play Control window, set all of the volume sliders to 70% or 80% and leave them there. Setting your computer’s output volume to the max tends to overdrive the onboard amplifier, which generally isn’t as efficient as the amplifier in your external speakers. From now on, if you rely on your speakers to control volume, you should get a cleaner sound.

If the hissing or buzzing persists, then you are probably experiencing interference from one of the multiple audio channels going into and out of the computer. The Line-In channel is the most likely suspect when it comes to a constant hissing. In the same Play Control window as above, click the Mute box under the Line-In column to block any audio input coming from that channel. Of course, if you use that audio input for a microphone or some other external audio input, then you will need to un-Mute the channel whenever you need to use the external device.

The other culprit may be your Microphone channel. Again, in the Play Control window, look for the Microphone channel. If it doesn’t show up, click the Options menu and select Properties from the drop-down menu. Under Show The Following Volume Controls, place a check mark in the Microphone box and click OK. You should now see the Microphone box. Place a check mark in its Mute box to silence any background noise that may be coming from that channel. In fact, you can keep your audio clean by muting any input or output channel that you don’t need.

In the end, if you’re having computer audio problems, the general rule is don’t set anything to the max. Also, be sure to always check for obvious solutions to your problems (be sure speaker cables are connected correctly) and then move on to the less obvious. **RS**

BY STEVE SMITH

What To Do When . . .

You Can't Install Something

It all seemed like such a good idea at the time. You picked up the newest, coolest video-editing suite this afternoon and spent the whole drive home thinking of how your video creations were going to put Martin Scorsese to shame. However, every time you tried to install the software, your



computer coughed up some new and exotic error that gave you no idea as to what the actual problem was. While the causes of install errors are many and varied, we've got you covered with some of the most common ones—and how to go about fixing them.

Insufficient Resources

There's one error that you may be able to circumvent before even buying the software. Too often, you can trace installation problems back to insufficient system resources. Most software manufacturers list the system requirements for their products right on the software packaging itself, but that helpful information really means nothing if you don't know what you're looking at or what resources your system has.

Let's take a look at your system's resources. In Windows XP, simply click Start, then Control Panel, then double-click System. In the window that pops up, click the System tab. Under the

System heading, you'll find your current operating system, as well as the Service Pack that's currently installed. In the lower-right quadrant of this window, you'll find information on your processor speed and available memory. Take note of all of this information; if your system's specifications don't match or exceed the requirements listed by the manufacturer, then the software won't properly function on your computer.

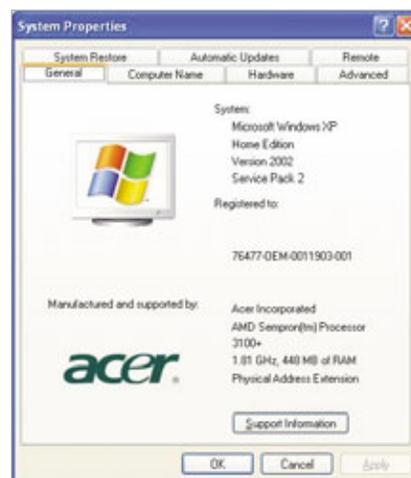
Some software packages will also have specific requirements for your video card, as well. While still in the System Properties window, you can check these by clicking the Hardware tab and then clicking the Device Manager button. To see what kind of video card your system has, click the plus (+) symbol next to the Display Adapters icon. (You can also find this information by double-clicking the Display icon in the Control Panel and then clicking the Settings tab; the video card should be listed under the Display: heading about halfway down.)

One final note about system requirements: Manufacturers will often list minimum system requirements as well as recommended ones. Though the software may work with the minimum requirements, it's probably a good idea to make sure that your system has the recommended ones because the programs you install will generally run a lot smoother and crash less if your system doesn't have to use every bit of its resources just to load them.

Do You Have Permission?

Another common problem users run into when installing new software, especially on newer machines, stems heavily from something called user permissions. Machines running Windows NT/2000/XP are all configured with an Administrator login, which is usually included so that normal users can't access certain parts of the computer. You'll know you have a problem with user permissions when your error message includes the words "Please contact your system administrator."

Of course, you probably don't have a system administrator. You're probably running the computer at home, not at an office. So why is your computer asking you to contact someone who probably doesn't exist?



You can find a wealth of information on your system in the System Properties window.



You can sidestep a large number of installation headaches if you make sure to log in as an Administrator before you try adding any new software to your system.

User privileges are sometimes tricky to negotiate, but the first step is to make sure that you're logged into your computer under the machine's Administrator account. To do this, click the Start button in the lower left-hand corner of the screen and then click Log Off *USERNAME*. When the system comes back up, choose the Administrator profile and then type in your password, which should have been set up at the time Windows was installed or set up on the computer. After you've logged in as an Administrator, try to install the program again. You shouldn't see any more error messages asking you to contact anyone.

Old News

Installation problems don't always crop up while you're installing that brand-spankin' new piece of software. Every once in a while, a program you've used with delight for years



Some programs require that you remove any old versions of the software before upgrading to a new one.

will give you a fresh error that's related to installation.

The problem here is that many types of software cannot install properly if there is an older version of the same software already present on the computer. Though this error can be frustrating, it's fortunately rather easy to fix. Click Start, then Settings, then Control Panel. Double-click the Add or Remove Programs icon.

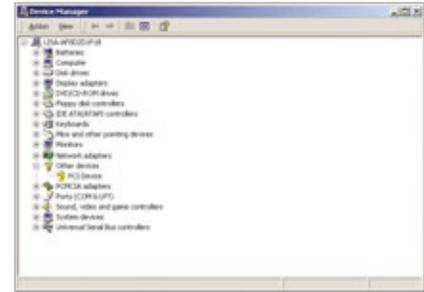
A list of the software that is currently installed on the machine should appear. Scroll down through the list until you find a match for the software you're trying to install (for example, if you're trying to install the newest Adobe Flash Player, check the list for any mention of that name). When you do find a match, click the software name and then click the Change/Remove button.

Your computer will uninstall the old version of the software. Sometimes, Windows will require you to restart your computer to complete the process. Once the computer is finished rebooting, log in as an Administrator and then try installing the software again.

If It Isn't The Software

So far, we've mainly covered software installation problems, but another set of errors can cause just as much frustration for the average home user. Instead of purchasing the newest, coolest video-editing suite, you've instead just purchased some new hardware, in the form of a DVD-R drive for your machine. You followed the instruction sheet to the letter, but when you turn your computer on, the new component still won't work. What gives? There are many reasons why a newly installed piece of hardware might not work, but we'll cover three of them in general here.

The first reason should look rather familiar, as it's also a common cause of software installation problems: system requirements. Check in the hardware's packaging, and make sure



When you see this little exclamation point, you know you've got a device conflict, which also means you've got a bit of work headed your way.

your machine meets or exceeds the manufacturer's requirements for the new part to operate.

If your system requirements are in order, make sure that your machine has the correct drivers installed to run the new piece of hardware. These will usually come in the box with the new hardware, most often on a CD. Run this CD to install the proper set of drivers for the new hardware. Also, the hardware manufacturer's Web site may also have the driver for the hardware available for download.

Now that the drivers are installed in your well-above-specs system, everything should work as advertised. If it doesn't, however, you may want to check for a device conflict. This error occurs when more than one device is trying to use the same resource or set of resources on your computer. To see if this is the case, open the Device Manager as described above and then check the list for any piece of hardware that registers a device conflict (there will usually be a red exclamation mark in a yellow circle next to the names of such devices). Check with the hardware manufacturer on how to resolve these errors, or check the "How To Install . . . Just About Anything" section of SmartComputing.com's Tech Support Center at www.smartcomputing.com/techsupport. **RS**

BY SHAWN KUPFER

What To Do When . . .

You Can't Delete Something



Deleting something is usually one of the easiest computing tasks to accomplish. So much so that OS (operating system) developers such as Microsoft (www.microsoft.com) have added safeguards to their products to make sure trigger-happy users think twice before deleting the wrong file and doing irreparable harm to their data or systems.

But there are times when the simple act of deleting something can go awry. The causes are many, from the simple to the exotic, but they all have one thing in common: They can be extremely vexing and frustrating when you just want to, well, throw out the digital trash.

Working Status

Deleting a file is usually quite simple. The application that you're working in may provide you with a warning before you delete a file, asking you to confirm that you indeed want to delete the file before proceeding. Once confirmation is given, that's all it takes.

Windows versions since Windows 95 all feature the Recycle Bin, the trash can icon on your Desktop that temporarily stores deleted files. The Recycle Bin is there in case you have second thoughts and decide you need a deleted file after all and is just an area on your hard disk set aside to temporarily hold files marked for deletion. Files stored in the Recycle Bin may last for a while, depending on the size of the Bin. (By default, Windows makes the Recycle Bin 10% of whatever the hard disk capacity is.)

But be aware that the Recycle Bin doesn't exist in certain situations. For

example, if you delete a file stored in a thumb drive, there won't be any Recycle Bin to bail you out if you change your mind. Ditto for network drives, which usually don't have a Recycle Bin either; usually, a file stored in a network drive is immediately deleted. But, since network drives are frequently backed up by businesses, there may be a copy of the file that you can retrieve from backup media if you accidentally delete something you needed after all.

Try, Try Again

You try to delete a file, but you receive a warning telling you the file can't be deleted. When this occurs, the first step is to determine whether the file is in use by a program. For example, if you attempt to delete a file that is open in Microsoft Word, switch to Word and then close the file within Word. Once you close the file in Word, you should be able to delete it with no problem.

In most cases, Windows XP tells you the application that is using the file in question, so it's pretty simple to close the file and then delete it. You can also get a clue as to the application that is using the file by the file's icon or the extension. For example, if a file extension is .PDF (Portable Document Format), you know this is an Adobe Acrobat (www.adobe.com) file that is viewed using Adobe Acrobat or Adobe Acrobat Reader.

Sometimes, even closing an application using a file isn't enough. This can happen because an application does not play nice and refuses to let go of the file even though the application is closed. In some cases, an application may appear

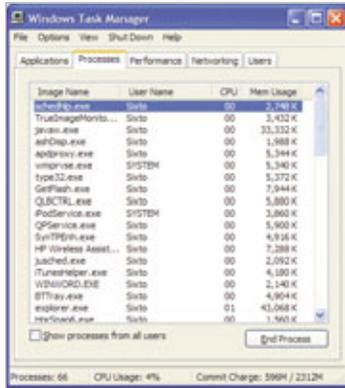
closed (you exited the application), but it is still running in the background.

For example, some applications don't close all the way when you exit but continue to run in the background. These apps may appear as a small icon on your **System Tray** (the area in Windows on the lower-right portion of the screen where you may see a number of small icons). If you suspect this is the problem, simply locate the application's icon in the System Tray and close the application. For most programs, right-clicking the System Tray icon will launch a small menu that contains an Exit or Close command. Click the appropriate command and then delete the file.

If the application using the file you want to delete is closed, there is no System Tray icon, and you still can't delete the file, you may be grappling with a poorly programmed app that refuses to release a file even after you exit the application in the normal way.

To close this type of stubborn program, press CTRL-ALT-DELETE to launch the Windows Task Manager. Click the Processes tab and look through the list of programs and processes running in your system. Unfortunately, the contents of this list are usually program names ending in .EXE or file names ending in .DLL, so things may appear a bit cryptic. Usually, the name of the program executable file for an application matches the name of the application: For example, Excel's program executable file is Excel.exe. Scan the list, find your application's executable file, and click the End Process button to close it.

If the name of the application's program executable file is not obvious,



The Processes tab in the Windows Task Manager window shows a list of all processes currently running in your system. In some cases, this may be the only way to close an application that refuses to release a file you want to delete.

browse to the program folder that contains the application's program files. To do this, double-click My Computer, Local Disk (C:), and the Program Files folder. Scroll through the list of folders until you locate the folder containing the program in question and then double-click it to open it. Look for file names ending with .EXE; one of those will be the app's main program executable, which you can then close using the Windows Task Manager's Processes tab.

If all else fails, the inability to delete a file may be an indicator of file system corruption. This means the area of the hard drive where the file is stored is corrupted. This could be due to a software or hardware issue. For example, if an area of your hard drive is physically damaged, strange behavior can occur.

To have Windows find and correct file system errors, click Start, All Programs, Accessories, System Tools, and Disk Defragmenter. Click the Analyze button in the Disk Defragmenter window. Windows will look for file system errors and correct anything it finds, if possible. Now try to delete.

If you still can't delete the file after trying this software fix, there may be serious errors with your hard disk signaling an impending hard drive failure. And that is a real problem requiring swift action. Back up your important files and replace the hard disk as soon as possible.

Video File Issues

It is possible that you may receive an Access Denied or Windows Can't Delete The File Because It's In Use error message while trying to delete a file ending in the .AVI (Audio Video Interleave) file extension. This problem can occur because WinXP creates thumbnails for video files (such as AVI files) that show the first frame of the video. This makes it easy for users to see what video content a file contains without having to open it.

To provide this functionality, WinXP uses a file called the Shell Media Extension (Shmedia.dll). This feature usually works perfectly, but whenever a video file is corrupted or not playing nice with Shmedia.dll, the system "locks" the file and doesn't release it, even after you reboot.

To solve this problem, you can do one of two things. First, you can open up a command line by clicking Start and Run and typing `cmd` in the text box. At the command prompt, type `CD drive where file is stored:\folder where file is stored` and press ENTER. For example, if the file is kept in a folder called Video in your C: drive, type `CD C:\Video` to open the folder. Type `dir` at the command prompt to see the list of files contained in the folder and then type `DEL file name` (where *file name* is the name of the file you want to delete) to delete the file.

If the name of the folder is greater than six characters, you must shorten it by entering `~1` after the first six characters. For example, if the name of the folder you are trying to get to is called Program Files, to open the folder from a command prompt you must type `CD C:\progra~1` to open the folder. That's because the command prompt environment can't handle long file names.

The second approach requires modifying your Windows Registry. (*NOTE: Making changes to the system using the Registry Editor may cause errors that render the operating system unstable. You should always create a backup before*

editing the Registry.) To do this, click Start and Run and then type `regedit` in the text box. With Registry Editor open, locate the following key:

HKEY_CLASSES_ROOT\System FileAssociations\.avi\shellex\Property Handler\{87D62D94-71B3-4b9a-9489-5FE6850DC73E}.

Click the key in the right-hand pane of the Registry Editor to highlight it, right-click the key, and select Delete from the context menu. You'll give up the thumbnail previews of video files feature, but you'll now be able to delete the offending AVI file.

For Your Own Protection

You keep deleting a file in one of your Windows system folders, but whenever you open the folder that contained the file, the file is there again. What's going on?

To prevent users from accidentally destroying their Windows installations, Win2000/XP contains a feature—which is enabled by default—called Windows File Protection. (The feature is called System File Protection in WinMe.) If you delete a file that Windows deems important, that file is automatically restored to its proper location from a cache of critical files that Windows keeps on your hard drive.

If you're trying to delete a file located in any of the Windows system folders, chances are you won't be able to do it unless you disable Windows File Protection. And disabling Windows File Protection, while straightforward, requires some editing of a DLL file using a hex editor.

Unless you have a really good reason to do this, you're better off leaving Windows File Protection alone. It's there for your protection. Only technically savvy users who are very experienced at tweaking and customizing their systems should attempt to remove Windows File Protection and delete files stored in the Windows system folders. **RS**

BY SIXTO ORTIZ

What To Do When . . .

You Accidentally Delete Something



easier to execute but potentially as effective. First, though, it will help to know what you're dealing with when you lose data, accidentally or otherwise.

Where Deleted Files Go

Many users assume once a letter, photo, song, or other file is deleted that it's gone for good, but this isn't the case. Deleting a file essentially only erases the bookmark that Windows uses to retrieve the

file. What deleting a file really tells Windows is that you no longer wish to reserve hard drive space for the file. Thus, the file remains on your drive until Windows writes over it with new data. Until then, there's a chance of retrieving your accidentally deleted data.

Initially, the best thing you can do is actually nothing, as any new data you save to your hard drive could write over the file you want to retrieve. Also, running a disk defragmenter could wreak havoc on your deleted file. If you've scheduled Windows' Disk Defragmenter to run automatically, disable the option (click Start, Programs, Accessories, System Tools, Scheduled Tasks) until you retrieve the data. Ultimately, getting your file back may mean using an undelete program. At worst, a data recovery service can retrieve data from even a presumed dead hard drive, but typically at a stiff price (more on these options later).

At some point in your computing life, you will lose data, whether it's due to something as serious as a system crash or something less drastic but equally as frustrating, such as accidentally deleting a file. While the sting of losing a coveted photo, spreadsheet, or audio file definitely smarts, it may ease your pain knowing there's a good chance of getting your data back if you act quickly and logically.

For this article we're assuming you've accidentally deleted or misplaced a file, folder, icon, or similar data and a backup copy isn't available. Data lost to such problems as malfunctioning hardware/software or Windows-related errors often require more time-consuming and complicated solutions—uninstalling/reinstalling Windows, using Windows' Repair or Recovery Console utilities, replacing a hard drive, and more—than those we'll discuss here, which are generally

Search For Your Files

Often, just searching for a file can tell you if you really deleted it or accidentally saved it to another location. First, check the list of recently accessed programs and files Windows XP keeps at the left of the Start menu. Windows programs such as Word and Excel also keep a list of recently opened files specific to that program on the File menu. Clicking the File menu in Word, for example, shows you four recently accessed Word documents and their locations.

Another option is Windows' Search tool (click Start, Search). In the Search Results dialog box under the Search Companion pane are options to search for Pictures, Music, Or Video; Documents (Word Processing, Spreadsheet, Etc.); All Files And Folders; and Computers And People. Try clicking All Files And Folders and entering appropriate text in the All Or Part Of The File Name and A Word Or Phrase In The File text fields. Next, click My Computer from the Look In drop-down menu and click Search. Your results will display to the right. If Search doesn't find what you're after, try using a wildcard (*) character and the document's file extension, such as *.doc or *.xls. Search also has such advanced search options as Search Hidden Files And Folders and searching by file size, last modified date, and other criteria.

Check The Recycle Bin

If Search proves fruitless, check that Windows isn't holding the file in the Recycle Bin (double-click the Recycle Bin Desktop icon). Most files you manually delete remain in the Recycle Bin, taking up hard drive space until you empty the bin (click File and Empty Recycle Bin). By default, the Recycle Bin uses 10% of your hard drive's capacity (change this by right-clicking Recycle Bin, clicking Properties, and adjusting the Maximum Size Of Recycle Bin slider.) When the capacity is full, Windows

drops off older files as new ones are added. If you have a large-capacity hard drive, your files can remain in the bin for a long time. If your file is in the Recycle Bin, highlight it, click File, and click Restore to retrieve it.

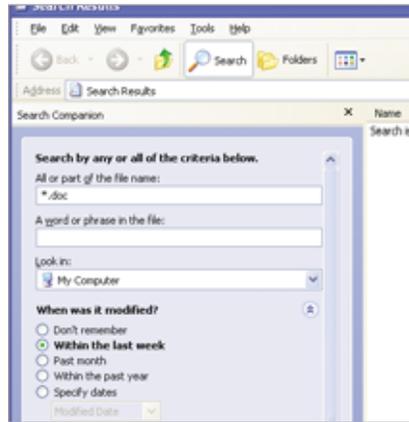
Use System Restore

System Restore is Windows' utility that can roll your system's settings back to a previous date, or Restore Point. System Restore doesn't alter files you've recently created, such as email and Word docs. Using a Restore Point will remove any Windows updates or program-specific upgrades (particularly virus and spyware definitions) you installed after the Restore Point's date. You'll need to reinstall these after the restoration. To use System Restore, click Start, Programs, Accessories, System Tools, System Restore, and follow the steps given.

Use Undelete Software

If your file is still missing, it's time to consider using an undelete program, which will scan your hard drive for data that's still active but that Windows doesn't recognize. Note, however, that an undelete program may only retrieve portions of a file due to several reasons, including how Windows stores data. Rather than save a file in one location on a hard drive, Windows chops the file into smaller chunks, or clusters, that it fits into spaces on the drive as they become available. These spaces usually aren't next to one another, and as new data is saved to a drive, it can write over various portions of the file.

Although undelete programs range in price and difficulty of use, most can also scan removable storage devices and include a search tool and helpful filters for narrowing down searches. Many free undelete apps are available, but most will only display the files they can retrieve until you pay the program's full version to retrieve them. When looking at undelete apps,



To make certain you really accidentally deleted a file and didn't actually save it to another location, use Windows' Search tool to (hopefuly) find the file.

consider one that you can download to and run from a removable storage, such as a CD/DVD, floppy diskette, or USB keydrive, as, again, installing an app to your hard drive could write over the files you want to retrieve.

Additionally, although programs differ in how they search for retrievable data, most offer quick and deep-scanning options and filters for searches and viewing results. This last point is important, as typically a program will return hundreds to thousands of files that may date back years. Finally, look for an app that rates the chances of retrieving files, such as PC Tool's File Recover does using Poor (partially recoverable) or Excellent (fully recoverable) qualifiers.

For this article we used various demo, free trial, and final versions of PC Tools' File Recover (\$29.95; www.pctools.com), WinRecovery Software's WinUndelete (\$49.95; www.winundelete.com), OfficeRecovery's Free Undelete (free; www.officerecovery.com), Executive Software's Undelete 5.0 Home (\$29.95; www.executive.com), and R-tools Technology's R-Undelete (\$54.99; www.r-undelete.com). Other apps include QueTek Consulting's File Scavenger 3 (\$49; www.quetek.com), Active@Data Recovery's Active@File Recovery (\$29.95; www.file-recovery.net), and

Stompsoft's Recover Lost Data (\$39.99; www.stompsoft.com). Well-known manufacturers such as Symantec (Norton SystemWorks Standard, \$69.95; Save & Restore, \$49.99; Norton Ghost 10, \$69.99; www.symantec.com) and McAfee (Internet Security Suite, \$49.99; www.mcafee.com) also offer recovery tools.

Use A Data Recovery Service

Depending on how valuable your lost data is, a data recovery service is an excellent option. The bad news is that such services are typically time-consuming and expensive, ranging from hundreds to thousands of dollars. Typically, after evaluating the drive, the service will provide a cost estimate for getting your data back. Further, you may get multiple estimates based on different factors that may influence the ability to get back your data, such as if the hard drive is physically damaged.

Before choosing a service, ask what data you can expect it to retrieve, including the specific data you want back. Check if the company performs retrievals in its offices, onsite, or offers software you can operate yourself at home. Most importantly, make certain the company adequately answers all privacy-related questions, as the service will have access to all the data on your hard drive, including personal information. Two data recovery services include DriveSavers (www.drivesavers.com) and Ontrack Data Recovery (www.ontrack.com/services).

Overall, some preparation is often the best solution for getting accidentally deleted data back. This means routinely backing up important files and having an undelete program on hand so you can immediately search for the file after you realize it's gone. Additionally, many Windows programs have auto-save and backup features, such as Word's Always Create Backup Copy setting (Click Tools and Options and click the Save tab). **RS**

BY BLAINE A. FLAMIG

What To Do When . . .

Your PC Starts Slowly



PCs that boot slowly are among the most common complaints users have, but there's slow and then there's *slow*. A computer that needs a minute between pressing the power button and letting you start a program is perfectly normal, even if those 60 seconds may feel like an eternity. A computer that takes a little longer may be suffering from a minor problem (or might just be an older machine), but a computer that takes four or five minutes (or more!) to get rolling is almost certainly suffering from one or more problems that need your attention.

Most slow-boot problems have to do with software; specifically, there's too much software running automatically when Windows boots, but this shouldn't be the first thing you attempt to tackle. You should check hardware problems first. Follow that by checking for spyware and viruses, because these issues can undermine

even the most thorough, intricate software cleaning job. And if you notice your boot process suddenly taking longer after recently adding new hardware or software, you may have already determined the root of your startup problem.

Finally, although there may indeed be a smoking gun—a large, single problem causing the delay—long boots are frequently a result of many small delays and inefficiencies added together. Booting a computer requires dozens of sequential steps, so it's certainly possible to save 60 seconds by eliminating 10 six-second delays.

Basic Hardware Checks

It isn't uncommon for a computer to slow as one or more of its components starts to fail, and a slow boot may just be the only noticeable symptom. Fortunately, performing tests and checking the obvious is fairly easy.

First, take a deep breath, open up the computer (assuming it isn't a laptop), and turn it on. Check that all the fans are spinning. Some fans are temperature-sensitive and won't speed up (or even start spinning) until things are warm, so consider leaving it running this way for a little while. Make a note of any fans that seem dead; have a professional replace them or, if you know what you're doing, replace them yourself.

Next, turn the PC off and take a good look at the CPU's heatsink. (You may have to remove a plastic shroud that surrounds the CPU.) If it's covered with dust and grime, clean it with a can of compressed air (readily available at most electronics stores) or a small brush. This ensures the CPU is cooling itself properly, because most modern CPUs throttle back to a lower clock speed if they're overheating. And a lower clock speed can contribute to a slower boot process.

A marginally working CPU, hard drive, or memory module can also slow the boot process down, especially when the failing component still "sort of works." For example, a failing hard drive might finally work after 10 attempts at reading from it, and Windows may retry using that failing hard drive many times before giving up.

Fortunately, we recommend a free bootable CD called the Ultimate Boot CD, which you can download from www.ultimatebootcd.com. It has dozens of generic tests for your CPU and memory and includes all the major hard drive manufacturers'



Lavasoft's Ad-Aware SE, often your first line of defense against spyware, can purge malware that's plaguing your startup.

alter the tasks it performs by accessing your system's BIOS setup. Immediately after you turn on your computer, take a close look at the screen for a message such as "Press F2 To Access BIOS Setup" or similar language and press that key.

hardware tests. And because it's a bootable CD, you don't need to load Windows (and, after all, loading Windows is really the problem in the first place) to run the disc's tests. You can run through all the CPU tests in a few minutes, but let one of the memory checkers run overnight. The hard drive tests will only need a few minutes to do a quick check, but if you can spare another night, opt for running a deep test for better results.

If your hardware checks out, you can move on.

BIOS Tweaks

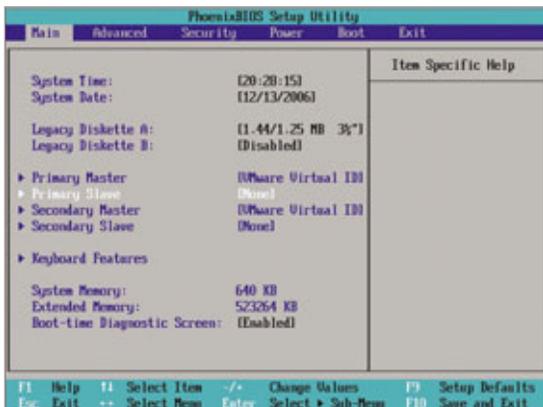
When you fire up your PC, its BIOS (Basic Input/Output System) leaps into action, initializing hardware, testing RAM and other hardware, and looking for a bootable device. You can

Your PC's/motherboard's users manual should also identify the appropriate keystroke. With luck, it may even describe some BIOS options.

If your goal is to eliminate as many small delays as possible, then there are a few changes you can make to your BIOS. First, look for an option called Quick Boot and enable it; this eliminates some of the system tests during the boot. This feature's name may vary on a different BIOS, but you should generally enable any option that appears to accelerate your boot speed.

Next, move to the Hard Drive Detection (sometimes called IDE Detection) screens, and switch the IDE (Integrated Drive Electronics) positions you know to be empty from Auto to None—in other words, if you don't have a Primary Slave IDE drive, set Primary Slave to None. You can

identify an IDE drive by the flat, wide cable that connects the drive to the motherboard, but when you start making changes to your BIOS, always be certain you understand



Although the BIOS (Basic Input/Output System) is unfamiliar territory, making a few changes could speed up your system.

exactly what you're changing. And if your system only uses SATA (Serial Advanced Technology Attachment) drives, then set all the IDE positions to None.

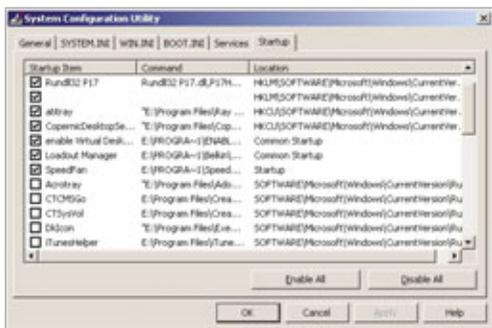
Finally, if you never boot from a floppy diskette drive, CD/DVD ROM drive, USB device, or network connection, set the hard drive as your first boot device. This prevents your PC from checking for bootable media elsewhere every time.

Clearing Bad Parasitic Software

After you've eliminated any hardware issues and streamlined your BIOS, it's time to deal with the bad software: viruses and spyware. If your computer boots slowly but works reasonably well once it completely boots, any malware that's snuck into your system is probably a minor infestation, which means it's probably one you can clear with automated tools.

If you have antivirus software installed, it's time to update your definitions and run a full scan. And if your commercial antivirus subscription (for example, Norton AntiVirus) has expired, either renew your subscription or uninstall what you have and install a free antivirus product, such as AVG Anti-Virus Free (free.grisoft.com) or AOL's Active Virus Shield (www.activevirusshield.com). Because viruses evolve rapidly, it's critically important to use an antivirus product with current definitions. Don't bother with out-of-date antivirus software.

Spyware can also bog down your boot, so you should clear that, too. Like antivirus software, antispyware products need current definitions to do an effective job, so update what you have before running a full system scan. If you don't have any antispyware tools and don't think you have a serious spyware problem, then try a couple of free programs to be safe. Most of the free scanners don't have always-on components, and different scanners tend to focus on different types of threats; you can usually install



a few and let them scan without worrying that one program will interfere with another. Two that work well together are Ad-Aware SE (www.java-softusa.com) and Spybot Search & Destroy (www.safer-networking.org). Perform each application's antispyware scan individually instead of running them simultaneously.

Clearing "Good" Parasitic Software

It should come as no surprise that software often installs itself to automatically run every time Windows starts, but the sheer volume of this particular software that's running on your system may shock you when you count it all up. Limiting your software that starts on boot to just the programs, utilities, and drivers you always need can dramatically reduce boot times.

There are two challenges to face here. The first is finding a list of programs that start automatically, and the second is to know which programs you can safely disable at boot time.

Fortunately, there's a handy tool that's built into every version of Windows (except Windows 2000) that shows you almost all your auto-start programs: msconfig. To run it, click Start and Run. Type **msconfig** and click OK. Next, click the Startup tab to see the auto-start list; a check mark next to an application means that it's starting every boot, while an empty checkbox means the program is disabled.

If you have Win2000 or want a more advanced tool, then try using AutoRuns for Windows (www.microsoft.com/technet/sysinternals/utilities/Autoruns.msp). Just extract

Mscconfig will help you prevent infrequently used applications from starting alongside Windows.

the ZIP file you download and double-click Autoruns.exe to run it. Like Msconfig, each checked entry is set to run automatically at startup, and unchecking a program disables it at startup. (You'll still be able

to use program but will have to manually start it each time.) AutoRuns is more thorough in ferreting out auto-start programs, so its list is much longer than Msconfig's and broken down into different auto-start methods. To whittle that list and focus on third-party software, click Options, Hide Microsoft Entries, and the Refresh button.

Regardless of which utility you choose, you shouldn't just uncheck everything in the list. (Although interestingly, WinXP will run just fine—and quite fast—with everything disabled in the Msconfig Startup tab). Instead, you need to figure out what each item is and decide if it's something that you really need to run every time Windows starts. For example, many peripherals, such as PDAs and game controllers, have supporting programs that start automatically every time (you can usually see their icons in the System Tray), but how often do you really HotSync your Treo or play a game? If you don't frequently use the peripherals that require these support applications, consider disabling them at startup. When you plan to actually use the device, manually run the program instead. For example, only run the Palm HotSync Manager when you actually need to HotSync your PDA.

You should only disable programs that you can properly identify; determining which programs you can disable occasionally requires some sleuthing. For example, you can track down an oddly named program, such as P17Helper, by doing an Internet keyword search. In this particular

case, P17Helper is an ASIO (audio stream input output) driver for a Sound Blaster card, which allows for high-speed digital audio recording. If you never record digital audio, you should consider disabling it. Many Web sites that identify startup programs also state if you can safely disable the programs.

Deciding what to disable can be tricky if you can't find guidance online, but there are useful guidelines the adventurous can follow. If you disable a program related to hardware, reboot and see if the hardware still works. If it doesn't, re-enable the program. Ditto for software application helpers—make sure the main application they help still runs after you restart.

Many programs, such as Microsoft Office, Adobe Acrobat, and RealPlayer, preload some parts of an application into your system's memory under the assumption that the associated applications will start a few seconds faster when you actually run them. You can safely disable these preloaders, but the trade-off is that your application might take a few extra seconds to load. Some applications install their own schedulers or version checkers, which is something you can usually do manually. Don't forget to check for updates yourself if you disable these programs at startup.

Ideally, when you identify a startup program you want to disable, you should disable it from within the program itself. If there's no such option, simply uncheck its entry in Msconfig or AutoRuns.

The Payoff

By carefully pruning your auto-start programs, optimizing the BIOS, and eliminating hidden malware, you should be able to reduce your boot time from three or four minutes to less than a minute. Over the course of a year of daily startups, that can really add up. **RS**

BY WARREN ERNST

What To Do When . . .

Your PC Runs Slowly Or Erratically



So, your computer is acting strangely. Is it running slowly? Does it clip along normally one moment, only to grind to a halt minutes later? You better be ready to roll up your sleeves to tackle this one yourself, because this is the sort of problem that a computer repair

person or phone support techie rarely solves. These folks will usually fix what's obviously broken and move on, but much of the time, a slow or erratic system is suffering from something that isn't obviously or completely broken. Your computer's only in good enough shape to "mostly" work most of the time.

Ultimately, although it seems like just about anything could slow a PC or prompt weird behavior, there are several things that tend to be the root of these problems. Even if you can't

completely solve the problem, you can frequently narrow the problem down

so that someone else can attempt to solve it.

Sudden Problem Or Long-standing Issue?

If you suddenly notice your PC acting up, consider if you've made any recent changes. Have you installed any new hardware or software lately? Does your PC's bizarre behavior happen to coincide with the new addition? If so, then the new stuff becomes your prime suspect, and following these tips could help you crack the case.

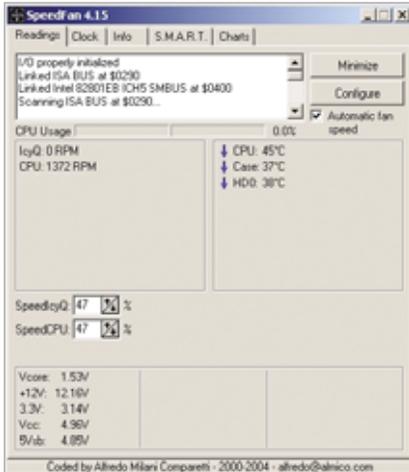
New software is likely to slow a system down if it has some sort of "always-on" component, such as a background virus checker or a scheduler, but even software which lacks such a feature can occasionally cause problems. Try uninstalling the new software with its uninstaller first. You can also uninstall by using Add Or Remove Programs in the Control Panel. (Click Start, Control Panel, and double-click Add Or Remove Programs.) Once you've removed the software, reboot and see if your computer is still running slowly.

New hardware can also slow down a system, especially if you're using an older driver. Ironically, if you've followed the hardware's installation documentation to the letter, then you probably used the drivers/software that the manufacturer included on the installation disc, and those drivers could be old. First, try downloading and installing the most recent versions of drivers and any bundled software from the manufacturer's Web site. These updates often fix bugs or glitches that can affect system performance.

If the slowness remains, remove the new hardware; if it was an upgrade to existing hardware, reinstall the old hardware. If your system returns to normal, then the new hardware is either faulty or not completely compatible with your PC. Consider using an alternative product from another vendor.



The Ultimate Boot CD contains a plethora of diagnostics and utilities to fix a finicky PC.



If you suspect your CPU's running hot enough to scramble eggs, free software such as SpeedFan should be able to tell you if overheating is causing your slowdowns.

Double-Check The Hardware: The Basics

Although system slowdowns tend to be software-related, there's no point in chasing down an elusive software problem unless you know your hardware is working properly. The main components to check are the CPU, RAM, and hard drive.

There are many diagnostic programs out there, but perhaps the simplest way to go is to the Ultimate Boot CD, which is available as a free download from www.ultimatebootcd.com. If you choose to download the application and burn it to a disc, your burning software must be able to burn ISO (International Organization for Standardization) image files. If you don't have the necessary software, the Web site maintains a list of people who can create and mail you a physical copy, usually for a nominal fee.

When you have the CD, start your computer with the disc in your CD-ROM drive. After the program loads, start with a CPU test and let it run for at least 30 minutes. Then, start a RAM test and let it run overnight. (Memtest86+ is a good one.) If your computer passes these tests, run a hard drive check. The Ultimate Boot CD also contains the latest utilities

from different hard drive manufacturers. Run the utility that matches your drive and let it run through both the quick test and the thorough test, which take approximately 20 minutes and several hours, respectively, to complete.

Some computers also come with a "diagnostic partition," which you can access by pressing a certain key at boot-up. Your manual should provide more explicit information, but if you look quickly as your computer is in the first few seconds of its boot sequence, you should see a message on the bottom of your screen that may read something like "Press F8 For Boot Menu" or "Press F10 For Diagnostics." If you see this, press the key as directed and select the choice that seems to be diagnostic software. Odds are that these diagnostic tools are geared specifically for your hardware (rather than the generic utilities found on The Ultimate Boot CD) and can ferret out any hardware troubles.

Double-Check The Hardware: System Cooling

It goes without saying that your PC's internal components generate heat, but have you considered what would happen to your PC if your CPU overheated? Those clever engineers at Intel and AMD have, and most (though not all) modern CPUs will automatically throttle back when their built-in thermistors (which are transistor-sized thermometers) detect when a system is overheating. After a few minutes (or even seconds) of operating at a lower speed to reduce the CPU temperature, the CPU throttles up to full speed again.

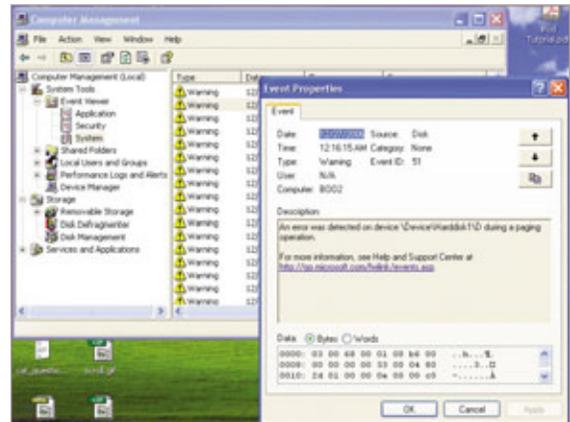
This scenario should never happen in a computer that's functioning properly. But if the CPU cooling fan

or one of the case fans stop spinning (or spin at a reduced rate) or a CPU heatsink clogs with dust, this is exactly what can happen. Although the CPU is only protecting itself from burning out, from a user's point of view, the computer starts a cycle of acting normally and then slowing down.

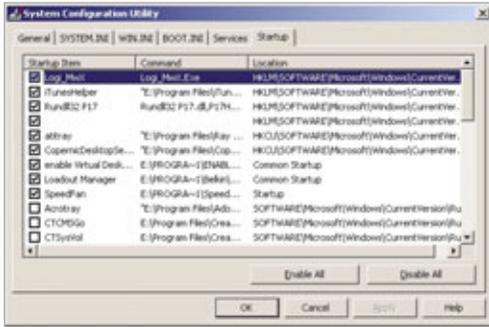
Opening your PC and cleaning out all the dust is a task you should probably do at least once a year. So if your PC is acting oddly, cleaning it should be high on your list. While you're in there, clean the CPU heatsink with a can of compressed air or a small brush. (You may need to remove a plastic or metal shroud that directs airflow to the CPU.) If the fans are covered with gunk, hold the blades in place to keep the fan from spinning if you use the compressed air to blow them clean.

After you've cleaned it out, turn the computer on while it's still open and check that all the fans start spinning. If there's any fan that refuses to spin or sounds rough or gravelly, it may need replacing.

If you aren't sure if a fan is running as fast as it's supposed to, then you should also check the processor's temperature while Windows is running to ensure it isn't overheating. This task is easily accomplished with free software, such as SpeedFan. To download SpeedFan, open a Web browser with an active Internet connection and go



Windows' Event Viewer can contain logs of any errors or other misbehavior. You can often find a solution online.



Use Msconfig to disable memory-hungry background applications and free up your system resources.

expand the Event Viewer icon in the tree on the left-side pane, revealing the Application, Security, and System logs. If you're interested, Microsoft explains the purpose of these logs at support.microsoft.com/kb/308427, but, put simply, each log lists application, security, and system messages and warnings. You should look for warnings and errors that tend to frequently recur. Double-click an entry in the right-side pane to view the full message.

For example, if you saw the same hard disk page file error again and again, it may be time to update your motherboard's drivers or run a diagnostic scan on the motherboard, hard drive controller, or hard drive. If you saw a driver that was unable to start repeatedly, consider looking for an updated driver or determine if the hardware that the driver controls is malfunctioning. If an antivirus updater constantly causes error messages, you should fix or replace your antivirus software. And if the exact nature of the error isn't clear from the message, entering the message into an Internet search engine may yield solutions that have worked for other folks.

Eliminating Rogue Programs

If your PC is still acting slow or erratically, focus on software running in the background that's commandeering too many resources. Even though most of this software

is working exactly as intended, uninstalling or reconfiguring it may speed up your slow-moving system.

First, display the Windows Task Manager, which will launch when you press CTRL-SHIFT-ESC, and click the Processes tab. Then click the CPU column header twice to sort the list of background processes with the highest CPU utilization at the top. Take a few minutes to look over the column as it updates, noting what programs occasionally jump to the top of the list. You can leave this window open while you use other programs, allowing you see which programs are consuming the most of your system resources as you normally use your PC. In fact, if you only occasionally see a dramatic slowdown, you should keep this window open until the slowdown occurs and note the processes that jump to the top of the list.

After initially booting your computer, System Idle Process should consistently be 95 or higher, which basically means 95% of your system's resources should be available. If it isn't, then one or more other programs are consuming excess resources and are probably contributing to the slowdown. These programs should appear just underneath System Idle Process. Ideally, the programs will be obvious, such as WINWORD.EXE (Microsoft Word) or ipodservice.exe (Apple iTunes). For dealing with mysteriously named programs, Microsoft's Process Explorer (www.microsoft.com/technet/sysinternals/utilities/ProcessExplorer.msp) does a good job of tracing a background program to its base application. If shutting down any of these programs restores your system to full speed, then you've found your problem. You may need to manually do this for multiple programs.

If you've traced a slowdown to a busy background program and its parent application, you need to

either replace it or make it play nice. First, open the program and try to find any settings to reduce CPU priority. We also suggest disabling any functions you don't need or use. Alternatively, there may be a more efficient application that does essentially the same thing as your troublesome program. Try replacing one program with another (for example, using Zone Alarm Firewall instead of Norton Internet Security) to see if it's less of a burden.

Lighten The Background Process Load

Once you've cleared away the gross offenders of CPU power consumption, the last thing to do is review all of the programs that automatically launch when Windows starts up and determine if any are unnecessary. The Task Manager lists how many processes are running at the bottom left corner of its window; if you have more than 50, you probably have more running than you really need.

We cover this topic in detail in "Your PC Starts Slowly" (see page 56), but in a nutshell, run msconfig. Click Start and Run and type `msconfig` in the empty field. Click OK. When msconfig starts, click the Startup tab. The resulting list shows all your startup programs, and removing the checkmark next to an entry prevents it from starting alongside Windows. Before using this method to force programs not to start during Windows' startup, try disabling any auto-start functionality directly from within the program itself.

The Payoff: Speed & Stability

Hopefully, you'll find that after you run through all these steps, your system feels far more sprightly and isn't prone to weird pauses. And without the hiccups and delays, your overall computing experience should be that much better. **RS**

BY WARREN ERNST

What To Do When . . .

Your PC Internet Connection Is Slow



One of the more frustrating aspects of computer usage in the Internet era are the times when your PC slows to a crawl for no apparent reason. Suddenly it seems as if the bits are passing through molasses as they travel from the Internet to your living room.

The good news is that there are solutions to nearly every common Internet problem. While the problems vary depending on how you connect to the Internet, there are troubleshooting tactics and system tweaks you can use to optimize performance. And if all else fails, there are ways to make life more bearable on a slow Internet connection, using add-on tools that can speed up browsing and downloading under such conditions.

Generic Problems

The first things to examine whenever system performance slows to a crawl are the tasks, or processes, your PC is running. No matter how fast of a CPU you have, running too many apps at once can slow everything down.

Check running applications. Use the Windows Task Manager to check on hidden apps that could be starving your browser of precious time. Right-click the Taskbar, select Task Manager, and click the Processes tab. You'll see a list of every process (Windows calls them Images) running on your PC;

you can sort the list by name, amount of CPU time, or memory usage.

If you sort by CPU time and notice a couple programs trying to grab all the CPU, it's a clue something has gone awry. If you identify an unknown program hogging all the CPU, you can stop it by right-clicking the name and selecting End Process. But be careful: accidentally killing a valid Windows process may cause other problems, requiring a reboot to fix.

Check the drivers. You also may be overloading the network pipe. For example, if you're using a dial-up connection, you likely won't be able to watch the latest YouTube video while downloading email. When you notice performance deterioration, make sure your system has the latest network and modem drivers. These are often automatically updated by Microsoft Update (see www.microsoft.com/athome/security/update/msupdate_keep_current.mspx), but if you know your modem or network card model, it doesn't hurt to check the manufacturer's Web support site for updates.

Physical Network Problems & Troubleshooting Tips

Dial-up connections use the same basic technology: a modem connected to a phone line. But there are a number of broadband technologies (DSL [Digital Subscriber Line], cable TV,

and fixed wireless), each with its own causes of performance degradation.

Start any diagnosis of suspected network problems by getting quantitative data. There are a number of Web sites for performance testing; one of the best is at www.speedtest.net. It presents users with a world map of various test points relative to your location (which it does a good job of deducing from your Internet address), providing a convenient way to check speed against a number of servers. Speedtest.net remembers your PC from session to session, recording all your tests to a database to allow comparisons of results over time. Try testing at different times over several days. If you see results coming in below the rated speed of your service, it's time to investigate.

Depending on your specific connection type, there are a number of quick things to check when troubleshooting degraded Internet performance.

Dial-up. A slow connection is often caused by a poor phone circuit. For example, dialing in from a new house in the suburbs, with new wiring all the way to the phone central office, will likely approach the theoretical maximum of 56Kbps (kilobits per second), while connections from older homes or rural areas may be lucky to reach 28.8Kbps. If your dial-up connection is slow, start by redialing or changing your access number. Persistently poor connections may be due to bad home wiring or too many line splitters between the wall jack and your PC. Make sure wiring is as short as possible.

Broadband DSL. DSL circuits are dedicated to your location, so you should get the full-advertised bandwidth. However, they require special line filters if a phone is used on the same line. If your connection is slow, isolate wiring problems by unplugging all phones and fax machines, connecting your DSL modem to the wall socket, and retesting your connection. If the speed improves, you may have a bad line filter or too many splitters on the same line. Put your DSL modem on a dedicated phone line, if possible.

Broadband cable. Cable TV circuits are shared with other homes in your neighborhood—perhaps as many as 50—so download rates vary and are usually slower during prime time. Signal problems on cable circuits should be visible on your television, particularly on local channels (e.g. 2 to 12), and generally require a service call to correct. If your television signal looks good, try checking the speed at off-peak hours to see if your neighbors are hogging bandwidth.

Wireless. Fixed wireless uses a portion of the broadcast spectrum to transmit to a stationary receiver. Signal strength can affect download speed and depends on placement of the receiver in relation to the antenna. Try moving the receiver to different locations. If the best location isn't close to your PC, many wireless companies offer modules that can route the connection to other locations over electrical wiring.

If none of these do-it-yourself solutions works, call your service provider to see if it can isolate the problem.

Home Network Changes

Beyond your ISP (Internet service provider), Internet connection slowdown can also result from problems on your home network. If you don't share your Internet connection (most dial-up users), you can skip this section.

Wireless technology, also known as Wi-Fi, operates on a portion of the radio spectrum also used by many cordless phones and microwave ovens. Within this spectrum, Wi-Fi routers run on one of 11 channels. If you live in close quarters such as an apartment building, a neighbor's router could be configured to run on the same channel as yours, causing interference. If you notice a slowdown, use your router's Web configuration page to try a different channel; your PC will automatically find the new channel.

Cordless 2.4GHz phones operate over the same frequencies as Wi-Fi, so you'll likely notice a slowdown or lost connection when the phone is in use.



Speedtest.net provides an easy way to performance-test your PC.

Either position the phone base station and wireless router as far from each other as possible or get a phone that runs on the 900MHz or 5.8GHz band.

To get a detailed look at what is going on in the Wi-Fi ether, MetaGeek has a great gadget called Wi-Spy (www.metageek.net). It's a USB key with sophisticated software that analyzes and graphically charts interference, quickly identifying any problems.

Occasionally the default network settings from your ISP can cause a slowdown. All Internet applications use DNS (domain name system) servers to look up the Web addresses of sites you access. When a broadband router connects to the ISP, it picks up addresses for the DNS servers and passes these along to your PC. If these servers are slow, changing to an OpenDNS server can alleviate the bottleneck. Details on how to start using OpenDNS are available at www.opendns.com/start.

If all else fails, reboot your modem and router. This ensures the router picks up the latest configurations and can often clear up problems.

Browser Configuration Changes

Tweaking some browser settings can also help improve Internet connection performance. The simplest change is to increase the size of your Internet cache, or Temporary Internet Files in Internet Explorer parlance.

Your browser keeps copies of pages you visit, including the graphical content, in the cache. When you revisit a page that has been cached, your browser looks for elements that haven't changed since your last visit and uses the local copies instead of re-downloading. Given the enormity of today's hard drives, most browsers have conservative defaults for cache size, usually less than 50MB. Bumping this up to 100 to 250MB can help. In Internet Explorer, select Tools, Internet Options and click the General tab. Under Temporary Internet Files, click the Settings button. Enter a new amount of disk space used for the cache.

If you're on a very slow link, you can also have the browser block most bandwidth hogs, including images, Java applets, and ads. Firefox offers the most flexibility in controlling what is displayed, with settings contained on the Options:Content tab. Internet Explorer can be configured by selecting Tools, Internet Options, clicking the Advanced tab, and scrolling down to the Java and Multimedia sections where you can check or uncheck a series of boxes to control whether various multimedia elements display.

Unwanted pop-up windows are another source of frustration on slow links. Internet Explorer 7 comes with a pop-up blocker add-on. Firefox also comes with a free add-on, Adblock Plus. Adblock and other Firefox add-ons are available by selecting the Add-ons menu and clicking the Get Extensions button.

System Configuration Changes

Windows has a number of network parameters defined in the system Registry. The default values provide good performance, but they are not always optimal. While modifying the Registry is not for the faint of heart, CableNut (www.cablenut.com) provides a simple interface for changing the relevant parameters. CableNut includes a number of preset configurations for various connection types and

can back up and restore previous Registry settings, should you need to back out of any changes.

Tools

A number of ISPs and third-party products attempt to accelerate dial-up connections by using compression on different downloaded elements such as text and graphics. With these high-speed, dial-up services, the ISP runs an acceleration server that acts as an intermediary between your PC and Web servers. The acceleration server uses its broadband connection to fetch and cache pages you request and then compresses the data before sending it to your PC, where it is decompressed by a small client program running on your PC.

While many data types used on the Internet are already highly compressed, much is not. Depending on the page, these accelerated services often load more than three times faster than an unaccelerated dial-up account. If your ISP doesn't offer high-speed service, several third parties provide equivalent functionality usable with any account (see the sidebars on this page for lists of ISPs and software).

Be aware that most of the client-only products, such as Accelerate (accelerate.webroot-software-inc.qarchive.org) or Net Accelerator (www.programurl.com/net-accelerator.htm), really just automate the tweaking of Windows network settings, similar to what CableNut allows you to do by hand, offering little extra value.

Another way to increase your online efficiency is by using offline reading tools. You can configure email clients such as Outlook and Thunderbird to download all new mail and disconnect, letting you read and reply to mail offline. Both IE7 and Firefox offer RSS (Really Simple Syndication) news-reading add-ons that can download content from your

Web Acceleration Software

Program	Compression	Client OS	Browser	Network Server	Connection
Airstream (www.airstreamcomm.net)	Text/HTML (Hypertext Markup Language),	Windows, Mac	Any	PC – ISP (Internet service provider)	Dial-up
Artera Turbo (www.arteraturbo.com)	Text/HTML, Images, email	Windows	Any	PC – Artera server	Any (dial-up, broadband, wireless)
Google Web Accelerator (www.google.com)	Yes	Windows	IE, Firefox	PC – Google server	Broadband
ISP Booster (Slipstream) (www.ispbooster.com)	Text/HTML, Images, email	Windows	Any	PC – ISP	Dial-up
Onspeed (www.onspeed.com)	Text/HTML, Images, Flash, Office Docs	Windows, Mac, mobile	Any	PC – Onspeed server	Any
Propel (www.propel.com)	Text/HTML, Images, email	Windows, Mac	IE, Firefox, Opera	PC – Propel server	Any
Proxyconn Web Accelerator (www.proxyconn.com)	Text/HTML, Images, Flash, Office Docs	Windows, Mac, mobile	Any	PC – Proxyconn server	Any
Toonel (www.toonel.net)	Text/HTML, Images, email	Windows, Linux, Mac, mobile	Any	PC only	Any

favorite blogs or other RSS-aware sites for later perusal, similar in function to a number of third-party readers such as Newz Crawler (www.newzcrawler.com) or Feed-Demon (www.newsgator.com/NGOLProduct.aspx?ProdId=FeedDemon). Firefox and IE6 also have a “work offline” mode (available from the File menu) that allows you to browse previously visited pages; however, this feature has been eliminated in IE7 in preference of the more powerful RSS subscriptions that automatically download new content without having to manually access the site.

Intermittent Internet connection problems are an unpleasant reality, but there are a number of techniques and tools you can use to solve most basic problems and fine-tune your connection. For those stuck with slow dial-up links, high-speed services are available that provide noticeable improvement, although they still fall short of even the

slowest broadband service. Use of offline reading software, coupled with simple changes in usage habits, can also greatly reduce the frustration of working with a slow connection. 

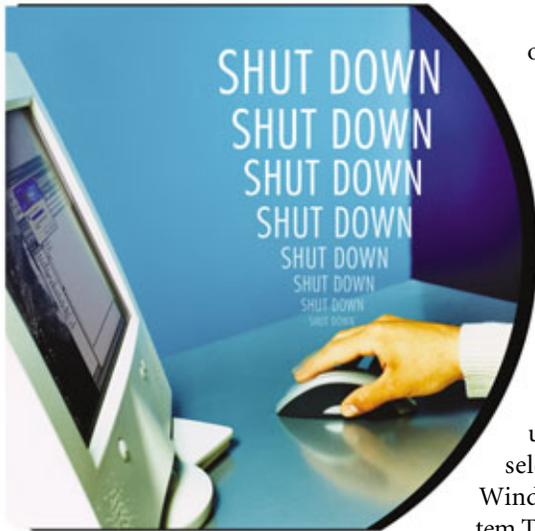
BY KURT MARKO

High-Speed Dial-up Providers

- 550 Access: www.550access.com
- Basic ISP: www.basicisp.net
- Budget Dialup: www.budgetdialup.com/index.htm
- Copper.Net: www.copper.net
- Earthlink: www.earthlink.net/dialup
- ISP.com: www.isp.com
- NetZero: www.netzero.net
- PeoplePC Online: www.peoplepc.com/connect/index.asp
- TotalUSA.net: www.totalusa.net
- TurboUSA: www.turbousa.com

What To Do When . . .

Your PC Shuts Down Slowly Or Won't Shut Down At All



It seems to happen at the worst time: You're in a hurry and when you shut down your computer, you get an hourglass that spins and a computer that fails to shut down quickly or at all. This has happened to many other people. And while you could simply pull the plug on your PC or hit its power switch, you may know from previous experience that failing to properly shut down a PC results in an extended boot process. That's because improperly shutting down your computer forces Windows to check your system's hard drive for data errors. Shutdown issues are among the common types of problems you'll encounter with Windows. Read on for some simple steps you can take to make shutdown a faster process.

Basic Troubleshooting & Maintenance

Sometimes the simplest thing at the root of a slow shutdown is the most

overlooked. Proper maintenance is essential to good hard drive function. All versions of Windows 98 and later have a built-in drive Cleanup Utility. Cleaning your drive not only helps you liberate some extra hard drive space, but it can also help improve overall operating system performance including system shutdown. To access the Cleanup Utility, open the Start menu; select Programs (All Programs in Windows XP), Accessories, and System Tools; and click Disk Cleanup.

Another maintenance task is the regular defragmenting of the hard drive. If you have a heavily fragmented hard drive, the OS has to search the drive for all the pieces of scattered data. The longer your OS has to search, the slower all functions become. To defragment your system, navigate to System Tools and click Disk Defragmenter.

Although many PCs on the market these days have just about all the peripherals you would want, some systems also offer an abundance of USB ports for connecting additional hardware. If you suspect that a recently added USB device is causing a slow shutdown, it's possible the added peripheral doesn't support the Selective Suspend power management feature. To correct this, try disabling the Power Management option for your USB hub. Right-click My Computer and select Properties. Select the Hardware tab and click the Device Manager button. Expand Universal Serial Bus controllers, right-click USB Root Hub, and

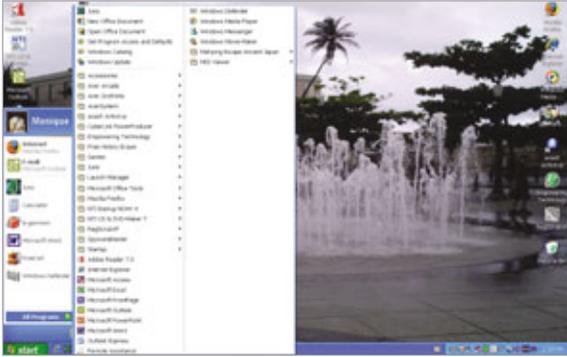
select Properties. Next, click the Power Management tab, clear the Allow The Computer To Turn Off This Device To Save Power checkbox, and click OK.

When Your System Hangs

One of the most commonly encountered Windows problems is when you shut down your computer and the process takes an excessive amount of time to complete. The OS is made up of a collection of small programs; therefore your computer must end each program individually during shutdown. Any anomaly in just one of these smaller programs can prolong shutdown or cause the process to fail.

Delays follow a new installation. If you experience shutdown delays and you installed new apps recently, you'll want to determine if the new programs are the cause. Try uninstalling the programs starting with the last one first. In Windows, the last program you install will appear at the end of your Start menu list of applications. That is, unless you sorted this list by name. Then you'll need to do a little searching.

When uninstalling a program, you can use the application's built-in uninstall feature (located in its folder entry in the Start menu) or the Add Or Remove Programs utility (click Start, select Control Panel, and double-click Add Or Remove Programs). After removing the program in question, restart your machine and attempt the shutdown again. If your PC shuts down properly, you'll know the application was the cause. One note: Before you remove the suspected application,



When determining what programs you installed recently, check your Start menu. The last program you install will appear at the end of the Start menu, unless you recently sorted the list by Name.

you may want to check the manufacturer's Web site for patches and/or updates that may be available for you to download and make the program operate correctly.

Trouble stems from an update. When you initiate the Windows shutdown procedure from the Start menu, Windows may prompt you for some type of user input when an app crashes or fails to respond. When this happens, Windows halts the shutdown process until you permit Windows to stop the nonresponsive application. Fortunately, there is a temporary workaround for this situation. By making a simple adjustment to Windows' Registry, you can instruct WinXP to automatically close pesky crashed applications. Before tweaking the Registry, you should back up your system in case you need to return it to a previous setting. For specific instructions on backing up the Registry, visit the Microsoft Help And Support article at support.microsoft.com/kb/322756.

After you create the backup, open the Start menu, click Run, type **regedit** in the Open field, and click OK. In Registry Editor, navigate to HKEY_CURRENT_USER\CONTROL PANEL\DESKTOP. Double-click **AutoEndTasks** in the right panel, type a **1** in the Value Data field, and click OK. Close Registry Editor and restart your machine. Now when you shut down

your computer, WinXP can close any applications that hang, and it will do so without any further input from you during the process.

If you experience shutdown problems after installing updates, new drivers, or software, you can usually return your PC to its preupdate condition using System Restore.

Open the Start menu; select All Programs, Accessories, and System tools and then click System Restore.

By default, WinXP enables System Restore on all your computer's hard drives provided you have enough hard drive space (about 200MB). After rolling back to a restore point, start up and shut down your PC once or twice to confirm the slow shutdown problem is resolved. It's important to note that System Restore isn't a substitute for uninstalling a program. Therefore, you will need to remove the offending application as we previously mentioned.

System issues occur after adding new a profile. You recently added a new profile on your computer for a family member and now your system hangs at logoff or when you shut down the system. The biggest reason for this problem is Windows is unable to unload a user profile because system processes and/or apps occasionally maintain connections to Registry keys in the user profile even *after* the user logs off. Microsoft's Download Center (www.microsoft.com/downloads) provides User Profile Hive Cleanup Service, a free utility that cleans user profiles. The utility is available for registered Windows users, and it is specifically engineered to make certain that user sessions are completely terminated when a user logs off.

Slow shutdown occurs after enabling the Clear Pagefile On System Shutdown option. Although it is true that clearing the page file on system shutdown will delete all data stored there so others can't retrieve it, doing

this does substantially increase shutdown time. The page file works as virtual memory (storage) in WinXP and can, on occasion, grow to mammoth proportions. Because some third-party applications could use the page file to temporarily store sensitive information in virtual memory, some people prefer to set their machines to clear the page file at shutdown.

If you think your system is running slow because you enabled the Clear Pagefile option, you can tweak the Registry and make things run quicker. Back up your system first. Then open the Registry Editor and navigate to HKEY_LOCAL_MACHINE\SYSTEM\CURRENTCONTROLSET\CONTROL\SESSIONMANAGER\MEMORY MANAGEMENT. Double-click **ClearPageFileAtShutdown** in the right pane and set the Value Data field to 0.

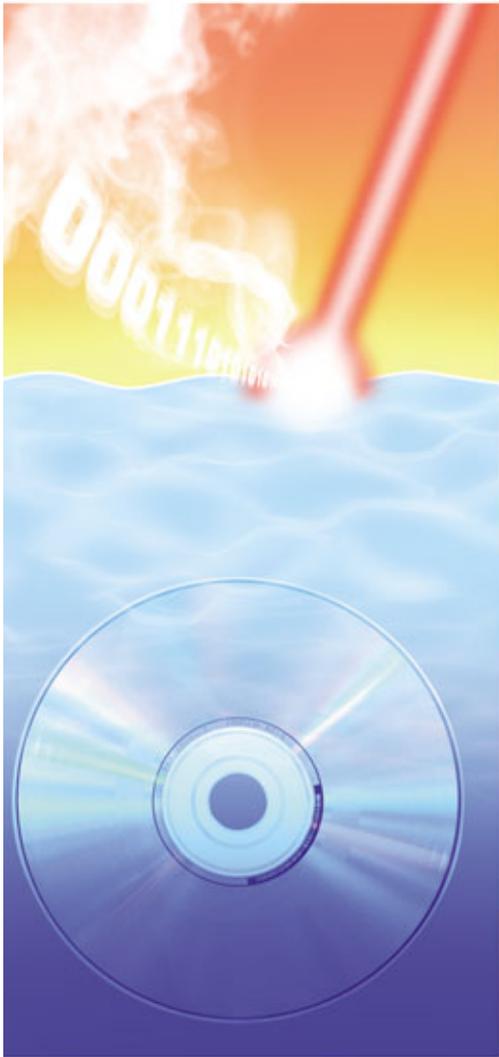
System Delays & Increased Internet Activity

Despite our best efforts, viruses and spyware sometimes take refuge in our PCs causing systems to shut down slowly or worse, not at all. If you suspect your system has a virus, make sure you update your virus signatures and run a complete scan on your machine. Antivirus alone is not enough these days, so good spyware prevention software is a must. Microsoft's Windows Defender (free; www.microsoft.com/at/home/security/spyware/software/default.mspx) scans your system to ferret out spyware that could be slowing down your PC.

Take Action

Although some people have learned to live with their computers' slow shutdown times, that doesn't need to be the case. Proactive intervention will certainly speed up a computer's shutdown process, and it may eliminate most of the common problems altogether. **RS**

BY DOUGLAS SCHWEITZER, Sc.D.



What To Do When . . .

You Can't Burn A CD/DVD

The good news is that there are logical reasons for these problems, and we'll cover several of them here. We'll also try to give you the most likely and least expensive solutions, so you don't blow your bankroll on a state-of-the-art combo drive only to discover that it, too, refuses to copy your entire collection of home movies.

Problem: I got a real deal on 300 blank CD-Rs from an off-brand manufacturer. But I've found that only five of the first 15 I tried actually worked; the rest were rejected by my CD burner.

Solution: We all like bargains, but the reason many off-brand CDs are such a

great deal is that their manufacturers have less-than-exacting standards where quality control is concerned. This even applies to some name-brand discs, which are simply rebranded, priced-up versions of off-brand CDs. We've had very good luck with Verbatim and Maxell. They're not the least expensive CDs around, but when you factor in frequent duds lost to bad manufacturing that show up on some other labels, they're more cost-effective. So before you decide your software or CD player is bad, go out and buy some really good media. You've saved some real money if that solves your problem.

Problem: I'm trying to make an exact copy of a CD in my collection,

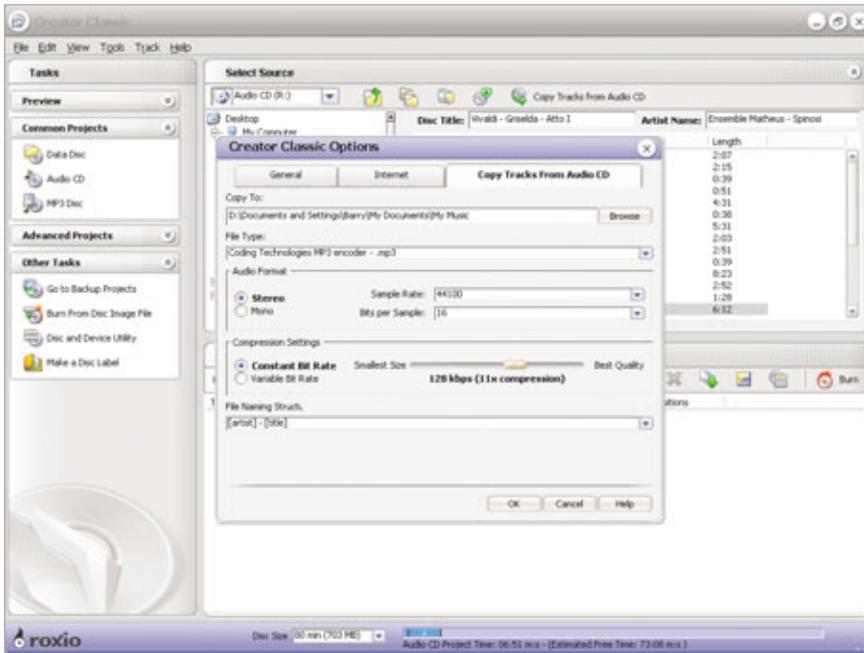
but I keep getting an error message that the remaining tracks on my original won't fit on my copy. This is despite the fact that the media are of identical length.

Solution: You're probably experiencing a **buffer underrun**. This occurs when a CD copy is "closed" to any further burning before it has truly been filled. Low memory's usually the culprit: You have too little available by the time you reach point X on your CD copy, so burning terminates as though you've reached the end of the disc. The best way to combat this is to provide more memory, and you can do that by closing all windows and memory-resident applications (screensavers, virus checkers, emulators, etc.) that you normally use while engaged in the burning process. Whatever you do, avoid running memory-intensive background processes such as defragmenting your hard drive while burning—we all love to multitask, but this is the worst time for it.

Slowing the burn speed might help, too. The faster you burn, the more intensive the process. Note, too, that the maximum burn speed for your CD/DVD drive may not be the best for your entire system. A very fast drive in a (relatively) underpowered CPU with low memory isn't going to be live up to its potential.

Finally, you may be experiencing a buffer underrun if you're employing some forms of data compression on the source drive. This slows down access time, since the data has to be decompressed before it can be transferred to your writer.

For the most part, DVD-R/RW (recordable/rewriteable) and CD-R/RW drives work as advertised, giving us a convenient, affordable way to make archival copies of software, media files, and the like and to create our own multimedia masterpieces. Yet sometimes the **burning** process (that of writing data to a CD or DVD) stops midway, with some enigmatic message appearing on our screens; or the results won't play properly; or the drive itself is no longer recognized by Windows. It's enough to make one yearn for the days of audio cassettes and VHS tapes. The copies you made were always a degraded image of the original, but barring mechanical failure in the media, they worked.



Most CD burning programs let you select the bit rate (measured in kilobits per second) you want your audio files to use.

Problem: I'm trying to burn a disc, but my CD drive isn't coming up as an available source or destination.

Solution: Windows isn't recognizing your CD-ROM drive. The most likely cause is an outdated driver. On a Windows XP system, right-click My Computer, then click System Properties. Click the Hardware tab in the System Properties dialog box and then click the Device Manager button. Click the plus (+) sign next to DVD/CD-ROM Drives, double-click the drive you want to check, and then click the Driver tab in the resulting dialog box. Under Driver Date, you should see the issue date of that driver. Go to the manufacturer's Web site and check to see if an update is available. If one is, create a System Restore point (if you're using System Restore), install the newer driver, and then reboot.

Problem: My PC is equipped with a CD/DVD combo drive. Recently, I've been unable to play or burn DVDs on it, although I can still use it to burn CDs.

Solution: If you can't use both CDs and DVDs, a number of possibilities

present themselves. The most likely is unfortunately the most unpleasant to consider: combo drives typically use a dual-laser setup; so if DVDs fail but CDs can still be used, it's very likely a case of the DVD laser giving up the ghost.

Problem: The sound of my burned CD copy is very distorted.

Solution: This could be due to several possible issues. First, have you checked to make sure that the source disc is still in good shape? Contrary to manufacturer claims in the early years of CD technology, CD surfaces can deteriorate over time. Second, are those source files of decent quality? There are MP3 files available with a bit rate as low as 32Kbps (kilobits per second; although 80 or 96Kbps is more common). You can fit a lot of material on a disc using such a low bit rate, but the audio quality will suffer. For good, relatively distortion-free transfers, 128Kbps is a good minimum bit rate.

Finally, is your system capable of handling the write speed you've chosen? Just because the CD-ROM drive comes with a very high setting

doesn't mean your computer can automatically handle that. Try authoring discs at a lower write setting and see if that lessens or eliminates the distortion.

Problem: I've been burning CD-RWs lately because I like being able to reformat them and overwrite the old contents. But I now find that the music compilation discs I've made and updated over time won't play on all my gear, and a couple of my CD-RWs won't even play in players that previously worked fine.

Solution: Yes, rewriteable CDs are great when you want to keep just a few discs around. You can theoretically replace their contents as often as you wish, as opposed to CD-Rs, which only let you write to them once.

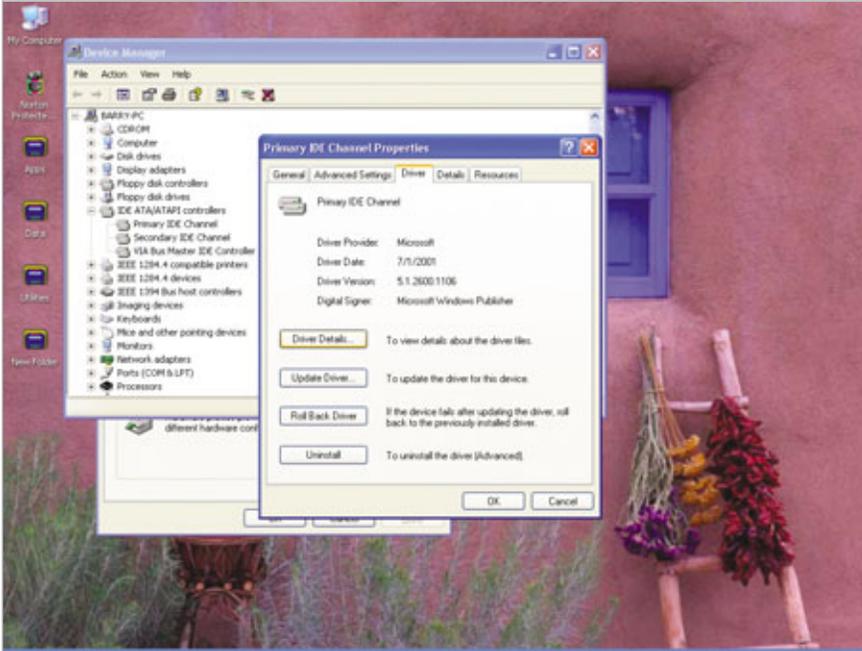
But there are a couple of drawbacks to CD-RWs. First, older readers may not recognize them, and that seems to be in part what you've discovered. Second, some have raised concerns that the material that makes up some CD-RWs' data layer can too easily go bad and become unreadable, though when this happens it usually occurs after a couple of years, not weeks or months.

So CD-RWs are a good, economical bet if you don't plan to use them for archival purposes and if you only want to play them on equipment purchased in the last couple of years.

CD-R media, on the other hand, has been touted as having a life expectancy of 50 years barring manufacturing defects, scratches, high heat, and/or humidity. In any event, we recommend that you play it safe; if you want to keep a CD forever, make a fresh backup copy every few years.

Problem: I just got the latest version of a great burner software package I've used in the past. Suddenly, I'm getting tons of errors while making copies.

Solution: Unfortunately, new applications aren't always released in a "ready for prime time" condition. Some require one or more software patches, or updates, to bring them up



Check your optical drive's driver software version in Windows' Device Manager.

to speed. Some media-authoring programs are particularly notorious for this. The only real solution is to put aside that latest major release for several months, which may mean uninstalling the software and reinstalling the previous version. If the problems you're having go away, you'll know what's to blame.

In any case, when you install new software, always check the publisher's site for the most recent updates.

Problem: I burned a CD on my computer, but it won't play in my car stereo or the CD player in my home entertainment center.

Solution: There are several possibilities here. The most likely is that you didn't finalize (or close) the burning session when you finished writing to it. If you haven't finalized it, it can only be read by the burner you used to make it. (By the way, you'll want to leave an uncompleted disc open, as that will let you add to it at a future time. Once a read-only disc is finalized, you can't amend its contents.)

Second, are you trying to play a copy of a commercially recorded, store-purchased CD? Because some

players won't accept this. Check your player's manual to find out.

Third, are you using an audio format that your players are compatible with? CD-ROM drives are unusually broad in terms of what formats they'll accept and reproduce, but you'll need to check your manuals to be sure.

Fourth, try burning another copy using higher-quality media. That might make a considerable difference.

Fifth, make sure you transferred the disc from the computer to other players in a manner that prevented it from acquiring dust or scratches. Either imperfection can and will prevent a proper read.

Problem: My CD-ROM drive reads commercial software and music CDs, but if I load a CD I've made just a few weeks ago, the drive won't recognize it and acts as though no CD is there.

Solution: Reboot your PC and then try loading other CDs you've made and successfully run before. If your drive fails to recognize the others, as well, your drive itself may be on its last legs. Typically, when the drive laser begins to weaken, it begins to have trouble reading CD-RWs and

later CD-Rs. At some point, even commercial software and music CDs will go unrecognized. Fortunately, CD drives are very inexpensive these days, and replacing one yourself is relatively easy.

Problem: I tried to burn a CD today, but my drive wouldn't open.

Solution: The most likely explanation is that your drive is stuck in an attempt to read a damaged or unreadable disc. Power down your system, then gently probe the small hole just below the tray (often on the right side) with a straight, sturdy piece of wire, such as a straightened paper clip. This should trigger the drive door's opening mechanism, and you'll be able to slowly pull it the rest of the way open. Remove the disc, close the drive, and start up your system. If this problem persists, you may need to look at replacing the drive.

Problem: My DVDs are taking longer and longer to burn. I didn't notice it at first, but where I used to burn one in fewer than 10 minutes, the process now takes 30 minutes or more.

Solution: DVD burning uses a lot of hard drive space, so that's the first place to look. Do you defragment your drive often? A surprisingly large number of people go for months without defragmenting their hard drive, and it makes caching torturously slow. Another problem is the accumulation of junk files on your hard drive. A good hard drive utility package such as Iolo System Mechanic Professional (www.iolo.com) or Vcom System Suite (www.v-com.com) contains tools that defragment and also let you examine user-defined junk files for potential deletion. If these are done regularly, DVD burning should show a significant increase in speed. As a side effect, you should see an improvement in speed to many of your other applications, as well. **RS**

BY BARRY BRENESAL



What To Do When . . .

Your System Restore Won't Work

You've just installed new software on your system, but after the requisite reboot, the PC fails to work properly. Slowed performance or an improperly working application leads you to use the Windows XP System Restore utility, but it fails to work. What do you do?

Error messages related to System Restore contain a description of the problem along with suggestions for resolving the problem. While System Restore should not be your only method of backup, you can try some simple solutions when System Restore fails to work properly.

Where To Start

The first thing to do is verify the System Restore service is actually running. You can do this two ways: through the Computer Management dialog window or through a command line interface.

To access the Computer Management dialog window, go to Start and Run, and in the Open box, type **compmgmt.msc** or go to Control Panel and Administrative Tools, and click Computer Management. Once you're in the Computer Management window, expand Services and Applications in the left-hand pane and click Services. All services locally running on the system will appear in the right-hand pane. System Restore Service should have a Status of Started and a Startup Type as Automatic. If it is not running, highlight the service and right-click to open a menu that will let you Start or Restart the service, as well as access the

System Restore Service Properties dialog box to verify that the service is set to automatically start.

This dialog box also offers general information about the Service name (srservice), its executable path, and Service status. Under the Log On tab, check to make certain the System Restore service is enabled for the specific hardware profile. For example, when laptops are docked, the service may be automatically disabled.

The System Restore service may also only be accessible by an administrator, leaving the local user unable to restore previous backup points. In this case, log out of the Windows profile and log back in as a local administrator before proceeding.

You can quickly verify the System Restore service status through a command prompt window. Go to Start and Run, and in the Open box, type **command**. At the prompt, type **Net Start**. A list of Windows Services that have been started will scroll through the display. This method only verifies that the service has been started and offers no additional information.

Troubleshooting

One of the most common problems is insufficient drive space. A minimum of 200MB on the drive the service is running is required for System Restore to properly operate. Once you free up the required space, which you can do by using the Disk Cleanup tool or by manually deleting needless files, folders, or programs from the drive, System Restore should function again.

Insufficient drive space can cause a second, more serious problem with System Restore. When drive space reaches 50MB on the drive that the service is running, System Restore will be suspended across the entire system, meaning that no Restore Points will be created from there on out. So even when you free 200MB to allow the System Restore service to engage, there may be missing restore points due to the service shutting down.

To avoid this problem, especially on smaller drives that do not require backup, you can turn off System Restore for that particular drive. You can do this by accessing System Restore through the System Properties dialog box. Go to Control Panel, double-click the System icon, and choose the System Restore Tab. Then select the appropriate drive, click Settings, and in the box that pops up, click the checkbox for Turn off System Restore on this drive.

If the System Restore service is automatically running and drive space isn't the issue, try installing an older restore point. Sometimes this is where users also run into challenges. If the System Restore disk space usage for a certain drive is set too low in the System Restore tab under System Properties, the number of restore points may be significantly reduced, leaving few restore point options.

Unfortunately, older restore points are not always available. System Restore uses a First In, First Out process for decreasing the size of the data store to 75% of the total size when the data store reaches 90% of its

total allotment—either by default or that set by the user. This deletion is automatic regardless of the amount of total disk space available.

Restore points have a life span of 90 days, so if the restore point is past this mark, it will be automatically deleted and thus unavailable.

Bare Bones Boot

If you have been unable to successfully install a restore point operating in a normal Windows environment, reboot the machine into Safe Mode by holding down F8 during the initial boot sequence until the Windows Advanced Options Menu appears. Choose the first option: Safe Mode. Upon logging in, Windows offers you the immediate option of restoring the machine to a previous state using System Restore by simply clicking No. By choosing this option, System Restore automatically opens.

You can also run System Restore from a command prompt. In the same way you booted into Safe Mode, access the Windows Advanced Options Menu and choose the third option: Safe Mode with Command Prompt. With this option, instead of offering immediate System Restore, a command line interface window opens. At the command prompt, type `%systemroot%\system32\restore\rstrui.exe` to manually launch System Restore.

Blank Calendar

If you see that the restore point calendar on the left side of the Select A Restore Point window is blank, there could be a problem requiring adjustments to the Registry. This may be due to the file association for HTML (Hypertext Markup Language) component (.htc) files missing from the Registry. (NOTE: Making changes to the system using the Registry Editor may cause errors that render the operating system unstable.)

To check the Registry, go to Start and Run, and type `regedit`. Locate the



Using the Command prompt, you can quickly verify that the System Restore Service is running.

keys below by finding the first category and subsequent categories by expanding the appropriate folders. The following keys should be present in the Registry for the System Restore Calendar to be properly populated with valid restore point configuration. If one of the Registry keys is not present, you will need to create a new key.

To create a new key in the Registry, first open the Registry editor by going to Start and Run, and type `regedit` in the Open box. Locate the corresponding keys in the directory tree in the left pane of the Registry editor and add the following values. To add keys, highlight the working directory in the tree to which you want to add a key and select Edit, New, and Key.

To add a new Value name, highlight the key, and in the right pane, right-click to obtain the New menu and choose String Value. Right-click the String Value and rename to the corresponding key information below. Right-click the renamed String Value and choose Modify to edit the Value data to correspond to the key information below. Do this for all keys listed.

- HKEY_CLASSES_ROOT\htc
 - Value name: Content Type
 - Value data: text/x-component
- HKEY_LOCAL_MACHINE\Software\Classes\htc
 - Value name: Content Type
 - Value data: text/x-component

HKEY_CLASSES_ROOT\MIME\Database\Content Type\text/x-component

Value name: CLSID
Value data: {3050f4f8-98b5-11cf-bb82-00aa00bdce0b}

Create a second entry with the following values:

Value name: Extension
Value data: .htc
HKEY_CLASSES_ROOT\CLSID\{3050f4f8-98b5-11cf-bb82-00aa00bdce0b}

Value name = "Microsoft Html Component"

HKEY_CLASSES_ROOT\CLSID\{3050f4f8-98b5-11cf-bb82-00aa00bdce0b}\InProcServer32

Value name: Default
Value data: "C:\Windows\System32\Mshtml.dll"

Create a second entry with the following values:

Value name: "ThreadingModel"
Value data: "Apartment"

If this procedure results in returning the Restore Points to the Calendar and you use the System Restore tool, the earlier configuration may not have the necessary Registry entries needed to populate the Calendar. Check to be certain the Registry Keys are present, and if not, repeat the Registry edits and create a new restore point by going to Start, Programs, Accessories, System Tools, and System Restore. Choose Create a restore point and click Next. In the next window, enter a description for the restore point and click Create.

If the System Restore continues to fail, check the Event Viewer System Log, which records all system errors. Go to Control Panel, choose Administrative Tools, and double-click Event Viewer. Click System in the left-hand pane to display the log on the right. Sort the list by clicking the Source tab, and look for entries with sr or srservice. Double-click each entry to view the Event Properties for a detailed description of the error. **RS**

BY SANDRA KAY MILLER

What To Do When . . .

Your Cell Phone Won't Work

If you watch TV, you've probably seen the series of commercials that feature the cell phone signal strength indicator and customers' muted yelling about their cellular network dropping calls or a loss of service causing social awkwardness. As good as cellular phone service has become, there are still times when we just want to hurl our phones through a window. We either can't connect a call or the signal strength keeps dropping off and cutting us off midconversation. Though the majority of these problems are beyond our control, there are a couple of things we can do to at least increase our chances of making or keeping a call, and we'll discuss them below. For general troubleshooting, please see our online cell phone article at www.smartcomputing.com/rs1101/cellphones.

Problem: Sometimes my cell phone drops a call.

Solution: There could be any number of problems causing dropped calls. If you can't connect, the network might be busy. Try hanging up and making the call a few moments later. You should also make sure that your cell phone battery is fully charged. A low battery can affect the transmitter or receiver in your cell phone handset. You can also try cycling the power of your handset. As with all other technology, sometimes turning it off and then on again can fix the problem. If none of these things work, you might just be falling victim to the nature of the system.

Cellular antennas broadcast and receive radio waves over relatively short distances (about 10 square miles) and are dispersed to create a "quilt" of coverage with as little overlap as possible. Since the cellular providers don't want to cover the same area twice, there are naturally some spots where coverage can't be guaranteed. These areas are called "dead zones." As you near the edge of a tower's coverage area, the signal strength will drop off significantly to avoid overlap, as well. If you're located in a dead or weak-signal zone, no matter how briefly, you will have problems with reception.



The Dual-Band Dome Antenna from Wilson Electronics (www.wilsoncellular.com) is designed to be mounted on your ceiling or an internal wall to boost the signal being broadcast to your cell phone.

Problem: The signal to my cell phone in my car is poor.

Solution: If you're passing through a dead zone, there's nothing you can do but wait until you're in an area where

cellular coverage is better. Having said that, there are some things to do to increase your signal strength when you're on the fringes of a cellular tower's coverage area. First off, manufacturers recommend that you keep your finger away from the phone's antenna while making a call. Your body can draw signal strength away from your phone, resulting in a poor connection. Some manufacturers also recommend using a wired hands-free kit to effectively increase the antenna length of your cell phone. Anything you can do to bring extra cellular radio waves into your cellular handset might help.

If you drive a lot and are willing to spend a little money, you can also purchase an antenna to help boost the signal to your phone. These antennas can be mounted on the outside of your car and will draw in as much cellular radio signal as possible. Companies such as Wilson Electronics (www.wilsoncellular.com) manufacture antennas that can be mounted on your roof or trunk and require no external power source to provide a possible increase in cellular reception while you're driving.

Problem: Cell phone reception is bad in my home or office.

Solution: If you happen to be in a cellular dead zone, you can't just

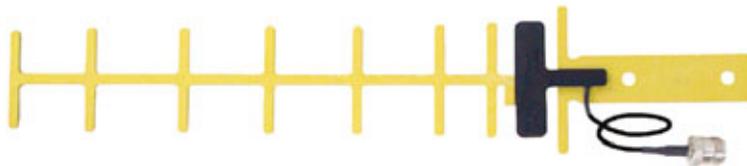


move your residence to an area with better coverage. You should discuss your location with your cellular service provider to determine whether or not you're actually in a location without that provider's coverage. If that's the case, you will either have to make and receive calls outside your home or switch to a service provider with coverage in your area.

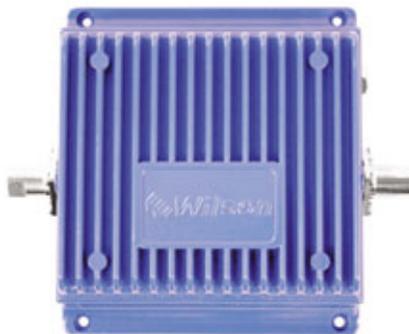
Fortunately, with the rise in popularity of mobile phones over the past few years, cellular service providers have spent millions to increase their coverage across the United States, so this is becoming less of a problem. Of course, just because you *get* service doesn't mean that the quality will be good. If you have determined that your residence is in an area with cellular coverage, you might be losing signal due to your surroundings. Metal, concrete, and glass all diminish the signal strength from the outside of a building to the inside. If your apartment is in the middle of a building or your home contains a lot of AC ducting, metal superstructure, or concrete, the signal just might not be reaching your cell phone. Wilson Electronics also offers antennas that mount on your roof or an exterior wall and will draw in as much signal as possible and might increase the cellular signal strength within your home or office.

Problem: The cellular signal is so weak that an antenna won't help.

Solution: If you drive in areas with little cellular signal or your home is located in a fringe area, a passive antenna (one that doesn't require any power to operate) just might not be enough. If you determine that to be the problem, you can opt for a signal repeater or amplifier. These active devices require a power source such as a wall outlet or cigarette lighter to operate but will actually draw in, amplify,



The Yagi 1800-1900MHz PCS Antenna from Wilson Electronics is compatible with PCS providers such as Cingular (www.cingular.com), Sprint (www.sprint.com), and T-Mobile (www.t-mobile.com).



When used with an external antenna, Wilson's Mobile Wireless Cellular Amplifier amplifies and wirelessly broadcasts Verizon (www.verizon.com) and Alltel (www.alltel.com) signals inside your car.

and rebroadcast weak cellular signals. The amplification can provide a boost to cellular signal strength. If it's a wired connection, you will need to connect the amplifier directly to your phone through your phone's accessory port, while a wireless connection is more universal since it doesn't require a direct connection to your phone.

Problem: I'm interested in purchasing signal boosting technology, but I don't know what to look for.

Solution: You will need to consider your own personal requirements before you purchase an antenna or amplifier. Do you need a wireless signal, or can you live with a wire connected to your phone in the car or at home? Is there a power supply available where you plan to use the device?

In addition to your usage preferences, you should consider whether the device has been approved by the FCC (Federal Communications Commission; www.fcc.gov). FCC

approval means that the government has inspected the product and deemed it appropriate for its listed use. It doesn't guarantee that the device will solve your problem, but it will help you avoid fly-by-night

companies who provide shoddy equipment. While searching the FCC Web site might not be the best way to go, a manufacturer will usually want to brag about their product and will say something like "FCC accepted" somewhere in the product documentation.

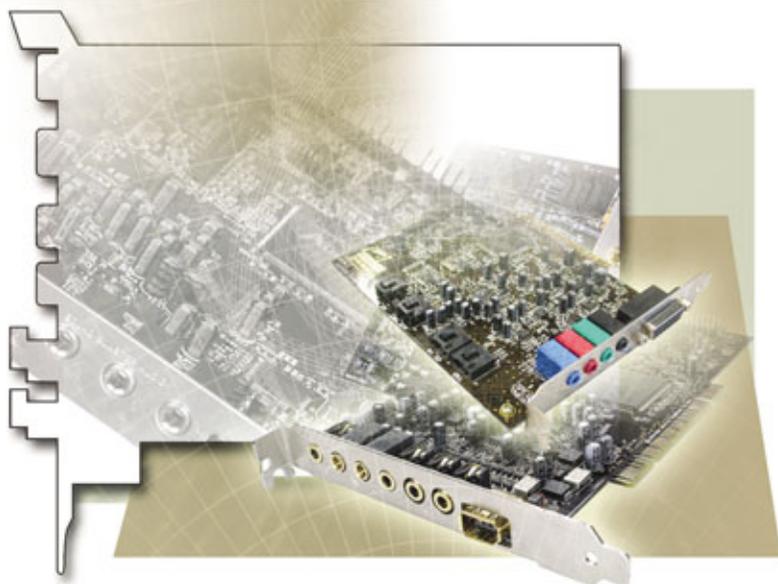
Finally, you should also determine whether or not it will be compatible with your cellular phone. An amplifier needs to match the network type of your phone. When looking at your network type, look for acronyms like 3G (third-generation cellular, which will include most newer cellular handsets), CDMA (Code Division Multiple Access), TDMA (Time Division Multiple Access), GSM (Global System for Mobile Communications) or EDGE (Enhanced Data for GSM Evolution). Cellular service providers will give you this information about your specific handset, as will most reputable antenna or amplifier manufacturers about their products.

When considering an antenna or amplifier, you also need to consider the frequency range of the device. All cellular networks operate on a specific frequency, measured in GHz (gigahertz) or MHz (megahertz), depending on whether the network is analog or digital and the network type. Your amplifier's operational range will need to support the frequency of your handset in order to provide the appropriate signal. Information about your network and the hardware you're considering should be available from your service provider and the manufacturer, respectively. **RS**

BY DAVID MILLER

Basic Troubleshooting

Audio Cards



The function of an audio card, or sound card, is pretty self-defining: It sends an audio signal out of (and may allow one into) your PC. In addition to analog signals, some sound cards send and receive digital audio through coaxial and/or optical jacks. Many sound cards also handle MIDI (Musical Instrument Digital Interface), a protocol for controlling and synchronizing electronic music gear and software.

Although their function is the same, sound cards come in different forms. The most basic is a circuit board that plugs into a computer's PCI (Peripheral Component Interconnect) slot. Because a PCI sound card's faceplate has a limited amount of space, some manufacturers pack in more connectivity options than there's room for on the faceplate by including a breakout cable, an octopus-like plug sprouting multiple audio inputs and outputs.

At the other end of the design spectrum are external sound cards, which aren't cards at all, but peripheral devices that route audio to and from the computer through a USB or FireWire cable.

In between are hybrid designs that utilize a PCI card cabled to an external box, or a housing that fits into a drive bay, with various jacks and controls.

Product information. If you don't know the make and model of your card—say, it came installed, and you've never needed to identify it before—you can find this information in Windows' Device Manager.

There's more than one way to access the Device Manager, but the quickest is to right-click the My Computer icon and, from the pop-up menu, select Properties. Next, click the Hardware tab and the Device Manager button.

Now click the plus (+) sign next to Sound, Video And Game Controllers to open its list and find the entry for your sound card. For further information, right-click the listing and select Properties from the menu.

Working status. If your audio card is acting up, the symptoms will usually be obvious: no sound, poor sound, unexpected hardware behavior after installation, and so on. We'll cover each of these and more, but if you suspect that your problem lies with your speakers, rather than your sound card, consult "Basic Troubleshooting: Speakers" on page 140.

Problem: I'm not getting any sound at all . . . or I'm getting sound from some audio sources, but not others.

Solution 1: A problem this nebulous can stem from one of several causes, so first eliminate the things that would make you slap your forehead if you discovered them after an hour of serious effort. Software settings are a good place to start. Open the System Tray at the end of the Taskbar, click the Volume icon, and make sure the slider isn't set to zero or the Mute box checked.

Solution 2: For a more thorough look at things, right-click the Volume icon and select Adjust Audio Properties. This opens the Sounds And Audio Devices Properties dialog. Under the Volume tab,



Two audio cards, two different designs: M-Audio's Audiophile 2496 (\$129.95; www.m-audio.com) is a PCI (Peripheral Component Interconnect) card with a breakout cable. Creative's Sound Blaster X-Fi Elite Pro (\$299.99; www.soundblaster.com) pairs a PCI card with an external box.

click Advanced. Now you'll see a Volume Control mixer. This includes sliders and mute boxes not only for the master volume, but also for components such as CD audio and the line input for an external device. Make sure these channels aren't set to silence one or more sources.

Also, if necessary, click the Audio tab and make sure that the expected sound card is the device selected under Sound Playback.

Solution 3: Make sure that your audio card's driver is properly installed. Navigate to Windows' Device Manager by right-clicking the My Computer icon and selecting Properties. Click the Hardware tab followed by the Device Manager button and open the Sound, Video And Game Controllers list. If you see a question mark or an exclamation point next to your card's listing, or if you don't see it listed at all, reinstall the sound card's driver.

Solution 4: Give your connections a thorough inspection. Make sure all cables are firmly seated in their jacks. And if the cables are exposed, make sure they're not frayed or damaged—pets and small children can be effective gremlins. If you have an audio system that requires its own power, such as a 2.1 speaker system with a subwoofer, make sure it's plugged in and turned on, with the volume up.

Solution 5: Try plugging the audio card into another PCI slot. It's possible that the card is fine, but the slot itself, or the bus that serves it, has failed. If you're using an external sound card, try a different USB or FireWire cable, in case the original has gone bad, as well as plugging the cable into different jacks on each end.

Solution 5: If you would like Windows to provide a guided walk-through to pinpoint a problem, open Sounds And Audio Devices Properties

as described in Solution 2, then click the Hardware tab, select your audio card in the list, and click the Troubleshoot button.

Problem: I've performed an operating system upgrade or installed other software, and now my sound card isn't working the way it used to or doesn't work with the new program I installed.

Solution: You may have introduced a software incompatibility to what had been a stable setup. First, check your card driver's version number. Go to Windows' Device Manager, right-click your sound card's listing, and, from the pop-up menu, choose Properties, then click the Driver tab.

Now visit your audio card manufacturer's Web site and see if they've issued any updated drivers for your card. If they have, download and install the latest driver. Check the release notes to see if they specifically cover what you might have installed to cause the incompatibility.

Problem: My audio has low levels of hiss, static, or crackling.

Solution: Internal sound cards can be sensitive to EMF (electromagnetic field) interference caused by such system components as the power supply and other circuitry. Fortunately, increasing the distance between components by even a small amount can eliminate, or at least minimize, EMF problems. Try isolating your sound card by moving it to another slot, as far from other components as possible.

EMF problems can also come from external devices: fluorescent lamps, cell phones, home entertainment gear, and other gadgets. If you've recently placed anything of the sort in your computer's vicinity, unplug or move it and see if that makes a difference in your audio performance.

If your PC came with an integrated sound card, and you've determined that the problem is internal interference, you're not going to have a quick fix. An integrated sound card is

hardwired in as part of the motherboard, which helps lower the price tag but introduces a greater possibility of EMF interference. If you can't live with it, you'll need to install a different card.

Problem: I've tried replacing the integrated card with a new, better PCI card, but it seems to operate erratically or not at all.

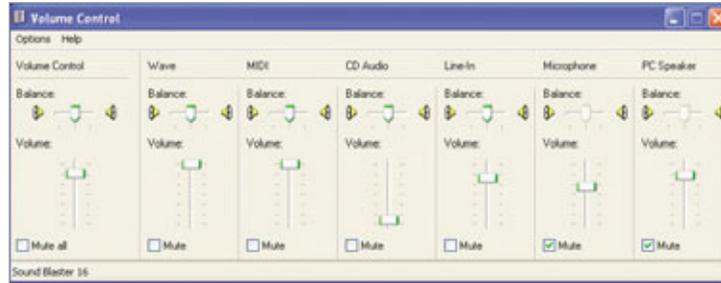
Solution: Before installing a new audio card, disable the integrated audio card. Begin by deleting its driver. Navigate to Windows' Device Manager (right-click My Computer, select Properties, click the Hardware tab and then the Device Manager button) and expand the Sound, Video And Game Controllers list. Right-click the driver and, from the pop-up menu that appears, click the Uninstall option.

Next, disengage the integrated audio card by restarting your PC. As your system reboots, press and hold the proper key to access your BIOS (Basic Input/Output System) settings. This varies according to manufacturer, but the DELETE key is the most common.

Once you're in the BIOS, select the Advanced option (although we have found the audio card under a category labeled Integrated Peripherals). Whichever location you go to, look for an item called Onboard Audio, Audio Device, or something similar. Choose its disable option, then press Escape and select Save And Exit from the main BIOS menu. After your PC boots into Windows, shut it down, install the new sound card, restart the PC, and install the drivers for the new sound card.

Problem: I've properly installed a new sound card, but it seems dead, or the sound gets stuck on a small snippet of audio, or the machine manifests some other bizarre hardware behavior.

Solution: This sounds like an IRQ (Interrupt Request) conflict between the card and another hardware device or component. Windows' IRQ system is its means of handling the continual stream of requests for the processor's attention. For smooth operation, components need a unique identifying number. If two devices end up



The Volume Control mixer shows that the CD Audio is turned down. Now, aren't you glad you checked simple stuff like this first?

with the same number, they're asking for trouble.

Problem: I'm trying to run an audio signal into or out of a digital jack on my sound card, but I'm getting ugly noise in the signal, or no sound.

Solution: First, let's address how digital audio differs from analog audio. Digital audio is a data stream with two settings, one of which is crucial to establishing a digital connection.

The first setting is the **sample rate**. This denotes how many times per second an analog audio signal has its picture taken, so to speak, during the conversion process. Music CDs use a sample rate of 44.1kHz—each second consists of 44,100 slices of audio data.

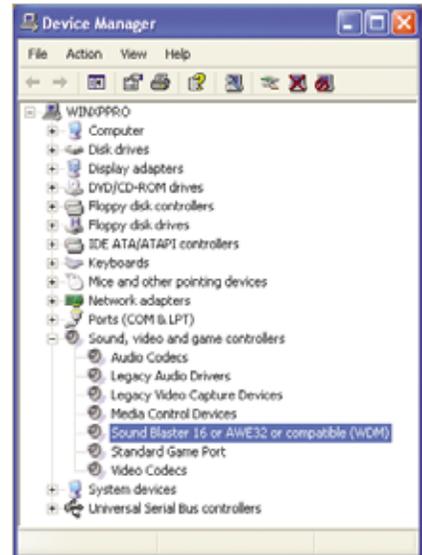
The second setting is **bit depth**. This denotes the resolution for the volume of each sample. The higher the bit depth, the greater the resolution, the smoother the sound, and the greater its dynamic range. Music CDs are 16-bit.

For two digital audio devices to communicate successfully—one sending, the other receiving—they need to communicate at the same sample rate. When they are, they're considered locked.

Some digital devices automatically reset to the sample rate they're receiving; others must be set manually. Where your PC is concerned, you'll likely set the sample rate in the sound card driver's control panel or in the software you're using, such as recording software.

Also, some sound cards that offer both coaxial and optical connections permit only one to be active at a time. Check the card's control panel to ascertain that the connection you want to use is the designated choice.

As for bit depth, devices communicating at different rates will still be compatible, but it's better to send a lower-rate signal to a higher-rate destination. If, say, a 16-bit signal flows into a 24-bit destination, such as a recording application, you'll capture the audio in full fidelity. Record a



Windows' Device Manager is key to several troubleshooting procedures for your sound card.

24-bit signal as a 16-bit file, however, and you'll be lopping off 8 bits of data, which can degrade audio quality. **RS**

BY BRIAN HODGE

Basic Troubleshooting

CD/DVD Drives



CDs for a quarter, DVDs for a dollar. Talk about cheap storage for your data.

With a DVD±RW or CD-RW drive and a disc-burning utility such as Roxio or Nero, you're all set to make your own music, backup, and video discs. On the other hand, there's plenty that can go wrong. Burning CDs and DVDs with an optical drive still isn't as easy as copying files to a hard drive or USB memory key, although Windows Vista finally adds belated DVD-writing support.

There are many different kinds of CD/DVD errors, including media defects, disc incompatibilities, playback problems, drive errors, and software bugs. In this article, we'll tell you about some universal troubleshooting steps that can fix the majority of these, or at least reveal the likely cause so you can try a new tack. We'll also get into specific fixes for other problems.

All Will Be Revealed

Open your computer's case and look at your optical drive's label to find its brand and model number, such as the Lite-On SHM-165H6S. If this is a hassle, open the Device Manager by right-clicking the My Computer icon, choosing Properties. Then, click the Hardware tab and the Device Manager button. Next, click the plus sign (+) that's beside DVD/CD-ROM Drives, and you should see your drive's information, such as _NEC DVD_RW ND-3500AG for the NEC ND-3500AG burner.

For some kinds of problems, you'll need to find out your drive's firmware version number, too. Download Nero InfoTool (www.cdspeed2000.com) and install it. Run it, then choose

your drive in the drop-down menu at the top. InfoTool 4.03 reported our ND-3500AG's firmware version, 2.16, in the Drive tab's upper-right corner.

Universal Troubleshooting Steps

You can solve many optical drive problems with these simple tips. If you're wondering whether your drive is going bad, download Sony's free DriveCheck diagnostic utility (sony.storagesupport.com/cdrw/diagnostics.htm) and run it.

Reading errors are usually due to smudged, scratched, or defective discs. Clean a troublesome disc with a CD/DVD cleaning spray from a consumer electronics store. The water vapor from your breath can do in a pinch. Wipe the disc's recorded surface in straight lines from the inner hole to the outside edge with a clean, soft cloth. Never rub a disc sideways or in circles. Any contact with a cloth leaves microscopic scratches on a disc, but scratches that run radially from the center of the disc outward usually won't cause skips like ones that follow the spiral track of data around the disc. Occasionally run a special lens-cleaning disc through your drive or disc player to remove dust from the laser lens. If all else fails, try reading the disc in a different drive.



Most CD and DVD drives use the IDE interface. However, some Plextors (such as this PX-755SA) and Samsungs are SATA (Serial ATA) drives, and therefore don't have the jumper, cable, and DMA (direct memory access) mode issues that can crop up with IDE units.

Writing errors may generate a warning in the burning software, or they may only show up later as skipping or stuttering audio and video or errors in burned data files. Defective CDs and DVDs aren't uncommon, so try another disc. A different brand or type of media (such as a DVD-R instead of DVD+R) might be in order. Next, try writing at a slower speed, such as 1X for DVDs or 4X to 8X for CDs. Finally, try reading the help file in your burning software or the FAQs on the developer's Web site.

Always store your discs in jewel cases or sleeves to avoid scratches and dirt. Never toss a bare disc on your desk or dashboard if there's anything important on it. Finally, keep in mind that too much direct sunlight, excessive heat, and prolonged humidity can make any CD or DVD unplayable.

Optical Irritations

If the universal steps above don't help you, perhaps the tip you need is listed below. Note that some solutions apply to more than one problem.

Problem: Recording doesn't always work correctly with a particular burning utility.

Solution: Check the software developer's site for updates. The site might also have a forum or knowledgebase that could help you with error messages. Also, search for keywords such as the brands and types of your drive and the discs you're using, such as Verbatim DVD+R 16X or Plextor PX-716.

Next, check your software's settings to find the cache or temp folder it uses to temporarily store files on the hard drive before burning them to disc. You should maintain unused space on that hard drive partition (such as C:)



There's no major difference between regular CD-R/RWs and pricier ones marked "Music" or "Video," but some standalone disc recorders require you to use the latter.

to give the cached data somewhere to go. Plan on at least 800MB of free space before you burn a CD, 5GB for a DVD, and at least 9GB if you're writing a DL (double-layer) disc. Defragment the partition before you burn the disc to keep the hard drive from scattering the data and slowing down the process.

Problem: Recording doesn't work correctly with a particular drive.

Solution: A firmware update may solve certain problems with your burner and/or expand its compatibility with various brands and speeds

of media. If the drive manufacturer's site lists a newer firmware version than the one InfoTool says your drive is using, consider downloading it and updating your drive (called flashing the firmware). The drawback is that if the flashing session fails or is interrupted, your CD/DVD drive might be useless afterward. Hey, at least new drives are cheap.

First, be certain that the firmware is for your specific drive model. Also, closely follow the instructions in the update's Readme file or on the download page. For example, some LG drives require you to place them as the Master, and only, device on the IDE data cable during a flash update. Also, many firmware update utilities require you to turn off your antivirus, antispyware, and other security applications during the update process.

Problem: A DVD you've burned doesn't play back in a consumer player. The video or menu may freeze after a few seconds, or it may generate an "unknown disc" error.

Solution: In general, the newer the player, the more formats and types of media it will support. Some players at the low end may sacrifice some compatibility for an inexpensive price, however. And some standalone recorders might require that you pay extra to use recordable media marked "for video" as a sort of pre-emptive tax on unauthorized copying.

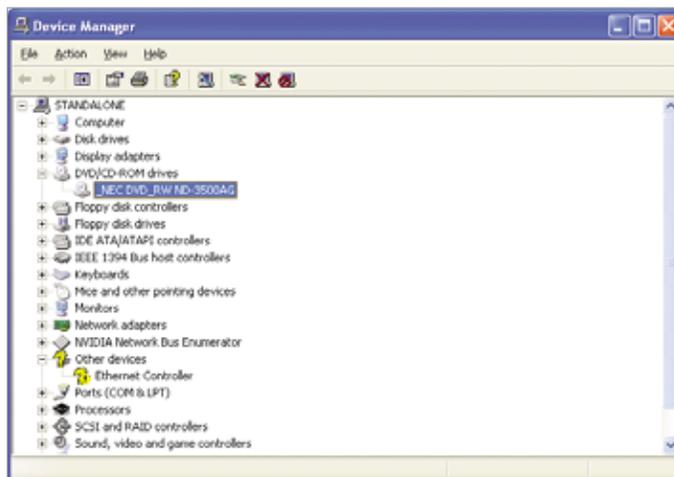
The discs most likely to play back without problems in consumer players are DVD-R, DVD+R, and DVD+RW, in that order. DVD-RW wasn't initially designed to be a video playback format, although some consumer recorders may support it.

If you want to make DVD-Video discs with DVD+R/RW media, your drive might hold the key



If your LightScribe labels seem too faint even on the Best quality setting, try LightScribe 1.2 media or download the Extended Label Contrast Utility (www.lightscribe.com/support/index.aspx?id=306).

to better compatibility. Some DVD burners can change the book type of DVD+R/RW/DL discs, making them seem to be DVD-Rs or DVD-ROMs to players and drives. If your drive can do this, called bitsetting, you'll see Book Type-related settings in recent versions of burning software. Set the Book Type to DVD-ROM or DVD-R, and your disc should stand a better chance of playback in more players.



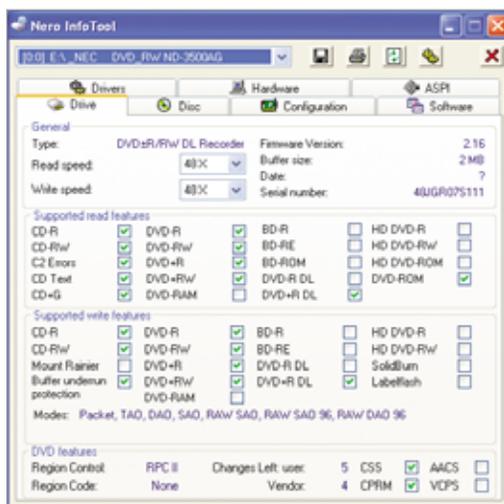
Windows' Device Manager will report the brand and model number of your CD or DVD drive, so you don't have to open your computer case.

Problem: Either an SVCD (Super Video CD) or VCD (Video CD) doesn't play in a consumer DVD player or on a computer with DVD playback software, plays with video errors, or is only recognized as an MP3 audio file disc.

Solution: Some DVD players simply don't support these types of discs. Others may play VCDs or SVCDs only if the discs were authored with certain settings, which the VCD/SVCD/DVD creation software may point out. The same goes for DVD playback software, although the developer may provide a patch or plug-in to enable this functionality.

First, consult the DVD player's documentation for VCD/SVCD support. If your DVD player allows firmware updates, as some DVD recorders do, try updating it. Update your DVD playback software if there's a later version you can download. You can also try burning a new disc at a slower speed and/or using a different brand of CD-R.

You might find that different burning software, even from the same developer, may make discs that are compatible with your player. For an Apex DVD player with a checked history of disc compatibility, as an example, we created compatible



Nero InfoTool (www.cdspeed2000.com) can tell you your optical drive's firmware version, plus just about anything else you want to know.

SVCDs with Nero 7 Ultra Edition's NeroVision Express, but not with Nero Express.

Read up on your disc authoring software's settings for VCDs and SVCDs in its help file and options, as well as the support section of the developer's Web site. Try different settings related to disc compatibility. If all else fails, try options that make nonstandard discs.

Problem: A CD-RW or DVD±RW drive will not read prerecorded

CD-ROMs faster than 40X, although the drive's rated 48X or 52X.

Solution: This behavior is intentional in many drives. Because prerecorded CD-ROMs' data layers are generally made of aluminum with pits stamped into it, some discs may be slightly out of balance and/or might have structural weaknesses. At rotation speeds above 40X, some might even fly apart, damaging the drive and possibly injuring someone in front of the drive.

Plextor has even gone as far as to build tougher bezels that are designed to contain plastic shrapnel from disintegrating media.

CD-R/RWs use a dye-based recording layer, and don't seem to be as vulnerable to this phenomenon as CD-ROMs. However, improperly applied labels can throw any disc out of balance. Also, any cracks in a disc can come under stress at high rotational speeds, causing the disc to shatter.

You can force some 48X and 52X drives to temporarily bypass the 40X limitation by following the manufacturer's directions. This usually involves holding down the drive's eject button for a few seconds until the activity LED (light-emitting diode) blinks and then inserting the CD-ROM you want to read at high speed. Plextor calls this feature SpeedRead; other manufacturers use different marketing terms, if they draw attention to this safety feature workaround at all. Most drives will revert to 40X max speed after you eject the disc.

Note that most drives can only read an optical disc at the maximum rated speed near the outer edge. The edge of the disc is the last section to be recorded, so if a disc isn't full, you'll never see those 48X or 52X transfer rates from it. Therefore, you may not

notice much of a speed difference during typical use, although you may shave some seconds off of a CD rip or software installation. Of course, if a \$50 game CD-ROM does fly apart in your \$35 drive, that's \$85 down the drain. In general, setting read speeds above 40X isn't really worth the risk.

Problem: Pops and/or other noises when playing back a music CD you've burned.

Solution: The write speed may have been too fast in comparison to the data supplied by the original CD or hard drive. Try recording at a slower speed, especially if your burner is too old to have buffer underrun protection, and leave the computer alone until the new disc is finished.

If you're copying one CD to another on a computer, set the burning software to cache the music data on the hard drive before writing it to the blank disc. A hard drive will typically be faster than the optical drive reading the original CD, so it shouldn't let the data stream dry up during a burn. Defragment the hard drive partition designated for this cache, and make sure there's at least 800MB of free space on it.

If these steps don't help, try a different brand of CD-R. Verify that the drive's data cable is connected securely and shows no visible damage. Make sure that the optical drive's jumpers are set correctly, meaning that it's the Master device if it's on the end connector on the data cable or the Slave device if it's on the middle connector. Also, check for updates to your burning software.

Samsung adds that some CD recorders don't write audio frame headers on music CDs, which can cause noises during playback.

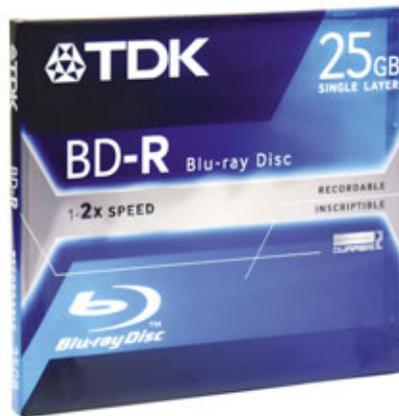
Problem: Your drive theoretically supports a new type of media, but it won't burn it at its top speed.

Solution: This is the type of problem that a firmware update might fix, as mentioned above. If

there isn't one available yet, try another brand of media.

Problem: Your brand new Blu-ray or HD DVD drive doesn't read or write to CDs.

Solution: The first generation of BD and HD DVD drives don't support CD media. Fortunately, recordable DVD drives do. Many cost less than \$35 online, so if your computer has room, run a DVD burner alongside your blue laser unit.



The Blu-ray (25GB or 50GB) and HD DVD (High-Definition DVD) (15GB or 30GB) formats can store much more than DVD±R/RW (DVD Recordable/Rewritable) (4.7GB) or DVD±R/RW DL (Dual-layer) (8.5GB), but current BD and HD DVD drives are way too slow and expensive.

Problem: Your car stereo can only play MP3s on a CD-R from one folder at a time, not from all the folders on the disc in one playlist.

Solution: Some car stereos and other CD players are MP3-compatible but nevertheless can't handle folders very well. Many music lovers store each album in a separate folder on their hard drives, so it's tempting, but not advisable, to create MP3 discs with the same folder structure. The best way to make an MP3 disc is to use Nero's or Roxio's suggested applications.

You can also drag and drop files to a CD-R in Windows XP or Vista. If you do the latter, only transfer files to the disc, not the folders they're in.

Your goal is a disc with all of its songs in its root directory.

Problem: A drive doesn't read or write discs properly, and may freeze the PC temporarily, when set to the Master or Slave jumper settings.

Solution: Some drives work best with their jumpers set to the CS (Cable Select) setting. One such drive was Sony's DRU-820A with its initial firmware version.

Shut off your PC. Move the DVD drive's jumper to the CS setting, then reboot. If problems persist, turn off the PC and try a different data cable.

Problem: Other owners of the same drive report faster burning times and read rates.

Solution: Until recently, DVD and CD burners could get by with old 40-wire ATA-33 data cables because they weren't capable of sending more than 33MBps. Today, some drives only work properly with 80-wire ATA-66/100/133 cables, which actually still use the same 39- or 40-pin connectors as ATA-33 cables (the extra wires are for grounding). The rule of thumb is that when you install a new drive, use the cable that came with it.

Don't forget to check that your drive is running in DMA mode (see the "Your Hard Drive Is Much Slower" problem in "Basic Troubleshooting: Hard Drives" on page 85). Also, know that different media, firmware versions, and burning software versions will have an effect on how fast your drive writes discs, as will your overall system speed.

Problem: You've downloaded an ISO file, but you can't seem to burn the disc image it contains onto a CD or DVD instead of the ISO itself.

Solution: When you start a project or compilation in your burning software, enable the option or setting to "Burn Image," "Burn From Disc Image," "Record Disc From Image," or something similar. 

BY MARTY SEMS

Basic Troubleshooting

Graphics Cards



Your graphics card, or graphics adapter, is the component of your PC responsible for processing everything you see on the computer's display, including your operating system's GUI (graphical user interface), software applications, videos, still images, and text. Depending on your computer, your graphics adapter is either a standalone graphics card or an integrated chip built into the motherboard. For instance, most desktop PCs feature graphics cards plugged into a PCI (Peripheral Component Interconnect), AGP (Accelerated Graphics Port), or PCI Express slot on your computer's motherboard. On the other hand, notebooks and small form factor systems commonly use integrated graphics adapters.

Identify Your Adapter

If you suspect that your graphics adapter is causing problems with your system, then a useful first step is to verify if your computer can recognize it. Identifying your graphics adapter is also useful for finding the

graphics card's most up-to-date driver.

If you can access your Windows Desktop, click Start, right-click My Computer, and click Manage. Click Device Manager from the left pane of the Computer Management window, click the plus (+) sign beside Display Adapters to expand it, and then double-click the graphics adapter installed on your

system. Take note of the model and manufacturer as described on the General tab.

If you don't see the Display Adapters option and instead see a yellow exclamation mark in front of Video Controller, then your computer can't recognize your graphics card. To verify this, right-click anywhere on your Desktop, click Prop-erties, and then click the Settings tab. If you see Default Monitor under the Display heading, then your computer is using a generic display driver rather than one designed for your graphics hardware. See the Resolve Driver Conflicts section below for information on downloading and installing an updated driver.

You may not be able to view your Desktop if your graphics adapter is malfunctioning. In these instances, the documentation that came with your computer or standalone graphics card is your best source of information about the model and manufacturer. If your graphics adapter is an integrated chip, then check the documentation for your motherboard or computer or check the PC manufacturer's Web site.

If you don't have the original documentation and still don't know the model and manufacturer of your graphics card, then your last resort may be to physically open the case, remove the card from your system, and inspect it for a sticker that identifies it. To locate your standalone graphics card with your case open, find the VGA (Video Graphics Array) or DVI (Digital Visual Interface) port that connects to your monitor cable. This port is located on the back of the standalone graphics card. For more details about removing your graphics card, refer to the Inspect Your Connections solution in the first problem.

Fix Your Graphics

If you notice problems with anything you see on your display, then you'll probably need to troubleshoot your graphics adapter. To eliminate the possibility that your monitor is the source of the problem, however, refer to "Basic Troubleshooting: Screens & Monitors" on page 100.

The following are a series of common graphics card-related problems and possible solutions. If you don't see your particular problem listed below, download the latest graphics card driver from the manufacturer's Web site, uninstall the existing driver, restart the computer, and then install the new driver. For more details, see the Resolve Driver Conflicts solution later in this article.

Problem: The PC seems to boot, but the display is blank.

Solution 1: Check your display. Make sure your monitor is plugged into a working power outlet, connected to the appropriate VGA or DVI port on the graphics card or motherboard, and powered on. Also, check the VGA or DVI cable connectors for bent pins that may interfere with your video signal.

Solution 2: Inspect your connections. Check to make sure the graphics card is fully inserted into the

motherboard's PCI, AGP, or PCI-E slot. To check and reseat a standalone graphics card, start by shutting the computer down, unplugging it, unplugging the monitor cable, and removing the PC's side panel. Touch a grounded piece of metal to dissipate static electricity before touching any internal component. Unless you have a tool-free case, use a screwdriver to remove the screw that secures the card bracket to the case's rear panel. If your graphics card requires one or two power connectors, disconnect them before removing the card from the slot. Next, examine the slot that the graphics card is plugged into. AGP and PCI-E ports typically have some form of locking mechanism that holds the card in place. Unlock the card by sliding, pushing, or pulling the latch. On some motherboards, you'll need to gently bend a tab while pulling the card out of the slot. Slowly and carefully pull the card straight out of the slot and examine it for damage or other obvious problems. Remove dust from the card and slot with a clean, dry cloth and reinstall the graphics card, making sure to insert the card fully into its slot. Plug in all the power connectors that you unplugged and restart the computer.

Problem: Your system crashes intermittently or when running graphics-intensive applications.

Solution 1: Check your card's cooling. Your graphics card produces a lot of heat under normal conditions. That heat output can dramatically increase when running 3D games and other graphically demanding applications. Some computers feature built-in sensors that let you monitor your case temperatures. If applicable, consult your documentation for information about your PC's temperature monitoring capabilities. Video cards all have different recommended operating temperatures, so consult your computer or



This graphics card from ATI requires a single 6-pin power connector from the PC's power supply.

video card documentation for the recommended ranges. To resolve the problem, remove the side panel from your case and examine the graphics card for dust buildup. Use a dry cloth or canned air to remove the dust from your fans, vents, and components. Start the PC again to make sure your case fans and graphics card fan are working properly.

Solution 2: Check your power supply. If the video card has one or more power connectors, make sure they are plugged into the power supply. Intermittent restarts can also be the result of an overtaxed power supply. Consult the documentation that came with your computer or power supply to determine its wattage capabilities and then make sure your graphics card doesn't push your system over that limit. For more information on troubleshooting a power supply, refer to "Basic Troubleshooting: Power Supplies" on page 93.

Problem: Your system intermittently freezes, reboots, or displays poor graphics performance.

Solution 1: Verify compatibility. Before purchasing any new component, you should always make sure that it will work with your existing hardware and software. Even if you've installed a PCI, AGP, or PCI-E graphics card into the appropriate slot types in your PC, you may still encounter problems. For instance, an

AGP 1.0-compatible motherboard can typically run an AGP 8X-compatible graphics card, but it will only run at slower 1X or 2X AGP speeds, resulting in poor graphics performance. Also, newer motherboards may have multiple slots that a PCI-E graphics card will fit into, but these slots may operate at different speeds. You'll typically want to install a PCI-E graphics card in the fastest slot available. You may need to consult your documentation or a manufacturer's Web site for these details.

Solution 2: Resolve driver conflicts. Make sure you uninstall the old graphics card driver and configuration software before installing a new graphics card or the latest graphics driver for your existing card. Even if you already installed the new card or driver without uninstalling the old drivers, it's best to download the latest driver for your new graphics card from the manufacturer's Web site (if you haven't already done so), uninstall the existing driver, and then reinstall the latest driver. Both Nvidia (www.nvidia.com) and ATI (ati.amd.com) offer unified drivers that work for all graphics card models of the same series, such as GeForce and Radeon.

If you plan to play games, download the latest version of DirectX at www.microsoft.com/windows/directx/default.mspx before uninstalling the old graphics driver. Save the latest driver and DirectX executable files to your Desktop and then uninstall the old graphics card driver and configuration software. Installing the latest driver can also resolve graphics issues that sometimes appear after installing Windows XP's Service Pack 2.

To uninstall the old driver and configuration software, use the Add Or Remove Programs utility. In WinXP, click Start, Control Panel, and then click (double-click in Classic View) Add Or Remove Programs. If you're using Windows 98/2000, click Start, Settings, and Control Panel and

then double-click the Add Or Remove Programs icon. Scan the Currently Installed Programs list for the graphics card's manufacturer and then click the Remove or Change/Remove button on all items that pertain to the graphics card. Now you can double-click the new driver's executable file to install it. If applicable, install the graphics card configuration software and DirectX.

Solution 3: Install new motherboard chipset drivers. The chipset on the motherboard is responsible for communications between the CPU and graphics card slot. For this reason, you may be able to resolve some graphics card problems by installing the latest version of your motherboard chipset's driver. To determine your chipset driver, click the Start button, right-click My Computer, click Manage, select Device Manager from the left pane of the Computer Management Window, and then click the plus (+) sign in front of System Devices. Your chipset should appear as multiple entries in this list. For instance, if you see "Intel® 955X Processor to I/O Controller – 2774," then your chipset is the Intel 955X Express. Visit the motherboard or computer manufacturer's Web site to download the driver. Install it and restart your computer.

Solution 4: Try another graphics card. If you have access to a spare graphics card, you can eliminate the possibility that another aspect of your system is causing the problem by swapping the problematic card with the spare. Shut the computer down, dissipate static electricity by touching a metal portion of the case, and then unplug it. Next, remove the monitor cable from the back of the graphics card, remove the existing graphics card (making sure to open the locking

mechanism on the slot), insert the other graphics card, and lock it in place. Plug in any necessary power cables, close the case, connect the monitor, and restart the computer. Once Windows loads, install the appropriate driver and reboot. If everything goes smoothly, you can assume that your existing card is the cause of the problem. If the same glitch occurs, you may need to troubleshoot another aspect of the system.

If the problems started after you installed a new graphics card, try the old card again to eliminate the possibility

your computer to fail to boot. Restart your computer and enter the BIOS utility, commonly by pressing DELETE, ESC, F1, or F2. You may need to consult your computer or motherboard manual for which key to press. Press the function key that loads the default settings and then press the designated Save And Exit key, which typically appears somewhere on the BIOS screen. Your PC should load Windows after you exit the BIOS, and you can then find out whether resetting the BIOS fixed your problem.

Problem: The display flickers continuously.

Solution: Adjust the refresh rate. A low refresh rate can cause CRT (cathode-ray tube) monitors to flicker. To change the refresh rate, right-click anywhere on the Desktop, click Properties, and click the Settings tab. Click the Advanced button and the Monitor tab and then click the Hide Modes That This Monitor Cannot Display checkbox to select it. You may need to consult your monitor's documentation or the manufacturer's Web site to determine the refresh rates your monitor supports. Use the drop-down box to choose a higher supported refresh rate. A refresh rate of 75Hz or faster should prevent screen flicker. Click Apply, click OK, and close the Display Properties dialog box.

I Can See Clearly Now

Troubleshooting your graphics card can be frustrating because often you won't see any error messages or on-screen prompts that might clue you in to the source of the problem. But you're not flying blind. Anyone can resolve a vast majority of graphics adapter problems using the procedures listed above. 



The graphics card is typically located in the top-most PCI (Peripheral Component Interconnect), AGP (Accelerated Graphics Port), or PCI Express slot on the motherboard, just below the CPU.

that the new card is damaged. Uninstall the new card's drivers, shut the system down, remove the new card, insert the old card, restart the system, and reinstall the old card's driver. If the problem is resolved after you reinstall the old card's driver, and you have eliminated the possibility that there is a hardware or software conflict, then you can assume that the new card is faulty or has been damaged.

Solution 5: Reset the BIOS to defaults. Often, improper settings in the BIOS (Basic Input/Output System) utility can wreak havoc on your system. For more specific information on navigating the BIOS, see www.smartcomputing.com/rs1101/bios. Always exercise caution when changing the BIOS settings, as one wrong move can cause

Basic Troubleshooting

Hard Drives

Your PC's hard drive affects nearly everything your computer does. It stores your operating system, your applications, your games, and your personal files. If it "forgets" a few bytes of data, you'll get errors, hangs, and possibly a loss of any documents or photos you haven't backed up yet.

In addition, your PC hits your hard drive for data much more often than the slower CD/DVD drive or Internet connection. In a very real sense, then, your hard drive is your computer's main bottleneck, because it's the slowest data-moving device your system commonly accesses. If your hard drive slows down, your entire computer becomes less responsive and fun to use. And if it breaks, nothing else works.

This article delves into basic troubleshooting for these mass storage devices. We'll get into solutions for

some common maladies for single (non-RAID [redundant array of independent disks]) hard drives, as well as a few relatively uncommon ones.

Drive(s) License Or Other Form Of ID

Before you start to research a potential problem, jot down the model numbers of the parts involved, such as the hard drive and controller chip or card. You may be able to ID all the parts involved without cracking open your computer case. If your PC uses a controller card rather than a controller built onto the motherboard to run your hard drive, however, you may need to open the case to check the card's brand and model number.

In the Device Manager (right-click My Computer, choose Properties, and click the Hardware tab), look under Disk Drives for your hard drive's model number, such as HTS 548040M9AT00. A Google search of that number will likely lead you to the drive manufacturer's site and an ID of the drive's advertised name, such as Travelstar 5K80.

Consumer desktop hard drives come with either IDE (Integrated Drive Electronics, also called ATA [Advanced Technology Attachment], PATA [Parallel ATA], EIDE [Enhanced IDE], or DMA [direct memory access]) or SATA (Serial ATA) interfaces. An IDE drive is easy



to spot because it uses a wide ribbon cable instead of SATA's skinny cables. In the

Device Manager, look under IDE ATA/ATAPI Controllers for your IDE or SATA controller chip's name. If an expansion card handles data flow to your hard drive (the drive's data cable connects to a card instead of the motherboard), it might be listed under SCSI And RAID Controllers instead.

Universal Troubleshooting Steps

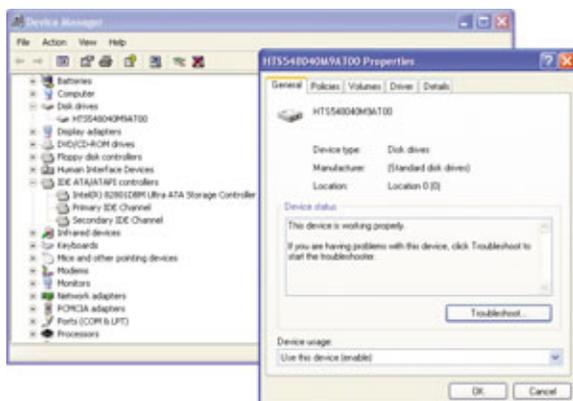
When you suspect your hard drive is having problems, before you do anything else, open your computer's case and make sure that its power and data cables (both ends) are snugly attached. Back up your personal data to another hard drive, a DVD, or a CD. Try not to replace an earlier backup if that's your only copy of the data, as you don't want to overwrite a good backup with possibly corrupted files.

Next, update your controller's drivers in case there's a later bug fix you need. If you've combined hard drives in a RAID, make sure you download and install a RAID-compatible driver.

Scan for errors. In Windows Explorer (right-click Start and choose Explore), right-click a partition on your hard drive, such as C:. Select Properties, the Tools tab, and Check Now under Error-Checking. Click both options' checkboxes to enable a longer, more thorough scan of your



If your only complaint about your hard drive is how noisy it is, start shopping for a low-decibel model. Seagate offers some of the quietest drives around.



The Device Manager tells you your hard drive's and controller's model numbers, which is essential troubleshooting information.

drive, including every bit of its disk surfaces. Finally, click Start. A scan of your C: drive may require a reboot.

If the scan turns up errors on your drive, or if Windows runs erratically or not at all, restart your PC and enter the BIOS (Basic Input/Output System) setup, usually by pressing the DELETE or ESC key during the boot process. Enable SMART (Self-Monitoring Analysis and Reporting Technology) monitoring, if your hard drive supports it. This setting can be in several places in the BIOS, but it's usually in menus having to do with the hard drive, SATA, and/or IDE settings. Save your changes and exit.

Next, use a different computer to download Seagate's SeaTools (www.seagate.com/support/seatools) and install it on a bootable CD-R or floppy diskettes. Boot your problem PC with SeaTools in the CD or floppy drive. Use a PS/2 (Personal System/2) mouse instead of a USB one to avoid having to navigate SeaTools with the TAB key, the Spacebar, the arrow keys, and combinations of ALT + underlined letter keys, such as ALT-N for Next. After the utility loads, run a full scan of the suspect hard drive. Click View Report to read the results, should a yellow or red circle icon indicate trouble.

If your drive has some bad sectors, you've lost the files stored on them. SeaTools will offer to overwrite the

bad sectors, which will erase the data stored on them but will also prompt the hard drive to map out the defective areas so that they're never used again. Allow the overwrite, then run another full scan afterward. When your drive has a clean bill of health, eject the SeaTools CD or diskette and reboot.

Drives are disposable. Most drives develop a few bad sectors over time. This isn't a big deal. On the other hand, if your drive accumulates more bad sectors every time you run a scan, it's probably gradually failing. If so, replace the drive. Like power supplies and RAM modules, hard drives are replaceable, not fixable, commodities. If your drive gets wiggly on you, it's time to buy a new one.

Hard Problems

If error and surface scans come up clean, your hard drive probably works fine. Of course, some of the data stored on it could be at fault. Rolling your PC back to an earlier time with System Restore or uninstalling and reinstalling a troublesome application may help.

If not, read on for some possible fixes for various problems. Many hard drive maladies and remedies overlap, so it's worthwhile to try everything listed here.

Problem: Your computer seems to run slower over time.

Solution: After checking for errors, run Disk Cleanup (in My Computer, right-click C: or another drive letter, then choose Properties and Disk Cleanup) to free up storage space. Make sure there's at least 1GB of unused space on the drive, or Windows won't run as fast as it should.

After Disk Cleanup, defragment your drive so that it stores data in a more orderly manner. In Windows XP, right-click the drive letter, choose Properties, and click the Tools tab and Defragment Now. The nice thing about third-party programs such as Diskeeper (www.diskeeper.com) or Raxco PerfectDisk (www.raxco.com) is that most can move the apps you use most to areas of the hard drive that take less time to access. This can shave a second or two off the time it takes to launch an app. Watch out, though—on rare occasions, defragmenting the partition with the currently running OS (operating system) on it, such as the C: drive, can cause problems such as file system errors.

Problem: Your hard drive is suddenly much slower.

Solution: To check an IDE hard drive, launch the Device Manager. Under IDE ATA/ATAPI Controllers, right-click Primary IDE Channel (this may be called Parallel ATA Controller on some motherboards, such as those using nForce chipsets). Next, choose Properties and click the Advanced Settings tab (or the Primary Channel or Secondary Channel tabs, if present). Make sure that your hard drive's Transfer Mode is some variation on Ultra DMA. You may first need to set the Transfer Mode to DMA If Available or uncheck the Let BIOS Select Transfer Mode box, depending on the settings available to you.

SATA drives can run slightly slower without certain settings enabled, too. Under IDE ATA/ATAPI Controllers in the Device Manager, right-click a SATA Controller entry and choose Properties. In its Advanced Settings, Primary Channel, or Secondary Channel tabs, as applicable, make sure that read and write caching are enabled, as well as Command Queueing.

Problem: Your computer suddenly doesn't recognize a drive previously in use.

Solution: If you've recently worked inside your computer, you might have inadvertently bumped a data cable loose. It's very easy to nudge a SATA data cable out of place, so check that these are snug.

In one isolated case, we once found a drive's SATA power connector to be unreliable. If your SATA hard drive has both SATA and Molex (4-pin) power connectors, unhook the former and connect the latter. You should never attach both types of power hookups to a drive, however.

Problem: Your computer doesn't recognize a new hard drive you've just added.

Solution: For an IDE drive, verify that you've moved its plastic jumper near the power and data ports to the correct pins. Set the drive on the end connector of the data cable to Master (a boot drive may work best as the Master device on the Primary Channel), and any other hard drive or CD/DVD drive on the middle data cable connector to the Slave setting. Don't use the Cable Select jumper setting unless it's necessary to solve a drive problem. However, if you've just built an external drive out of a spare hard drive and an enclosure kit, the kit manufacturer might recommend Cable Select for best results.

You may also need to update your motherboard's BIOS to the latest version. Follow the manufacturer's instructions to the letter.

Often, installing a SATA or ATA/133 controller card solves a lot of compatibility issues, especially on an older motherboard. After you install the controller card according to its instructions, connect the hard drive's data cable to the card instead of the motherboard.

To get a recent, high-capacity IDE hard drive to work on an older motherboard without a card, try limiting the drive's capacity to 137GB with a jumper setting, if present. If it works after

changing the jumper setting, install a controller card that circumvents the motherboard's 137GB limitation.

For a 3Gbps (gigabits per second) SATA hard drive, you might need to set a jumper on it to change it to 1.5Gbps (150Mbps [megabits per second]) mode to get an older controller to recognize it. This will limit the drive's speed negligibly, if at all, but it may solve a compatibility issue with a 1.5Gbps controller.

Problem: Your PC doesn't power on or occasionally crashes after you add a hard drive.

Solution: If your power supply unit doesn't have enough amperage on the 12V and 5V rails to fire up your PC with the addition of a new drive, consider removing less important devices or upgrading your PSU (power supply unit). Flip forward to "Basic Troubleshooting: Power Supplies" on page 93 in this issue for some tips.

Problem: After a hard drive is disconnected from and then reconnected to your PC, the computer won't load the OS and reports that there's no boot device.

Solution: When some BIOSes detect that a hard drive is removed, they automatically change the devices in the boot priority list. However, most of these BIOSes don't reverse the changes when the missing device is reattached.

During your PC's POST (power on self test) when you first turn it

on, press DELETE or the indicated key to enter your BIOS setup. Find the boot priority device list, adjust it, and save your changes when you exit. If you have multiple hard drives, you may need to choose which drive is the boot device in a separate setting.

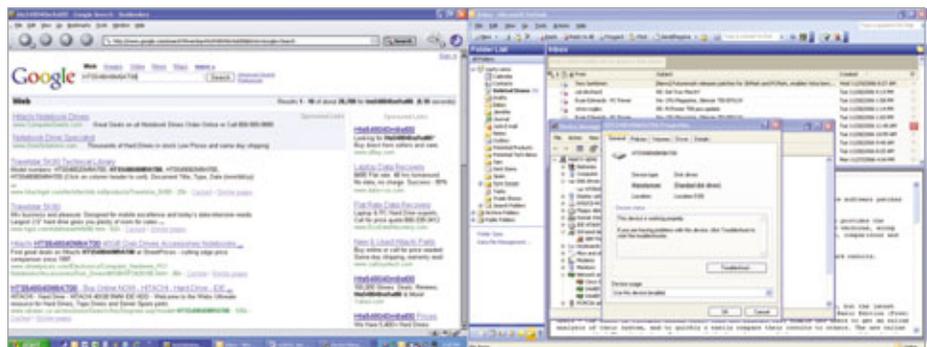
Problem: A drive is noisy.

Solution: If it's a new noise, especially a loud or unusual one, the hard drive could be failing. Make sure it's not just a fan or an imbalanced disc in your DVD drive that's whining or howling.

If your hard drive is only noisy during periods of heavy seek activity, check to see whether the manufacturer offers a download that can change your drive from its performance mode to a quieter mode with acoustically optimized seeks. The drive will act slightly slower after the change, but it shouldn't be as loud.

Certain drives such as the Maxtor D740X with standard bearings are audible even when idle. Most current drives use fluid dynamic bearings, which help eliminate the whine that older drives can emit. You can replace the drive with a quieter model, such as a Seagate drive. Look for a maximum dB (decibel) rating in the 28dB or lower range for near-silent operation. **RS**

BY MARTY SEMS



Once you've located your drive's model number, Google it to find its name and specs.

Basic Troubleshooting

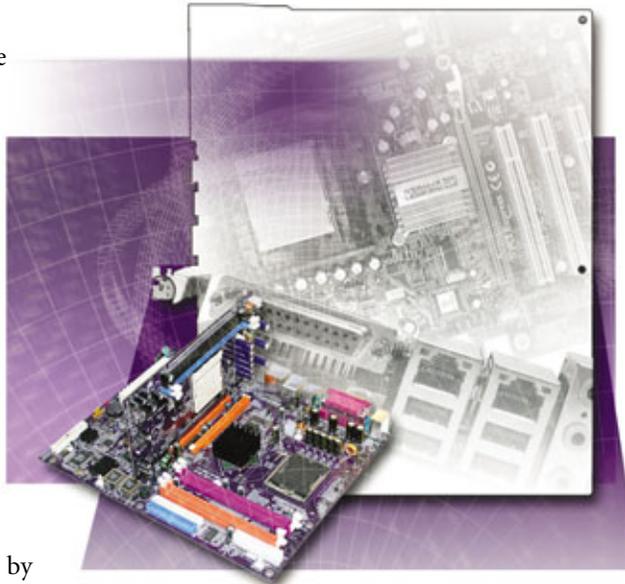
Motherboards

If momma ain't happy, no one's happy. That old joke is just as true for computers as it is for people, at least where the computer's motherboard is involved.

The motherboard is the large circuit board that every other computer component connects to, and it serves as the sole communications conduit between those devices. When the memory banks need some data from the hard drive, when a video game needs information from the video card, a key is pressed, the mouse is moved, or any other action is performed by any piece of hardware, the motherboard routes the output to the appropriate input. This universal role means that when something goes wrong with the computer, it could be a bad piece of connected hardware, or it could be a malfunctioning motherboard.

The motherboard is hard to miss when you open the computer's case. It holds the expansion cards, the memory modules and the processor, and also has connections for the cables coming from your hard drive, CD or DVD drive, and other components. Check to see that all of the expansion cards and memory modules are fully seated in their respective slots and that all locking clips or other restraining devices are completely closed. Cards and memory modules are not properly seated if a large portion of the metal contacts on the bottom of the unit are visible above the motherboard slot, or if metal contacts at one end stick up more than those at the other end, indicating that the unit is seated crooked in the slot.

Look closely at the metal contacts on expansion and memory slots for



signs of corrosion. Also, look for corrosion and signs of bulging on all of the barrel-shaped capacitors on the motherboard, as these types of damage indicate the need for a motherboard replacement. If any part of the motherboard is cracked, scratched, or has a soldered-on component that has broken loose, a complete replacement is also in order.

Finally, make sure the ends of all cables are pressed completely into their respective slots. Moving internal cords and cables out of the way to make room when removing or adding components can sometimes pull cables loose, causing the hardware on the other end of that cable to malfunction.

The best place to find out the exact motherboard your computer uses is to look in the documentation that came with the system, but there are a number of free tools that provide even more information than the manual does. One of the best tools is System Information For Windows (free; www.gtopala.com). Download the

latest version, double-click the file, and click the Motherboard entry in the Hardware section. The most important information you'll need when troubleshooting is the model and SMBus type. It is highly recommended that you visit the computer or motherboard manufacturer's Web site every few months to download and install the latest motherboard driver software, and you'll need to know the exact model of the motherboard to obtain the right software to perform this upgrade. Keeping the driver up-to-date helps eliminate bugs in your system, improves hardware compatibility, and may even boost your computer's overall performance.

Motherboard problems are notoriously difficult to troubleshoot because many of the problems experienced with them are also associated with particular hardware devices. For example, motherboard problems can cause system lockups, but trouble with memory, video cards, and power supplies can also freeze the computer. If the computer refuses to turn on, it may be a motherboard issue, but it is more likely to be a problem with the hard drive or with Windows. Damage to the motherboard can cause hardware malfunctions, and improper motherboard settings can cause hardware incompatibilities, but faulty hardware generally is to blame. Despite their complexity, motherboards are pretty reliable if the drivers are up-to-date, and you should always troubleshoot other hardware before focusing your attention on the motherboard.

Motherboards are very susceptible to damage from static electricity so be sure to touch a grounded piece of metal before you start poking around. Better still, get a grounded wrist strap, which should be available at nearly every computer store, and always wear it while working inside the computer's case.

Problem: Nothing happens when I press the power button.

Solution: In rare cases, the power button itself breaks, so open the case and inspect the button for damage before trying anything else. If that isn't the cause, then the motherboard may be fried due to electrical damage, but this problem most often happens after you install a hardware component and accidentally unseat the motherboard's internal power plug from its socket.

The size and shape of this socket (and sometimes there are two separate sockets) varies depending on the type and age of your motherboard, but the documentation that came with your computer should let you know where to look. You are looking for the power supply's ATX (Advanced Technology Extended) plug, which has either 20 or 24 pins, and the ATX socket, which has an equal number of holes to accommodate the power pins. Some motherboards that have 20-pin ATX sockets also have a 4-pin ATX socket located elsewhere on the board, and both of these must be powered by separate cables for the motherboard to function. All you need to do is make sure the power plugs are fully seated in the sockets and the computer should boot.

Problem: When I press the power button, nothing appears on the monitor and the computer begins to beep.

Solution: Those beeps you hear are diagnostic codes that indicate the motherboard has detected some serious trouble. The beeping patterns and their meanings differ depending on the type of motherboard you have, so you'll need to refer to the motherboard's documentation or contact the manufacturer to find out the specifics.

Problem: When I press the power button, the computer seems to boot (the fans run properly, for example) but nothing appears on the monitor.

Solution: This indicates a problem with the video card, the monitor, or the motherboard's integrated video or video expansion card slot. Check the cable between the video output and the monitor, make sure the monitor is turned on and set to the appropriate input, and reboot the computer. If there is still no video, open the case to make sure your add-in video card (if you have one) is seated properly and secured into place. If that's not the problem, remove the video card according to the instructions it came with, connect the monitor to the motherboard's integrated video output (if your motherboard has an integrated video output—not all do), making sure to enable the appropriate BIOS (Basic Input/Output System) setting as detailed in the computer's manual, and see if that works. If your system uses the motherboard's integrated

video rather than a separate video card, install a video card in the motherboard's video expansion slot and change the BIOS setting to bypass the integrated video hardware. If none of those options work, you may need to replace your system's motherboard. You can learn more about tweaking a BIOS in "Basic Troubleshooting: BIOSes" at www.smartcomputing.com/rs1101/BIOS.

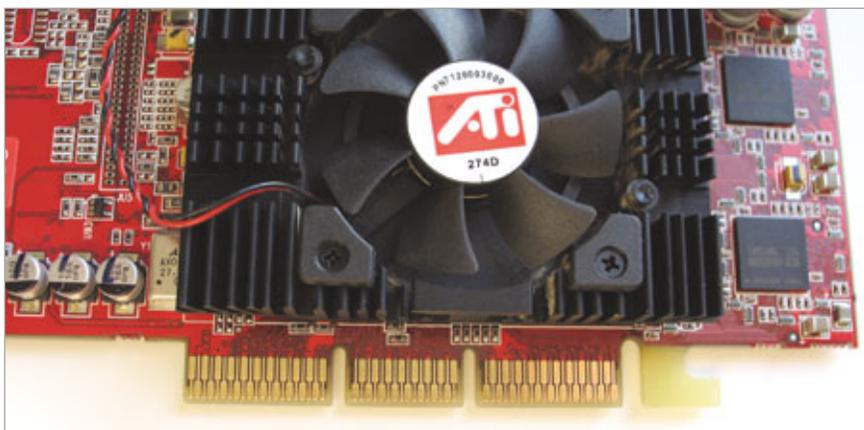
Problem: I just installed a new video card or sound card but the new one isn't detected.

Solution: Many motherboards have integrated sound and video hardware, and the problem in this scenario is that the motherboard isn't switching audio or video responsibilities over to the new hardware device. To force your motherboard to relinquish control to the new add-in card, you must disable the integrated audio or video hardware using the motherboard's BIOS settings. This procedure differs from motherboard to motherboard so you'll need to consult the computer's manual.

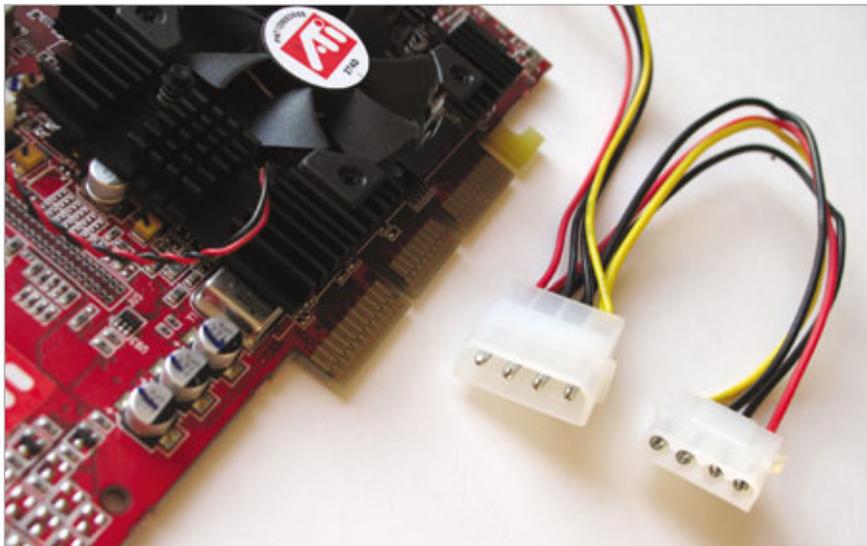
Problem: I have to install a new hardware component or remove an old one, but the force needed to insert or remove it seems excessive, and I'm afraid I'll crack the board.

Solution: No component should cause the motherboard to flex when it is inserted or removed, let alone cause enough force to threaten cracking the board. If this problem arises when inserting memory modules, check the edges of the memory slot to make sure any locking clips are completely opened. Most memory module clips are designed to lock into place automatically when the module is fully seated in the slot, but you may need to manually push each clip into its completely locked position.

Another common problem when inserting memory modules is that some are designed to be pressed straight down into the slot while others are designed to be inserted at a slight angle and then swung into a vertical position, where they lock into



The contacts on expansion cards are the shiny silver or gold metal bars that are seen here. Make sure they extend evenly from any expansion slot, and never touch the metal.



When a video card requires external power plugs (two of them in the case of this energy-hungry card) make sure your power supply is up to snuff.

place. Look at the instructions that came with the modules or the documentation that came with the motherboard to see which insertion method your memory slots require.

When inserting expansion cards, particularly video cards, look for locking clips that must be opened before the card is inserted or held open as the card is inserted. Most modern motherboards have video card slots with locking mechanisms that must be manually held open when a card is removed, so look for one before accidentally applying excessive force when you remove the card. Never rock an expansion card or memory module back and forth to get it into place or you risk damaging the metal contacts, and never put pressure on the side of the card or the memory module or you'll risk breaking off the delicate plastic slot. Don't touch any metal contacts on the motherboard or the hardware, and be extremely careful when screwing or unscrewing expansion cards into place, because if the screwdriver slips it can scratch and ruin the motherboard.

Problem: I just installed a new hardware component that requires a power connection, and now the

PC won't boot or reboots itself at random times.

Solution: Inexpensive computers often come with very basic power supplies that can't provide enough electricity to accommodate the fastest video cards, multiple hard drives, or other power-hungry components. Unfortunately the total wattage ratings most power supply manufacturers apply to their products overstate the amount of electricity they can consistently output, so even if you add up all of the wattage used by your components and it comes in under the stated output of the power supply, these types of problems can still happen.

First you should remove the newly-added hardware and see if the computer runs in its original configuration. If it does, you'll likely need to upgrade to a new power supply or replace the new component with something that uses less wattage. Be sure to check carefully with the manufacturer before ordering a new power supply because some motherboards, like those found in a lot of Dell systems, use proprietary connections that prevent the installation of a third-party power supply.

Problem: I installed more memory but Windows doesn't recognize it.

Solution: Bad memory modules aren't very common, but test the computer with a different module if possible to see if the one you originally installed was a dud. The most common cause of this problem is that some motherboards require that memory modules be installed in pairs. Most RIMM memory modules, for example, must be installed in pairs that match exactly in speed and capacity or they won't work. Newer systems that support dual-channel DDR SDRAM (Double Data Rate Synchronous Dynamic Random Access Memory) modules will work when the memory modules are installed singly, but performance is enhanced (sometimes dramatically) if you install matched pairs of RAM modules instead (i.e. you get better performance using two 512MB modules than from using a single 1GB module, even though the overall memory capacity remains the same). Check the manual carefully when installing memory to make sure you place the modules in the correct slots.

Problem: The computer never keeps track of time properly.

Solution: Motherboards have a CMOS (complementary metal-oxide semiconductor) memory area that is used to store the time, date, and essential data the PC used when starting up. The CMOS must be constantly powered to retain data, even when the PC is turned off or unplugged, so it is attached to a small battery. Open the case, find the small silver battery on the motherboard, and remove it carefully. Take it to a battery or electronics store to find an exact replacement, put the new one in, and access the BIOS or CMOS setup screen to make any necessary changes to the BIOS, as those settings are lost when the battery is removed. If you don't see a silver battery, the motherboard may use a soldered-on battery, in which case you'll need to have it professionally replaced or purchase a new motherboard. **RS**

BY TRACY BAKER

Basic Troubleshooting

Ports

You wouldn't be able to interact with your PC very well at all if it weren't for PC ports. Ports are the pathways for connecting hardware devices to your computer. Lots of important devices use ports, such as monitors, keyboards, and printers. With the advent of the USB port, it became easier to connect a wide variety of gadgetry to your computer. Now you can transfer photos from a digital camera, connect a flash drive, and synchronize your PDA through USB ports.

How To Obtain Port Information

To identify the types of ports installed on your computer, you can check the specifications that came with your PC. You can also check the PC manufacturer's support Web site to find information about ports and connections included with the model of your computer. But the most reliable method of checking port information is the Windows Device Manager. To open Device Manager, right-click My Computer, click Properties, click the Hardware tab (if present), and click Device Manager. For parallel and serial port information, click Ports in the list that appears in the Device Manager window. For USB information, click Universal Serial Bus Controllers. Double-click an item to display its Properties dialog box with additional details about the port.

Port Problem Or Hardware Problem?

Because you use ports to connect peripherals such as printers and PDAs to your computer, inoperable hardware is a symptom of a port problem. Try

resetting the port by restarting your PC and re-connecting the device. If this doesn't work, it's time for some trial-and-error troubleshooting.

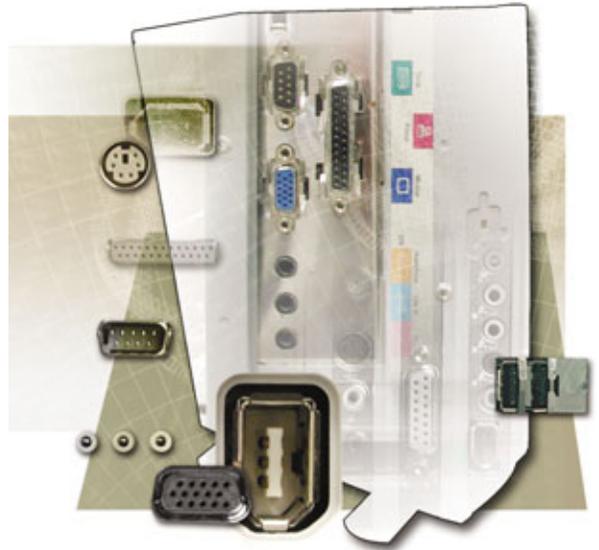
To try to determine whether the port or a malfunctioning device is causing the problem, connect the hardware device to another computer. If it works, the problem may be related to the port. If you don't have another computer available, you can try plugging a different device into the port. For example, if you plug a keyboard into a USB port and it's not working, try a USB mouse or flash drive. If it works, you can focus on troubleshooting the nonworking peripheral device and not the port.

General Port Troubleshooting

Problem: My hardware works when it's connected to a different PC's USB/parallel/serial port, but not on this PC. What should I do next?

Solution: If you determine the probable cause is not a hardware issue, the next steps are to check the computer's BIOS (Basic Input/Output System) settings and to check for upgrades to the computer's BIOS.

To check the BIOS setup screens, you press a key or key combination as your PC is starting, before Windows begins to load. Common setup access keys are DELETE, ESC, and F function keys. If you're not sure which



key you need to press to enter your PC's BIOS, watch for a message as your system starts for the key(s) to press. Repeatedly pressing the key(s) as your computer is starting helps to ensure you press them at the correct moment.

When the BIOS setup screens appear, take care not to inadvertently change settings. The on-screen display should note how to exit the screens without saving changes, if you need to. As you review the BIOS information, look for the BIOS version and write it down. You can check the manufacturer's Web site for BIOS update instructions after you exit the BIOS setup.

Next, check the BIOS settings for the port you are troubleshooting. Port settings are normally located in the Advanced menu. If your computer is



An external USB hub, such as this model from Adaptec, can give your computer more USB ports. However, they can also cause problems for some USB devices.

newer, the BIOS setup screens may not include port information. If that's the case, simply exit the BIOS to continue the PC startup.

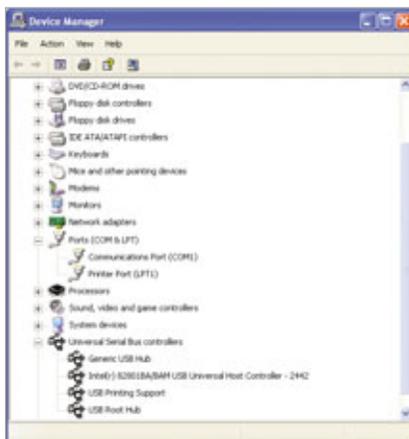
If the BIOS setup screens contain settings for the port you are troubleshooting, check to make sure the port is enabled. You may need to enable additional features, depending on the hardware device you want to connect to the port. For example, if you are working with a parallel port for your printer, you may need to enable bidirectional capabilities in the BIOS. ECP (Extended Capability Port) mode is a bidirectional parallel port standard that lets modern printers communicate with your PC and vice versa. Check your documentation for instructions.

If the port continues to malfunction after you check the BIOS information, you can move on to troubleshooting Windows settings with the Device Manager. To open Device Manager, right-click My Computer, click Properties, click the Hardware tab, and click Device Manager. For parallel and serial port information, click Ports in the list that appears and expand Universal Serial Bus Controllers for a USB issue. (NOTE: If you are using Windows 98/Me, check the Microsoft Knowledge Base article at support.microsoft.com/kb/133240/EN-US for details about using Device Manager.)

In the Device Manager, look for error messages or symbols (such as an exclamation point on a yellow background) next to the controller or near items in the expanded list. If a message or symbol does not appear, check each item in the expanded list by right-clicking it and clicking Properties. Check the Device Status box to determine if there is an error associated with the device. If so, follow the suggested solution.

Troubleshooting USB Ports

Problem: When I use my external USB hub, Windows does not recognize the device I attached to it or it stops working.



The Device Manager provides information and tools for managing system components, including parallel, serial, and USB ports.

Solution: External USB hubs are either self-powered (obtain power from an AC/electrical outlet) or bus-powered (obtain power from the USB port on the PC that it's plugged into). Bus-powered hubs can only handle low-power USB devices that use 100mA (milliamps) or less, such as mice, keyboards, joysticks, or USB devices that are self-powered (use an AC power connector). They can't handle devices that require 100 to 500mA of power, such as video cameras, scanners, and external drives. If the device is a high-power device, attach it to a USB port on the PC or purchase and install a self-powered hub. Or you can try distributing high-power and bus-powered USB devices across your PC's USB ports, so that not all high-power devices are on the same external hub.

Problem: None of my USB devices work when plugged into the USB port on my computer.

Solution: Verify that the power requirements of the USB port are not exceeded. USB devices can draw a maximum of 500mA per connection. If a device attempts to draw more than this, Windows may disable the port until the system power cycles. In addition, if the device draws less than 50mA, the port never becomes active.

Check the Power tab in USB Root Hub properties to check the power usage. To access the Power tab, open the Device Manager, expand Universal Serial Bus Controllers, and double-click the USB Root Hub. In the Properties dialog box, click the Power tab and check the Hub Information area for details about power usage. Repeat this process for each USB Root Hub listed in the Device Manager.

Printer (Parallel) Ports & Serial Ports

Problem: My printer won't print to the parallel port.

Solution: To determine whether a printing problem is due to a faulty parallel port, try sending data to the parallel port through the command prompt. Click Start, click Run, type **command** in the Open box, and press ENTER. In the command prompt window that displays, type **dir > lpt1** and press ENTER. You may need to type this more than once to send enough data to the printer to cause a page to print. If a page does print, the printing problem is not related to the parallel port, and you should troubleshoot the printer. See "Basic Troubleshooting: Inkjet Printers" on page 122 and "Basic Troubleshooting: Laser Printers" on page 128 for more information about dealing with printer problems.

Problem: I connected a serial device to my computer, and Windows is not detecting it.

Solution: The problem may be that Windows is misinterpreting the hardware as a nonserial device and is not enabling the port. Microsoft has created a tool to help you enable and disable serial ports. For a link to download the tool, see Microsoft Knowledge Base article 819036 at support.microsoft.com/kb/819036. 

BY CARMEN CARMACK

Basic Troubleshooting

Power Supplies



about 6 inches wide by 3.5 inches tall by several inches long, with a mass of wires coming out of the front of it. Most PSUs have one or more fans that vent warm air out the back of the PC.

Identify The Suspect

Should you need to verify your PSU's brand and model to look up its specs or seek tech

support, you'll need to read its label. This probably will require you to open your PC's case.

Power supplies are marketed primarily by wattage ratings. This is both a blessing and a curse. It's a blessing because in general, a novice can pretty much assume that a current-generation PSU with x number of watts and the right connectors will handle his computer's needs, and more often than not, he'll be right.

There's no real penalty (and even some power-saving benefits to be had) from purchasing a power supply with "too much" wattage, save a higher price. On the other hand, manufacturers don't all report their products' wattage the same way, and there are many caveats and electrical formulae behind that deceptively simple number.

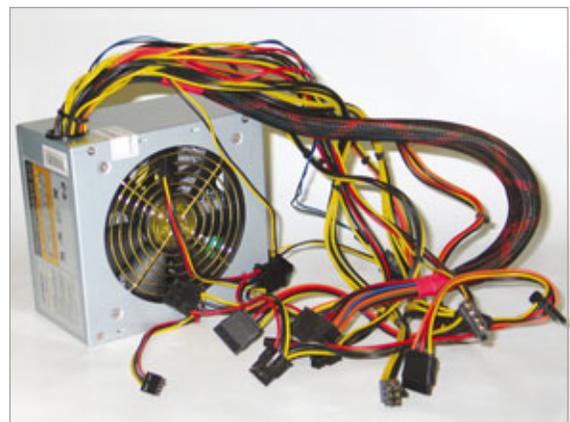
Performance enthusiasts and gamers in

particular should look deeper into a PSU's specs, especially the temperature (such as 50 degrees Celsius, or 122 degrees Fahrenheit) at which the manufacturer logged those specs. If the rated temperature is lower than the typical temp inside a running computer, such as 25 C, the PSU will be less efficient and provide less power during normal use. The hotter the temperatures, the weaker a power supply will be due to increased resistance. Also, the number of amperes on each 12V rail (separate circuit) is important because high-end graphics cards require relatively large amounts of power.

Put It To The Test

If you suspect your power supply has failed, you can check it with an inexpensive testing device. One example with a long name sells for \$14.99 at www.frozencpu.com/psu-165.html.

If you have access to another power supply with sufficient wattage and the same connectors, try it in place of the old one. You don't have to physically install the second unit in the case, but you do have to disconnect the old one from each device and use the power connections from the spare PSU. Alternatively, a repair shop can run a quick test for you with a known good power supply.



A typical power supply looks like a metal box with wire harnesses sprouting from one side.

Many computer users never know what a PSU (power supply unit) is until they have a problem with one. Most of the time, a power supply just works, which is why users who don't tinker with their PCs may have never noticed that they own one. If your computer suddenly stops working, starts to generate errors, or randomly shuts down (especially after you install a new device), the PSU should be one of the first suspects on your list.

Technically, what we call a power supply is actually a switching transformer. It transforms AC (alternating current) into DC (direct current). It also reduces the voltage from 110 volts to 12V, 5V, and 3.3V to run the CPU, hard drives, and other devices.

Instead of using a "wall wart" or a black adapter in the middle of a power cord, like a notebook or an external hard drive, a computer keeps its power supply inside the case. It's the device that the main power cable connects to. In a tower-style case, you'll usually see the power supply near the top and rear. It's a metal box,



Just about every tower-style PC has its power supply located in the upper-rear corner of the system's case.



Four screws usually hold a PSU in place. However, this Lian-Li computer case uses an additional plate to mate the power supply to the case's rear panel.

Powerful Problems

Most power supply troubles stem from one device or upgrade too many, so several of the following problems and solutions overlap to some degree.

Problem: The PC doesn't turn on.

Solution: Before you try a different PSU or a tester as described above, check that the master switch on the back of the PSU is turned on. Make sure the cord is firmly plugged in on both ends, and that your surge protector is powered on.

If the surge protector has tripped due to a power spike, its reset button may be sticking out. If so, buy a new one. Most consumer surge protectors aren't

meant to be reused after they've taken one for the team.

If other devices or room lights aren't working either, check your home's breaker switches. If none have tripped, try another outlet, then another power cord. Your next steps require a tester device or a spare PSU as outlined above, or a repair shop.

Problem: Brownouts, weird errors, or a dead PC since a new device was added.

Solution: A common problem with a premade computer from a major manufacturer is a power supply that's just good enough for the devices that shipped with the PC. Add a new multicore processor or a hot new video card or two, and you might find that the computer works erratically under load, if at all. If your upgraded system dies every time you start up a taxing game such as

F.E.A.R., for example, you might need a stronger PSU. And if your PC doesn't work at all after the upgrade, either the new device is defective enough to cause a major electrical problem, or the total wattage your PC now requires to run is more than the PSU can supply.

Also, make sure that your PC's fans provide enough airflow. As mentioned above, a hot power supply doesn't provide as much current as a cooler one, all else being equal.

Note that your power supply may be ready and willing to supply more current to devices that run on 5V or 3.3V power, but that doesn't matter if the 12V devices overwhelm the 12V rail's capability. Most power-hungry devices, from the CPU to the graphics card to

hard drives and DVD/CD drives, require 12 volts to run. For this reason, many servers start up their hard drives in a staggered sequence so that they don't overtax the PSU. This feature is possible with SATA (Serial ATA) hard drives, but as yet, staggered spin-up isn't commonly supported in desktop PCs.

Problem: The PSU sparks, makes noise, or smokes.

Solution: Sometimes, power supplies die quietly. At other times, they go out with a bit of drama.

If there's a popping noise, a burning smell, smoke, or sparks when your PC suddenly stops working (usually when you turn it on), immediately unplug it. Make sure that nothing is on fire, then open the computer case. See whether anything looks scorched or blackened, especially on the motherboard. If not, perhaps your power supply failed. Your main concern now is to make sure that it didn't take other devices with it.

If you have a spare PSU, replace the old one and its power cord. Only connect the replacement to the motherboard, the video card (if necessary), and the floppy or CD drive. Plug in your computer, insert a bootable floppy or disc, and try to start your PC. If possible, use a floppy made with MemTest86 (www.memtest86.com) because this utility will test your CPU, RAM (try installing only one RAM module at a time if you encounter errors), and motherboard for problems.

If your PC boots, and a few minutes of MemTest86 indicates no problems, shut the system off. Reconnect one device (such as the hard drive) and boot the PC. If that device seems OK, repeat the process until you've discovered any damaged components. Hopefully, you'll only have to replace the old power supply. Don't forget to throw away the dead PSU's power cord, too.

Problem: The PC's case fans are too loud.

Solution: Some PSUs' "Fan Only" line supplies 12V to fans with Molex

connectors, which runs them at full speed; others send a lower voltage for quieter operation albeit with less airflow. Some power supplies adjust the power on the Fan Only circuit by case temperature.

If your Molex-style fans run too loud, install a fan controller in a drive bay. You'll find them on major reseller sites such as Newegg (www.newegg.com) as well as on enthusiast sites such as FrozenCPU.com.

Intrepid tinkerers with pin removal tools from Frozen-CPU.com might reverse the pins in the fan's connector so that it takes 5V (from the red wire) instead of 12V (from the yellow wire). Most fans will run very quietly on 5V, although they won't move as much air. If you do this, switch the pins for the black ground wires on the inside of the connector, too. Note that bigger fans, such as 120mm, may not run on 5V.



After you remove its retaining screws and disconnect all its power plugs, your power supply should slide out the back of the PC. Don't let the power supply fall into the case.

Problem: Your computer requires connectors the PSU doesn't have.

Solution: Current PSUs have a variety of plugs to support recent and near-future motherboard requirements, such as a 24-pin main power connector that splits off 4 pins to fit in an older 20-pin socket. On the other

hand, a cutting-edge PSU might not have a plug that a 6-year-old motherboard needs. For older motherboard connections, you will need to research and buy a PSU with the correct plugs.

Device connections are more forgiving. You'll find many inexpensive adapters for sale online or at computer stores. Many adapters, such as Molex-to-PCI-Express and Molex-to-SATA, are included with particular graphics cards or motherboards. Note that some SATA hard drives can accept either SATA or Molex power connectors, but you should *never* attach both to a drive at the same time.

Problem: Molex connectors don't fit together easily.

Solution: This problem seems to crop up more and more in recent years, and it happens with PSUs from well-respected vendors as well as value brands.

The trouble seems to be that the male and female metal pins inside the connectors just don't seem to fit as snugly as in Molex connectors of yesteryear. Each pin has "wings" that flare out after the pin is inserted into the plastic connector during manufacture. These wings act like the barb on a fishhook, making it difficult for the pin to come back out of the connector. If OEMs make the pins out of thinner metal to cut costs, the wings won't be as rigid. The result is pins that "float" around in the connector instead of staying centered. Obviously, this makes it harder to connect two plugs.

Try grasping the juncture of the wires and the base of the connector using your thumb and forefinger. Usually, this puts pressure on the pins so that they all point in roughly the same direction. As you attach the connector to a device's plug, wiggle it a little. Assuming the pins aren't damaged, the connector should slide in. **RS**

Shopping For A New One

Power supplies are meant to be replaced, not fixed, so troubleshooting a PSU usually ends in shopping for a new one. Whatever you do, don't go cheap with an off-brand. As with RAM, a low-quality power supply means you're more likely to experience errors and hangs, with reboots and random shutdowns thrown in. Stick with a good brand such as Corsair (www.corsairmemory.com), Enermax (www.enermaxusa.com), FSP (www.fsp-group.com.tw), OCZ (www.ocztechnology.com), or PC Power & Cooling (www.pcpower.com). A long warranty is a good indicator of relative quality.

A PSU in the 400W to 600W range will be more than enough for most users for the next several years. Support for EPS12V ensures good compatibility with your next motherboard upgrade. An efficiency rating of

80 to 85% or better means your electricity bill shouldn't suffer, and a noise rating of 28dB or less means your new PSU's fans probably won't make your PC any louder.

If you play PC games, shop for a PSU labeled "SLI Ready" and/or "CrossFire Certified". These indicate that the power supply meets the requirements to run two video cards simultaneously, should you ever want to upgrade your PC in this way for faster 3D performance. More powerful graphics card combos require beefier PSUs, so check specific card/PSU compatibility at Nvidia's site (www.nvidia.com) for SLI or AMD's site (www.amd.com) for CrossFire.

Of course, many power supplies with sufficient amperage (at least 17A on each 12V rail) and connectors will run dual graphics cards even without these certifications. **I**

BY MARTY SEMS

Basic Troubleshooting

Processors

Technology writers often refer to the processor as a computer's "brain" because it handles much of your system's data processing. The similarity doesn't end there: as with a brain, the processor is extremely fragile. You can damage it by bending its pins, by gouging its protective casing, or by running the processor without a heatsink.

Make & Model

If your computer can boot into Windows, you won't have much trouble identifying your CPU's model number. The easiest way to find it is to right-click the My Computer icon on your Desktop and then click Properties. When the System Properties window opens, the General tab's Computer section lists your CPU's manufacturer, model number, and speed.

Is Your CPU The Problem?

If your PC has an ailing CPU, it will probably display some dramatic symptoms: Windows may crash or freeze, or your system may not even start its POST (power on self test) when you boot up the PC. In some cases, a CPU that isn't sitting properly in its socket will run Windows very slowly.

Unfortunately, a defective motherboard may have similar symptoms, which makes it difficult to identify the source of the problem (unless, of course, you have a similar CPU or motherboard on hand, in which case you can swap it with your system's current part). If you're not sure whether your CPU or motherboard is the problem, read this article and see "Basic Troubleshooting: Motherboards"

on page 88. You choose the article that seems to fit your PC's trouble and follow its troubleshooting steps. If one article doesn't solve the problem, you've just eliminated that part as the trouble source; now follow the other article's steps.

Problem: I recently installed a new processor. Now my PC runs slowly.

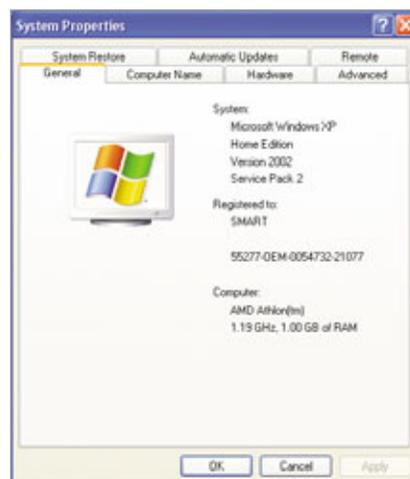
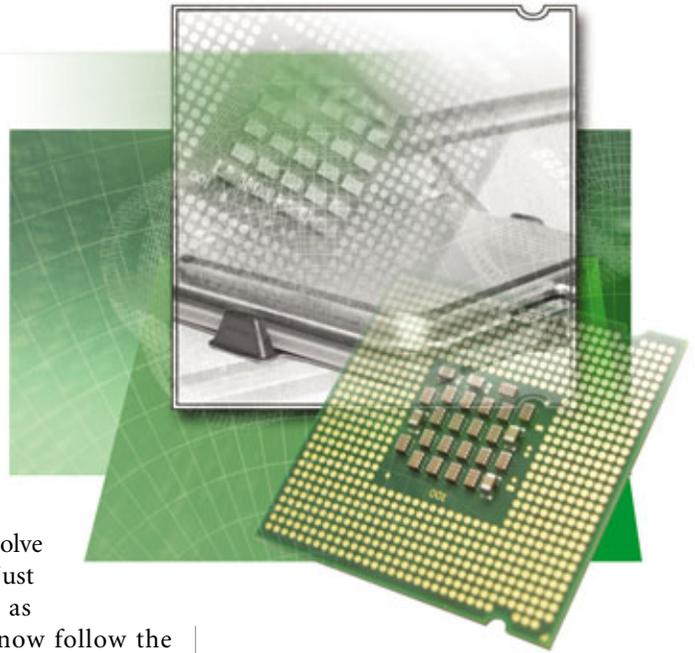
Solution: Reseat the processor in the motherboard's CPU socket. Whether you installed a new CPU or a new heatsink, you may not have seated the processor correctly. This problem affects both CPUs that have pins and CPUs that lack pins; if the processor sits at even a slight angle, the heatsink won't sit flush against the CPU's protective shield. Even small gaps between the heatsink and the

processor will reduce your heatsink's ability to adequately cool your CPU.

Remove your heatsink and then inspect the CPU and CPU socket. Although motherboard sockets vary by motherboard manufacturer (and socket type), most have a lever or similar mechanism that locks the processor firmly into the socket. Lift this lever and then press the edges of the processor gently to make sure it is flush with the socket. Next, snap the lever back into place, according to your motherboard's instructions. Be sure to secure the lever gently to avoid jolting the CPU out of place.

Next, you'll need to remove the thermal paste (or thermal pad) from the top of the CPU and bottom of the heatsink. To remove the old thermal material, drip rubbing alcohol onto a lint-free cloth (PC enthusiasts often use coffee filters) and then rub the CPU and heatsink lightly. Once the alcohol dries, you can apply new thermal paste (follow the thermal paste's instructions to make sure you apply the appropriate amount of paste).

If your old heatsink included a thermal pad, instead of thermal paste, consider buying a new heatsink: once the thermal pad softens (from your CPU's heat), it fills the



The System Properties Window lists basic information about your computer's processor and system memory.

heatsink's microscopic divots. Thoroughly removing a used thermal pad is more difficult than removing used thermal paste.

Finally, reattach the heatsink according to its instructions. Make sure the heatsink sits flush against the processor. Before you power on your system, check to see if the heatsink's power cable is connected to the motherboard's connector (your heatsink won't do much good if the fan doesn't spin to dissipate the heat). If your computer still runs slowly, the CPU isn't the problem. See "Basic Troubleshooting: Your PC Starts Slowly" on page 56 or "Basic Troubleshooting: Your PC Runs Slowly Or Erratically" on page 59 to check out other troubleshooting tips.

Problem: My computer sometimes crashes or freezes, or displays other odd behavior.

Solution: Check for and fix overheating problems. Heat is your computer's worst enemy, whether you live in hot or moderate climates. If your PC doesn't have a strong airflow, susceptible components, such as the hard drives, video cards, and the CPU, will behave erratically or slowly. Although newer CPUs have much better protection against heat than their older counterparts (most new processors have heat shields that cover the processor die and help rapidly distribute heat to the PC's heatsink), all processors suffer when their temps rise too high. We'll show you how to identify common heat issues.

Step 1: Check the CPU temp via the BIOS (Basic Input/Output System). Your motherboard has a built-in feature that determines your processor's temperature. Although CPU manufacturers offer max temperatures for individual processor lines, you can generally expect your CPU to operate efficiently at temperatures in the 40 to 45 degree Celsius range. To check your CPU temperature, press DELETE as the PC boots to enter your BIOS.

When the BIOS appears, use the arrow keys to find your BIOS' Status or Health section, which should display your CPU's temperature.

Step 2: Check the CPU heatsink/fan. Your processor's metal heatsink quickly pulls heat away from the CPU. The fan, which sits at the top (or, on some models, the side) of the heatsink, forces cool air through the heatsink's fins to remove heat from the heatsink. If your heatsink fan power cable detaches from the motherboard, the fan won't spin and the processor will quickly overheat. Make sure the heatsink fan's power



Double-check the heatsink fan's motherboard connector before powering on your system if you've recently moved your PC or performed maintenance inside the case.

connector is plugged into the motherboard connector marked CPU and then power on your system without replacing the PC's side panel so you can make sure that the fan is spinning.

Step 3: Dust your PC. Although a PC that stands on the floor will suck up more dirt and pet hair than a PC on a desk, your system is vulnerable to dust no matter where it stands. Dust collects on components and traps the heat, reducing the effectiveness of your PC's fans. Speaking of those fans, many PCs have a filter that sits between the PC's front fans and its front panel. If you haven't cleaned this filter (you can usually pull it from the bottom of the front panel), your dirt-laden filter may be causing airflow problems. Use a can of compressed air to clean out your system;

be sure to spray out the spaces between the CPU heatsink's fins.

Step 4: Check your system's airflow. Although fancy PCs sometimes have exotic cooling systems, such as special fan designs or watercooling, most PCs have a standard cooling setup: one or two intake fans at the lower-front portion of the PC suck cool air through the front panel and push it over the hard drives and into the system. Then, a fan at the upper-back portion of the case sucks the internal air (including the hot air coming from the CPU heatsink) and exhausts it out the rear of the PC. Make sure your fans are functioning and that cables aren't disrupting the airflow from the front to the back of the PC. You can use plastic cable ties to bunch cables together and run them away from the PC's center.

Buying A New Heatsink

Although new CPUs generally include a heatsink, many PC equipment sellers offer OEM CPUs that don't have heatsinks or traditional packaging. Whether you're buying a heatsink for an OEM CPU or simply want to replace your current heatsink, you'll want to consider a couple heatsink features as you shop.

For one thing, make sure your new heatsink supports the motherboard's processor socket. If you buy a new AMD Athlon 64 processor that uses the AM2 motherboard socket, for example, you'll need to buy a compatible heatsink. The heatsink's packaging lists the sockets it supports.

Also, consider a copper heatsink (or an aluminum heatsink that has copper heatpipes). Although aluminum is less expensive than copper, it can't dissipate heat as efficiently. If you're worried that your current aluminum heatsink isn't providing enough CPU cooling, try a copper device. **RS**

BY JOSHUA GULICK

Basic Troubleshooting

RAM

When you boot your OS (operating system) or launch an application, your computer grabs data off the hard drive and stores most of it in solid state RAM, or random-access memory. RAM is much faster than a hard drive or other storage medium, so it makes a computing session more responsive and the user more productive. However, if there's a minuscule defect anywhere in a RAM module's silicon chips, and it drops a 0 or a 1, the file stored in that location becomes corrupted. The result is that your OS or application will crash, freeze, or report errors.

This article tells you how to troubleshoot RAM with universal testing tips as well as solutions for common problems. For stability reasons, we'll

assume you're running your RAM at its rated speed, voltage, and timing specifications. You can find these by searching for the RAM's model number on the manufacturer's site, and you can verify and/or adjust them in many motherboard's BIOS (Basic Input/Output System) Setup (during bootup, press DELETE, ESC, or the indicated key).

The Very Model

Windows won't tell you a DIMM's (dual inline memory module) brand and model number, so shut off your PC and pop open your computer case.

Remove one of your RAM modules by pressing the retention clips on either end of the module downward (toward the motherboard). As the clips pivot away from the DIMM, they'll simultaneously lift it out of the slot.

Hopefully a label on the module's chips or metal heat spreader will tell you the module's brand and model number, such as Corsair CMX256A-3200 C2. There may be several similar alphanumeric markings, so be prepared to search for each marking on the manufacturer's site until you can confirm which one is the model number. Don't look up the numbers printed on individual memory chips,

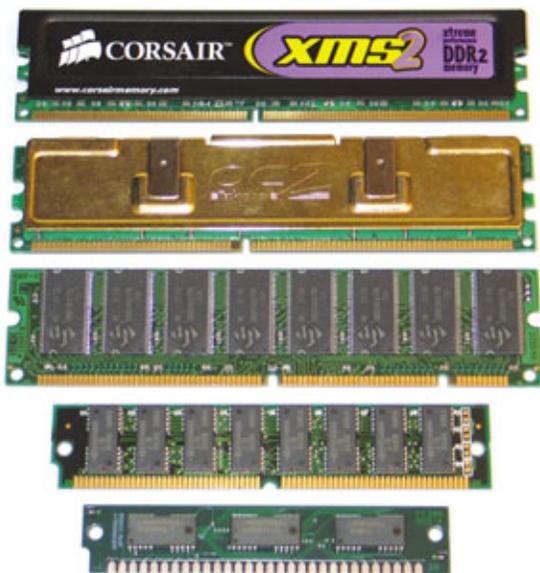
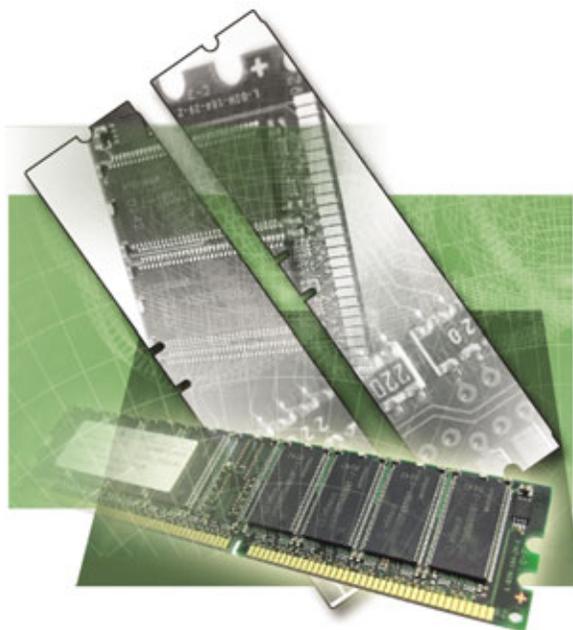
however, as most DIMM manufacturers build their modules using RAM chips from semiconductor foundries such as Samsung.

Universal Troubleshooting Steps

Bad RAM can manifest itself in various error messages, application hangs, and OS crashes. If malware scans come up clean, System Restore doesn't help, and your computer's power supply is known to be good, RAM should be your prime suspect in this case.

Memtest86 (www.memtest86.com) is free RAM testing software that's extremely easy to use. After you download it, you can create a bootable CD or floppy diskette with it, depending on the version you choose. Restart your system with the bootable medium in its drive, and Memtest86 will automatically test your memory until you press ESC to stop it. (Make sure your floppy or CD/DVD drive comes before the hard drive in your PC's boot device order in the BIOS.) You should allow the utility to run at least one complete pass, which may take most of an hour.

We downloaded Memtest86 3.2 as an ISO (International Organization for Standardization) file by clicking the self-explanatory link. We then used the



New types of RAM use different edge connectors to keep users from placing them in older memory slots. From top to bottom here's DDR2 (double data rate), DDR, and regular SDRAM (synchronous dynamic RAM), followed by truly ancient EDO (extended data output) and Fast Page DRAM.

free IMGBurn utility (www.imgburn.com) to create a bootable CD. At this writing, the link to the floppy version's handful of files was called Download – Pre-Compiled Memtest86 v3.2 Installable From Windows And DOS. To make a bootable diskette with it, run the file called Install.BAT. Both Memtest86 downloads are compressed in the ZIP format, so if your OS can't open ZIPs as WinXP and Vista can, use a compression utility such as WinZip (www.winzip.com) to extract Memtest86's ISO or files.

Troubleshooting errors. If your diagnostic utility reports any errors, turn off your PC and remove all but one stick of RAM. Re-run the memory diagnostic for a while with each DIMM by itself until you've isolated the module with a problem. Try the troubleshooting solutions in the section below, as applicable.

If you have access to another PC that uses the same type of RAM, put your suspect memory in it and run Memtest86 on that computer. If no errors surface, the RAM might be incompatible with the memory controller in the original motherboard's chipset (for Intel-based PCs) or in the processor (for AMD Athlon 64, X2, Sempron, and FX-based computers).

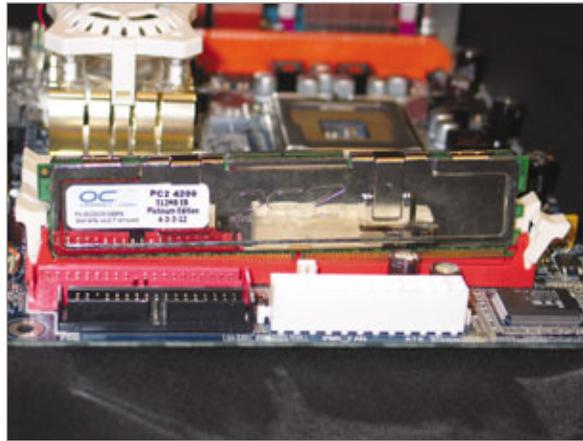
If a DIMM causes errors consistently or intermittently on both PCs, you can bet it's defective in some way. Contact the reseller or manufacturer about replacing it or getting a refund.

Lapses Of Memory

Sometimes bad things happen with good RAM. Here's a list of common problems and possible fixes.

Problem: Errors start only after the PC has been running for a few minutes or during heavy workloads.

Solution: Check that the PC's fans are all running and that there is decent



Sometimes it helps to eject your RAM modules and reseat them. If you seat the DIMMs deep enough into their slots, the retention clips on the ends will flip up into place.

airflow over the RAM and other devices. Carefully blow out any dust. Also, verify in the BIOS that the RAM is running at its specified voltage, such as 2.2v.

Problem: Your RAM works with one motherboard, but not another.

Solution: Check the motherboard manufacturer's site for compatibility with specific brands and model numbers of RAM modules. Note that some motherboards may be compatible with particular sticks of memory only at slower timings (such as a CAS [column address strobe] setting of 4 or 5) or FSB (front side bus)/system bus/HyperTransport speeds, such as 667MHz. Timings refer to how often (usually in CPU clock cycles) different operations happen in the RAM, whereas the FSB/system bus/HT speed describes the rate of data transfer between the RAM and the CPU. You may be able to change some or all of these settings in the BIOS. Other boards may require you to slightly increase the voltage to the DIMM slots in order to get the RAM to run stably.

Problem: The RAM is approved for your motherboard, but it's still causing problems.

Solution: Try different DIMM slot(s). Consult the motherboard's

documentation to determine which slots should work best with the number and size of your RAM module(s).

Problem: You can't run your RAM in dual channel mode, which allows the CPU to access both sticks simultaneously for a slight performance gain.

Solution: Both the motherboard and processor must support dual channel memory access. For example, a 939-pin Athlon 64 CPU supports dual channel, but a 754-pin Athlon 64 CPU can't. Also, you must place the pair(s)

of DIMMs in particular slots, which are color-coded on some motherboards. Dual channel mode may not work well unless you use identical RAM modules.

Problem: The metal heat spreader covering the module doesn't touch all the chips.

Solution: Your best option is to send the RAM module back for replacement, if it's still under warranty.

If your warranty coverage has run out, you can try removing and reseating the heat spreader. Buy some double-sided thermal tape from an enthusiast site such as FrozenCPU.com. Next, carefully work off the heat spreader's clips with a small screwdriver. Remove the metal heat spreader halves, then clean the old tape residue from it and the DIMM's chips with isopropyl alcohol. If either heat spreader piece is bent, straighten it so that it will make better contact with the chips.

Apply new thermal tape to the heat spreader halves, then attach them to the RAM module in the correct positions. Squeeze the spreader halves firmly over each pair of chips to help the thermal tape adhere, then reattach the spreader's clips. 

BY MARTY SEMS

Basic Troubleshooting

Screens & Monitors

Unlike other PC components, when your monitor isn't working exactly the way you expect it to, it's relatively easy to see what's wrong. Blank screens, oversaturated displays, wavy lines, and other issues are easy to spot. The cure, though, isn't always as evident.

Before trying a fix, first take stock of your device and note the manufacturer and model number. Then, either view the documentation that came with the monitor or visit the manufacturer's Web site for detailed information. If your difficulty is with, say, improperly sized application windows, knowing the device's specs may make all the difference when troubleshooting the problem. One spec to pay close attention to with an LCD monitor is the native resolution. Native resolution is the resolution the monitor is designed for, and it is based on the number of pixels in the display. When your monitor is set to its native resolution, the picture you see will be of the best quality possible.

And, keep in mind that one of the more difficult tasks, when faced with a troublesome display, is figuring out whether the problem lies with the monitor itself or the graphics card. The graphics card, also known as a video card, is the device in your PC that controls all of the images and colors displayed on the monitor. Therefore, we'll cover some monitor issues here first and give you some tips on when it might be necessary to troubleshoot your graphics card. If you suspect the problem may lie with the graphics card, we recommend

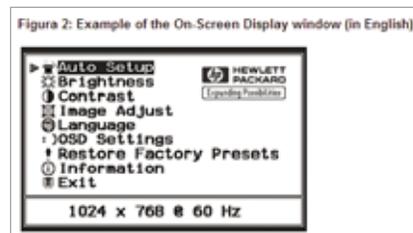
you connect a different monitor to your PC to see if the problem persists. If it does, the issue likely stems from the graphics card and not the monitor. Or, you can plug the monitor into a different PC. If the problem still exists, it's likely an issue with the monitor.

Monitor Adjustments

Sometimes the images on your monitor just don't look quite right, but you can often overcome those issues by making a few monitor adjustments. Here are several ways you can fix these kinds of problems.

Problem: I can see the images on my display, but the display is either too light or too dark.

Solution: Get to know your on-screen display controls. Almost all monitors have an OSD (on-screen display) function, or a list of image quality adjustments, that is controlled



The OSD (on-screen display) feature typically lets you manually adjust contrast, brightness, and display position.



by a button on the monitor's bezel. OSDs let you change settings including contrast and brightness. Because OSDs vary from one manufacturer to the next, we recommend you view your product documentation or visit the manufacturer's Web site for a description of how to use the OSD for your monitor. In addition, overhead lighting, especially fluorescent light, or outdoor light streaming into in your office may create a glare that makes the display appear washed out. (NOTE: With fluorescent lighting, try to sit facing the same direction as the length of the bulbs. This can help minimize eyestrain and headaches.)

Problem: The image isn't centered on the screen, and there's a black border along the sides (or one side) of the screen.

Solution: Along with controlling a display's contrast and brightness, the on-screen display typically controls how the entire display appears on your screen. In a perfect world, the display will cover the screen entirely, with no black borders. Sometimes, however, the display is shifted horizontally or vertically. That's where the OSD comes in handy, because it has a vertical or horizontal adjustment control.

Again, if you don't know how to work your display's OSD, consult your monitor manufacturer's documentation for instructions.

Problem: The image colors aren't very sharp, or I see faint flickering, or my application windows are too large or too small.

Solution: While these problems may seem unconnected, they likely have one thing in common: the method for solving them. The Windows Display Properties feature regulates many items relating to how images appear on your display. Right-click the Desktop and select Properties from the context menu. In the Display Properties dialog box, select the Settings tab. If your monitor's image colors are somewhat muted, it could be that you aren't taking full advantage of the available color depth. In the Color Quality drop-down menu, select the highest available option. For newer systems, this is 32-bit color.

On the other hand, if the program windows are too large or too small, you'll want to change the screen resolution settings. The optimal setting will depend upon several factors, including your eyesight and your monitor's native resolution (if you're using an LCD monitor). You'll find the appropriate setting with a bit of trial and error. Remember that the higher the resolution, the sharper (and smaller) the images. Move the Screen Resolution slider bar in the desired direction and click Apply.

If the problem is screen flicker, it could be that the refresh rate, or the rate at which the monitor redraws the screen, is set too low. Click Advanced in the Settings tab of the Display Properties dialog box. Click the Monitor tab and check the Hide Modes That This Monitor Cannot Display checkbox to select it. From the Screen Refresh Rate drop-down menu, select the highest available speed. Click OK. Close the Display Properties dialog box.



Upping the refresh rate on your CRT (cathode-ray tube) monitor can eliminate flickering.



If your computer is automatically shutting down after a period of time, change the power saver settings to Never.

Problem: An "out of range" message appears on the LCD.

Solution: As with many monitor problems, if you see an "out of range" error message on your display, your first step should be to check the cables and make sure all connections are secure. If they are, it could be because your monitor is trying to display data but can't because it doesn't work with your computer's settings. This is more typically the case with LCD screens, and it happens when the PC's settings for the screen resolution and refresh rates do not work with the

monitor. In this case, start the PC in Safe Mode. When booting the machine, press the F8 key until the Startup menu appears. Select Safe Mode. When the Desktop appears, open the Control Panel. In Classic View, double-click the Display icon. Select the Settings tab. Move the Screen Resolution slider bar to the monitor's native resolution (check your monitor manufacturer's instructions or Web site if you don't know the monitor's native resolution). Click Apply.

Problem: A snowy display, streaking colors, or other unclear display. I've tried the above solutions, but nothing seems to work.

Solution: Your monitor's hardware isn't the only thing that affects your display. Sometimes the fault lies with the graphics card, in which case no amount of fiddling with the monitor will fix an unacceptable display. We invite you to read "Basic Troubleshooting: Graphics Cards" on page 82 for more information.

The Monitor Is Not Working Properly.

Some display problems are worse than simple image quality issues. What if your monitor doesn't display anything at all, or mysteriously shuts down? Don't worry, you can usually fix those problems too.

Problem: I turned on the computer, but all I see is a black screen.

Solution: When faced with a "dead" monitor, it may be easier to bring it back to life than you think. Before you place that frantic phone call to tech support, take a good look at your hardware setup. Even we (yes, we freely admit it) have been momentarily stumped by a blank screen, only to realize that a co-worker (or child, or spouse, or cat, or you name it) has hit the power switch on the monitor, inadvertently or perhaps intentionally turning the unit off. Check the cable that runs between the monitor and

the PC, and unplug and replug it to verify the connections are solid. Also, check the power supply and ensure it is firmly connected both to the monitor and to the outlet.

Problem: The monitor tends to turn off unexpectedly.

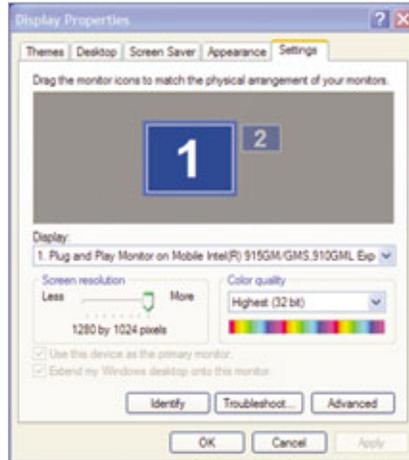
Solution: Assuming the cable connecting the PC to the monitor is firmly in place (if not, this can also cause the monitor to shut down), the solution likely lies in the Power Saver settings. Windows PCs have a power saving feature that powers down your monitor after a predetermined amount of time. You may wish to disable this feature completely. To do so, open the Control Panel. (If using Windows XP, for the purpose of this exercise, switch to Classic View.) Double-click the Power Options icon. Select the Power Schemes tab. From the Turn Off Monitor drop-down menu, select Never. Click OK. (NOTE: Even if you want to keep the power saver feature enabled, keep in mind the system generates a power surge when the monitor turns back on. Setting the monitor to shut off after a short time, of, say, 10 minutes, is counterproductive.)

Problem: The images are fluctuating. One second they're there, and the next they're not.

Solution: If the connection between your PC and your monitor isn't perfect, the data may have difficulty making its way from the computer to the screen. Take a look at the cable running between the PC and the monitor. Is it bent or crimped? Are the pins not straight? Are the connectors loose? If you answer yes to any of these questions, you may need to replace or secure the cable.

Problem: I see dead pixels on my LCD monitor.

Solution: Dead pixels, or tiny spots on the monitor that do not display the correct color, can be an annoyance, and too many of them can be a significant problem. You shouldn't attempt



Changing the screen resolution can lead to larger or smaller application windows.

to fix this on your own, but you may be able to get a replacement monitor from the manufacturer. Manufacturers have varying standards for what constitutes an unacceptable monitor when it comes to dead pixels, and most of them lay out that information in black and white on their Web sites. HP, for instance, notes that LCD monitors under warranty are allowed a maximum of three bright pixel defects (a bright pixel on a dark background), five dark pixel defects (a dark pixel on a light background) or a combination of five pixel defects total. If your HP monitor falls above that threshold, you may be entitled to a replacement monitor.

Problem: I see distortion or wavy lines on the screen.

Solution 1: Computers are sensitive to other electronic devices. If you keep a fan near your desk, or another monitor, or a television, or another piece of electronic equipment, the device may be interfering with your monitor's ability to do its job. We recommend you move such items several feet from the monitor. If that doesn't do the trick, it's also possible the power source is the culprit. Some electricity lines, especially those in older homes, are susceptible to line noise problems. Try powering up your PC in another location.

Solution 2: Windows 98 users may run into similar "wavy line" difficulties with some makes and models of monitors. For example, if you're using a MAG DX-1795 monitor, a solution to wavy lines on a display may be to manually install your monitor. Open the Control Panel via Start, Settings, and double-click Display. Click the Settings tab. Click Advanced. Select the Monitor tab. Clear the Automatically Detect Plug & Play Monitors checkbox and click Change. Click Next. Click Display A List Of All The Drivers In A Specific Location and click Next. Click Show All Hardware. In the Manufacturers box, select the monitor brand and choose the model in the Models box. Click Next and follow the on-screen instructions.

Problem: Photos and other images that look great on the display don't look as good when I print them.

Solution: Invest in high-quality paper and fresh ink . . . and know that there's no perfect solution to this problem. It's just a fact of life; what you see on the screen does not always match what you print. This may not matter much when you're printing text documents, but when you're printing photographs, we know how frustrating it can be to spend time fiddling with photo-editing software to achieve the perfect color and light balance only to have the photo look far different from what you expect. Avoid using plain (non-photo) inkjet paper, which tends to show colors at their dullest. Purchase fresh ink. Study your monitor's documentation and calibrate it so the colors display as accurately as possible. Lastly, look at your printer's and image-editing software's documentation and help files and experiment with various color options. If the latter becomes too laborious, you're better off accepting the discrepancies between the monitor output and the printer output. **RS**

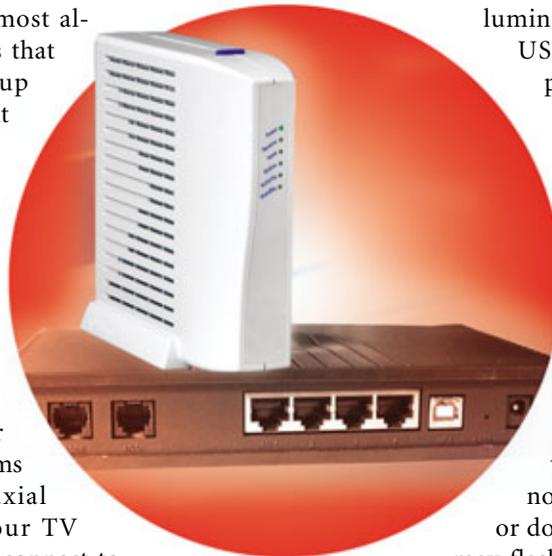
BY HEIDI ANDERSON

Basic Troubleshooting

Cable Modems

Broadband access has become so ubiquitous that you can get this high-speed 'Net connection almost everywhere. Most users rely on a cable modem or a DSL (Digital Subscriber Line) modem for obtaining this fast connection, and these modems are almost always external. That means that these modems will take up some extra desk space, but it also makes it easier to find out what's wrong and troubleshoot the devices.

Cable Internet access typically offers transfer speeds of 1Mbps (megabit per second) or more—that's at least 20 times faster than the speediest dial-up modem. As their name implies, cable modems connect to the same coaxial cable that brings you your TV signal. Most of them then connect to your computer either via an Ethernet or a USB connection.



On The Outside

You can glean a lot of information about your cable modem just by looking at it. For example, the manufacturer name and model number will be on the device somewhere, usually on a sticker on the back. This can come in handy when you're searching online for updates or troubleshooting help.

The front of the cable modem usually features a series of indicator lights; the most commonly used ones say Power, Cable, Data, Ethernet, and USB. The Cable light might also be called an Online light on some modems, and the Data light is sometimes divided into two lights for uploads and downloads. These LEDs (light-emitting diodes) can also be quite helpful when you're troubleshooting as they will flash (or not flash) differently as a way of delivering error messages.

The rear of the cable modem will have ports for the coaxial cable, a power supply, and Ethernet and USB cables. You'll also often find a reset button—more on that later.

When your cable modem is working as it should, most of the front lights will be illuminated. Either the Ethernet or USB light should be off, depending on which connection was used to hook the cable modem up to your PC. The Power light should naturally be glowing steadily as should the Cable light, which indicates you have a connection to your Internet service provider.

The Data light or the upload/download lights will flash depending on your traffic. Even if you're not actively browsing the Web or downloading a file, these lights may flash as an application on your computer might be sending small bits of data to a Web site or the cable provider might be broadcasting data across the network. Most of the time, this is innocent background noise, but make sure that you haven't been infected by a virus by keeping your antivirus software up-to-date. (Ironically, antivirus programs are also applications that will sometimes take part in this background "chatter.")

Problem Solving

OK, now that you know what your cable modem should be doing when it's working properly, let's talk about some scenarios where everything is not going quite as smoothly. Having an always-on connection usually means you'll never have to worry about your Internet connection. But as anyone who's ever had a broadband connection knows, "always on" can also mean "sometimes off." Before

you call your cable guy or gal, there are a number of do-it-yourself fixes you can try to keep your cable modem and broadband connection working at top speed.

Problem: My cable modem doesn't have a connection to the Internet.

Solution: The first thing you should check when your cable modem connection goes down is whether or not your television is working. Because the coaxial cable is bringing both the TV and Internet signals down the same pipe to your home, turning on your cable TV is a quick and easy way to make sure there's not a major problem with your cable provider.

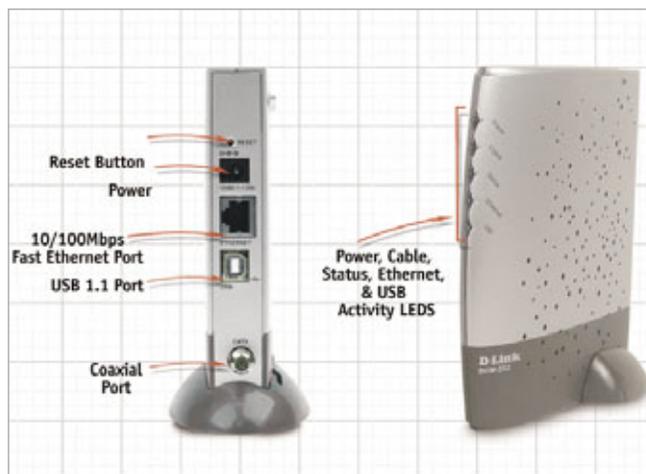
If your cable television is working, then you'll want to check all the connections to and from your cable modem to make sure that a cable hasn't been accidentally unplugged or loosened. The indicator lights can give you some clues about which cables to check.

If all the lights are on and all the cables are snugly affixed, reboot your PC. This simple act can solve a good chunk of computer problems all on its own.

If this doesn't help, you can also reset the modem at the same time. Resetting the modem is easy if there's a reset button (usually you just hold it down for five seconds or so, or use a paper clip to press it if it's a recessed reset button), but you may want to follow these steps to ensure a proper "hard" reset. First, unplug the power cord from the back of the modem. Next, unplug the connection to your PC, either USB or Ethernet. Then, wait a couple of minutes. You can reboot your PC again during this time just to ensure you're working with a clean slate. Finally, reconnect the power cord

and PC connection. You'll need to wait a minute or two while the cable modem re-establishes communication with your provider and your PC, but this step often does the trick when your connection is down.

If you still don't have a connection to the Internet, you'll need to call your provider to find out what's going on. Often, it'll have a voice menu letting you check on service in your area or telling you about current connection problems.



The connections and indicator lights on the D-Link DCM-202, a common cable modem used by many providers.

Problem: I can't get my new cable modem to work.

Solution: Many cable service providers let you save an installation fee if you set up your cable modem yourself. Because it's an external installation, even a computer novice can usually handle it smoothly. But there are problems you may run into during installation.

If you can't get your new cable modem up and running, make sure all the cable connections are tight. For example, make sure the Ethernet cord is snapped into the modem all the way (you'll hear a snap), and that the coaxial cable is tightened securely. Reboot your system and reset the modem.

Even if you're doing the modem installation yourself, you may need

to call your cable service provider during the process. They'll need the serial number and MAC address number of your specific cable modem so it is allowed to sync up with their network.

Problem: My cable access is slow.

Solution: When cable modems were first introduced, the biggest criticism of cable Internet access was that you would share a connection with your neighbors. So theoretically, if all of your neighbors were online at the same time, you'd face a huge slowdown.

This limitation has pretty much been overcome, but it's still not uncharacteristic to see slowdowns during peak Internet usage time, such as the late afternoon and early evening when kids are home from school and adults are home from work. If you're seeing slowdowns during other times of the day, however, it's something that needs to be addressed.

First, check your speed with an online test site such as www.bandwidthplace.com/speedtest or www.speakeasy.net/speedtest. Some of these sites also have comparative information so you can see how your Internet speed stands up to typical cable modem access in your area.

If your cable access is slower than average, check with your provider. It may have different tiers of access and you might be signed up for the lowest one (but even the lowest cable modem tier should be plenty fast for browsing the Web and light online gaming).

If your connection is really slow, you can try resetting your modem by following the directions above. If you're still having serious slowdowns at odd times, talk to your Internet service provider. It may

need to replace your cable modem or external wiring.

Problem: My cable connection keeps going in and out.

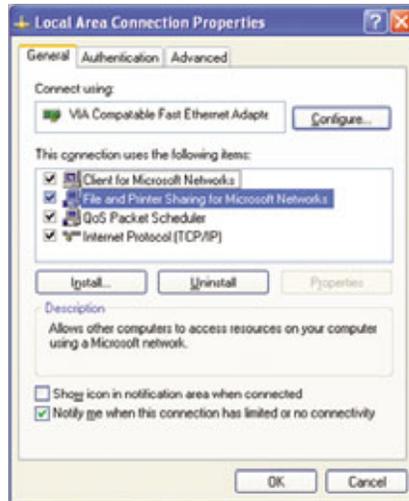
Solution: If your cable modem is having problems maintaining a constant connection to the Internet, it could be because the signal isn't strong enough. If you have a splitter on the coaxial cable line (a y-shaped device used to connect two cables to one main cable line), this could be weakening the signal. Make sure that your cable modem has a dedicated coaxial line.

Also, you'll want to recheck all the connections to and from your modem and make sure that every cord is attached snugly. And it never hurts to reset the modem and reboot your computer. But if this intermittent connection goes on too long, you'll need to contact your service provider. If the cable signal in the room where you have your cable modem isn't strong enough, your service provider can add a signal booster that will beef it up so it's strong enough for high-speed data transfer.

Problem: I'm afraid of getting hacked. How can I protect my Internet connection?

Solution: Cable modem connections, like other always-on broadband connections, are vulnerable to outside attacks. While these are fairly rare for most users, it's still good to protect yourself when you have broadband access.

First of all, make sure you're running a software firewall. This application will prevent unwanted users from accessing your system. Windows XP has a firewall built in, so make sure it's up and running. You can access it in the Control Panel by selecting Network and Internet Connections and then Windows Firewall (in the Classic view of the Control Panel, Windows Firewall is its own icon). If you're not running WinXP, Zone Alarm is an excellent—



Turning off File and Print Sharing is one easy way to help secure your broadband connection, and for most users, it's a good idea.



Without a reset button, you can simply unplug the power cable and the PC connection cable from your modem to reset it.

and free—firewall available at www.zonelabs.com.

You'll also want to make sure that you don't have File and Print Sharing turned on if you're not sharing files or printers over a network. In Windows 2000/XP, open the Control Panel (Start, Control Panel) and then click Network and Internet Connections and then Network Connections (if you're in Classic view, just double-click Network Connections). Right-click the Local Area Connection icon and select Properties from the pop-up menu. In the window that appears, uncheck the box in front of File and Printer Sharing for Microsoft Networks and then click OK.

You should also have an antivirus application running to prevent infection or Trojan horse attacks. If you have antivirus software and your computer is acting suspiciously, run a full system scan to see if you've been infected. If you don't currently have antivirus software installed, Grisoft's AVG is an excellent—and also free—program available at www.grisoft.com.

Problem: My wireless network isn't working through my cable modem.

Solution: A broadband connection such as cable is excellent for multiple computers connected to a wireless network. But it's not uncommon for secondary PCs on a Wi-Fi network to have access problems while your main computer is still able to access the Internet through the cable modem. Although this isn't a problem with your cable modem per se, you can often fix this problem by resetting your cable modem.

If that doesn't work, you'll also want to reset your wireless router and any wireless adapters you're using on other PCs in your home. This means rebooting all your notebook computers and desktops connected to the network, as well as unplugging the power from your wireless router and plugging it back in (or pressing the reset button if your router has one). It may take a few minutes for all your wireless equipment to reset all the connections, but this will fix most wireless network problems.

Hopefully, our solutions to these problem scenarios can save you some lengthy phone calls with your cable service provider. It's always better if you can troubleshoot a PC problem yourself. You save time and you always learn something in the process. **RS**

BY JOEL STRAUCH

Basic Troubleshooting

DSL Modems

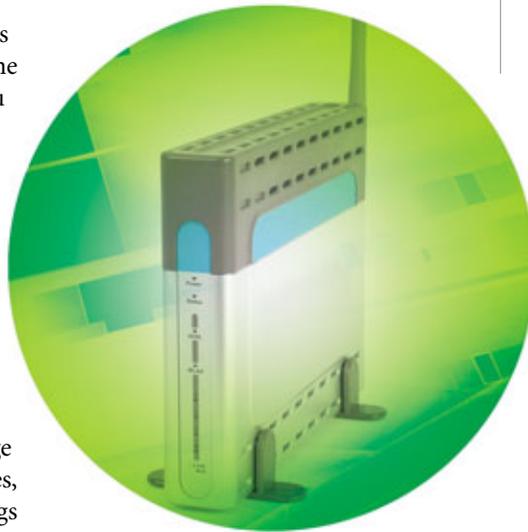
So much to see, so little time. It's a common problem for anyone who surfs the Web, where you can find sites on everything from British monarchs to blowfish. With DSL (Digital Subscriber Line), you can find them quickly, too—unless there's a problem with your DSL modem.

Common DSL modem problems include no downloads, slow downloads, or downloads that blaze one second then crawl the next. Blinking lights on the modem, strange errors with cryptic codes, loose cables, and router problems can mess things up, too. (A router is a device that sits between your DSL modem and the Internet; it lets you share your Internet connection among many computers)

Where To Start?

Before you can fix your modem, you need to know what kind of modem you have. By and large, DSL modems come in two flavors: Ethernet and USB. An Ethernet modem connects to your computer using a standard network cable—most often it's blue—with RJ-45 jacks (they look a lot like phone jacks, only bigger). To use an Ethernet modem, you'll need to have a notebook or desktop with a network card, also called a network adapter. In contrast, USB modems connect to your computer through a USB port, and they tend to install without much fuss. Some modems offer you both Ethernet and USB connections.

You'll also want some nuts-and-bolts information such as your modem's make and model, in case you need to contact the manufacturer.



The simplest way to find this is to look on the modem itself. On the underside, you'll see a label with the manufacturer's name and the modem's model and serial numbers.

If for some reason that's missing, you can also get the information from the user guide that came with your modem, or even from Windows itself. In Windows XP, click Start, right-click My Computer, and click Properties. Click the Hardware tab and then click the Device Manager button. You'll see a list of all the hardware installed on your system. Click the plus sign next to Modems or Network Adapters to locate your DSL modem and then double-click its name for more information.

What's Wrong???

If you have a connection problem, you'll know it at once. What you won't know, sadly, is what's causing it. Is it your modem? Your router? The ISP (Internet service provider)? It could be your phone jack or even a

nearby microwave or cordless phone if you're using a WiFi network. (Microwaves, cordless phones, and even remote controls can play havoc with WiFi signals.)

Your first chore is finding out if your problem is with the modem itself or another device, and the best way to do that is by a process of elimination. If you're using a router of any kind, look at it closely: Are its lights flashing green, yellow, or red? Check your router's user guide to see what the lights mean, and whether or not they indicate a problem with the DSL line or the router itself. (We'll discuss the lights on your modem in greater depth below.)

The next step is more drastic, but conclusive: Disconnect your router and connect your DSL modem directly to the phone jack in the wall. To do this, of course, you'll have to turn off your equipment, move it, and perhaps reconfigure your modem. But if you can surf the Web when your DSL modem is linked directly to your DSL line—and not when it's connected through your router—then you know your router is on the fritz.

Because DSL splits your phone line into voice and data channels, you need to use a filter—a small, plastic device your DSL provider gave you when you set up your account—on every device that connects to your phone line except your DSL modem itself. This means every phone, fax machine, caller ID box, and even your TiVo. Be sure that each device has a filter before you look to the modem itself.

Fixing Problems

Once you've determined that your modem is the culprit, use the problem/solution suggestions below to fix it.

Problem: I can connect, but my connection is slow.

Solution: If you can view a Web site but it takes forever to download,

try a different site. A good test site is www.purple.com, which has nothing on its homepage but a bright purple background, to help it load quickly. (Big, splashy sites like CNN, MSN or AOL can load slowly on even the fastest modems because they have so much content and so many users.)

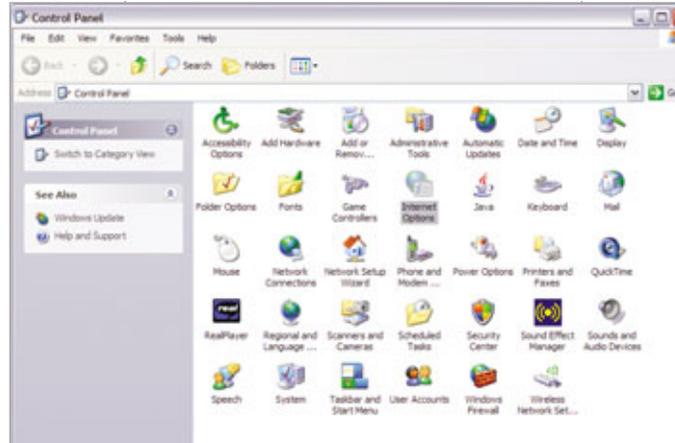
If your downloads are glacial no matter where you go, reboot your PC and try again. If the problem persists, cycle the modem's power. Start by turning it off, or simply unplugging it if there's no on/off switch. (Some USB modems draw their power from the computer they're attached to, so you'll have to detach the modem from the computer itself.) Next, reboot your PC. Last, turn the modem back on, connect to the Internet, and test your download speed.

Still slow? If your modem has a Reset switch, use it. A Reset switch is a small hole on the back of the modem's case that can only be pressed with a paper clip, the tip of a sharp pencil, and so on. Be sure to reboot your system as well and then try to access a Web site.

If your Internet connection is still slow, check your system for spyware. Spyware can download huge amounts of data without your permission, clogging your connection or scotching it completely. Programs from Symantec (www.symantec.com), McAfee (www.mcafee.com), TrendMicro (www.trendmicro.com), and LavaSoft (www.lavasoftusa.com) can scan and remove offensive code from your machine.

Problem: My connection is fast one minute but slow the next.

Solution: If your connection normally works fine but suddenly becomes



If your computer starts your dial-up (that is, analog) connection when you expect to use your DSL, you can fix the program in the Control Panel. Click Start, Control Panel, and then double-click the Internet Options icon.

slower than molasses only to speed back up without any input from you, then it's highly likely that you're losing your DSL signal, due to a problem in your phone line or a problem in your modem itself.

Start by checking the lights on your DSL modem. Most often you'll have a power light, a line light (which indicates the status of your DSL line), a connection light (which indicates that your modem is connected to your PC), and an activity light (which blinks when your PC is downloading data). These lights may go by different names on your particular modem. The line light is often labeled Sync, Ready, DSL, ADSL, PPPoE, Status, Network, or Line. The connection light is often labeled Ethernet, USB, Link, or LAN (local-area network).

If the line light is amber, red, or slowly blinking in any color, consult your modem's user guide for the correct interpretation. Often it means there's a problem between your modem and the phone line, or a problem in the phone line itself. If that's the case, there's a help desk call in your future, since there's little you can do to fix your phone lines yourself. (You can, however, try using a different jack; sometimes merely switching jacks will clear things up.)

If it's the connection light that's amber, red, or blinking, check to make sure your modem's cables are securely attached to your computer. If they are, you may need new cables, or even a new modem if the USB cable is hardwired to the modem's chassis. It's also possible—but unlikely—that power problems are causing your modem to lose and regain its Internet connection.

Problem: I can't connect at all.

Solution: If you can't get any connection to the Internet, make sure that your DSL provider has set up your service. It's not uncommon for users to install their modems only to find their phone companies or Internet service providers are a day or two behind them.

Of course it also helps to check the basics, too. Does your modem have power? Do you have a dial tone? If the answer to both those questions is yes, make sure the modem is correctly installed on your PC. Open the Device Manager by clicking Start and then right-clicking My Computer and choosing Properties from the context menu. Click the Hardware Tab followed by the Device Manager button. Now locate your modem in the equipment list (you'll find it under Modems or Network Adapters). If you don't see it, it's not installed, and you'll have to run the setup procedure outlined in your modem's user guide.

If the modem appears but has a red "x" or a yellow question mark by its name, there was a problem with the modem's installation. You have two options: You can uninstall and reinstall the modem, or you can call your ISP's help line, as they can help you tweak the modem's advanced properties or download a firmware update.

(Firmware is software installed on the modem itself; sometimes new firmware can fix a faulty connection, but only your service provider can tell you where to find and download the fix.)

If your modem has two connection options—Ethernet and USB—try connecting it with the option you’re not using now.

Problem: When I open my Web browser, my PC starts to dial a number through my analog modem.

Solution: This is an easy problem to fix. Click Start, Control Panel, Internet Options, and then select the Connections tab. Choose Always Dial My Default Connection. In the list above it, make sure your DSL connection is set to the default. If not, select it, and then click the Set Default button. Now click Apply and OK.

Problem: I’m prompted for my username and/or password.

Solution: Sometimes your username or password is slightly different than what you think it is. For instance, one service provider may use *jdoe* as a username, and a second may use *jdoe@serviceprovider.com*, while yet a third may use a random series of numbers or letters. If you’re positive that you’ve typed your username and password correctly, contact your ISP to have them reset your account’s login information.

DSL Error Messages

There are dozens of error messages that indicate a DSL problem. Here are some of the most common DSL issues, along with their solutions (the exact wording of your

Most firewalls, including well-known versions from McAfee and Symantec, will show you the names of programs that have tried to upload or download data.

error message may differ slightly from the ones below).

Problem: I get a message on my screen that says “Error 602: The modem is in use by another dial-up networking connection”

Solution: Make sure that no other programs, such as remote access programs or spyware, have established an Internet connection. One way to do this is to open the Windows Task Manager to see a list of all running programs. Just press CTRL-ALT-DELETE and then click the Processes tab. Of course, the Task Manager gives you a *complete* list of the software running

on your system, and that list can be long and confusing. Software names not only include easy-to-decipher entries, such as Outlook.exe or Napster.exe, but less comprehensible names, such as MSKAgent.exe or Mcvsshld.exe. If you’d like to know which of these programs is trying to access the Internet, try your firewall. Most firewalls, including well-known ver-

sions from McAfee and Symantec, will show you the names of programs that have tried to upload or download data. Some firewalls also

give you access to their event logs, which not only show you which programs have tried to go online, but when they did so, too.

Problem: I just received an error message that says “Error 619: The port was disconnected”

Solution: Your username and/or password failed. If the problem persists, call your service provider.

Problem: I was connected, when suddenly I received an “Error 629: You have been disconnected from the computer you dialed” message.

Solution: This commonly indicates a problem with your Internet service provider’s hardware. You’ll need to call them to alert them of the problem you’re having.

Problem: I’m trying to use the Internet, and I get an “Error 650: The remote access server is not responding” message.

Solution: First, reboot your machine. If you still have the problem, delete then re-establish your DSL network connection. To delete your connection in WinXP, click Start, My Computer, My Network Places, View Network Connections. Locate your DSL connection, right-click it, and choose Delete. Click Create A New Connection to launch the New Connection Wizard, then consult your modem’s or service provider’s user guide for precise instructions from this step forward, since it varies from provider to provider. **RS**



To set DSL as the default connection, click the Connections tab in the Internet Options dialog box, then choose your connection from the list.

BY DAVID GARRETT

Basic Troubleshooting

Dial-up Modems

Think of your dial-up modem as your computer's link to the outside world. It's a slow, noisy device, but it gives you access to millions of Web sites, email, and all the marvels of the Internet—when it's working. When it's not, a modem can be as much fun as a dentist's drill. To fix it, you first need to gather some basic information about the modem you have.

Nearly all analog modems (as opposed to cable and DSL [Digital Subscriber Line] modems) are internal. Just look for the phone jack on the back or the side of your PC, and you've found your modem. You can find out the manufacturer and model number by looking in the Windows Device Manager. In Windows XP, click Start, then right-click the My Computer icon. Choose Properties, click the Hardware tab, then click the Device Manager button. Now click the plus sign next to Modems to see each modem installed on your system. If you want more information, right-click your modem and choose Properties. If you don't find what you need here, you can always check your modem's or your PC's users guide and packaging, where you'll get a complete list of tech specs.

Find The Culprit

You also need to know if the problem is your modem or something else that's keeping you from connecting to the Internet. Plenty of problems can



keep your computer from getting online, including your phone line itself. When you pick up your phone, do you hear static, hissing, or crackling? It's called "line noise," and it can prevent modems from connecting or keeping a connection active. (We'll discuss line noise in more depth below.)

Bad weather can also give your modem the blues, because rain and excessive humidity can introduce noise into an otherwise normal phone line. Adapters, line splitters, and cable extenders can do the same.

Have you tried a different phone jack? If you can keep a connection on one jack but not another, there's a good chance the problem is the jack itself, or frayed wires inside it. Try removing the phone jack's wall plate and looking inside; if you see exposed copper or old, decaying plastic, you may have found the root of your connection woes.

Even software can prevent you from getting online, or staying online once you've established a connection.

Some software, such as Microsoft Outlook and Outlook Express, can disconnect your call after you send and receive email. In Outlook, click Tools, Options, Mail Setup, and uncheck the box marked Hang Up When Finished With A Manual Send/Receive.

You should also consult your firewall's users guide for issues that mask themselves as modem problems.

Problem: I can't get the modem to connect.

Solution: Let's start with the basics. Does your modem have the most up-to-date software, including drivers and firmware? Drivers are programs that let your modem communicate with your system. Firmware is software that resides on the modem itself and governs how the device acts. Both can be **flashed**—that is, updated with a download from the manufacturer's Web site. So before you do anything else, find a computer with an active Internet connection, get online, download an update if one exists, and copy it to a floppy diskette or burn it to a CD. The Web site should tell you how to install it.

If your modem starts a call and only gets halfway through the handshake—the loud, high-pitched noise that indicates your modem is connecting to a computer on the other end of the line—open the Device Manager and click the plus sign next to the word Modems, then right-click the modem you're using and choose Properties. Click the Advanced tab, and then click the Change Default Preferences button. Set the number in the Cancel The Call If Not Connected Within box to 180 or even 240 seconds (the default setting is 60). Click OK twice to return to the Device Manager, then close the Device Manager and try to connect again.

Still no luck? Sometimes it helps to add special commands to your modem's **initialization string** (a special set of numbers and letters that tell

the modem how to connect to a computer on the other end of the call). The commands you'll add are text strings themselves, such as `S95=1+MS=11` or `&KO`. To find them, check the Web site of your modem's manufacturer or search the large database at www.ModemHelp.org for your modem's make and model. When you've found the string you'd like to try, first open the Device Manager, right-click your modem, choose Properties, and click the Advanced tab. Enter your commands in the box named Extra Initialization Commands and try to connect again.

If that fails, line noise or faulty hardware in the modem could be to blame. There's no fix for faulty hardware; only a replacement modem will do. If you checked for line noise before getting started, keep in mind that modems can detect far more noise than the human ear. Call your phone company and tell them you think you have a noise problem that's preventing your modem from connecting; they can test the line from their office or send a specialist to your house to tweak line settings such as gain control—that is, how much their equipment boosts your phone line's signal, adding noise in the process.

Problem: The modem connects, then drops the call.

Solution 1: If you can get a connection but can't keep it, try everything in the step above, as it applies to this problem, too. Remember that certain software (email programs are constant offenders) can disconnect your call after performing key functions.

If your call disconnects after 10, 20, or 30 minutes, call your ISP (Internet service provider) and ask if they use a heartbeat message for incoming modem calls. A heartbeat is a small signal sent from the ISP's server to your computer, to see if your machine is still active. If not, the ISP will disconnect you, to keep its lines open and save money. You can also download freeware or shareware that sends regular



Most analog modems are internal modems that look similar to the one shown above. Note the phone jacks that allow you to plug your modem directly into your phone's wall outlet.

data packets to your ISP to defeat heartbeat systems. One well-known program for this is Stay Live 2000 (www.gregorybraun.com/StayLive.html).

Solution 2: Do you have call waiting? If so, incoming calls may force your modem to drop a connection. Your phone company can tell you how to disable call waiting prior to placing a modem call; often, it's as simple as pressing `#43#` on your phone.

Solution 3: If that fails to work, you should turn off your modem's data compression feature. Open the Device Manager, right-click your modem, choose Properties, then click the Advanced Tab and the Change Default Preferences button. In the Data Connection Preferences section, set the Data Compression menu to Disabled, then click OK twice to

return to the Control Panel. Close it, reboot your system, and try your connection again.

Solution 4: If the problem continues, try connecting at a lower speed. The higher your connection speed, the less stable your call. To change your connection speed, open the Device Manager, right-click your modem, choose Properties, then click the Advanced Tab and the Change Default Preferences button. In the Data Connection Preferences section, set the Port Speed to a lower number and try to reconnect. Repeat the process if the problem persists, choosing a lower number each time. You can also click the Advanced Port Settings button on the Advanced tab and set both the Receive and Transmit buffers to their lowest options. If that fails to work,

uncheck the Use FIFO Buffers option and try to reconnect.

If your modem continues to drop calls, call your ISP's help desk or the support line at your modem's manufacturer.

Problem: The modem's download speed is extremely slow.

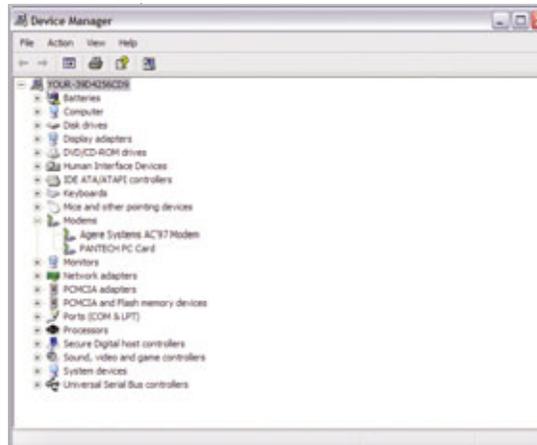
Solution: Does your connection slow to a crawl? Are you a year older when a page loads? If so, remember that analog modems aren't the fastest connections around. DSL and cable boast speeds up to 50 times faster, and sometimes more.

What's more, even a 56K modem won't connect at 56K. Speeds in the 30 to 50Kbps (kilobits per second) range are far more common, given problems with phone lines, line noise, and modems themselves. In fact, when computer and modem makers say "56K," what they mean is "56K under ideal conditions that don't exist outside our labs." Problems that keep your connection from achieving its fastest speed include your distance from the phone company's switching station and whether your neighborhood or apartment building has a concentrator (a device that converts analog phone lines into digital signals).

Last, your DNS (Domain Name System) and DUN (dial-up networking) settings can add molasses to your modem. Rather than tweak them yourself, it's best to call your ISP's help desk, explain the problem, and ask them for guidance, as the settings they recommend may depend on the configuration of their internal systems.

Problem: My modem's "handshake" process goes on and on and on but never connects.

Solution: The handshake—the loud, high-pitched noise that indicates



To find out your modem's name, model number, and manufacturer, open the Windows Device Manager and look in the Modems section.

your modem is connecting to another computer—is a key step in the connection process. It helps your modem identify connection settings and error correction rates (error correction lets your modem deal with a change in the quality of the phone line's signal without disconnecting the call).

There are two types of error correction: hardware and software, of which hardware is far and away the best. Check your modem's users guide to see which type of error correction you have. If it's software, consider buying a different modem, as software-based error correction can slow down data rates drastically.

If your modem's error correction feature is hardware-based, update your firmware using the directions outlined above. Old firmware is a common cause of long handshakes.

Problem: When I try to connect, I'm told there's no dial tone.

Solution: Have you checked the phone line itself? If your phones get a dial tone but your modem doesn't, check your modem's connection to the wall jack. Make sure it's tight. If you have an external modem, check your modem's power cable and power supply. If they all check out, you may have too much line noise in

your connection, or your modem itself may need to be replaced.

Problem: When I try to connect, I see a message that says "A dial-up connection could not be established" or "The protocol is not configured."

Solution: You may have a problem with your network protocols. A protocol is simply a convention used to govern the connection between devices. Common protocol names are TCP/IP (Transmission Control Protocol/Internet Protocol), IPX/SPX (Internetwork Packet Exchange/Sequenced Packet Exchange), and Client for Microsoft Networks. Different ISPs use a different blend of protocols to let your modem connect to their machines; if you receive an error message that mentions protocols, call your ISP's help desk to see which protocols they use, then turn off extra protocols that can interfere with a connection. (Often, your ISP won't need the IPX/SPX protocol, which Windows turns on by default.)

To turn off a protocol, click Start, Control Panel. Double-click the Network Connections icon and right-click your modem's dial-up connection. Choose Properties from the context menu. In the section named Use These Components With this Connection, click the Networking tab and uncheck the box next to any protocol you don't want. If you need to add a protocol, click the Add button and select your protocol type from the list. Then follow the prompts to add it to your system.

If all else fails, call your ISP's help desk again and report the problem in detail. Often they're a better source of advice than your modem's manufacturer because they deal with modem problems day in, day out, all year long. With some luck you'll get your problem fixed and be surfing in no time. **RS**

BY DAVID GARRETT

Basic Troubleshooting

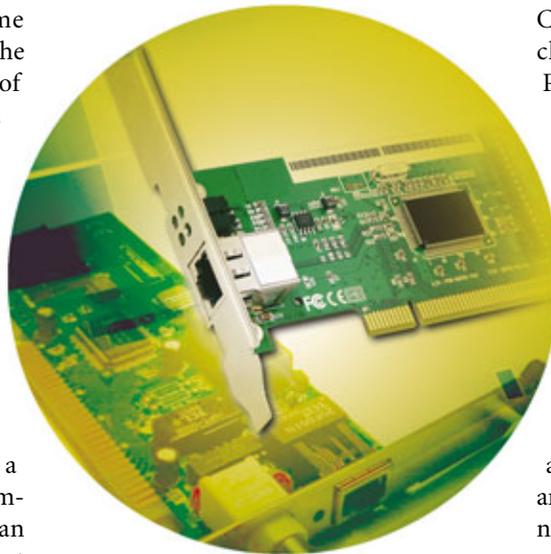
Network Interface Cards

Whether you have a home network or are among the ever-increasing number of people signing up for broadband Internet access, your computer's NIC (Network Interface Card) is its lifeline to the rest of the world. Making sure your NIC runs at peak performance (or runs at all) is a big priority for any PC user, and doing so has become increasingly difficult because of the problems associated with wireless NICs.

Most of today's computers have a NIC integrated directly into the computer's motherboard. If you have an older computer, the NIC is most likely installed in a PCI (Peripheral Component Interconnect) slot, or it may have an external NIC that attaches to a USB port.

If the computer has a wired NIC, you can identify it by looking for an Ethernet port, which looks like an oversized phone jack and has lights above or below it that flash to indicate network activity. An Ethernet cable attaches to the jack, and then the other end of the cable attaches to a broadband modem or to a router (also called a gateway or access point) if you have a home network. Wireless NICs typically attach to one of the computer's USB ports (or slide into an expansion bay if you have a notebook computer), although some wireless NICs designed for desktop PCs use a PCI slot and have an antenna instead of an Ethernet port.

The NIC is just one link in the chain between the computer and the Internet or network, so it's sometimes



difficult to tell if the NIC is responsible when those types of connections go haywire. With wired and wireless NICs, if the connection is working but seems very slow (especially over the network), then the NIC is likely to blame. If there is no connection at all, check the router and broadband modem first to make sure they are plugged in and operational. Wired NICs are incredibly reliable, while wireless NICs are notoriously unreliable, so keep that in mind when determining what is responsible for network and Internet problems.

If the router and broadband modem seem to be working properly and you don't see any lights blinking on the NIC, the NIC is likely dead and needs to be replaced. Beyond that, there are several common troubleshooting steps you can take that will clear up most problems. All of the following tips apply to Windows XP

but will work with other versions of Windows with slight modifications.

General Troubleshooting

Problem: The NIC doesn't run as fast as advertised.

Solution: Click Start, Control Panel, and Switch To Classic View (if necessary), and double-click Network Connections. Right-click Local Area Connection, click Properties, and click Configure. Select the Advanced tab and click the speed-related entry in the Property box (on our PC it was labeled Link Speed & Duplex, but this may vary depending on the NIC that is installed). Use the Value drop-down box to select the fastest speed your NIC supports, which is likely 10/100Mbps (megabits per second) Full Duplex but may be 1,000Mbps Full Duplex if you have a Gigabit Ethernet card installed. Click OK and reboot the computer. The card should operate at its full speed, assuming your router and the network computer you're connecting to also support that speed.

The speed of a wireless NIC depends mainly on the strength of the wireless signal it receives. You can get a quick read of the strength of your NIC's wireless connection by hovering the mouse cursor over the wireless icon in the system tray and waiting for a balloon to appear that tells you the overall signal strength. If it doesn't say Excellent or Very Good, then you may need to move the computer closer to the wireless router, upgrade the router, or invest in an antenna that attaches to the router and boosts the signal.

Problem: The NIC has power (the lights blink), but my computer won't connect to the network or to the Internet.

Solution: Sometimes the NIC must be "reset" so the router recognizes it. Click Start, Control Panel, and Switch To Classic View (if necessary), and double-click Network Connections. Click Repair This Connection in the

Network Tasks box, wait for the process to complete, and click Close. If the connection still doesn't work, you may need to uninstall and reinstall the NIC according to the instructions it came with.

Problem: My NIC has an inherent problem that I've heard is fixable by applying a driver and/or firmware update, but I don't know how to do this.

Solution: Drivers are software that Windows uses to communicate with your hardware, while firmware is software that is installed in a special memory chip on the NIC and that controls all aspects of the NIC's operation. Updating to the latest drivers and firmware revisions can fix bugs, enhance compatibility, and add new features to the NIC that can help you avoid further trouble. You must download the latest drivers and firmware from the manufacturer's Web site, and when doing so you must make sure it matches up with the exact make and model of NIC you use. To find out this information, look for a sticker on the bottom of an external NIC. For internal NICs, click Start, right-click My Computer, click Properties, and select the Hardware tab. Click Device Manager, expand the Network Adapters entry by clicking the plus (+) sign next to it, and write down the exact name that appears there.

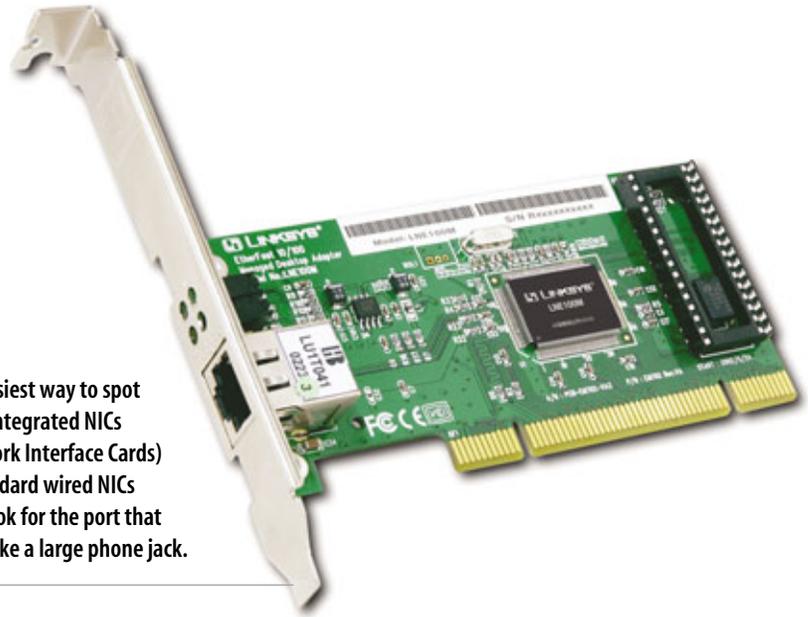
Use the instructions provided by the manufacturer to install the drivers or firmware. This is especially important during firmware upgrades as mistakes during the process can render the NIC useless.

Troubleshooting Wireless NICs

Problem: I attached a wireless NIC to a device (such as a game console or digital video recorder), but the device does not have access to my home network or to the Internet.

Solution: The first thing to do is to determine whether the device is compatible with a NIC, because there's a good chance it needs a

The easiest way to spot most integrated NICs (Network Interface Cards) or standard wired NICs is to look for the port that looks like a large phone jack.



wireless bridge. Bridges are a lot like wireless NICs except they have more internal hardware that lets them act as a sort of wireless cable. This means bridges work with just about every type of network-enabled product, whereas wireless NICs only work with products that have enough integrated networking hardware to recognize the NIC and manage the network connection.

If the device requires a bridge, you'll need to buy one, attach it to your router, and configure it to work with your network according to the instructions provided with the router. Once you configure the bridge, it should work with all of your network-enabled devices simply by plugging it into their Ethernet ports.

If the device is supposed to work with a wireless NIC, then it must have some network setup menu that you can access to input network settings such as the network name and password. Check the documentation that came with the device to figure out how to enter this data, which must match the settings that were established when you set up and secured your wireless router.

Problem: I booted the computer but can't access either the network or the Internet.

Solution: Sometimes the wireless NIC simply doesn't turn on or fails to connect to the network on its initial attempt. When this happens, the wireless icon in the system tray has a red X next to it, so right-click the icon and click Repair. If that doesn't establish the connection, right-click the icon and click View Available Wireless Networks. Find your network on the list, click its entry, and click Connect.

Problem: My NIC says it supports speeds that are much faster than the 802.11g or 802.11a specifications allow, but I never achieve those high speeds when transferring network files.

Solution: 802.11g and 802.11a (the two most popular high-speed wireless Ethernet standards) operate at up to 54Mbps (megabits per second), but most manufacturers add speed-boosting technology to their wireless products that allow for much faster speeds. Unfortunately, these technologies are not standardized and therefore do not work with similar products from other manufacturers, so stick to products from the same company (that use the exact same speed-boosting technology) to benefit from a faster connection. **RS**

BY TRACY BAKER

Basic Troubleshooting

Routers & Hubs

A router or hub is the cornerstone of the average home network. An Ethernet hub, which has several Ethernet ports, lets users share folders and files among all of the computers connected to the home network. A router generally has a built-in hub and also has features that let it share a broadband Internet connection with the networked PCs. Routers also usually include other features, such as wireless connectivity and a hardware firewall that can protect your computers from many of the digital threats floating around the Web.

Because the router is the center of your network, many network problems can be traced back to it. A defective device, bad settings, old firmware, and firewall issues can all put your network on the blink. We'll show you how to troubleshoot your router or hub so you can spot and fix common problems.

Know Your Model

Some of our problem/solutions below may send you to the router or hub manufacturer's Web site to download product updates. To download the right updates, you'll need to know the unit manufacturer and model number of your device. Many routers and hubs bear the model number on the front panel and other information (such as the serial number) on the bottom of the device.

How To Tell If The Router Or Hub Is The Problem

You can determine whether your router is the source of your network



troubles by eliminating other network devices as the problem sources. Chances are, there're only a few potential troublemakers beyond your router: the connection from your ISP (Internet service provider) to your home, the broadband modem that translates the data from your phone or cable line, or a troubled network card. You can rule out the first two problem sources easily enough (see "Basic Troubleshooting: Network Interface Cards" on page 112 for network adapter troubleshooting).

To determine whether your cable modem is the problem, you'll need to reset it. If your cable (or DSL [Digital Subscriber Line]) modem doesn't have a reset button, you can probably reset it by unplugging the power cord from the device for a few minutes. Once you plug the power cord back into the cable modem, it will try to reconnect to your ISP.

If the reset doesn't solve the problem, call your ISP's tech support number. The representative will let you know if Internet access is down in

your area and can test the connection from the ISP to your modem to make sure it's working properly. The representative can probably even test your modem remotely, as well.

Once you've determined that the ISP and modem are not to blame, disconnect your computer from the router and instead plug the PC's Ethernet cable directly into the modem. Be sure to enable your firewall software before you try this test, as you'll bypass the router (and its built-in hardware firewall) completely. (You can use Windows XP's built-in Firewall: Open the Control Panel, double-click Windows Firewall, and then choose the On radio button.) If your computer can connect to the Internet, you're looking at a router problem. If the PC still won't connect to the Internet, you'll need to troubleshoot the PC itself.

Problem: My firmware is not up-to-date.

Solution: Before you dive into the specific problems and solutions below, make sure your router's firmware is up-to-date. This step is important—in fact, we provide all other solutions in this article under the assumption that you have already updated your router's firmware without solving the problem.

Unlike peripherals, which require drivers to communicate with your PC, your router needs only firmware, which is a small program stored in the device's memory. Firmware controls the device and provides a menu of features that you can access via an Internet browser.

As they do with drivers, device manufacturers often release updated versions of firmware that fix bugs and add new features. If you're experiencing any problems with your router, you should kick off your troubleshooting session by making sure that the device has the most recent firmware release—after all, the new firmware version may fix the problem



Routers and hubs usually have multiple LEDs that indicate data transfer activity, transfer speed and other information. Check out your manual to learn more about your device's lights.

automatically or provide tools that will let you fix the problem.

To determine the router's current firmware version, you'll need to open the firmware menu. Open your Internet browser (such as Firefox or Internet Explorer) and then enter the router's IP (Internet Protocol) address in the browser's Address bar. Your router's users manual will come in handy here (if you don't have it any longer, download the manual from the Support section of the manufacturer's Web site), as it will include the router's IP address (such as 192.168.1.1). You will almost certainly see a login screen before the menu appears. Consult your manual for the login information if you haven't already changed the username and password (and don't forget to change the username and password later on—default login info leaves your network open to even the most inexperienced hackers).

You can visit the router's IP address via your Internet browser whether your Internet connection is working or not: the data travels between your PC and the router via your Ethernet cable. When the firmware menu appears in your

browser, look for the firmware version number, which generally appears on the front page of the menu. If you don't see the firmware version, check your manual—the manufacturer likely placed the version number somewhere else in the menu.

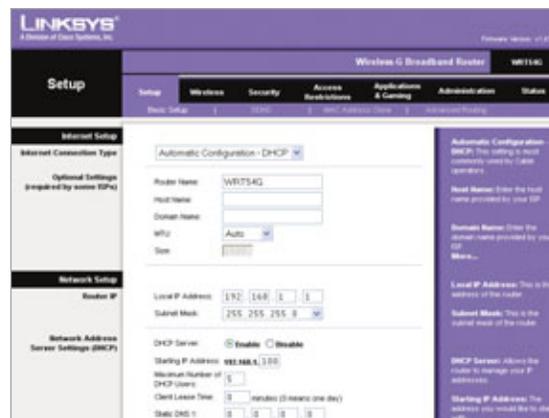
Once you have your current firmware version number, visit the router manufacturer's Web site and head for the Support section. Look up your router's model number to see whether the manufacturer has a more recent version available for download. Don't panic if you don't have the latest version: Downloading

and installing it is a very simple process. Once you've downloaded the new firmware, check your manual for installation instructions. In our experience, the manual will tell you to return to your router's existing firmware and use a built-in update feature that can automatically update the device via the file you just downloaded.

Problem: I can access the Internet when I connect directly to my broadband modem, but not when I put a router between the modem and my PC.

Solution 1: Update your firmware by following our instructions in the previous problem and solution, as buggy firmware might be the problem. If you already have the latest version of the router's firmware, use the firmware menu to return all of the features to their default settings. If this solves the connection problem, be sure to make future settings changes one at a time so you'll know what setting causes trouble if you encounter problems again.

Solution 2: Reset your network devices. This gives them the chance to reassign IP addresses and connect to each other without conflicts. To completely reset your network devices, power off your PC and then unplug your broadband modem and router. Leave the units unplugged for a few minutes. Consult your device manuals to determine whether you need to perform any additional tasks to reset the devices (some units have Reset buttons, for example). Finally, plug in and power on your devices, starting with the broadband modem, then your router, and then your PC.



One of the easiest hardware fixes around is the firmware update. New firmware releases often contain fixes that address common problems with PC hardware.

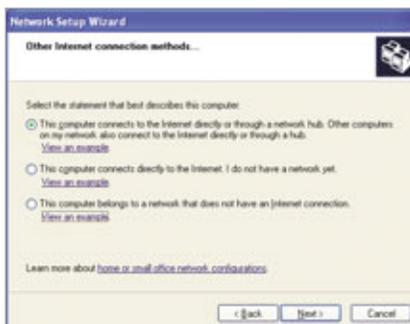
Problem: I can't access certain Web sites from computers on my network.

Solution: Chances are good that your software firewall is the culprit, rather than your router. Software firewalls might

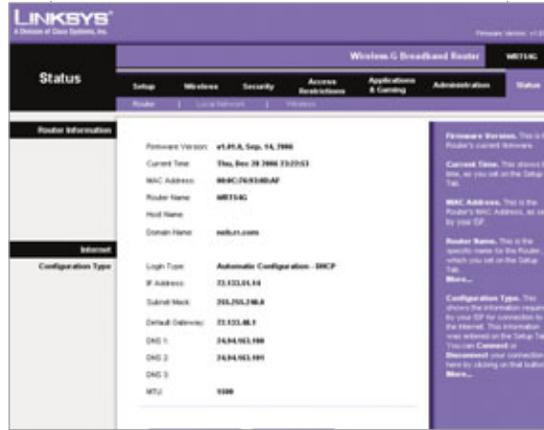
block your access to certain Web sites for a variety of reasons. If your computer runs a software firewall, start your troubleshooting by first disabling the software firewall and then visiting the Web site again. If you still can't access the site, enter your router's firmware menu and then navigate to its filtering settings. Anyone who can log into your router's firmware (via the username and password you defined) can use the router's filtering features to create a list of Web sites that the router will block access to. As we mentioned, this is a much less likely scenario than your software firewall detecting something on the Web site that triggers its own blocking features.

Problem: All of my computers can access the Internet via the router, but they can't see each other.

Solution: You can easily solve this problem by configuring your PCs to recognize each other (and share files, folders, and printers) over the network. Although your computers are physically networked, they may not yet belong to a specific network group and may lack other settings (such as file sharing settings). Some networking devices include file-sharing



Although your router is already sharing Internet access with all of the computers on your network, you'll need to run Windows' Network Setup Wizard or third-party software to share files and printers.



Reassign IP addresses to break your router free of a dropped wireless connection. In our experience, we've had the best luck by powering off the computer that dropped the connection before forcing the DHCP release.

programs that let you configure your network, but don't panic if your equipment doesn't include such software. Windows has a built-in Network Setup Wizard that can configure your computers and put them into a network group. Once you complete the wizard on each networked PC, you'll be able to see all of your network computers' shared folders in the My Network Places window and access any shared printers. To start the wizard, click Start, All Programs, Accessories, Communications, Network Setup Wizard, and then follow the Wizard's instructions.

Problem: My wireless router dropped the connection to my home computers.

Solution: Your wireless router assigns an IP address to each of the computers on your network. If your computer drops its wireless connection and doesn't produce any error messages, you can probably reinstate the connection by reassigning an IP address via router. Routers generally use DHCP (Dynamic Host Configuration Protocol) to automatically assign IP addresses, so you'll want to release the router's DHCP assignments and then force it to assign new IP addresses.

To force a DHCP release, enter your router's firmware menu and look for a DHCP Release feature. Your router's manual or the firmware's support documentation will help you find the feature. Many routers feature DHCP Release and DHCP Renew buttons that let you quickly complete this task.

Problem: My hub's connections work fine but the Speed LED doesn't light up for one of my connections.

Solution: The connection that isn't triggering the LED is not operating at the hub's maximum data transfer speed. Most

hubs support at least two speeds (10Mbps [megabits per second] and 100Mbps), and some also support gigabit (1,000Mbps) speeds. Rather than clutter the hub's front panel with LEDs for each of the hub's supported speeds, the manufacturer simply added a single LED (per port) that lights up only when the port is operating at full speed. Many hubs have a separate LED that indicates whether data is currently transferring across the port. If this LED doesn't light up when you attempt to send data, you may have a connection problem. Otherwise, you're simply facing a port that isn't operating at its top speed.

If you expected the port to operate at its maximum speed, double-check the cable that connects to the port, as well as the network adapter in your PC. The adapter is particularly important—if it doesn't support the same top speed that your hub supports, the data transfer will slow the adapter's speed. The cable can also affect data speed in some situations. Standard 10/100 hubs transfer data over CAT5 (Category 5) Ethernet cables, whereas gigabit hubs need CAT5e cables to offer top data transfer speeds. **RS**

BY JOSHUA GULICK

Basic Troubleshooting

Wireless Access Cards

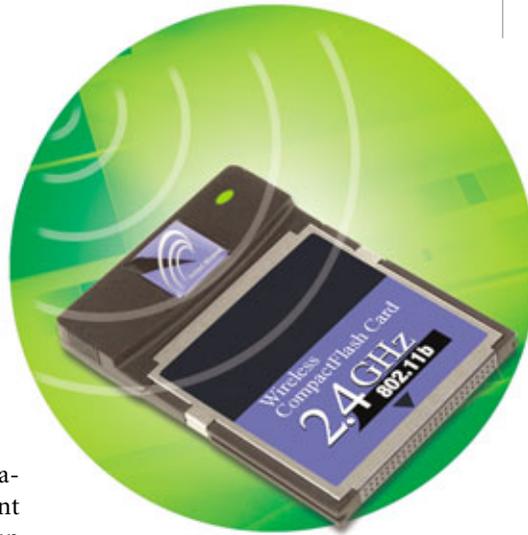
Wireless access cards, also known as wireless adapters, replace standard Ethernet cables to create a wireless link between your PC and a wireless AP (access point) or router. Although wireless networking equipment offers convenience to users who want to place computers in multiple rooms without running Ethernet cables around the house, the equipment isn't foolproof: You're bound to run into network problems at some point. We'll help you troubleshoot an unruly wireless adapter.

Make & Model

Whether you plan to call tech support or simply want to search for drivers on the manufacturer's Web site, you'll need to know your device's model number. In most cases, finding the model number is a snap: If you don't see the model number on the device itself, you can find it via your computer's Device Manager. Click Start, Control Panel, and then open System. Click Device Manager and then click the plus (+) sign next to Network Adapters. Your adapter's name will appear and will most likely include a model number. The adapter's software will also generally display its model number.

Update Your Drivers

Software publishers and hardware manufacturers tweak their products



for months (and sometimes years) after they release them. Software publishers update their programs via patches, while hardware manufacturers tweak their hardware with firmware updates and new driver releases. Updated drivers sometimes add functionality, but they also often include important bug fixes. If you're experiencing any problems with your wireless adapter, we recommend that you download and install the latest driver for your adapter.

To determine your driver's version number, click Start, Control Panel, and then open System. Click Device Manager and then click the plus sign next to Network Adapters. Right-click your wireless adapter and then click Properties. Finally, click the Driver tab, which will display your driver version and driver release date.

Next, visit the Support section of the manufacturer's Web site and see if a newer driver is available. If it is, download the driver to your hard drive. To uninstall your existing driver, open the

adapter's Properties window, click the Driver tab, and then Update Driver.

When the Hardware Update Wizard appears, click the No, Not This Time radio button and then click Next. Click the Install From A List Or Specific Location (Advanced), click Next, and then check the Include This Location In The Search box. Click the Browse button, navigate to the downloaded driver on your hard drive, and then complete the wizard.

If your adapter connects to one of the PCI (Peripheral Component Interconnect) slots in your computer, keep in mind that you may need to remove the adapter before you start the driver installation. (Your adapter's manual will let you know if you need to disconnect it.) Keep a screwdriver handy.

Problem: My PC's wireless adapter won't connect to my wireless AP or router.

Solution 1: Make sure your AP or router supports the same wireless networking standard that your adapter uses. For example, you can use 802.11b and g devices without any compatibility problems, but you can't use an 802.11a adapter to connect to an 802.11g network. This may seem like a "no kidding" sort of solution, but if you've ever fretted over a seemingly dead PC, only to discover that the power cord was unplugged, you'll agree that sometimes the obvious answer is the one we overlook.

Solution 2: Renew the router's DHCP (Dynamic Host Configuration Protocol) settings. Your router most likely uses the DHCP networking protocol to automatically assign IP (Internet Protocol) addresses to all of the PCs on your network. You can often fix a dropped connection by entering your router's firmware menu and using the firmware's DHCP Release/Renew feature (see "Basic Troubleshooting: Routers & Hubs" on page 114 to learn more about forcing a DHCP release).

Solution 3: Switch your wireless connection software. Chances are,

you're using the adapter manufacturer's software. Windows XP includes the Wireless Zero Configuration Utility, but your adapter's software overrides it by default. You can switch to the Zero Configuration Utility only if your adapter's software permits it. Find the adapter's icon (which appears in the System Tray) and then right-click it. You may see Use Windows XP Wireless Configuration (or a similar link). Click the link, open the Control Panel and then open Network Connections. Next, double-click the Wireless Network Connection icon to view available networks.

Problem: My wireless connection is weak or drops frequently.

Solution 1: Determine whether physical obstacles are weakening the signal. Not surprisingly, wireless networks offer the strongest signals in open spaces, but unless your home resembles a hanger, your wireless network must negotiate walls and floors, both of which can reduce the strength and range of the signal. Today's home networking equipment can reach as far as 300 feet in the very best circumstances, but your home's metal and concrete will savage your router's signal strength. If the computers closest to your wireless AP or router aren't dropping the wireless connection and the computer that is dropping the connection is at the far end of the house, you can probably blame your network troubles on distance and physical barriers.

There are two popular types of signal-strengthening devices on the market for home users: range-boosting antennae and repeaters. Several manufacturers offer APs and

wireless routers that have removable antenna. If you can detach your router's antenna, you can replace it with an antenna that offers more dBi (decibels relative to isotropic). Chances are, your router's manufacturer also offers an optional range-boosting antenna.

Repeaters, which are devices that resemble APs, also boost your router's signal strength and are great for throwing the signal around corners. Unlike antennae, which attach directly to the router, a repeater can sit far from a router, pick up the router's signal, and "repeat" it. If your PC sits behind a particularly thick wall or other physical barrier, consider placing a repeater between the router and the PC that drops connections.

Solution 2: Move your wireless adapter or your computer. If your computer sits under your desk or in a cupboard, consider buying a wireless USB adapter that includes a lengthy cable. You can run the USB adapter's antenna up to the top of your desk, where it may get better reception.

Solution 3: Change your wireless channel. If you live in an area that has many wireless networks, you may see a performance boost when you change your router's wireless channel. Other APs and wireless routers that use the same channel your router uses may reduce the strength of your signal. Your router supports up to 11 channels, which means you have plenty of wiggle room.

To change your router's channel, you'll need to enter its firmware menu via an Internet browser (see "Basic Troubleshooting: Routers & Hubs" on page 112 to learn more about accessing the menu). Once you enter the menu, browse for the router's wireless settings, which will include a field that lets you choose



Your wireless adapter's software can display available networks and lets you configure the adapter's settings.

a channel. Most standard networking devices choose a channel by default and then let users change the channel, but enhanced devices that offer extra range and speed functionality may insist on a specific channel until you disable the performance-boosting feature.

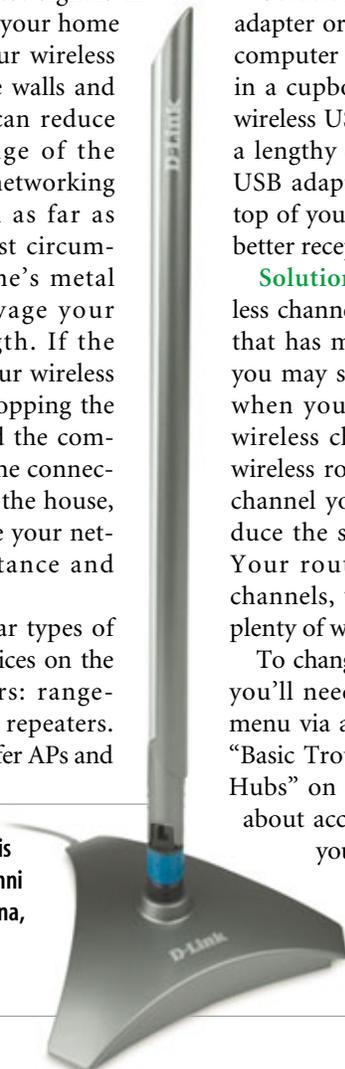
Problem: I can't find my wireless access point or router.

Solution: When you first try to connect to your network, your wireless adapter's software will scan the area for available networks and then display a list of networks. If you don't see your own list in this network, you may have disabled the router's SSID (Service Set Identifier) feature, which broadcasts the SSID to local wireless adapters. Disabling the SSID broadcast is a common security method, as it effectively stealths your network, making it that much harder for would-be hackers to spot.

The good news is that your adapter doesn't need to see the SSID to connect to your router. Your adapter's software includes a manual connection feature that lets you enter your network's information, including the SSID (which means that you'll need to know your router's SSID—refer to the router's firmware to find it). Once you enter the appropriate SSID and encryption information, you'll be able to connect to your router without any trouble. **RS**

BY JOSHUA GULICK

Optional antennae, such as this D-Link ANT24-0700 2.4GHz Omni Directional 7dBi Indoor Antenna, can boost your AP's (access point's) wireless signal.



Basic Troubleshooting

Digital Cameras

Digital cameras make taking photos easy, but only when our cameras function properly. When your camera misbehaves, there are steps that you should take to troubleshoot it so you can start snapping photos again.

Identify Your Camera

Before we dive into trouble-shooting your digital camera, we'll take a look at some of the important information about and specifications for your camera that you should know. First, identify the manufacturer and model of your camera. Common manufacturers include Canon, Fujifilm, HP, Kodak, Nikon, Olympus, Pentax, and Sony, as well as many others. The camera manufacturer's name is usually printed on the body of the camera. You'll also find it printed on your owners manual.

Likewise, the model name and number of your digital camera is probably printed on the camera's body. Most cameras have a series name, such as Canon's PowerShot line, Nikon's Coolpix line, or Sony's Cyber-shot line. In addition, most cameras also have a model number. For example, Canon's PowerShot SD40 is from the PowerShot line and has a model number of SD40. Once you know the manufacturer, series name (if applicable), and model number of your camera, you can search the manufacturer's site, the Web, and other resources for information about any problems that you encounter with your camera.

Finally, if you need to call the camera manufacturer for technical support, you should try to locate the serial number of your digital camera before you place the call. The serial number usually starts with "SN," "SN#," or "No." and is printed on a label or a barcode on the bottom of the camera. If you can't find the serial number, the manufacturer should be able to help you locate it when you call for tech support.

Find Other Camera Specs

As you troubleshoot your camera's problem, you'll find that it helps to know the camera's speci-



cations. Some of the details of your camera's specs are visible from a simple examination of the camera's body. You can probably identify most of the shooting modes by examining the camera's mode dial. You'll also find that the focal range of a lens is usually printed around the barrel, close to the lens.

You'll probably find many of the specifications printed on the box that your camera came in. Detailed specifications are usually available in your users manual and on the manufacturer's Web site.

In-Camera Errors

Problem: My digital camera doesn't recognize my flash memory card.

Solution: There are several reasons that a camera may not recognize a memory card. To troubleshoot, first determine if the card worked in your camera in the past. If it worked in your camera before but now your camera doesn't recognize the card, the card is likely either formatted wrong or corrupted.

If you formatted your memory card on your computer rather than in your camera, there's a good chance that this is the source of the problem. Digital cameras use the FAT (file allocation table) file system, which is the same file system used by Windows 9x/Me/NT. Windows XP can also use a FAT system, but it also supports a newer technology, NTFS (NT file system). The FAT file system is available in several forms, including 12-, 16-, 32-, and 64-bit.

Although your computer likely uses NTFS or FAT32, your digital camera probably uses FAT12 or FAT16. These file systems are older than the ones that your computer uses, and therefore your digital camera may not be able to read newer formats such as FAT32. Your camera will not recognize NTFS-formatted data.

If your camera no longer recognizes a card that you formatted with Windows, you can try to resurrect the card by reformatting it in Windows using a different file system. Connect a flash memory card reader to your computer and insert the memory card. Double-click My Computer and then the icon that represents the card reader. Make sure that you've selected the correct drive so that you don't accidentally delete the data on one of your other connected drives. Right-click the icon for your card reader and click Format. In the resulting window, click to select FAT under File System. Make sure that Default Allocation Size is selected. Then make sure that both the Quick Format and Compression checkboxes are selected.

Next, click the Start button. You will lose any data on the card, and this will format your card in FAT16, which is compatible with most digital cameras.

After Windows finishes formatting the card in FAT16, right-click the card reader's icon and click Eject. Remove the memory card, insert it in your digital camera, and turn your camera on. Your camera will probably recognize the card. If so, before you do anything else, format the card in the camera, according to the manufacturer's instructions.

If your camera still doesn't recognize the memory card, insert your memory card in the card reader again. Click Start and Run. In the Open field, type `cmd.exe` and click OK. When you see a command prompt, type the letter of your memory card reader, followed by a colon (:). For example, if your card reader is the G: drive, you would type `g:`. Then type `/FS:FAT`. So if your card reader is the G: drive, you'll type `g:/FS:FAT` at the command prompt. Press ENTER. Finally, close the window with the command prompt. After you properly eject the memory

card from the reader, insert the card in your digital camera. If your camera still can't recognize it, the card itself is probably damaged, and you should invest in a new memory card.

If your camera can't recognize a new memory card, either, you'll need to contact the manufacturer to repair your camera. There may be a problem with either the camera's memory card slot or the camera's internal motherboard that causes data corruption.

Finally, to avoid formatting problems in the future, always format a card using your digital camera instead of Windows. The method of formatting a card varies among camera brands and models, so you'll need to consult your users manual for instructions.

Problem: My digital camera's LCD displays an error code or error message that I'm not familiar with.

Solution: Consult your camera's users manual or the manufacturer's Web site to determine what the error code means. For example, according to Canon's Web site, when a Canon digital camera displays "E18" on the LCD, there is some type of problem with either the lens or the lens cover. Take the time to research the error message. Armed with knowledge about the error, you may be able to solve the problem yourself.

Difficulties Moving Photos From Camera To PC

Problem: I've connected my camera to my computer, but my camera can't transfer the photos to the PC.

Solution: First, double-check the transfer procedures for your camera. Some cameras require only that you press the power button. Other cameras also require that you turn a mode dial to a USB Transfer mode.

Sometimes data transfer problems occur because your camera's driver (software that tells your PC how to communicate with an external device) has become corrupted. You have a couple of options. You may download



Your camera's model number and focal range is probably printed on the face of the camera.

the most recent driver for your camera from the manufacturer's Web site, install it, restart your computer, and then try to transfer photos again.

Another option is to bypass the driver problem by using a card reader to transfer photos to your PC. Make sure that you buy a card reader that supports the type of memory card that your camera uses. When you use a card reader, you're less likely to encounter the device conflicts that often occur when a camera's driver conflicts with another device's driver. (This is especially likely to happen if there's more than one digital camera in your home.)

Problem: My camera's batteries don't last long enough to reliably transfer images from my camera to my computer.

Solution: As we discussed in the previous solution, memory card readers are an excellent alternative to transferring images directly from your digital camera. Card readers don't require an external power supply. They gather all of the power that they need from a PC's USB or Fire-Wire port, so you don't need to worry about the toll that transfers take on your camera's batteries. Also, data corruption is less likely because you don't need to worry about losing battery power during a data transfer.

Problem: I don't see an icon for my digital camera in My Computer.

Solution: First, make sure that the cable for your camera is firmly connected to both the camera and to your PC. Also, double-check that your camera is turned on and, if it has a USB Transfer mode, that you have pressed the right button or turned the mode dial to the proper position.



The serial number is usually located on the bottom of the camera.

If you still can't find an icon for your camera in My Computer, remember that some cameras show up as removable drives.

Trouble Viewing Photos On A PC

Problem: I can't open RAW images on my PC.

Solution: To view RAW images on your computer, you'll need to use special software. You may use the software that came with your digital camera, or you can use an application that supports viewing and processing RAW images. For example, the Adobe Camera RAW plug-in for the Photoshop and Photoshop Elements programs lets you open and process RAW images. Because RAW files are proprietary to each digital camera, you'll need to save your images in a universal format, such as TIFF

(Tagged Image File Format) or JPEG (Joint Photographic Experts Group) when you're done processing the RAW file.

Problem: Some of my photos on my card are messed up. For example, part of the image is missing, there are colored stripes running across my photo, or it has random color blobs and digital noise throughout the image.

Solution: When you see garbled or otherwise "messed-up" images on your camera, it usually indicates that the images are corrupted. Luckily, there are software programs that may be able to repair corrupted images. For example, PhotoRescue Wizard PC (\$29; www.datarescue.com) is software that applies algorithms to corrupted data on a memory card to recover lost data. This doesn't always work, but often you can save at least some of your photos.

If you don't need to recover the photos from the memory card, try to format the card in your camera. If you continue to see corrupted images in the future, you should buy a new memory card. If you still see corrupted images, even after switching to a new memory card, you should contact the camera manufacturer because there may be a problem with your camera that is causing it to write corrupted data to your memory cards. **RS**



If your camera no longer recognizes a memory card because you formatted it using Windows, you can try to format the card again, this time selecting FAT-16 as the file format.

BY KYLEE DICKEY

Basic Troubleshooting

Inkjet Printers

Most of us have experienced the frustration of encountering a printer error just as we attempt to print a quick copy of a document. It seems that printer problems never occur at a convenient time, but at least with the right knowledge and a little bit of effort, you can troubleshoot your way through most of your inkjet printer woes.

What You Need To Know

Before you begin to troubleshoot your printer, make sure that you know if you have an inkjet printer or a laser printer. There are several differences between an inkjet and laser printer. For instance, an inkjet printer dispenses small droplets of liquid ink from a cartridge onto a sheet of paper. A laser printer, on the other hand, uses toner, a powdered form of ink. To make the toner adhere to the paper, the toner must be hot so that the powder can fuse to the paper. A laser printer uses a laser and static electricity to do this. You may not be able to tell just by looking at your printer whether it is an inkjet or a laser printer, but generally paper comes out of an inkjet printer relatively cool, whereas paper comes out of a laser printer quite warm to the touch. Often, you can tell from the name of a printer whether it's a laser or an inkjet. For instance, laser printers may contain the word "laser" in the product name, and inkjets may contain the words "jet" or "photo" in the name. Of course, the best way to find out for sure which type of printer you have is to



look in your users manual or visit the manufacturer's Web site.

This article deals primarily with the type of problems you may encounter when you use an inkjet or photo printer. If you have a laser printer, see the article "Basic Troubleshooting: Laser Printers" on page 128.

The first thing you should do is identify the manufacturer of your printer, as well as its model name or number. Usually this information is printed on the face of the printer. Some common inkjet printer manufacturers include Canon, Epson, HP, and Lexmark, among others. The model number usually (but not always) consists of a series name, one or two letters, and a string of numbers. For example, you might have an Epson Stylus Photo R300. Epson is the manufacturer, Stylus Photo is the series name, and R300 is the model number. It's important to have this information so that you can download drivers, manuals, and any other necessary files from the manufacturers' Web site.

You may also find it helpful to have a copy of your printer's specifications. You can usually find the specs either in your users manual or on the manufacturer's Web site. Typically, on a company's Web site, specs are located either on the product page or in the Support section. In the specifications, you'll find information such as the maximum paper-handling capacity of your printer so that you don't overload the inkjet tray with paper. You'll also find what resolutions the printer supports, which can help you determine if your prints reflect the image quality you would expect from the printer. The specifications also contain vital information, such as what types and weights of papers are safe to use with your printer.

Basic Troubleshooting

Regardless of the type of problem you have with your printer, you should start with several basic troubleshooting steps, which we've listed below. By checking these things first, you can save a lot of time as you try to solve your printer's problem.

Check cable connections. First, check to ensure that the power and data cables are firmly connected on both ends. If a cable is loose, data communication errors may occur when you try to print.

Update drivers. Visit the manufacturer's Web site and check the Support, Downloads, or similar section for the most recent drivers for your printer. If you find a newer driver version than the one that you have installed, download and install it. Often, a simple driver update resolves a problem.

Check the paper tray. This may sound obvious, but when your printer refuses to print, you should verify that there is paper in the tray and that no sheets of paper are jammed in the printer.

Print a test page. Some printers include the option to print a test page. The test page is a document that prints directly from the printer and that does not require you to load a file from your computer.

If you cannot print a specific document on your computer but you can print a test page, the problem most likely lies with the software you're using, the printer driver, or some other software-based element that resides on your computer. If your printer will not print a test page, you know that the cause is more than just a problem with the program in which you opened the document you wanted to print. If a printer cannot even print a built-in test page, something is wrong with the computer itself. This could be something as serious a printer malfunction or as easily-remedied as a paper jam.

If you don't know if your printer can generate test pages, consult your users manual or the manufacturer's Web site for more information. The procedure varies depending on your brand and model of printer, and some inkjet printers do not produce a test page at all. (Test pages are more common on laser printers than on inkjet printers.)

Print a different document. Make sure that you have tried to print more than one document. This will help you to determine whether the source of the problem lies with a single, possibly corrupted document or if the problem is more widespread.

Print from a different application. Whenever you have a problem printing, you should try to print a document from another application. This way, you can determine if the printing problem is system-wide or if it is just a single program that

cannot send documents to the printer properly.

Check the Page Setup and Print options. In most applications, you can access both Page Setup and Print through the File menu. Check the configurations in both of these dialog boxes. Often, the source of a problem is a simple misconfiguration.

When Nothing Prints

The first and probably most distressing type of problem is when you can't get anything to print at all. There are several potential causes.

Problem: When I send a document to the printer, nothing happens. I don't hear the printer charge the ink, attempt to pull paper through its rollers, or anything.

Solution: As you should with any troubleshooting venture, start by checking the simplest things. Start by verifying that the power cable is plugged into the printer and a wall outlet, power strip, or surge protector. Next, make sure the printer's power button is turned on and that the printer's data cable is connected to both the printer and your PC.

Next, make sure there isn't a sheet of paper stuck in the printer. If there was a paper jam earlier, your printer

may not even attempt to print any more documents until you remove the paper that's stuck.

Problem: My document won't print, and there's a light flashing on the body of the printer.

Solution: When a light flashes on the face of the printer, it usually means that the printer has encountered an error. That's the bad news. The good news is that you can usually learn more about the nature of the error by examining how many times the light blinks or by launching the printer utility that came with your printer.

First, consult your users manual or the manufacturer's Web site and look for "Blink codes," "LED (light-emitting diode) status codes," or similar guidelines to printer errors. You may learn, for instance, that a certain number of blinks indicates that the printer is out of paper and that a different number of blinks means that there's a paper jam.

If your printer doesn't have LED codes, launch the printer utility that came with your printer. Often, this tool provides valuable information about the type of error your printer encountered. For example, the printer utility may tell you that one of your ink cartridges is empty, that your printer lost its connection to your PC, or that a necessary driver is missing.

Something Prints, But It Looks Bad

Problem: There are tiny, blurry smudges across my print.

Solution: Usually, if you see small smudges across your prints, some type of lint or other debris has worked its way into your printer. As the ink heads deposit ink, some of it soaks the small bits of debris, which are then



Check the manufacturer's Web site for the most recent drivers for your printer.

forced through the printer's components along with the paper. As a result, you'll see smudges of ink on the paper where the ink-soaked debris rubbed against the sheet of paper.

The key to handling such ink smudges is first to ensure that you keep your printer clean and free of debris. Next, make sure that you only use papers which are safe to use in your printer. For example, if you want to use a cloth-based paper, such as a velvet or canvas, check your documentation or call the manufacturer to confirm that this type of paper will work with your printer.

If your printer has already accumulated debris, the best way to clean things up is to clean the print head. The procedure for cleaning the print head is different for each printer, but usually you do this either by pressing a button on the face of the printer or by clicking a button such as Clean Print Head in the printer utility. You may need to clean the print head several times to remove debris if your printer is especially dirty. Cleaning the print head consumes some ink, so plan to use up a bit of the ink in your cartridges.

If cleaning the print head does not clean the printer enough to remove smudges from prints, you will need to call an authorized repair center. Do not try to disassemble and clean the printer yourself.

Problem: There are small, white lines or gaps in my print.

Solution: When you see small gaps in your printouts, this, too, usually means that it's time to clean the print head. See the previous problem and solution for more information about cleaning the print head.

Rarely, gaps in printing occur because a print head is out of alignment.

Again, your printer utility should have a tool for aligning the print head.

If you've cleaned and realigned the print head but you're still having problem with gaps in prints, you



A common cause of printer errors is a simple paper jam.



Most printers have an LED (light-emitting diode) that blinks when there is a printing error.

should either take your printer to an authorized repair center or buy a new printer. (Keep in mind that inkjet printers aren't very expensive, so it may be cheaper to buy a new printer than to repair your current printer.)

Problem: My prints have a severe color cast. The overall tint seems to be more red, yellow, green, or blue than it should be.

Solution: You're likely to see a color cast in your prints if you haven't used your printer for several weeks or months. This is because the nozzles of the ink cartridges can dry out if they aren't used periodically. If one or

more of the ink heads is dry and clogged, your printer cannot deposit the proper proportions of colored ink on the paper.

If you notice a color cast, the first thing to do is clean the print head, as we discussed earlier in this article. If the color cast continues after you clean the print head a few times, you should buy a new cartridge to replace the one that you suspect is dried out. To avoid such problems in the future, try to print something at least once every week or two. You don't need to use a lot of ink to do this. You can print a test page from your printer or a very small document. You may even conserve ink by printing in draft mode. The important thing is that every so often, the ink cartridge dispenses some ink so that the ink heads don't get clogged with dried ink.

Besides dried-out ink cartridges, there are a couple of other things that can cause a color cast. First, an improperly calibrated monitor may display colors that are quite different than the colors that print. Calibration is a complicated topic that requires more space than what we have here. However, you can search the Smart Computing Tech Support Center (www.smartcomputing.com/techsupport) and the Web to find information about monitor calibration.

Finally, some printer manufacturers have specially formulated inks that do not appear as the correct colors unless they are used with the manufacturer's proprietary inkjet papers. For example, if you use Canon paper in an Epson printer, some of the colors may look funny. The best option in this case is to buy the paper that the manufacturer recommends.

Problem: There's a slight difference between how my photos looked on my computer monitor and how they look

when I print them. Specifically, it seems as if some colors are darker or lighter than they were on the screen.

Solution: Start by cleaning the print head and calibrating your monitor. Also, though, check your print settings. Make sure that you have selected the right type of paper, the desired print quality, and the correct color settings (if the option is available). If you have not selected the right type of paper in the Print Setup or Print Properties dialog boxes, your printer may deposit the wrong amount of ink on the page. For example, if the Print dialog box indicates that you'll print on glossy photo paper but you insert standard inkjet paper, your printer will likely print much too heavily for the weight and finish of the standard inkjet paper.

Likewise, if the Print Properties dialog box says that you will print on transparency paper, your printer will leave much less ink on the page than it would if it were printing on standard paper. Always make sure that you've selected the right type of paper before you begin printing.

Paper Problems

Problem: A sheet of paper is stuck in the printer.

Solution: Unfortunately, most of us have had a sheet of paper get stuck in the printer at some time. It can be a very common occurrence. To resolve a paper jam, you usually gently pull the sheet of paper back out of the printer and then reset the printer. However, to avoid damage to your printer, you should consult the users manual to first ensure that you remove the paper jam in a way that is safe for your printer.

Problem: The printer feeds more than one sheet through at a time.

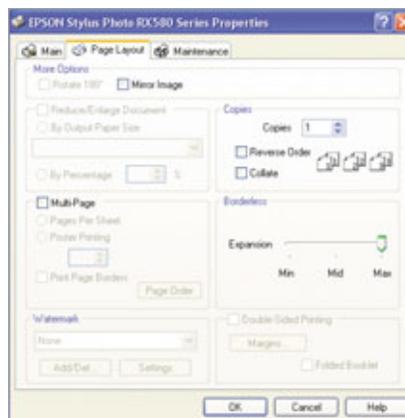
Solution: If your printer pulls more than one sheet of paper through

at a time, there are three likely causes. The first is that you're using a paper type or thickness that your printer doesn't support. (Check your documentation to determine if the paper is the problem.)



There are several things that can cause a print to have a color cast, which throws off the tint in the image.

The second possible cause is humidity. If your printer is in a humid room, the sheets of paper may become slightly moist and curl or stick together, causing them to feed through the printer improperly. You have a few options to fix this problem. First, you can run an air conditioner or a dehumidifier in the room. This will remove excess moisture from the air. Second, you can move your printer to a room where the air is drier. Third, you can store



Check the expansion settings if your borderless prints don't print all the way to the edge of the paper.

your paper in a dry location and retrieve paper only when you're ready to use it.

The third cause of a printer grabbing more than one sheet of paper at a time is a malfunction. It's possible that the rollers that grasp the paper may need an adjustment. If you can find no other logical reason for the misfeeds, you should contact an authorized repair center to do this work for you.

Problem: I can hear the printer attempt to grab paper, but no sheets are actually entering the printer.

Solution: A printer that cannot grasp paper likely has one of the same problems that we just discussed (wrong paper type, high humidity, or malfunction). Read the previous solution for more guidance in resolving these problems.

Problem: My printer supports borderless photo printing, but there's a gap around the edges of the pictures I print.

Solution: First, make sure that you've selected the proper paper size, such as Borderless 4x6, in the Page Setup and Print Properties dialog boxes. Then look for your printer's Expansion setting. The name may be slightly different depending on the make and model of your printer. If you can't find this setting, consult your users manual. Many printers that support borderless printing let you configure the degree to which your printer should expand your images to make sure that they print all the way to the edges of the paper you're using. If the current expansion setting is too low, increase the expansion setting a little bit and try again. This should fix the problem. **RS**

BY KYLEE DICKEY

Basic Troubleshooting

Keyboards

Imagine a computing world without a keyboard. Doesn't seem plausible, does it? Though they're often taken for granted, keyboards are vital toward helping us input data into email, Word and Excel documents, Web sites, and more. They also let us quickly open Windows programs, execute commands, control multimedia content, and play games. If you've experienced a keyboard-related problem, you know computing life seemingly stops until the problem is rectified.

Depending on whether you use a notebook or desktop system, your keyboard likely has 80 to 110 keys and uses a traditional QWERTY layout vs. a Dvorak or other layout. Most keyboards connect to a computer via a cable that has a connector that plugs into a computer PS/2 or USB port. The connection provides the keyboard power and relays electrical signals between the keyboard and computer. Wireless keyboards typically use battery power and a receiver that you connect to the computer for communicating, usually via RF (radio frequency) or Bluetooth technology.

Inside a keyboard, a built-in microprocessor and circuitry manages those electrical pulses, which occur when you press a key and it connects to a sensor that's underneath. The microprocessor, or controller, analyzes the pulses, converts them to binary form, and passes them to the operating system, which executes the appropriate command or enters content into the proper program. Fortunately, keyboards are fairly simple devices and don't generally experience many problems. Still, there may come a time when you notice



incorrect characters or no characters at all displaying on-screen, multimedia keys not functioning, error messages indicating a keyboard isn't present, or keys sticking. The following are common keyboard-related problems and possible fixes.

Simple Problems, Simple Solutions

Most keyboard problems usually relate to the keyboard's cable, proprietary software, its cleanliness, or mechanical failures. Fortunately, most of these problems are easily corrected.

Problem: Your keyboard only types capital letters or the numeric keypad won't display numbers or text you enter overwrites existing characters.

Solution: These problems are usually caused by keys with functions you can toggle on and off. For example, if the keyboard only displays capital letters, the CAPS LOCK key is probably on. Press it to turn the function off. The same applies to the NUM LOCK, INSERT, and SCROLL LOCK keys.

Problem: You've spilled fluid on the keyboard.

Solution: Drink enough coffee, soda, or other beverage around your computer, and accidents are bound to happen including spilling liquid on your keyboard. If this happens, acting quickly is imperative, as the underlying circuitry is in immediate risk of being permanently damaged. To (hopefully) rescue the keyboard, first shut your system down to turn off electricity to it and then tip the keyboard to drain as much fluid as possible. Follow up by wiping it with a dry rag or towel.

If the fluid was something other than water, use warm water to wipe the board clean. Some experts advise rinsing the entire board. If you do, make certain the keyboard is completely dry before plugging it back in, as electricity and water don't mix. Using a hair dryer can accelerate the drying process, especially underneath the keys, but take care not to damage the circuitry with excessive heat. For safety reasons, consider waiting several days before using the keyboard again. If these steps don't do the trick, a replacement is probably necessary.

Problem: Certain keys stick when you press them.

Solution: Your keyboard will usually let you know if a key is sticking by ringing out a continuous beep, indicating the keyboard's memory buffer is packed. Otherwise, characters may display erratically, or you'll physically feel the key is stuck. Keys stick for several reasons, including if the board is particularly dirty. Over time, keyboards accumulate significant dirt, dust, and debris on and under keys. A cloth tissue with a little water usually is enough to clean the board's surface, and using a can of compressed air will clear most junk from underneath the keys. If you still notice keys sticking, power your system down and try to gently pry off the stuck key with a flathead screwdriver, cleaning the

space with a cotton ball and some isopropyl alcohol.

Beyond The Basics

Although most keyboard-related problems aren't severe, a few go beyond a cable simply being loose. The following problems require a bit more effort to resolve.

Problem: Your computer isn't recognizing your keyboard.

Solution: If Windows displays an error message that a keyboard isn't present or characters you type aren't displaying on-screen, check the connection to the computer. Shut your system down and then look at its back to make sure the connector is securely plugged into the proper PS/2 or USB port. PS/2 keyboard ports are typically colored purple, and the connector will only fit one way. Check also that the connector's pins aren't bent or broken. It's possible to gently bend a pin back in place, but if it's broken, replacing the keyboard is your only option.

If the pins are fine but you suspect the board isn't receiving power, plug another keyboard into the computer. If it works, your keyboard's circuitry may be damaged, and you'll likely need a replacement. If the substitute also fails,

the PS/2 or USB port or a motherboard controller may be bad, and it's possible you'll have to replace the motherboard. Finally, if the keyboard is plugged into a USB hub, the hub may not be capable of supplying sufficient power to the keyboard. Try connecting the keyboard directly to a dedicated USB port.

Problem: The multimedia or quick-launch keys won't work.

Solution: Many keyboards include special keys for controlling multimedia content, such as adjusting volume levels, or for opening commonly used programs, such as a Web browser. Accessing these functions or customizing the keys usually requires installing proprietary software and a device driver that the keyboard's manufacturer provides. If these keys aren't working, check that the software is installed and the configurations set correctly. Check also that the keyboard meets Microsoft's compatible tests. (You can check at testedproducts.windowsmarketplace.com.) If your board isn't listed, check with your manufacturer for updated software.

Problem: You accidentally turned on StickyKeys and can't turn it off.

Solution: Windows provides the StickyKeys tool for those who have

trouble holding down two keys at once, such as CTRL-Z. With StickyKeys turned on, you can push one key one at a time to perform a key combination. Pressing the SHIFT key five times turn StickyKeys on. Pressing SHIFT five times again turns it off.

Problem: Characters repeat on-screen when you type.

Solution: If characters consistently and unintentionally repeat on-screen, adjusting the sensitivity of your keyboard's keys can help. Do this in Windows XP by clicking Start and Control Panel and then double-clicking Keyboard. On the Speed tab, use the sliders under Repeat Delay and Repeat Rate to experiment with how long you have to hold a key down before it repeats and the rate at which repeated characters display. When you find a setting you're comfortable with, click OK.

Other Keys To Success

Other options for curing what's ailing your keyboard include checking if Device Manager shows the keyboard as being problematic. In WinXP, click Start and Control Panel and then double-click System. In the System Properties dialogue box, click the Hardware Tab, click Device Manager, and look for the Keyboards entry. If you see a yellow exclamation mark or red X, there is a problem. Highlight the keyboard and click the Uninstall button. Reboot the system, and Windows will reconfigure the board.

If your board displays odd characters on-screen, check that Windows is using the correct language setting by opening Control Panel and double-clicking Regional And Language Options. On the Languages tab, click Details and check that English (United States) – US is set as the default. If not, click the Add button under Installed Devices and select it from the drop-down menu. **RS**



If you see error messages indicating a keyboard isn't present, it could mean your keyboard cable is unplugged, loose, or plugged into the wrong port. Most keyboards plug into a purple PS/2 port or USB port. Make certain the board isn't plugged into the green PS/2 port for mice.

BY BLAINE A. FLAMIG

Basic Troubleshooting

Laser Printers

Laser printers are a complex combination of mechanical, electrical, and chemical components. Without the proper care and operation, a laser printer's inner workings can suffer and cause printer malfunctions or poor print quality. But you can apply logical troubleshooting to identify many laser printer issues and perform the appropriate laser printer maintenance or software adjustment to resolve many printing problems. The following problems and solutions assume that your printer is responsive (see "What To Do When . . . Your Printer Won't Print" on page 14) and concentrate on correcting the most common laser printer annoyances.

Although your first instinct may be to rip open the printer and look for the "smoking gun," the printer's outputted pages provide the most solid trail of evidence. If your pages are flawed by smears, smudges, or lines, the problem is most likely within the printer because it's doubtful a print setting could cause such defects. Laser printer components tend to degrade over a long period of time, so sudden changes in printer performance are more often the result of an improper print configuration in your application or printer settings. For example, if you have trouble printing from Microsoft Word but not from Internet Explorer or Microsoft Excel, a print setting in Word is causing the problem. If you're unsure what your print problem is, first check your application settings or printer properties for faulty print configurations. A quick inspection of these settings can save you from wasting time and frustration pursuing other solutions.



Wheels Within Wheels

To transfer a digital image to paper, laser printers employ a xerographic printing process that requires the near-instantaneous interaction of all its components. The printer shoots a laser beam onto an OPC (optical photoconductor) drum, and the drum's electrostatic charge attracts a black or colored powder called toner. The toner is then applied to the paper and passed through a fuser that bonds the toner to the paper through heat and pressure. For the process to work perfectly, the toner cartridge, drum, fuser, and paper in the laser printer must meet product specifications.

When purchasing any replacement parts, make certain the product is compatible with your laser printer's model. If you don't know your model or manufacturer, it's displayed on the laser printer's case, many times near the control panel or in the upper-left or right-hand side. To ensure quality, purchase replacement products from the manufacturer because their parts

are optimally designed to work with their laser printers.

Before opening your laser printer's case, unplug the printer to prevent electrical shock from the printer's internal components. If you recently used the laser printer, let it cool down for a few minutes so that the fuser mechanism and photoconductor drum don't burn your fingers. Don't touch the OPC drum or the oil on your skin may stick to its surface, get baked onto the roller, and cause smudges on all your future prints. If toner gets on your clothes, wipe it off with a dry cloth and wash your clothes in cold water because hot water will set the toner into the fabric.

Laser Printer Paper Problems

Problem: My laser printer reports it has a paper jam, how do I remove it?

Solution: Open the front panel of the printer. Your printer's users guide, user CD with flash animation, or an illustration on the printer can show you how to do so. Remove the toner cartridge from the printer and hold it horizontal to the floor to keep the toner from spilling. Place it on a disposable sheet of paper to confine any loose toner. Once you find the paper jam, gradually pull the paper out so that you don't tear the jammed page. If the page can't be moved, look for illustrations next to the rollers that indicate how to manually advance the paper. Should the paper rip, remove all the torn pieces, or they may jam the printer again.

Problem: The paper is stuck at the rear of the laser printer.

Solution: A paper jam stuck in the printer's fuser mechanism is often unreachable from the front panel. For this reason, many laser printers include a removable rear panel. You may need to remove a few screws from the panel and the fuser assembly to reach the paper jam. Once the back cover is

open, gradually extract the paper from the fuser assembly and pick up any torn pieces inside the printer.

Problem: The laser printer often feeds multiple pages into the printer.

Solution: Laser printer paper comes in many weights (the heavier the weight, the sturdier the paper) and finishes. Generally, laser printers work with a variety of paper types, but check your product specifications to make certain the paper currently in the tray is compatible with your printer. The main paper tray of most laser printers supports paper weights from 20 to 24 pounds, and the manual feed tray is designed to work better with heavier or specialty paper such as transparencies, stationery, and envelopes. Check that the paper isn't warped or stuck together because this can cause the feeder to grasp multiple pages. Pick up the stack of paper and separate any pieces that may be stuck together by fanning the stack with your thumb. Remove any warped or bent pages and straighten a wavy stack of paper by bending it in the opposite direction. After you insert the paper, slide the back guide and side guides until they fit tightly against the stack of paper but not so firm that they cause the paper to bow. Avoid mixing different paper types in the same tray because their different textures and weights can make it difficult for the printer to grab a single sheet.

Problem: The printer won't use its manual feed tray.

Solution: Laser printers typically automatically sense paper in the manual feed tray through a trigger switch next to manual tray's entrance. If the paper or media isn't firmly inserted into the tray, you may need to set the side guides or insert

the paper farther into the tray to activate the trigger switch. If the printer still uses the main tray, change your printer's properties to always grab media from the manual feed tray. Click Start, Printers And Faxes, and then right-click your printer and choose Properties. Click the Device Settings tab and in the Paper Source drop-down menu choose Manual Feed. Once you finish printing from the manual tray, change the Paper Source back to Main Tray, or it will continue to grab media from the manual tray.

Problem: My laser printer won't feed transparency sheets, or the transparencies are coming out melted or warped.

Solution: Before you print a transparency, remove the white piece of gripper edge tape because the printer may have trouble grabbing or moving the polished edge through its paper path. Typically, transparencies feed better through the manual tray because it's designed to handle specialty media. Transparencies have a rough and smooth side, and you should print on the rough, grainy side of the sheet. If your transparencies come out of the laser printer slightly melted or warped, you need to purchase laser printer

compatible sheets because unsuitable transparencies may melt and injure your printer's internal components.

Problem: I'm having trouble feeding envelopes in the laser printer and getting the text to appear in the correct location.

Solution: Each laser printer handles envelopes in a different fashion, and you should follow the laser printer's guidelines exactly. Typically, the manual feed tray's paper path is better at handling thicker and smaller media, so it'd be best to insert your envelopes in the manual tray. Any envelopes you use should fall within the type and thickness recommended in your laser printer's manual and meet general laser printer standards. The heat and pressure applied to the glue during the fusing process could seal unsuitable envelopes. When you insert an envelope, adjust the paper guides so that they will pull the envelope straight through the printer. Remember to reconfigure your printer's software for the proper envelope size. Once you set the correct media size, use the print preview function to make certain the text is correctly formatted.

The Print Quality Is Poor

Problem: My laser printer prints out pages with randomly faded-out areas or blank spots.

Solution: The paper manufacturing process can sometimes cause paper to reject toner. Try a different type or brand of paper in the printer. If your paper is stored in a humid environment such as a basement or storage room, check the paper for moist spots on its surface. The paper may not feel damp, but its moisture content may affect how the toner fuses to the paper. Set the



Laser printers often feature a removable rear panel to reach paper jams in the fuser mechanism at the back the printer.

paper in a dry room or storage container for a week or two before reinserting it in the printer. The toner cartridge may also be running out of toner. Remove the cartridge and shake it horizontally to redistribute the remaining toner. If the blank spots still crop up, it's time for a new toner cartridge.

Problem: Blank spots or faded-out areas appear in the same spot on every page.

Solution: The photoconductor drum underneath or inside your toner cartridge needs to be cleaned, or it has been damaged. Although the drum may not appear dirty, it could have residual electrical charges that impede the laser printer from applying new charges. Depending on your printer, its software may include an internal cleaning utility that can wipe the OPC drum of both residual toner and electric charges. Various programs label their utilities differently, but your users manual will indicate which program to use and provide step-by-step instructions. You could also purchase laser printer cleaning sheets that feed through the printer to remove toner particles from the internal rollers and drums. If cleaning the print drum doesn't fix your problem, you may need to purchase a new toner cartridge or OPC drum.

Problem: The entire page prints out black.

Solution: If your printer has a Print Density setting, verify that it has not been turned to the darkest level. If the

Print Density is set correctly, your toner cartridge may be damaged or incorrectly installed, causing it to release too much toner. Remove the toner cartridge and make certain it fits within your laser printer's product specifications. Although a little loose toner is



If you live in a humid environment or store your paper in a humid storage room, the paper may draw in moisture, become warped, and create poor prints or jam your laser printer. Try storing your print media in a dry room or storage container to keep out the unwanted moisture.



If possible, print your envelopes through the manual feed tray because its paper path handles thick and small media better than the main tray.

normal, excessive amounts within your printer not only cause bad prints, but will eventually cause the failure of your printer's mechanical parts. Wipe the internal printer cavity with a dry, lint-free cloth and use a brush to clean toner particles off the components. If the toner cartridge needs to be cleaned, follow the manufacturer's directions in

your users manual to both clean and correctly install it.

Problem: The printer only outputs blank pages.

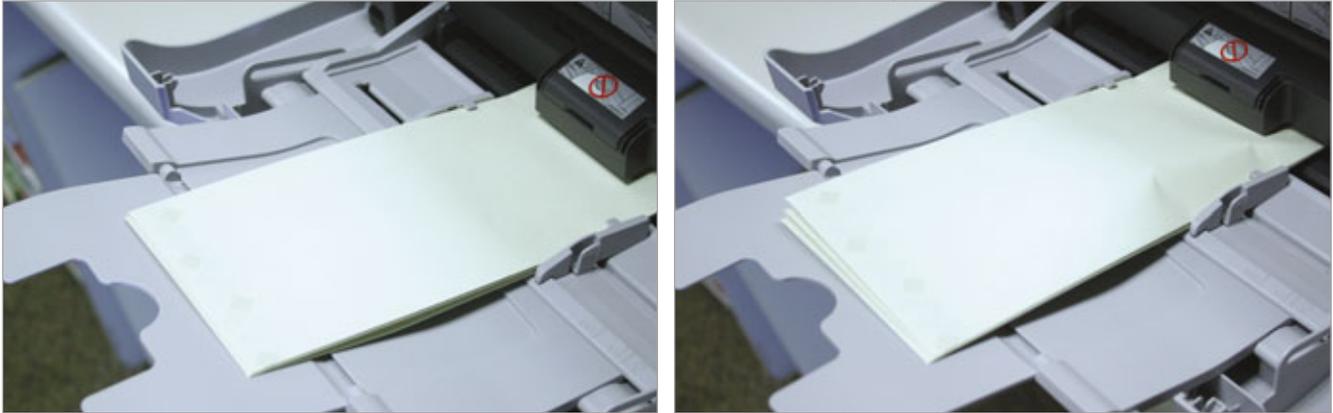
Solution: If the toner cartridge is new, make certain you removed the sealing tape covering the toner cartridge's opening. If you noticed the laser printer outputting lighter and lighter pages, the toner cartridge may be running out of toner.

Problem: The printer occasionally prints completely blank pages.

Solution: Your laser printer may be configured to separate different print jobs by attaching a blank page after each individual document or image. Click Start, Settings, and Printers And Faxes. Double-click your printer, select the Printer menu, and click Properties. Click the Separator Page button, remove the separator page file, and click OK. If no separator page is selected, you may have extra spaces or blank lines attached to the end of your documents.

Problem: The same object or letter repeats down the length of the page at even intervals.

Solution: This effect is called ghosting, and it usually occurs with images that require a large amount of toner. When the toner cartridge can't provide sufficient toner, a residual electrical charge can be left on the drum that will repeat down the length of the page. To resolve ghosting, try printing in Landscape mode because the different perspective may distribute the toner better. Click the Start menu, select Settings, and then



Once you insert an envelope, adjust the paper guides so that they're flush but not so tight that they bend the envelope.

click Printers And Faxes. Double-click your printer and select Properties. In the laser printer's Preferences, change its Orientation radio button from Portrait to Landscape. If that doesn't do the trick, lower the Print Density setting through your printer's control panel. You could also try inserting a high-quality paper that will better adhere with the toner. In most cases, this condition only affects certain images because their detail requires a sizeable amount of toner.

Problem: My photo prints tend to look mediocre.

Solution: Although standard office paper works great with text, photos have greater detail and look dreadful on anything less than photo-quality laser printer paper. If your photos still look bad using photo-quality paper, make certain the printer is configured to output on photo-quality, glossy, or thick paper. Besides setting the paper quality, make certain your printer is set to output on the highest resolution possible. Each printer's software is different, but typically you can choose the paper quality and print quality in the printer's preferences.

Problem: Some images in photo prints are wavy or seem twisted.

Solution: Typically, this happens with photo paper or glossy paper that isn't intended for use with laser printers. Make certain the paper fits

within the printer's specifications or try using another kind of paper. If the laser printer is outputting a scanned image, the paper on the scanner may have moved during the scanning process.

Problem: There are black horizontal or vertical lines on every page.

Solution: Other than smoke billowing from the printer, consistent black horizontal or vertical lines are the worst problem a laser printer can display. In most cases, the black lines mean the printer's OPC drum has a scratch that has accumulated baked-on toner. Even if you clean off the toner, new toner will collect each time you print a page and result in the same horizontal or vertical line. Because the drum is a cylinder, the lines will appear at equal distances down the page. However, a dirty corona wire can also cause distinct lines and fuzzy areas along the length of the page. Your users manual will indicate the correct way to access the wire, and you can clean the particles off it by running a brush or cotton swab along the wire. Check the printer's preferences and verify the line isn't caused by any watermarks or hidden lines in your application. If the line persists and the laser printer is older, consider purchasing a new one because a new toner cartridge or print drum can be almost as expensive as a brand new laser printer.

Problem: The page is full of garbled text or is missing portions of text.

Solution: The cable that connects your laser printer to the computer may be too long or has become damaged. Your printer's specifications usually list a recommended length; parallel cables generally need to be less than 6 feet, and USB cables should be less than 10 feet long. If you connect the laser printer to a USB hub, your printer may be sharing the same port with another device that's causing interference. Directly connect the printer to the computer's USB port. If the printer still outputs rubbish, download and install an updated driver for your printer from the manufacturer's Web site.

The Next Step

If your problem isn't covered in this article, consider searching your manufacturer's Web site for some model-specific troubleshooting. If the manufacturer doesn't offer many online solutions, try running the software CD that came with your printer. Many newer laser printers include a CD with troubleshooting advice and flash animations to help you perform basic maintenance. If you're still unable to fix the problem, call the manufacturer's tech support for further advice. 

BY NATHAN LAKE

Basic Troubleshooting

Multifunction Devices

MFDs (multifunction devices) are a staple in homes and home offices across the country, and it's easy to see why. They have dropped dramatically in price over the past couple years, making them affordable for nearly any budget. You can typically print, copy, scan, and maybe even fax with one such machine, which saves valuable space in what might be a crowded work area. Plus, you have to learn how to use only one machine, not two, three, or even four. But the trade-off is that if something goes wrong with your all-in-one device, you may be stuck without any of its essential components.

That's why knowing a few basic troubleshooting steps can be critical. With so many manufacturers, makes, and models out there, figuring out exactly what is causing a problem may not be an easy task. Still, there are some common issues that affect MFDs across the board. Before you throw up your hands in frustration, inspect your device, noting the manufacturer's name and the device model number printed on it. Then, gather any of its documentation, take a couple of deep breaths, and read through our troubleshooting solutions.

Installation Issues

If you have acquired a new MFD and can't get even the first step—installation—to go smoothly, it doesn't mean the machine is a dud. Nor does



it mean the machine necessarily won't work with your PC. Instead, there could be a simple solution.

Problem: I've plugged in all the cables and followed the procedures on the installation disc that came with my device, but when I reboot my PC, the computer doesn't recognize any new hardware.

Solution: When you first receive your new MFD, it's tempting to pull everything out of the box and start the installation process without taking a look at the documentation. After all, it's fairly obvious where the cables connect, and we all know how to insert and follow directions on a CD. Don't give in to that temptation. Your OS (operating system) and your MFD's manufacturer may have different techniques for installing a new piece of hardware, and they may conflict. For example, suppose you're running Windows XP, and your MFD

includes a driver that's newer than the one WinXP has listed. WinXP's installation wizard might "hang" when automatically installing a plug-and-play MFD unit.

Instead, first pull out the MFD's quick installation guide. Pay close attention to whether you should physically connect the device before you insert the installation CD, or whether the steps should be reversed. The instructions may tell you to cancel WinXP's Found New Hardware wizard, a step you would likely not take if you were following the same procedures you typically do for numerous other types of devices.

Problem: I followed the installation instructions to the letter, but my PC still doesn't recognize my MFD.

Solution: All-in-one devices may do it all, but they don't operate in a vacuum. Most components rely in some way upon the interaction they have with your PC. And if you're using, say, a Windows 98 PC and your device supports only WinXP and later OSes, you could be out of luck. Make sure you read the system requirements for the MFD that you want to buy *before* you buy it to make sure it's compatible with your PC.



When your multifunction device, such as this MFD from Brother, stops functioning correctly, you may lose your printer, copier, scanner, and fax machines all at once.

If you're running the required OS but the two units aren't communicating properly, the conflict may lie in the connector between the two. Most MFDs these days connect to PCs via USB cables, and some newer ones require they be connected to a USB 2.0 port, or Hi-Speed USB port. If you try to connect the MFD to a USB 1.1 port (more common on older PCs), the device may not work. To determine whether your PC has a USB 2.0 port, go to Start, My Computer. Under System Tasks, select View System Information. In the System Properties dialog box, select the Hardware tab. Click the Device Manager button. Scroll through the list of devices until you see Universal Serial Bus controllers, and click the plus (+) sign to expand it. If the list contains a device that contains a phrase like "USB2 Enhanced" or simply "Enhanced," you have a USB 2.0 port.

Also, keep in mind that some motherboards have both USB 1.1 and 2.0 ports on the same board. If you suspect the trouble is a faulty port or one that has too low a speed, be sure to try to connect the MFD to various ports on your PC.

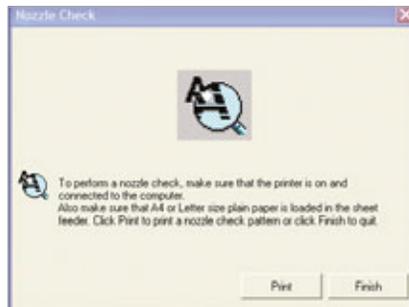
Problem: I'm trying to install software for my HP ScanJet MFD, but I get the error message: "An unexpected internal error has occurred. Click OK to close the program, and then try one of the following: Restart the program. Restart the PC and then try again. Reinstall the Photo & Imaging Software and try again."

Solution: Our experience has been that this occurs with a number of HP MFDs. You can ignore the error message and continue to install the software, but the scanning component of your HP device may not work properly. To remedy the situation, we recommend you uninstall the ScanJet software. Then, install all Windows Updates. Next, install the Msjavax86.exe file from www.hi-teach.com/infohub/help.htm. When that is complete, temporarily disable any antivirus software you have running.

Finally, install the ScanJet software and reboot your computer—and don't forget to turn the antivirus software back on.

General Non-working Issues

It can be difficult to diagnose why your MFD stops working altogether. Here are some possible scenarios.



Run a nozzle check to verify your MFD (multifunction device) hardware is working properly.

Problem: My MFD was functioning just fine, but it has simply stopped working.

Solution: As with any computer peripheral, the first items to examine are the physical connections. Is the power cord firmly in place in both the back of the device and in the wall outlet or power strip? Is the USB cable secure? Is the cable plugged into the proper spot on the PC? Once you've eliminated these obvious causes, consider any security features your device may have. Some units have features that prevent, for instance, unauthorized copying. For example, several Epson all-in-ones have security locks, which appear as prompts in the LCD panel. When the lock is on, you are prompted to enter a PIN code. To disable the lock in this type of Epson MFD, insert the Epson installation CD. Open the SecurityLock Tool folder and double-click the program in the folder. Select Security Lock Off and click OK. Click OK again.

Problem: One component (fax, scan, copy, print) has stopped working, but the others are still operational.

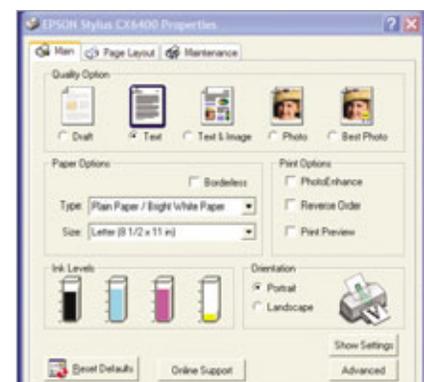
Solution: MFDs are complicated devices with complex device drivers. If one component "suddenly" stops working, a likely culprit is a device driver. Visit the manufacturer's Web site to download the latest drivers. Or, you may have recently installed another piece of hardware or software that conflicts with that particular component. Uninstall the new application to see if that fixes the problem.

Problem: The MFD went into power saving mode. When I tried to get it to come back on in full power, it no longer works.

Solution: This is a known issue with some HP MFDs when they are plugged into surge protectors. The device goes into a sleep mode, and when you "wake" it, the unit registers a significantly higher power usage. The surge protector, depending upon the model, may consider this to be a power surge. Doing what good surge protectors do, the surge protector limits the increase in power to the MFD, which may cause some or all components to stop working. Unplug the MFD from the surge protector and plug it directly into a wall outlet.

Paper Problems

Whether you're copying or printing, paper problems can really jam you up.



Using the correct paper size and type can eliminate various printing problems; check your MFD's (multifunction device's) software settings to verify they match the paper in the tray.

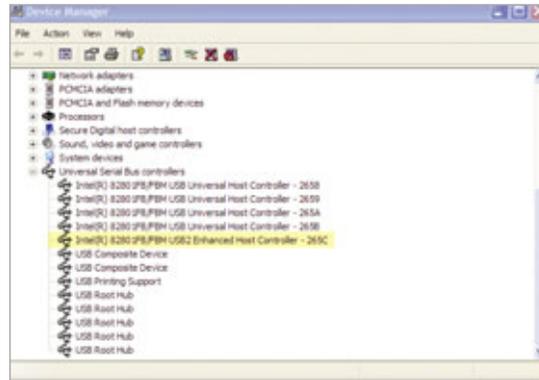
Problem: Paper won't feed through the machine.

Solution: When paper won't feed through your MFD, it's often a hardware issue. Over time, rollers get dirty and either feed paper through askance or not at all. Throw into the mix a paper jam that isn't fully cleared (it can be difficult to find that last, tiny scrap of paper stuck in your MFD), and the paper feed mechanism may break down. Open the device and check all of the housings and other mechanisms in the unit. Make sure each is clear of any impediment and securely close each one. Also, you may need to clean the rollers. The specific steps will vary, depending upon the unit, but your first step should be to turn off and unplug the device. Rub a lint-free cloth, lightly moistened with pure or distilled water, across the rollers.

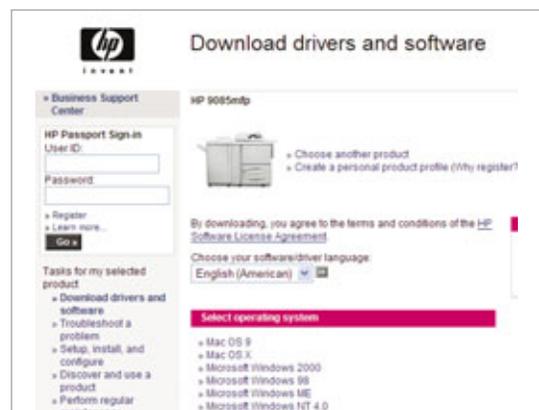
It's possible that the problem has nothing to do with the MFD's hardware and can be fixed by adjusting the paper stack. Make sure paper is straight (no bent or curled edges) and that all the paper in the stack is of the same size and type. Check the manufacturer's recommendations for the number of sheets; a stack that is too large may cause the rollers to balk at loading paper. Also, check the paper settings in the MFD's software application to make sure they match the paper in the paper tray.

Problem: Paper is feeding through the machine, but the output is entirely blank.

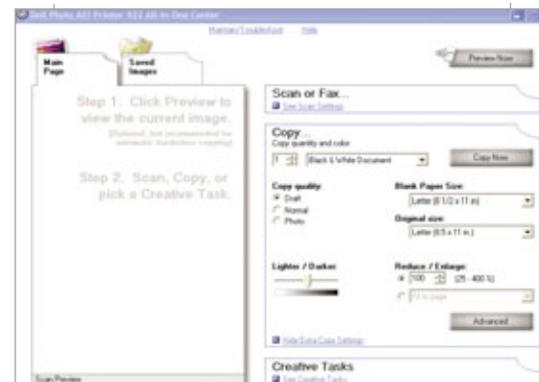
Solution: This is a problem with many possible solutions. The first one is to make sure you follow the manufacturer's procedures for replacing and properly installing the ink cartridges. If that doesn't do the trick, check your devices' software. Have



To see whether your PC has a USB 2.0 port for your MFD (multifunction device), take a look at your Device Manager dialog box.



Make sure your MFD (multifunction device) device drivers are up-to-date by downloading the latest drivers and patches from the manufacturer's Web site.



To cure slow copying woes, change your MFD (multifunction device) settings to a faster setting.

you installed the latest print drivers? Is the MFD selected as the default printer? Are the settings appropriate for the paper size you're using? If you've answered yes to all three questions, it's time to check the print

heads. Many MFDs have utilities that clean print head nozzles. Visit the manufacturer's Web site for detailed instructions on how to clean the nozzles.

Problem: I'm able to get paper to feed through the machine and ink to print onto the paper, but the output is fuzzy or the print quality is otherwise poor.

Solution: This is another problem that may need multiple troubleshooting steps to solve. First, keep in mind that with regards to print quality, there are two main types of MFDs: inkjet and laser printers. If you are using the wrong paper for your device, the output may be blurred. (Plus, you run the risk of using unnecessarily excessive amounts of ink when you print from an inkjet device onto paper designed for a laser machine or vice versa.) Also, check the software settings and make sure that you have them set for the highest desired quality rather than the Draft or other "low-quality" setting. In addition, most MFDs have some type of check that you can run to verify the device is performing up to par. For example, when you open a Dell unit's Control Panel software application for many of the Dell all-in-one models, press the Maintenance button. You can select from a variety of options, including Clean To Fix Horizontal Streaks, which may improve print quality. Explore your own device's software cleaning options. If this fails, you may need to clean the unit's print head nozzles; visit the manufacturer's

Web site for instructions.

Scanning & Copying

Some MFD users think of their devices as glorified printers, but when

you rely on the scanning and copying components, it can be frustrating when they aren't working as expected.

Problem: The scan output is displaying bizarre characters that weren't in the original, printed document.

Solution: Scanning software applications can treat files in one of two primary ways: as images or as text documents. When scanning a text document, if you don't want the option of editing the text of the scanned file, your best option is to scan it as an image file rather than a document. This helps ensure the scanned output is nearly identical to the original file. If you're scanning the document as a text file, the software's OCR (optical character recognition) function kick in. The text is scanned one character at a time, and the OCR software translates the character images into ASCII (American Standard Code for Information



If your PC has a fax utility, you may be able to fax from your MFD (multifunction device) even if it doesn't have a telephone handset.

Interchange), which the computer can read. If the OCR software isn't up to snuff, you may end up with "mistranslated" text characters. Investing in some high-quality OCR software should solve this problem.

Problem: When I try to scan an image directly into my third-party photo-editing software, it takes what seems like an eternity.

Solution: Many MFDs let you scan images directly into a photo-editing



Installing an inexpensive DSL (Digital Subscriber Line) filter can get your MFD's (multifunction device's) fax component operational.

application, which can be convenient if you plan to edit or otherwise manipulate an image. There are some known conflicts, however. For instance, users of some Dell units report that when they try to scan an image into Paint Shop Pro Studio, the system runs slowly or stops running altogether. One work-around is to scan the photo into another application or simply to scan it onto your PC's hard drive, and then to launch Paint Shop Pro Studio (or similar image-editing application) and open the scanned image from within that application.

Problem: The copying function of my MFD is much too slow.

Solution: Keep in mind that the more complex the original document, the longer it will take to copy. Plus, other variables affect copy speed, some of which you can manipulate to make the copying process proceed more quickly. Check your product's documentation for instructions on how to determine if the copying function is running in the fastest possible operation mode. Then, time the copying process. If it is significantly lengthier than the manufacturer's specifications, testing and cleaning the hardware may solve your problem. Wipe down the scanner glass with a cloth lightly covered with glass cleaner, making sure no cleaner drips into the unit. Then, follow your manufacturer's instructions for cleaning the contacts of the ink cartridges.

Faxing

Faxing has become less popular now that it's so easy to email files to remote locations, but faxing still has its place. Whether you need to send or receive a fax, it's critical to be able to rely upon your MFD's fax capabilities (assuming the unit has them).

Problem: The product's Web site says I can use my MFD as a fax machine, but there's no telephone or fax function button. How does this work?

Solution: Some MFDs, even those without telephone handsets, can act as virtual fax machines, provided your MFD is connected to a PC that is equipped with a fax modem. The exact procedure for sending a fax will vary according to the MFD, but here's one example. Suppose you have an Epson MFD that advertises virtual fax capabilities. Before installing the Epson, make sure your PC already has a fax utility. (WinXP comes bundled with such a program, called Fax Services.) Then, after the MFD installation, place the document on the MFD's glass "table," press the keypad numbers on the unit to enter the fax number, and press the Start button. The image is scanned and converted to a fax image.

Problem: I'm trying to fax over a telephone line that is connected to a DSL (Digital Subscriber Line) modem, and there's too much interference.

Solution: Depending upon your MFD, you may be trying to send a fax through a machine designed to handle analog data, while your DSL setup is delivering digital data to your PC via the phone line. Installing a DSL filter on the line can eliminate unwanted interference. (For detailed instructions on how to do this, read the article "Good Connections: Get The Vibe For Fast, Reliable Internet Access" online at www.smartcomputing.com/2006/internetaccess.) 

BY HEIDI ANDERSON

Basic Troubleshooting

Scanners

Scanners convert text documents, paper photographs and images, slides and negatives, and even small three-dimensional objects into digital files. Essentially electronic copy machines, most scanners come in three main types: flatbed scanners, sheetfed scanners, and multifunction/all-in-one devices.

A flatbed scanner features a horizontal glass pane, usually in letter or legal size, on which you place a document for scanning. Scanners with an ADF (automatic document feeder; a slanted tray that holds documents for scanning) are sheetfed scanners. A sheetfed scanner may or may not include the flatbed component, and depending on the scanner model, you can place one or more documents to scan in the ADF. Finally, many multifunction or all-in-one machines include scanning capabilities, together with other features such as copying, printing, and faxing.

In addition to the hardware, most scanners come with software for editing images, previewing scans, and setting scan properties. To convert documents into digital text, many scanners include OCR (optical character recognition) software.

To identify your scanner's manufacturer and model information, first check the exterior of the scanner for brand and model labeling. If you cannot locate identifying information on the scanner itself, try the Windows Device Manager. To open

the Device Manager, right-click My Computer, click Properties, select the Hardware tab, and click Device Manager. Expand the Imaging Devices section to view a list of installed devices, including scanners.

Typically, scanner problems are related to one or more of four general areas: a faulty cable or connection, issues with the scanner software settings



or the driver, physical characteristics of the document to be scanned, or maintenance/cleaning issues. The following troubleshooting section discusses typical scanner problems and provides multiple solutions. If none of the suggestions work, contact the scanner manufacturer for assistance in case the scanner needs repairs or replacement.

Steps For Troubleshooting Typical Scanner Problems

Because most scanner problems have multiple solutions, we list a series of troubleshooting actions for each problem. Try the actions in the order presented, testing after each. If the action taken does not resolve your problem, move on to the next action.

Problem: My computer can't find the scanner or the scanner doesn't start scanning.

Solution 1: Check the power supply and cable. Verify that the power light is on and the scanner is ready. Make sure to use the power equipment that came with the scanner. If the power supply is plugged into a power strip or surge protector, try plugging it directly into the wall.

Solution 2: Check the USB cable, if applicable. If your scanner is connected to the computer with a USB cable, use the cable that came with the scanner. If you are using a different USB cable, it should be no more than 6-feet long. Try plugging the USB cable into a different USB port on the PC. If the USB cable is plugged into a USB hub, try connecting the cable directly to the computer. If you have another compatible cable, try replacing the current cable.

Solution 3: Check the SCSI or FireWire cable, if applicable.

Some high-capacity scanners use a SCSI or FireWire interface. Use the cable that came with the scanner, and double-check the connections on your computer and the scanner itself. Try disconnecting and reconnecting the cables. If you have another compatible cable, try replacing the current cable.

Solution 4: Check the shipping lock. If the scanner has a shipping lock, verify that it is in the unlocked position. The shipping lock prevents carriage damage to the scanner during shipping.



The Kodak i150 scanner uses an ADF (automatic document feeder) to load documents for scanning.

Solution 5: Reset the scanner. Follow the manufacturer's instructions to reset the scanner. If you do not have instructions, disconnect the cable that connects the scanner to the computer. Disconnect the scanner power cable to turn the scanner off. Turn off the computer and wait a couple of minutes. Turn on the computer, reconnect the scanner power cable to turn the scanner on, and reconnect the cable that connects the scanner to the computer.

Solution 6: Update the scanner driver and software. Check for updates to device drivers and new software patches. Install the updates as instructed by the manufacturer.

Solution 7: Check the device driver in the Windows Device Manager. To open the Device Manager, right-click My Computer, click Properties, select the Hardware tab, and click Device Manager. Look in the Imaging Devices section for a yellow exclamation mark or red X indicating a problem with the device or driver. If a problem is indicated, right-click the scanner and click Properties. In the Device Status box, look for any messages about problems with the scanner, or click the Troubleshooting button for additional help.

Solution 8: Verify scanning software settings. Most scanning software automatically opens when you attempt to perform a scan. If yours does not, open the software manually. If you don't

know the correct software settings, change the settings to the factory default, or refer to the software's online help or support information.

Solution 9: Close all open programs and disable antivirus software. If this solves the problem, the antivirus software may be interfering with the scanning software. Check with the antivirus software manufacturer to resolve the conflict.

Solution 10: Try repairing the scanner software. Click Start, Control Panel, and Add Or Remove Programs. Select the scanning software and click Change or Repair. Follow the on-screen instructions.

Solution 11: Uninstall and reinstall scanner software. Click Start, Control Panel, and Add Or Remove Programs. Select the scanning software and click Remove. Follow the on-screen instructions to remove the software. Reinstall the scanner software using the original installation CD.

Problem: I don't have enough disk space, or memory errors occur when I use my scanner.

Solution 1: Try scanning to a lower resolution. Most scanners let you scan at different resolutions. Image resolution is measured in dpi (dots per inch), which is sometimes referred to as ppi (pixels per inch). As dpi/ppi increases, so do image quality and file sizes. How you plan to use the

scanned image dictates the dpi/ppi level to use. Ideally, you can use the following guidelines for dpi/ppi settings. If your computer is running out of memory or hard drive space, however, try a lower setting.

Image for email or CRT (cathode-ray tube) display: 75dpi/ppi

Image for on-screen LCD display: 200dpi/ppi

Text documents and medium-quality images for printing: 300dpi/ppi

High-quality images for printing: 600dpi/ppi

High-quality images for enlarging: 1,200dpi/ppi (may require 100MB or more of drive space)

Solution 2: Reduce memory use. Close all unnecessary applications, such as email and word processing software. You can also reduce the number applications running in the background with the Windows configuration tool. To do this, click Start and Run. In the Open dialogue box, type `msconfig` and click OK. Select the Startup tab and remove the checks from any applications you do not want your computer to start automatically. If you're not sure, do not remove the check—write down the name of the item and research it later. When you have completed unchecking items, click OK and restart your computer. Windows restarts in the Selective Startup state. If your system does not operate correctly in Selective Startup or you want to return to the previous state, select Normal Startup and restart Windows again.

Solution 3: Increase hard drive space. To up the amount of space available on your computer's hard drive, start by emptying the Recycle Bin. To do this, right-click the Recycle Bin on the Windows Desktop and click Empty. You can also run the Disk Cleanup utility. To do this, click Start, Programs, Accessories, System Tools, and Disk Cleanup. Follow the on-screen prompts to select files to remove. You can free additional space by removing applications you do not need. Click Start, Settings, Control

Panel, and Add Or Remove Programs. For each application you no longer need, select the application and click Remove.

Problem: My ADF is experiencing feed errors and paper jams.

Solution 1: Inspect documents for obstructions. Make sure the documents you are attempting to scan do not have staples, paper clips, binder holes, glued edges, punch holes, tears, or other characteristics that interfere with the ADF.

Solution 2: Check document compatibility. Do not place documents in the feeder that the ADF is not designed to handle, such as multipart forms. If you're scanning a document that's not a standard size, check the scanner documentation to verify the sizes it supports.

Solution 3: Confirm ADF installation and document placement. Verify the ADF is installed properly and in the correct position. If you are scanning multiple documents, do not exceed the recommended ADF capacity, and fan the pages prior to placing them in the ADF to separate them.

Solution 4: Work with different types of documents and sizes. If you are scanning pages of different sizes, try scanning only the same size pages at the same time, or scan each page one at a time. If the paper has a

glossy or semi-glossy coating, try non-glossy paper.

Solution 5: Clean the ADF. Follow the manufacturer's instructions for cleaning the ADF assembly. If parts such as pads or rollers appear worn, refer to the manufacturer's instructions for replacing them.

Problem: My scans are blank or of poor quality.

Solution 1: Check ADF document placement. If you are using an ADF, make sure you have placed the documents correctly in the ADF. For example, make sure it is facing up or down, as indicated in the manufacturer's directions.

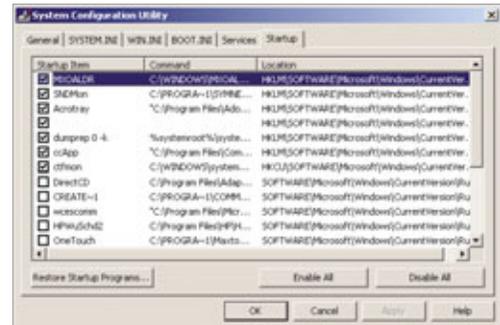
Solution 2: Inspect the original document or image. Verify that the original is clear and not distorted or damaged.

Solution 3: Clean the scanner glass. Most manufacturers recommend cleaning with a lint-free cloth and nonabrasive glass cleaner or isopropyl alcohol.

Solution 4: Preview the scan. If available, use your scanning software's preview feature to verify the scan quality. Adjust software settings to increase sharpness and/or resolution. For color images, use 24-bit output, and for black and white use 256 shades of gray (8-bit grayscale).

Solution 5: Check the scanning software. Verify that photo scanning is not selected for text or line drawings and vice versa.

Solution 6: Check for bleed through. If the original document is



The Windows System Configuration utility lets you control the programs that automatically start when you turn on your computer. You can deselect some of the items to increase your computer's available memory.

two-sided, the information from the reverse side of the document may bleed through. Adjust brightness, contrast, and threshold settings to reduce bleed through.

Solution 7: Reinstall or update the scanner driver. Check the manufacturer's Web site for an updated driver or reinstall the current driver following the manufacturer's instructions.

Problem: My scans have vertical lines or stains.

Solution 1: Scan a blank sheet of paper. If the lines or stains continue to appear, clean the scanner components.

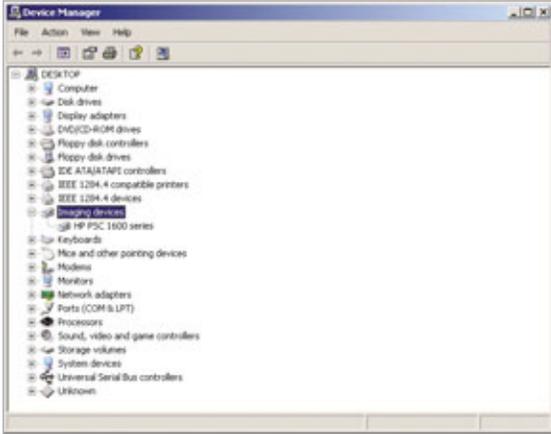
Solution 2: Clean the scanner glass. Most manufacturers recommend cleaning with a lint-free cloth and nonabrasive glass cleaner or isopropyl alcohol.

Solution 3: Clean the ADF mechanism. Follow the manufacturer's instructions for cleaning the ADF assembly. If parts such as pads or rollers appear worn, refer to the manufacturer's instructions for replacing them.

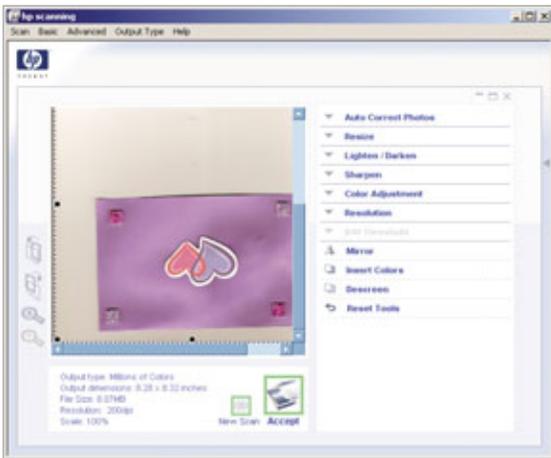
Problem: The scans are clipped, incomplete, or skewed.



HP's Photosmart 2570 All-in-One Printer, Scanner, Copier is designed for home users. It has a glass flatbed that you can place documents on for scanning.



Scanners are listed in the Imaging Devices section of the Windows Device Manager. You may need to turn the scanner on for it to display in Device Manager.



The preview feature of scanning software lets you adjust the scanned image before it is finalized and saved to a file.

Solution 1: Place the image or document correctly. If you are placing the image on a scanning bed, make sure it is positioned correctly. Try turning the image 90 degrees and rescanning.

Solution 2: Check ADF issues. If you are using an ADF, align the page in the sheet guides and do not exceed the ADF sheet capacity. Make sure the sheet guides are not loose or broken. For multi-page scans, especially pages of different sizes, scan one page at a time. If the paper you're using has a glossy or semi-glossy coating, try non-glossy paper.

Solution 3: Verify your scanner's software settings. Check whether your scanning software has an automatic

cropping feature enabled. Additionally, if the scanning software includes an automatic straightening feature, it may attempt to straighten an image that includes a large graphical design. Turn the feature off and try the scan again. If a page is missing from the scanned document, turn off any scanning software options that automatically remove blank pages.

Problem: The scanned image's color or brightness is incorrect.

Solution 1: Verify software settings. Check the settings for color and brightness. Adjust as needed, using the preview feature if available.

Solution 2: Move the document. Try rotating the original document 90 degrees in the scanner.

Solution 3: Use default settings. Set the scanner and software to the original factory default settings.

Solution 4: Adjust settings for colored paper. If you are using colored paper, set the output type

to black and white. Change the color channel to red, green, or blue to determine the channel that works best with the background. Magazine pictures and postcards might benefit from the descreening option, if available, which reduces undesirable patterns.

Problem: Scanning is very slow.

Settings in the scanner software help you define the correct settings for different types of documents, such as text documents and graphics.

Solution 1: Change to black and white. Reduce scan time by choosing black-and-white output, if possible.

Solution 2: Adjust resolution and file size. Modify the scanner software to reduce the resolution and decrease the file size. Avoid using the 24-bit color output, if possible. Lower-quality settings generally result in faster scans.

Solution 3: Decrease the image size. Crop or resize the photo to a smaller scan dimension.

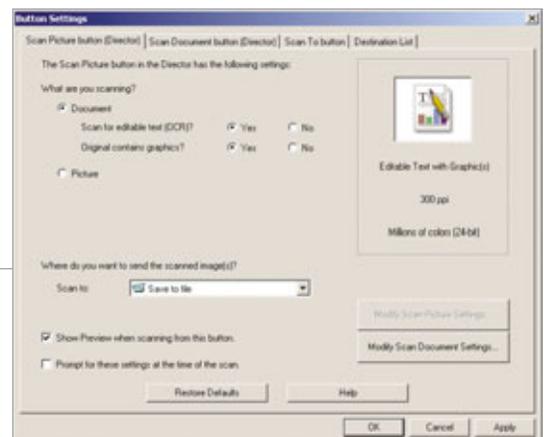
Problem: Text created by the OCR software is incorrect.

Solution 1: Ensure software settings are correct. Check the scanner software to be sure you selected a text document for scanning. Also, select a minimum dpi of 300. Even under ideal conditions, the OCR software may not be able to convert all text correctly.

Solution 2: Check the original document. OCR software is less reliable when the quality of the original document is poor.

Solution 3: Reformat the scanned document. Word processors may not be able to read all of the scanned document's fonts if the font is not available on your PC. Also, the OCR software may not preserve columns, tables, and other formatting. Use the word processor to reformat the document as needed after scanning. **RS**

BY CARMEN CARMACK



Basic Troubleshooting

Speakers



Sometimes, the sound card in your computer, rather than your speakers, causes the audio problems you're experiencing. If you suspect this is the case, take a look at our articles on troubleshooting sound cards on pages 46 ("You're Having Audio Problems") and 75 ("Basic Troubleshooting: Audio Cards").

No Sound At All

Problem: You click a link to an audio file on a Web site, but hear nothing.

Solution: Some Web pages open a separate window in order to initiate the audio player. Popup blockers sometimes block this new window from opening. If you have a popup blocker installed, add the Web site you're accessing to the whitelist to allow all popups. For more information on popup blockers, see "You're Pestered By Popup Ads" on page 25.

If you don't have a popup blocker, or if it's set to allow all popups from the site you are visiting, make sure your computer has completely downloaded the audio file you're trying to listen to. Depending on your Internet connection speed and the size of

the file, it could take a few seconds or a few hours to download an audio clip.

Finally, check to see if you can hear sound from other applications. Put an audio CD in your computer's CD-ROM drive and play the files using an audio player such as Windows Media Player. If you're able to hear sounds from other applications, make sure you have the appropriate software plug-in to listen to the audio file, keeping in mind that some Web sites use very specific audio players.

Problem: Regardless of the application, I cannot hear sound coming from my computer speakers.

Solution 1: Check all of the jacks that connect your speakers to the computer. Disconnect and reconnect the cords to ensure there is a solid connection. Make sure you have the appropriate speaker cords plugged into the appropriate jacks on your computer; look for Line In, Line Out, Microphone, and Joystick-specific jacks.

Solution 2: Verify the external speakers have power by looking for a light on the speakers. Plug a different device such as a lamp into the same outlet to make sure that the outlet is live.

Solution 3: If your speakers have an external volume control, turn up the volume past the minimum sound level. If you're having difficulty hearing

sound in a specific program, check to see if the program has volume controls or a mute button that you may need to adjust.

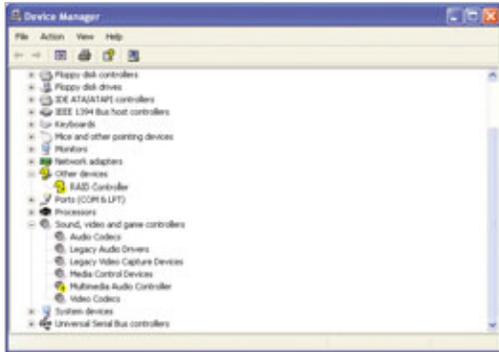
Solution 4: Check the volume settings within Windows XP; navigate to the Control Panel and then open Sounds And Audio Devices. In the Sounds And Audio Devices Properties dialog box, make sure the box next to Mute is unchecked.

After downloading a new track from your favorite online music store, you're ready to jam. Much to your disappointment, you discover there's something wrong with your computer's speakers. You can't hear a thing, even though the program you're using to play the track appears to be outputting sound. In this article, we'll look at some of the things you should check when there is no sound coming from your computer's speakers.

Most laptops have built-in speakers. With a laptop, you also have the option of connecting external speakers. Many laptops have the ability to mute the speakers and adjust volume using hardware buttons on the laptop. If you have a desktop computer, there may be an integrated speaker in the case, but you will need separate, external speakers in order to play music and other audio files.



Use Sounds And Audio Devices to configure your computer's various sound settings.



With the Device Manager, you can easily see if a device is working properly or has an error (denoted by an exclamation mark).

Check other volume settings in this dialog box and click the Speaker Volume button to set the volume level for your speakers. Open the master Volume Control by clicking the Advanced button. In the Volume Control dialog box, make sure that none of the boxes next to Mute are checked.

Solution 5: Make sure the appropriate driver for your sound card is installed. To check for drivers, right click My Computer, select Properties, navigate to the Hardware tab, and click the Device Manager button. In the Device Manager, expand the tree for Sound, Video And Game Controllers. First, verify that the sound card is enabled. If the sound card is disabled, there will be a red X through the device icon in the tree listing.

If there is no red X through the sound card icon, right-click the sound card and choose Properties. In the sound card properties dialog box, navigate to the Driver tab. On the Drivers tab, you will see driver information for your sound card. To update the driver for your sound card, click the Update Driver button. A wizard will walk you through the update process. For more information on troubleshooting sound card problems, see “Basic Troubleshooting: Audio Cards” on page 75.

Problem: I hear audio from a Web site, but it stops abruptly.

Solution: Make sure the audio file has finished downloading; be patient,

especially if you are using a dial-up modem or are downloading multiple things at once.

Problem: I can hear sound from some applications, but not others.

Solution: Check all settings within the program that will not play sound. Look for any volume control or mute options. You may also want to look into the possibility that the program you are using is having a conflict with your sound card.

If necessary, contact the

software manufacturer for information on troubleshooting with your sound card.

In addition, it never hurts to check the volume settings on the speaker to make sure they are set to appropriate levels. Next, check the volume settings on your computer to ensure they are turned up and not muted. You may need to check the volume settings both in Windows and in your specific audio player. To check volume settings in Windows, click the Start menu, navigate to All Programs, then highlight Accessories, Entertainment, and click Volume Control. In the Volume Control window, make sure all sound levels are set to appropriate levels and not muted.

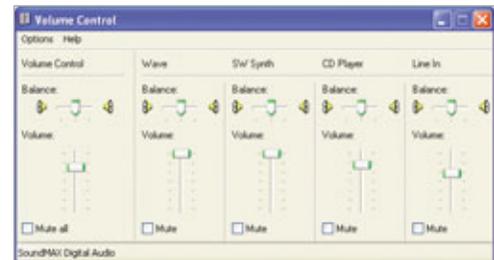
Problem: I have a multi-speaker setup, and I’m only hearing sound from some of the speakers in my setup.

Solution: Check to make sure that your computer is set to use all of your speakers. Navigate to the Control Panel, and double-click Sounds And Audio Devices. Select the Audio tab, and then click the Advanced button under Sound Playback. On the Advanced Audio Properties Speakers tab, choose the speaker setup that most closely resembles your setup. If you change this setting, click Apply, OK, and then OK again to exit the

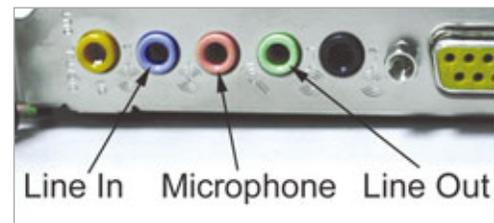
Sounds And Audio Devices Properties dialog box. Also, make sure you have the most current driver available for your sound card.

Problem: I can hear audio from programs on my computer, but I’m unable to hear audio from music CDs that I’ve inserted into my CD-ROM drive.

Solution: Check the wire that connects your sound card to your system’s CD-ROM or DVD-ROM drive to verify it is properly connected. Also, make sure the CD audio isn’t



Make sure all of the Mute boxes in Volume Settings are unchecked to ensure you’ll hear audio from various sources.



Most sound cards since 1999 use Microsoft’s PC 99 standard for color-coding microphone, line-in, and line-out jacks.

muted and is set to an appropriate level in Volume Settings.

Jam Time

With a little bit of time, you should figure out what’s preventing your speakers from producing sound. If you suspect that the problem is with your sound card, rather than your speakers, refer to “Basic Troubleshooting: Audio Cards” on page 75. **RS**

BY JENNIFER JOHNSON

Basic Troubleshooting

External Storage



The large storage capacity and portability of external hard drives and flash drives make external storage an extremely convenient way to back up, transport, and swap files. Many of us now rely solely on external storage to back up our internal hard drive or to transport multimedia libraries on our key chain. However, when the external storage device you've come to depend on is operating poorly or not at all, it can be frustrating and inconvenient—especially if the drive contains important work documents or the entire contents of your hard drive. The following troubleshooting tips can help you restore and improve your external storage drive's swapping and storing capabilities.

Malfunction Junction

When troubleshooting an external hard drive or flash drive, it's wise to search the Internet for known incompatibilities relevant to your device and to visit the manufacturer's Web site to make certain you don't need any special software or drivers. To find the appropriate download, you need to know the drive's name, model number, or serial number and its storage capacity. Typically, external hard drives display this identification above the bar code on the bottom of the drive, and flash drives include a name and model number in the

accompanying packaging or user's guide.

Operating systems created after Windows 98 don't require you to install any drivers to recognize external storage drives. Therefore, you can trace the majority of detection problems to a misconnection or incorrectly configured port. If you're experiencing sluggish file transfer and drive access, the problem is more likely because of inadequate USB or FireWire hardware within your computer. While you can resolve both detection and slow drive problems, an external hard drive that exhibits grinding noises or extremely hot running temperatures may be on its last legs and you should remove data from the drive as soon as possible.

The Computer Isn't Detecting My External Drive

Problem: My external storage device isn't listed in My Computer.

Solution: Partially connected USB or FireWire connectors (or devices that are inadvertently unplugged) are a common cause of undetected drives. The plug may appear firmly seated, but you should disconnect and reconnect the USB or FireWire connector to ensure the drive is plugged in. If your external storage drive connects to a USB or FireWire hub, ensure the hub

has power and that its connector is plugged into the computer. Note that some external storage devices work poorly or not at all when connected to a hub; try connecting the drive directly to a port on the computer. If the drive still isn't detected, test an external hard drive's cable by switching it with another USB or FireWire cable.

Problem: My external storage device is connected but not recognized by Windows.

Solution: If you use an external hard drive, ensure the AC power cord and any subsequently connected power strip securely plugs into the power outlet and that both are switched on. Eliminate the port as the source of the problem by connecting your flash drive or external hard drive to another port. If the external storage isn't recognized in another port, open Device Manager to determine if your port or drive has a system conflict. Select the Start button, Settings, and then click Control Panel. Double-click System, select the Hardware tab, and then click the Device Manager button. Click the plus sign (+) next to Universal Serial Bus Controllers for a drive that connects via USB and the plus sign next to IEEE

1394 Bus Host Controllers for a FireWire connected drive.

A yellow exclamation point signifies the port has a driver conflict, and a red “X” indicates the port has been disabled. Right-click and select Enable to reopen a disabled port. To resolve a port conflict, right-click and choose Uninstall for each controller until all the USB or IEEE 1394 Controllers are removed. After you uninstall each controller, restart your computer and it will reinstall the proper Bus Host Controllers. To check for an external storage conflict, select the Disk Drives heading and find your external storage drive. If the drive has a conflict, you



On an external hard drive, you can locate a drive's name, model number, or serial number above the bar code on the bottom of the drive.

may need to install its included software and proprietary driver for the computer to recognize the device. If the drive still can't be detected, uninstall the external drive and then reboot the computer to facilitate its detection.

Problem: My flash drive works fine at home, but isn't recognized on my work computer.

Solution: Many office networks use mapped network drives that override Windows' drive lettering system for removable devices. Through the Disk Management utility you can manually assign a drive letter to your flash storage device. Right-click the My Computer icon, select Manage, and then double-click Disk Management. Right-click your flash drive and choose Change Drive Letter And Path. Select

an unused drive letter from the drop-down list and click OK. You should now see the flash drive listed under that drive letter in My Computer.

Problem: My computer runs Windows 98 and it won't recognize my external storage device.

Solution: To use any USB device on Win98, you need to update your installation of Windows 98 via the Windows Update Web site. Some USB devices have problems in Win98FE (First Edition) and most work better in Win98SE (Second Edition). You'll also need to install the Win98 driver that came with your accompanying software. FireWire devices only work in Win98SE, and you'll need to download a FireWire update before you can detect your FireWire drive.

I Can't Read/Write Data To My External Storage Device

Problem: My external storage device shows up in My Computer, but I can't access or write to the drive.

Solution: The drive may be incorrectly formatted for Windows or have a corrupt partition. Windows 2000 and XP feature a utility called Disk Management that analyzes your external drive and assigns it an Online, Healthy, or Unreadable status. Open the utility by right-clicking the My Computer icon and selecting Manage. Under the Storage heading, double-click Disk Management to view your external storage drive's status. If it has an Unreadable status, you need to format the drive to remove the corrupt partition or incompatible Windows file format. Before you do, attempt to transfer the drive's data onto another computer because formatting completely erases the files on the drive. To format, simply right-click the external hard drive and click Format.

Problem: My external storage device works with Windows, but I

can't access it on Macintosh operating systems.

Solution: Your drive is most likely formatted in the NTFS (NT file system) file format. To use external storage on both Windows and Macintosh operating systems, it must be in the FAT32 (32-bit file allocation table) format. You'll need to reformat the drive and choose FAT32 when prompted for a file format. To reformat the drive, right-click it in My Computer and click Format.

My External Storage Works Slowly

Problem: My new external storage device is USB 2.0 compatible but my files don't transfer any faster than they did with the USB 1.1 external storage device.

Solution: At 480Mbps (megabits per second), USB 2.0 can transfer up to 40 times faster than USB 1.1. But both your computer and any connected hub must have USB 2.0 hardware to perform the higher-speed transfer. If you're unsure of the computer's USB capabilities, look under the Universal Serial Bus Controllers in Device Manager. USB 2.0 is denoted by either Standard Enhanced or USB 2.0 Enhanced. If your computer doesn't support USB 2.0, you can install an add-on card to take advantage of the greater transfer speed. Note that for Windows to support USB 2.0, you must install Service Pack 2 for WinXP or Service Pack 4 for Win2000.

Problem: My FireWire external storage device transfers slowly.

Solution: FireWire 800 (also known as IEEE 1394b) can only transfer at 800Mbps when used with a 9-pin to 9-pin FireWire cable. A 9-pin to 6-pin cable allows for backward compatibility between older FireWire devices, but it only transfers data at 400Mbps.

A major benefit of FireWire devices is that you can connect them in a chain, meaning you can connect your digital camcorder to your external hard drive and expect both to communicate

with your computer. However, the entire FireWire chain shares the same bandwidth, and if multiple devices are active, you can significantly reduce your transfer speed. If you must daisy-chain FireWire devices, connect the external hard drive to the computer and place the slower FireWire devices at the end of the chain. In this fashion, your



External USB storage devices may not work when connected to a USB hub. If the drive isn't recognized, directly connect it to the computer's USB port.

external drive's data won't have to pass through the slower devices.

Problem: My external storage drive accesses data slowly when it's full.

Solution: You can improve your external drive's performance by running Windows' Disk Defragmenter utility to better organize the files on your drive. Select the Start menu, Programs, Accessories, System Tools, and then click Disk Defragmenter. In the Disk Defragmenter window, select your external drive and then click Analyze. Although Windows may indicate the drive doesn't need to be defragmented, doing so may still improve its performance. Check Disk (or ScanDisk as it's known in older versions of Windows) is another helpful utility that locates errors and bad sectors on your drive. Open My Computer and find the icon for your external storage device. Right-click the icon, select Properties, and then click the Tools tab. Click the Check Now

button and select Automatically Fix File System Errors and Scan For And Attempt Recovery Of Bad Sectors. During the repair, Check Disk may stop to give you the option to save unrecoverable data. This data is an indecipherable jumble of characters that won't provide any usable files—don't recover the data and let Check Disk continue the repair.

External Drive Produces Errors

Problem: Windows reports my USB or FireWire flash drive is write-protected.

Solution: Some flash drives have a write-protect switch located on the side of the drive that locks data from being written to it. Use a ballpoint pen or small object to unlock the drive's write-protection. It's also possible to trigger write-protection by unplugging a drive in the process of writing data. Al-

though it's typically fine to remove an idle flash drive, the Safely Remove Hardware tool in the taskbar is designed to stop Windows from accessing the drive. You can click this icon, even after the error has occurred, to remove the write-protection from the drive. If the drive is still protected, you may need to connect the flash drive to another port and reboot your computer to reset the flash drive's settings.

Problem: Windows reports that my external storage is full even when it has more than enough free space.

Solution: If your drive uses the FAT32 file format, Disk Is Full or Not Enough Space error messages can occur when you transfer files larger than 4GB. Although FAT32 can't work with files over 4GB, the NTFS file format can. Win2000 and XP feature a

converter tool that lets you convert a drive from FAT32 to NTFS without removing any files from the drive. Before running the converter tool, Windows advises you to back up the drive's data because an error during the conversion process could corrupt it. Click the Start menu, select Run, type `cmd`, and then click OK. At the DOS prompt, type `convert (drive letter): /fs:ntfs` and press Enter. For example, if your external drive's letter is E, type `convert E: /fs:ntfs` to change it from FAT32 to NTFS. After you enter the command line, you may be required to enter the drive's volume name, which will be listed in My Computer next to the external drive's letter.

Past Basic Troubleshooting

Most external hard drive and flash drive manufacturers maintain substantial online databases that can help you resolve difficulties. If you experience a problem we didn't have room to cover in this article, see if your drive's manufacturer covers the problem online.



Some external hard drives have a power button that may need to be switched on.

Should you need to call the manufacturer's tech support line, have your product identification handy and outline any steps you've already taken to solve the problem. This information will not only help expedite the troubleshooting process, but it will also provide the tech support agent a better understanding of your problem. **RS**

BY NATHAN LAKE

Basic Troubleshooting

Antivirus Software



If you are using any of the most popular AV (antivirus) software programs, including Norton AntiVirus, McAfee VirusScan, AVG Antivirus, BitDefender, Kaspersky Anti-Virus, F-Secure Anti-Virus, or Trend Micro PC-cillin, and you haven't already run into problems, chances are, at least statistically speaking, you will soon enough.

For most computer users, AV software is the first line of defense from viruses that rampage about, seeking to destroy data or simply make life miserable. AV software detects, identifies, and eliminates

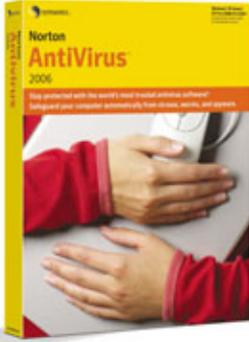
computer viruses and other malware that proliferate on the Internet. Life is good when your AV software is working and up-to-date. But when your AV software conflicts with other programs or refuses to remove or isolate a detected culprit, you'll be tempted to disable the software because it's not doing the job it was intended to do. AV software can also eat up precious system resources and make your computer lag like a snail, when you want it to work now.

AV software usually works behind the scenes, so there aren't any obvious signs reporting everything that is happening while the software is doing its job. This is a good thing, because it lets you sit back, relax, and watch your AV software do the job you paid it to do.

Virus Updates

Windows makes it fairly easy for you to identify the type of AV software your computer is using. The best place to go if you are using Windows XP Home Edition, including Service Pack 2 (if you are still using Service Pack 1, it's a good idea to run your Windows Update to download Service Pack 2), is the Windows Security Center. The Security Center detects and lists currently installed AV software (including third-party software). The Security Center also works behind the scenes, constantly checking the state of your AV software.

To get to the Windows Security Center, click Start and Control Panel. Click the Security Center icon (in the Classic or Category view). The Windows Security Center dialog box opens. Notice the three security essentials: Firewall, Automatic Updates, and Virus Protection. To best protect your computer, Microsoft recommends all three of these security essentials remain on. Click the Virus Protection selection to expand a description of the AV software running on your computer.



Symantec's Norton AntiVirus is one of the most popular antivirus software programs available.

While the Windows Security Center can detect most types of antivirus software, it does not detect all antivirus types, as some antivirus programs do not report their status to Windows. If you are sure that your computer is running AV software and the Security Center is not detecting it, check with the AV software manufacturer to see if the software is supported. If the software is supported, you may need to uninstall and reinstall your AV software and update Windows to allow Windows to report your AV software properly.

The Security Center isn't the only place to find out what type of AV software you are using. Click Start and All Programs (or Programs if Windows is using the classic Start menu). In the list of programs, look for the word "antivirus." (Refer to the first paragraph of this article for the names of some common AV software names.)

One other way to find out what antivirus program you're running is to hover your mouse pointer over the icons in the Taskbar's System Tray area (the area in the bottom right of your screen that includes the system clock) and wait a brief moment for a yellow description box to appear. The box should include the word "antivirus." Once you've found the antivirus program, right-click the icon, and a Properties menu appears. The menu should include choices to open the AV software or to activate the program options.

AV software from most major vendors will download and apply updates, also known as virus definition files, on a regular basis. These updates are necessary to protect your computer from new threats that evolve on the World Wide Web. Most computer manufacturers include a trial version of AV software on a new computer. And if you like the software you are using, you can renew (on an annual subscription basis) the software when the trial period expires.

Identifying Problems

Even if you have antivirus software installed on your PC, it doesn't always mean it is functioning properly or getting regular updates from the Internet. The Windows Security Center makes it easy for you to verify that your AV software is functioning as it should be. To verify that your AV software is functioning properly, click Start and Control Panel. Click Security Center (in the Classic or Category view). The Windows Security Center dialog box opens. Check the Virus Protection category. If it's shaded blue and includes a green light and the word ON, your AV software is reporting that it is up-to-date and that virus scanning is on. The Security Center will also report the name of the software your computer is running.

If the Virus Protection category is shaded red, your virus protection is turned off. If this is the case on your computer, click the Recommendations button and follow the on-screen instructions. You can either turn on your installed AV software or obtain another antivirus program.

If the status in the Security Center indicates that the antivirus program on your computer needs attention, but you know that it is installed and functioning correctly, you can override the Security Center's monitoring by clicking the

Recommendations button in the Virus Protection section (should be shaded red). Click the checkbox marked I Have An Antivirus Program That I'll Monitor Myself. If you choose this option, be advised that Windows will not send any alerts indicating that the AV software is out of date.

If you prefer to have Windows alert you (or not alert you) about your antivirus program, you can also modify the Alert Settings in the Windows Security Center. If you modify these settings, you are either telling Windows to stop alerting you altogether about the status of your AV software or you want Windows to alert you if your computer is at risk.

To modify the Alert Settings, in the Resources section on the left side of the Security Center dialog box, click the last link in the list titled Change The Way The Security Center Alerts Me. Click the Virus Protection checkbox to have Windows alert you if your computer may be at risk because of your AV software settings. Uncheck the checkbox if you do not want Windows to alert you about your AV software.

Common Problems & Solutions

There are literally dozens of problems that can happen to AV software, and most are specific to the program you have installed. We've identified a few of the more general problems and outlined their solutions.



The Windows Security Center identifies whether your computer's virus protection is on or off.

Problem: My AV software is conflicting with other programs.

Solution: It happens all the time. You are trying to install a program and you receive an error related to your AV software, and the installation stops. Or perhaps you have installed a program and all of a sudden that program stops responding, or your AV software stops working. AV software is powerful, and it can easily conflict with other software programs, including Office applications, drivers, and even Windows itself. To avoid further conflict, temporarily disable your AV software. When the AV software is disabled, you can finish installing your other program (or reinstall if necessary) or uninstall the program causing the conflict. Most AV software programs can be disabled by right-clicking the AV program icon on the Taskbar and selecting Disable from the menu. Just be sure to turn your AV program back on once you're done installing or reinstalling the applications.

You can also try running your AV software updates to check for a new version. Sometimes the manufacturer will discover a bug, so it updates the software to include the fixes for those bugs, which might resolve the conflict you are experiencing.

Problem: I am running two AV software programs on the same computer, but I'm still getting virus and malware alerts.

Solution: Most AV software manufacturers admit that their software isn't 100% bulletproof. In other words, certain malicious code types can bypass some signature- and heuristic-based technology. Although it's not recommended, you may be tempted to run two antivirus programs on the same PC. If you want to do this, be aware that there's a difference between an AV monitor and an AV on-demand scanner. An AV monitor is the part of AV software that constantly checks files before they are executed. An AV on-demand scanner is the part of AV software that runs on a scheduled basis, checking all files for viruses.

If you have two antivirus programs installed on the same computer, you shouldn't run two AV monitors at the same time. AV monitors wire themselves deep into Windows and scan files before they load for execution. If two AV monitors are running simultaneously, they can interfere with each other, causing the computer to hang or slow down. The solution here is to disable one of the AV monitors. For most

AV software, this is accomplished by right-clicking the Taskbar icon and then choosing to disable the AV monitor (for example, if you are using Norton AntiVirus, choose Disable Auto-Protect). Disabling the AV monitor does not mean you are disabling the entire AV solution; you're only disabling the part that automatically scans files before they are executed.



You can disable most antivirus software programs

by right-clicking the program icon on the Taskbar and selecting Disable from the menu.

Problem: My AV software has flagged something as potentially dangerous, but it can't isolate or remove it.

Solution: As we've said before, not every AV program is bulletproof. Sometimes intelligent or brand new viruses can squeeze into your computer before your AV software gets a chance to automatically update itself with the latest virus definitions. Chances are your computer has contracted a virus, and your AV software does not know how to handle it. While the software detects suspicious activity, it needs the proper virus definition file to rid your system of what it has contracted.

There are several possible solutions to this problem.

The first thing you should do is manually update your virus definition files. Along with automatic updating, any good AV software will include an option to manually update the latest virus definition files. When you open Norton AntiVirus 2006, for example, there's an option on the upper left of the screen to run a Live Update. This update will check for the latest virus definition files, as well as the latest Symantec products and components you have installed. After the latest virus definition files have been downloaded, run a full system scan on your computer to see if your AV software eliminates the culprit it found.

If the AV software still fails to remove the flagged file or files (and you

What To Look For In AV Software

The best AV (antivirus) software should be easy for anyone (both novice and expert) to use and install. Look for software that effectively seeks out and identifies virus threats but also cleans or isolates infected files and is light on the system resources at the same time. AV software that includes understandable reporting and superb help and support is also commendable. Some criteria commonly used to evaluate AV software includes: ease of use, effectiveness at identifying viruses, effectiveness at cleaning or isolating infected files, easy-to-understand activity reporting, well-rounded feature

set, easy installation and setup, and detailed help documentation.

Most AV software manufacturers include a troubleshooting center or knowledge base area on their Web site. Your AV software manufacturer's Web site should include common troubleshooting tips, FAQs, and articles and insight from industry experts as well as peer users. If you are experiencing problems that are discussed in this article and still haven't resolved your problem after trying our recommendations, it is important to get your problem remedied as soon as possible to maintain the security of your machine. ■

Basic Troubleshooting

Browsers

Stagnant for years, the Web browser is seeing a new wave of excitement crest as major versions of Microsoft Internet Explorer and Mozilla Firefox have been released recently. While early browsers were limited to the display of Web pages, modern browsers are more properly thought of as frameworks for viewing and interacting with a variety of sites, including Web-based applications such as email and rich media such as video—not just traditional HTML (Hypertext Markup Language) pages. Users are excited about the features and functionality that the new browsers offer, but these updates open the door to a different set of software issues and problems.

Over the next few pages, we'll show you how to fix common kinds of browser errors, as well as how to determine if the problem is really with your Web browser in the first place. We'll focus on troubleshooting the latest versions of the most popular browsers for Microsoft Windows XP—Internet Explorer 7 and Mozilla Firefox 2—two free programs that control over 90% of market share by most estimates. While we won't explicitly consider other operating systems, Firefox has versions available for other operating systems, so some of the information presented herein may be applicable to those versions. As well, some of the general tips may be

applicable to other browsers, such as Opera and Safari.

Product Information

Since your browser is a piece of software, you can easily obtain the version number to aid you in your



troubleshooting. To determine your browser version, follow these steps:

1. Click on the Help menu and select About Firefox . . . (for Firefox) or About Internet Explorer (for IE 7).
2. In the window that appears, look for the version number immediately under the product name.

Earlier versions may have slightly different selections in the Help menu; if so, look for an About option or an option that appears like it. If you don't see anything like these, you

likely don't have a current version of your browser.

Working Status

Your browser depends on a stable, unimpeded connection to the Internet. If your browser does not appear to function, it may be your online connection rather than your browser that is actually at fault. If you have current versions of both Firefox and IE installed on your PC—and why not, since they're both free?—when one browser isn't working, start the other one and see if you can reach the Web. If you can't reach the site you're trying to reach, then try to reach another big site that will likely be up—examples include www.google.com, www.yahoo.com, and www.microsoft.com. If you can reach any site through another

browser, you can eliminate the possibility that your Internet connection is malfunctioning. Also, check the network connection icon in the System Tray (the area next to your computer's clock) to make sure that the network connection is up.

Another way to verify your Internet connection is through this simple test:

Click the Windows **Start** button on your Desktop.

Select **Run . . .**

In the Run window's "Open" text box, enter the word **command**, and then click OK.

In the Command window that appears, enter the command **ping www.google.com** and then press ENTER. (If you get a security check from your firewall, give permission for the connection.) You should get several lines of text, including a number of lines that say something along the lines of "Reply from 209.73.186.238: bytes=32 time=34ms TTL=51." (The numbers in the response will vary.) If the number after "time" is relatively low—for instance,

under 100 for most modern connections—the problem is not your Internet connection.

If you get a response like “Ping request could not find host www.google.com. Please check the name and try again,” try entering the command ping **www.yahoo.com**. If you get an error with that one as well, then you likely have a bad Internet connection.

```
C:\WINDOWS\system32\command.com
Reply from 72.14.203.99: bytes=32 time=48ms TTL=240
Reply from 72.14.203.99: bytes=32 time=42ms TTL=240
Reply from 72.14.203.99: bytes=32 time=48ms TTL=240
Ping statistics for 72.14.203.99:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milliseconds:
        Minimum = 48ms, Maximum = 48ms, Average = 46ms
C:\>ping www.yahoo.com
Pinging www.yahoo-hq2.akadns.net [209.73.186.238] with 32 bytes of data:
Reply from 209.73.186.238: bytes=32 time=35ms TTL=51
Reply from 209.73.186.238: bytes=32 time=38ms TTL=51
Reply from 209.73.186.238: bytes=32 time=38ms TTL=51
Reply from 209.73.186.238: bytes=32 time=33ms TTL=51
Ping statistics for 209.73.186.238:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milliseconds:
        Minimum = 33ms, Maximum = 35ms, Average = 31ms
C:\>
```

Running a ping test. Make sure that your Internet connection isn't the issue by running a ping test.

If you get a set of responses that include “Request timed out” and something like “Reply from 209.73.186.238: bytes=32 time=34ms TTL=51” and/or you have a number after “time=” that’s over 200, then this means that your Internet connection may be up, but it may be slow. If this happens with only one site, it indicates a problem with the Web site you’re trying to reach. If you get that kind of result with multiple sites, then the problem is probably with your Internet connection or your Internet service provider—not with your browser.

To troubleshoot an Internet connection, see “What To Do When . . . You Can’t Go Online” on page 18.

Problems & Solutions

Problem: Issues with browsers earlier than Firefox 2 and IE 7.

Solution: Upgrade.

The latest version of Firefox and IE offer many security and functionality upgrades. If you don’t upgrade, you will not experience the full benefit of the modern Web. If you can’t upgrade to IE 7 (e.g. you have a

pre-Windows XP PC), upgrade to the latest version of Firefox. If your PC can’t run either Firefox 2 or IE 7, then you should seriously consider upgrading your PC—the security benefits of these browsers make this a great reason to upgrade your PC.

The only reason that you shouldn’t switch is if you have certain applications that will not run in Firefox 2 or in IE 7. Examples of this might be a proprietary system at work that works in only one browser. (In general, you should *never* upgrade a work system without first talking to the appropriate IT professional at your employer.) If you have to use a certain browser version for a particular application, then consider using that browser for only that reason and using the latest version of Firefox or IE for everything else.

If you are using IE on a pre-XP system, at the very least, make sure that you have the latest version of IE by using Windows Update at windowsupdate.microsoft.com.

Problem: Browser won’t start.

Solutions for Internet Explorer: Try each of these steps and, after each, see if IE starts correctly.

1. **Reboot.** First restart your computer and see if the browser will work after rebooting.

2. **Check for malware.** Update your antispyware and antivirus software and do complete antivirus and spyware checks on your PC. If malware is found, remove it and then try to start IE. If it starts, the malware was probably causing the issue.

3. **Try a different home page.** Click the Start button and select Control

Panel. (Control Panel may be in the Settings menu.) Select Internet Options. In the window that appears, under the General tab, change the Home Page box to **about:blank**. Click OK. Try to start IE and browse to another Web site—but not your original home page; if it works, the problem is with the home page you are using. Try troubleshooting with the plug-in section below.

4. **Clear all cached data.** Go to Internet Options as described above. In the General tab, under Browsing History, click Delete. Click Delete Files and then confirm by clicking Yes. Click Delete Cookies and then confirm by clicking Yes. Click Delete History and then confirm by clicking Yes. Click Close and then OK in the primary window. Try to start IE; if it works, you’ve likely solved the problem.

5. **Disable unused extensions.** Go to Internet Options as described above. On the Programs tab, click the Manage Add-ons . . . button. Disable any add-ons that you don’t use by clicking on the add-on listing and click the Disable radio button. When you have disabled all of the add-ons

you don’t use, click OK, and then click OK in the Options window. Try to start IE. If it works, one of the add-ons was the problem. Re-enable each of add-ons in turn by following the steps above, except click the Enable radio button for each. After you enable one, try to start IE. If it fails, then

you know that extension was at fault.

6. **Use Default Settings.** Go to Internet Options as described above. Go to the Advanced tab. Click Restore Advanced Settings. Then click Reset. Confirm that you want to do this by clicking Reset in the window that appears. Click OK and try IE again.

7. **Reinstall.** If none of these steps work, then reinstall IE 7. First, down-



Cleaning Firefox’s cache. Selecting Clear Private Data from the Tools menu lets you clean out the cache quickly.

load the executable at www.microsoft.com/windows/ie/downloads. (If you don't have another browser installed, use another system to download the executable, then copy it to your primary PC.) Then, if you can, uninstall IE 7. Click the Start button and select Control Panel/Add Or Remove Programs. (Remember, Control Panel may be nested in the Settings menu. If IE 7 came installed with

your PC, you may not be able to uninstall it using the Add Or Remove Programs window. If this is the case, then skip this step.) Then, click on the listing for Internet Explorer 7 and click Remove. After clicking through the removal routine, run the IE 7 executable that you downloaded.

Solutions for Firefox: Try each of these steps and, after each, see if Firefox starts correctly.

1. Reboot. First restart your computer and see if the browser will work after rebooting.

2. Check for malware. Update your antispymware and antivirus software and do complete antivirus and spyware checks on your PC. If malware is found, remove it and then try to start Firefox.

3. Try starting in Safe Mode. From the Start/All Programs (or Programs)/Mozilla Firefox menu, select Mozilla Firefox (Safe Mode). If you can get Firefox running in Safe Mode, try steps 4 and 5 under the "Problem: A page does not behave correctly . . ." section—that doesn't help, continue with step 4.



Controlling IE. Select Internet Tools from the Control Panel to get to the General tab, where you can reset your home page and clear out your cache.

4. Clear all cached data. Click the Start button and select My Computer. Go to the folder C:\Documents and Settings\[Your Username]\Local Settings\Application Data\Mozilla\Firefox\Profiles. Under each folder in Profiles, delete the Cache folder. Then go to C:\Documents and Settings\[Your Username]\Application Data\Mozilla\Firefox\Profiles. Delete the History.dat file from each folder in the Profiles folder. Try to start Firefox.

5. Remove extensions and plugins. Using My Computer as shown in Step 4, delete the contents of the C:\Program Files\Mozilla Firefox\Extensions but not the folder itself. Delete the contents of the C:\Program Files\Mozilla Firefox\Plugins folder but not the folder itself. (If Firefox is installed in a different folder, you will need to change the C:\Program Files\Mozilla Firefox above to correspond to the folder in which you installed Firefox.)

6. Reinstall. If none of these steps work, reinstall Firefox. First, using IE, download the executable at www.mozilla.com. Uninstall Mozilla. Click

the Start button and select Control Panel/Add Or Remove Programs. Then click on the listing for Mozilla Firefox and click Remove. After clicking through the removal routine, run the Firefox executable that you downloaded.

Problem: A page does not behave correctly—the formatting is messed up or it just doesn't work properly.

If you have a problem with a specific Web page, it is generally a configuration problem, or there may be an incompatibility with the browser you're using.

Solutions for Internet Explorer: Try each of these steps in turn and see if it corrects the problem.

1. If you have Firefox installed, try it for the Web site in question. This can allow you to work around the problem if nothing else helps, as some sites work better in Firefox than in IE.

2. Reboot. First restart your computer and see if the browser will work after rebooting.

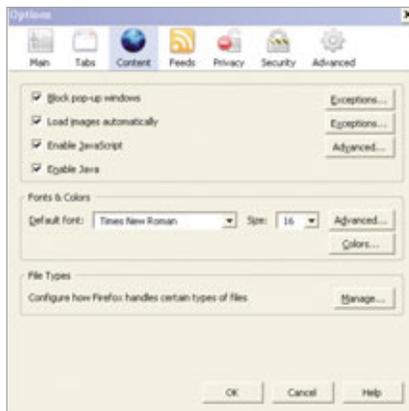
3. Check for malware. Update your antispymware and antivirus software and do complete antivirus and spyware checks on your PC.

4. Clear all cached data. Follow the cache clearing instructions in the "Browser won't start" section above.

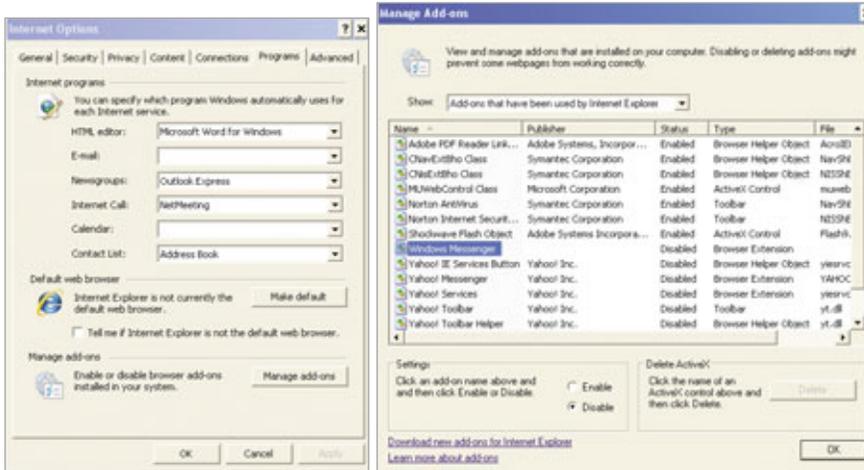
5. Pop-ups. Select Internet Options from the Tools menu. Then click the Privacy tab. If the Turn On Pop-up Blocker box is unchecked, go to the next step. Otherwise, click the Settings button immediately next to Block

Pop-up Windows. In the window that appears, enter the domain of the Web site that you are having a problem with in the Address Of Website To Allow box and then click Add. Click Close, then OK.

6. Reset Security. Click Tools/Internet Options. Click the Security tab. Click on



Allowing pop-ups in Firefox. If you don't allow pop-up windows, some Web sites won't work correctly.



Disabling add-ons in IE. A bad add-on can disable your IE. Disable them in the Manage Add-on screen.

Internet Zone if it's not already selected. Set the Security Level For This Zone selector to Medium-high. If the Reset All Zones To Default Levels button is active, click it. Click the Privacy tab. If the Security slider is set to a setting higher than Medium, then set it to Medium. Click OK.

7. Upgrade. Make sure that you're using the latest version by going to windowsupdate.microsoft.com and downloading the latest updates.

Solutions for Firefox: Try each of these steps in turn and then try using Firefox to see if the step corrects the problem.

1. If you have IE installed, try it for the Web site in question. This can allow you to work around the problem if nothing else helps, as some sites will not work in Firefox no matter what you do.

2. Reboot. Restart your PC and see if the browser works after rebooting.

3. Check for malware. Update your antispyware and antivirus software and do complete antivirus and spyware checks on your PC.

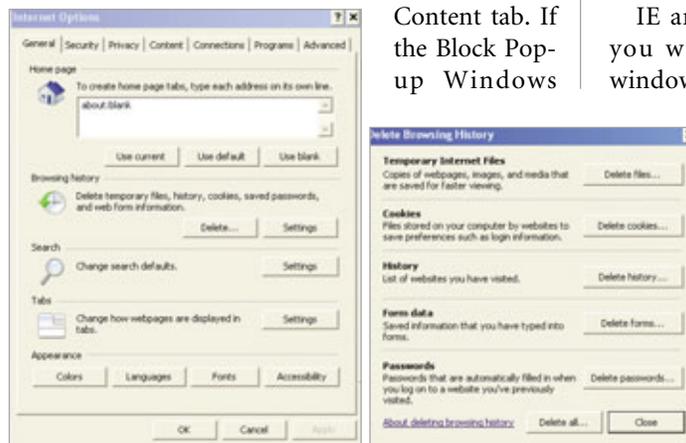
4. Clear your cache. Select Clear Private Data from the Tools menu.

Select Cache and Authenticated Sessions only, and then click OK.

5. Check for updates. Select Tools/Check For Updates. The window that appears will tell you if there are updates to be downloaded. If there are, follow the instructions in the window and update your Firefox.

6. Popups. Select Tools/Options. . . Then click the

Content tab. If the Block Pop-up Windows



Clearing cache in Internet Explorer. Clearing out the cached data can solve a multitude of problems.

box is unchecked, then you are done with this step. Otherwise, click the Exceptions button immediately next to Block Pop-up Windows. In the window that appears, enter the domain of the Web site with which you are having a problem and click Allow. Click Close, and then click OK.

7. Javascript and Java. Select Tools/Options . . . , then click the Content tab. Make sure that the Enable Javascript and Enable Java boxes are checked. Click OK.

8. Accept Cookies. Click Tools/Options Then click the Privacy tab. Make sure that the Accept Cookies From Sites box is checked, then click the Exceptions button immediately next to Accept Cookies From Sites. Check the list to see if Firefox is blocking cookies from the problem site. If it is, highlight the listing for the problem site. Click Remove Site. Click Close, then OK.

9. Remove Cookies. Click Tools/Clear Private Data. Select Cookies only, and then click OK.

Problem: Music, video, or some other media won't play in a Web site.

Solution: This is almost always a plug-in-related issue. A plug-in (or add-on) is a helper program that extends a browser's capabilities. The steps to correct a plug-in issue are similar in both IE 7 and Firefox.

IE and Firefox will often prompt you with a bar at the top of the window telling you that a plug-in is needed and giving you instructions to install it. If this doesn't happen, most Web sites indicate what plug-ins are needed to run the site and include a link to download the latest version. Go to the site in question and download the updated plug-in version. Exit your browser, and then install the plug-in.

If you still don't know where to go to install the plug-in, see the Web sites addons.mozilla.org for Firefox and www.ieaddons.com for IE for more information. These sites include links to download and install all of the major plug-ins for the various browsers. **RS**

BY SHAWN MUMMERT

Basic Troubleshooting

Email

Email has become as much a part of everyday life as cell phones, Google, and Paris Hilton news. There are a wealth of options for those who want to swap messages with friends, family, and colleagues—email applications range from free, open-source options to simple Web-based types, such as Hotmail (www.hotmail.com) or Yahoo! Mail (mail.yahoo.com), to the most ubiquitous of all applications, Microsoft Outlook and Outlook Express, or OE, (www.microsoft.com).

Like any software, email programs have their glitches in terms of message handling, security, storage space, and general operations. Fortunately, they also tend to be fairly straightforward applications, which can make troubleshooting easier.

Working Status

The first step in identifying potential problems is to understand the version of the email program you are using and how it operates normally. For the purposes of this article, we'll be using Outlook Express.

To identify the specifications of Outlook Express on a system, navigate to the Help drop-down menu and click About Microsoft Outlook Express. A pop-up box will come up with the version of the



application. (In our case, we're using Outlook Express 6.)

Normal operation of any email program, including Outlook Express, is fairly straightforward: Emails can

be written in a message field and sent without difficulty or received in a timely fashion and formatted in such a way that reading it all is just a matter of scrolling down the page.

More high-level functionality includes making sure an address book is working or that identity protections are in place, but again, problems in those spheres will result in an error message. In other words, no OE system messages tends to mean that all is well.

Problem Set

Although it would be nice to zip through life with no error messages ever, Outlook Express is an application and, like any piece of software, can have difficulty in combining with specific system settings or in transferring or storing data. Here are some common problems in OE and how to get rid of them quickly.

Message Handling

Problem: Server error messages come up when I send and receive mail.

Solution: There are a number of messages that might crop up related to the server while it is trying to deliver or send mail. These might include:

No connection could be made because the target machine actively refused it.

The server could not be found.

There are several areas to check when the server is involved, with the first being firewalls. Often, firewalls are configured to restrict the type of network



You can easily find the version of your Outlook Express email program by clicking About Microsoft Outlook Express in the Help drop-down menu.

traffic that it considers suspicious or to only allow certain applications to send information over the network.

If using a firewall from McAfee (www.mcafee.com) or Symantec (www.symantec.com), you'll have to check the application permissions. For example, with McAfee, that would involve right-clicking the McAfee icon, navigating to Personal Firewall, and then clicking Internet Applications. What will appear is a Permissions list of the applications that are allowed to access the Internet. If Outlook Express is not checked for approval, select it and then restart the computer.

(NOTE: Keep in mind that with some troubleshooting fixes, it might be necessary to temporarily turn off security features on the system. If this is the case, be sure to put security measures back into place or restart the computer, so it can boot up with the proper security settings after mending the problem.)

Another common error message is: *Your server has unexpectedly terminated the connection. Possible causes for this include server problems, network problems, or a long period of inactivity.*

What might be happening is that server is timing out before messages can be sent. Basically, the connection opens for a certain amount of time, but the server isn't leaving the window open long enough. To fix the problem, go to the Tools menu in OE and click Accounts and then the Mail tab to view the list of accounts. Highlight the POP3 account in question and click the Advanced tab to view your current settings. Microsoft recommends gradually increasing the timeout setting using the slider until you find the right setting for your machine.

Problem: You receive an error when opening messages or sending to people in your address book.

Solution: When there is a problem in message handling that isn't server-related, error messages may include:

There was an error opening this message.

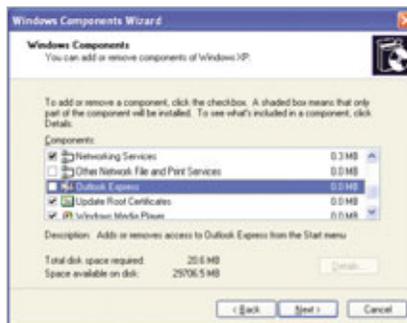
The Address Book failed to load. Outlook Express is incorrectly configured, please re-install.

Some of the recipients for this message are not valid. Please verify the names.

If the message in question contains an attachment, the first step would be to ask the sender to retry without the attachment. The system, and particularly the firewall, could be blocking the message because it finds it suspicious.

With all three error messages, a fix might be to remove and reinstall Outlook Express. If using Windows XP Home, click Start and Run. In the text box, type `appwiz.cpl` and click OK, which will cause a screen to appear with Add Or Remove Programs. Navigate to Add/Remove Windows Components. In the list that appears, click to clear the Outlook Express checkbox and click Next. Outlook Express will be removed.

Run through the same process to add it back in: Go to Start, Run, type



Sometimes uninstalling and reinstalling Outlook Express is enough to solve a problem. An easy way to do this is by using the Windows Components Wizard.

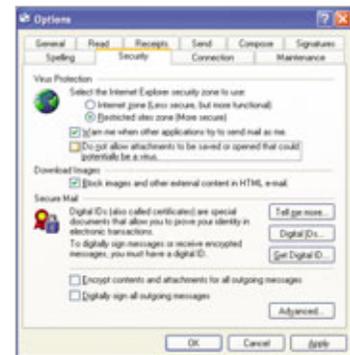
`appwiz.cpl`, and instead of removing Outlook Express, check the box, click Next, and it will be added back in. Once the installation is done, click Finish. This will reinstall the application using default settings and hopefully reset the application and its components.

(NOTE: Don't attempt to remove Outlook Express from a computer running Microsoft Windows Server 2003, which relies on the email application to run properly. For example, automated

messages meant for managing the server could be stop-ped if Outlook Express is reinstalled.)

Problem: An attachment you received has been blocked.

Solution: If the sender attempts to resend a previously blocked message without the attachment, and it gets through fine, the difficulty might be that Outlook Express is blocking the attachment. To get it through, go to Tools in the OE menu bar and select Options. In the Options window, select the Security tab and uncheck the option for Do Not Allow Attachments To Be Saved Or Opened That Could



One way to get through a troublesome attachment is by unchecking the Do Not Allow Attachments To Be Saved Or Opened That Could Potentially Be A Virus box.

Potentially Be A Virus and click OK. Before doing this, make sure that virus protection is in place, however. After you receive the attachment, change your settings back to ensure no unwelcome attachments make it through.

In a workplace, changing attachment security settings is not possible because Microsoft administrators consider some file types to be too dangerous to let onto a system. These might include file extensions such as .EXE, .CMD, and .MSP.

Problem: The messages in my Inbox aren't in the order I want them.

Solution: Outlook Express gives you the option to select how you would like to arrange the messages within your

folders. To change the arrangement of your messages, click Tools and Sort By. In the resulting drop-down menu you can choose to arrange your messages by Priority, Attachment, Flag, From, Subject, or Received. At the bottom of the drop-down menu, you can also select Sort Ascending or Sort Descending for each of the categories.

So, for example, if you want your messages to display with the most recent messages at the top of your Inbox, click Tools, Sort By, and Received and select the Sort Descending option. This menu can also be helpful if you want to find a specific email or group of emails. You can easily select the criteria you're looking for, such as From or Subject, to find the email in question and then change your settings back to what you prefer as the default once you've identified the email you need.

Storage Challenges

Problem: You receive a message notifying you that your storage limit has been reached.

Solution: Many email programs are building more storage into the system for users, but large attachments, such as photos and video, can still bring a mailbox to its limit.

After receiving a message about storage limitations, the easiest tactic is to do some digital housecleaning. Delete some messages, focusing specifically on those that have attachments.

Another option is to download attachments to the hard drive, so you can delete the email. To do this, select the message with the attachment, go to the File menu, and select Save Attachments. If the email has more than one attachment, you will have the option to save just one of or all of the attachments. Once that option is chosen, you can save the attachment anywhere, such as on a CD or to the Desktop.

General Operations

Problem: My file is too large to be sent over email.

Solution: With the growth of video content, PowerPoint files, and other media-rich applications, it's increasingly common that large files present a challenge for email users. Whereas photos and images can be sent separately, something such as a PowerPoint presentation can't be broken down into components. Fortunately, with compression software, it doesn't have to be.

One particularly popular option is WinZip (www.winzip.com), made by Corel. The latest version, 11.0, can be purchased online for \$29.95 and has a number of intuitive features. To "stuff" a file and make it smaller for emailing, open the WinZip application, and a screen will appear with options that include New, Wizard, Add, and Extract. The easiest way to Zip a file is to using the WinZip Wizard.

When you open WinZip, the Wizard may open automatically. If not, click the Wizard button and select Create A New Zip File when you're asked What Do You Want To Do?. Click Next and follow the instructions to create your new Zip file. After you've saved the file to a folder of your choice, you can attach it to an email as you would any other file and send.

Other choices for compression include PKZIP (\$29; www.pkware.com), StuffIt Standard (\$24.99; www.stuffit.com), and ZipGenius (free; www.zipgenius.it).

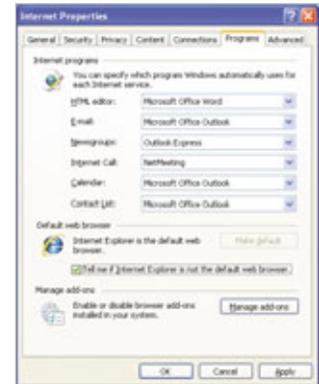
Problem: Web links don't work from inside an email message.

Solution: Problems with Web links can occasionally be an issue with the type of browser being used, but more often it's associated to the way the email program interacts with the browser.

One solution might be to download the latest version of your preferred browser, whether it's Firefox (www.mozilla.com), Internet Explorer, Opera (www.opera.com), or any of the other browser options. Some users don't keep their browsers up-to-date, and settings that are revamped in Outlook Express can conflict with older versions.

Because OE is a Microsoft product, it might be prudent to utilize the company's newly refreshed IE 7 browser, which you can download at www.microsoft.com/windows/ie.

The Web site will guide you through the downloading process. After the installation, make sure that IE is the default browser so that when Web links



If you use Internet Explorer as your browser, setting it as your default browser in Internet Properties will help to ensure that links within your emails will open properly.

appear in an email, it will use IE to open them. To do that, select Control Panel from the Start menu, double-click Internet Options, and click the Programs tab. In the Default Web Browser section, make sure the Tell Me If Internet Explorer Is Not The Default Web Browser box is checked and click OK. The next time IE is opened, it will ask to be the default browser. Click Yes.

Sources Of Help

For many general questions, including those related to security, storage, or message routing, answers may be found by accessing OE's Help function, which can be accessed by pressing F1 or by clicking Contents And Index in the Help menu.

You can access Help files by using the Content, Index, and Search tabs. The Contents tab is organized by subject, and the Index tab contains an alphabetical list of subjects. If you are unsure where to start, use the Search

tab to help you narrow down topics that might be helpful.

Another choice if problems keep occurring with Outlook Express is to consider buying repair and recovery utilities, available through the Microsoft site and developed by companies such as ScanDBX (www.scandbx.com),



Outlook Express' Help menu has a wealth of information. To find documents on a specific topic, use the Search tab to narrow the choices.

DataNumen (www.datanumen.com), Recovery ToolBox (www.oemailrecovery.com), and Accurate Solution (www accuratesolution.net).

The ScanDBX tool, for example, is designed to repair damaged OE files and installations, while DataNumen's Advanced Outlook Express Repair is geared toward file recovery.

Web Mail

In addition to Outlook Express, many users opt to have Web-based accounts as well, either as a supplement to OE, or as their sole email. Providers such as Hotmail or Yahoo! sometimes act as a "junk mailbox" for users who want to limit the amount of spam and e-newsletters that are delivered to their primary accounts.

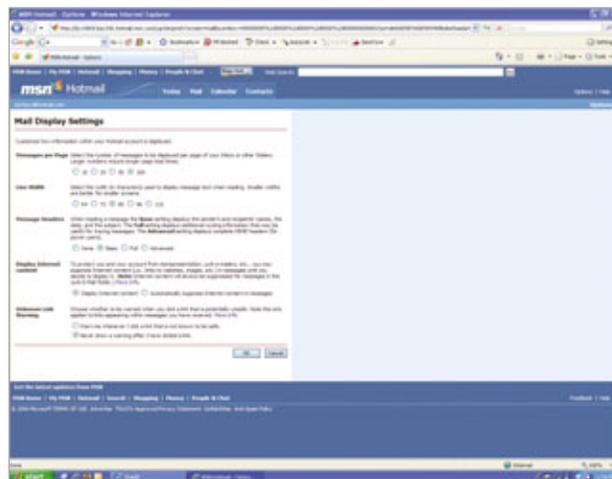
Much more simplified than a full-featured application such as Outlook Express, Web mail tends to be

fairly stripped down and straightforward. Users can employ tools to limit junk mail, set a different reply-to address for messages, create custom filters that send incoming messages to specific folders, and get alerts on a mobile device whenever there's a new message.

For Hotmail, settings can be tweaked, and troubleshooting can be done by selecting Options from the upper-right corner of the Web page. That will bring up a page with a number of features to access, and the one usually most helpful when there are email difficulties is Mail Display Settings, located under the Mail tab.

Another helpful section can be accessed through the Help link in the lower-right corner of the screen. Click Common Problems With POP Accounts to access subsequent screens to help you identify what the difficulty might be, such as trying to access an MSN email account from behind a corporate firewall.

Yahoo! is currently testing a beta version of its forthcoming Webmail, which looks more like Outlook



The Mail Display Settings menu in Hotmail (www.hotmail.com) allows you to adjust your display to meet your preferences and needs.

Express than previous iterations. In terms of its current mail application, however, it resembles Hotmail, including having its Options link at the top-right corner of the page.

But Yahoo! trumps its online competitor in terms of having more complete troubleshooting information in its Help section, including the opportunity to contact customer care directly.

Other email programs, such as Google's Gmail (www.gmail.com) and Apple's Mac Mail (www.apple.com), also put their troubleshooting tips into a section called Help and give tips on creating different mail settings as well as fixing any problems that crop up.

In general, whether using Outlook Express, a subscription service such as Mac Mail, an account from a local ISP such as Comcast (www.comcast.com), or just a vanilla Web-based app such as Yahoo!, email can be a boon for communication, and in some ways, it doesn't matter which software you pick. After all, a message is the same whether sent through Hotmail or Outlook Express. But tapping into the troubleshooting power folded into every application will definitely make sure those messages don't get lost in the digital ether. **RS**

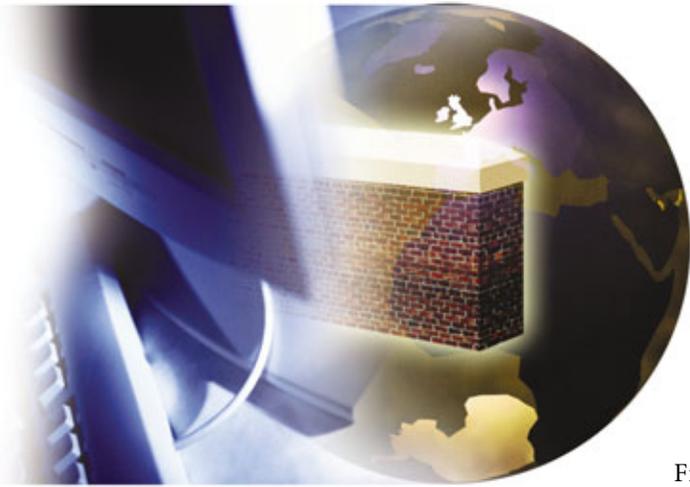
An advertisement for ScanDBX software. The ad features a blue and white color scheme with a central image of a family. Text includes 'DOWNLOAD NOW', 'New Version 2.20', 'Get your email back.', and 'Quickly Detect and Repair Outlook Express Problems with ScanDBX'. There is a 'BUY NOW' button and a 'How do I...' section.

ScanDBX (www.scandbx.com) is a third-party repair tool for OE that may be able to help you troubleshoot problems with damaged files.

BY ELIZABETH MILLARD

Basic Troubleshooting

Firewalls



When the firewall stops working, so does your Internet connection or even your whole computer. But there are ways to fix it, and most of them are simple.

Who's At Fault?

First things first. Before you get started, you need to know what's truly causing your problem. Is it your firewall? Your ISP (Internet service provider)? Your phone line?

The best way to determine if your firewall is playing tricks on you is to turn it off and see if your problem persists. If the problem disappears, you know what the culprit is.

If the problem persists, remember that many things can prevent you from viewing a Web site, sending or receiving email, using a chat program, streaming a movie, or sending photos to Flickr (www.flickr.com) or MySpace (www.myspace.com), all of which are tasks governed by firewalls because they involve the transmission of data over the Internet. For instance, if you can't view a Web site, the problem could be the settings in your Web browser or a problem on the Web site itself. Some Web sites use ActiveX and JavaScript—types of code that give a Web page advanced features but also give hackers a way to exploit your computer—which your browser may block for safety. (To check your security settings in Internet Explorer,

including your ActiveX and JavaScript settings, click Tools, Internet Options, and Security.)

The Nitty Gritty

If you think your firewall is at fault, try the steps below to fix the most common problems. If you don't find what you need, try your software's users guide, Web site, or support line, since most firewall problems are well-known to the companies that make them.

Problem: I can't send or receive data on my computer.

Solution: A firewall keeps the bad stuff out and the good stuff in, but sometimes it can keep programs you need from sending and receiving the data they need to function. In that case, the program is said to be "blocked." Often you'll see a pop-up window explaining this and prompting you to unblock the program or continue to block it. For instance, if Windows Firewall has blocked a program, it will show you a message reading, "To help protect your computer, Windows Firewall has blocked some features of this program." The message has three buttons: Keep Blocking, Unblock, and Ask Me Later.

If you know and trust the program that's trying to send or receive data, just click the Unblock button, and the problem is solved. (*NOTE: The Windows Firewall only blocks incoming data. Only third-party firewalls, such as the firewall in Symantec's Norton Internet Security or McAfee's Internet Security Suite, will block data from leaving your computer as well as invading it.*)

Problem: I need to unblock a program, but I'm not prompted to do so.

Solution: Most firewalls will show you an alert when a program tries to send or receive data over the Internet, prompting you to block the program, unblock it, or defer your decision. If you don't see an alert, you'll have to unblock the program directly.

Keeping safe online can be explained in two easy steps: Keep the bad stuff out and the good stuff in. Firewalls can do both, which makes them a vital piece of software in today's age of hack attacks, adware, and spyware of every kind.

A firewall is like a moat around your computer. It screens inbound and outbound traffic to determine if it should pass, keeping malicious code such as virus attacks from getting into your system and keeping private data from getting out when keylogging programs and other nasty codes try to steal it.

Windows XP (Service Pack 2) comes with a built-in firewall called the Windows Firewall. But many notebooks and desktops come preloaded with third-party software from Symantec (www.symantec.com), McAfee (www.mcafee.com), CA (www.ca.com), Zone Labs (www.zonelabs.com), and others. To see which firewall you have (or whether you have one at all), click Start and All Programs and look for the vendor's name.



In Windows XP (Service Pack 2) the Windows Security Center includes a basic firewall that blocks unwanted inbound traffic from making its way onto your system.



This is the interface for McAfee's Personal Firewall Plus, one of the most popular current firewalls. Unlike the Windows Firewall, it blocks inbound and outbound traffic alike.

The procedure varies slightly from program to program, but it's largely the same. For instance, to unblock a program using the firewall in Norton Internet Security, look for the Norton icon in the System Tray (the set of icons in the bottom-right corner of your screen, next to the clock). The icon, which differs slightly from version to version, looks like a globe combined with a grid. When you've found the icon, double-click it to open the Norton control panel.

Next, click Personal Firewall and then Configure. Click the Programs tab. In the Manual Program Control section, Click Add and then browse to the program you'd like to add. (Most programs can be found in C:\Program

Files, the default location for Windows software.) From there, just follow the prompts to return to the Desktop and reboot your system.

Problem: I can't print to a networked printer or access documents on another computer.

Solution: Sometimes your firewall will keep you from using a network resource, such as a printer or a document store, on your small or home office network. If your company gave you the computer and the IT department installed your network and firewall, it's best to let someone from your company resolve this problem. You're not passing the buck; you're just being careful because you might change a setting that unwittingly opens your corporate network to attack.

If you're using your own network and have more leeway to alter your software's settings, you can fix the problem fairly quickly. If you're using the built-in Windows Firewall, which is the software most likely to

block a printer or file share, open the Windows Security Center by clicking Start and Run and typing Wscui.cpl in the Open box. Then click OK.

In the Windows Security Center window, click the Windows Firewall link at the bottom, choose the Exceptions tab, and select the File and Printer Sharing option from the Programs And Services list. Click OK and close the Security Center window and reboot your computer. This will give you access to shares that were blocked, but there's a catch: Using the File And Printer Sharing exception on any computer that's directly connected to the Internet can give hackers access to the shared documents on your network. To guard against this, you can

double-click the File And Printer Sharing option in the Programs And Services menu and click the Change Scope button in the Edit a Service dialog box. In the Change Scope dialog box, make sure that My network (subnet) only is checked and follow the prompts to return to the Desktop and reboot your system.

But even that can expose you to unneeded risk. A far better way to fix the problem is to use a third-party firewall that will give you full access to your network, without exposing your machine to the dangers of the wild, wild Web. By Microsoft's own admission, the Windows Firewall is not designed to give you full protection, merely to add a basic layer of defense to Windows.

Problem: I can't turn my firewall on.

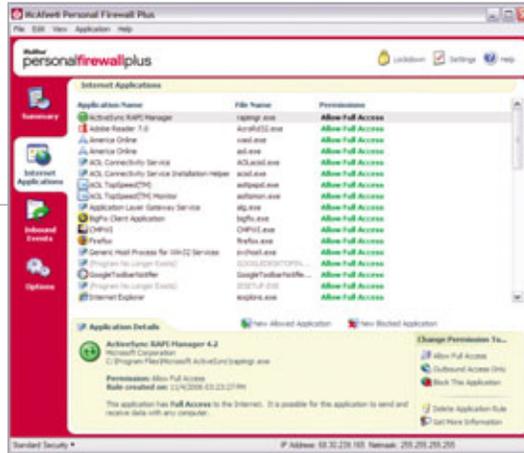
Solution: Two things will keep you from using your firewall: The first is a faulty installation, which you can often fix quickly. The second is more worrisome. Spyware and other malware can turn off or completely kill your firewall as part of its plan to hijack your system.

If you think your firewall did not install properly, uninstall and reinstall it



Your firewall is not always to blame for your connection problems. If you can't see a specific Web site, look at your browser's security settings. In Internet Explorer, click Tools, Internet Options, and Security.

Most firewalls give you near-complete control over which programs can send and receive data over the Internet. This screen shows access permissions in McAfee's Personal Firewall Plus.



using the directions that came in your software's users guide (or see the problem below on uninstalling your firewall). On the other hand, if your firewall installed correctly and worked fine until you clicked a suspicious Web site or opened a suspicious email, use a spyware/adware detector to clean your system. Norton, McAfee, Zone Labs, and LavaSoft (www.lavasoftusa.com) all make well-known programs that can remove most but not all malware from your system.

You can also contact your firewall vendor to see if it offers a fix. For instance, McAfee's firewalls can be attacked by spyware that very subtly edits the Windows Registry to disable it. (The Registry is a master database of program settings in nearly all versions of Windows.) It alters the following Registry key:

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon\Notify\SensLogn

to read as follows:

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon_disable\Notify\SensLogn

In the second key, there's an extra word ("disable"). Rather than fix it yourself, it's better to contact your support team because even the smallest change to the Registry can result in disastrous effects.

Once you've run a spyware tool or a utility from your firewall vendor, you may have to reinstall your firewall because malware can leave it so damaged that you need a fresh copy. If the problem still persists after all these

steps, contact your firewall vendor again to seek help.

Problem: My firewall turned off Internet Connection Sharing.

Solution: ICS (Internet Connection Sharing) is a Microsoft program that lets you share one Internet connection among many computers. Some firewalls turn it off when they install, along with connection sharing programs from any vendor.

One solution is to repeat the ICS setup. But first check with your firewall vendor; some make tools you can download to re-establish your ICS connection quickly. You can download the tools from the vendors' Web sites.

Also be careful about the effects ICS can have on your firewall. Some vendors note that you can install their firewall on the ICS gateway (that is, the computer that's directly connected to the Internet) and guard all computers that share its connection from malicious inbound traffic. But if you want to guard against outbound traffic, you'll have to install the firewall on every ICS computer you want to protect.

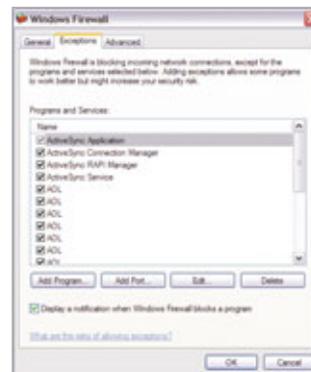
Problem: I can't uninstall my firewall.

Solution: Firewalls can be hard to uninstall. Spyware, adware, and hack attacks can try to alter or remove your firewall from your system, so firewall vendors make the programs stick to it.

The best way to remove a firewall is to use the Add Or Remove Programs feature in the Windows Control Panel because it triggers the firewall's built-in removal process. If the Add Or Remove Programs feature doesn't work, consult your users guide or vendor's Web site to see if there are different ways to remove the software. For instance, you can remove certain McAfee programs, including the McAfee Personal Firewall Plus, with a program called the McAfee Removal Tool that you can download from www.mcafee.com.



To change access permissions for inbound traffic in the Windows Firewall, open the Windows Security Center and click the Windows Firewall link at the bottom.



Click the Exceptions tab in the Windows Firewall dialog box to see a list of programs that are not blocked from receiving inbound traffic. If you don't see the program you'd like to unblock, click the Add Program button to open the Add A Program dialog box.

Problem: I have two firewalls running at once.

Solution: By all means, turn one off. Using more than one firewall does not make your system any safer. It just makes it harder to manage inbound and outbound traffic by setting rules, policies, and exceptions because you now have twice as much work.

Most experts suggest you use a third-party product over WinXP's built-in firewall because the Windows version only protects against malicious inbound traffic. If you've unknowingly installed a piece of spyware that begins to send your personal data over the Internet, Windows Firewall has no way of protecting against it. (The firewall in Windows Vista does protect against malicious outbound traffic, but users have to configure the protection themselves because it's turned off by default.)

Problem: I can't configure my firewall. All the options and advanced settings are grayed out.

Solution: This is an occasional problem with the Windows Firewall. It means that you're not logged on to your system as an administrator and don't have the right permissions to alter sensitive system settings. To fix the problem, log off and then log back on as an administrator. If you're using a corporate desktop or notebook, your account may not have administrator's rights, and you'll have to ask your IT department to do the work for you. (It's possible your IT group did this to keep you from changing your settings and leaving a hole in the network.)

If you can't alter the advanced settings of firewalls from Norton, McAfee, Trend Micro (www.trendmicro.com), Zone Labs, and others, you should run antispyware and anti-



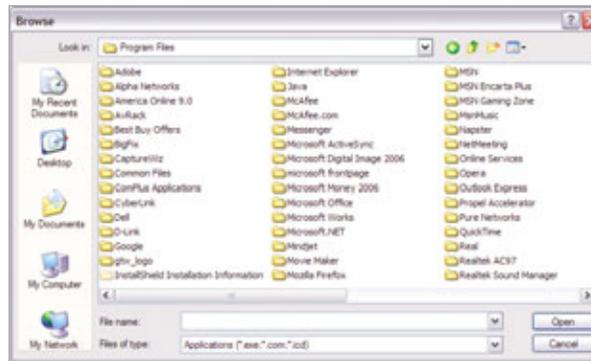
In the Add A Program dialog box, you can choose the program from a list or click the Browse button to look even deeper into your system.

adware programs on your system to ensure a hack attack is not the root of your problem.

Problem: I can't connect to my office VPN.

Solution: A virtual private network lets you send encrypted information through the Internet to your office computers, keeping it safe even though it moves through a high-

ly public set of networks. On occasion, your firewall will conflict with your VPN software, leaving you without a connection to the office.



The Browse window lets you choose any program on your Windows system. By default, most programs are stored in C:\Program Files and sorted by vendor.

ISP to ask for the DNS number of the server that sends out heartbeats. Tell them why you need it, too, since

it's not every day that someone asks them for private network data.

If you keep your firewall in good working order, you can trust it to keep you safe from the threats that mar an otherwise wonderful Web. **RS**

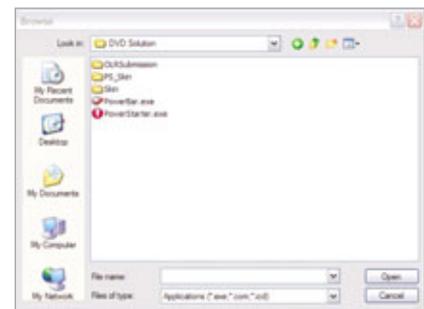
If this happens, contact your help desk or IT department and notify them of the problem. If you alter your firewall or VPN settings, you could unknowingly open a hole in your corporate network.

Problem: I keep losing my Internet connection.

Solution: If you can't keep a connection, check your modem, phone line, or any software that governs your connection. But there's a chance your firewall is the nosy culprit.

Some ISPs save money by disconnecting idle users to keep them from chewing up modems and bandwidth. To determine if a user is idle, the ISP sends a heartbeat message—a small packet of data to test your connection—to your machine. Some firewalls

BY DAVID GARRETT



You can identify programs by their extension, which is always .exe.

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