Fast Track *to*
TROUBLESHOOTING YOUR PC

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YOUR HANDY GUIDE TO EVERYDAY TECHNOLOGY

Fast Track
to
Troubleshooting
Your PC

By Team Digit

Credits

People Behind This Book

Band-Aid

Few aspects of technology can ever aspire to be as frustrating as computing. Unavoidable that they are, PCs come with new problems for every one they solve, and some claim that PC problems can even drive people to drink! We've always hoped for a helping hand to turn to for every weird sound, every ugly error and every sluggishly-performed operation, lest we too succumb to such vices.

In this month's *Fast Track*, we've taken a long, hard look at the most common (and some bizarrely uncommon) problems that rear their ugly heads during the course of your computing experience. From upgrading and assembling troubles to trouble when online to problems with memory and hard disks, it's all here in this one-stop shop to cure what can ail your PC.

As always, this *Fast Track* has been written to be your happy helper—something that is thankfully within arm's reach. For quick reference and relief, there are Symptom > Problem > Solution structures within each chapter, so when something strange happens with your PC, your solution will be right there. You might also want to keep your eyes peeled for a handy tip every now and then.

The first two chapters will help you get your PC started without having to worry about beeps, clicks or any such undesirable sounds. Following them are solutions to common display and sound woes, both hardware and software, before we move on to more complex matters such as memory, storage and networking.

Unless otherwise specified, we've assumed that the OS you use is Windows XP, though many of the solutions aren't that different from those for older versions of Windows.

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The Basics

When working with PCs day-in and day-out, a problem is bound to crop up. This handy reference guide will give you an insight into many of the common problems users face, and provide suggestions in solving the problem or at the very least point you in the right direction.

In this guide we cover basic to intermediate-level hardware and software troubleshooting. We assume you're running Windows.

1.1 Troubleshooting Techniques

The primary requirement for troubleshooting is to be methodical. Don't panic, don't rush. Being patient and methodical is better than being quick and sorry. Whatever the problem, the first step is to develop an understanding of what are the possible causes. Using a notepad and pencil (or pen) is helpful. First, note down the symptom. The symptom is what you see happening, not what you *think* may be happening. Once you know the symptom, the next step is to identify the possible problems that might be the cause for this symptom. Some symptoms may be caused by a single problem. Usually, you will not be so lucky. Most symptoms can be caused by one or more problems. Isolate the sub-systems (this guide covers all the major sub-systems) that may be causing the problem. Then investigate each sub-system and eliminate them from the possible problem checklist. Look at the example troubleshooting table below to give you an idea on how you can approach the exercise:

Symptom: PC powers on but there is no display			
Sub-system	Problem	Solution	Remarks
Power Supply Unit (PSU)	New video card may be overtaxing the PSU	Get new PSU or use old video card	Check the other sub-systems first
Video card	Not plugged in properly	Plug it in correctly	
Live power / Video feed	Check the power cables: the monitor to motherboard cable	Fix them properly	
RAM	RAM not plugged in properly	Set the DIMMs in firmly	
Software drivers	Software drivers not loading	Roll back to last known good or boot in safe mode and rectify	

If you are used to troubleshooting, you are most likely following something similar in your head already. Once you begin to think in terms of the various sub-systems, the chances of you not finding your problem are very low. Over time, and with experience, you would be doing this naturally and automatically. Of course on paper it looks terribly boring and to tell you the truth, it is! But, it is a good strategy to use a methodical approach in troubleshooting rather than dive straight in, start poking around, pressing keys and buttons blindly and then regretting it later.

After trying everything and you are at your wits end with no solution in sight, it is time to take a step back and forget about it for a while—attack the problem after some time with a fresh mind. You could also post a message in the relevant *Digit* forum sub-section (www.thinkdigit.com/forum), the members are pretty helpful and quite experienced. Chances are someone else has faced the same problem and you should be able to get an answer quickly.

1.2 Don't Be Careless

When working with hardware, the first thing is to ground yourself properly. Whenever you are tinkering under the hood, have an anti-static wrist strap hooked up. If you don't have one, stop what you are doing and go buy one now! Never, ever, work without protecting your delicate electronic components from static. A tiny shot of static can fry your CPU, RAM and even the motherboard.

Computer components have highly complex and delicate electronics. When working with an exposed and live motherboard don't try to take shortcuts, keep the area clear of other electricity conductors, an accidental short can just as well fry your PC components. The same goes for leaving components lying around on the floor, or on the edge of the shelf—you could accidentally step on or drop them. Also take care to not drop things onto the motherboard, bend any components or touch anything you shouldn't.

1.3 Troubleshooting Power Supply Units (PSUs)

Among all the PC components, the power supply is the most dangerous. It converts the 240V wall voltage into smaller 12V, 5V and 3.3V DC allocations required by the PC. Usually, the power supply comes with the cabinet and is backed by a warranty so you shouldn't have problems. However, it pays to be careful and take the extra effort to verify the quality of the power supply. If you are purchasing it separately, opt for a brand name. Check around with your friends, the Internet and other system builders. Horror stories of faulty PSUs

A PSU with all its connectors

that blow up and ruin entire PCs are common, so be careful. A good quality PSU will not only give your system a long life span, it will also help reduce the noise and heat generated inside the cabinet. Some common problems you may face with PSUs are:

1.3.1 The power doesn't come on

1. **No power from the wall socket**: Use a live power outlet. In rare cases, the power cable may be defective and may require replacement. Check the power cable on another working PC. Plug in a lamp or any other electric device to see if you have a live outlet.

2. **Incorrect voltage setting on the PSU**: Select the proper voltage setting (220-240V) on the back of the PSU. WARNING: If you have switched on the PC with the voltage set to 110-120V and with a mains supply of 240V you may have blown your PSU beyond repair at worst or blown a fuse at best. Be careful!

3. **The front panel power switch's connector to the motherboard is not fixed correctly or has come off or is defective:** Check the motherboard manual and fix the lead (wires) from the front panel switch to the motherboard correctly. If there is still no power, try a different lead.

4. **The front panel power switch is defective**: Replace the switch. In case you do not want to get a replacement, one option is to use the reset button. The only problem with this is that to cut the

power to the system in case of system hangs etc., you will have to switch off the power from the mains wall outlet rather than from the front panel.

5. **The power supply connections to the motherboard are not correct:** Check the power connections from the PSU to the motherboard. Refer to the motherboard manual and identify the correct connection points.

6. **Not identified; non-PSU related problem:** After attempting all the above, if the system still doesn't power up, it is time to look elsewhere.

Disconnect all the drives and see if it is powering up. (*Note:* Pull out the power cord when removing or disconnecting something.)

If the system is powering up, then start reconnecting the drives one by one to identify which is defective drive.

If the system is not powering with all drives disconnected, remove the other adaptors one at a time and checking to see if it is powering up. Leave the video adaptor for the last.

If you are able to isolate the problem to one of the adaptor cards, verify that the slot and the adaptor cards are compatible. Then try plugging it into a different slot and see if the system powers up before discarding it and going for a new one.

If the system is still not powering up, then you either have a defective PSU or a defective motherboard. If there is a burnt smell, then most probably either one of them has been fried. Look for burn marks on the motherboard. Sometimes the PSU and motherboard may be incompatible. If the motherboard looks fine, replace the PSU, since it's cheaper!

Check the relevant sections of this guide for troubleshooting hints for the other components.

1.3.2 The PC powers on after the second or third try

The mostly likely problem is that the power_ok (or power_good) signal is sent before the power supply has stabilised. Get a better quality PSU. In modern PCs, the power switch is a logic device that tells the PSU to supply full power to the motherboard. The power_ok signal tells the motherboard that the power supply is available and stable. If the signal is sent too soon the motherboard does not recognize it and stays off to protect itself. This can happen in lower-quality PSUs. Booting more than once is not recommended, and you will be better off getting a better PSU.

1.3.3 The PC powers on but nothing happens after that (no beep)

1. This may be due to the addition of new hardware that is over-taxing the power supply. Remove the last hardware component installed and check again.
2. A defective hard disk or one that is not plugged in correctly: Check the power cable to the hard disk. Sometimes it may not be fully plugged in. Check the hard disk on another system.

1.3.4 The PC powers on, beeps and stops. No Power On Self Test (POST) messages.

This may be a motherboard problem and not related to the PSU. Check the motherboard section of this guide.

1.3.5 The PC powers on and runs POST but there is no display

This may be a display card problem and not related to the PSU. Check the display section of this guide.

1.3.6 There is a squealing/whistling/whining noise when the PC starts

This could indicate either a problem with the fan, which has accumulated dirt over time, or one of the internal components of the PSU. Switch on the PC and listen carefully to confirm that it's the PSU fan and not the CPU fan or the hard disk. Usually, the noise will stop once the fan picks up speed, and you can ignore it temporarily. It's a good idea, however, to clean out the dirt around the

PSU fan using a PC vacuum. This will increase the working life of the PSU fan as well as the PSU itself. If the fan stops working, the PSU will generate heat and cause more trouble. So a little prevention will save you a lot of headaches later.

If the sound is not from the fan but from within the PSU itself, then you may be able to service it. A PSU has no 'user-serviceable' parts, and it's best left to a competent technician, although in most cases of component failure, you will have to replace the PSU.

1.3.7 The PC freezes or reboots suddenly

1. This could indicate a failing PSU that is not supplying power correctly to the motherboard. You may be able to get the PSU serviced but in most cases you will be better off getting a new power supply.

2. This could be due to overheating of the PSU or CPU: If the PSU is overheating, the metal cabinet may be hot to touch or you might get a shock. Shut off immediately. Check if the PSU fan is working, clean or replace the fan if not working or spinning very slowly. If it's a faulty PSU you may be able to service it.

   If the PSU seems normal it might be due to an overheating CPU.

1.4 Troubleshooting Motherboards

Problems with motherboards are rare. It gets blamed for problems caused by other hardware such as add-on cards. However, you cannot eliminate the motherboard from your list of suspects till you've investigated further. It's a good idea to leave troubleshooting the motherboard for the end, unless, of course, there is some visible sign like scorch marks or a burnt smell coming from the motherboard. The bad news is there is little you can repair on the motherboard. So, keep your fingers crossed when working with it, and hopefully you won't have to shell out big bucks to replace it. And not to forget the standard warning: *Don't work on or touch the motherboard with the power*

on unless you are absolutely sure of what you are doing. An accidental short can just as easily fry the motherboard, RAM, display card or any other add-ons you may have.

1.4.1 The PC powers on (with/without beeps) but there is no display

1. After ensuring that the problem is not related to the PSU or the display card, it may be that the RAM modules are mismatched or are not seated properly. If the problem is with the RAM, you will most likely hear beeps emitted by the BIOS. See the BIOS section to understand beep codes and how to troubleshoot the BIOS. Check the RAM modules to see if they are seated properly. Also, try to use modules from the same manufacturer. In some cases, RAM modules from different manufacturers don't work together. Also check the memory section in this guide to troubleshoot RAM and memory.

2. The CPU may not be seated correctly. This problem should only be relevant if you have installed a new motherboard or upgraded the CPU.

A Pentium IV motherboard

Visually inspect to check if the socket CPU is sitting flat in the socket, which means that the heat sink should be perfectly parallel to the motherboard. With a new socket CPU the heat sink may completely cover the CPU and you will have to remove the heat sink to check. Check for any crushed or bent legs. If the CPU's socket locking arm was not raised up all the way up before seating the CPU or if it was not lowered all the way down after seating it, the CPU won't sit properly. If the CPU doesn't sit properly after this, then either the socket is faulty, or you have the wrong CPU for the motherboard!

It's pretty difficult to tell by visual inspection if slot CPUs are seated properly. When in doubt, reseat the CPU, which is fairly easy since the heat sink and the CPU are an integrated unit. Also, make sure that you correctly identify release levers located on the top of the slot CPU package.

3. There's no power to the heat sink fan

If the heat sink has a fan, it should be hooked to the correct power source on the motherboard for the BIOS to monitor and control its state. Be careful! If you have installed a new CPU and switched it on without the fan it may have failed already! Hopefully, you will be lucky and get away with it by hooking up the fan. It may also be that the power point on the motherboard is failing.

4. The jumper settings may have been incorrectly set if you are experimenting with overclocking or have installed a new motherboard Return the motherboard to its default settings. Use the motherboard manual to get the default values.

5. The cabinet or uneven fixing of the motherboard may be causing a short. Put the motherboard on a cardboard box covered with foam or a static free bag and hook it up. If the PC boots normally then the problem is most likely related to the cabinet or the fixing of the motherboard. Mechanical stresses on a bent motherboard might be leaving a circuit open and preventing it from working. Fix the motherboard properly in the cabinet and if the problem re-occurs change the cabinet.

Note: If there is a crack on the motherboard, you are in serious trouble! The motherboard is a printed circuit board and hence a crack will break the circuitry. You will in all probability have to buy a new motherboard.

1.4.2 The PC runs POST and then freezes
1. This may be a problem with the RAM modules or other add-on cards. In case of RAM module problems, you will usually be alert-

ed by beeps from the BIOS. Strip the PC down to the 'barebones', that is, just the power supply, motherboard (with CPU & heat sink), minimum RAM and display card. Switch the RAM module to another slot. Verify that the RAM modules are as per the specs defined by motherboard manufacturer. Use matched RAM modules from the same manufacturer. Try a different RAM. If everything is working you should boot up and see the message 'No boot device' or something similar. Power off, connect the hard disk and reboot. If the problem still occurs, this points to something wrong with the hard disk or the basic boot up of the operating system. Check the storage section and the Windows troubleshooting section of this guide.

If the OS boots normally, then power off and start adding each add-on card one by one, powering up after adding each card until you isolate the culprit. Check the relevant sections for troubleshooting hints for those components.

2. It may be a BIOS problem. Check the BIOS section in this guide.

1.4.3 The PC freezes suddenly

1. This could be due to overheating of the CPU caused by poor contact between the heat sink and the CPU Remove the heat sink and fan (make sure the fan is working). On the exposed CPU die surface apply some thermal grease or thermal tape. This is to fill in the microscopic gaps that may exist between the CPU and the heat sink. Don't use too much grease and don't try to substitute with something else, use approved thermal media only. Also, don't get impatient and try to force the heat sink on the die to try and make it fit. You may break the heat sink or worse still damage the CPU.

If the fan is not working, verify the power connections. If the connections are correct and the fan still does not work you can try replacing the fan but the best option is to get a new heat sink unit (heat sink + fan). *Note:* The problem with a failed heat sink is the likelihood that you have already cooked your CPU. Most modern CPUs overheat very quickly and require cooling right from power on.

1.5 Troubleshooting Hardware Device Conflicts In Windows

Hardware devices can conflict with each other due to a variety of reasons. Every hardware device installed must be allocated a set of operating system (Windows) resources to operate correctly. These resources include IRQ, DMA (Direct Memory Access), I/O port addresses and memory resources. Some of these resources will be shared by more than one device while others cannot. This depends on the capabilities of the hardware and its software drivers.

Each device installed will have one or more software device drivers that enable the operating system to access and use the device. The software could be provided either by Microsoft itself that will enable basic functionality, or by the device vendor who knows more about the specific model and hence will be able to provide a more tightly integrated device driver.

Normally, Windows Plug and Play will automatically detect the newly-added hardware, determine the system resources required and assign them properly. Plug and Play will also search for the required software drivers and install them transparently. If Plug and Play cannot find the required drivers, it will prompt the user to provide them by inserting the CD/floppy provided by the device manufacturer. Additionally, it will also reconfigure the system resources if required, for example when the newly added device requires some resources already in use.

1.5.1 Device Conflict Symptoms

A hardware conflict may occur when you add a new device to your system. In some instances, this conflict will not cause any problem, and depending on the operating system you may not even be aware that such a conflict exists. Typical symptoms of hardware conflicts include:

○ The operating system may freeze frequently
○ The new device may suffer performance problems

❍ An existing device that is conflicting with the new device may suffer performance problems
❍ Windows starts in Safe Mode
❍ The system crashes and you get a BSOD (Blue Screen of Death)
❍ The sound card stops working or stutters
❍ The screen jumps and shows garbled images
❍ The mouse stops working
❍ Modem/network card doesn't respond
❍ CD/DVD drive doesn't respond or crashes the system

1.5.2 Problems causing conflicts

A wide range of problems may be causing the above and other symptoms. Assuming that the hardware is not defective and has been installed correctly, at the operating system level the problems can be broadly classified as follows:

❍ There could be a resource allocation (IRQ/memory address) conflict. Two devices are allocated the same IRQ/memory address space. Usually, non-Plug and Play devices would give this problem. Since Windows is unable to detect these devices it may not allocate the resources properly and hence cause conflicts with an existing device.

Note: Some devices, such as PCI devices, can share a single IRQ without conflicts in Windows 2000/XP.

Concepts

IRQ
Interrupt ReQuest lines. These are communication lines over which all hardware components talk to the processor.

DMA
Direct Memory Access enables hardware devices to transfer data directly from memory (RAM) without going through the processor.

I/O Ports
Input/Output ports: the connection points between the motherboard and hardware devices.

Memory Address
A specific physical location in the RAM chip.

Windows Registry
A database that stores all the configuration information of the computer.

❍ The software device drivers may not be compatible with the operating system, or may have been corrupted, or may not have been installed. If you have recently upgraded from Windows 95/98, this would usually be the problem.

❍ A new software program installed is trying to use system resources allocated to other hardware devices or software programs.

1.5.3 Resolving conflicts

With thousands of devices that work with Windows operating systems, it is practically impossible to describe all scenario specific solutions. What remains is to describe a strategy that will help you identify and resolve the problem.

The first step is to determine that the problem is really a hardware conflict at the OS level and not something caused by an incorrect physical installation. If you are able to normally boot into the OS, this would probably mean that the physical installation is fine. However, you cannot be certain at this stage. Try accessing the device. If the system hangs, crashes or starts acting weird, then it is pretty safe to assume that the physical installation is fine and the problem is because of the operating system's interaction with the device. However, just to be on the safe side, power off and inspect the device for proper installation.

If everything seems correct, verify that you have followed the installation procedure as described in the manufacturer's manual, have all the required software driver CDs and/or floppies on hand and switch the PC on.

If the device drivers are already installed and you are facing system instability when accessing or using the device, go to the *Using the Device Manager* section.

1.5.4 Installation of Plug and Play Devices

If the device is a new installation, Windows should detect the device at startup. One of three things can happen:

1. Windows will already have the required software device drivers

and configure the system with or without user prompts
2. Windows will prompt the user for the OS installation CDs to retrieve the required drivers
3. Windows will prompt the user to provide the location for the required drivers supplied by the device manufacturer.

This would be your cue to insert the manufacturer's CD that came with the device and point Windows to the correct driver installation file for the OS. Alternately, the manufacturer's installation guide may provide a different method for installation. Example: most USB devices require that you install the software first before connecting the device.

If Windows recognizes the device but you don't have the manufacturer's CD, there is a good chance that you can enable basic functionality by using the default Windows drivers. See the section *Installation of non-Plug and Play Devices* on how to tell Windows to use the default Windows drivers.

1.5.5 Installation of non-Plug and Play devices

If the device is not getting detected by Plug and Play during system startup, this usually means that you have a non-Plug and Play device. If you have the manufacturer's CD and/or manual, look for installation instructions. Non-Plug and Play devices are usually older, and require manual allocation of resources, usually through setting jumpers or switchers on the device itself. Once you have ensured that the device been configured as per the manufacturer's guidelines, boot up and install any software provided by the manufacturer as per the installation guidelines.

If there are no installation guidelines or the device is a second hand component with no documentation or you don't have the required software drivers, then you can try to force Windows to recognise the device. First try to verify if the physical installation and the jumper/switch settings on the device are correct. Search the Internet for information on how to do this. If you are able to do this, good; if not, don't worry

too much about it and go on to forcing Windows to recognise the device:

1. Click on the Add New Hardware (Windows 9x/ME) | Add Hardware (Windows 2000/XP) in the Control Panel. The Add Hardware Wizard will start up. Click Next.
2. If you have Windows 9x/ME go to Step 3, else go to Step 5.
3. In Windows 9x/ME, the Wizard will inform you that it is going to search for new hardware. Allow it to do so by clicking Next twice. After Windows finishes searching for Plug and Play Devices it will report that no Plug and Play devices are found.
4. Click Next. The first option tells Windows to search for non-Plug and Play devices. If it successfully detects the device, follow the on-screen instructions to complete the installation. Otherwise, select "No, I want to select the hardware from a list" and click Next. Go to Step 6.
5. In Windows 2000/XP, select "Add a new hardware device" and click Next. In the next dialog box, you can either ask Windows to search for a driver, or you can install the device manually. For manual device installation, select "Install the hardware that I manually select from a list (Advanced)".
6. Select the hardware type from the list and click Next.
7. If you know the name of the device manufacturer, select the name of the manufacturer and browse through the list on the right side to see if your device model number is listed or a generic name for your model series e.g. HP DeskJet for DeskJet printers. If you do not know the name of the manufacturer or the device model number, check if there are standard device types that you can install. If there are no standard types that can be installed, you will need to find a suitable driver by searching the Internet or getting it from other sources.
8. If the device has a standard type, choose the specification closest matching to your device. If the device does not have a standard type, click the "Have Disk..." button and provide the location for the appropriate driver installation file. Follow the on-screen instructions to complete the installation.

The above steps (for both Plug and Play and non-Plug and Play devices) should normally solve the device conflict and get your hardware operational. However, if you still face problems with the device see the section *Using Device Manager* for further troubleshooting.

1.5.6 Using Device Manager

The Device Manager utility provides a graphical view of all the hardware installed on the computer along with their associated device drivers and resources. It also acts as a central point to change any hardware settings and update associated device drivers. To access Device Manager on Windows 9x/ME, right-click My Computer and select Properties. Select the Device Manager tab. On Windows 2000/XP, right-click My Computer, select Manage, and click Device Manager in the left pane.

Device Manager will list all the hardware in the PC in a tree structure. You can view devices by device-type or by connection-type. In either view, Device Manager will list the devices causing problems. The problem devices will be listed with any of the following symbols:

- ❍ A black exclamation mark (!) in a yellow circle means that the device has a problem. *Note:* A problem-state device could still be working.
- ❍ A red "X" means the device is disabled. That is, it is physically present in the computer and is consuming resources, but does not have a driver loaded.
- ❍ A blue "i" on a white circle means that the device's "Use Automatic Settings" feature is not selected for the device, and that the resources were manually allocated, usually for non-Plug and Play devices. *Note:* This does not mean that the device is in a problem or disabled state.
- ❍ A green question mark (?) in Device Manager means that a compatible (and not the actual) driver for this device is installed, which makes it possible that all the functionality may not be available. *Note:* This applies only to Windows ME.
- ❍ A yellow question mark (?) with "Unknown Device" means that Windows has not recognised the device.

Once you've identified the device(s) with problems, double-click on the device to bring up the property page for the device. The property page or sheet has a General tab that shows the details of the device, and its current status (enabled or disabled). Depending on the type of device, there may be additional tabs such as Resources, Driver and Settings.

1.5.7 Device Manager Error Codes
Additionally, a problem code explaining the problem is displayed for the device. The next step is to understand what each of these error codes mean and apply the recommended resolution. The list of problem codes and the recommended resolution are as follows:

Code 1
Code Meaning: The device is not configured correctly.
Recommended Resolution: The software drivers for the device have been incorrectly installed or incorrectly configured. Select the Driver tab and click the Update Driver button. This will launch an update Wizard. Follow the instructions and locate the correct driver for the device to install it.

Additionally, you could try removing the device from Device Manager and reinstalling it using the Add Hardware Wizard.

Verify from the hardware documentation/manufacturer's Web site that the device will work with your OS.

Code 2
Code Meaning: (Not applicable to Windows XP) Depending on the type of device, this could indicate either a problem with the BIOS or a problem with loading the device driver.
Recommended Resolution: Check with the BIOS manufacturer for an updated BIOS. See the *BIOS* section of this guide on how to update the BIOS.

OR

Get an updated driver for the device from the manufacturer and update the device software by clicking Update Driver on the Driver tab.
AND/OR
Remove the device from Device Manager and reinstall it using the Add Hardware Wizard.

Code 3
Code Meaning: The driver is corrupt or your system is running low on memory and other resources.
Recommended Resolution: Run the Update Driver Wizard and reinstall the driver or get an updated driver from the manufacturer.
AND/OR
Close any applications using memory.
AND/OR
Add more RAM. See the chapter on Memory on how to do that.
AND/OR
Remove the device from Device Manager and reinstall it using the Add Hardware Wizard.

Code 4
Code Meaning: (Not applicable to Windows XP) One of the drivers for the device may have been corrupted, or its Windows Registry entry may be damaged.
Recommended Resolution: Check the registry by running scanregw.exe. Click **Start > Run**. Type **scanregw.exe** and hit [**Enter**]. This program will check the Registry for corruption and prompt you to restore a previous good version of the Registry if it encounters any damaged entries.
AND
Remove the device from Device Manager and reinstall it using Add Hardware Wizard.

Code 5
Code Meaning: (Not applicable to Windows XP) The device has requested a resource that Windows doesn't know how to handle.
Recommended Resolution: Run the Update Driver Wizard and rein-

stall the driver or get an updated driver from the manufacturer.
OR
Remove the device from Device Manager and reinstall it using the
Add Hardware Wizard.

Code 6
Code Meaning: (Not applicable to Windows XP) Another device is
using a resource that this device needs.
Recommended Resolution: Run msinfo32.exe to get more infor-
mation on the conflict. Check the Resources tab to get details of
the conflict. Refer to the hardware documentation and/or the man-
ufacturer's Web site for instructions on the correct values that
need to be set manually. Clear the Automatic Settings checkbox,
click the Change Setting button and input the values.
OR
Run the Update Driver Wizard and reinstall the driver or get an
updated driver from the manufacturer.
AND/OR
Remove the device from Device Manager and reinstall it using Add
Hardware Wizard.

Code 7
Code Meaning: (Not applicable to Windows XP) The drivers need to
be reinstalled.
Recommended Resolution: Run the Update Driver Wizard and rein-
stall the driver or get an updated driver from the manufacturer.
AND/OR
Remove the device from Device Manager and reinstall it using the
Add Hardware Wizard.

Code 8
Code Meaning: (Not applicable to Windows XP) Windows cannot
load the basic device loader file that loads the device driver, or it is
missing or corrupt, or a software value for the device is missing or
corrupt.
Recommended Resolution: Run the Update Driver Wizard and rein-
stall the driver or get an updated driver from the manufacturer.

AND/OR
Remove the device from Device Manager and reinstall it using the
Add Hardware Wizard.

Code 9
Code Meaning: (Not applicable to Windows XP) The BIOS is report-
ing the resources for this device incorrectly and the Windows
Registry is invalid.
Recommended Resolution: Run the Update Driver Wizard and
reinstall the driver or get an updated driver and the correct
Registry entries from the manufacturer.
AND/OR
Remove the device from Device Manager and reinstall it using the
Add Hardware Wizard.
OR (as a last resort)
Reinstall Windows.

Code 10
Code Meaning: The hardware will report the reason for failure that
Windows should display. If the hardware doesn't report the reason
for failure, Windows will say that the device is not present, not
working correctly or does not have all the required drivers
installed.
Recommended Resolution: If the failure message is present, use
that to troubleshoot the problem by referring to the documenta-
tion or manufacturer's Web site.
AND/OR
Run the Update Driver Wizard and reinstall the driver or get an
updated driver from the manufacturer.
AND/OR
Remove the device from Device Manager and reinstall it using the
Add Hardware Wizard.

Code 11
Code Meaning: (Not applicable to Windows XP) Windows stopped
responding when it tried to start the device, and hence will never
try to start this device again.

Recommended Resolution: Run the Update Driver Wizard and reinstall with an updated driver from the manufacturer.

Code 12
Code Meaning: Two devices have been assigned the same I/O port, interrupt or DMA channel. This could be by the BIOS, by Windows, or both. Also, it could be that the BIOS has not allocated enough resources for the device.
Recommended Resolution: Disable one of the devices. (Windows 9x/ME: Double-click, select "Disable in this hardware profile" on the General tab of the property sheet; Windows 2000/XP: Right-click and select Disable)
OR
Check the Resources tab to get details of the conflict. Refer to the hardware documentation and/or the manufacturer's Web site for instructions on the correct values that need to be set manually. Clear the "Automatic Settings" checkbox, click the "Change Setting" button, and input the values.
AND/OR
Reconfigure the BIOS resource allocation if possible. Refer to the motherboard documentation along with the device documentation.

Code 13
Code Meaning: (Not applicable to Windows XP) Windows did not detect the hardware.
Recommended Resolution: Verify that the hardware is working and that the physical installation is correct. Refer to the manufacturer's documentation for specific installation instructions.
AND
Remove the device from Device Manager and reinstall it using the Add Hardware Wizard.

Code 14
Code Meaning: The device cannot work properly until the system is restarted.
Recommended Resolution: Restart the computer.

Code 15
Code Meaning: (Not applicable to Windows XP) The device is causing a resource conflict.
Recommended Resolution: Run msinfo32.exe to get more information on the conflict. Check the Resources tab to get details of the conflict. Refer to the hardware documentation and/or the manufacturer's Web site for instructions on the correct values that need to be set manually. Clear the "Automatic Settings" checkbox, click the "Change Settings" button, and input the values.

Code 16
Code Meaning: The device is only partially configured and Windows could not find all the resources required by this device.
Recommended Resolution: Run msinfo32.exe to get more information on the conflict. Check the Resources tab to get details of the conflict. Refer to the hardware documentation and/or the manufacturer's Web site for instructions on the correct values that need to be set manually. Clear the "Automatic Settings" checkbox, click the "Change Settings" button, and input the values.

Code 17
Code Meaning: (Not applicable to Windows XP) The hardware is a multi-function device whose driver file is reporting invalid information on how to split the resources.
Recommended Resolution: Remove the device from Device Manager and reinstall it using the Add Hardware Wizard. Use an updated device driver if required.

Code 18
Code Meaning: The drivers for this device should be reinstalled.
Recommended Resolution: Select the driver tab and click the "Update Driver" button. Use an updated device driver if required.

Code 19
Code Meaning: A problem with the Windows Registry entry for this device was detected.
Recommended Resolution: In Windows 9x/ME/2000, run the

Registry scanner (scanreg.exe). If this does not solve the problem, run "scanreg.exe /restore". If this still does not solve the problem, remove the device and reinstall it using the Add New Hardware Wizard.

In Windows XP, run the Troubleshooting Wizard from the General tab of the Device Properties sheet. Click Uninstall and then click "Scan for hardware changes" to reinstall the device. If that doesn't solve the problem, restart the computer in Safe Mode and select "Last Known Good Configuration".

Code 20
Code Meaning: (Not applicable to Windows XP) One of the drivers for this device could not be loaded, and Windows is not able to interpret the result.
Recommended Resolution: Remove the device from Device Manager and reinstall it using the Add Hardware Wizard.

Code 21
Code Meaning: The device is being removed as it has a problem, and Windows needs to be restarted.
Recommended Resolution: Wait a few seconds and refresh the Device Manager. If the device still shows, then restart the computer.

Code 22
Code Meaning: The device has either been disabled by a user or has not started.
Recommended Resolution: Wait a few seconds and refresh the Device Manager. If the device still shows, then restart the computer. Trying enabling the device. If that is not possible, remove the device, reboot the computer and reinstall it using the Add Hardware Wizard.

Code 23
Code Meaning: (Not applicable to Windows XP) This indicates a problem with the drivers of either the primary or secondary display adaptor. The device loader program delayed loading the device and then did not inform Windows.

Recommended Resolution: Verify that the drivers for all the display adaptors on the computer are correct and updated. Remove the display adaptors and reboot. Windows will automatically detect the adaptors and configure them.

If the device is not a display adaptor, then remove the device and reinstall it using the Add Hardware Wizard.

Code 24
Code Meaning: Windows couldn't detect the device. This error may happen if the device has been set for removal.
Recommended Resolution: Verify that the hardware is working and that the physical installation is correct. Remove the device from Device Manager. Reinstall it using the Add Hardware Wizard. Update the device driver to the latest.

Code 25
Code Meaning: (Not applicable to Windows XP) The device installation has not yet been completed.
Recommended Resolution: Restart the computer. Windows may require to be reinstalled depending on whether the reboot solves the problem or not.

Code 26
Code Meaning: (Not applicable to Windows XP)
The device did not load or not all the drivers were installed.
Recommended Resolution: Remove the device from Device Manager. Reinstall using the Add Hardware Wizard.

Code 27:
Code Meaning: (Not applicable to Windows XP)
The Windows Registry entry describing the resources for this device is not valid.
Recommended Resolution: Remove the device from Device Manager. Reinstall it using the Add Hardware Wizard.

Code 28
Code Meaning: (Not applicable to Windows XP) The driver for the device was not installed correctly.
Recommended Resolution: Use the Update Driver Wizard to reinstall the driver.
AND/OR
Remove the device from Device Manager. Reinstall it using the Add Hardware Wizard.

Code 29
Code Meaning: The device has been disabled in the BIOS, or the device will not work with the version of Windows you are using.
Recommended Resolution: Enable the device in the BIOS. Refer to the motherboard documentation for details and see the BIOS section of this guide for further information.

Code 30
Code Meaning: (Not applicable to Windows XP) An IRQ that cannot be shared is being used by this device and another device driver.
Recommended Resolution: View the resource conflict in the resources tab, if available. Refer to the manufacturer's documentation for either device and change the IRQ allocation manually. You can do this by clearing the "Automatic Settings" checkbox and clicking the "Change Settings" button.

Code 31
Code Meaning: To function properly, the device depends on another device which is not functioning properly. Most likely the other device will also have a error code.
Recommended Resolution: Troubleshoot the dependant device to enable this device. If they still don't work, remove them from Device Manager and reinstall them using the Add Hardware Wizard.

Code 32
Code Meaning: (a) The installation disk/CD-ROM or network location was not accessible to install the device drivers.
(b) A driver or service for the device has been disabled.

Recommended Resolution: (a) Restart the computer. If that doesn't solve the problem, copy the installation files to the hard disk and run the setup program for the device.
(b) Remove the device from Device Manager and reinstall it using the Add Hardware Wizard.

Code 33
Code Meaning: (a) The hardware is not responding to the driver software for the device.
(b) The software that determines the resources required by the device has failed.
Recommended Resolution: (a) Obtain an updated driver from the manufacturer. Remove the device from Device Manager and reinstall it using the Add Hardware Wizard.
(b) The hardware might have failed and needs to be replaced.

Code 34
Code Meaning: The device has to be configured manually.
Recommended Resolution: Refer to the manufacturer's documentation for instructions.

Code 35
Code Meaning: The BIOS is missing a resource assignment entry for the device and needs to be updated.
Recommended Resolution: Obtain and install a new or updated BIOS from the computer manufacturer or motherboard manufacturer.

Code 36
Code Meaning: The IRQ configuration has failed.
Recommended Resolution: Refer to the motherboard documentation to see if you can change the IRQ settings in the BIOS. See the BIOS section of this guide for further information.

Code 37
Code Meaning: The driver software failed to load.
Recommended Resolution: Remove the device from Device Manager and reinstall it using the Add Hardware Wizard.

Code 38
Code Meaning: The driver software is already loaded into RAM and cannot be loaded again.
Recommended Resolution: Restart the computer.

Code 39
Code Meaning: Some or all the drivers could not be loaded as they may be corrupted or missing.
Recommended Resolution: Remove the device from Device Manager and reinstall it using the Add Hardware Wizard. Update the driver if possible.

Code 40
Code Meaning: The driver's Registry entry is either corrupted or missing.
Recommended Resolution: Remove the device from Device Manager and reinstall it using the Add Hardware Wizard. Update the driver if possible.

Code 41
Code Meaning: This usually happens when Windows cannot detect non-Plug and Play devices.
Recommended Resolution: Obtain an updated driver for the device from the manufacturer. Remove the device from Device Manager and reinstall it using the Add Hardware Wizard. Update the driver if possible.

Code 42
Code Meaning: A (system bus) driver has created duplicate entries, or a serial number is discovered in a new location before it is removed from the old location.
Recommended Resolution: Restart the computer.

Code 43
Code Meaning: One of the drivers controlling the device notified Windows that the hardware has failed in some manner, and Windows stopped the device.
Recommended Resolution: Refer to the hardware documentation or the manufacturer's Web site to resolve this error.

Code 44
Code Meaning: A software program or system service has shut down the hardware.
Recommended Resolution: Restart the computer.

Code 45
Code Meaning: The hardware is not connected to the computer. This error is reported when the computer is set to show all devices previously connected to the computer.
Recommended Resolution: Reconnect the hardware or ignore the error. No resolution is necessary.

Code 46
Code Meaning: Windows is not able to access the device as the system is shutting down.
Recommended Resolution: The device should work correctly when the computer restarts.

Code 47
Code Meaning: The device has been prepared for safe removal either by unplugging or pressing an eject button.
Recommended Resolution: Unplug or eject the device and then plug it or insert it back in to bring the device back online. *Note:* Restarting the computer also brings the device back online.

Code 48
Code Meaning: The driver for the device is known to have problems with Windows.
Recommended Resolution: Obtain an updated driver from the device manufacturer and update the driver.

Code 49

Code Meaning: The system hive of the Windows registry has reached its maximum limit and new devices cannot work until the size is reduced.

Recommended Resolution: The system hive contains configuration for the entire computer. Uninstall all device drivers that are no longer in use to reduce the size of the system hive.

1.5.8 Troubleshooting unknown devices in Device Manager (Those with a yellow question mark)

There are many reasons that a Device Manager will list a device as unknown and hence, there is no foolproof way to troubleshoot the error. Some of the causes for Unknown Device error are:

❍ The hardware does not have the requisite software drivers, and Windows is not able to determine the device type
❍ The driver is not compatible with the OS and hence it is not able to inform Windows about the hardware. This is common if a Windows 9x/ME driver is installed on Windows 2000/XP.
❍ Each hardware component should normally communicate a basic device ID to Windows. If the hardware does not have this device ID or Windows does not recognise the device ID of the hardware, then the device is listed as unknown.
❍ Programs can also install virtual devices. Usually, these virtual devices act as a bridge between the software and some hardware function. Sometimes, device driver software for hardware is installed in a non-standard way. When the hardware along with driver software is removed, all the entries in the Registry are not-deleted.

First, boot the computer into Safe Mode. If the device is no longer listed in Device Manager, then most likely it was a virtual device driver. Next, check the programs loaded at system startup (Start > Programs > Startup). By trial and error, disable each program till you identify the software that is causing the device to be unknown. Uninstall and reinstall the software. If these steps do not work, or if you suspect that the problem is hardware-related, remove hardware devices from your comput-

er one at a time until Device Manager no longer lists the unknown device. Or, if you know what hardware is causing the error, verify that the hardware is working and that you have all the correct and updated drivers for the OS. Install the drivers through the Add Hardware Wizard.

1.6 Troubleshooting the Blue Screen Of Death

One of the most dreaded error messages for a Windows user is the blue screen, or the Blue Screen of Death (BSOD) as it is popularly known, which suddenly pops up informing you that something is seriously wrong with Windows. What this screen essentially means is that Windows has crashed and needs to reboot to recover. Usually, you will be able to recover and continue without any problems, but it can sometimes be a hair-raising experience—like when you're pressed for time and have to get that PowerPoint presentation ready for your boss!

Windows 9x/ME
In Windows 9x/ME this error is less serious but more common. You can usually recover from the error by simply pressing [Ctrl] + [Alt] + [Del] and restarting the computer, or by switching off the PC and switching it back on. However, the error message will contain very little information that you can use in troubleshooting.

1.6.1 Problems causing the BSOD
The BSOD is the main way for virtual device drivers to report a problem. The error description will state that Windows faced a problem (exception) at a particular memory address (a portion of the RAM) in a certain file, usually with the prefix VxD (virtual device driver), or the file name may have the DLL extension. At the minimum, it indicates that there was a problem with that particular file. Typically, this may have been caused by some action of the user that Windows does not allow—like accessing a document from a floppy and then removing the floppy before closing document. In other cases it may indicate that there is a problem with a

particular software or hardware. If the BSOD repeats with the same message, then there is potentially something seriously wrong, and you should investigate further.

1.6.2 The basic approach

Use the file name in the error message to give you a clue as to what is causing the problem. Search the hard disk for the filename and look at the folder in which the file is located to give you an idea of which software program or hardware uses this file. Also search the Internet for any information on this file. Once you have identified the software or hardware associated with the filename, uninstall or remove the software or hardware. Verify that the software or hardware, as the case may be, is compatible with your version of Windows. Get updates if applicable and reinstall it. Also, see the Troubleshooting Startup, Shutdown and Power Management sections in this guide.

1.6.2.1 System Restore in Windows ME and Windows XP

In addition to the above, Windows ME/XP provides the extremely useful System Restore tool. System Restore takes daily snapshots of the system state—every 10 hours the system is on and every 24 hours of real-time. The snapshot contains all the information required to restore the system to that particular point in time. To restore the system to a previous point in time do the following:

❍ Go to Start > Programs > Accessories > System Tools > System Restore.
❍ Choose "Restore my computer to an earlier time" and click Next.
❍ On the calendar on the left, choose the last day you remember that Windows operated without problems. On the right, choose the Restore Point description; if there are multiple restore points that day, choose the one you're most certain about or choose the latest time. Click Next.
❍ Make sure you've closed all open files and running programs, and click OK.
❍ The system will roll back to the settings of that restore point and you can continue working normally.

1.6.2.2 Windows 2000/XP

Error reporting in Windows 2000/XP is more robust, nevertheless,

when you get a BSOD, it is just as mysterious at first glance. The "Windows Stop Message", which is the official name for the BSOD, occurs when Windows encounters a problem from which it cannot recover. At this moment Windows stops and displays the error message shown on the screen.

System Restore in Windows ME

Additionally, the contents of the system memory are dumped to a file. This memory dump file can be analysed by competent support technicians to troubleshoot the problem in depth. All the stop errors are numbered according to the circumstances that caused the error. This is a big step up from Windows 9x/ME, where the stop errors were more generalised and hence were much more difficult to troubleshoot.

1.6.3 Problems causing the BSOD

The BSODs are generally associated with five problems faced by Windows:

The BSOD in Windows 2000

❍ Software or device drivers may have a problem
❍ A hardware device is malfunctioning, or was removed while Windows was running, or does not fully support Windows. On older machines, outdated BIOS information can also cause errors.

The BSOD in Windows XP

❍ Hardware or hard disk errors during installation of Windows.
❍ Corrupted startup files, hardware and driver software during Windows startup can also be the cause. This type of error will always require troubleshooting before Windows can start up normally.
❍ Intermittent errors that appear randomly. These can be caused by an overheating processor, a defective memory system, a dying or dead hard disk, or faulty software and device drivers.
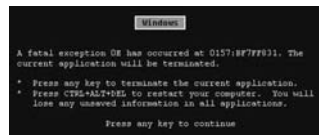
1.6.4 Possible solutions to the BSOD

When a BSOD occurs, the first step is to note down the Stop number, the 'friendly name' of the error and also the name of the file that is reported as the cause of the problem. The Stop number will be in hexadecimal format—something like this:

STOP : 0x0000000A (0xDB000000, 0x00000001, 0x00000002, 0xB04FB0DB)

The friendly name will be something like this:

IRQL_NOT_LESS_OR_EQUAL

If the error comes up very briefly, before you can note it down, and the system restarts, you will need to change a setting to tell Windows not to automatically reboot. Right-click My Computer, select the Advanced tab, and click "Startup and Recovery", in Windows 2000, clear the "Automatically Reboot" checkbox. In Windows XP, click Settings and clear the "Automatic Restart" checkbox. This, of course, assumes that Windows has rebooted normally and you are able to change the setting.

If you are not able to boot normally, restart Windows and press [F8] repeatedly during the POST cycle. This will take you to the Advanced Options menu. Choose Safe Mode. Windows will attempt to load with a minimum set of drivers. If Windows is able to boot into Safe Mode, this most likely means that the problem is with a particular software, and is not hardware-related. If Windows is not able to boot into Safe Mode, restart the computer, bring up the Advanced Options screen (by pressing [F8] during POST) and select "Last Known Good Configuration". Windows will then attempt to load the last settings where everything worked normally. If that doesn't work, then it most likely means you have a serious hardware or critical startup system file error. If this error has occurred after any recent hardware additions, remove the hardware and try to boot again.

If you are able to boot into Safe Mode, first perform a virus and spyware scan using a tool such as Norton AntiVirus and Spybot S&D. Uninstall any recently added software, and remove or roll back any updated device drivers. (To roll back device drivers, go to the Properties page of the device in Device Manager, select the Driver tab, and click Roll Back Driver). In XP, you can perform one additional step—running System Restore, as explained above for Windows ME.

Restart the computer normally and check if the problem recurs. If it is an intermittent problem, and occurs at random, you can note down the error number the next time it occurs, since you disabled Automatic Restart after a crash. Boot into Safe Mode and see if you get the same random error. If you do, then the problem is likely hardware-related. Resolve the issue by following the hardware troubleshooting steps explained below. If the error only occurs in normal mode, then it is likely a software problem. Follow the steps for software and device driver troubleshooting described below.

Look in Device Manager and troubleshoot any hardware device conflicts as explained in the *Troubleshooting Hardware Device Conflicts in Windows* section. You can remove or disable the device, or roll back its driver to a previous version.

If the BSOD is caused by a faulty program that crashes Windows at system startup, you can disable the software from starting up by using msconfig.exe. Type Start > Run, type in "msconfig" and press [Enter]. Select the Startup tab and disable any or all software you think may be the ones causing the problem. Better still, you could disable all the software in the list, enable them one at a time, and reboot the computer to identify the offending software.

If the BSOD is caused by faulty hardware, remove any recently added hardware—after switching off the PC, of course! If the BSOD still occurs, or there are no newly added hardware, test the RAM for errors by using a memory diagnostic program such as Windows Memory Diagnostic (http://oca.microsoft.com/en/windiag.asp). See the *Memory* section of this guide for further information. If the

diagnostic reports errors, then you've found the culprit. Replace the defective RAM.

If the BSOD is due to corrupt system startup files, you can repair Windows by performing a Repair Install. Boot the PC from the Windows installation CD, press [Enter] to set up Windows XP, press [F8] to accept the license agreement, and then press [R] to start the Repair Installation. Windows will reinstall all the system files and redetect all the hardware. *Note:* You will have to visit the Windows Update site to reinstall any patches and Service Packs, since the repair installation will remove them.

If you are still getting BSODs, switch off the PC, open the cabinet and remove all but the essential hardware: the mouse, keyboard, hard disk, CD-ROM, display card and RAM, along with the PSU and processor of course! Now, first attempt booting into Safe Mode, and if that works, reboot normally. If you are successful, the problem is with one of the peripheral devices. Add all the peripherals back one by one till you get a BSOD again—the last added peripheral is the culprit.

If you are getting BSODs during installation, then the problem could be with the RAM, hard disk, processor, or one of the peripherals. Test the RAM using a memory diagnostic tool as described above, check the hard disk for errors (most hard disk manufacturers provide software utilities that can diagnose errors), verify that the CPU is not overheating by following the instructions in the Motherboard section of this guide, and remove all peripherals and run the installation with the minimum configuration as described above. If the installation is successful, you can troubleshoot the rest of the hardware devices from within Windows.

1.6.5 Common Stop Message error codes and suggested resolutions

These are some of the most common Stop Messages along with their cause and suggested resolution:

Stop Code: STOP 0x0000000A
               IRQL_NOT_LESS_EQUAL
Code Meaning : Faulty device drivers, or services from backup utilities or virus scanners
Recommended Resolution: Remove, disable or stop the offending drivers, backup utilities or anti-virus programs. Get updated software from the manufacturer.

Stop Code: STOP 0x0000001E
               KMODE_EXCEPTION_NOT_HANDLED
Code Meaning: Some driver files may be causing a problem.
Recommended Resolution: Remove, disable or update the driver-file listed in the error message. Verify if new hardware installation is correct.

Stop Code: STOP 0x00000024
               NTFS_FILE_SYSTEM
Code Meaning: Usually caused by disk corruption in the NTFS file system or third-party disk defragmenters.
Recommended Resolution: Use hard disk diagnostic software to verify that the hard disk is working. Remember to always Use Microsoft-certified disk defragmenters.

Stop Code: STOP 0x0000002E
               DATA_BUS_ERROR
Code Meaning: Caused by a parity error in the system memory. Almost always caused by hardware problems—a configuration issue, defective hardware, or incompatible hardware.
Recommended Resolution: If physical RAM was recently added to the system, remove it and see if the error still occurs. If the error persists, try disabling memory caching in the BIOS. Else remove, repair or reinstall the defective hardware.

Stop Code: STOP 0x00000050
               PAGE_FAULT_IN_NONPAGED_AREA
Code Meaning : Caused when requested data is not found in memory; the system checks the page file, but the missing data is

identified as unable to be written to the page file

Recommended Resolution: Remove any newly-added hardware or run diagnostic software supplied by the manufacturer to check if the component has failed. Install updated device drivers or roll back to a previous driver.

Stop Code: STOP 0x0000007B
                INACCESSIBLE_BOOT_DEVICE

Code Meaning: Caused when Windows loses access to the system partition during the Startup process. This can be caused by: an incorrect driver for a SCSI, RAID, or UDMA IDE controller; incorrect ARC path in the Boot.ini; or a failed boot device.

Recommended Resolution: Verify that the disk storage device is installed correctly and working. Reinstall or update the device driver. Verify that the BIOS setting for the device is correct. Verify the integrity of the hard disk.

Stop Code: STOP 0x0000007F
                UNEXPECTED_KERNEL_MODE_TRAP

Code Meaning: Caused when the CPU generates an error that the kernel does not catch. Usually hardware related—especially RAM. Can also be caused by CPU overclocking, or defective components on the motherboard.

Recommended Resolution:
1. Run the memory diagnostic to test RAM.
2. Restore overclocked settings to previous values.
3. Repair/replace the motherboard.
4. Disable sync negotiation in SCSI BIOS; check SCSI termination.

Stop Code: STOP 0x000000D1
                DRIVER_IRQL_NOT_LESS_OR_EQUAL

Code Meaning: Occurs when the system attempts to access pageable memory at a process IRQL that is too high

Recommended Resolution: Very similar to STOP 0xA. Remove, disable or stop the offending drivers, backup utilities or anti-virus programs. Get updated software from the manufacturer.

Stop Code: STOP 0xC000021A
STATUS_SYSTEM_PROCESS_TERMINATED
Code Meaning: Caused when the user-mode subsystem (Winlogon or CSRSS) is fatally compromised and security cannot be guaranteed. The most common causes are third-party applications or mismatched system files.
Recommended Resolution:
1. Remove, disable, or roll back any newly-installed device driver.
2. Uninstall any newly-installed software.
3. Use Windows-compatible backup/restore programs.
4. Restore full control permissions to the local SECURITY account on the systemroot folder by doing a fresh parallel installation of Windows on a separate partition.

1.7 Upgrading from Windows 98 to Windows XP

If you are currently running Windows 98/ME and are thinking of upgrading to Windows XP, this section will provide you with the know-how. Upgrading from Windows 98/ME is not without its dangers. You will need to prepare for it to avoid running into problems and damaging your existing Windows installation. Actually, calling it an upgrade is a bit of a misnomer; what happens is that Windows XP examines your system, moves all the personalised settings to a backup location, installs a fresh copy of Windows XP and copies back all the personalised settings to new locations. Also, it makes a backup of the previous version of Windows so you can uninstall XP and go back if anything goes wrong.

The activities that need to be carried out can be classified into the following stages:

❍ Pre upgrade
❍ Upgrade
❍ Post Upgrade

Let's look at the steps involved look at each stage.

1.7.1 The pre-upgrade stage

1. Verify the minimum requirements for the hardware and system configuration.
While Microsoft's official recommendation is for a 300 MHz Pentium processor with 128 MB of RAM, experts and practical experience suggest you should at least have a Pentium III 500 MHz processor with at least 256 MB of RAM. Otherwise, Windows XP will be sluggish. In addition, you should have at least 1 or 2 GB of free hard disk space on your primary partition (the C: drive in most cases), an SVGA monitor that can support a screen resolution of 800 x 600 or higher, a display card, a sound card, a modem, and a CD or DVD drive. The sound card and modem are not essential, but you will want to connect to the Internet and update XP with all the latest patches once installation is complete, so a modem is required sooner or later. The sound card is preferable for your audio feedback (XP Setup sounds and music) at different stages of the setup process.

2. Which file system?
During setup, XP will ask you if you want to convert to NTFS from FAT/FAT32. FAT or FAT32 is the file system on which Windows 98/ME runs. NTFS is a newer, more robust file system used by both Windows 2000 and XP. Be warned, however, that this is a one-way street. If you convert to NTFS, you cannot convert back to FAT, and if you want to make your system a dual-boot, i.e. you want to be able to boot into either XP or Windows 98/ME, you will not be able to log into Windows 98/ME. The same goes if you want to uninstall XP and revert to your previous Windows version after converting to NTFS.

During setup, it is best to leave it as FAT32, and later, after you have stopped relying on Windows 98/ME completely, you can convert from FAT32 to NTFS. In Windows XP, open a command prompt and type in "convert/?" to get details of the FAT32 to NTFS conversion process.

3. Hard disk clean-up
Run Scandisk and Disk Defragmenter. This will clean up the hard disk for the installation.

4. Run Upgrade Advisor
The Upgrade Advisor is an excellent tool that will test your system's hardware and software compatibility with Windows XP. It is the same tool that runs during the XP Setup, but since you are running it independently, it will give you a report that will help you prepare for the upgrade. It is nearly 32 MB, in size and can be downloaded from www.microsoft.com/windowsxp/pro/howto-buy/upgrading/advisor.asp.

Once you've verified and are satisfied about the compatibility of your hardware and software, you can start the upgrade.

1.7.2 Upgrading to Windows XP
1. Insert the CD-ROM and select "Install Windows XP."

2. Close all running applications such as virus scanners, spyware scanners, etc.

3. Choose an installation type. You can either upgrade or do a clean install. The clean install will either overwrite the existing OS or create a dual-boot system where you can select to either log in to XP or your previous Windows version at system startup. If you're opting for a dual-boot, don't forget to retain your FAT/FAT32 file system. We assume you're opting for an in-place upgrade, so choose "Upgrade (Recommended)" and click next.

4. Accept the license agreement and enter the product key in the next screen.

5. This step duplicates the Upgrade Advisor and verifies the hardware and software compatibility. Review the report and proceed if you are satisfied, else cancel the installation and rectify the problems identified by the Upgrade Advisor.

Running The Upgrade Advisor

The first screen is basic information about the Advisor

In this screen, you are asked if you want to connect to the Internet and get the latest compatibility updates

More information on compatibility

Even more information on compatibility, informing you about the report categories

Upgrade Advisor connects to the Internet and downloads the latest compatibility information updates

The advisor examines the system against the latest compatibility list

The upgrade report lists all the software and hardware with problems and requiring either replacement or XP-compatible updates.
Save this report and review it to determine which hardware and software requires replacement or upgrades

You can also visit the Windows Catalog Web site to get a list of hardware and software that will work with Windows

6. If you are connected to the Internet, Setup will ask you if it can get updated setup files over the Internet. It is strongly recommended to accept this, as you will get all the latest critical updates and driver updates.

7. Windows XP Setup will be updated. It will copy some files to the hard disk and reboot. On reboot, if you see a message to press any key to boot from the CD-ROM, ignore it. Setup has configured itself to run from the hard disk.

8. Setup will copy more files and reboot again. Ignore the message to press any key to boot from the CD.

9. Setup installs devices and the network, and then copies files and configures the rest of the files needed to install XP.

10. Finally, program and system settings are upgraded, temporary files are removed, and the system reboots again.

11. The first time XP boots, you are presented with the option of connecting to the Internet, activating Windows and optionally registering. You are then presented with the XP desktop.

1.7.3 Post-Upgrade Tasks

1. Testing Installed Software

Check all your software programs to see if they are working. If any are not, try reinstalling the application or visit the software vendor's Web site to get XP updates for the program. If they still don't work, go to "Fixing a problem" in the "Help and Support Center" to get help in solving application and software problems.

2. Testing Installed Hardware

Check if all the hardware is working. Right-click on My Computer, and go to Properties > Hardware, and click on Device Manager. See if there are any problematic devices; double-click to see the properties page and the error code. See the *Troubleshooting Hardware Device Conflicts in Windows* section of this guide to understand what the Device Manager error codes mean, and their possible resolution. Update the drivers as applicable by right-clicking on the problematic device and selecting Update Driver. Leave the XP setup CD in the drive and try the option "Install the software automatically (Recommended)". If that doesn't work, get the updated Windows XP driver from the manufacturer. If that fails, go to "Fixing a problem" in the "Help and Support Center" to get help in solving application and software problems.

3. Run Windows Update

Update your installation of Windows XP with all the patches, other updates, and service packs by connecting to the Windows Update site.

4. Defragment your hard disk

The upgrade would have made your system files heavily fragmented. Open My Computer, right-click the installation drive (usually C:), select Properties, click on the Tools tab, and select "Defragment Now".

5. Customise

Further customise the system—wallpapers, screensavers, etc. You are now ready to use Windows XP!

Use Windows XP for a few weeks to verify that everything is working correctly. Once this is confirmed, go to Add or Remove Programs. Remove the option to revert to your old system. This will save on disk space, but be warned that there is no going back to your previous OS once you remove it.

1.8 Troubleshooting Startup And Shutdown Problems In XP

In the Windows family of operating systems, XP is by far the most reliable. Still, it's not without its problems, and there are chances of things going wrong. Startup and shutdown troubles are mostly due to incompatible hardware and software. Before getting down to troubleshooting, it is advisable to make sure your system has all the latest hardware device driver updates, patches and software programs updates that are XP-specific. At the minimum, you should run Windows Update and download all the latest patches. If you are not sure whether there is an update required for any device or software program, and are not sure where to start looking, don't worry—let's get on with the troubleshooting. We will eventually stumble across the offending device or program.

1.8.1 Troubleshooting startup problems

There are many sources of problems that could give you Startup troubles. These include (but are not limited to): defective, incompatible, or incorrectly configured hardware, incompatible (software) device drivers, or a recently installed program.

▶ **Problem**: Your screen remains blank when you switch on the PC.
Cause: That you are not able to even get the BIOS POST screen indicates a problem with basic hardware.
Solution: Look at the other sections in this guide. Work through the PSU, video card, and motherboard troubleshooting sections before checking the other components.

▶ **Problem**: After the POST screen, the system hangs.
Cause: Again, more hardware related problems. This time the culprit could be the video card.
Solution: Work through the video card troubleshooting section before checking the other components.

▶ **Problem**: Your XP computer stops responding at startup.
Cause 1: A device driver or a recently installed software or service is stopping Windows from booting up normally. There has been a corruption in the Windows registry.
Solution 1a: Restart the computer and log into XP in Safe Mode. Open Device Manager and look for any problematic devices. Ensure that any jumper settings on the hardware are properly set. If the hardware is properly configured and you are still facing the problem, then it may mean that the device driver for the hardware needs to be updated. Remove the device through Device Manager and reboot normally. Obtain the updated device drivers for the hardware (through the Internet, a CD, etc.). Run the Add Hardware Wizard and reinstall the device drivers.
Solution 1b: Reboot the computer in Safe Mode. If the problem is not related to hardware, or you don't see any problematic devices in Device Manager, run the System Restore utility to roll back the computer to a previous time when you know it was working normally.
Solution 1c: If System Restore doesn't get your computer to start normally, get to the Windows Advanced Options menu and select "Last Known Good Configuration (your most recent settings that worked)". Windows XP will start the computer using the Registry information from the last shutdown.
Solution 1d: If the Last Known Good Configuration does not work, then your final course of action is to do an in-place upgrade. Run the Windows XP Setup program from your installation CD. Refer to the *Upgrading Windows XP from Windows 98* section of this guide. The steps are similar.
Solution 1e: If you suspect that a recently installed system service is causing this problem, stop the service by following the steps outlined earlier.

Cause 2: The BIOS settings are incorrect.

Solution 2: Restart the computer and enter the BIOS setup screen. If you have changed any settings, restore them to the previous values. If you are not sure about the previous values or haven't changed the settings, select the Load Fail-safe Defaults (this could also be "Factory Defaults", "BIOS Setup Defaults", etc.) option and reboot.

Cause 3: There might be a hard disk failure or data corruption in the boot records

Solution 3: Insert the Windows XP installation CD and restart the computer. On the "Welcome to Setup" screen, press [R] to start the Recovery Console. You will be prompted for the administrator password. Type in the password, or if the password is blank, hit [Enter]. At the command prompt, type in "chkdsk". This will run the Checkdisk utility that will scan the hard disk for any faults. Checkdisk may report a hardware failure or errors on your disk. If it does, it is best to take your PC to a repair professional.

▶ **Problem**: You receive an error message when Windows XP starts.

Cause: A recently installed file or service or software program is incompatible with Windows XP and is preventing it from starting. Look carefully at the error message. If a file or service name is referred to in the error message, then you can troubleshoot by either clean booting or by stopping the service.

Solution 1a: To perform a clean boot in Windows XP, use the following steps:

1. Start the system configuration tool by going to Start > Run, typing in "msconfig", and pressing [Enter]
2. Click Selective Startup and clear the following checkboxes: "Process System.ini File", "Process Win.ini File", and "Load Startup Items".
3. Select the Services tab and click the "Hide All Microsoft Services" checkbox, and then select "Disable All".
4. Click OK and then "Restart" to restart your system.
5. When Windows restarts, if the error doesn't occur, re-open "msconfig" and check the "Process System.ini File" checkbox,

click OK and restart your computer. If the error returns, you know that the problem is with one of the System.ini entries. If the error doesn't occur, progressively enable the remaining checkboxes ("Process Win.ini File", "Load Startup Items", and "Load System Services"). Restart the computer after you enable each checkbox till the error occurs again.

6. Once you have identified the area in which the error occurs, disable the entry or stop/disable the service as the case may be.

Solution 1b: If you are unable to perform a clean boot to troubleshoot the problem and you know the name of the service, then start the Recovery Console as explained earlier. From the command prompt, change to the System32 folder. Type in "listsvc" at the command prompt in the System32 folder. A list of all services on your computer will be displayed. Locate the service name that is causing the error. Type "disable <servicename>" and press [Enter].

The computer will print a message listing the "start type" that is being shut down. Note it down in case you need to re-enable the service. Type "exit" and allow the computer to restart normally.

Solution 1c: If you recently installed a program that is causing this error, remove the program. If the program is not listed in the Add/Remove list, you'll have to visit the developer's Web site for instructions on how to remove the program.

▶ **Problem**: After an upgrade, programs that loaded during start up do not start.
Cause: This symptom is noticed when you log in for the first time after upgrading from Windows 98 or ME. Windows XP will remove all programs from the startup list, which it 'feels' are not compatible.
Solution: Click Start > Run, type in "msconfig" and press [Enter]. Click the Startup tab. Select the "Restore Startup Programs" option and click OK. Restart the computer. (This option won't be available if Windows XP Setup did not disable any startup programs.)

1.8.2 Troubleshooting Shutdown Problems

▶ **Problem:** When you click on "Shut down", XP reboots!

Cause: Windows XP, by default, is configured to restart in case of an error. This behavior may occur if an error is generated during the shutdown process. It could be either hardware or a software problem.

Solution: Disable Automatic Restart. Right-click My Computer. Select Properties > Advanced > Settings > Startup and Recovery. Clear the "Automatically Restart" check-box. Shut down the computer and see if you get an error message or a BSOD. Follow the troubleshooting steps explained earlier in the *BSOD* section of this guide. If there is no error message or BSOD, check your hardware. Some of the most common culprits are CD-Writing software suites (Roxio, Nero, etc.), some specialty keyboards such as Internet keyboards, USB devices, and power management settings. Check the drivers for all the hardware devices and update them if possible. Unplug the hardware devices one by one and go through the shutdown process to isolate the device. Check the power management settings and switch to the "Always On" option. Troubleshoot problems with Windows system services as explained earlier in this chapter.

> **Tip**
>
> Disabling the wrong service will cause further problems so be sure of the service you wish to disable. If you wish to re-enable a service from Recovery Console type "enable <service-name_ type>". Here, service-name_type should be the same type that was showed on your screen when you shut down the service.

▶ **Problem:** The system hangs at the "Saving your settings" screen.

Cause: This is a known issue in older XP releases, and can be patched by upgrading to Service Pack 1. Also, some software drivers "lock" during the shutdown process, preventing Windows XP from shutting down completely.

Solution: Upgrade your system to at least Service Pack 1. Update the

device drivers. If the problem persists, uninstall problematic devices through Device Manager and all their associated software, and restart the computer. Windows XP will auto-detect the hardware and ask you to provide the location for the software drivers. Specify the location of the new drivers and let Windows complete the installation. Some devices may require a firmware update. See the *Updating the BIOS* section of this guide to understand the general principles on how it is done. Refer to the manufacturer's Web site for details on the exact steps to be followed.

▸ **Problem**: A BSOD during shutdown.

Cause: This is most likely a problem with the hardware; it may also be caused by rogue software or problems with system services.

Solution: Note down the stop message error code and the friendly name. Refer to the *Troubleshooting BSODs* section for general principles on how to troubleshoot the problem. Troubleshoot problems with Windows system services as explained earlier in this chapter.

▸ **Problem**: Shutdown is very slow.

Cause: Windows is waiting for all running programs and services to stop before shutting down.

Solution: In XP, many programs (including Windows itself) install services that run in the background, waiting for some action from the user. Some of these may take a long time to shut themselves down after receiving the Shutdown command from Windows. Identifying the service or services causing this problem will mostly be a trial and error process. If you have installed some software recently it might have a service that is slow in exiting and is delaying the shutdown process.

To find out the list of services that are running on your system, click Start > Run, type in "services.msc" and click OK. This launches the Services Manager. Look through the list and identify any services related to software you have recently installed.

Stop the services one at a time and shut down the system till you identify the offending service. Restart all the other services and shutdown again just to make doubly sure you've stopped the right service. *Note:* Ensure that you don't stop any Windows systems services and other essential services. Stopping critical and essential services will cause more problems. Also, you should be aware that if you stop a service related to any software you have installed, that particular software may not function correctly or not function at all. Check the vendor's Web site for more details on the issue and any updates to correct it.

The BIOS

The BIOS is a dark and dangerous world, where a wrong setting can toast your OS, cook a hardware component, melt your motherboard and leave you with a lump of electronics looking at you in silent baleful accusation: "You killed me!" That said, it is not so easy to damage your system through the BIOS—but only if you're careful. Messing around with the BIOS requires patience first and patience last! You also definitely need to understand what you are doing when you're changing any setting. Scared already? OK, pay attention now...

2.1 The BIOS: What is it?

The BIOS (Basic Input/Output System) is the software code that first runs when the PC powers on. It contains all the information necessary to initialise nearly all the hardware components of the PC. Normally, when you switch on the PC, the BIOS performs a Power on Self Test, or POST as it is called. This is a series of diagnostic tests on the RAM and other hardware. It also initialises all the hardware devices such as the hard disk, memory, video and other hardware, identifies and reserves memory addresses for all the IRQs and ports available on the motherboard, and calls a small operating system program known as the boot loader. The boot loader, using the BIOS information amongst other things, starts calling the programs that will load the OS. And finally, the OS uses the BIOS information to take control over the hardware devices.

Motherboard manufacturers use the BIOS to define settings for the various hardware components including the hard disk, RAM, CD-ROMs, I/O ports etc. These are generally set at the factory and are what is called the Factory Settings or the BIOS Setup Default Settings.

EFI—The End of BIOS?

The BIOS as we know it is well over 20 years old, and has changed little since it was first introduced. In early 2000, Intel indicated that this was about to change with the release of the first version of the Extensible Firmware Interface (EFI). The EFI is a tiny operating system that has its own basic networking, graphics, keyboard and storage handling software. It will allow hardware vendors to create OS-independent device drivers. This means that whatever the operating system, your hardware device would work, at least theoretically, without you having to install specific drivers. Bye bye to Device Manager hell? It's still too early to say. Windows Vista will be the first Windows version to offer native EFI support, and hardware vendors have been reluctant to include EFI due to lack of mainstream (read Windows!) demand.

The BIOS software code and all the settings for the PC are stored on a memory chip that's continuously supplied with power by a battery. The battery also powers a real-time clock that keeps accurate time. Hence, these settings (and time values) are retained even when the power is switched off.

Motherboard manufacturers and BIOS vendors frequently release updates, which can be "flashed" to the BIOS. In some troubleshooting cases, your only option is to update the BIOS. Look later in this section to learn how.

To enter the BIOS setup, you'll need to press [Delete], or something similar, when your computer is booting up. Depending on the PC, the key may be different–[Esc], [F1], [F10], etc.

2.2 BIOS Beep Codes

When your system has a problem that won't let it start up properly, the first thing you will hear is warning beeps. These could be because of hardware or even because of the BIOS itself.

Unfortunately, beep codes are not standardised across BIOS vendors and motherboard manufacturers. Below are mentioned the beep codes, along with the possible problem that could be causing the beep, and some suggestions towards resolution. These are for two popular BIOS vendors—AMI and Award. If your BIOS is from any other vendor, you will need to refer to the motherboard manufacturer's or the BIOS vendor's manual for details.

Also, motherboard manufacturers may modify the beep codes to their convenience and not maintain consistency. Keep an open mind when you decipher the beep, and don't get into a tizzy if the codes don't match what is in here or in the BIOS vendor's manual! You should always try and contact the manufacturer to get the correct beep codes.

2.2.1 AMIBIOS (American Megatrends Inc.)

One beep: RAM failure
Problem: Motherboard problem or failed RAM.
Solution: Troubleshoot the motherboard and/or the RAM.

Two beeps: Parity Circuit Failure
Problem: Motherboard problem or failed RAM.
Solution: Troubleshoot the motherboard and/or the RAM.

Three beeps: Base 64K RAM failure
Problem: There is a failure within the first 64K of memory.
Solution: Troubleshoot the motherboard and/or the RAM.

Four beeps: System Timer Failure
Problem: One or more of the system timers on the motherboard has failed; usually indicates motherboard failure.
Solution: Troubleshoot the motherboard. You may need to replace it.

Five beeps: Processor Failure
Problem: The processor is generating an error condition. This does not mean that the processor is not working—with a dead processor, the computer won't boot at all.
Solution: Check if the processor is overheating, and whether it is set correctly on the motherboard. Troubleshoot the motherboard.

Six beeps: Keyboard controller or gate A20 failure
Problem: Keyboard, keyboard controller or motherboard error.
Solution: Check if the keyboard is connected properly. Use another keyboard to see if the problem persists. If it does, look for the keyboard controller chip on the motherboard and see if it is seated properly and that it is not damaged. If the problem continues, troubleshoot the motherboard.

Seven beeps: Virtual mode exception error
Problem: This error is reported when testing the processor's virtual mode.
Solution: Troubleshoot the motherboard/processor. Verify that

all jumpers are properly configured.

Eight beeps: Display memory read/write failure
Problem: The BIOS is not able to read/write the display card's memory.
Solution: Troubleshoot the motherboard and/or display card.

Nine beeps: BIOS' ROM checksum failure
Problem: The BIOS CMOS chip is most likely defective. May also be a problem with the motherboard.
Solution: The CMOS chip can be replaced, but replacing the motherboard is simpler and more cost-effective.

10 beeps: CMOS shutdown register read/write error
Problem: A motherboard component is creating an error when interacting with the CMOS.
Solution: Troubleshoot the motherboard and verify that all components are properly set up and configured.

11 beeps: Cache memory error
Problem: There is an problem with the processor's L2 cache.
Solution: Verify that the L2 cache chip is inserted correctly. Verify that all connections inside the PC are correct. Replace the cache module if the problem persists.

Continuous beeps: Video / Memory problem
Problem: A problem with the RAM, display card or motherboard.
Solution: Troubleshoot the RAM first, followed by the display card and then the motherboard.

Other beeps: Check motherboard manual
Problem: Check the motherboard manual or the vendor's Web site for more information. Treat it as a motherboard problem.
Solution: Troubleshoot the motherboard.

2.2.2 Award BIOS
Award has the least number of documented beep codes. They pre-

fer to display an error message on the screen. Beep codes are used only if the BIOS can't access the display subsystem.

One long beep: Memory problem
Problem: A problem with the memory or motherboard
Solution: Troubleshoot the memory and the motherboard

One long and two short beeps: Video error
Problem: The BIOS is not able to access the video sub-system
Solution: Troubleshoot the video card, and if the problem persists, go on to the motherboard.

One long and three short beeps: Video error
Problem: The BIOS is not able to access the video sub-system
Solution: Troubleshoot the video card, and the if problem persists, go on to the motherboard.

Continuous beeps: Video / memory problem
Problem: There is a problem with the RAM, display card or motherboard.
Solution: Troubleshoot the RAM first, followed by the display card and then the motherboard.

Other beeps: Check the motherboard manual
Problem: Check the motherboard manual or the vendor's Web site for more information. Treat it as a motherboard problem.
Solution: Check the motherboard manual. Troubleshoot the motherboard.

2.3 General BIOS Problems

▶ **Problem**: The BIOS fails to detect the hard disk(s), CD-ROM, floppy drive, etc.

Cause: All of a sudden, hard drives and floppies disappear from the list of devices, or you cannot boot because the BIOS declares that you have no hard drive!

Solution: The most common reason for this error is a bad or loosely connected cable or incorrect jumper settings on the device. Check all the cable connections to the device. Ensure that the data cable and the power cable are properly plugged in both to the device and to the motherboard. Next, check the jumper settings. If two disks are connected to a single port, make sure one is set to Master and the other to Slave. Also check the BIOS setup program and ensure that IDE controllers are enabled. Go to the Integrated Peripherals menu and confirm that the Primary and Secondary Channels are enabled. If you are not comfortable changing individual values, reset the settings using the "Load Fail-safe (or Factory) Defaults" option.

▸ **Problem**: After powering off the PC and switching it back on after a few hours, the time has changed

Cause: The CMOS battery powers the real-time clock. This symptom indicates that the battery is dying. In rare cases, it could also mean there's a problem with the battery port of the CMOS.

Solution: Replace the battery. If the symptom persists, there's a good chance that the battery port is damaged. In this latter case, you may need to replace the motherboard! Get it checked by a computer technician first.

▸ **Problem**: An error message says there is a problem with IRQ, I/O port, DMA configuration or resource allocation, and refers to troubleshooting the BIOS

Cause: The BIOS configures and allocates resources to the IRQ and I/O ports. In most BIOSes, this allocation cannot be changed or modified by the user. Some BIOSes may provide a "soft menu" to change these allocations.

Solution: It's preferable to get the BIOS checked by a computer engineer. Use the "Load Fail-safe (Factory) Defaults" options in the setup menu. If a soft menu is available, ensure you read up the associated documentation before changing any settings.

▶ **Problem**: An error message asks to update the BIOS
Cause: The BIOS firmware does not support the device without an update.
Solution: See the Updating the BIOS section

2.4 User-Configurable BIOS settings

Using the BIOS setup, you can configure and change the settings of many hardware components. Some of the settings can give you performance boosts if done right. If done wrong, they can cause rapid overheating and can fry your system. While we have tried to keep everything as accurate as possible, it should be noted that the BIOS options in your system may radically differ from what we have described here. Also, we cannot be sure on how these options are implemented in your system.

Make any changes one at a time or in the smallest increments. Test system stability by booting into Windows and working on it for 5 to 10 minutes after each change. If the system becomes unstable, revert to the previous settings. Using these settings is at your own risk!

2.4.1 Memory Options
15M–16M Memory Hole / Memory Hole
Options: Enabled, Disabled
Recommended Setting: Disabled
Explanation: Older ISA cards used the 15th megabyte of memory for their own purposes. Modern EISA, PnP-ISA and PCI cards don't need this, with one exception: Sound Blaster PCI128 and Sound Blaster Live cards. If you have these cards, leave this enabled.

Autodetect DIMM/PCI Clock
Options: Enabled, Disabled
Recommended Setting: Enabled
Explanation: Turns off unused slots. It may also slightly reduce power usage.

Bank Interleave
Options: Disabled, 2-Way, 4-Way
Recommended Setting: Depends on the memory modules you have.
Explanation: Interleaving requests to different RAM banks can give you a performance boost. 64 MB and lower RAM modules have two banks. Larger modules have four banks. Check your RAM modules and decide.

Data Integrity Mode
Options: ECC, Non-ECC
Recommended Setting: ECC
Explanation: Both the chipset (motherboard) and the RAM have to support ECC. If you don't know, then it should be set to Non-ECC.

Delay DRAM Read Latch
Options: Auto, No Delay, 0.5ns, 1.0ns, 1.5ns
Recommended Setting: Depends on the memory modules you have.
Explanation: Tweaks for high RAM loads. Two-sided 256MB modules are high-load, one-sided memory modules are not. For lower RAM loads, set it at No Delay. For high RAM loads, you need to increase the delay. If you are getting crashes after you install new RAM, this is the first place to look.

DRAM CAS Latency Time / DRAM Cycle Length
Options: 2, 2.5, 3
Recommended Setting: Depends on the memory modules you have.
Explanation: CAS latency is part of the wait between the chipset requesting data and the RAM modules getting ready to send it. Shorter delays are better. A lower number is therefore better if your RAM is able to handle it. 2.5 is only available with DDR RAM.

Fast R-W Turnaround
Options: Enabled, Disabled
Recommended Setting: Depends on system stability
Explanation: When the CPU switches from reading to writing

there is a delay. Enabling it reduces the delay. Disable it if it causes system instability.

Force 4-Way Interleave
Options: Enable, Disable
Recommended Setting: Disabled
Explanation: This is supposed to force the chipset to use 4-way interleave even if it does not detect it. The chipset will most likely turn on 4-way interleave if it is specified in the Bank Interleaving setting, so you can leave this disabled.

MD Driving Strength/Memory Data Drive
Options: Low, High
Recommended Setting: Depends on the memory modules you have.
Explanation: Change from low to high if the signal strength, under high RAM Load, is insufficient. Changing this setting may affect system stability.

Read Around Write
Options: Enabled, Disabled
Recommended Setting: Enabled
Explanation: Out-of-order read-write commands result in higher performance.

Read Wait State/Read Latency
Options: 0, 1
Recommended Setting: 0 if there is no instability.
Explanation: When a device reads from the RAM, the chipset holds the data for one cycle. Setting it to zero cycles increases performance, but the device may not be ready to receive the data—resulting in instability.

Refresh Interval/Refresh Mode Select
Options: 7.8 μsec, 15.6 μsec, 31.2 μsec, 64 μsec, 128 μsec
Recommended Setting: 128 μsec; depends on the memory modules you have.

Explanation: Every cell in SDRAM and DDR are refreshed every 64 milliseconds. But trying to refresh everything together will result in a power surge which is not good, so it is staggered. 128 MB and smaller modules are refreshed every 15.6 microseconds. 256 MB modules every 7.8 microseconds (μsec). Today's RAM modules can handle more than the recommended 64 μsec between refreshes. A setting of 128 μsec increases performance and reduces power consumption.

SDRAM Command Leadoff
Options: 3, 4
Recommended Setting: Depends on system stability
Explanation: 3 is better.

SDRAM Idle Limit/SDRAM Idle Timer
Options: Disabled, 0 cycles, 8 cycles, 12 cycles, 16 cycles, 24 cycles, 32 cycles, 48 cycles
Recommended Setting: 12 cycles for less than 512 MB, 32 cycles for all others
Explanation: The idle time before SDRAM recharge. Higher values postpone the recharge and reduce RAM latency. Use this together with the Refresh Interval setting for best results.

SDRAM Precharge Control/SDRAM Page Control
Options: Enabled, Disabled
Recommended Setting: Enabled. Disable it if there is instability.
Explanation: This checks whether the RAM or the chipset should control the refreshing. Enable for RAM to control the refresh. Can cause instability with large amounts of RAM or poor-quality RAM.

Video RAM Cacheable
Options: Enabled, Disabled
Recommended Setting: Disabled
Explanation: Enabling this causes video data to be cached in the L2 cache. Can cause a performance bottleneck when enabled.

2.4.2 PCI and AGP Options

8-bit I/O Recovery Time
Options: N/A, 1, 2, 3, 4, 5, 6, 7, 8
Recommended Setting: N/A
Explanation: Synchronises the PCI-ISA bus. If don't have an ISA card it does nothing.

16-bit I/O Recovery Time
Options: N/A, 1, 2, 3, 4
Recommended Setting: N/A
Explanation: Same as 8-bit, but for 16-bit transactions. Does nothing without an ISA card.

AGP 2x Mode and AGP 4x Mode
Options: Enabled, Disabled
Recommended Setting: Enabled
Explanation: This enables or disables AGP 2x or 4x depending on what your BIOS shows. Even if your card is AGP 2x and you set it to 4x, the chipset will fall back to 2x, so there is no harm in enabling this setting.

AGP Aperture
Options: Disabled, 8MB, 16MB, 32MB, 64MB, 128MB, 256MB
Recommended Setting: Disabled
Explanation: Controls how much system RAM the AGP card is allowed to use for AGP texturing. If you're not a heavy gamer, and if you don't work too much with 3D applications, there's no point assigning an AGP aperture. Also, if you've got, say, only 256 MB of RAM, you don't have RAM to spare—hence the AGP Aperture should be disabled.

Assign IRQ to PCI/AGP VGA
Options: Enabled, Disabled
Recommended Setting: Enabled
Explanation: Tells the BIOS to assign an IRQ to the display. Useful for Windows 95/98/ME. Makes no difference to Windows 2000/XP if enabled.

CPU to PCI Write Buffer
Options: Enabled, Disabled
Recommended Setting: Enabled
Explanation: Sets the priority to the CPU when writing to the PCI bus. Better performance if enabled. May cause instability with some sound cards.

Fast Writes
Options: Enabled, Disabled
Recommended Setting: Disabled
Explanation: There's a very slight performance increase if enabled. But it causes instability with video cards that doesn't support Fast Writes.

I/O Recovery Time
Options: Enabled, Disabled
Recommended Setting: Disabled
Explanation: Enable this if you are facing problems with any ISA cards you may have.

Master Priority Rotation
Options: 1 PCI, 2 PCI, 3 PCI
Recommended Setting: Depends on your configuration.
Explanation: Controls CPU access to the PCI bus. If you have RAID and SCSI, 3 PCI is better. With NICs and TV-Tuners, 1 PCI is better. You will have to experiment for your configuration.

Passive Release
Options: Enabled, Disabled
Recommended Setting: Depends on how your system responds.
Explanation: Allows ISA devices to write to the Passive Release Buffer without waiting for the PCI bus. Enable for better performance; disable if your ISA cards or NICs have problems.

PCI #2 Access #1 Retry
Options: Enabled, Disabled
Recommended Setting: Enabled
Explanation: Works with the CPU to PCI Write Buffer. Enabling

this will tell the buffer to retry any writes to the bus. Disable it if you face performance issues and your PCI bus has high-bandwidth devices. Many retries will jam the bus.

PCI Delay Transaction/PCI 2.1 Compatible/PCI 2.1 Compliance
Options: Enabled, Disabled
Recommended Setting: Enabled
Explanation: A buffer between the faster PCI and the slower ISA. If enabled, may cause problems with some sounds cards. Look for driver updates for the cards.

PCI Dynamic Bursting
Options: Enabled, Disabled
Recommended Setting: Enabled
Explanation: PCI devices write to this burst buffer, and the buffer writes to the PCI bus when it is free or the buffer is full.

PCI Latency
Options: 16 to 255
Recommended Setting: It varies. It's usually set to 32 or 64.
Explanation: This controls the time a PCI device is allowed to use the bus.

PCI Master 0 WS Write
Options: Enabled, Disabled
Recommended Setting: Enabled
Explanation: Disabling puts a 30ns write delay for PCI busmasters. Disable this if you are facing issues with SCSI or a NIC.

PCI Master Read Caching
Options: Enabled, Disabled
Recommended Setting: Disabled
Explanation: Caches PCI Master reads to the CPU's L2 cache. Will cause a performance hit on the CPU if enabled.

PCI Master Pipeline Req/PCI Pipelining
Options: Enabled, Disabled

Recommended Setting: Disabled
Explanation: Enable for better performance with a PCI video card, TV-Tuner, etc. May cause system instability with some devices when enabled.
Sidebanding
Options: Enabled, Disabled
Recommended Setting: Enabled
Explanation: Enabled is faster. Permits AGP to send addresses down different lines to data.

2.4.3 Other options

Force ESCD update
Options: Enabled, Disabled
Recommended Setting: Enabled
Explanation: This refreshes the ESCD (Extended System Configuration Data) data on every boot, regardless of whether it's changed or not.

IDE Access mode
Options: CHS, LBA, Large/Other
Recommended Setting: Depends on your hard disk.
Explanation: CHS for drives smaller than 512 MB. LBA for drives that are larger. "Other" or "Large" for drives that do not support LBA after 8 GB, usually very old drives that are larger than 8 GB.

PnP Aware OS
Options: Enabled, Disabled
Recommended Setting: Depends on the OS
Explanation: Enable for Windows 95, 98, NT4 and ME, and Linux kernels without ACPI support. Disable for Windows 2000 and XP.

USB Legacy/BIOS USB Keyboard/BIOS USB Translation/USB Keyboard Support
Options: Enabled, Disabled
Recommended Setting: Disabled
Explanation: Allows a USB keyboard to work in Win 3.x, MS-DOS,

and other environments that are not USB-aware. Enable only if you need to use an USB keyboard in a DOS environment, for example, flashing your BIOS from a DOS boot disk.

2.5 Updating (flashing) the BIOS and other firmware

Taking advantage of the capabilities offered by EEPROM, motherboard manufacturers have begun releasing new versions of the BIOS with greater frequency these days. There are many reasons that an update to the BIOS may be required: the new version offers better stability, compatibility or performance; new technical breakthroughs require new features in the BIOS; a device attached to the computer may not function without the newer version; and increasingly, flashes fix some problems in the earlier version of the BIOS!

> **Warning**
>
> **Never Flash The BIOS Unless Absolutely Essential!**
> In the old days, when you wanted to upgrade/update your BIOS, you had one of two options: change the motherboard or replace the chip with a newer model. With the introduction of EEPROM (Electronically Erasable and Programmable Read Only Memory) it has now become possible to update the BIOS via software.

Just as the PC motherboard has a BIOS chip, so do other hardware components and peripherals. These include things such as the video card, the CD-ROM/RW, DVD-ROM/RW, etc. Generally, the BIOSes on these are known as firmware. And just as the PC BIOS can be updated, the BIOS of these devices can be updated, too. While we only cover flashing the PC BIOS, the procedure is pretty similar for other firmware. In all cases, make sure you have all the information and the procedure down before the procedure.

Updating, or flashing as it's popularly known, the BIOS should only be undertaken if everything else fails and you have sufficient reason to believe that flashing your BIOS will help. The golden

rule to follow here is, "If it ain't broke, don't fix it!".

Identify if your BIOS is flashable

The first step is to identify if you have a flashable BIOS. Peel the sticker off the BIOS chip and note down the
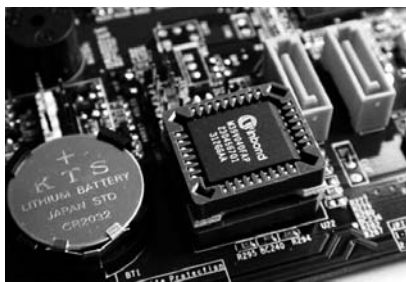
The CMOS chip on a motherboard

model number. Go to the motherboard manufacturer's Web site and search for the model and whether it's flashable. Once you've determined that you have a flashable BIOS, we are in business.

Note Down The Current Settings

The next step is to note down all the current BIOS settings. Switch on the PC and enter your BIOS setup. If you have a printer attached and the print screen button works, go to each and every menu page and print out the settings. Otherwise, note it down by hand. In case something goes wrong, you will need to refer to these settings to reset your BIOS.

Get the latest BIOS updates

Once you've copied down all your settings, the next step is to identify the latest updates for your BIOS. To do this, go to your motherboard manufacturer's Web site and look up BIOS updates for your motherboard model, make and number. Download the correct update from the site. Download the flash program (usually a .exe file) that will 'flash' the update onto your BIOS chip. Usually, the update and the flash program will be zipped together.

Create two MS-DOS boot floppy disks

Ensure that you're on a reliable power supply and that your floppy drive is not defective. Copy the flash program to a new floppy disk formatted as an MS-DOS startup disk. (Right click the floppy drive and select 'Format...'; in Windows 98, select the 'Copy System Files' checkbox, in Windows XP, select 'Create an MS-DOS Startup Disk'). Keep a second formatted disk also ready.

Back up your current BIOS

Ensure that the floppy drive is the first boot device in your BIOS settings. Insert the first floppy and reboot the system. You will taken to a DOS prompt (A:\) from where you should type in the name of the flash program. On the screen that appears, select the option to save your current BIOS to the first floppy disk where you only have the flash program. This will serve as a backup in case something goes wrong with your update and you need to revert to your old BIOS.

Flash the BIOS

Copy the flash program and the BIOS update file to the second floppy disk. Verify that the update file has been copied correctly. Reboot the system with the floppy inserted in the floppy drive. At the A:\ prompt, type out the name of the flash program followed by the BIOS update file name. A screen appears showing you the update file that will be flashed to the BIOS. Confirm it. *WAIT* will the BIOS is flashed. You will be informed when it is over and asked to exit. Once you are back at the DOS prompt, remove the floppy and reboot the system. If everything has gone off well, you should get the normal POST screen.

Configure the new BIOS

After flashing your BIOS with new version and rebooting, enter the BIOS setup. The first step is to load the factory defaults (or the BIOS setup defaults—the terminology may vary depending on your BIOS). This will ensure

Flashing From Within Windows

Some motherboard vendors have started offering the option of flashing software that works under Windows. This is usually a program that is specifically designed to work the motherboard and BIOS of that system and makes the process of updating your BIOS much easier. Typically, the software will search the Internet for BIOS updates and guide you through the update process through a Wizard-like interface. This option is safer than the manual process, but only a few motherboard vendors provide this facility. So if you are shopping around for a new motherboard, you might want to consider this feature as one of your requirements.

that all the new options will
default to the factory setting,
which under normal circum-
stances should be safe. After
loading the defaults, the next
step is to configure the BIOS to
your system-specific settings.
Pull out the screenshots you
printed out (or the settings you
wrote down) earlier and key in
all the settings there. You may,
of course, change any of those
settings if you are sure about
what you are doing. As a first
step, however, it is better to use

> ### Warning!
>
> Disable all forms of shadow-
> ing. Do not shadow the BIOS
> while trying to flash it. The
> BIOS will not be completely
> written. This applies to video
> BIOS or any other shadowed
> BIOS.
> Disable the byte merge set-
> ting–it can potentially kill
> your motherboard.
> Check the manufacturer's site
> for any other settings that
> need to be disabled.

the old settings and check if your system boots up to the OS and
everything is working normally.

Recovering from a corrupted flash

Some of the main reasons for flash BIOS corruption are incom-
patible add-on cards, aborted flash updates due to power fluctua-
tions (laptop users note: don't flash while on battery, ensure you
are plugged into a live wall outlet), or improper BIOS images.

If your flash attempt fails, don't panic! Such failures are often
reliably recoverable, as most newer BIOS codes today include a Boot
Block Protection option. A BIOS of this type has two distinct parts.
The first Boot Block part contains information needed to initialise
only critical system devices such as the floppy drive, processor,
memory and ISA video devices. This part is write-protected and can-
not be overwritten by flashing. The second part is the flashable part,
known as the System Block, and contains all the information need-
ed to initialise other system devices such as video, storage, COM
ports, input devices, other peripherals, and performing the POST.

To recover from a corrupted flash, you need to be able to boot
into the floppy where you have the flash program and the BIOS

file you want to flash. An ISA video card is preferable, but if you do not have one, you can still do it. If you have the ISA card then you will be able to see what you are doing. Reboot the system to the DOS prompt and repeat the steps outlined above for flashing, or the steps specified by your motherboard manufacturer.

If you don't have an ISA video card, create an autoexec.bat file, which will run when you boot into the DOS system. Use Notepad to a create a single line entry which will contain the flash program name followed by the update file name along with any switches that are specified. For example, the following line should be in the autoexec.bat file to flash an Award BIOS:

a: awd802.exe backup.bin /py /Sb /sn /cc /cp /cd /R.

This instructs the DOS system to run autoexec.bat when the system boots up and run the awd802.exe flash program using the backup.bin BIOS update file. The switches are various options specific to the flash program, with the last switch instructing the program to reboot once flashing is completed.

Copy the autoexec.bat file to the floppy with your flash program and the BIOS update file you want to use. The floppy should only contain the basic DOS system files, and should not have any other files (such as config.sys) that may auto-load on start up and interfere with the flashing.

The example above is for an Award BIOS update. While the parameters will most likely differ for your particular BIOS version, the general approach remains the same:

❍ Create a DOS system floppy
❍ Copy the flash program and the BIOS update file
❍ Create an autoexec.bat batch file with a single line entry instructing DOS to flash the BIOS when the system starts up

Be sure to read up the manufacturer's instructions on each switch parameter and how they should be used.

The Display

Nothing is more irritating than display problems. Sometimes you cannot see anything on the screen, leave alone be able to fix things. When displays go kaput, hair loss and blood pressure reading may increase drastically. This chapter should help you control all these...

3.1 Troubleshooting Display Problems

Earlier, images displayed on the monitor used to be processed by the CPU and sent to the monitor via the video adapter (also known by various other names such as display adapter, video card, video board, video display board, graphics card, graphics adapter etc). To change the image on the screen, a computer needs to change individual pixels. GUIs (Graphical User Interfaces) and image-
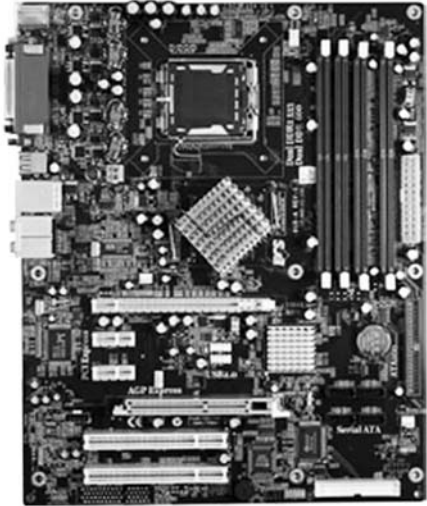
A motherboard with on-board graphics

intensive applications increased the burden on the CPU and the RAM, causing a performance hit on the rest of the system. To overcome this bottleneck, accelerated graphics cards were introduced. These took over the image processing tasks from the CPU, and, as is common in technology, graphics cards have become complex sub-systems in themselves. A typical mid-range graphics card is like a mini-motherboard with its own Graphics Processor, memory (RAM) and even a heat sink for all the heat generated. With growth in complexity came the increase in price, which led to a kind of reverse innovation where motherboard manufacturers began to incorporate the graphics card directly onto the motherboard. These are generally known as 'on-board' or integrated graphics adapters, and give fairly good graphics handling capability for general use.

Troubleshooting the video subsystem requires a basic understanding of what kind of graphics card you have—on-board or

Concepts

System bus: All the components and peripherals inside the computer such as the CPU, RAM, hard disk, graphics card, etc. communicate with each other via a data highway, generally referred to as the system bus or simply the bus. With continued improvements in technology driven by the need for faster communication between the various components, the bus has evolved over time. The older buses were ISA, EISA, MCA and VLB. We now live in the era of the PCI, AGP and PCI-Express (PCIe) buses. Each is faster than the previous one.

PCI: The most common bus on modern motherboards, with a maximum transfer rate of 133 MBps. The major drawback with PCI is that it is an 'open' highway. That is, all devices use the same highway mostly on a first-come-first-served basis. If the bus is fully in use, the devices would have to wait in queue till they get their chance. It's too slow for the graphics-rich 3D applications of today.

AGP: Strictly speaking, AGP is not a bus but a port. However, in terms of computing, its behaviour is more like a bus. AGP is a special kind of bus designed for exclusive use by graphics cards. This frees up the PCI bus to handle the data exchange between the various other components. AGP 8x has a maximum transfer rate of slightly more than 2 GBps.

PCIe: This is the new standard in graphics and system buses. The increasing high-bandwidth demands of modern applications and devices have led to the development of the PCI-Express bus. To squeeze faster performance out of graphics cards, PCIe 16x delivers data transfer rates at a whopping 8 GBps. Here we won't explain how, but if you are curious, just remember that PCIe does this by "serial communication at higher clock rates" as against the parallel communication used by all earlier buses.

add-on, and the kind of system bus it runs on—PCI-Express, dedicated AGP, or the older PCI. Some video-related settings (AGP and PCI) are handled by the BIOS, which have been covered in the BIOS section of this guide, so we won't repeat those here.

3.2 Troubleshooting the Monitor

Modern monitors are especially robust and in most cases, you would upgrade the PC before thinking of changing the monitor. Troubleshooting is relatively easier than the rest of the PC for the simple reason that it is an independent 'box' with no user-serviceable parts.

3.2.1 There's no power to the monitor

Cause 1: There actually is no power being supplied to the monitor.
Solution 1: By far the most common mistake people make is to forget to check the power cables! Sometimes, when monitors are moved around, the power connectors come off or become loose. Plug all cables in tight and check if the power returns. If it is connected to a UPS or stabiliser, check if there is power supply from that unit. Also check the power cable; try using another cable which you know works, to see if power is restored.

Cause 2: If the power cables are plugged in and there is still no power, the problem is more serious. It could mean that a fuse has blown, or there is a more serious problem with the CRT (Cathode Ray Tube).
Solution 2: If the fuse is accessible from the casing of the monitor, replace it and check. If the fuse blows again, or if it still doesn't power up, you have a problem with the electrical circuitry inside the monitor. Your only option is to take it in for repairs.

3.2.2 The LED on the monitor glows but the screen is blank

Warning

Do not try to open the monitor yourself. There are high voltages inside, and it is best left to a monitor professional who knows what he is doing.

Cause 1: A black screen is displayed.
Solution 1: Another common mistake. Check the brightness and contrast settings. Sometimes the settings are turned way down, giving you a blank screen. Also try the other display controls if changing the brightness and contrast don't seem to work.

Cause 2: The monitor is incompatible with the PC or the CRT is dead.
Solution 2: If the monitor is being connected to the PC for the first time, it could be that you have a monitor that is incompatible with your PC. Check if the monitor works on another PC. If the monitor doesn't work on that PC either, then it is most likely some sort of internal failure in the monitor and you will have to get it repaired, if possible. Otherwise, you'll have to go in for a new monitor.

Cause 3: There might be a problem with the signal between the PC and the monitor.
Solution 3: In most modern monitors, if there is no signal from the video card, there should be a message on the screen saying something like "No Signal." Absence of any message, however, does not rule out the possibility of a problem with the cable between the monitor and PC. If the monitor works with another PC and the signal cable is detachable (most monitors have the signal cable integrated with the monitor), use a different signal cable.

If the signal cable is not detachable you might have to take it in for repairs. Check the other possible problems before you do so. If there is still no picture then this would point to some problem with the video card. Check the *Troubleshooting the Video Card* section for further details.

3.2.3 The monitor is producing a high-pitched whine

Cause: This is often noticed in cheaper monitors, and it will become more pronounced with age.

Solution: Try adjusting the brightness and contrast controls, this may reduce the noise somewhat. You can also try ignoring the noise and let it merge with the background, like the hum from your TV. If it is bothersome, take it to repair shop; there might be some components that can be changed to reduce the noise.

3.2.4 The screen is totally white or grey in colour

Cause: There is no signal from the video card.

Solution: Check the signal cable as explained above. If the signal cable is fine, check the *Troubleshooting the Video Card* section for further details.

3.2.5 The display is too bright or dim; the contrast is too high or low

Cause: The brightness and contrast settings may not be set correctly. The CRT may be wearing out.

Solution: Check the brightness and contrast settings. As the CRT ages, the screen will start to dim. In some cases, your repair shop may be able to tweak the monitor to improve the brightness. Change the lighting in the room so that there is no direct light falling on the monitor. Turn off the monitor when not in use. In any case, this might well be an indication of age catching up with the monitor—time to go shopping!

3.2.6 The screen has a bluish, greenish or purplish tint

Cause: This is usually caused by a break in one of the three colour signals between the video card and the monitor. The problem is especially common in older monitors, and is caused by heat stresses that break the connections between the cable and the circuit board inside the monitor.

Solution: Check the signal cable for kinks, frays and other signs of wear and tear. If the cable is not integrated, have it replaced, else take the monitor to the repair shop and they should replace it for you at very little cost.

3.2.7 The screen twists with wavy lines and the picture bends

Cause: This is caused by electromagnetic interference (EMI) from some other appliance such as a fan, motor, or even other monitors, either very close to the monitor or on the same power circuit.

Solution: Move the other appliance out of range of the monitor or off the same power circuit. If the symptom continues, there could be an EMI problem with the monitor itself. Have it checked at the repair shop.

3.2.8 Images are blurred

Cause: This may be a problem with the display settings of the monitor, or with the signal cable

Solution: Adjust the display. There might be an option called 'Focus' or 'Sharpness'. Adjust that setting. If that doesn't work, check the cable and its connection to the PC.

3.2.9 There is some irregular discoloration along the edges of the screen

Cause: This is caused by the magnetisation of the metallic elements on the surface of the CRT. The magnetisation happens because of EMI or due to sudden knocks to the body.

Solution: Cycle through the display controls and select the Degauss option. Degaussing is the process of demagnetising the CRT.

A monitor being degaussed

3.2.10 The image disappears and reappears randomly

Cause: This most probably points to an electrical fault.

Solution: Check all the cable connections as well as the video card. The electrical fault may be internal to the monitor; get it checked at a repair shop.

3.3 Troubleshooting the Video Card / Memory / Driver / BIOS

3.3.1 The screen flickers, causing eye strain and fatigue

Cause: The computer 'paints' the screen with the image several times a second—this is known as the refresh rate. If the refresh rate is set too low, it can cause visible flicker, which can be a strain on the eyes.

Solution: Right-click on the Desktop, select Properties, go to Settings > Advanced, and look for the Refresh Rate option in the Properties window for the display adapter that launches. Increase the refresh rate to the maximum supported level. Note that setting the refresh rate too high can cause blank screens—you'll then have to revert to the old setting.

3.3.2 The image is scrambled or jumping, or there are diagonal lines

Cause: The display controls could have 'pushed' the image off-screen. It may also be a problem with the refresh rate or the resolution being set too high.

> **Read This First**
>
> Many problems with video (graphics, display, etc.) cards, and general Windows stability, can be due to incorrect software drivers. Before looking anywhere else, ensure that you have the correct drivers for your video card. This will save you many hours of needless frustration. If your card is onboard and part of the motherboard chipset you can visit the motherboard manufacturer's Web site to download the latest updates for the video drivers, or get it from the motherboard CD. If you have an add-on card, get the latest updates from the card manufacturer's Web site or the CD that came with the card.

Solution: Adjust the display controls and see if you are able to get back a stable picture. Reduce the refresh rate and/or the resolution. If you are not able to see the screen, reboot and press [F8]. Select Safe Mode from the list of options; Windows will start with a simple driver at a low resolution and low refresh rate. Disable any video drivers (through Device Manager) so that Windows is forced to use its own driver to handle the display when you reboot normally. After rebooting in normal mode, enable the driver and run the Add New Hardware Wizard to redetect your video driver at the basic resolution. Readjust your refresh rates and resolution to below the values that caused the scrambling.

3.3.3 The display is too large or small, or the screen is spilling out

Cause: It could be either that the horizontal, vertical, and other image controls are not adjusted properly, or it could be a problem with the video driver.

Solution: Adjust the image controls of the monitor. Check the screen resolution and try lowering it. Ensure that you have the correct video driver for your video card. Check the options in the video driver software to adjust the screen size.

3.3.4 You think the problem is with the video card, but you're not sure exactly what!

There are several possible problems that can't be directly pinpointed. The most likely causes are resource conflicts or wrong configuration settings. If you recently upgraded or added a component to your system, check that first. Verify everything is installed correctly; that jumpers, if any, are configured properly, and then read on.

Cause 1: If the video card was recently added, it could be a problem with the fixing.

Solution 1: Ensure that the card is seated tightly, firmly and completely in its slot. Power off, remove the card, reseat it properly, and then reboot.

Cause 2: If you have an older card, the chips on the card itself may have come loose.

Solution 2: Carefully press the chips back in. Take care not to touch any exposed circuitry. Moreover, don't pile on the pressure! A firm but gentle push should push the chips back in.

Cause 3: There maybe a resource conflict with another device using the same IRQ. PCI video cards generally use IRQs 9, 10, 11 or 12.

Solution 3: Remove the video card and reboot. Open Device Manager and verify that at least one of these IRQs are available. Check the video card manual for any jumper settings you need to set to match the IRQ settings of your system.

Cause 4: If the motherboard has an onboard graphics adapter, the video card may be conflicting with the adapter, and neither will work.

Solution 4: Disable the onboard video adapter in the BIOS or through a jumper setting on the motherboard.

Cause 5: The video card is bad.

Solution 5: If you have a similar video card, test the second one on your system. If the second video card works, then you can conclude that your original card is bad. Test your video card on another system. If your card works on the other system then the video card is good and the problem is most likely a resource conflict. In rare cases, it could mean that your video card is not compatible with your PC.

Cause 6: If you just added memory to your video card, this could point to memory incompatibility or faulty insertion.

Solution 6: Remove the memory module and reinsert it properly. Verify you have the correct memory for the card. The memory should be identical to what already exists.

Cause 7: Video BIOS Shadowing may be conflicting with the graphics card.

Solution 7: Disable Video BIOS Shadowing from the BIOS.

3.3.5 The screen blanks after it is idle for some time even without the screensaver

Cause: This could be due to the Power Management settings in either Windows or the BIOS. The settings control when the monitor should blank out after a period of inactivity.

Solution: Disable Power Management (ACPI) in the BIOS. If required, disable it in Windows as well. (Right-click on the Desktop, select Properties, and click the Power Management button on the Screen Saver tab).

3.3.6 A 'Not Enough Video Memory' error message comes up

Cause: This message would appear when you have run out of both RAM and virtual memory.

Solution: Increase the virtual memory of your system. Virtual memory should be at least 1.5 times your physical RAM. In Windows XP, right-click My Computer and select Properties. Click the Advanced tab, and click Settings under Performance. Select the Advanced tab. Under Virtual Memory, click Change. Select Custom, and set Initial equal to the amount of RAM you have and Maximum to 1.5 times the RAM you have.

3.3.7 The PC works fine for a few hours and then freezes

Cause: This symptom is typical of overheating. Overheating processors are a major source of PC freezes and crashes. Other than the main processor, the graphics processor can also overheat and bring the entire PC to a grinding halt. Like the CPU, the graphics processor has its own heat sink and fan. An overheating graphics processor would point to some problem with the cooling system.

Solution: Troubleshooting this is similar to troubleshooting an overheating CPU. However, you should eliminate all the other heat generating culprits first: check the power supply, the CPU heat sink, and fan. Once you have eliminated these possibilities, turn your attention to the graphics processor: check the heat sink and fan, it may be that the fan is not working or the heat sink is not fitted snugly on the graphics processor. Check the power connections for the fan and reseat the heat sink to fit it tightly with the processor. Use thermal paste if necessary.

Such graphics cards should have a temperature sensor that can be viewed from within the operating system. This would give you a good indication of whether the card is overheating. Unless you are stressing out the system with high-end 3D applications for hours on end, it is unlikely that the graphics card is your source of trouble. In most cases it would be the power supply. But the sudden freeze and shut down is typical of overheating, so look at the CPU and PSU again if you have ruled out the graphics card as the source of the problem.

A graphics processor card with a fan

3.4 Troubleshooting AGP

The AGP expansion slot was introduced to overcome the speed limitations of PCI on the graphics sub-system. The AGP slot is a modified version of the 66 MHz 32-bit PCI Slot. If AGP is disabled, the slot reverts to being a PCI slot. Initially, AGP 1x and 2x provided twice and four times the speed of PCI respectively. AGP 2.0 introduced Fast Writes and a 4x speed while reducing the signalling voltage. With AGP 3.0, the speed got pushed up to 8x and further reduced the signalling voltage.

On most computers, AGP works without a hitch. However, a significant number of PCs face problems with the AGP port.

▶ **Problems with instability:** Typical symptoms include random crashes in 3D mode, instantaneous crashes or hangs when entering 3D mode, image corruption, monitor blanking, computer freezes, and just about every other symptom that you might face with a video card.

Causes of the instability: There are two main sources of instability. First, there could be an incompatibility between the AGP card and the slot on the motherboard. Second, AGP instability will also be noticed on cards and motherboards con figured for 8x speeds. Sometimes, at this speed, the data trans fer rate of 2133 MBps becomes too fast for the rest of the system to handle.

The motherboard is a complex knit of multiple components, talking to each other at varying speeds. When the CPU, RAM, PSU and other components are all perfectly matched and adjusted, AGP should work just fine. Any weakness in any of the links in this chain and problems are bound to show up.

If you are facing reliability and stability problems with your system and you have narrowed it down to the AGP port, the solution is to verify card and motherboard compatibility and/or slow down AGP and see if that solves the problems. In rare cases, you might also face a memory resource conflict.

Solutions

Incompatibility: The AGP card communicates with the AGP motherboard using a 'signalling voltage' that varies according to the version. AGP 1.0 uses 3.3 volts, AGP 2.0 uses 1.5 volts, and AGP 3.0 uses 0.8 volts. Depending on the AGP version supported, the AGP card has one or two slots. 3.3 volts uses one type of slot, while 1.5 and 0.8 volts use the same type of slot. According to the official AGP 3.0 specifications, AGP cards have been categorised as in the table on the next page (*AGP Card Specifications*).

The above are Intel's official names for the cards allowed by the specification. Manufacturers, however, are not so consistent, and you might find various kinds of names describing their cards. So use the table on the next page to figure out what kind of AGP card you have. Similarly, AGP slots on the motherboard also have official specifications as in the second table (*AGP Slot Specifications*).

AGP Card Specifications

AGP Card Type	Connector Type	Details
AGP 3.3V	3.3 V slot	Supports only 3.3 V signalling. Available speeds are 1x, 2x.
AGP 1.5V	1.5 V slot	Supports only 1.5V signalling. Available speeds are 1x, 2x, 4x.
Universal AGP card	Double-slotted	Supports 3.3 V and 1.5 V signalling. Available speeds are 1x, 2x at 3.3 V & 1x, 2x, 4x at 1.5V.
AGP 3.0	1.5 V slot	Supports only 0.8 V signalling. Available speeds are 4x, 8x.
Universal 1.5V AGP 3.0 card	1.5 V slot	Supports 1.5 V and 0.8 V signalling. Available speeds are 1x, 2x, 4x at 1.5 V & 4x, 8x at 0.8 V.
Universal AGP 3.0 card	Double-slotted	Supports AGP 3.3 V, 1.5 V, and 0.8 V signalling. Available speed are 1x, 2x at 3.3 V; 1x, 2x, 4x at 1.5 V; and 4x, 8x at 0.8 V.

1.5V Slot   3.3V Slot   3.3V 1.5V Slot Slot
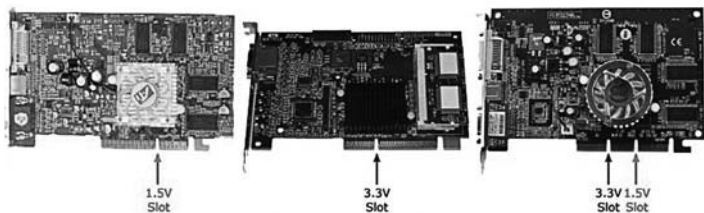
AGP Voltage Slots

AGP Slot Specifications

Motherboard Type	Slot Type	Details
AGP 3.3V	3.3 V keyed	Supports only 3.3 V signalling. Available speeds are 1x, 2x.
AGP 1.5V	1.5 V keyed	Supports only 1.5V signalling. Available speeds are 1x, 2x, 4x.
Universal AGP Motherboard	Universal	Supports both 3.3 V and 1.5 V signalling. Available speeds are 1x, 2x at 3.3 V and 1x, 2x, 4x at 1.5 V.
AGP 3.0	1.5 V keyed	Supports only 0.8 V signalling. Additional electrical ID to prevent 1.5 V operation. Available speeds are 4x, 8x.
Universal 1.5V AGP 3.0 Motherboard	1.5 V keyed	Supports 1.5 V and 0.8 V signalling. Available speeds are 1x, 2x, 4x at 1.5 V and 4x, 8x at 0.8 V.
Universal AGP 3.0 Motherboard	Universal	Supports 3.3 V, 1.5 V, and 0.8 V signalling. Available speeds are 1x, 2x at 3.3 V; 1x, 2x, 4x at 1.5 V; and 4x, 8x at 0.8 V.

For the AGP card to work with the motherboard both the slot type and the signaling voltage has to match. Verify the compatibility between your AGP card and motherboard using the table on the next page (*AGP Card And Motherboard Compatibility*). Note that for all practical purposes, none of the manufacturers make cards and motherboards with just AGP 3.0 (greyed out in the chart).

Stabilising the AGP port: Adjusting the AGP speed multiplier and Fast Writes can stabilise your AGP port. Typically, both the motherboard and the AGP port are initialised to the highest speed

multiplier each can support when shipped. This could be 8x, 4x, 2x, or 1x. The speed multiplier can be adjusted through either the BIOS or configuration software that came with your graphics card. It is preferable to use the configuration software, as that will be

AGP Card And Motherboard Compatibility

	AGP 3.3V Card	AGP 1.5V Card	Universal AGP Card	AGP 3.0 Card	Universal 1.5V AGP 3.0 Card	Universal AGP 3.0 Card
AGP 3.3V Motherboard	Works at 3.3V	Won't fit in slot	Works at 3.3V	Won't fit in slot	Won't fit in slot	Works at 3.3V
AGP 1.5V Motherboard	Won't fit in slot	Works at 1.5V	Works at 1.5V	Fits in slot but won't work.	Works at 1.5V	Works at 1.5V
Universal AGP Motherboard	Works at 3.3V	Works at 1.5V	Works at 1.5V	Fits in slot but won't work	Works at 1.5V	Works at 1.5V
AGP 3.0 Motherboard	Won't fit in slot	Fits in slot but won't work	Fits in slot but won't work	Works at 0.8V	Works at 0.8V	Works at 0.8V
Universal 1.5V AGP 3.0 Motherboard	Won't fit in slot	Works at 1.5V	Works at 1.5V	Works at 0.8V	Works at 0.8V	Works at 0.8V
Universal AGP 3.0 Motherboard	Works at 3.3V	Works at 1.5V	Works at 1.5V	Works at 0.8V	Works at 0.8V	Works at 0.8V

more specific to your card. Choose a speed below the current AGP speed setting. You may have to reboot the system for it to take effect. Sometimes, the software will not apply the change, so once you're back in Windows, go back to the software and verify that the speed has been changed. If you're not able to change the speed through the software, use the BIOS to change the speed.

If Fast Writes are enabled by default in your BIOS, leave them enabled and reduce the speed multiplier. If the system still shows instability, then disabling Fast Writes will most likely solve the problem. The reverse also applies: if Fast Writes are disabled by default, leave them disabled. Reduce the multiplier and

check for stability. If system is still unstable, then enable Fast Writes. Note that some graphics cards refuse to work with Fast Writes disabled.

Memory Resource Conflicts: This type of problem is rarely fixable. When you fix a new AGP card on an old AGP 1.0 slot, you might get memory resource conflicts. This would show up when you install the video card's display drivers. Try changing the memory addresses assigned through either the BIOS or Device Manager under Windows. If you are successful in getting the card to work, then you've been lucky! Typically, your only solution would be opt for a card that is compatible with your slot.

3.5 Troubleshooting Video Codecs

3.5.1 Problems
One of the common problems many people face is the inability to play some downloaded movie files or video CDs. There might be an error message stating that a particular codec is missing and needs to be installed before the file can play correctly. In many cases, the player will not give any kind of error message, leaving you mystified. Assuming that your CD and DVD drives are working without trouble, the culprit would be the lack of a supporting codec.

3.5.2 What are codecs?
"Codec" stands for "Compression-Decompression algorithm." In raw uncompressed form, multimedia files take up a huge amount of space. To minimise the space used, the multimedia video and/or audio files are encoded using a particular codec. When you want to listen to or view the file, a video/audio player decodes the information in the file using the specific compression-decompression algorithm. When a multimedia player (like Windows Media Player, Winamp, etc.) doesn't play a particular file, the problem is usually that the required codec is missing.

3.5.3 Finding and installing the missing codec

There are millions of codecs with varying efficiencies in encoding and compressing multimedia files. However, there are a limited number of popular video codecs and typically, your movie file/CD should be of one of the types in the list below:

MPEG-1 Part 2: One of the most popular, nearly all computers in the world can play this codec. It is regularly used for video CDs (VCDs) and sometime for online video.

MPEG-2 Part 2: Used in most digital video broadcasting, cable distribution and DVD systems. Also used in another form for SVCD. On DVD, it supports widescreen with good picture quality. It's not as good on SVCD, but definitely better than VCD. (Note: SVCD can hold 40 minutes of video on a CD whereas VCD can fit 60-70 minutes.)

MPEG-4 Part 2: Relative to MPEG-2, it offers better quality and is intended for use on the Internet and broadcast and storage media.

MPEG-4 Part 10: The current state of the art in standardised compression technology. It is rapidly gaining adoption in many applications, and has been recently adopted in a number of companies' products including the PlayStation Portable, Nero Digital product suite, and Mac OS X v10.4.

DivX, XviD and 3ivx: Video codec packages using MPEG-4 Part 2, with the *.avi, *.mp4, *.ogm or *.mkv file extension formats.

Sorenson 3: Many movie trailers on the Internet use this codec. It is used by Apple's popular QuickTime movies, which have the .mov file extension.

WMV (Windows Media Video): Microsoft's video codec family includes WMV 7, WMV 8, and WMV 9. It can be used right from low-resolution video for dial-up users to HDTV. Files can be written to CD-Rs and DVD-Rs or output to many types of devices. Also

useful for Media Center PCs, WMV can be considered a version of the MPEG-4 codec design.

RealVideo: Developed by RealNetworks, a popular codec (.ram file extension) technology a few years ago, now fading in importance for a variety of reasons.

Flash Video: Gaining popularity of late, the Macromedia Flash Video file format (FLV) is becoming a standard on many Web sites. To play back files, a Macromedia Flash Video player is embedded into the Web page. You may need to also get the Flash plug-in for your browser.

Finding out what codec is missing can be a frustrating process if done manually. Thankfully, there are codec information software tools that will do the job for you. Select the multimedia file that is not playing from within the codec information tool, and it will inform you what codec is required to play the file correctly. Some of the tools also give you direct links to download the missing codecs! Take your pick from some of the popular commercial and freeware tools listed below.

VideoInspector (www.kcsoftwares.com/index.php?vtb): This gives direct download links to missing codecs after analysing the file format. Can analyse most file formats such as AVI, MPEG, etc.

Gspot (www.headbands.com/gspot/): Even though it has some features missing that you can find in others, Gspot is a useful tool. It was a pioneer in troubleshooting video applications.

MediaInfo (http://mediainfo.sourceforge.net/en): An open source alternative to GSpot.

AVICodec (http://avicodec.duby.info): Another useful codec information tool.

Sound

If you've moved on from Windows 98 to XP, chances are that *most* of your problems with sound have faded into the background. Even so, there's always the odd chance that, out of the blue, something could just go wrong, . Here's what to do when unnamed forces stand between you and that perfect audio experience.

Easy Way Out

Windows XP offers you a Sound Troubleshooter, which takes you through a step-by-step solution to your problem.
Getting to the Sound Troubleshooter:
1. Go to Start > Help and Support
2. Under "Pick a help topic", choose Fixing a Problem
3. In the next screen, choose Game, Sound and Video Problems, and select Sound Troubleshooter on the right side of the window.

More often than not, if your problem is minor, the Troubleshooter proves quite handy to solve it.

4.1 Deathly Silence

You've begged and pleaded and prayed and cried, but still can't get a beep out of your system? Let's take a look.

Speaker Woes
Before anything else, check if your speakers are all right. Plug them into a power socket, and see if they're linked in properly. Use any type of audio device — portable or otherwise, to check if your speakers work with those. If they don't, it's probably time to get some new speakers.

Now make sure the speakers are connected properly. This rarely happens with 2 or 2.1 speaker systems (with all the colour codes and only one connection to make), but it's easy to go wrong with a multi-channel speaker system. Read the manual that came with your speakers to make sure you've plugged them in right.

If you're trying to use a multi-channel (say, a 5.1) speaker system with an onboard sound card, using the microphone and line-in jacks as output sound channels, make sure that the sound chipset on your motherboard supports being used that way (Line out for Front, Line In for Rear and Microphone In for Centre). To

find out which sound chipset is on your motherboard, open up your PC and look at the chip next to the sound jacks; note the name of the manufacturer and model number of the chip. Visiting the manufacturer's Web site will tell you whether the chip supports connecting a 5.1 speaker system. Most new motherboards come with chipsets that support this feature.

If you've connected your multi-channel speakers, checked all the connections, and one or more of them still stay silent, check the power connections—make sure that they are secure and that each speaker is getting power.

If some of your speakers still stay silent, it is possible that your system thinks that you are using a stereo speaker setup. To change this, go to Control Panel > Sounds and Multimedia Audio > Sound Playback > Advanced, and select your speaker configuration from the dialog that appears.
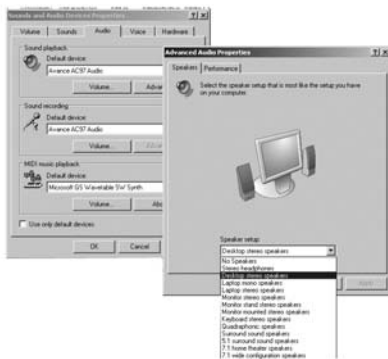
Choose your speaker configuration

Sound Card Woes

If you've installed a new PCI sound card, make sure that you've configured your PC to send sound to your new card rather than the old, on-board card. To do this, right-click on the Speaker icon in the taskbar and select *Adjust Audio Properties*. Under the *Audio* tab, make sure that your default device for sound playback is your new sound card. Make sure you check the *Use only Default Devices* box.

Selecting your default playback device

If you don't see your new card in the list for Sound Playback, it might not have been properly installed. You can check this in the *Device Manager*. To get to it, go to the Control Panel and open the System dialog. Under the Hardware tab, click

The Device Manager

on the Device Manager button. In the Device Manager, look under "Sound, Video and game controllers". If your card isn't listed here, you will need to manually install it using the Add Hardware utility in the Control Panel. If the utility fails to detect your soundcard, you might need to open up your cabinet and make sure that (a) Both, the card and the PCI slot are clean, and (b) the card is connected firmly.

Tip

If you're going to use an external sound card, disable the on-board card through the BIOS. Press the [Delete] button as soon as your system boots up to enter the BIOS. Go to the Integrated Peripherals section and change the setting for the on-board audio card to Disabled.

If your card does show up in the Device Manager, but has a big, yellow Exclamation Mark next to it, it means that the sound card's drivers weren't properly installed. Make sure you get the latest drivers from the manufacturer's Web site and install them.

Codec Woes
If your PC falls silent when you try to play a particular file type, it simply means the appropriate codec (Compressor-decompressor) hasn't been installed. Invariably, your media player will tell you so. All you have to do then is install the codec, and everything should be back to normal.

Game Woes

If sound works fine in Windows, but you get nothing from games, its quite possible that game has compatibility issues with your sound card, or simply that something's wrong with your DirectX drivers (which you need for playing DirectX-based games). Reinstall the latest version of DirectX

The DirectX diagnostic tool

and check again. If you still face problems, start the DirectX diagnostic tool by navigating to Start > Run, typing in "dxdiag" and pressing [Enter]. The diagnostic tool will test the sound on your system and will tell you exactly what's wrong.

4.2 Snap, Crackle, Pop!

All systems go, but sound quality not as you expected? A badly timed click here, a hiss there, some static somewhere, choppy sound—the whole experience just ruined?

Speaker Woes

Check if there are any other electronic devices in the vicinity. Speakers sometimes tend to pick up interference from the surroundings, and having an appliance in the vicinity doesn't help much. Try moving your speakers and wires around and see if it helps. A common culprit is the radio, and should be the first thing to be removed from the immediate surroundings. Your speakers shouldn't be too close to your monitor, either.

Another cause of your problem could be because of how your speakers are placed. Subwoofers are best under your table—for one thing, they sound best from there; secondly, they aren't magnetical-

ly shielded, so having them closer to your monitor can cause distortions in both sound *and* picture. If you own a 5.1 surround sound speaker system, keep in mind that audio from the centre speaker *fans out* horizontally, so the best place for it is above your monitor, where the sound won't encounter any obstacles.

> ### Tip
> To get the most out of your subwoofer, place it in a corner. The sound will reflect off the three wall surfaces, sending a very desirable blast all across your room.

Finally, check the speakers themselves—plug them into your music system as well, and check if they work fine. If they do, then the problem goes deeper than just speakers.

Sound Card Woes
Have you installed the latest drivers for your card? Every time you install drivers, make sure that you follow the installation instructions to the letter—there are no shortcuts to good sound.

Electro-magnetic interference is possible within your cabinet, too. Make sure that the sound card is not too close to other cards.

Have you connected any hardware you don't use? Every device reserves some resources for itself, so make sure you remove any devices you don't use.

If you don't have a microphone or a device connected to your Line-in jack, make sure that both the Microphone and Line-in are muted—any unused input is a potential noisemaker. To do this, double-click on the Volume icon in the System tray and check Mute for both. If you don't see a volume slider for either, go to Options > Properties and in the dialog, check the mute boxes for Microphone and Line-in.

System Woes
Sometimes sound won't play properly for the simple reason that your CPU is too slow to handle it! You should first try optimising your sys-

tem performance a little: go to the Control Panel and open the System dialog. Under the Advanced tab, click on the Settings button under Performance. Under the Advanced tab here, adjust for best performance of Background Applications. This can cause quite an improvement in sound performance. You should also close all unnecessary programs that may hog memory. If you're still insistent on running many programs at the same time, including sound applications, upgrade!

Codec Woes

If you're experiencing bad sound quality from only specific file types, it's more likely that the codec is either damaged or just badly written. If it's the former, all you need to do is reinstall the codec, but if it's the latter, you need to wait for a patched version that fixes the error. In case of any problems with specific file-types, we recommend first installing the K-Lite Mega Codec Pack (which we put on every *Digit* CD) before going any further.

Software Woes

If it's a particular software or game that outputs distorted sound, it might be a problem with the software itself. Check with the developer if there is adequate support for your sound hardware, and if a patch is available for it.

4.3 Bringing it Home

What could go wrong during a recording or CD-Ripping session?

Sound Card Woes

If you have an external sound card, make sure it's selected as the Default Recording device. Right-click on the Volume icon in the System Tray, select "Adjust Audio Properties", and look under the Audio Tab. Under Sound recording, select your sound card as the default device.

Microphone Woes

A common hassle with microphones is the horrifying sound your speakers make the moment you connect them. This is called *feed-*

back, and is caused by noise that is picked up by the microphone and output through the speakers, and this output goes back into the microphone again—effectively leading to the sound getting louder and hence a lot more irritating. The only way to avoid it is to keep the microphone a good distance away from your speakers, and turn down speaker volume a little when speaking.

Selecting a default recording device

If your voice recording is too soft to hear, first check the PC volume control by clicking on the Speaker icon in the System Tray. The Microphone's volume control slider should be a good way up. Even if this is insufficient, most sound cards (both on-board and PCI) offer a "Mic-Boost" feature, which you can use to kick up the microphone volume. You can access this feature by right-clicking on the Volume icon in the System Tray, selecting "Adjust Audio Properties", navigating to the Audio tab and clicking the Advanced button under Sound Recording. Be warned, this feature also increases feedback, and your microphone should be a good way away from your speakers for this to work well.

Tip

For many applications, you can still record voice while keeping the microphone muted. You won't get any output from the speakers, though, which means no feedback!

Aargh! Too loud and distorted!

When you connect an audio source to the line-in jack of your sound card, you need to know that first the analogue sound from your source is amplified and converted into a digital format. The

amplifier is built to handle weak audio signals—anything too strong causes it to overload and leads to distorted sound. So when you connect a music player to your sound card, start at a lower volume and increase it till the sound is just audible. After that, use the recording software to increase the volume of the sound input. This way, your sound will have little or no distortion.

If you have a file that you didn't record, but would like to tone down the volume, use the Normalize function which any sound editor will have. It reduces the volume levels in such a way that the loudest part of the sound file will be just loud enough not to cause any awful distortions.

Just plain distorted

For a smooth, error-free recording, you need to maximise the memory available to your recording application. Close all unnecessary programs and try to perform as little activity as possible while sound is recording. You might also want to turn off System Restore on all drives while the recording is going on to improve performance.

Out of Space?

All recording is first done in the uncompressed Wave format (.wav), and this can really hog disk space. Most recording software let you specify a location to store temporary recorded files. Select a partition with maximum free space to avoid any hassles in this department.

Rrrrrip!

Tearing your hair out trying to rip audio from CDs and DVDs? Every so often, you will find that your ripped tracks skip and click during playback. Check if the CD has any dust or scratches. A badly scratched CD won't rip properly, and you will need to look elsewhere for that music. If the CD is just dirty, use a soft, non-abrasive cloth to clean it.

Secondly, try not to load your PC too much while ripping audio. It needs a lot of memory to do its job, so make sure it gets it.

If you still experience problems, rip the audio to the uncompressed (WAV) format. It takes less memory, but will result in huge files, so ensure that you have enough hard-disk space. After ripping, use an MP3 encoder such as Lame Encoder to convert these WAV files to MP3.

4.4 Going Digital

Till recently, sound cards would convert the digital signal received from the CPU to analogue signals that could then be fed to the speakers. However, this often results in some loss of quality. With the coming of digital speakers, we can now avoid this loss and feed digital audio right into the speakers. But even this comes with a whole new set of problems.

What's up, Jack?

Digital Speakers don't plug into your standard 3.5 mm audio jacks. Instead, many of them use the S/PDIF (Sony/Philips Digital Interface) interface. Popularly, this consists of an RCA plug (the kind you use in TVs and Music Systems) or an Optical Toslink Connection. So if you come home with the new speakers and find that you can't connect them, you should either return the speakers or invest in a sound card that does support S/PDIF.

Make sure your sound card supports S/PDIF

No CD Audio

If you can't hear music from your audio CDs, it's probably because you haven't enabled digital audio from your CD/DVD drive. To do this, go to the Device Manager: Control Panel > System > Hardware > Device Manager. Right-click on your CD/DVD drive and choose Properties. Under the Properties tab, make sure that "Enable digital CD Audio for this CD-ROM device" is checked.

4.5 Players

Ah. So you've tweaked everything to ensure the best audio experience, and sit back to listen to your collection, but...

It just refuses to play!

If your media player gives you an error saying "Cannot playback stream" or something to that effect, it usually means that it can't access your sound card. Check if you have other programs running that are using the sound card (such as games, other media players or sound editors), and close them.

If the problem persists, check if you have the proper codecs installed to play the file. As mentioned before, installing the K-Lite Mega Codec Pack should take care of nearly all codec problems.

You could also try VLC Media Player to play the file—it can play almost any audio format.

The music just...stops

If your audio files play a little way through and then fall silent, it means that the file is corrupt—it's probably due to an error in downloading or ripping. If you encoded the file yourself, the corruption may be due to a glitch in the encoding process. When encoding files, make sure that you close all unnecessary applications and try to do as little with your machine as possible while encoding. You'll need to download or encode the file again to fix this.

Some MP3s won't play on my portable player

Check if the MP3 is a VBR (Variable Bit-rate) or a CBR (Constant Bit-rate) encoded file. Open the file in a player such as Winamp and check the description. Some older portable music players do not have support for VBR MP3s, so you won't be able to hear them.

There is also the chance that you've had a run-in with Digital Rights Management (DRM). Music vendors program the MP3 with limitations in an attempt to curb piracy. One of these measures is pre-

venting the use of such files on portable MP3 players. Unfortunately, if the MP3 is protected, there is little you can do to play it.

Windows Media Player Woes

Older versions of Windows Media Player have a bug that causes sound to distort when the equaliser is set to anything but the default, and you decide to repeat playback for the file. The only way to prevent this is to disable the equaliser in the Now Playing Options under the View menu, click Graphic Equalizer and then click the "On" option to switch the equaliser off.

Online Woes

Streaming audio is extremely prone to skips and distortions, depending on the speed of your Internet connection. So unless you have a *really* fast connection, close applications such as download accelerators, P2P applications, etc., while you are listening to Internet radio.

If you're trying to stream an audio file, hit Pause on your media player, let the file download completely, and then click play.

Strange Beautiful Music

We didn't believe it at first, but if it's on Microsoft's Knowledge Base, it must be true!

"During normal operation or in Safe mode, your computer may play "Fur Elise" or "It's a Small, Small World" seemingly at random. This is an indication sent to the PC speaker from the computer's BIOS that the CPU fan is failing or has failed, or that the power supply voltages have drifted out of tolerance. This is a design feature of a detection circuit and system BIOSes developed by Award/Unicore from 1997 on."

Link: http://support.microsoft .com/?kbid=261186

Internet

In this chapter, we'll look at all the problems you may come across while online. These include problems with browsers, e-mail clients, spyware as well as connection hassles and problems with modems.

5.1 Firefox
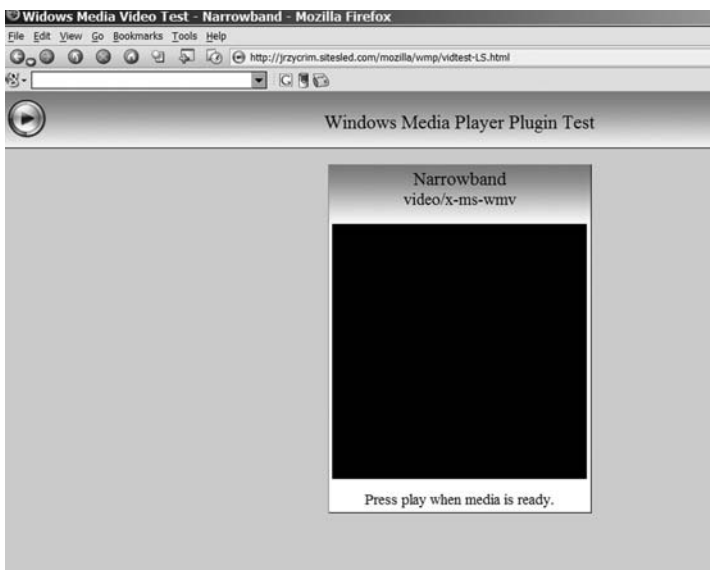
The Windows Media Player Plugin Test for Firefox

▶ **Problem**: Firefox is unable to play embedded Windows Media Player files in Web pages.

Cause: The plugin could be missing, or it might be refusing to work properly.

Solution: Restore the plugin if it is missing, and configure it if it doesn't work properly.

First off, you need to you have Windows Media Player 9 or 10 installed.

The WMP Plugin Test for Firefox

You can test the Windows Media Player plugin at http://jrzycrim.sitesled.com/mozilla/wmp/vidtest-LS.html. If the test player works, then the Windows Media Player is installed. If it doesn't, you need to check that Firefox can detect the Windows

Media Player plugin. Type "about:plugins" into the address bar. This will display Firefox's plugin information. If the following MIME type entries are present under "Windows Media Player Plug-in Dynamic Link Library," then WMP is installed correctly. Note that under the "Enabled" column, all the entries should be "Yes":

application/asx; video/x-ms-asf-plugin; application/x-mplayer2; video/x-ms-asf; video/x-ms-wm; audio/x-ms-wma; audio/x-ms-wax; video/x-ms-wmv; video/x-ms-wvx.

Also, under the following...
"Microsoft DRM
File name: npdrmv2.dll
DRM Netscape Network Object"
...the MIME type "application/x-drm-v2" should be enabled.
Finally, under...
"Microsoft DRM
File name: npwmsdrm.dll
DRM Store Netscape Plugin"
...the MIME type "application/x-drm" should be enabled.

Note that the "Microsoft DRM" entry with the filename "npwmsdrm.dll" might be called "Microsoft Corp. DRM Netscape Plugin" instead. Now, if any of these entries are missing, the Windows Media Player plugin is not properly installed.

To restore the Windows Media Player plugin, look for the files in the Windows Media Player directory (usually C:\Program Files\Windows Media Player), and copy them to the Firefox plugins directory (usually C:\Program Files\Mozilla Firefox\plugins). Then repeat the "about:plugins" step and-check the files are all there.

If any of the entries are still not present, close Firefox and then install the Windows Media Player Plug-in for Netscape Navigator, which contains some of those files. When installation is complete, repeat the "about:plugins" step and check if the files are all there.

If some of the files are still missing, you can download the individual files from dlldump.com:

npdsplay.dll: www.dlldump.com/dllfiles/N/npdsplay.dll
npwmsdrm.dll: www.dlldump.com/dllfiles/N/npwmsdrm.dll
npdrmv2.dll: www.dlldump.com/dllfiles/N/npdrmv2.dll

Download them to the Firefoxs plugins folder (usually C:\Program Files\Mozilla Firefox\plugins).

▶ **Problem**: You're having issues with the WMP plugin, such as the video disappearing when you press a control.

Comments: There are several known issues with the WMP plugin. Here are some of them.

Solution:

1. If, when playing a video, the video image is either invisible or disappears when you click a control, you need to adjust the plugin settings:

❍ When the player is active, right-click on it and select 'Options...'

❍ At the bottom of the window should be a 'Video Acceleration' option. Change it from full to half by moving the slider.

2. If the player controls look like they are from an older version of Windows Media Player:

❍ Right-click this link and save it to your desktop: http://plugin-doc.mozdev.org/resources/wmp9.reg

❍ When it has downloaded, double-click it. A pop-up will ask if you want to add the information in it to the Registry. Click Yes.

3. If you get a "Cannot create DirectShow Player" error, try reinstalling WMP and installing the latest version of DirectX. Users with WMP 9 can try upgrading to WMP 10, and WMP 10 users can also try rolling back to WMP 9. It has been reported that booting Windows XP in Safe Mode, deleting WMP, then reinstalling WMP will solve it.

4. You could get the following error when you try to watch embedded Windows media:

"Illegal Operation in Plugin

Windows Media Player Plug-in Dynamic Link Library
The plugin performed an illegal operation. You are strongly advised to restart Navigator."

❍ This can be caused by having JavaScript disabled.
❍ Click Tools > Options > Web Features, and make sure JavaScript is enabled.
❍ Make sure that any extensions you might have that can block JavaScript are not blocking the site in question or are disabled. These include NoScript and Adblock Plus.

5. Firefox could crash while trying to play embedded WMV files. This can be because VLC Media Player is installed, which includes its own browser plugin. This plugin conflicts with the WMP plugin, so you need to remove the VLC plugin for embedded WMV files to play properly.

▶ **Problem**: Firefox crashes often.
Cause: There are several causes. We list a few here.
Solution #1: Update Firefox.

It is always a good idea to use the latest public release version of Firefox, since it will contain the most recent fixes. You can download and install the latest version of Firefox from www.mozilla.com. Doing so could disable Extensions or Themes if they are likely to cause problems.

If you are using Firefox 1.5 or later (1.5.0.x), the latest updates can be downloaded and installed from within Firefox. Simply open the "Help" menu and choose "Check for Updates".

Solution #2: Check for problematic extensions

A list of problematic extensions is maintained at http://kb.mozillazine.org/Problematic_extensions.

Problematic extensions for Firefox

If an extension you use appears in the list and is known to cause crashing or hanging, update it to the latest version or uninstall it from Firefox until a fix is available.

Solution #3: Update Extensions

Every time a new version of Firefox is released, extensions need to be updated so that they are compatible. However, irrespective of your Firefox version, it is always best to use the most recent release of any extensions that you have installed.

Not all extension updates will be available through Firefox's update system. You may have to find updates for these extensions manually by visiting their homepage and installing the latest version over the top of the current version. You may also find extensions at the following sites:

https://addons.mozilla.org
http://www.extensionsmirror.nl
http://extensionroom.mozdev.org

Note that if you instal extensions from sites other than Mozilla Update then you do so at your own risk!

Solution #4: Update Plugins

As with Firefox and Firefox Extensions, the latest versions of the plugins are always the best. You can find plugins at Mozilla Update's Plugin page (https://pfs.mozilla.org/plugins/?application=firefox) and PluginDoc (http://plugindoc.mozdev.org/).

Plugins that are known to cause crashing in Firefox if they are not updated include:

❍ Macromedia Flash (www.macromedia.com/go/getflashplayer)
❍ Real Player (www.real.com)
❍ Real Alternative (www.codecguide.com/about_real.htm)
❍ Java (www.java.com/en/download/)

Solution #5: If you're having problems downloading files

Close Firefox, then search for and delete "downloads.rdf" from your hard disk. You will need to search for hidden and system files. You may also be able to solve this problem by clearing the Download History from the Clear Private Data tool.

Solution #6: Some programs could be causing Firefox to hang.

Having Microsoft AntiSpyware running in the background has been known to affect Firefox. If you're experiencing hangs running both these programs at the same time, turn off MS AntiSpyware. Also, McAfee AntiVirus can stop Firefox from operating correctly. To fix the problem, open the virus-scan Console, and go to Access protection > Prevent downloads from the World Wide Web, and add "firefox.exe".

Solution #7: Try a standard diagnostic.

If all the above have been ruled out as causes of your problem, try the standard diagnostic at http://kb.mozillazine.org/ Standard_diagnostic_%28Firefox%29.

▸ **Problem**: Firefox uses too much memory.
Comments: By default, Firefox does not use a fixed size memory cache. Setting a fixed size memory cache can reduce memory usage. The about: config window in Firefox lists many options you can change.
Solution: To set a fixed size memory cache, add the following preference in about:config (type in "about:config" in the address bar):

browser.cache.memory.capacity

This is an integer value, and can be set to the size you want the cache to be, in kilobytes.

To disable the memory cache entirely, set browser.cache.memory.enable to false. Note that this is not advised unless you're extremely short of memory, as it can slow things down severely, as well as causing other odd behaviour.

There is also a preference that enables trimming Firefox memory usage when you minimise all Firefox windows. To enable it, set "config.trim_on_minimize" to "true" in about:config.

▸ **Problem:** Firefox takes longer than expected to go back and for ward between pages or Firefox 1.5 is too slow when you use multi ple tabs.
Comments: There is a preference in about:config that can fix this, depending on how much RAM you have.
Solution: Firefox 1.5 has a new fast back/forward feature that vast
ly reduces the amount of time taken to display pages when the back/forward buttons are used. This does add to memory usage, though. Set "browser.sessionhistory.max_total_viewers" to the

Preference Name	Status	Type	Value
accessibility.accesskeycausesactivation	default	boolean	true
accessibility.browsewithcaret	default	boolean	false
accessibility.tabfocus	default	integer	7
accessibility.tabfocus_applies_to_xul	default	boolean	false
accessibility.typeaheadfind	**user set**	**boolean**	**true**
accessibility.typeaheadfind.autostart	default	boolean	true
accessibility.typeaheadfind.enablesound	default	boolean	true
accessibility.typeaheadfind.enabletimeout	default	boolean	true
accessibility.typeaheadfind.flashBar	**user set**	**integer**	**0**
accessibility.typeaheadfind.linksonly	default	boolean	false
accessibility.typeaheadfind.soundURL	default	string	default
accessibility.typeaheadfind.startlinksonly	default	boolean	false
accessibility.typeaheadfind.timeout	default	integer	5000
accessibility.usebrailledisplay	default	string	
accessibility.usetexttospeech	default	string	
accessibility.warn_on_browsewithcaret	default	boolean	true
advanced.mailftp	default	boolean	false
advanced.system.supportDDEExec	default	boolean	true
alerts.height	default	integer	50
alerts.slideIncrement	default	integer	1
alerts.slideIncrementTime	default	integer	10
alerts.totalOpenTime	default	integer	4000
app.update.auto	default	boolean	true
app.update.channel	default	string	release
app.update.disable_button.showUpdateHistory	**user set**	**boolean**	**false**
app.update.enabled	default	boolean	true
app.update.incompatible.mode	default	integer	0
app.update.interval	default	integer	86400

The about:config window in Firefox lists many options you can change

appropriate setting. When set to -1, it stores 1 page in memory: set 1 page if your RAM is 64 MB; 2 if it's 128 MB; 5 if it's 512 MB, and so on. When set to 0, Firefox does not store any pages in memory. When set it to any positive integer, it stores those many pages in memory.

▶ **Problem**: A Web page with sound on it opens properly (with the sound) in Internet Explorer, but not in Firefox.

Comment: There is an extension and a user script that can solve this.
Solution: First, install the Greasemonkey extension:

https://addons.mozilla.org/extensions/moreinfo.php?id=748

Then, install the following user script into Greasemonkey so that it will play embedded sound in Firefox that was coded only for IE:

http://userscripts.org/scripts/show/1827

As a final word, you can post your questions, receive answers, and read others questions and answers at forums.mozillazine.org.

5.2 Internet Explorer

▶ **Problem**: You're unable to load certain pages in Internet Explorer.

Cause: One reason could be active content (ActiveX scripts and controls, as well as Java programs) in the Web pages you're trying to view.

Comments: We'll be talking about disabling active content, so some functionality in the Web sites that are causing the problem will be affected. Here are three steps you can take. After the first step, you should check and see if the Web page in question is loadable. If it's not, continue to steps 2 and 3. These apply to IE versions 5.0, 5.01, 5.5 and 6.

Step 1: Configure Internet Explorer so that it does not run Active scripts automatically. Click Internet Options on the Tools menu in IE. Click the Security tab, click the Internet Web content zone, and then click Custom Level. In the Security Settings box, go the Scripting section, and click the Disable radio button next to both 'Active scripting' and 'Scripting of Java applets'. Click OK twice to save and exit.

Step 2: Configure Internet Explorer so it does not automatically use items that show active content, such as vertical marquees or animations. On the Tools menu, click Internet Options, click the Security tab, click the Internet Web content zone, and then click Custom Level. In the Security Settings box, click Disable under all the following: 'Download signed ActiveX controls', 'Download unsigned ActiveX controls', 'Initialize and script ActiveX controls not marked as safe', 'Run ActiveX controls and plugins', and 'Script ActiveX controls marked safe for scripting'. Click OK twice.

Step 3: Disable Java. Under Internet Options, click the Advanced tab. Scroll down to the Java icon where it says "Use JRE..." Uncheck the box.

▶ **Problem**: When you're browsing a Web site, all of a sudden, you receive an error message that looks something like this: "A run time error has occurred. Do you wish to debug? Line number... **Error**: Permission Denied."

Cause: This can occur when you upgrade to IE 5.5 (on Windows XP with SP1). The upgrade enables the script-debugging and script-error-notification options.

Solution: Disable the script-debugging and script-error-notification options: go to Tools > Internet Options. Click the Advanced tab. Click to select the 'Disable script debugging' checkbox. Also clear the 'Display a notification about every script error' checkbox. Click Apply, and then OK.

▶ **Problem**: A new Internet Explorer Window opens partially off the screen. When this occurs, only a small section of the new win dow may be visible on the screen.

Cause: This can occur if certain registry values for IE are incorrect or damaged.

Solution: Always use the Registry Editor with care, and do so at your own risk!

Use the Registry Editor to delete the following IE registry values, and then restart your computer.
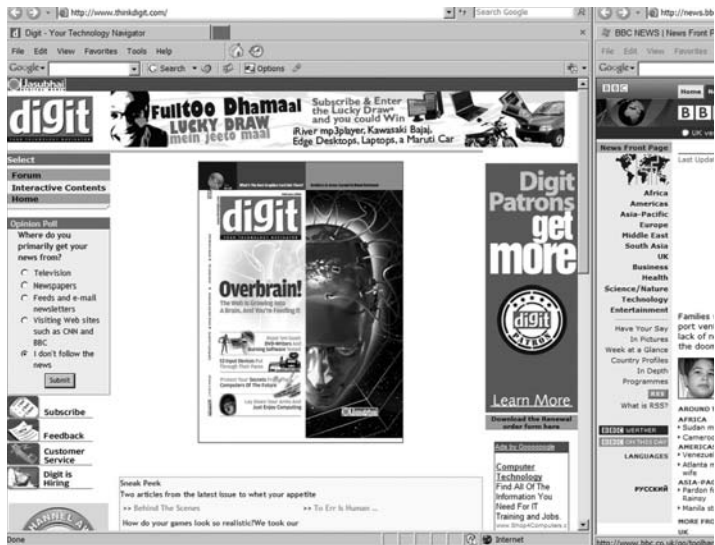
IE windows can sometimes appear off-screen

HKEY_CURRENT_USER\Software\Microsoft\Internet Explorer\Main\window_placement

HKEY_CURRENT_USER\Software\Microsoft\Internet Explorer\Desktop\oldWorkAreas\OldWorkAreaRects

▶ **Problem**: You get invalid page faults in Internet Explorer.
Cause: There are several causes for this, and here, we mention several solutions.
Solution #1: This could be the result of video resource limitations. Upgrade to the latest version of your video driver. To do so, look up the Web site of the manufacturer of your video adapter.

Solution #2: Disable the "Run=" and "Load=" lines in the Win.ini file: click Start > Run, type in "sysedit", and click OK. On the Window menu, click 'Win.ini'. Then on the Search menu, click Find, type "load=" in the Find box, and click Next. If there is text to the right of the equals sign (=), place a semicolon (;) at the beginning of the "Load=" line.

Next, on the Search menu, click Find, type "run=" in the Find box, and click Next. If there is anything to the right of the equals sign (=), place a semicolon (;) at the beginning of the "Run=" line. Save the file.

Solution #3: Reduce the hardware acceleration for your video adapter: right-click My Computer, click Properties, and then click the Performance tab. Click Graphics, and then move the Hardware Acceleration slider to 'None'. Click OK, click Close, and click Yes to restart your computer.

Solution #4: Install the latest version of DirectX from www.microsoft.com/directx.

Solution #5: Check with the video adapter manufacturer for specific Internet Explorer issues. Some video adapter manufacturers have fixes for issues with their display adapters. For example, sever-

al ATi video adapters with the Rage chip set require a "DevBmp=1" entry in the [Display] section of the Windows\System.ini file.

▶ **Problem**: Internet Explorer is very slow at loading pages.

Cause: This could be a spyware issue.

Solution: Scan your computer for spyware using both Lavasoft's Ad-Aware and Spybot Search&Destroy. If no spyware is detected, or if you detected spyware and still have the same problem, try doing a System Restore: go to Start > All Programs > Accessories > System tools > System restore, and choose a Restore Point for a date before the problem first cropped up.

▶ **Problem**: Internet Explorer starts up with a weird, unknown page, displays a lot of pop-ups, and you see sites in your Favorites folder that you don't recognise.

Cause: This happens when your browser has been "hijacked" by spyware.

Solution: First off, clean your system of spyware by using both Lavasoft's Ad-Aware and Spybot Search&Destroy. If no spyware is detected (which is unlikely), or if the problem persists, visit http://hijack-this.net/ and do a free scan of your computer.

After the spyware scans, check for the spyware itself, and delete them manually from your computer (including the folders). Note down the names of the folders you deleted. Open the Registry Editor. Find the keys with the names of these folders and then delete the keys. Remember to always take a backup of your Registry!

5.3 Microsoft Outlook

▶ **Problem**: You get attachments in Outlook as "winmail.dat".

Solution: Use AkeeSoft WMViewer, a free GUI utility for dealing with the winmail.dat problem. It can extract winmail.dat files, view the mail body and save any attachments. To use it, just open

WMViewer.exe, drag/drop a WINMAIL.DAT file onto it to retrieve the mail body and attachments. Download WMViewer at www.winsite.com/bin/Info?23500000036956

▸ **Problem**: Sent e-mails appear blank with no body text. Also, incoming e-mails could show the same behaviour.

Cause: This is a known Microsoft issue.

Solution: A fix is provided in MS Office XP SP3. Download SP3 at http://snipurl.com/4z5f

▸ **Problem**: Nothing happens when you click an embedded link in an e-mail.

Solution: Reset Web-related options to their defaults in Internet Explorer. In IE, select Internet Options on the Tools menu. Click the Programs tab. Here, click 'Reset Web Settings'.

▸ **Problem**: Outlook is slow.

Cause: There may be several causes for this. Here is one solution.

Solution: Turning off the Instant Messaging feature in Outlook often improves performance. In Outlook 2002, on the Tools menu, select Options. Choose the 'Other' tab. Deselect 'Instant Messaging' and click OK.

▸ **Problem**: The Search feature in Outlook does not appear to be working.

Cause: Sub-folders have not been selected.

Solution: Make sure to configure the Search to include sub-folders: click the main folder in which to start the search. On the Tools Menu, select Find. In the Look For box, enter the information you want to find. Then in the 'Search In' drop-down list, select 'Choose Folders'. And in the far left corner, select 'Search Sub Folders'.

▸ **Problem**: When you reply to a message in Outlook, a copy goes into the Inbox.

Cause: You've set an option that causes this to happen.

Solution: To turn off the option that causes this to happen, on the Tools menu, select Options, then Email Options. Under Email

Options, select Advanced E-mail Options. Deselect the option "In folders other than the Inbox, save replies with original message".

▶ **Problem:** There are many attachments you cannot open in Outlook.

Cause: This is intentional, in order to make your computer more secure.

Solution: Outlook 2002, Outlook 2003 and Outlook 2000 SP3 allow you to use a registry key to open up access to blocked attachments. Always make a backup before editing the registry. Open the Registry Editor, and go to this key: HKEY_CUR-RENT_USER\Software\Microsoft\Office\10.0\Outlook\Security

(change 10.0 to 9.0 for Outlook 2000 SP3 or to 11.0 for Outlook 2003.) Under that key, add a new string value named Level1Remove. For the value for Level1Remove, enter a semicolon-delimited list of file extensions. For example, entering ".mdb;.url" would unblock Microsoft Access files and Internet shortcuts. Note that the use of a leading dot was not previously required, however, new security patches may require it. If you are using "mdb;url" format and extensions are blocked, add a dot to each extension. Note also that there is no space between extensions.

If you prefer not to edit the Registry, you can use one of these tools to make the change; not all support both Outlook 2002 and 2000.

Attachment Options

(http://www.slovaktech.com/attachmentoptions.htm): This is a shareware COM add-in that adds an Attachment Security Options page to the Tools > Options dialog in Outlook 2002 to allow you to manage which file attachments are blocked. It is *only for Outlook 2000 SP3, Outlook 2002, and Outlook 2003*. It also provides a user interface for setting two other Outlook options: Read As Plain Text (Outlook 2002, SP-1 or later) and Minimize to System Tray.

Attachments Zip Compressor
(http://slipstick.com/redirect.asp? id=compressor):
Automatically compresses outgoing attachments into .zip files.
Can extract files from incoming .zip attachments or compress
attachments in an incoming message. Can handle incoming files
that Outlook blocks and put them into .zip files.

DetachOL
(http://mcdev.com/programs.php?page=DetachOL):
A free, standalone utility to change the list of blocked file attach-
ments according to the level of risk you're willing to take. Works
with Outlook 2000, 2002, and 2003.

Outlook Permissions Add-in (www.mrhtech.com/Software /OPA/):
A freeware add-in for adjusting which attachments you can open
under Outlook's increased security, for Outlook 2003, 2002 and
Outlook 2000 SP3 or later.

TweakOL
(http://mcdev.com/programs.php?page=TweakOL):
Modifies the Windows Registry to change the list of blocked file
attachments according to the level of risk you're willing to take,
always show the Bcc field, minimise Outlook 2002 to the system
tray, and disable or enable MSN Messenger. It is freeware, and is
available for Outlook 2002 and Outlook 2003.

Xenos Outlook Security Extension
(www.xenossoftware.com/ xsoutlooksecurityext/):
A utility to manage file attachment blocking in Outlook 2000 SP3,
Outlook 2002, and later. Also manages optional settings such as
minimize to tray and purge data file on exit. New settings added
in new Outlook updates are supported through online updates to
the software.

After applying this registry fix or using one of the above tools,
the user still has to save the attached file to a system drive before
opening it.

▶ **Problem**: Your PST file is damaged.
Comment: There are several possible causes for this.
Solution: Microsoft provides the Inbox Repair Tool for correcting most problems with damaged Personal Folders (.pst) files. If you do not see the Inbox Repair Tool on the Start menu, under Programs > Accessories > System Tools, use Start > Find or Start > Search (depending on your operating system) to search your system for Scanpst.exe, since you will need to know the location of the .pst file that you want to repair.

When you run Scanpst.exe, it performs a number of tests. If it finds errors, it asks whether you want to make a backup copy of the original file. Always say Yes. It then tries to correct the errors.

If you run Scanpst.exe against a .pst file that Outlook 2003 created for a local copy of Windows SharePoint Services events and contacts lists, you will get an error message that you can ignore. If you do receive the error message, see http://support.microsoft.com /?kbid=817966

For seriously corrupted PST files, try running Scandisk.exe under Programs > Accessories > System Tools first. Then Scanpst.exe, repeating 3 to 4 times until neither program returns an error. This technique has been known to restore data that the user thought was lost forever. If that doesn't do it, try the following:

1. Outlook has no inbuilt way to reduce a PST or OST file that has gone over the limit. However, Microsoft provides a tool, PST2GB, which you can download to restore the file to operability. Note, however, that the utility truncates the data from between 25 and 50 MB, and the truncated data is not recoverable. The remaining data under 2 GB should be restored.

The file "PST2GB" is available from www.microsoft.com (do a search for that term).

If you want to attempt repairs yourself, use a tool called a hex editor to edit the data in the file directly.

Every Windows shareware site has a selection of hex editors. A recommended, free hex editor is the iHex editor (http://www.memecode.com/ihex.php), which loads only 64 KB of the file at a time, making it ideal for tinkering with extremelylarge PST files.

2. Make a backup of your PST or OST, then open the original file with the hex editor. You'll want to remove a few characters from the middle of the file, then save it and try to run the Inbox Repair Tool (Scanpst.exe) to repair the damage you did with the hex editor. If Scanpst can repair the file, you should be able to open it Outlook again. If not, try removing some additional characters from the file.

If this process works, you could end up losing only one or two items. You may be able to recover all the data by repeating the process with a new copy of the file.

▶ **Problem**: When you upgrade to Outlook 2002 from Outlook 2000, you cannot find Outlook 2002 on the Start menu.

Comment: If you click 'Add or Remove Programs', Outlook 2002 appears as an installed program.

Cause: This issue may occur when all the following conditions are true

❍ You installed Outlook 2000 using the 'Not Available' option in the Microsoft Office 2000 Setup program.

❍ You installed Outlook 2002 using the typical 'Install Now' installation option in the Microsoft Office XP Setup program.

Workaround: Use one of the following methods to work around this issue depending on your situation.

Method 1: Use this method if Outlook 2002 or Office XP is installed:

Go to Add or Remove Programs in the Control Panel. Click your installation of Outlook 2002 or your installation of Office XP, and then click Change. Click Add or Remove Features, and then click Next. Click Microsoft Outlook for Windows, and then click 'Run all from My Computer'. Click Update.

Method 2: Use this method if Outlook 2002 or Microsoft Office XP is not installed:

Start the Setup program for Outlook 2002 or for Office XP. Type your user information and the Product Key from your Outlook 2002 or from your Office XP CD-ROM, and then click Next. Accept the License Agreement, and then click Next. Click Custom, and then click Next. Click "Choose detailed installation options for each application", and then click Next. Click Microsoft Outlook for Windows, click 'Run all from My Computer', and then click Next. Click Install.

▶ **Problem**: When you start Microsoft Outlook 2002 Service Pack 3 (SP3), you receive the following error message: "Outlook cannot open the data file (File Name) until it has been checked for problems."

Cause: This issue may occur if Outlook was previously shut down incorrectly and you are using a personal folder file (.pst) or an offline folder file (.ost).

Solution: No action is required. When this message appears, Outlook is checking the files. Outlook opens normally when this check is complete.

More Information: The message in the "Symptoms" section is a new message that is introduced in Outlook 2002 SP3. When the message appears, the check is in process. If you end the Outlook process, this issue is not resolved. The check process must complete before Outlook can open, and the file check does not display a progress status.

▶ **Problem**: Every time you try to send a self-extracting zip file, or self-running PowerPoint presentation, etc., Outlook 2002 auto matically deletes the .exe file attachment.

Workaround: Change the extension, and tell the receiver to change it back to .exe. (Change digit.exe to digit.2exe, for example).

▶ **Problem**: You aren't able to control line length in messages.

Comments: Line length is an issue in plain text format messages and in rich-text format (RTF) messages sent to recipients whose entries in your address book are not set up for RTF. It is not an issue

in HTML messages, unless you send an HTML message to someone whose mail program can't display HTML (such as Outlook 97).

Mail may use a "content-transfer-encoding" called "quoted-printable," which does not have a fixed line length. Some e-mail programs cannot wrap "quoted-printable" text and, therefore, display it all as one long line. On the other hand, if you send mail using a fixed line length, when recipients reply and using "Internet-style" quoting, the resulting message may have lines that wrap with just one or two words on a line.

Solution: The default setting in Outlook 2003 is to insert a hard return at the end of each line in a plain text message. This causes long URLs to be unusable in the received message. You can turn off these hard returns (and, by default, use quoted-printable encoding) by adding a WrapLines entry to the Windows registry. Here's how it's done, as described in the MSKB article available at http://support.microsoft.com/?id=823921:

1. Locate, and then click the following registry key: HKEY_Current _User\Software\Microsoft\Office\11.0\Common\MailSettings
2. In the right-pane, double-click the WrapLinesDWORD value.
3. Note the value that appears in the Value Data box.
4. If the WrapLines value is set to a non-zero value or is not present (the default setting), plain text lines are wrapped before the e-mail message is encoded. In this situation, you must create the WrapLines value. To do so, follow these steps:

a. Locate, and then click the following registry key: HKEY_Current_User\Software\Microsoft\Office\11.0\Common\ MailSettings
b. On the Edit menu, click Add Value.
c. In the Value Name box, type WrapLines.
d. Click REG_DWORD in the Data Type drop-down list, and then click OK.
e. In the Data box, type 0, and then click OK.

If the WrapLines value is set to 0, no line-wrapping is performed before the e-mail message is encoded.

▶ **Problem**: You're not able to use Internet-style quoting in replies.
Comments: Internet-style quoting consists of putting a ">" or other character in front of the original message when you reply or forward it. Recipients can easily distinguish the original message from your comments. This method is preferred on many Internet mailing lists that transmit in plain text only.

Solution: Choose Tools > Options. On the Preferences tab, click E-mail Options. Under "When replying to a message" and "When forwarding a message", choose "Prefix each line of the original message". Set the prefix character(s) under "Prefix each line with". Click OK twice.

▶ **Problem**: Within your own domain, you can't send, using Outlook, messages without the full domain name. For example, within thinkdigit.com, you have to type in "digit@thinkdigit.com" instead of just "digit".

Workaround: Outlook, Exchange and Windows Messaging do not support this feature directly. You'll need to enter the address in the 'To' box as [SMTP:accountname], being sure to include the brackets. The "SMTP" tells Outlook that it's an Internet address. It will try to deliver it to the "accountname" account on your own SMTP server.

▶ **Problem**: You are not able to view full Internet headers.
Solution: The method depends on the version of Outlook. With the exception of Outlook 2003, Outlook displays only the headers, not the full message source. If viewing headers is something you need to do often, use Pocketknife Peek (www.xintercept.com/pkpeek.htm) to view and copy the headers.

▶ **Problem**: You receive an error that says:
"Sending and Receiving reported error (0x800CCC0F) : 'The connection to the server was interrupted. If this problem continues, contact your server administrator or Internet service provider (ISP).'"
Cause: This error is generally caused by a spam mail sent to you with a malformed header.
Solution: The easiest way to clear the problem is go to your Web mail interface (if you have one) and delete the offending spam message.

▶ **Problem**: You are prompted for your password, and you may receive duplicate e-mail messages if your profile has two POP3 accounts in Outlook.

Cause: This can occur if your Outlook profile contains two Internet accounts that both point to the same POP3 server, or for other reasons. We point here to six solutions.

Solution #1: Turn off e-mail reception for one of the POP3 accounts: in Outlook, on the Tools menu, point to Send/Receive Settings, and then click Define Send/Receive Groups. Double-click the group that contains the two POP3 accounts, and under Accounts, click one of the POP3 accounts. Click to clear the Receive mail items checkbox.

Solution #2: Outlook downloads duplicate POP3 Messages after exchange server is temporarily offline. Visit http://support. microsoft.com/default.aspx?scid=kb;en-us;290043

Solution #3: Outlook downloads messages from a POP3 server twice. Visit http://support.microsoft.com/default.aspx?scid=kb;en-us; 292249

Solution #4: Mail retrieval problems occur when you receive POP mail. Visit http://support.microsoft.com/default .aspx?scid=kb;en-us; 317945

Solution #5: Duplicate messages appear if Outlook profile has two POP3 accounts. Visit http://support.microsoft.com/default. aspx?scid=kb;en-us;284404&Product=ol2002

Solution #6: POP3 headers are duplicated. Visit http://support. microsoft.com/default.aspx?scid=kb;en-us;289942&Product=ol2002

5.4 Outlook Express

▶ **Problem**: You've lost all your Outlook Express mail.

Cause: This could happen if you have background compacting selected and it was running when Windows was shut down improperly. Check if this option is selected under Tools > Options > Maintenance.

Solution: If your computer often shuts down improperly, disable background compacting. Now, to recover your mail, re-extract them using a paid utility called DBXpress from www.oehelp.com/ DBXpress/Default.aspx

▶ **Problem**: Outlook Express will not allow attachments
Cause: This is intentional. It's meant to make your computer more secure, but can be an annoyance.
Solution #1: Go to Tools > Options > Security tab and remove the checkmark beside "Do not allow attachments to be saved or opened that could potentially be a virus". Press Apply and then OK. Exit Outlook Express via the File menu, then re-launch the program. You should now be able to view and save attachments to your hard disk, but it is generally advised that you leave this turned on most of the time to prevent accidentally opening infected attachments.

Solution #2: Here's a quick work-around. Open the mail with the attachment, then click Forward (just as if you were going to forward the message to someone else). The attachment will now be viewable below the Subject Line.

▶ **Problem**: OE won't switch identities.
Comments: There is a fix available for this: "An Overview of the Cumulative Update for Outlook Express 6.0 SP-1". This is available at http://support.microsoft.com/default.aspx?scid=kb;EN-US;q3319 23
Workaround #1: You might find that the problem was caused by installing SP1. The workaround is to uncheck the "use this identity as default" box under "Manage Identities", and get prompted for which identity to use every time you start.
Workaround #2: Hit the [F1] key before switching identities. This will bring up the Outlook Express Help window. With this window minimised, you can switch identities.

▶ **Problem**: Outlook Express loads very slowly.
Cause: A possible cause for slow performance when starting Microsoft Outlook Express in Windows XP is the integration of Windows Messenger.

Solution #1: Is Messenger starting when Windows starts? If so, then that's the cause of OE's performance hit. If it is not running at startup, then OE is probably launching Messenger and waiting for it to fully initialise before it continues initializing OE itself.

To prevent OE from launching Messenger, click Tools > Options and remove the check mark for "Automatically log on to Windows Messenger". Then add a checkmark for "When starting, go directly to my Inbox folder". Then click View > Layout, and remove the checkmark for "Contacts".

Note that if you open the Contacts pane, or if you open the OE start page, then Messenger will launch in order to update the online status of your contacts.

Solution #2: Open the Registry Editor and navigate to this key
HKEY_CLASSES_ROOT\CLSID\{FB7199AB-79BF-11d2-8D94-0000F875C541}\InProcServer32
In the right-hand pane, double-click on the "Default" value and delete whatever is entered there, leaving it blank. Click OK. Now perform exactly the same step with the key directly underneath, namely
HKEY_CLASSES_ROOT\CLSID\{FB7199AB-79BF-11d2-8D94-0000F875C541}\LocalServer32
Once both "Default" values are empty, OE will open normally.

▶ **Problem**: Outlook Express could not be started because MSO ERES.DLL could not be found.
Cause: Outlook Express may not be installed correctly.
Solution: First, uninstall and reinstall OE. This can be done from 'Add or Remove Programs' in the Control Panel, and selecting "Windows Components." Remove OE, and re-install it. If that doesn't work, try the following link:
http://support.microsoft.com/default.aspx?scid=KB;EN-US;Q318378

▸ **Problem**: Links in mails do not work
Cause: This is a problem with your file type settings.
Solution: In Windows Explorer, go to Tools > Folder Options > File Types and scroll down to "HTML" or "HTM". Check the values there. Click "Advanced" at the bottom right. Assuming you're using Internet Explorer, click "open", then click "Edit". Under "Application used to perform action, the entry should be

"C:\PROGRAM FILES\INTERNET EXPLORER\iexplore.exe" -nohome

(Check the path to iexplore.exe to make sure it is correct.)

"DDE" should be checked. In the boxes below it you should have, in order,

"%1",,-1,0,,,,
IExplore
 (blank)
WWW_OpenURL

If this is incorrect, change the values to the above. If it's correct and you still have problems, go to Start > Run and type in "regsvr32 urlmon.dll". Next, open Internet Explorer and go to Tools > Internet Options > Programs, and click "Reset Web Settings".

▸ **Problem**: Messages do not appear in Outlook Express 6
Comments: When you try to access e-mails or newsgroup messages, the general header information appears, but when you click on the message, you get an "hourglass" cursor, and the body of the message does not appear. This happens to pre-downloaded email as well, not just new messages.
Cause: One of the causes of this could be a virus or spyware.
Solution #1: Do a thorough spyware and virus scan using the latest definitions.

Solution #2: Go to: Start > Run and type in "regsvr32 inetcomm.dll", and press [Enter]. That might do the trick.

Solution #3: In Outlook Express, go to Tools > Options > Read > Fonts, and change the default encoding setting to Western (ISO).

▶ **Problem**: When a mail is highlighted and deleted, a copy goes to the deleted folder but the original stays in the Inbox.

Cause: This can occur if the Deleted Items folder is damaged.

Solution: Move all messages you want to keep out of the Deleted Items folder and into another mail folder. Close OE, then delete the "Deleted Items.dbx" file in your Identity's store folder. OE will create a new one when it is reopened.

(To find where your data files are stored, go to Tools > Options > Maintenance > Store Folder and see where OE is keeping its files.)

▶ **Problem**: After installing Windows XP SP2, you get a Red X instead of a picture.

Comments: In order to view the pictures, you need to click the bar under the subject line in the preview pane that says, "Some pictures have been blocked...Click here to download pictures." The pictures will now be visible.

SP2 blocks images in e-mails

Cause: This is an intentional feature in SP2.

Solution: If you would like to turn the feature off all together, go to Tools > Options and click the Security tab. Under "Download Images", uncheck the box marked "Block images and other external content..." Your pictures should now appear without you having to do anything.

▶ **Problem**: Messages are invisible in the Inbox.

Comments: When you do a search for an e-mail message, you find it to be in your Inbox. But when you go directly in to the Inbox, it's not there.

Cause: This is due to a corrupt inbox.dbx file.

Solution: First, use the search feature and move the files from your Inbox to some other folder (you could create a new folder and put the files in there). After that, locate the folder where OE stores

your messages by going to Tools > Options > Maintenance tab > Store Folder. In that folder, delete the inbox.dbx file. (You'll need to shut down OE before doing this.) Now when you restart OE, a new Inbox folder will have been created.

5.5 MODEMS

▶ **Problem**: Your modem does not work properly.
Cause: There are too many possible causes for this to list here.
Solution: There are resources for troubleshooting modem problems in Windows XP at http://support.microsoft.com/kb/q308022/

▶ **Problem**: You get low connection speeds with your 56K modem.
Cause: There are too many possible causes for this to list here.
Solution: Visit http://support.microsoft.com/kb/q310590/

▶ **Problem**: Spyware seems to have hijacked your browser, and you're getting very low download speeds. You also experience weird errors such as dialup settings keeping changing from "never dial" to "always dial" or vice versa.

Solution: Your dialup settings may change if you have Norton AntiVirus with Auto-Protect turned on. If this applies to you, turn off the Auto-protect and set NAV to only scan program files.

Check for spyware. Apart from Lavasoft's Ad-Aware and Spybot Search&Destroy, visit www.trendmicro.com/cwshredder. CW Shredder removes browser hijackers—"CW" stands for "CoolWeb Search", which installs dozens of bookmarks on your desktop, mostly to pornographic sites, changes your home page without asking, and continually changes it back if you attempt to correct it. Furthermore, it significantly slows down the performance of your PC, and introduces modifications which cause Windows to freeze, crash or randomly reboot.

If you haven't installed SP2, use BHOCaptor from www.snap-files.com/reviews/BHOCaptor/bho.html. BHOCaptor lets you con-

trol the Internet Explorer Browser Helper Objects (BHOs) installed on your system. It makes it easy to see what BHOs are installed and to de-activate them. BHOCaptor puts you in control, displaying all BHOs, and lets you deactivate them if desired.

WinSock XP Fix (www.spychecker.com/program/winsockxp-fix.htm) is a last resort if your Internet connectivity has been corrupted due to invalid or removed registry entries. It can often cure the problem of lost connections after the removal of adware components or improper uninstall of firewall applications or other tools that modify the XP network and Winsock settings. If you encounter connection problems after removing network related software, adware, or after registry cleanup, and all other ways fail, then give WinSock XP Fix a try. It can create a registry backup of your current settings, so it is fairly safe to use.

Also download and run HijackThis from www.merijn.org/downloads.html. This is a free tool as well.

▶ **Problem**: You cannot connect to the Internet after installing IE6 SP1, XP SP1, Hotfix 312176 or Hotfix 325662.
Solution: Visit http://support.microsoft.com?scid=kb;EN-US;Q331 906

▶ **Problem**: You cannot establish a dial-up networking connection if you quit Internet Explorer while you are connecting.
Solution: Visit http://support.microsoft .com/default.aspx?scid =kb;EN-US;Q285786

▶ **Problem**: When you try to connect to the Internet by using a Point-to-Point Protocol over Ethernet (PPPoE) connection, you may receive one of the following error messages:
❍ Error 769: The specific destination is not reachable.

   or

❍ Error 769: Either you specified a destination address that is not valid, or your remote server is down.

Comments: This behaviour may occur after you upgrade to Windows XP.

Cause: This may occur if the network card in your computer is not enabled.

Solution: To resolve this issue, enable the network card, and then run the Network Setup Wizard: in the Control Panel, click Performance and Maintenance, and then click System. In the System Properties dialog box, click the Hardware tab, and then click Device Manager. In Device Manager, click Network adapters. On the Action menu, click Enable. Quit Device Manager. Now, in the Control Panel, click Network and Internet Connections, and then click Network Connections. In Network Connections, click Network Setup Wizard under Network Tasks, and then follow the on-screen steps. Finally, restart your computer.

▶ **Problem**: Internet Explorer does not automatically connect to the Internet.

Solution: Visit http://support.microsoft.com/default.aspx? scid= kb;EN-US;Q231643

▶ **Problem**: The computer keeps disconnecting from the Internet.

Cause: This could be due to Internet Explorer or Outlook Express settings.

Solution: In Internet Explorer, do to Tools > Internet Options > Connections > Dial-up Settings > Advanced Dial-up settings. Make sure that 'Disconnect when connection may no longer be required' is turned off, and that the option to disconnect if idle is turned off as well.

Outlook Express options can cause problems as well. Go to Outlook Express > Tools > Options > Connections, and make sure "Connect to this account using" is not selected for each mail and news account. Make sure there is no conflict in account settings-each account should show the connection option "Any available". Next, go to Tools > Options > Connections and turn off "Hang up after send/receive".

▶ **Problem**: Auto-disconnect doesn't work, or the settings change.
Solution: If the settings change, visit http://support.microsoft
.com/default.aspx?scid=kb;EN-US;Q230142

If auto disconnect doesn't work, go to the advanced options of
your dial up settings: in Internet Explorer, go to Tools > Internet
options > Connections > Dial-up settings > Advanced dial-up set-
tings, and turn on the option to "disconnect if connection no
longer required."
Also see these links:
http://support.microsoft.com/support/kb/articles/q153/9/65.asp
http://support.microsoft.com/support/kb/articles/q180/9/48.asp
http://support.microsoft.com/support/kb/articles/q193/5/55.asp
http://support.microsoft.com/support/kb/articles/Q256/3/02.ASP
If that doesn't work, open the Registry Editor, and navigate to
HKEY_CURRENT_USER\RemoteAccess\Profile\<Connection>
Now look at the following DWORDS:
EnableExitDisconnect
EnableAutodisconnect

If either one has the data of 00 00 00 00, right-click the value
and select Modify. Change the data to 01 00 00 00.

Also check this registry key: HKEY_CURRENT_USER\Software
\Microsoft\Windows\CurrentVersion\Internet Settings. Look at
the DWORD: EnableAutodisconnect. If this value has the data of 00
00 00 00, change it to 01 00 00 00. Reboot your computer.

▶ **Problem**: Web pages take too long to get displayed.
Cause: Your browser cache may be full.
Comments: Your computer stores temporary copies of the sites you
visit on your hard drive, which helps each site open much faster
when you visit it again. This set of stored files is called a cache. If
the cache gets too big, it may take a long time to display a Web
page in your browser.
Solution: You can empty your cache in Internet Explorer by select-
ing Tools > Internet Options, then under the General tab, delete
the files and cookies.

▶ **Problem**: You have a problem with your modem settings.
Cause: There are too many causes to be listed here.
Solution #1: Modem Strings
Some modem manuals recommend that you add special modem initialisation (or 'init') strings to your modem settings. These are a series of numeric commands that can improve efficiency and stability of online connections. Check your modem documentation or Web site for more information.

Solution #2: Modem Drivers
Modem manufacturers continually tweak and refine their modem software. Re-installing the software of your modem or running a firmware upgrade may significantly improve connectivity and speed. Most manufacturers make copies of their latest software available for download on their Web sites.

Solution #3: Software Modems
Some modems use the processing power of your computer to perform some tasks. If you own a software modem and an older PC, or a PC with low memory, this may affect your connection speed. Also, having a lot of applications open while using a software modem may affect the speed and stability of your connection.

Solution #4: Modem Port Speeds
External modems connect to your computer via a communications port to a piece of hardware known as a 'serial card'. Although on all new PCs, these are built into the motherboard, some older PCs, however, have slower serial cards, which struggle to keep up with faster modems. If you use a 56K modem in conjunction with an older PC, you may experience unstable connections. We suggest you consult the modem documentation or speak with the vendor to find out what type of serial card your PC has, and whether it is suitable for the modem you're using.
Solution #5: Overheating Modems
External modems can become quite hot during their normal operation and may start to perform erratically if they overheat. Be sure to place your modem away from your PC, preferably in a well-ventilated area.

Solution #6: Modem Power Supplies
You should only use the power supply provided with your modem. Even though other power supplies might work, they may cause the modem to act erratically, resulting in slow speeds or disconnection.

Solution #7: Modem Error Correction
High data speeds require an error correcting modem. Ensure your modem has this feature enabled/turned on (usually found in the Control Panel under Modems).

▸ **Problem**: Your 56K modem connects at 33.6 or less.
Cause: There are several causes for this.
Solution: Some Internet service providers have separate phone numbers for 56K. Make sure you're calling the right number. Next, if there is a telephone, answering machine, etc., plugged into the back of the modem, unplug it. The modem is supposed to ignore devices plugged into it when it is online, but that is not always the case. Also try disconnecting additional telephony devices (fax, phones, answering machines, etc.) from the phone line, even if they're in a different room. Try running the phone line directly from the back of the modem to the wall, without passing through surge suppressors, splitters, phone line extenders, etc.

It's always a good idea to check the firmware and drivers page for your modem to see if there is a more recent version available. Many people's problems disappear once they installed a new version of the driver or firmware.

▸ **Problem**: You cannot get PPPoE in XP to log in automatically at bootup.
Solution: Open Network Connections in the Control Panel, right-click on your connection icon, and select Properties. Uncheck "Prompt for name and password..." and click OK. Now go to C:\Documents and Settings\All Users\Start Menu\Programs. Here, add a shortcut to your PPPoE connection.

▸ **Problem**: A prompt to shut down the Internet connection comes up when you switch users in Windows XP.

Cause: This is by design in XP.

Solution: To enable a permanent Internet connection with multiple users on your PC under Windows XP, open the Registry Editor, and navigate to

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\WindowsNT\Current Version\Winlogon

Right-click the right-hand pane, and select New > String Value. Name the value KeepRasConnections and set it to 1.

▶ **Problem:** When you dial up in XP, you sometimes cannot connect, and get error messages about the PPP link control protocol being terminated.

Cause: This has to do with Windows XP's "multi-link" option.

Solution: If you're seeing this error message, the multi-link option is probably already off, but you'll need to turn it on and then back off. Select your dial-up connection, select Properties and click the Networking tab. Below and to the right of "Type of dial-up server I am calling", click the Settings button. Now in the PPP Settings window, find the checkbox labelled "Negotiate multilink for single link connections". If the box is checked, click to remove the checkmark. If the box is already unchecked, click to make the checkmark appear, then click again to remove the checkmark. Click OK until all the dialog boxes close and try connecting again.

▶ **Problem:** You're not sure if you're getting optimal speeds out of your modem.

Solution: Visit www.speedguide.net/downloads.php. The TCP Optimizer is a free, easy Windows program that provides an intuitive interface for tuning and optimising your Internet connection. No installation is required. The program makes it easy to find the best MTU and RWIN values, test latency, and tweak all the important registry parameters. This application can be helpful with tuning any Internet connection type, from dialup to Gigabit+.

Networking

Networking has become an integral aspect of any computing system today—be it connecting two home computers or connecting to the Internet. Sometimes, simple network connections can lead you to dead ends, and these can be terribly frustrating! Here are some common problems and solutions.

6.1 Wired Networks

The most common problem you might face in networking is when you are not able to see other computers on the network. In this situation you need to follow the following steps.

The Device Manager in Windows XP

First, check if your network card is properly installed. Verify that your network card is properly inserted in the motherboard slot and that the card's resources are properly set and not conflicting with other hardware. Also check that there are no loose network cable connections. If you have connected your home network to a hub or switch, check if the cables are connected properly and that the hub or switch is powered on. It is important to note that the maximum allowable distance from an adapter to the hub is 100 metres.

To check if the network cable is properly connected to the back of the computer, look if the LEDs on the network card are properly illuminated. If there is a solid green/yellow LED, or if the light is blinking, it indicates that the card is connected and that it is receiving signals from the network.

To check if your LAN card is conflicting with other hardware in your computer, open the Device Manger. If the network drivers are not properly installed, there will be a question mark icon in front of the device. You should install the motherboard drivers first, and then the network drivers. If you want to update the net-

work driver, use only the latest drivers from the adapter manufacturer's Web site.

If you are connecting two computers together without using a hub or switch, make sure you've used a crossover cable. Crossover cables can be easily confused with regular cables.

Let's Play Ping-Pong

If you've followed the above steps and still have no luck, check if the network card can ping itself. "Ping" is a diagnostic utility that helps you to find out if

Pinging your LAN card

the network connection is working properly, and the utility is present in all versions of the Windows and Linux operating systems. In Windows, you can ping your network card by going to Start > Run, typing in "command" and pressing [Enter]. At the command prompt, type in "ping 127.0.0.1" or "ping localhost". You should see a set of replies from your network card. If you receive an error message, or if transmission fails, then the network card is not physically installed in the computer correctly, or is faulty. If the network card is faulty, get it replaced instead of trying to get it repaired. If you buy a new card, opt for a gigabit Ethernet card instead of the older 10/100 cards.

If your card is properly installed and pings itself, but still cannot see other computers on the network. It's time to verify that the protocols used are correct and installed on all the computers on the network. Most computers today use TCP/IP as the default protocol, but some network administrators prefer IPX/SPX and NetBEUI.

When specifying the IP values, it is important to make sure that the Subnet Mask must be the same on all the systems connected to the network, and that no two systems have the same IP

address. The Internet Assigned Numbers Authority has reserved the following three blocks for private networks such as a LAN: 10.0.0.0 to 10.255.255.255, 172.16.0.0 to 172.31.255.255, and 192.168.0.0 to 192.168.255.255. So if you are setting up a LAN that's also connected to the Internet, you can safely use these numbers within your network without causing errors in DNS (Domain Name System) resolving.

If you have firewalls installed on the system, make sure that all ports that are required are open. If you are running a firewall and cannot access the network, try disabling your firewall for a bit and attempt to access your network again.
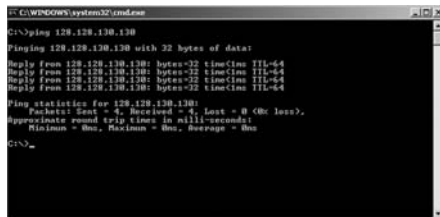
Note: Ports are gateways for programs on your system. When a browser wants to communicate with a server for Web pages, it does so via port 80. Each program uses certain ports to communicate.

If you still cannot see computers on the network, try to ping other computers. To do this, verify that the TCP/IP protocol is installed on all the computers on the network. At a command

Pinging a computer on the network

prompt, type in the IP address you want to ping. Let's say there is a computer on the network with the IP address 192.168.0.2. Then you should type in

"ping 192.168.0.2"

If you get a response from the computer you pinged, it means that you are able to communicate with that computer. If you are still unable to connect or see the network, there may be other network issues.

Another method of isolating issues with your network is using the "tracert" command ("traceroute" for Linux users). To use this
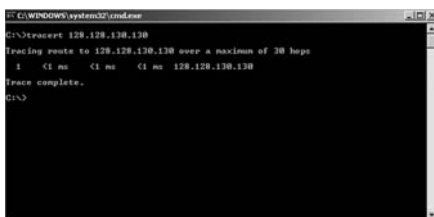
command, get to a command prompt and type in the following:

"tracert 192.168.0.2"

This will start listing the number of hops between the computer and network devices. When a device fails, you

Tracing the number of hops

know it's that device that is causing the problem.

Note: Hops are the number of intermediates (such as routers) through which data passes from the source (your computer) to the destination (the traced computer) or vice-versa.

Missing Protocols

In Windows 95 and 98, to check if TCP/IP is installed on your computer, go to Network in the Control Panel. If the protocol is installed, it should be listed under the installed Local Area Network properties. If not, you need to reinstall it by clicking the Add button. Select "Microsoft" as the manufacturer, and under the network protocol, select the TCP/IP protocol. You'll need to reboot the system.

If you're using Windows ME/2000/XP, go to Control Panel > Network and Dial-up connections > Local Area Connection. Here, go to Properties. If the protocol is installed, it should be listed under the network adaptor properties. It is important to note here that a network adaptor is different from a dial-up adaptor. The dial-up adaptor gives you access to the Internet, and not to the LAN. If you don't see the TCP/IP protocol here, click the Add or Install button, select the protocol and click OK. Once installed, you will need to reboot your system for the changes to take effect.

Version Problems

Sometimes, problems crop up when using certain programs, and you see a pop-up with an error message. This may be due to differences

in program versions between the connected systems, or it could be that one system does not have the latest network drivers. The best way to solve this is to verify that the programs you're using on the different systems are of same version. Also, it's advisable to update your LAN card driver—go to Control Panel > System > Hardware > Device Manager > Network Adaptors, right-click on the LAN card displayed in Network Adaptors, and select Update Driver. Make sure you have the updated driver handy—the system will ask for its location.

If the TCP/IP protocol files are corrupt, you need to reinstall them. Go to Control Panel > Network Connections, select the Local Area Connection, right-click it and go to Properties. Select "Internet Protocol (TCP/IP)", uninstall it, reboot your computer and reinstall it. If you don't find the protocol after rebooting, return to the menu, click Install > Protocol > Add, and select TCP/IP.
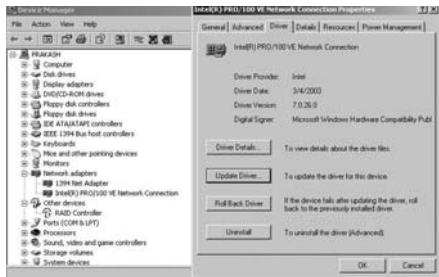
Updating the LAN drivers

What Icon?

If you can't see the network icon in the system tray, it's only because it isn't set to be displayed. By default, the system tray network icon is not enabled in certain Windows versions. To enable the system icon, go to Control Panel > Network Connection > Local Area Connection,
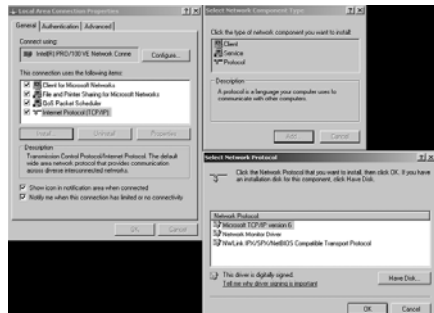
Installing the TCP/IP Protocol

right-click your LAN connection and select Properties. Check "Show icon in notification area when connected".

Router Woes

If your system is part of a LAN, and you're trying unsuccessfully to connect to the Internet through a router, try to connect to the Net directly from your system. If you are still not able to connect, call your ISP and get the Internet connection checked.

If you can connect to the Internet directly from your system, reconnect the router, modem (dial-up, DSL, or cable) and computer. Check if you can log on to the router. If not, check for loose cables or joints. Also check if the LED of the port on the router that your computer is connected to is lit up. If the LED does not light up, connect the cable to a different slot. If that doesn't work, power off the router for a few minutes and then turn it back on.

If no LED lights up after this, hard-reset your router. You can do this by looking for a tiny hole at the bottom of the router, inserting a pin into the hole and pressing the tiny button inside. Remember, the router power needs to be on while hard-resetting.

The router should now check if its IP address is static or dynamic, and if you are using PPPoE. If you are using the router to connect to an ISP that assigns static IP address, type in the ISP's DNS and the address of the gateway. If PPPoE is configured, enter the username and password set by you or your ISP and click Apply. If the router still cannot find its IP address, power off the modem, router and computer. First turn on the modem, wait a minute or so, and then turn the router back on and finally the computer. If you can access the Internet now, no computer on your network should have any problems.

If you still cannot access the Net, try and find the modem's IP address through the router's status page, as described in the router's manual. If you can't see the IP address of the modem, then there is a problem with your browser settings. The browser's security settings may be set to high-change this to medium.

Other Problems

Wake on LAN: Check if the system you are trying to wake up is connected to the power source. Check for loose cables and for the Wake up on LAN setting in the BIOS (this should be enabled). If you don't find the "Wake on LAN" setting in the BIOS, your mother-board doesn't support this feature.

Cannot access a system: If you're trying to connect to a Windows NT/2000/XP-based system and receive a message that the system cannot be found, it's probably not a network prob-lem—it's just that the user name might not be listed. To over-come this, just add the user name to the Windows NT, 2000 or XP-based system.

System locks up after installing network card: Sometimes, when you install a new LAN card, your system could hang. If that hap-pens, open your machine's cabinet and remove the LAN card. Clean the LAN card's golden connectors as well as the PCI slot on the motherboard. Re-plug the card and make sure that the card sits properly in the slot. Now restart the system in Safe Mode and go to Start > All Programs > Accessories > System Tools > System Information > System Summary > Hardware Resources > IRQs. Check if any IRQ is conflicting with another.

Cannot see others computers on the network: Check if there are multiple workgroups. If so, go to Control Panel > System > Computer Name. Here, click "Change…". Under "Member of" in the Workgroup text field, type in the name of the new workgroup you want to connect to and click OK. You should now be able to see other computers on the network.

Cannot share printers or folders over the network: If you want to share your printer, but other systems on the network cannot access it, your printer is not shared. To share a printer, go to Control Panel > Printers and Faxes. Select the printer you want to share, right-click it and select Sharing. Here, select "Share this printer" and give it a name that others can use to connect to it.

Similarly, if you want to share a folder, right-click on the folder, go to "Sharing and security...", and check the box "Share this folder on the network". If you want others on the network to modify the contents on the folder, check the box "Allow network users to change my files". Click Apply and then OK. Now other systems under the same workgroup should be able to access the printer and the shared folder.

Networked computer works with 10BASE-T network but not with Fast Ethernet: You might face this problem when the computer is located far from the hub. The computer should be within 100 meters of the hub or switch. If the system in the network is further away, you need to install a repeater.

One user can't access network, but others can: This problem arises only when the user has not logged on to the network. To overcome this problem, log off the system and log in again.

6.2 Wireless LANs

Poor performance: The throughput of a wireless LAN (WLAN) is said to be around 54 Mbps for 802.11g and 11 Mbps for 802.11b. If your computer is using the 802.11b standard and the source is using 802.11g, you will not receive speeds in excess of 11 Mbps.

Apart from this simple mismatch, problems with WLANs abound: high utilisation, coverage holes, obstructions, interference and bad access point placement can also affect the speed of the network. WLANs work on the radio frequency and use air as the medium. Since air has a time lag while sending and receiving signals (as compared to copper), it causes high collision rates and retransmission. These collisions result in noise, which in turn affects network speeds. Gadgets such as microwave ovens affect the performance of a WLAN as well. Other objects include cordless phones that run on the 2.4 GHz frequency, as well as other WLANs. If there are other WLANs within the area, change your WLAN to non-conflicting channels. It's important to note here that there are only three

channels available in the 2.4 Ghz spectrum—1, 6 and 11. If you have a microwave or cordless phone, place them in a position that's well away from your normal work area and access points.

If you find that there are other WLANs using all three channels, increase the transmitting power of your WLAN. Remember to keep access points closer to each other to improve the signal to noise ratio. Also, if too many users log on to your network at the same time, your network performance will degrade—keep access points closer together and reduce the transmission power (the same concept used in your mobile phone). This reduces the number of users per access point.

Obstructions in the WLAN field can also affect performance. Properly survey the area that you want to cover with your WLAN and place access points smartly. Walk about with a laptop and look for coverage holes—spots in your coverage area where network strength drops drastically (even to zero). Shift your access points about and increase transmission strengths to plug these holes. You could also try to get hold of directional antennas, and point them in such a way so as to plug coverage holes.

Sometimes, the access points themselves are to blame, due to lockdowns, broken antennas, use of incorrect power adaptors or varied output frequencies. A reboot of the access point should solve a lockdown problem. Make sure to upgrade the firmware regularly, and also only use adaptors meant for the same model.

Connection Problems: You could face connection problems when moving from one access point's area to another's. This happens when the two access points have different subnet masks.

WLANs that work on the older 802.11a (5 GHz frequency) system are not compatible with newer standards such as 802.11b and g. The newer versions work on the 2.4 GHz frequency and are backward-compatible. You will have to upgrade your network card if you want to connect to an 802.11b/g network.

Storage

The most common problems you encounter with your system are arguably those with optical drives and media. Hard disk errors, though not as common, are grave because of the magnitude of the problem they pose. We cannot (in this space) give you an exhaustive listing of all drive problems, but list out the most common ones and possible solutions.

7.1 Internal Hard drives

▶ **Problem:** You can't access the full capacity of a hard drive that's larger than 8.4 GB.

Cause: This a common problem with older computers when the hard drive is upgraded. BIOSes on older machines were written such that they could only recognise hard drives of up to 8 GB capacity. When one tries to attach a higher-capacity hard drive, the system either recognises it as an 8 GB drive, or fails to recognise it altogether.

Solution: The most common solution to this problem is to flash the motherboard BIOS. However, since such motherboards are really dated, it is quite unlikely that you'll be able to get hold of new BIOS. If you're lucky, you might find a new BIOS on the manufac-

Use an IDE-PCI card as the last option

turer's Web site. If you don't, you have the option of installing an IDE-PCI card—a card that fits into the PCI slot and offers two IDE connectors for hard drives. These IDE-PCI cards have a separate BIOS, which allows you to attach higher-capacity hard drives. It shouldn't cost more than Rs 500.

▶ **Problem:** FDISK in Windows 98 misidentifies the capacity of a drive over 64 GB.

Cause: This generally occurs when your bootable floppy has an older version of the FDISK tool.

Solution: FDISK is a hard drive partitioning tool often used for preparing the hard drive before installing an OS. This tool is often bundled with the Windows CD, and is an essential part of the bootable floppy created using any Windows machine. If you have your original Windows 98 CD then boot the machine via it and then use the FDISK tool from the CD. Else you can also use the Ranish Par-

tition Manager- a free tool and excellent at that too. Go to **www.ranish.com/part** to download it.

▶ **Problem**: A UDMA/66 or UDMA/100 drive runs at UDMA/33 on systems that support UDMA/66 or UDMA/100.

40 pin conductor and 80 Pin conductor

Cause: This problem was common with IDE drives, but seldom occurs with SATA drives. The troublemaker used to be the cable that connected the drive to the motherboard.

Solution: For drives supporting UDMA/100, one needs to use an 80-pin conductor cable to make it work at its full potential. As a rule of thumb, use 80-pin conductor cables for connecting IDE drives unless the drive is older than, say, four years: back then, UDMA 33 and 66 were the *de facto* standard.

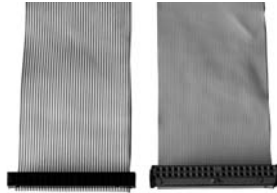▶ **Problem**: You get an "IDE drive not ready" error at startup.

Cause: The BIOS flashes this message during startup. The problem generally occurs when the hard drive fails to spin up quickly enough.

Solution: Hard drives have mechanical components that need to attain a certain threshold rotational speed before they are ready for data transfer. There is a motherboard setting in the BIOS known as "Hard Disk Pre-delay". Activating this setting determines the amount of threshold time offered to the drive before the BIOS polls it for the requisite information. You can increase or decrease this setting with some motherboards. In most cases, increasing the hard disk pre-delay time works.

▶ **Problem**: The boot sector is corrupt.

Cause: You'll face this problem when a boot sector virus corrupts the MBR (Master Boot Record). Boot sector corruption can generally be attributed to viruses, but sometimes, tweaking the boot loader can also leave the system with a corrupt boot record.

Solution: For Windows 9x/ME and DOS, one can use the FDISK command to repair the boot sector. Boot the system from a bootable

floppy or CD-ROM and locate the FDISK command. Once located, type in "FDISK /MBR" and hit [Enter]. Wait for the process to complete, and your boot sector should be fixed.

For Windows NT/2000/XP, boot via the bootable CD-ROM and enter the repair console. Here, type in "FIXMBR" and hit [Enter] to restore the boot sector.

▶ **Problem**: You get an error that says, "Immediately back up your data and replace your hard disk drive. A failure may be imminent."

Cause: A failure could indeed be imminent. The error is displayed during the boot process only when you have a hard drive that is SMART-enabled. "SMART" stands for "Self-Monitoring Analysis and Reporting Technology," and is an industry-wide standard for increasing the reliability of hard drives to prevent loss of data.

Solution: When you get such an error, it is advisable to back up the data on your hard drive. If your drive is in the warranty period, it should be immediately sent to the service centre for replacement or repair. As of now, the SMART tool can detect up to 70 per cent of drive errors—the warning should therefore be taken seriously.

▶ **Problem**: The system refuses to boot after installing a new hard drive.

Cause: The hard drive may not be connected properly, i.e., the data connector and the power connector could be improperly connected.

Solution: When installing a new hard drive, always double-check the connection of the data cable. Pin number one on the motherboard should coincide with pin number one on the hard drive. One edge of the data cable is marked red to indicate it as pin number one.

While connecting it to the drive, make sure the red line coincides with pin number one of the drive and motherboard. Usually, the red line on the cable and the red wire of the power connector will be side by side when connected to the drive—this indicates a proper connection.

▶ **Problem**: Hard drive letters after C: are pushed ahead when a second drive is attached.

Cause: This generally happens when the second drive has a primary partition on it. Since primary partitions take precedence over extended ones, it will take up a drive letter immediately after the primary partition of the first drive, i.e., C:.

Solution: After installing the second drive, make sure the drive is formatted and that all partitions created are extended. If the second drive contains data, move the data to the first drive and then remove all the partitions before creating new (extended) ones.

▶ **Problem**: You get an "Invalid media type" error.

Cause: This generally occurs when one tries to view a non-formatted, non-partitioned drive in Windows, or when you try to view a different file type in an OS that does not support that particular file type. For example, trying to view an NTFS partition in Windows 98 will result in this error.

Solution: First use a bootable floppy or CD-ROM, and then use FDISK to see what type of partitions are present on the drive. The fourth option in FDISK lets you do that. If a non-Windows partition exists, delete it and create a new FAT32 or NTFS partition that Windows can recognise. If the drive is brand new, then creating new partitions and subsequently formatting them should help.

▶ **Problem**: Your hard drive is not detected in the BIOS.

Cause: This is the most common problem with hard drives, and it has a simple solution too. Improper connection of the power cable results in this problem. Also, current-generation drives require more power to run, so if your power supply isn't powerful enough, the hard drives will fail to start up.

Solution: Check whether the power connector is connected properly; if you think it is, then touch the drive. A powered drive will always vibrate a little because of the high-speed spinning of the platters. If the drive doesn't seem to vibrate, the platters aren't spinning, and the drive requires more power to work—in which case, you'll need to change your power supply. If it is vibrating and still the drive isn't recognised then probably there is some problem with the data cable connection, or the BIOS is not set up properly.

▶ **Problem:** The system can't detect either of two drives connected on the same channel.

Cause: This occurs when both drives are set to either Master or Slave.

Solution: Check the jumper connection on both devices and set one as the Master and the other as the Slave. In newer motherboards, you can set both the devices to cable select—this takes care of the problem in an efficient manner.

▶ **Problem:** There is a large number of .CHK files in the root direc tory of the drive.

Cause: .CHK files are created by the SCANDISK and CHKDSK utilities when they scan the system for lost allocation units.

Solution: You can safely delete all .CHK files after searching for them. It's only when the PC is not shut down properly that these .CHK files are created by the two scanning utilities. Hence, always switch off the PC properly, i.e., don't reboot the machine by pressing the reset button on the front panel.

▶ **Problem:** You're unable to view a SATA hard drive during Windows XP installation.

Cause: Windows XP loads the required drivers before it begins to copy the files necessary for installation. Motherboard chipsets lacking native support for SATA drives are not recognised during the installation. You'll have to manually load the drivers before the file copying starts.

Solution: Such motherboards come bundled with a floppy drive that contains the necessary SATA drivers. While loading Windows XP, at a certain stage, i.e., before loading generic drivers into memory, you're prompted to press [**F6**] for installing additional device drivers. Press [**F6**] once the generic drivers are loaded. The system will prompt for the floppy disk containing the SATA drivers; insert the floppy disk and then load the appropriate driver for XP. Once this is done, Windows XP will recognise SATA drives during setup.

7.2 Optical Drives

▶ **Problem**: Your drive reads data very slowly.
Cause: This could occur if the drive is old, and the laser pickup assembly weakens. It might also happen when the pickup lens gathers dust.
Solution: Get a lens cleaning kit and clean the lens. If that doesn't work, it's time to get a new drive!

▶ **Problem**: Your CD-RW drive ejects and reloads the disc during operation
Cause: This isn't a problem; it's a mechanism to clear the drive's buffer. All CD-RW drives are provided with some buffer memory to smooth out the writing process. While some drives have a way to clear it out, some aren't provided with any, in which case the drive might pop out the disc to clear the buffer memory.
Solution: Before buying a drive, make sure it has a way to clear out buffer memory. To find out what drives have this feature and which ones don't, ask someone who already has the drive model you're contemplating buying.

▶ **Problem**: Your CD-ROM drive immediately ejects an empty disc.
**Cause**: This can be either a software or a hardware problem.
Solution: Certain hardware faults can cause the drive to immediately reject certain CDs. To make sure that it's the drive and not the OS that is rejecting the CD, pull out the data cable from the drive and then insert a CD. If it is rejected, then the drive has a hardware fault. If the problem is with the OS, try disabling features such as auto-insertion notification.

If the machine is powered on for some time and the CD-R was in use, then the resultant heat can at times lead to such rejection problems. The drive might needs realignment, and should be given to a service centre.

▶ **Problem**: A multi-session disc has only the last-burnt data; you can't see data from older sessions
Cause: This happens when you forget to link the data from previous

sessions to the data in the latest sessions. Most CD-ROMs can't view the data from older sessions unless they use an application that allows a selection of sessions to view.
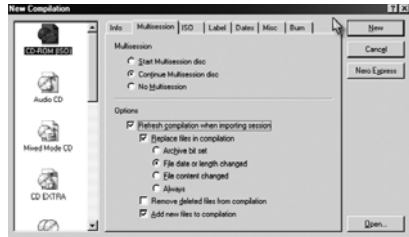
Nero Multisession details

Solution: This used to be a problem with older burning applications that simply overlooked this problem. Newer applications default to saving the older sessions, or prompt for user input in this regard. If you are stuck with older software, update to a newer one that supports the session-saving feature. Else in the older software, make sure you manually specify that the disc is a multi-session disc and that you want the older session to be saved.

Also, applications such as IsoBuster and CD-R diagnostics allow accessing of older data sessions. However, some older CD-ROMs might not be able to work with this software, especially for retrieving older data.

▶ **Problem**: A disc fails repeatedly.
Cause: The problem probably lies with the media and not the writer.
Solution: Media compatibility is critical for proper CD writing. Cheap blank CDs are the culprit—their reliability is questionable. Always use reliable CDs, even if they are more expensive. Try out different media and see which one offers better compatibility with your drive.

▶ **Problem**: You're unable to copy game CDs
Cause: *It's illegal to try to copy game CDs!* Today, most game CDs come with some form of copy protection to avoid piracy. The game publisher places blank or unreadable sectors on the disc, which confuses the copying applications.
Solution: There's no "solution" we can provide! We only suggest you use your game CD carefully so you won't ever need a copy.

▶ **Problem**: You get a buffer underrun error.
Cause: Almost all CD/DVD recorders come with a small amount of buffer memory to smooth out the burning process. The buffer reads ahead and provides the data required for burning in a lin ear manner. A buffer underrun error happens when the data source slows down for some reason. Since the CD is spinning and there is no data to be burnt, it causes the burning process to be aborted, resulting in a coaster.

Solution: Unless you have a really old drive, you shouldn't see this error. In fact, almost all recorders today have hardware support to ensure buffer underruns don't occur. Moreover, burning software also have support for this feature - make sure you activate it; it's just a matter of checking a box. If you have a drive that does not support this feature, make sure you use your hard drive as the data source, since a CD to CD copy will definitely result in a coaster. Also, defragment your hard disk regularly to avoid a slow-down during the burning process.

▶ **Problem**: Despite the write process completing, a CD turns up blank.
Cause: It's not clear why this happens.
Solution: Try using different media. Go to the burning software's Web site and check whether any patches to fix the problem have been released. Sometimes, these patches will fix such an issue, if they don't, try an alternative application.

▶ **Problem**: A recorder won't work with blank CD-RWs.
Cause: This is a common problem. CD-RWs are rated as Slow (1x to 4x), High Speed (4x to 10x), Ultra Speed (12x to 24x), and Ultra Speed+ (for drives supporting even higher burning speeds).
Solution: Choose the correct CD-RW media depending on the burning speed supported by your drive. Also, if you're trying to use an Ultra Speed + media, it might not get detected, whereas a lower-speed media will get burnt at its maximum speed.

▶ **Problem**: Video DVDs stutter.
Cause: This is a common problem with most DVD players. During video playback, most drives drop down to a lower speed to cut

down on the excessive noise they make when spinning at high speeds. In technical terms, this lowering of the speed is called riplock. In poor-quality DVD drives, riplock is responsible for video stutter.

Solution: When choosing a DVD drive, make sure it won't suffer from video stutter - ask people who have bought the same model you're contemplating. Essentially, opt for drives from known manufacturers.

▶ **Problem**: Some DVDs aren't recognised in your DVD drive.
Cause: The problem lies with the media type. There are two main DVD formats - +R and -R. -R format is more commonly available and hence is usually supported by lot many older drives than +R format. If you have an older DVD drive, then it is possible that it has been manufactured to recognise only one format.
Solution: Check the formats supported by your drive and use media of only that format.

▶ **Problem**: Your DVD-Writer doesn't play DVD-RAMs.
Cause: Not all DVD-Writers are equipped to handle DVD-RAM. Unlike DVD±RW, DVD-RAM uses phase-change dual technology peppered with magneto-optic features. The main advantage of DVD-RAM is its defect management and faster access speeds. However, as we've mentioned, this format incompatible with most drives.
Solution: Select a drive that features support for DVD-RAM. Drives manufactured by LG, Hitachi, and Matsushita (Panasonic) have support for DVD-RAM.

▶ **Problem**: You can't burn DVDs faster than the rated speed as you used to do with your CD-Writer.
Cause: Overspeeding is a feature supported only by a handful of drives, and only on selected media types. DVD drives from BenQ and Philips officially support overspeeding; however, you need to use good-quality media or media specially developed for overspeeding.
Solution: Buy a DVD drive that officially supports the overspeeding feature. Also, make sure you use officially certified overspeeding media, for example, Taiyo Yuden. It might be possible to get such media, but it is not commonly available.

▸ **Problem**: Some movie DVDs don't play on your DVD drive
Cause: The movie is region locked, and will only play on a DVD drive that has the same region code. To control the release of their movies, the motion picture group divided the world into seven regions or zones. Each zone has its own region or zone number. When a specific movie is released in a particular zone, it is encoded with the zone number. DVD players, too, have a zone number. Hence, a movie released in America plays on all DVD players manufactured in the US, but not on DVD players manufactured in India such as those from Onida, Mitashi, Sony, etc.

Solution: Many DVD players can be hacked using software to do away with the region locking encryption. This voids the warranty, but it isn't illegal to do so. On some drives, however, you need to modify the chip to make it all-region playable.

7.3 External Storage Devices

▸ **Problem**: Windows pops up a message saying, "A HI-SPEED USB device plugged into a non-HI-SPEED USB hub."
Cause: This problem generally occurs when one plugs a USB 2.0 device into a USB port, the reason being the lack of proper drivers.
Solution: In you're using Windows XP, make sure you have installed the drivers for proper functioning of the USB 2.0 hub. Most motherboards rely on Microsoft-certified USB drivers for USB 2.0. You can download the USB 2.0 drivers from Microsoft's Web site, or you can install Windows XP SP2.

▸ **Problem**: Your Flash drive is 512 MB, but it can't store data more than 256 MB
Cause: This is a common problem with most cheap Flash drives. Though they are advertised as 512 MB and show up as 512 MB in the system, they have a bad memory chip that doesn't allow copying of data more than 256 MB.
Solution: Don't take chances with Flash memory. Buy a Flash drive only from a reliable and known manufacturer.
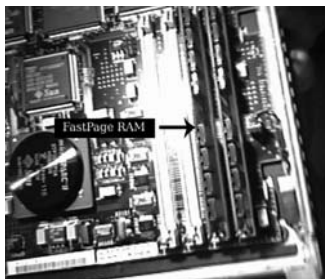
Computer Memory

System memory is as important a component of a computer as the processor, motherboard and graphics card. These four components are interdependent, and a system won't function properly if one malfunctions. It is important to have sufficient, fast and reliable memory for optimum functioning of a system.

8.1 Testing the Memory

Why does one need to test RAM? If you observe poor performance even after reinstalling Windows, if the system hangs intermittently, or Windows restarts every now and then, you should check the memory for problems!

FastPage RAM looks a little similar to EDO RAM.

Memory problems are difficult to trace. Problems with memory often seem like problems with other areas of the system.

Even A Blue Screen Of Death (BSOD: a STOP error) can be caused due to a faulty memory module, but the displayed error may not specifically mention it. So, if you've had enough trouble getting your machine to work, then it's time you checked the RAM for errors.

8.1.1 How Do I Test It?
Every motherboard BIOS has a small memory test program that runs at POST (Power On Self Test). It not only tests the memory, but also counts it. The count thus obtained is compared to a count that was obtained the last time PC was operational. You will see or hear an error message if a failure is detected. The POST memory test runs quickly; it is not a thorough test to detect intermittent and subtle hardware errors.

Memory module testers are of two kinds—hardware kits and software diagnosis. We will look at the software diagnostic method of testing: hardware kits are expensive and are used by PC repair workshops.

Diagnostic tools are available on the Internet for this purpose, but one should be careful in selecting the right tool. Microsoft, too,

provides such a tool. Those who want to use a non-Microsoft product can rely on Memtest86. It is reliable, powerful and free. It is a preferred tool because it is capable of detailed diagnosis, but it takes a lot of time to do its testing.

The idea of memory testing revolves around throwing a pattern of data to the memory and then testing whether the pattern is intact in the module.

To use either tool mentioned above, you need to create a start-up disk or a bootable CD containing the downloaded utility. Boot the system from this disk and run the memory test program.
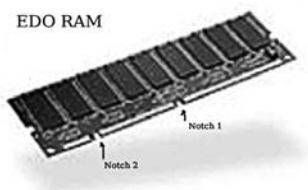
Memtest86

Download the precompiled, latest Windows version (Memtest86 v3.2) or the ISO image from www.memtest86.com to create a bootable CD. Start your PC and go to the CMOS/BIOS setup by pressing the appropriate key (most likely [**Delete**] or [**F2**]) and change the boot priority to CD-ROM. Save the changes and exit the CMOS/BIOS setup. Your PC will boot Memtest86, a tool that is independent of the installed OS. The help bar, located at the bottom of the screen, guides you through the process of memory testing. All you have to do is press [**C**] to enter the main menu from which you can choose 'Test Selection'. Advanced options such as Cache mode, ECC mode, Address range, etc. are also available from the main menu.

Windows Memory Diagnostic

The file (mtinst.exe) that is available for download at Microsoft's Online Crash Analysis site (**http://oca.microsoft.com/en/windiag.asp**) can be used to create a start-up (floppy) disk or an ISO image file (windiag.iso) on your hard disk. Once you have a bootable CD/floppy ready, boot the machine using it. This will load the Windows Memory Diagnostic with a DOS-like user interface. The first test pass begins; you may choose to pause it or just exit the memory test. If the first pass completes without any errors then it is unlikely that second pass will find any, as the consequent

tests will use the same test set-tings. Press [**T**] for a detailed inspection of the memory module. This process consumes a lot of time, and you may have to leave your machine on through the night.

EDO RAM

EDO RAM—Match the notches with those on the slots when fixing the RAM otherwise you may damage the module

If you have more than one RAM chip, then use one chip at a time while testing. This way, you'll know which one is faulty. Moreover, the problem could also arise due to a corroded interface on the motherboard. To counter this problem, perform the test using different combinations of slots and memory. Depending on the type of error and its gravity, you might need to call a technician to rectify the problem—which is most likely replacing the RAM chips or soldering new RAM slots to the motherboard.

8.1.2 Generic testing procedures

Keeping the system cache enabled when testing memory is the biggest mistake you can make, as most systems have a 'write-back cache', which invalidates the memory test. Data sent to main memory is first written into cache. A memory test program first writes data and then immediately reads it back. Eventually, the test program mainly reads and writes from the cache, and does not test all of the memory! The cache should therefore be disabled from the BIOS/CMOS setup before memory test programs are run.

The generic test procedure is a method by which a user can identify whether there is a problem, and then isolate it.

Procedure A: Detecting a problem

i. Power on the system from an off state and observe the POST session. If no errors were detected, go to step ii otherwise follow procedure B.

ii. Restart the system and enter the CMOS setup. Set all cache settings to 'Disabled'. Save and exit the CMOS setup and boot the system from a start-up disk containing a memory diagnostic tool.

iii. Follow the instructions laid down by the diagnostic tool to test the system memory. If an error is found, then follow the instructions in procedure B.

iv. If no problems were detected and you're still having a problem, then it is undetectable by simple pass/fail testing methods. You will have to call an engineer or technician to test the memory on a SIMM/DIMM tester for more accurate analysis.

At the end of procedure A, we assume you've detected a problem, and so we need to isolate the cause—is it faulty memory, or a bad memory slot?

Procedure B: Isolation

i. Start the system and enter the CMOS/BIOS setup. Load the Setup defaults or BIOS defaults; these are normally the slowest and most workable settings for a system. Save and exit the BIOS setup. Follow the steps in procedure A; if the error is resolved, then the cause was faulty BIOS settings. If the problem persists, go to the next step.

ii. Turn off the machine and unplug the power cord. Open the cabinet so you have access to the memory chips. Remove all the installed memory chips and clean the connecting ends using an eraser or satin cloth. Use a blower to clean the slot. Replace the RAM into the slots and restart the machine. Follow procedure A; if errors are still detected then go to the next step.

iii. Here we need to isolate the RAM modules (if you have more than one module). Keep only one module on the first memory bank on the motherboard and follow procedure A. If an error is detected, the problem could be with slot or the module. Use a known good module and retrace the step. If the test passes, then the earlier memory module is faulty, and if it fails, the slot is faulty. Repeat this step to test the other modules.

iv. If the modules are faulty, you need to replace them, but if the problem is with the slot, you can either change the motherboard or replace the SIMM/DIMM slots with the help of expert technicians at PC repair shops.

8.2 Common Symptoms, Problems And Solution

▶ **Problem**: The computer beeps and doesn't boot. The error beeps may vary between BIOS manufacturers. A memory error beep-code is normally repeated long beeps with an interval of a few seconds. If your machine produces this pattern of beeps, and the system fails to boot, you have problems with your RAM module(s).
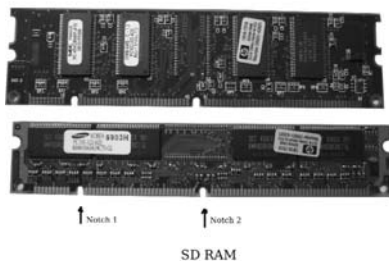
When choosing SD RAM make sure to choose the one supported by your motherboard

Cause: The problem can be due to a loosely-inserted module. Other causes could be failure of the BIOS to recognise the module, and the failure of the module itself.

Solution: Clean the modules and the slot using non-static cloth, carefully insert the modules (making sure the notches match and that the clips hold the RAM in the slot), and start the machine. This should take care of loosely-inserted modules or improper contact due to accumulation of dust or fungus. If the problem is not solved, make sure you have a RAM module that matches your system (motherboard) requirements. If all these fail, perform a BIOS update. Check with the motherboard manufacturer whether an update is necessary to support the RAM module you purchased. Contact a technician or the dealer from whom you purchased the system if the problem persists.

▶ **Problem**: The system doesn't display the proper memory value. The system boots normally, but Windows doesn't show all of the installed memory capacity.

Cause: Do you use on-board graphics? If yes, then the graphics will share memory from the system RAM, since it doesn't have its own. If the installed module is dual-banked and the system board only supports single-banked memory, then the computer will read and

use only half the installed memory. Older machines have a limitation on the amount of system memory. If the limit is crossed, the additional megabytes go unrecognised.

Solution: Find out (from the BIOS setup under Advanced Chipset Features) how much MB of the system RAM is allotted to on-board graphics. Now compare the remaining amount with the amount displayed by Windows. If the count does not match, then restart the system and check with the BIOS/CMOS setup for the memory count. Failure of the BIOS to detect the entire capacity indicates incorrect choice of hardware. Refer the motherboard manual or site or dealer for suitable specifications.

▶ **Problem**: Address (Hexadecimal) Error Messages

Such error messages indicate a problem with the memory. They specify a hexadecimal address. For example:

Memory failure at 0x44AE44683C

Memory verification error at: 0x00FC3588AE

(Note: The addresses specified above are not real—they're just for the sake of explanation.)

Cause: The computer constantly performs read-write processes on the memory, and also verifies the authenticity of the data being processed. Errors mentioned above come up on the screen when the computer does not receive the expected data/value from the RAM. This error can be caused by a defective module or a mismatch between old and new modules.

Solution: Use only one RAM module at a time (remove the new module, if any) and work on your PC the way you would normally do. If you still face the problem, remove the old module and check again with only the new module inserted.

▶ **Problem:** Himem.sys Error

This is a common error with Windows 9x systems. The most common error messages related to this are:

"Himem.sys missing or corrupt"

"ERROR: HIMEM.SYS has detected unreliable memory at address 001003A4h"

Cause: Himem.sys file is a program that controls system access to

RAM, and it is supposed to load with CONFIG.SYS. The error is either a result of a corrupt HIMEM.SYS file, or physical issues such as a RAM module not meeting the system board specifications.

Only one Notch

DDR RAM Module

DDR RAM has only one notch and it is not centrally located

Solution: Assuming that the file is actually corrupt, let's overwrite it with a new file. Boot the system with a Win 9x startup disk. If the system boots properly, then it is likely that Himem.sys is corrupt or missing, or it hasn't been configured properly in CONFIG.SYS. At the prompt (A:\>) type in **"copy himem.sys C:\WINDOWS"** and press [**Enter**]. If you encounter the problem on rebooting the system, then edit CONFIG.SYS and make sure that it contains the line

DEVICE=C:\WINDOWS\HIMEM.SYS

Save the edited file and reboot the system. You will have to consult a technician or replace the module(s) if the problem persists.

▶ **Problem**: New RAM Module Doesn't Work On A Branded PC

You purchased a new RAM module and installed it in addition to an existing module on a branded PC. The new module is not detected by the computer.

Cause: Some branded PC manufacturers customise computer peripherals to deliver better performance. Due to this customisation or proprietary peripherals, a user is unable to buy and install peripherals available in the market. If you do, mismatch errors are encountered.

Solution: Upgrading of the RAM must be done through the dealer of your branded machine. Call their customer care centre for assistance.

▶ **Problem**: Problem Booting A RIMM-Based Machine

A RIMM-based machine fails to boot when a few RIMM slots are left open.

Cause: Intel's 850 chipset motherboard includes RIMM sockets as a support for RDRAM. Usually, the board has four slots. RDRAM works in pairs, so for 256 MB, you will need two identical modules of 128 MB each and two 'dummy' modules, or four modules of 64 MB each. The latter option will limit the scope of upgrading.

Dummy' modules are used to enable conductivity in empty sockets. If the sockets are left open, then the RIMM issues a failure error and the system won't boot.

Solution: Keep the RIMM slots/sockets occupied with compatible RDRAM or 'dummy' (or conductivity) modules. Also make sure the modules in the pair are identical.

▶ **Problem**: Frequent Reboots

Windows restarts frequently.

Cause: Recurring restarts can arise due to problems in both hardware and software. As far as RAM is concerned, it can be caused due to electrostatic discharge (ESD), overheating, corrosion at the contacts, a module mismatch, or a faulty power supply.

Solution: Replace the memory module for damage due to ESD. To avoid such damage, apply anti-static measures—use anti-static gloves, and keep materials that attract static charges away from your work area.

Use stabilisers or high-end SMPSes to eliminate errors caused by faulty power supplies. Clean the contact surface of the memory and socket if you suspect corrosion to be the cause of constant restarts.

▶ **Problem**: Registry Error

Windows prompts you to restart and restore the machine stating a registry error.

Cause: Windows writes a large part of its registry into the RAM. If the RAM is faulty, Windows finds it difficult to read the registry, and so prompts the user to restart and restore the system.

Solution: Replace your system RAM with a known working piece of RAM. Use the machine as you would normally, for diagnostic purposes. If the system runs without any glitches, then go through the procedure of isolation to identify which module is corrupt, and replace it with a new one.

▶ **Problem**: "Out of memory" Error In Win9x And Win ME

After upgrading the RAM to 512 MB, the system displays an error message stating it's "out of memory."

Cause: This is due to a bug in Windows 9x and Windows ME systems that have more than 512 MB of RAM. This is because the OS reserves too much memory to be used as temporary cache. The reservation is based on the amount of RAM. Therefore, when you use any Windows application, or at Windows startup itself, this error message pops up; the system is not actually out of memory.

Solution/Workaround: Go to **Start > Run** and type in **"sysedit"** and hit [**Enter**]. The System Configuration Editor window opens; it opens all the system configuration files within its window. Choose the '**C:\Windows\system.ini**' box, and under '[**vcache**]', enter the following parameter:

MaxFileCache=524288

The above value is in KB, and the amount should be less than or equal to 512 MB. If you do not have [vcache] in your system.ini file, then make the entry towards the end of the file:

[**vcache**]
MaxFileCache=524288

Save the file and reboot the machine.

▶ **Problem**: Virtual Memory Error

There can be two types of error arising from virtual memory:

1. A STOP error stating "DRIVER_IRQL_NOT_LESS_OR_EQUAL"

2. System low on virtual memory

Cause: Let's take the first case. Virtual memory is the swap space used by Windows that creates an illusion of larger system memory. This space is allocated by the OS under the primary partition (in most cases). NT calculates this space as RAM + 12 MB, whereas Windows 2000 and Windows XP counts it as 1.5 times the amount of RAM. A STOP error occurs when the area on your hard disk that contains pagefile.sys (the virtual memory) gets corrupted.
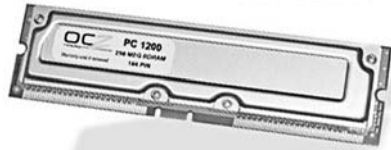
When the real system memory is low and the page file thus allotted is also low, applications that use RAM extensively issue a 'System low on virtual memory' error as the requirement shoots over the total memory (RAM + virtual memory) available to the operating system.

Solution/Workaround: To rectify the first problem, all you have to do is relocate the virtual memory to another partition. Let's assume the system has 256 MB of RAM; the virtual memory should ideally be 1.5 times the RAM, that is, 384 MB. But this value may be insufficient if Windows XP is installed running many memory-hungry applications. So, take three times the size of RAM if the system RAM is less than or equal to 256 MB. The safe value in our example would be 768 MB.

To administer these changes, go to **Control Panel > System**. Find "Virtual Memory" and click on it to change the settings. For Windows XP users, virtual memory is located under the 'Advanced' tab of the

RD RAM should be installed in pairs and the open slots should be filled with Dummy modules else machine will not boot sue to RAM error

System Properties dialog box that pops up on double-clicking 'System' in the Control Panel. Click on the 'Change' button to change the size of the virtual memory. Choose an initial size and final size for the page file. You can also choose to change the partition under which the page file should reside. Set the values and apply the changes. You will have to reboot the machine to effect the changes.

8.3 RAM Optimisers: Are They Any Good?

There are many paid products available on the Internet that claim to optimise system RAM for better performance. Such software manipulates certain settings in the OS that deal with accessing the RAM and the virtual memory.

The pages for the most frequently used applications are kept in RAM, whereas those used not so often are kept in the page file by Windows. And virtual memory is much slower than RAM. So, applications running from virtual memory are slow, and make the system look slower.

RAM optimisers or accelerators force application to use as much RAM as possible when it is free. And some even flush redundant data out of the RAM. Theoretically, the implementation of such a tool is helpful, but how much difference will they make in current machines? Analyse this: RAM speeds are on the increase; processors and graphics cards available now are a thousand times better than what was available a few years ago; and now, both processors and motherboards have dual-channel memory architectures. If that weren't enough, you can also instruct Windows XP to limit its swap usage by editing the system.ini file.

The moral of the story is that memory optimisers may sound useful, but they will not effect a radical change in performance. If you think your system is slow, then you need to check the system requirements of the OS and the applications you are using. It's always better to have more than sufficient RAM. For instance, running Windows XP on 2.4 GHz system with 256 MB RAM will result in slow performance because the system memory will be used up by the OS, anti-virus and other start-up applications. So, additional applications will have to use the little space left in the RAM, or be satisfied with virtual memory. Upgrade the RAM to obtain better performance.

8.4 Points to remember when buying RAM

It is foolhardy to go out and buy RAM without knowing your system specifications. Listed here are a few tips to use when buying RAM.

❍ First and foremost, you must figure out the type of RAM (whether SD, DDR or RD) supported by your system. This information is available in your motherboard's manual, or by searching for the specification of your motherboard on the Internet. Second, find out the speed of RAM supported by your motherboard, which may be 266, 333 and 400 MHz for DDR and 533 or 800 MHz for DDR2 modules. For RDRAM, the speeds are 533 and 800 MHz and, the old SDRAM's clock ticks at 66, 100, 133 and 166 MHz.

❍ In case of an upgrade, you must check the speed of the installed RAM module and preferably buy an identical (same model and manufacturer) module to avoid mismatch errors. The POST screen will display the clock speed of the current RAM under the memory count.
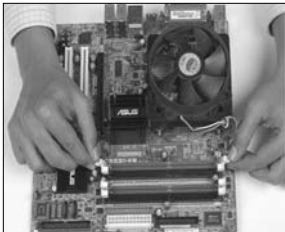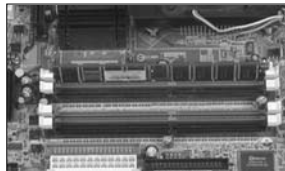

1. Open the clips
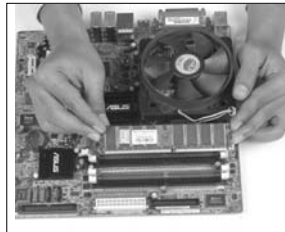
2. Insert RAM Modules

3. Push the module till the clips snap back

4. Inserted DDR RAM Module

Steps to Install RAM Modules in Motherboard Slots

❍ Buy sufficient memory depending on your needs—operating system, applications, gaming, etc. The reason is pretty straight-forward... more memory = better performance. It's better to buy more memory when you decide to buy any memory at all, because the next time you get to buying memory, the kind of RAM you're using now might not be in stock!

❍ In case of RDRAM, buy two identical chips. Such RAM is very expensive, so be extremely conscious about the size of the RAM.

❍ Prefer good-quality modules that come in static-proof packages.

Input Devices

What happens when your mouse, keyboard or joystick start giving trouble? More often than not these are hardware issues, but sometimes erratic or corrupt software drivers can play havoc with your computing experience. Be it hardware or software, this chapter will cover most of the problems you come across.

▶ **Problem**: You're facing intermittent keyboard failures.
Cause: The keyboard cable or keyboard jack might be defective.
Solution: Test the cable and jack with a digital multimeter.
If there's no signal someplace, you'll need to replace the jack
or the cable.

▶ **Problem**: Your regular keys
work but not the multimedia
keys.

Cause: You don't have the correct
software.

Solution: Download the latest
software from the manufacturer's
Web site. The software is also
probably present on the CD that
came with the keyboard (if one

did), but checking for the latest version is always recommended.

▶ **Problem**: Your USB keyboard doesn't work in the BIOS.

Cause: The USB legacy mode in the BIOS hasn't been enabled.
Solution: Connect a non-USB keyboard, and enable USB legacy
mode in the BIOS.

▶ **Problem**: Your mouse doesn't work with a different port type:
for example, when you're trying to connect a PS2 mouse to a USB
port using an adapter.

Cause: The mouse needs to be a hybrid mouse.
Solution: Check whether the mouse is indeed of the hybrid type
(designed for various ports). Use only the adapter that came with
the mouse packaging.

▶ **Problem**: The mouse pointer jerks onscreen.

Cause: The mouse ball and/or rollers are dirty, or there's some-
thing stuck on the ball, such as a hair.
Solution: Turn the mouse upside down and unscrew the plastic
cover that reveals the mouse ball. Clean it. Also clean the three
rollers using your nails or a liquid such as distilled alcohol or
acetone.

▶ **Problem**: A liquid such as coffee or Coke spilt on your keyboard, and you need to fix it.

Comments: It is possible in most cases to get a keyboard, to which this has happened, working.

Solution: Immediately turn off the PC and disconnect the keyboard. Then, drain all the liquid from the keyboard by shaking it. If the fluid in the keyboard was not plain water, rinse the keyboard out using plain water, preferably distilled water. Then, rinse out the keyboard using distilled alcohol. This will force the water out of the keyboard and allow it to dry better. Wait until the keyboard is thoroughly dry; this may take two or three days even. The keyboard should then be usable, but don't try to plug it in unless you're sure it is thoroughly dry.

This procedure is not foolproof, and can destroy the keyboard; of course, not doing it will, in many cases, mean the keyboard is destroyed anyway. If the spill was just water, and you don't want to use alcohol, you may be able to just wait for the water to evaporate. This can take a lot of time.

▶ **Problem**: One or more of the keys on your keyboard is sticking, bouncing, repeating, or not generating a keystroke reliably.

Comments: Sometimes, on older keyboards and/or ones that have seen a lot of use, keys may stick when you press them down (and refuse to pop back up), or they may cause bouncing or repeating (more than one character showing up after pressing a key only once). Sometimes a key may not generate a keystroke the first time it is pressed and may have to be pressed down hard in order to recognise.

Cause: These problems are usually caused by dirt and debris within the keyboard, and can usually be fixed. On very old keyboards, these symptoms can just generally be a sign of wear-out of the internal mechanisms.

Solution #1: If the problem is that of keys repeating, and this happens on many different keys on the keyboard, then this may not be a physical problem but rather the "typematic" setting. This is a feature that causes a keystroke to repeat automatically when you hold the key down. Check in your BIOS and in the Keyboard sec-

tion of the Control Panel for a setting to control the typematic delay, which is the amount of time a key must be held down before it starts repeating, and increase it if you are finding the key repeating too quickly.

Solution #2: Clean the keyboard. If you are only having a problem with one key, you may want to try first just cleaning around that key cap. Of course once you open up the keyboard (if you do) you might as well clean the entire inside of the keyboard. Be careful about what you open; some keyboards cannot be reassembled once opened!

▶ **Problem**: There is a loud ringing or repeated beeping sound from the PC speaker when the keyboard is connected to the system.

Cause: This is usually caused by the PC getting confused when the keyboard is attached to it. Systems don't usually react well to having a keyboard attached to them when they are already on.

Solution: Turn the PC off, wait for 15 seconds, and then turn it back on.

▶ **Problem**: You get a "Keyboard error or no keyboard present" error during startup.

Cause: This can happen if keys have been pressed during the POST (Power On Self Test).

Solution: Make sure the keyboard is attached correctly and that no keys are pressed during POST.

▶ **Problem**: You get an error that says something about the device driver for the Standard 101/102-Key or Microsoft Natural PS/2 Keyboard when you try to enter standby.

Cause: This issue may occur if Adobe Type Manager is installed on your computer. Certain versions of Adobe Type Manager (version 4.0, for example) may not be compatible with the power management features of Windows XP.

Exact Symptoms: When you try to put your computer into standby, you receive the following error message:

"The device driver for the "Standard 101/102-Key or Microsoft Natural PS/2 Keyboard" device is preventing the machine from entering standby. Please close all applications and try again. If the problem persists, you may need to update this driver."

Solution: To resolve this issue, uninstall Adobe Type Manager.

▶ **Problem**: You get an error message when using [Ctrl] + [Alt] + [Delete] to shut down the computer with a USB keyboard.

Exact Symptoms: If you press [Ctrl] + [Alt] + [Delete] twice on a USB keyboard in Windows, you may receive the following error message on a blue screen:

"A fatal exception 06 has occurred at xxxx:xxxxxxxx. The current application will be terminated."

Cause: Restarting Windows by pressing [Ctrl] + [Alt] + [Delete] twice is not recommended. This method causes Windows to suspend most processes and should be used only when the normal shutdown process is not possible.

Solution: Use the Shut Down command on the Start menu to restart your computer.

▶ **Problem**: Your wireless USB Mouse does not seem to get connected to the system.

Cause: You haven't synchronised the device properly.

Solution: There are three ways you can get the mouse to work. First, press the Connect button on the mouse itself, located at the bottom. You'll need to use a pen for this. Second, press the Connect button on the USB receiver. Third, go to the Mouse

Properties in the Control Panel, and on the Cordless tab, click Connect. One of these three should solve the problem, and your mouse should get connected.

▸ **Problem**: Batteries in your optical mouse drain out too quickly.
Cause: You're using a bad mouse pad or no mouse pad at all.
Solution: LED-based optical mice work better with a light background (ideally, white) under them. Use a white mousepad (or any other white background) for your mouse. The batteries will last longer.

▸ **Problem**: On your multi-button mouse, you can't seem to assign a non-standard button to a function.
Cause: You don't have the latest drivers installed.
Solution: Download the latest drivers from the manufacturer's Web site.

▸ **Problem**: You have a problem defining keys in games—all of them appear as "mouse wheel up".
Cause: The cause for this could be the device drivers themselves!
Solution: Use Windows' generic drivers instead.

▸ **Problem**: Your computer hangs when you try to bring it out of Standby or out of Hibernation using a USB device.
**Solution**: To resolve this problem, obtain the latest service pack (SP2) for Microsoft Windows XP.

▶ **Problem**: You have several issues with your USB joystick, such as it not initialising properly.

Cause: This is due to a bad USB configuration.

Solution: Remove all entries under "Universal Serial Bus Controllers", rebooting as necessary. This lets you start at square one. Now install the drivers for your hardware. You can also try plugging the joystick into another port.

Another problem occurs if you've got too many drivers and devices listed. The proper driver for your joystick is probably not loading. You can fiddle with this, but it is advisable to remove everything under "Universal Serial Bus Controllers" and start from scratch installing the USB drivers and joystick drivers first.
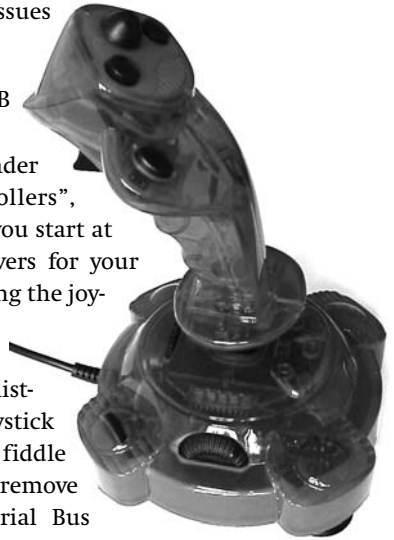
▶ **Problem**: Your joystick won't work in a game. And when you try to test it in Windows, it doesn't even appear as a selection.

Cause: There could be several causes for this.

Solution #1: Before beginning more troubleshooting, try the device on another system. If you install the software on another system and the gaming devices works as it should, then continue with the other solutions. If it doesn't work on another system, you'll need to exchange the product.

Solution #2: If a USB port hub is being used, try connecting the device directly to the USB port on the computer.

Solution #3: Do not connect the device to the serial and USB ports at the same time; use only one connection at a time. Connecting a gaming device to both ports simultaneously can cause detection problems or erratic joystick behaviour.

Solution #4: Many early USB systems (PIX 3) shipped with the USB

ports disabled. These systems must have their USB ports enabled before a USB device will be detected and function properly. These USB ports are generally enabled through the system BIOS.

Solution #5: In many cases, updating or reinstalling Microsoft DirectX can resolve these issues.

Solution #6: Check to see that the USB port is correctly configured. Go to System in the Control Panel. Click on the Device Manger tab. Here, verify that you have an entry called "Universal serial bus controller". If this entry does not exist, you will need to contact a technician for information on correctly configuring the USB Controller. If the entry does exist, expand "Universal serial bus controller". Verify that there is a USB Root Hub icon and an icon for the USB Port. If either of these icons are missing or have an exclamation points or red crosses on them, contact a computer engineer.

Solution #7: In many cases updating the driver for the USB port resolves detection issues.

Solution #8: In some cases, corrupted system files can cause detection issues. System File Checker can check for corrupted files and attempt to repair them. At a command prompt, type in "SFC/SCAN-NOW" and hit *[Enter]*. Select "Scan for altered files", and click "Start".

System File Checker will now scan for damaged and altered files. If SFC finds such files, use the option to repair or restore the files. Please note that if SFC finds that "USER.EXE" is damaged, do *not* restore this file. "USER.EXE" is a core Windows component and indicates a serious problem with Windows. If you decide to restore "USER.EXE," you should back up any important data, as Windows may not restart if this file is restored.

▶ **Problem**: Your joystick appears to be uncalibrated.
Solution: Simply disconnect and reconnect the game controller to

the USB port. It is very important that when you reconnect the joystick, it remains centred. If that doesn't work, try the manufacturer's clear calibration utility. Most manufacturers offer this tiny utility for download on their sites, and running it will clear all registry values that relate to device calibration. Note that all calibration information might be removed for *all* game controllers from *all* manufacturers.

▶ **Problem**: Your joystick is jumpy or erratic in a game.
Cause: Various things can cause a gaming device to act erratically. These include problems with DirectX, calibration entries in the Windows Registry, and game issues.

Solution: Make sure you are running the latest version of DirectX. If you are unsure about what version of DirectX you are using, at a command prompt, type in "dxdiag" and press [Enter]. The box that comes up will tell you about what version of DirectX you have installed on your system. Check the Microsoft Web site (www.microsoft.com/directx) for the latest version.

You may also want to uninstall and reinstall the joystick software. In some cases, if the calibration issue is within a game, you could try uninstalling and reinstalling the game.

▶ **Problem**: Your game says it supports force feedback, but you don't feel any forces on your force feedback device.

Solution: In order to feel forces, the game must support the IFORCE-2 instruction set. In addition to using the IFORCE-2 instruction set, the option to feel forces must be turned on in the game. For information on enabling forces within the game or finding out if the game uses the IFORCE-2 instruction set, consult the game's documentation.

Peripherals

A snag with a peripheral device is not as serious as something gone wrong with your PC, but getting something to work can sometimes be really frustrating. A recurring problem with, say, a new printer or scanner, can also be a royal pain in the, err..., neck, making you wonder whether you should have bought a different make and model! Drivers are often the cause of problems with peripherals, but as you'll see in this chapter, there can be other issues as well.

10.1 Printers

▸ **Problem:** In Windows Me, a printer connected to the USB port is not detected, even after using the Add New Hardware Wizard.

sdfsdf

Cause: This can occur if the printer was already installed, or if an install was attempted and did not complete.

Solution: When you attempt to reinstall the driver, the 'Add New Hardware' Wizard does not appear again. To solve the problem, you need to uninstall the printer first. Download and execute the USB supplemental uninstaller from the manufacturer's Web site. This will uninstall the printer from your system. After the system restarts, you will be able to successfully install your printer.

▸ **Problem:** Whenever you try to print, you get an error saying "Incorrect Installation" and "Your colour cartridge is not properly installed." Also, when you open the top lid, the cradle comes to rest at the centre, but after closing the lid, it does not go back to its rest position at the right; instead, the cradle stays in the centre, and the resume/error light continues to flash.

Cause: This is most probably a problem with the installation of the printer cartridges.

Solution: Try a printer self-test without using the software driver. For this, switch on the printer power supply and hold down the Resume button for a few seconds. The self-test page should print. If this doesn't work, try reinstalling the cartridges. Specifically check for whether you have removed the tape over the ink nozzles on the colour cartridge, and that the colour cartridge is firmly locked in position. Make sure you push down and align the arrow on the cartridge top with the three coloured dots on the top of the cradle, and then push the arrow towards the

coloured dots till the cartridge locks into position. If the problem persists, the most likely cause is a mechanical fault due to fluctuating voltages, and you might have to get the printer serviced.

Inkjet Printer Cartridge

▶ **Problem**: On a peer-to-peer network connection, you are able to connect all the systems, but are unable to share the printer amongst all the systems. For example, you might be able to connect the printer only with the first, fifth and sixth system.

Cause: The File and Printer Sharing service is improperly installed.
Solution: Right-click the Network Neighbourhood icon, select Properties, and make sure you have "File and Printer Sharing for Microsoft Networks" installed on the machine to which your printer is connected. Also make sure you enable "Print Sharing" in the "File and Printer Sharing" settings. Then, check that your client PCs have "Client for Microsoft Networks" installed, and are mapping their printer driver to the network port instead of a local port. Also, ensure that you set up the protocols for all the machines properly.

▶ **Problem**: Windows 98 SE hangs whenever you try to take a printout. The printer LPT port properties shows basic configuration 0000 with input/output range 0378 - 037F, 0778 - 077B, interrupt request 07 and Direct Memory Access 03, with no conflicts.

Cause: This could be due to Improper configuration of the parallel port in the BIOS and/or an IRQ conflict.
Solution: Go to your BIOS settings and check whether your parallel port is configured as ECP mode + EPP mode. Next, check whether your printer is assigned IRQ 7, and whether any other hardware is utilising the same IRQ.

If your printer is not assigned IRQ 7, make sure you assign this

IRQ to it, and change the IRQ of any other hardware that uses it.

▶ **Problem:** You are unable to print clipart or pictures in Word or PowerPoint. You've tried the repair feature, rein stalling Office and reinstalling your printer drivers.

Color Inkjet Printer

Cause: There are multiple possibilities.

Solution: Try printing a heavy image in any image-editing package, even MS Paint. If that works fine, then the problem is certainly with Office XP's print engine, otherwise it's a printer cartridge problem. First try printing in high quality mode and if that doesn't solve the problem, reinstall the package. If that doesn't work, remove and clean the cartridge.

▶ **Problem**: You are unable to take printouts from Outlook Express or Microsoft Outlook. When you try to print, the printer dialog box doesn't appear, and there is no response.

Cause: Your Office XP files are corrupt.

Solution: Uninstall Office XP, delete the folder it creates in Program Files, and also delete the registry entries (navigate to **HKEY_LOCAL_MACHINE\Software\Microsoft\Office** and delete it). Make sure you take a backup of the registry before making any changes to it. Now reinstall Office XP.

▶ **Problem**: Your LaserJet printer gives you an "Out of memory" error.

Cause: There are multiple possibilities.

Solution: Each printer has a distinct set of drivers that instruct the printer on how a task is to be handled. Your driver or the settings might have been changed. Some printers also require the user to specify the amount of RAM that the printer will be allo-

cated. Hence, check the settings for the printer. Go to **Start** > **Settings** > **Printers and Faxes**, right-click on the printer and go to Properties. There you will be able to see this option. The setting here should match the rated setting of the printer. If this is not a problem, then it may be that the printer

Laser Printer

spools all tasks to the hard disk before printing any task; over a period of time, your hard disk may have become clogged with all this data, leaving you with no space to spool tasks. This can be fixed by clearing some space from your hard drive.

There's another, remote possibility: the memory chips might have become loose or perhaps damaged. In that case, you'll need to contact a technician.

▶ **Problem**: Your printer prints garbled text.
Cause: It could be a corrupt driver, or the problem could be with the print head—worn-out pins or badly-rotating pin cushion rollers.
Solution: If reinstalling the drivers doesn't help, you'll need to call in a technician.

▶ **Problem**: When you try to print, you get a message saying "Error writing to LPT1".
Cause: There are multiple possibilities.
Solution: There are quite a few ways to fix this error. First, make sure the printer is online and that there is sufficient paper in the tray(s). Then, clear the printer's memory by turning off the print-er, and check whether the printer cable is properly connected. If you still get the error, remove the printer drivers by going to Add/Remove Programs, and reinstall them. If you still can't print, then check the parallel port settings by right-clicking My

Dot Matrix Printer

Computer and selecting Properties. Go to Device Manager, double-click 'Ports (COM and LPT)' and double-click 'Printer Port (LPT1)'. Select the Resources tab and check the 'Conflicting device list' box for an IRQ or DMA conflict. If another device is using the printer port's IRQ, disable that device or assign it a new IRQ.

To disable the device, locate it in Device Manager, open its Properties dialog box, select the General tab, and check 'Disable in this hardware profile'. To look for a DMA conflict, first check whether your printer port is configured as an ECP port (the latest parallel port technology designed to speed up printing by using a DMA; older settings are Standard, Bi-directional, and EPP). If your printer does support ECP, assign the parallel port to an unused DMA, usually in the BIOS.

If your printer doesn't support ECP, configure the parallel port to a slower, compatible setting. The next-best option is EPP. If your printer doesn't support that either, go with Standard - the slowest but the most compatible setting.

▶ **Problem**: Your parallel-port printer takes a long time to start printing. Even the preview takes a long time to show up.
Cause: This is due to improper configuration of the parallel port in the BIOS.
Solution: The preview time may be long because of the file being

heavy. However, if a light file such as a text file takes too long to preview, then the program you are viewing it in is not correctly installed. Try reinstalling the program.

In order to speed up the printing process, go to your BIOS, and under 'Communication Ports', select the parallel port and configure it as ECP + EPP.

▶ **Problem**: How does you use a parallel port scanner and printer simultaneously?

Solution: All scanners that use the parallel port have two parallel ports at the back panel. One is marked 'To Computer', and the other, 'To Printer'. All you need to do is first detach the printer cable from the computer and reattach it to the scanner. Then take the scanner cable and attach it to the computer. This way the scanner mediates between the printer and your computer, and both devices can be used simultaneously.

▶ **Problem**: With a dot matrix printer under Windows XP, you are not able to change the page setup to 9 x 6 inches.

Cause: This is because of an old printer driver.

Solution: The available paper sizes are just a function of the printer driver. Download the latest drivers for the printer you're your manufacturer's Web site. You could also try using different dot matrix drivers for the printer from the Windows XP list of printers (**Control Panel > Printers > Add Printer**).

▶ **Problem**: While printing a document in landscape orientation and draft mode, the printer prints from the right edge of the paper, irrespective of the right margin set.

Cause: This is a printer driver issue.

Solution: Download the drivers for your printer from your manufacturer's Web site. If this does not solve the problem, download the drivers for a printer from the same family and try those instead. Also, when printing in landscape orientation, try using the Landscape (Rotated) option.

▶ **Problem**: Your laser printer prints heavy on one line about two inches from the bottom.

Cause: The toner cartridge may be damaged, or the lower fuser roller may be bad.
Solution: Some printers sometimes don't pinch the paper tightly enough during fusing, causing smears. The fuser has a Teflon-coated hollow metal roller with a heat lamp inside, and another roller that pinches the paper against the hot roller during fusing. The lower roller is made of high-temperature silicone rubber. Those sometimes go bad as described above, but if you have replaced the fuser assembly recently, that isn't the problem.

Look for any rollers between the pickup roller and the fuser, and clean them with naphtha or mineral spirits. If there is a black roller with a foam-like surface, it is electrically conductive, and is part of the mechanism that places electrical charge on the paper. Clean it with alcohol, taking care not to get fingerprints on it.

Clean everything in the paper path: if there is a corona wire (instead of the conductive roller), clean it with a Q-tip dipped in alcohol. If this does not help, the toner cartridge might need to be replaced.

▶ **Problem**: A shared printer prints documents fired from the host computer, but not from other computers on the network.
Cause: The printer drivers have not been installed properly.
Solution: Uninstall the drivers and install them afresh. A printer connected to either a USB port or an LPT port should not in any way cause a problem while printing on a LAN.

10.1.1 How to get the best out of your inkjet printer
❍ Use original ink cartridges to prevent clogging, leaks and bleeding.
❍ Set the printer driver settings correctly.
❍ The best results will be achieved by matching the printer, printer settings, ink and paper.
❍ Handle inkjet papers like photographic papers, by the edges to avoid oil deposits and fingerprints.
❍ Set your printer for the proper paper type and weight. Fine art

papers are heavier than ordinary inkjet or bond papers. If possible, set printer to thicker paper settings, or use the 'envelope' setting.

❍ Feed heavy/stiff paper one sheet at a time. Placing a sheet of plain copier/bond paper behind a heavy sheet sometimes improves the feed.

❍ Media settings on your printer determine how much ink will be applied to the paper. Thinly coated glossy films require less ink, while plain paper soaks in more. Coatings are designed to control ink absorption and spread, producing brilliant, sharp images with less ink.

❍ Allow ink to dry completely to avoid smudging. The time it takes to dry will vary based on the ink and paper quality used as well as the temperature and humidity conditions.

10.1.2 TLC for your laser printer

❍ Select a good location for your laser printer. A properly ventilated area is recommended. Select a place where temperature and humidity do not change frequently. Try to avoid areas with heavy dust build-up.

❍ Position the printer on a sturdy and level surface. Allow sufficient space around the printer for air flow.

❍ While cleaning your printer, always use a lightly dampened cloth to clean the outside of the printer. To clean the inside, use a dry, lint-free cloth. This will ensure that no liquid enters the inner parts of the printer. Most manufacturers provide useful cleaning information on their manuals - always refer to them.

❍ Use paper manufactured specifically for your printer, and also select the correct paper type for your print job.

❍ Keep your printer up-to-date by downloading the latest drivers and patches from the manufacturer's Web site. This helps because most manufacturers provide driver updates for their units and these include patches that add fonts or rectify incompatibilities.

❍ If debris is the primary cause of failures, toner is the primary cause of debris. All toner cartridges release a small amount of toner into the machine. This is why it's important to clean the machine when you change the cartridge. It is also important that the density control of the machine be properly set to prevent the machine from pulling too much toner into itself. We all like dark prints, but if your print settings are too dark, it could be detrimental to the life of the printer in the long run.

❍ Don't pile documents or miscellaneous objects on top of your printer, as they could cause damage. Your printer could over-heat and this could result in malfunctioning and even a reduction in the printer's life.

10.2 Scanners

▶ **Problem**: On close inspection, you notice a green spot under neath the scanner glass.

Cause: This could be a manufacturing defect.

Solution: It is advisable to contact the nearest service centre and get it checked. Even if your scanner works well, you should ask an authorised technician to check the device and change the glass if necessary.

▶ **Problem**: Scans come out blurred and blocky.

Cause: The scanner resolution is set too low.

Solution: The default resolution of most scanners is set low (as low as the print preview). Hence the image scanned using the default resolution appears to be blurred. You will have to change the manual scan resolution to a higher resolution that suits your needs.

▶ **Problem**: When scanning at full resolution, you keep getting "Out of memory" errors.

Cause: There is insufficient RAM and/or free disk space.

Solution: Scanning at high resolutions pro-duces very large files: for example, whereas a 72 dpi colour (RGB) scan of an A4 page uses 1.43 MB of disk space, the same scan at 300 dpi uses 24.9 MB, at 600 dpi, it uses 99.6MB, while at 4800 dpi, it requires around

Flatbed Scanner

6.4 gigabytes of memory! As a rule of thumb, a PC should have at least as much RAM as the size that will be occupied by the image to be scanned, and at least double the free disk space on the hard disk. A higher amount of free space will improve the scanner's (and the computer's) performance.

Multi Function Device Scanner

Note: CMYK scans are 25 per cent larger than RGB scans, while greyscale scans are a third of the size of RGB scans.

▶ **Problem**: The colours in your scanned photographs don't appear the same as the original.

Cause: You're probably scanning at a low colour bit depth.

Solution: Try increasing the colour depth of the scanner in the manual scan options. You should also check if your display adapter is set to display the highest colour bit depth from the Display Properties in the Control Panel.

▶ **Problem**: While some applications are able to scan from your scanner, there are some that are unable to locate a scanner.

Cause: The incorrect scan source has been selected.

Solution: In order to use a scanner with an application, you need to choose the TWAIN source corresponding to the scanner you're using. You will be able to select the TWAIN source in the application, most likely under the File menu.

10.2.1 How to get the best out of your scanner

Selecting the scanning area: Always preview the document and select just the area to be scanned, instead of scanning the entire document. This will reduce the scanning time as well as the file size, especially when scanning at high resolutions.

Resist scanning at high resolutions: If you intend to scan your documents only to view them onscreen, scanning at a resolution between 100 and 150 dpi is enough, as monitors can only display 72 dots per inch (dpi). Scanning documents at higher resolutions will only result in a larger file size. If you are scanning a document for faxing or OCR-ing, 200 to 300 dpi is sufficient; for printing photos, 300 to 600 dpi is more than enough. For photo scanning, keep the setting at the maximum colour depth that your scanner supports.

Use the Descreen option: When you scan content from magazines or newspapers, you will notice a lot of moiré (converging and diverging lines) on the scanned image. The best way to reduce this pattern is to use the Descreen option in the scanner software. If your scanner software does not have a Descreen option, you can use an image editing software.

Image formats: Select an image format depending on where you will be using the image. If you will be using it for the Web or for animation, save it in JPEG or GIF—these compressed formats save a lot of hard disk space. On the other hand, if you are scanning the image for print, TIFF is the best format, as it compresses the image with hardly any loss in image quality.

Correct ghost images: A ghost image occurs when the scanner picks up images from the back of the page. This can usually be corrected by changing the brightness and contrast settings. Experiment to find the best settings for your scanner. Another simple way to correct this is to place a thick white paper over the document being scanned.

Adjust brightness, contrast and sharpness: Many a time, the scanned image turns out to be dull. This can be easily fixed through the TWAIN driver (if your scanner supports it) or using image editing software, where you can adjust the contrast and brightness levels.

10.3 Other Peripheral Devices

▶ **Problem:** When your PC attempts to detect your Webcam, it hangs and then restarts. After restarting, the following error shows up: "[filename] is missing…"
Cause: The Web cam's drivers are corrupt.
Solution: Download the latest drivers from the manufacturer's Web site.

▶ **Problem:** When you connect your Webcam to a USB port, Windows does not detect it. (You installed it on another computer and it worked just fine.)
Cause: The onboard USB is not enabled in your motherboard.
Solution: To enable onboard USB, you need to access the BIOS setup and select the 'Integrated Peripherals' option. Here, you will find the options to enable/disable onboard USB. Enable it and restart your machine with the device plugged in.

▶ **Problem:** You are unable to use the USB ports on your PC.

Cause: The USB ports might be disabled, or there's a problem with Windows.
Solution: Enable the USB ports in BIOS. This is usually under the Integrated Peripherals option. If you have an older version of Windows such as 95 or 98, you will need to install the USB drivers for your version of Windows either from the motherboard driver CD or from the motherboard manufacturer's Web site.

▶ **Problem:** USB ports are available in the BIOS but are not visible under System in the Control Panel.

Cause: The USB header cables are not connected to the motherboard.
Solution: Some motherboards have

Game Controller

USB headers that require to be connected to separately provided USB ports. Install the USB header cables and the USB ports will be ready to use.

▶ **Problem**: A USB game con
troller doesn't work with
some older games.

Cause: The USB game controller might not perfectly emulate game port-based controllers.
Solution: Check with the game controller manufacturer for updated drivers, patches or workarounds.

▶ **Problem**: You can't use a USB keyboard and mouse outside of Windows.

Cause: USB legacy support is disabled in BIOS.
Solution: Enable USB legacy support. You can do this under the Integrated Peripherals setup in the BIOS.

▶ **Problem**: You cannot use any USB devices—they are not detected.
Cause: USB is disabled, or not assigned an IRQ.

Solution: Enable USB in the BIOS. This will be accessible under the Integrated Peripherals option. If this does not solve the problem, then assign an IRQ to USB in the BIOS. See the BIOS section of this book for details.

▶ **Problem**: The USB 2.0 ports aren't supporting USB 2.0 devices at top speed.

Cause: The USB 2.0 ports might not be configured correctly.

Solution: Enable USB 2.0 support in the BIOS and install the correct USB drivers for your motherboard. These drivers are usually provided on the driver CD that accompanies the motherboard, or you can download them from the motherboard manufacturer's Web site.

▶ **Problem**: A USB pen drive is not recognised by Windows 98, but is recognised by later versions.

Cause: Windows 98 does not have inbuilt support for USB pen drives.

Solution: Install the correct USB driver on the Windows 98 system to enable support for USB pen drives. These drivers will most likely be provided on the driver CD that accompanied the pen drive. You can also download the drivers from the USB drive manufacturer's Web site.

▶ **Problem**: USB peripherals work when plugged into the computer but not when plugged into a hub.

Cause: External hubs that are bus-powered might not provide enough power for some devices.

Solution: Use the Power dialog box on the "USB hub properties" sheet in Device Manager to see the power requirements for a device and the power available.

▶ **Problem:** When you con nect your USB camera to your Windows 98 computer, an error that says "STIMON caused an invalid page fault" is displayed. When you access 'Scanners' from the Control Panel and select the camera in the window, an error with Sticpl.cpl is displayed.

Cause: The Stimon.exe file on your PC is damaged.
Solution: Press [**Ctrl**] + [**Alt**] + [**Del**] and check if Stimon is running. If it is, end the task. Delete the file from **C:\Windows\System** (where **C:** is the drive Windows is loaded on). Run the Registry Editor and navigate to **HKEY_Local_Machine\Software\Microsoft\Windows \CurrentVersion**. Look for a value named "**StillImageMonitor**" under either the "**Run**" or "**RunServices**" keys. Delete the value and restart the PC. Now reinstall the drivers for the USB camera. If you still get an error, replace the Sticpl.cpl file as well. To do this, run "sfc" from Start > Run and insert the Windows 98 installation disk. Select the option 'Extract one file from installation disk' and click Browse. Locate Sticpl.cpl in the ..**Windows\System** folder and click Start. Restart the machine after restoring the file.

▶ **Problem:** Your Web camera just doesn't activate in Windows 98. You've tried reinstalling the drivers, but the installation failed. The camera is not detected when you plug it in either. The USB port is enabled in the BIOS. The Web cam works perfectly on another system.
Cause: Since the possibilities have been narrowed down; the USB port seems to be the culprit.
Solution: To be doubly sure that it is a problem with the USB port, you can try installing a version of Windows with better USB sup port, such as Windows XP. If the problem persists, your USB port is definitely kaput! You are then left with two options—either buy new USB ports with cables that connect to the USB header on your motherboard (if your motherboard has such headers), or buy a USB PCI card for new USB ports to connect your devices to.

▶ **Problem**: Your USB DVD-Writer fails to write at its maximum rated speed, even when you use media certified for the maxi mum rated speed of the writer.
Cause: The USB DVD-Writer is USB 2.0 compliant while the port is an older version.
Solution: Check if the motherboard supports USB 2.0. If not, the speed bottleneck may be the cause of your problem. If your moth erboard supports USB 2.0, then check if it is enabled, and set it to USB 2.0 mode in the BIOS.

▶ **Problem**: When you disconnect a USB device from your PC and reconnect it later, duplicate names of the device appear in the Device Manager.

Cause: The firmware of the USB device is corrupt.
Solution: Download the latest firmware for the USB device from the manufacturer's Web site and upgrade your device.

▶ **Problem**: You have a FireWire DV Camcorder. After installing Service Pack 2 on Windows XP Professional, the performance of the FireWire has decreased, and your capture application reports dropped frames every now and then.
Cause: This is a known issue with Windows XP Service Pack 2.
Solution: There is an update available on the Microsoft

Web site at **http://support. microsoft.com/?kbid=885222** which addresses this issue.

▶ **Problem**: Your external FireWire DVD-RW drive is not detected by XP.

Cause: This is a bug in Windows XP.

Solution: Microsoft suggests you install at least Service Pack 1. This will solve, in most cases, problems faced while hot-plugging FireWire devices such as DV Cams, DVD-RW drives, etc. The other possible solution is to open the Device Manager and if you see an exclamation mark beside the FireWire controller, uninstall the controller and restart the computer.

10.3 Glossary

BIOS: Basic Input Output System, which handles the communication between the computer and its peripherals. Often burned onto read-only memory (ROM) chips or rewritable Flash (EEPROM) memory chips found on motherboards and expansion cards, such as video cards and SCSI and ATA/IDE host adapters.

Bit depth: This is the number of bits used to describe the colour of each pixel on a computer display. For example, a bit depth of two (2 to the power 2) means the monitor can display only black and white pixels; a bit depth of four (2 to the power 4) means the monitor can display 16 different colours; a bit depth of eight (2 to the power 8) allows for 256 colours, and so on.

CMOS (Complementary Metal-Oxide Semiconductor): A type of chip design that requires little power to operate. In PCs, a battery-powered CMOS memory and clock chip is used to store and maintain the clock setting and system configuration information. The PC BIOS is built on such a chip.

FireWire: Also called IEEE-1394 or i.Link, this is a serial I/O inter-face standard that is extremely fast, with data transfer rates up to 400 Mbps, 800 Mbps, or 3.2 Gbps, depending on the version of the standard used. Most current implementations use the 400 Mbps IEEE-1394a and b versions.

ECP (Enhanced Capabilities Port): A type of high-speed parallel port jointly developed by Microsoft and Hewlett-Packard that offers improved performance for the parallel port and requires special hardware logic. ECP ports use both an IRQ and a DMA channel.

USB (Universal Serial Bus): USB version 1.1 is a 12 Mbps (1.5 MBps) interface over a simple four-wire connection. The bus supports up to 127 devices. USB 2.0, also called High-Speed USB, runs at 480 Mbps and handles multiple devices better than does USB 1.1.

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