Raising your game

We all know our computers perform numerous complex tasks, often at the same time, but the demands of the latest multimedia applications can prove testing for even the sturdiest desktop workhorse. Niall Magennis shows you how to change that with specific upgrades to turn your machine into a complete home entertainment system

There's no doubt that personal computers are incredibly capable machines and can turn their attention to completing a vast range of operations and calculations. Power PCs are designed to perform a whole raft of applications and our expectations of their abilities are constantly increasing. But even the most highly specified model eventually dates and begins to show its limitations – often when computing technology suddenly makes a great leap forward, such as improved processing speed, graphics-rendering or support for video-editing applications.

So unless you're the lucky owner of a brand-new multimedia powerhouse bought specifically for its exceptional sound, video and games capabilities, chances are there have been times when you've found the system lacking a little. Thankfully, improving your PC's assets is neither a complicated process nor, in many cases, a significantly expensive one. A better sound card, accompanied by a decent set of speakers, may be all that's required to ensure that corporate presentation sounds crystal clear, while a better screen can make all the difference to video playback.

Here, we provide upgrade options specifically designed to boost your system's multimedia capabilities. Use as many or as few as you need to improve your PC's performance. Follow them all and you should end up with a fantastically impressive setup that could take pride of place in your living room, combining DVD playback, swish graphics and scarily realistic surround sound audio that will transport you and your force-feedback gamepad into another dimension.

First-time fiddler?

Even if you've never done it before, there's no need to hit the big red panic button when someone suggests you should open up your beloved PC for a spot of upgrading. If the nearest you've ever come to upgrading involved plugging a USB cable into the back of your PC it's likely you'll be overcome with fear when someone suggests performing what seems like open-heart surgery on your precious computer.
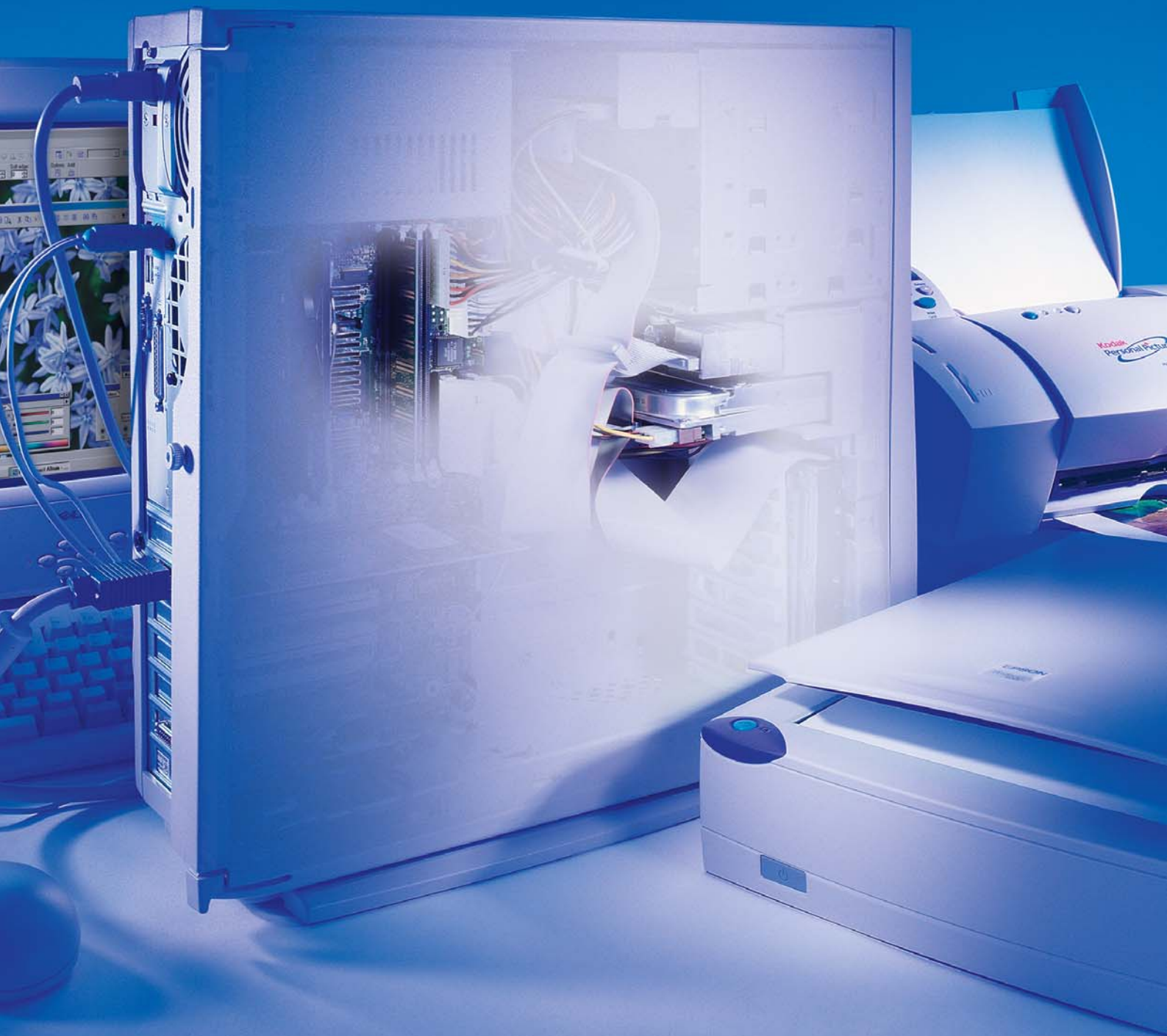
In reality, upgrading your PC is so simple you'll be kicking yourself you haven't done it before. And, contrary to popular opinion, you don't need a large hooded anorak zipped all the way to the top to qualify as an upgrader. In fact all the pieces inside your PC fit together like a grown-up version of Lego. There's little chance of fitting a component the wrong way round or making a bad connection as each piece has grooves or notches cut into it to help you get it right.

Modern PCs are extremely powerful when it comes to displaying games graphics and blasting out hi-fi sound, but the pace of development in graphics and audio hardware has been astonishing of late. As a result, sound and graphics cards that were the bee's knees at the start of last year have fallen out of favour faster than you can say Boyzone. But don't worry, *PC Advisor* is here to help. We're going to look at how to beef up your PC so it will once again rise to the top of the multimedia performance charts.

To turn your PC into a multimedia home entertainment powerhouse you're going to need some serious kit, so first let's take a look at the hardware options available.

Card sharp

Gamers will always eye up the fastest graphics card available but this isn't necessarily the most sensible option. Brand-new technology is initially priced at a premium because the manufacturers know that early adopters are willing to pay over the odds. Often, by waiting a couple of months, you can get a feature-rich card for less money.

For example, the Hercules All-in-Wonder Radeon 850DV not only has blisteringly fast graphics, it also boasts an onboard Nicam TV tuner, FireWire port, analogue video capture and TV-out facilities for around the same price as many high-end GeForce4 cards. For the budget-conscious buyer, nVidia's cut-down GeForce4 MX chipset is a good option.

Sound advice

It's easy to concentrate on graphics when talking about games performance, but a first-class sound card with support for surround sound can also make a huge difference to gaming. Linked to a surround sound amp, games can really come alive with surround standards such as EAX and A3D. For instance, you'll be able to hear the bad guys creeping up behind you in first-person shooters.

Creative has been leading the way with EAX, especially since it bought up its only real competitor, Aureal. The SoundBlaster Audigy Platinum EX is top of the range with its own breakout box (an attachment fitted with a range of input and output sockets), FireWire port and 5.1 analogue output for watching DVD movies and support for both EAX and A3D.

However, if you're a bit of an audiophile or are into making music yourself, you should check out Terratec's 6Fire 24/96. Like the Audigy, it is a sound card tied to a breakout box, but it features a true 24bit/96kHz signal path, meaning that it has amazingly crisp audio quality. The 6Fire comes with excellent Asio drivers, which are important if you want to use the card for making music with a sequencer such as Cubase or Logic. Unfortunately, it lacks the Audigy's FireWire port but is slightly cheaper as a result.

If you need FireWire you can always add this option by choosing a video-editing bundle, such as the Studio DV Clip from Pinnacle. This gives you

Where to buy

Below are details of the products used in this feature. Many will be familiar from our Top 10 charts and our Reviews section but they are by no means gospel. These components are merely suggestions and can easily be substituted for equivalent products.

Hobbyist
- Second hard drive **IBM Deskstar 40GB; www.watford.co.uk; 0870 220 0700; £59.**
- Graphics card **3D Graphics Blaster GeForce4 MX 420 64MB AGP TV-out; www.watford.co.uk; 0870 220 0700; £85.**
- Optical drive **Philips DVDRW208; www.watford.co.uk; 0870 220 0700; £275.**
- Sound card **Creative Audigy Platinum EX; www.dabs.com; 0800 138 5136; £179.**
- Speakers **Logitech Z-540; www.3dsolutions.co.uk; 01246 267 788; £44.**
- Gaming peripherals **Saitek Touch Force Mouse and P1500 rumble gamepad; www.saitek.com; 01454 451 900; £39.99 and £29.99 respectively.**
- FireWire **Onboard via Audigy.**
- Monitor **CTX PR960F; www.ctxeurope.com; 01923 810 800; £283.**
- Software **Pure Motion EditStudio 3.0; www.puremotion.com; 07092 265 529; £59.**

Professional
- Second hard drive **Western Digital 1200JB 120GB; www.westerndigital.com; 01372 360 055; £196.22.**
- Graphics card **Hercules 3D Prophet All-in-Wonder 8500DV; www.dabs.com; 0800 138 5136; £286.**
- Optical drive **La Cie DVD-R; www.euro-tech.co.uk; 0870 458 0011; £396.**
- Sound card **Terratec 6Fire 24/96; www.euro-tech.co.uk; 0870 458 0011; £153.15.**
- Speakers **Videologic DigiTheatre DTS; www.dabs.com; 0800 138 5136; £299.**
- Gaming peripherals **Microsoft SideWinder; www.dabs.com; 0800 138 5136; £42. Logitech WingMan Formula Force GP; www.jungle.com; 0800 035 5355; £58.99.**
- FireWire **Pinnacle Studio DV clip; www.dabs.com; 0800 138 5136; £37.**
- Monitor **LG Flatron LCD 782LE; www.lge.co.uk; 0870 607 5544; £502.**
- Software **Adobe Premier; www.dabs.com; 0800 138 5136; £443. Showshifter; www.showshifter.com; 0131 625 1480; £34.**

not just FireWire ports courtesy of a PCI card but also some video-editing software to get you started.

Guest speakers

There's no point in having a top-quality sound card if you haven't got great speakers to go with it. For the last couple of years 4.1 sound systems (four surround speakers and a subwoofer) have been popular. This type of setup is great for gaming but it's not so hot for DVD playback. This is because Dolby Digital is designed for full 5.1 systems – 4.1 plus a central speaker. To compensate, a 4.1 system has to create a pseudo centre channel by mixing the centre channel sound equally to both front speakers.

Nevertheless, if you're not going to play DVDs on your PC a 4.1 system is

cheaper and does an excellent job for gaming. Logitech has a solid range of 4.1 sound systems and its Z-540 bundle strikes a good balance between sound quality and price.

Those who are interested in DVD movies or just interested in the best possible sound setup should look for the full 5.1 quota. There are two types of 5.1 setups: those that come with a surround sound decoder and those that don't.

To use a 5.1 system without a decoder you need a sound card capable of outputting 5.1 audio in analogue format. If you want to use your 5.1 system with a games console or standalone DVD player opt for a setup with a decoder. Videologic's DigiTheatre DTS is an excellent speaker set that includes an external decoder.

Good looking

Whether it be gaming, watching DVDs or just surfing the web, your monitor is the window into the world of all things PC related. The majority of desktop users own a 17in CRT (cathode ray tube) display, so the next jump is either a 19in CRT model or a 17in flat-panel.

An LCD (liquid crystal display) monitor will obviously save on desk space, but this is still the costly option. However, if you can justify the expense then the LG Flatron LCD 782LE has been at the top spot of our charts for quite some time and features both DVI (digital visual interface) and Dsub connectors. On the CRT side of things, the 19in CTX PR960F is a *PC Advisor* award winner thanks to its all-round value for money (see our Monitors chart on page 134).

Let the games begin

If great graphics and excellent surround sound aren't enough to satisfy your gaming needs then force feedback gaming peripherals surely will. Saitek has a number of low-cost options available, such as its P1500 Rumble Gamepad and TouchForce optical mouse. Moving further up the ladder, Microsoft's SideWinder force feedback joystick will appeal to those who want to add a touch more reality to flight sims, while petrol heads could do a lot worse than Logitech's low-cost Formula Force GP wheel, which also works on the PlayStation2 games console.

Once you start to get into editing video and recording audio you'll find your hard drive pretty soon becomes clogged with huge media files. There are two solutions to this problem: add a second hard drive

or invest in a DVD writer. Hard drives are falling sharply in price and you can now pick up a 120GB drive for under £150. However, adding a DVD writer will not only allow you to back up wads of video and audio files, but some will also write video discs that are compatible with standalone DVD players. You can either fit an internal drive such as the DVDRW208 DVD+RW drive from Philips or an external model such as La Cie's DV-R drive which connects via a FireWire port.

Of course, there's no point in having a killer multimedia machine if you don't have any software to use with it. The king of video editing is Adobe Premiere, but more affordable options include Roxio VideoWave 5.0 or PureMotion EditStudio 3.0. If you fancy using your PC as a Tivo-type device then check out Showshifter from www.showshifter.com, while musicians should look at Cubase VST and Logic for their midi-sequencing needs.

Proceed with caution

Choosing the upgrades is the easy part; installing them is more tricky. First, a few words of caution. Before you open your PC's case, make sure the power is off. Don't just turn off your computer but also unplug the power lead, just to make sure. Unlike old Pentium-based machines, modern ATX power supplies feed a small amount of current to your motherboard even when the computer is switched off.

Secondly, static electricity is harmful to PC components. However, by taking some simple precautions you can avoid hurting your beloved PC, so change out of that polyester jumpsuit you're wearing and move the PC off the shagpile carpet. Once you have the PC open and before you start messing with components, touch the metal housing of your PC's power supply to discard any static electricity your body may be storing. If you're overly paranoid about the dangers of static electricity buy yourself an antistatic wristband from your local electronics store.

Luckily, most PC cases today are easy to open, but refer to your PC's manual if it's not obvious how to remove the cover. Usually you'll only need take off the lefthand panel of a mini tower case to gain access to the PCI and AGP slots.

Gimme some space

First up, we're going to install a new hard drive. We don't want to replace our existing drive, instead we want to add a second disk to increase the storage space and provide plenty of room for saving multitrack audio files and chunky video footage.

All motherboards have two IDE channels for connecting hard drives and optical discs to your computer. Each of these channels can handle two drives. However, the PC must be able to tell the difference between the two drives to save confusion. This is done by assigning one drive as Master and the other as Slave. Because we're just adding a second disk we need to set this drive to Slave.

To change the drive's Master/Slave setting you need to set a jumper on the rear of the drive to the appropriate position. This setting is usually shown in a diagram on the rear of the drive, but most likely you'll have to check the manual or the manufacturer's website. Once you've set the drive to Slave insert it in a spare 3.5in drive bay and secure it in position with the four screws that came with the drive.

The IDE cable that connects your existing hard disk to the motherboard should have a spare connector in the middle. Insert this in the socket on your new drive. There should be a notch on the cable that matches the notch on the disk's socket to make sure you connect it the correct way round. If there's no notch, look for a wire on the cable with a stripe.

Insert the connector into the socket on your drive so that the wire with the stripe is closest to the power connector on the drive. There should be a few spare power connectors inside your PC, so find one and connect it to the disk. Power connectors have grooves cut into the top of their housing so you can only connect them one way round.

Reconnect the power to your PC and turn it on. Once it starts hit the Del key to enter your PC's Bios. Under Standard Cmos setup, set the primary Slave drive type to Auto. Save the changes and exit. Your drive should come with software for formatting it. If it doesn't, check the manufacturer's site for a formatting utility you can download. All the major drive manufacturers provide their own utilities.

Recordable drives

Fitting a CD-RW drive or a DVD-R drive is even easier than adding a new hard drive as you don't need to format the drive once it's installed. Apart from that detail, the whole process is pretty much identical.

Start by setting the jumper on the drive to either Slave or Master. Set it to Slave if you're adding an additional optical drive or Master if this is the first optical drive. Now pop out the front panel of a spare 5.25in drive bay. The plastic panel should pop out easily but the metal protector behind it may take a bit more coaxing to work itself free. Insert the drive into the bay and secure it with screws.

Next connect the IDE cable to the drive, remembering that the red line on the ribbon cable should be closest to the drive's power connector. If you want to be able to play music from your new drive remember to connect the supplied audio cable from the drive to your sound card. If you've already got one drive connected to the CD connector on your sound card, you can always connect the second drive to the AUX or TV connector.

Turn on your computer, enter the Bios and set either the secondary Master or Slave type (depending on how you set the jumper on the drive) to Auto before saving and exiting. Now, when you boot into Windows your drive should be recognised automatically.
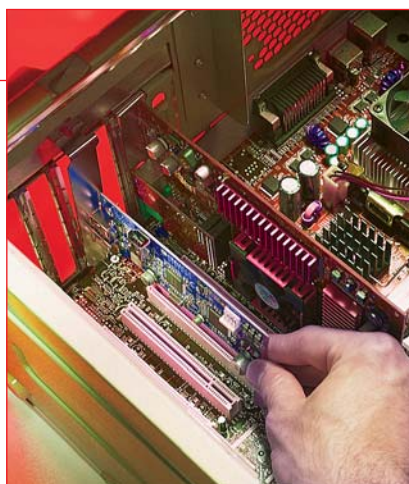
From here, you can install any CD-burning or DVD-authoring packages that may have been bundled with the recordable drive.

Sound and vision

Our next task is to add a graphics card. Thankfully this is an extremely easy process. Do yourself a favour and remove the drivers for your existing card before you install a new one. You can usually do this using Add/Remove Programs in Windows' Control Panel.

When you open up your PC you'll see there are a number of expansion slots. Most of these will be white, but the AGP slot you are looking for should be brown. Remove your existing graphics card from this slot by taking out the screw (which you need to keep for your new card) and rocking the card from end to end to gently unlatch it.

Now insert your new card into the slot and use the screw to secure it. Reconnect the power to your PC and start your PC. Once the computer boots into Windows follow the instructions printed in your card's manual to install the appropriate drivers.

A great graphics card for games needs a killer sound card to go with it. Once again, begin by removing the drivers for your old card by using Add/Remove Programs in Control Panel. Next, open up your PC and look for your sound card nestled in its PCI slot. Disconnect any audio cables connected to the card from CD or DVD drives, undo the card's retaining screw and gently rock

the card from end to end to release it from the slot.

Insert your new card and, once you're sure it's firmly in place, secure it with the screw. Insert the sound card's drive bay module into a free drive bay and secure it in position with the four screws the manufacturer has provided. Connect the cable from the drive bay unit to the sound card and reconnect the CD- or DVD-ROM audio cables to the connectors on the top edge of the sound card. If you can't read the labels for these connections on the card itself, refer to the diagram printed in your sound card's manual. Once you've done this, reboot your computer and install the sound card's drivers as detailed in the card's manual.

Where's the fire?

A PCI FireWire card is installed in exactly the same way as a sound card or graphics card. You just need to place the card in a free PCI slot, secure it in place with a retaining screw and then reboot your PC and install the card's drivers.

Make a display of yourself

We've now completed all the upgrades that involve delving about inside your PC, so you can relax. All the other upgrades we're going to perform simply involve plugging in cables. Let's start with the monitor. If you've invested in a new CRT (cathode ray tube) display all you need to do is plug the monitor into the Dsub connector on the back of your graphics card. A flat-panel display, on the other hand, may have both Dsub and DVI (digital visual interface) connectors.

If your graphics card has a DVI connector then hook up the monitor and PC together using a DVI cable. However, if either your flat-panel or graphics card does not have a DVI connector, you'll need to revert to using a standard Dsub connection between the two.

Having upped the quality of your PC's sound and graphics, you might want to use its multimedia capabilities to watch a DVD or too with friends. What better way to do this than to hook up your PC to a digital projector (using the same Dsub port your monitor is usually connected to), unroll the screen and turn down the lights? You'll find relevant buying information in this month's Technofile on digital projectors, starting on page 76.

All gaming peripherals now come with either USB or Gameport fittings because serial connections are no longer supported for devices under Windows XP. Always opt for USB peripherals as this allows you to hot-swap the device safe in the knowledge that it will be recognised automatically.

Connecting 5.1 speakers is a simple matter of choosing between analogue or digital connections. If you're using an external decoder for a 5.1 surround setup you'll need to make a digital connection between your sound card and decoder. This can be done using either an optical or coaxial cable and the choice will depend on the options available on the decoder and sound card.

If you're using your sound card as a decoder then you'll need to make analogue connections to your speaker amp. The necessary connections are well marked so you shouldn't have any trouble, but it's a good idea to keep both your sound card's and speakers' manuals to hand just in case.

With your upgrading complete all that's left to do is load up some games or DVDs and start enjoying your hard work. Finally, a word of caution: by opting to upgrade you will almost certainly invalidate any warranty cover you may have, at least for that component. ■

Thanks to Intel for supplying us with a processor and Crucial for providing RAM for the test machine used in this feature.