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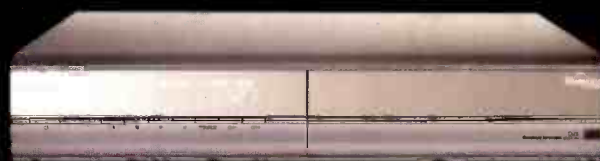


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- Nvidia Geforce 7800 GTX 512MB
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- Think Outside Bluetooth Keyboard
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How to get Internet TV
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5 consoles on test



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- 17" Flat Panel Monitor
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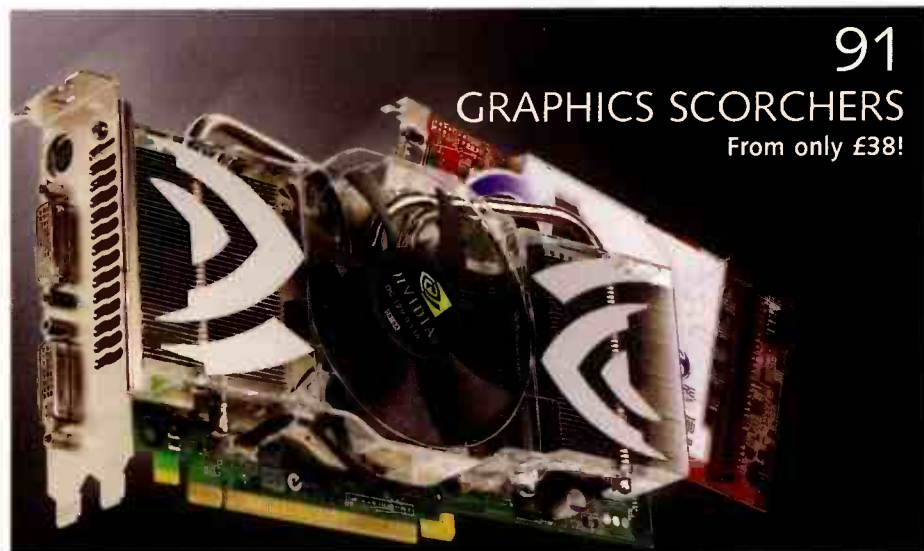


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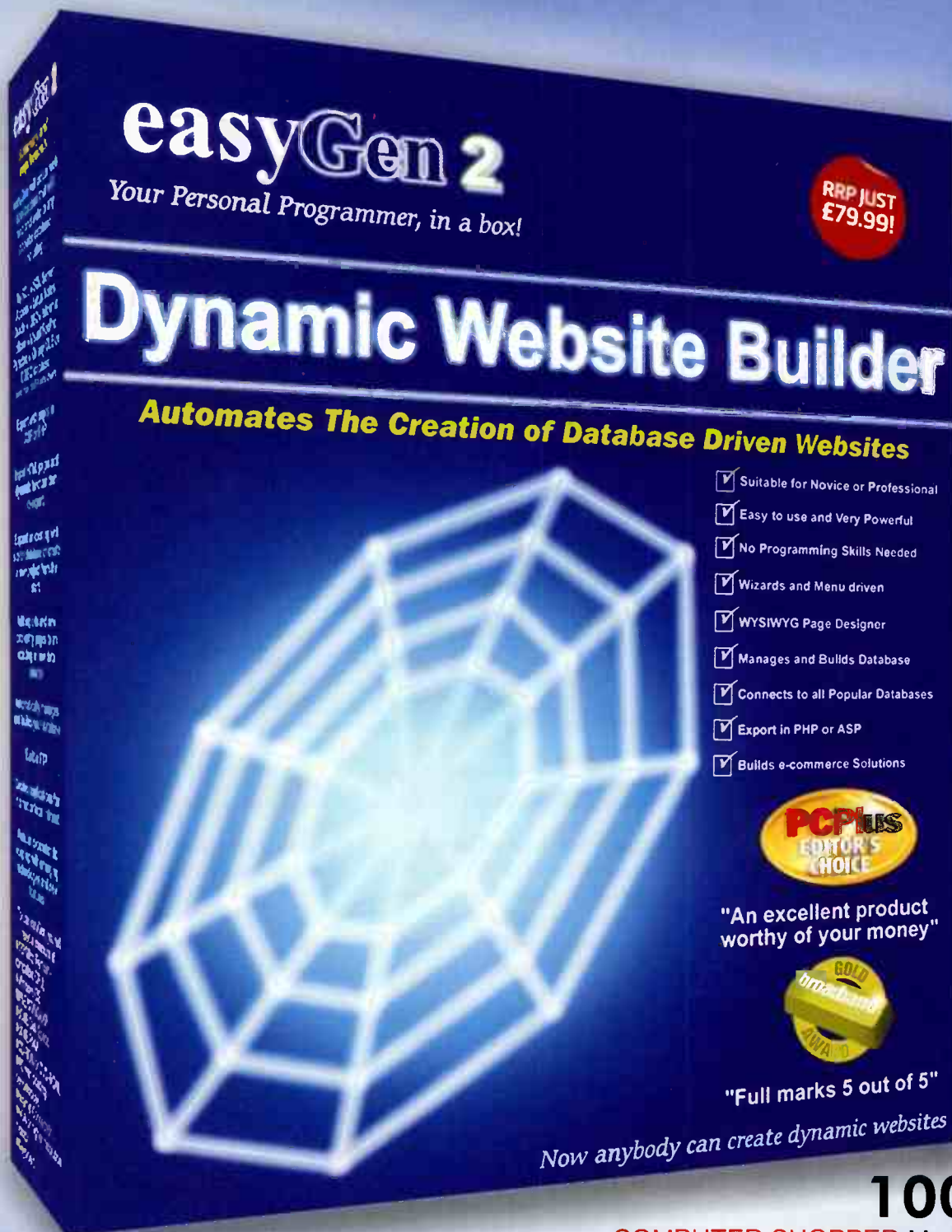
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rob_jones@vnu.co.uk

Editorial

Customer service must be a priority for etailers

High-street shops fight back as online stores go out of their way not to help, says Rob Jones

The high street is suffering, according to reports, and an obvious reason for this is the increase in online shopping. But I fear there could be a backlash against the march to the web unless we start to see more concern about customer service.

The attitude of many etailers, especially in the high-tech sector, is shocking. There seems to be a belief that they can take the money and run. Complaints are often treated with disdain and customers are given misinformation and pretty much left to sort out the mess themselves. Little regard appears to be shown for consumer protection laws, although the Government doesn't help by making them foggy and difficult to pin down.

How often do you shop online, only to find it impossible to get a phone number to call should anything go wrong? The reason is simple – etailers don't want you to call, because dealing with the problem personally costs money. It doesn't inspire confidence when they are casting you adrift even before they've got your money.

One of the most common complaints from readers is that, if products break it becomes a struggle to get them replaced or repaired, because the seller is not interested. Consumers are often charged for returning goods, or told to deal with a manufacturer directly. Just because a transaction took place online for a bargain price, a retailer does not have the right to shirk its responsibilities. If a product is inherently faulty, the retailer is responsible for shipment costs. The trouble is, they get you to pay up front knowing that most people cannot be bothered to jump through hoops to get back their postage money.

Mistakes happen, products break, and most consumers accept this. But what these retailers forget is a lesson most shops and banks learnt long ago – a customer who has suffered a problem that has been dealt with and resolved quickly will be a loyal customer. But a customer spurned will never again be your customer.

The online shopping market will continue to grow, however high-street shops are fighting back and adopting some interesting practices. I recently needed ink for my printer, so looked at online prices for genuine cartridges. PC World's web store offered a decent price, but what attracted me was that I could pick up my purchase in any branch. I ordered my ink and picked it up the next day. I saved about £7 on the in-store price, even though I paid over the counter, not online. In fact, PC World doesn't ask for any payment details online if you use this service. The only downside in my view is the service is not available for every product.

I also needed additional memory for my PC, and as the in-store service wasn't an option, I looked for the best price, and then went on Ebay, looked for the same product, and bought it new for less than the price any etailer was offering. It was a low-cost item that's unlikely to break and I now trust Ebay sellers more than many branded online outlets. You can see very easily if a seller has built a good reputation, and many are so paranoid about losing their good name that they put in the extra effort to provide decent service in getting the goods to you.

It's a cut-throat world online, I understand that. But it's a cut-throat world offline as well and I don't hear high-street stores offering lame excuses for treating customers badly. **PCW**

'Complaints are often treated with disdain and customers are left to sort out the mess'

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See page 199

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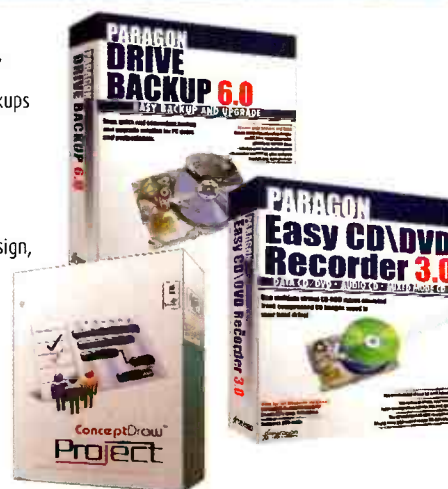
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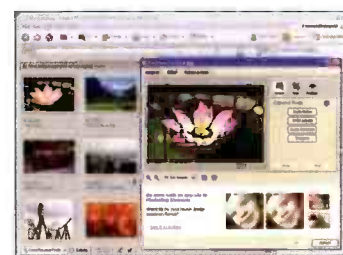
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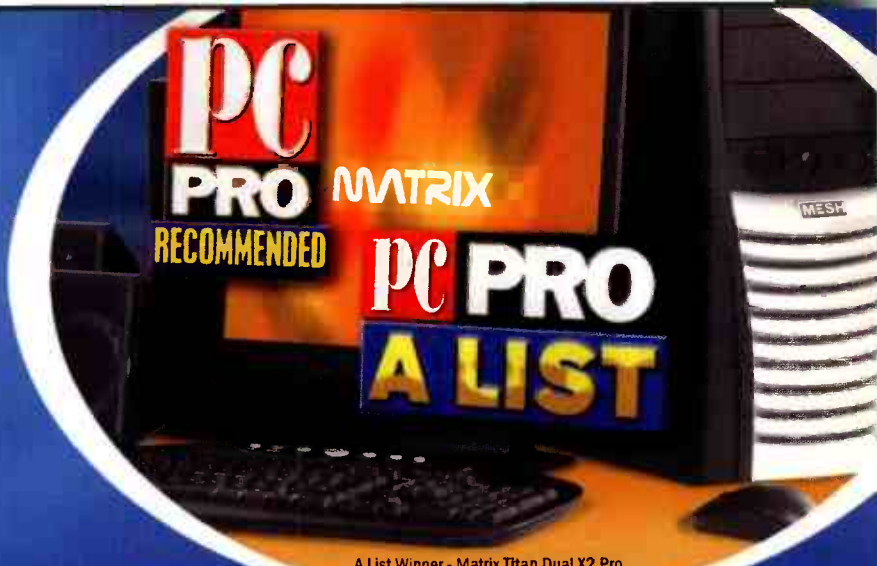
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All pictures for illustration purposes only. *Shared Memory Architecture. **Sony Multi-burners R/W all standard formats Except DVD-RAM

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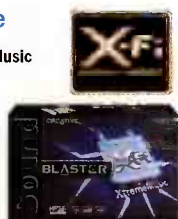
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NEWS

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The new Office 12 formats are not a plot to take over the world, says Microsoft. But it does seem rattled by calls for an open format.

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MS offers Office 'standard'

Software dominated IT news over the past month as Microsoft geared up for the biggest shake-up in its products for a decade. The major shock came when it submitted its new Office 12 document formats to the European Computer Manufacturers Association (ECMA) for approval as a standard.

This looked like a crafty move to outflank the Oasis organisation, which has approved a rival Open Document format. Neither ECMA nor Oasis is recognised as independent by the EC, and both will submit the rival formats to the International Standards Organisation (ISO).

The EC says it wants an open format for documents exchanged between member states, and ISO approval would satisfy its definition of one. This is unlikely to happen for at least a year, particularly as there are now two candidate standards, and there remain doubts as to whether Microsoft will cede control of its Open XML formats enough to qualify.

But Microsoft's ECMA move may be enough to get it off the hook in the State of Massachusetts, which has also said it will only use a standard format. The dispute there has turned nasty, with the



Flying visit... a new free web access facility called Google Space has been set up at London's Heathrow Airport to promote services, such as Google Earth, which can show travellers satellite views of their destinations. Google is challenging Microsoft on its own desktop with such services

state's Opendoc-supporting chief information officer being accused of accepting bribes because he failed to report trips to open-source conferences.

It has, however, provoked a debate over whether a document standard is needed at a time when an increasing diversity of platforms have to exchange data. It is also a sign of a sea change that is

happening in software – mainly because of the general adoption of XML, the file description language which facilitates this exchange.

Major events for most users will be the release in late 2006 of the new Vista version of Windows and the Office 12 application suite, which has been rewritten around XML. But the emerging software generation also includes a wealth of new back-office code and development tools – see page 22.

Another big change is that Google is using its browser front end to challenge the Windows desktop as the most-used computing interface. Both Google and Microsoft have introduced desktop searches and almost simultaneously last month they trialled versions of personal portals offering messaging and search facilities with a choice of news feeds.

Microsoft's offering, Windows Live, is supposed to be a platform for delivering future services which will include browser-based office applications. But even Jeff Raikes, Microsoft's head honcho at the IT Forum in Barcelona, admitted these applications were likely to be used only by companies with a need for browser access.

Clive Akass

- Forum report – page 22
- Analysis – page 24

Get all the news from CES as it happens

PCW will be reporting from the Consumer Electronics Show (CES) in Las Vegas in January, and you can keep up to date every day with the latest news and product releases online at www.pcw.co.uk. We are also launching a dedicated CES portal, at www.pcw.co.uk/ces, where you can not only get daily news updates, but also read blogs and listen to podcasts from the event.

Taking place between 5 and 8 January, the show is rapidly becoming one of the most important in the annual calendar and if you are a fan of the Test

Bed, our labs blog, this will also keep you up to date with CES.

PCW is now producing a weekly Products newsletter, where you can access and read every new review we put online. It comes out every Wednesday and you can sign up for it at www.vnuseservices.co.uk/vnunet. Alternatively, if you want to get our weekly round-up of the most important news, a selection of the latest reviews, software downloads, plus read our blogs – the Test Bed and PCW Interactive – then you can sign up for the newsletter at www.vnuseservices.co.uk/pcw.



Finally, with Christmas almost upon us, we have set up the Wise Man's Guide to Christmas Shopping at www.pcw.co.uk/christmasguide. This gives you access to the best prices for a wide range of products, provided by Kelkoo and has Buyer's guides to help you decide.

Rob Jones

Xbox sells below cost price

Microsoft is selling its new premium Xbox 360 games console at around a third less than the price of its components – and that is not counting the cost of assembly, testing, distribution and marketing, according to research firm Isupply.

Andrew Rassweiler, manager of Isupply's Teardown Analysis Service, estimated the bill of materials at about \$525 (£302), of which the ATI graphics card costs an estimated \$141 (£81) and the custom-designed triple-core PowerPC processor costs \$106 (£61). The Xbox 360 costs \$399 with a 20GB hard disk in the US, a discount of around 31 per cent on cost; the UK price is £209.99 without a disk, which costs £69.99 extra.

It is usual for games consoles to be sold at a discount but figures are generally hard to come by. Hackers went to considerable trouble to bypass the security on

the first Xbox so it could be used as a cheap PC and play standard PC games.

Microsoft will recoup the subsidy from the sale of accessories as well as games.



Some of the accessories, such as a £32.99 wireless controller, are near-essentials.

Isupply said prices for the processor and graphics card are likely to drop in 2006 as a result of better manufacturing yields, which should reduce material costs by \$50 (£29).

The Xbox 360 went on sale in Britain on 2 December. In the US, where it was launched a couple of weeks earlier, there were reports of crashes and faults, but it was unclear whether these were more than normal for a new product. Microsoft said machines affected were a 'very small fraction' of the total.

The Xbox 360 is being sold at around a third less than cost price



In brief

7in bender

Samsung says it has made its biggest-yet flexible liquid-crystal display, a 640 x 480 (VGA) screen measuring 7in designed for handheld devices, notebooks and wearable electronic designs.

RIP geeks

The specialist worker who excels in IT but lacks other business talents is about to become extinct, analyst firm Gartner predicted. It expects that online services and mobile phones will rob IT geeks of their status as problem solvers inside their social networks.

Smiles worse

A bid to introduce a biometric passport in Germany hit problems because too many Germans were smiling. But it was no joke. People had to be warned to use a neutral expression and look straight at the camera.

Tablets get truly mobile



The popularity of Blackberry-style email-on-the-move services has focused the attention of product designers on how to input text into a handheld. Numeric keypads are just about up to SMS messages but not for lengthy replies to emails.

O₂ and T-Mobile have launched identical handhelds with a tiny Qwerty keypad. The O₂ model, branded as an XDA, is pictured on page 23, where we report on how the next version of Microsoft's Exchange messaging server has native support for push email. But easily the best answer to the input

problem is Microsoft's underrated Tablet PC interface. I've finally got my paws on Motion Computing's LS800, one of the first truly portable Tablet PCs, and it's a revelation. It weighs just over a kilo and its 8.4in screen is getting close to the 7in concept Tablet PC shown by Bill Gates in June.

The handwriting recognition, used with just a little care, is adequate for writing emails and instant messages. You can bet that as tablets get smaller and more powerful we'll see an end to finger-numbing mini-keypads.

Proper Qwerty keyboards are another matter. I've also had a brief look at Fujitsu-Siemens' new Lifebook P1510 Tablet, which converts into a keyboard machine even though it is the same size and weight as the LS800. Watch out for reviews of both machines in PCW. Clive Akass

T-Mobile earns on pictures

A while back we reported that the US company Danger was designing a handheld for sale at less than \$100 that could act as a PDA, smartphone and games machine. Now T-Mobile has launched a version called Sidekick 11, costing a maximum £49.99 depending on tariff.

It has nothing to do (so far as we know) with the original Sidekick, the pop-up personal information manager (PIM) that was a must-have PC utility in pre-Windows days, although it does have a PIM as well as a VGA camera. It supports GSM and GPRS links, web browsing and instant messaging – another challenge to SMS.

It was launched with a new tariff called web'n'walk, bundling 40MB of web traffic with 100, 200 or 400 minutes of voice calls for £30, £38 or £55 respectively. It also

comes with free use of a personal portal, accessible from any browser, where you can back up all the pictures or personal information on your Sidekick.

There is a snag; the backups are done automatically over the T-Mobile link and deducted from your monthly allowance. In effect you will be paying T-Mobile for every picture you take. CA



The Sidekick 11 comes with the use of a portal to back up information

In brief

Bright Sparc

Sun's Ultrasparc T1 processor has eight cores, each capable of processing four threads, yet uses only 70w of power running all 32 threads, the company said. This is less than half the power drawn by Intel server chips with one or two cores. Sun said equipping the world's web servers with the 'eco-friendly' chip would have the same effect on carbon-dioxide emissions as planting one million trees. See also page 20 and Gordon Laing's Inside Information column on page 34.

Be a DJ

A new product from Hercules is aimed at PC users with a stack of mp3 tracks who entertain fantasies about being a DJ. The £79.99 DJ Control MP3 consists of mixer software with a control box and two jog-wheels that are said to emulate the feel of using the traditional twin-deck.

→ www.hercules.com

Dot promise

Asus is selling LCD monitors in Britain for the first time, offering buyers a replacement if their display shows a single bright dot (a common defect) within a year of purchase. It is also providing a three-year collect-and-return warranty. Ex-VAT prices for 17in models range from £154 for an 8ms entry-level to £199 for a 3ms with built-in speakers. Some models are already available at www.scan.co.uk and www.microdirect.co.uk.



BBC trials P2P catch-up TV

A BBC trial is using peer-to-peer (P2P) file sharing to allow catch-up viewing of TV programmes shown in the past week. The service, which uses a P2P platform called Kontiki, raises many questions about the future of public-service broadcasting and is bound to be watched closely by commercial rivals.

The trial, involving 5,000 users including myself, differs from catch-up radio already available on the BBC site in that it uploads an mpeg file rather than streaming the data (although the company does offer mp3 downloads of some radio shows for use with music players).

P2P has become associated with illegal file shares but there is nothing intrinsically criminal about it. The BBC system is rights managed, so you can only play a file on an authorised machine and it is deleted a week after broadcast. IP addresses are monitored so only British users can access the service.

This might seem to put the BBC in the position of restricting access to publicly owned content, but many



The BBC Interactive Media Player (IMP) relies on Microsoft Windows Media Player 10. But different software is likely to be used when web TV services go mainstream. The BBC is developing its own open-source codec for media stream that will save hefty fees for commercial products

BBC programmes are made by other companies or are co-productions.

P2P technology was chosen as it was the cheapest way to deliver content and avoid server overloads.

With P2P, the first people who download the programme can start sharing it with others, PC-to-PC. It is not fast: the sharing PC is

restricted to its upload speed, typically less than 500Kbits/sec. My first download of a 327MB file of a one-hour programme took well over an hour on a 4Mbits/sec line.

Service providers are beginning to offer catch-up TV and video-on-demand services from fast local servers, which would be in competition with the BBC and perhaps more efficient.

There is also the problem of who pays for the bandwidth. Broadband flat rates are giving way to per-gigabyte charges, so you could pay for other people's downloads. Also, service providers pay for P2P traffic outside their own infrastructure.

A BBC spokesman said: 'These are some of the issues the trial is intended to assess.' *Clive Akass*

Realtime streaming on the way

The BBC plans to offer realtime TV streaming on the web, like that already available for radio shows, in about a year. Again, for copyright and other legal reasons, the service is likely to be restricted to British IP addresses.

It has also been forced to include content ratings for programmes because timeshifting makes a nonsense of the 9pm threshold for grown-up content. The current Interactive Media Player (IMP) trial includes some high-definition content.

300GB holo discs 'on sale in 2006'

A holographic disc holding 300GB will go on sale in 2006 according to its American developer. Lucent spin-off, Inphase Technologies, said drives using the technology, called Tapestry, will be able to read and write data at 10 times the speed of a normal DVD.

Inphase has formed an alliance with Hitachi/Maxell to market and sell the discs, which were demonstrated publicly for the first time at the International

Broadcast Equipment Exhibition in Tokyo.

Tapestry can store more than 26 hours of broadcast-quality high-definition video on a single 300GB disc, recorded at a data rate of 160Mbits/sec. The 13cm discs are slightly wider and thicker than a DVD, and have six times the maximum capacity of first-generation Blu-ray discs.

The Tapestry system uses light from a single laser split into two

beams: the signal and reference. Data is added to the signal beam, which is then directed to intersect with its twin within the recording medium, capturing the resulting interference pattern.

By varying the reference beam angle, wavelength or media position, many different holograms can be recorded in the same volume of material.

The first products are likely to be for professional use. *Ken Young*

Sony opens door to viruses

Sony faced a legal and public-relations disaster over an anti-piracy module on music CDs. In effect, this sets up a hiding place for rogue code on any PC on which the CDs are played.

The Extended Copy Protection (XCP) module, distributed on around two million CDs covering 50 titles, was installed to stop CDs being copied more than three times. Critics complained that the procedure was done sneakily, possibly illegally, plus it slowed down and could even crash a PC.

Far worse was the fact that the module was effectively a rootkit, as used by hackers to hide their code from the operating system and anti-virus programs.

Rootkits (see the Windows 'hacking' feature in January's *PCW*) are often used to provide backdoors into systems, particularly as part of 'botnets' of hijacked PCs used in denial-of-service attacks. Backdoors can also be used to harvest information for identity theft.

XCP could easily be used by criminals (see box, right), and it was

not long before they were doing so. Virus specialist Kaspersky identified a backdoor module called *breplibot.b*.

Privacy campaigners complained the XCP could report back to Sony with information on a user's web activities and tastes in music. The company denied this but there were web reports that Mediamax, another digital rights management module used by Sony, has this capability.

Sony faced at least two lawsuits over the issue: one, from the Electronic Freedom Foundation, named both XCP and Mediamax; and the State of Texas claimed a breach of its anti-spyware law.

XCP was written by a UK company, First4Internet. A spokesman said: 'We have been advised not to say anything with the court case going on.'

Sony withdrew the offending CDs and offered a way to uninstall XCP but even this was attacked as insecure. So how did it leave itself and its customers so wide open?

Kaspersky chief technology consultant David Ems said it seemed Sony didn't realise the code would be spotted and 'because they are not in the malware business, they did not realise how others would use it'.

How hackers can fiddle the count

XCP works by intercepting calls to the Registry, which holds configuration information, and ensuring that nothing can see references to the module itself or files it wishes to hide.

The idea, so far as Sony was concerned, was to keep a count of CD copies in a way that users could not tamper with. But the XCP module hid any files beginning with *\$sys\$*; so all a virus writer needed to do to hide rogue code was to give it such a name. The *breplibot.b* backdoor hid under the name *\$sys\$drv.exe*.

In brief

Web data threat

Proposed European anti-terror laws granting access to web-traffic records should be extended to all criminal offences to help trace illegal file sharers, the film and music industries have urged.

An open letter to the European Parliament from the Creative and Media Business Alliance, which includes Sony BMG, Disney and EMI, came days before a 13 December vote on a law which would force service providers to maintain email and other traffic records for three years. See www.pcw.co.uk for an update.



Blue move

PC builder Evesham has teamed up with navigation specialist Destinator to offer a £299.99 Bluemedia GPS in-car system (pictured) that has a speed camera alert and mp3 player (see review page 54).
→ www.bluemediagps.com

Label burners

HP has launched two new DVD burners supporting all the usual dual-layer DVD formats plus DVD-Ram. The dvd840 drives come in internal and external versions and support Lightscribe, which allows you to use the same machine to burn a label on the disc.

Radio aid

Magix Webradio Deluxe enables simultaneous recording of multiple radio programmes, timeshifting, and automatic burning onto CD or DVD. It costs £19.99.
→ www.magix.co.uk

Apple downloads outsell high street

The Sony rootkit row (see story above) came as Apple's iTunes was reported for the first time to be outselling CD sales at chains such as Tower Records and Borders.

Apple claims to have sold 600 million songs to 10 million subscribers. However, Wal-Mart, Best Buy, Target, Amazon, FYE and Circuit City all scored higher than iTunes, said research firm NPD.

The Recording Industry Association of America (RIAA), just about the only group to back Sony over the rootkit, claimed digital sales accounted for just four per cent of the market during the first half of 2005, up from about 1.5 per cent the previous year.

A US Supreme Court recently ruled against P2P service Grokster, which had to pay the RIAA \$50m after unsuccessfully arguing it was not responsible for illegal activity by its users.



This CD player called a Hard-Fi doubles as an mp3 jukebox and allows you to upload tracks to a mobile player without the aid of a computer. It converts CD tracks into mp3 files as you listen to them and stores them on internal memory. The prototype, from former Sinclair and Amstrad electronics designer Martin Brennan, was one of the ideas on show at an open day at Cambridge's St John's Innovation centre. See www.hard-fi.org





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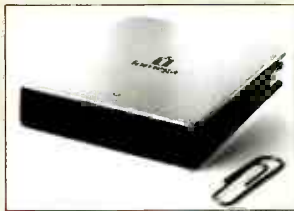
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In brief



Thin drives

Omega says its new Micro Mini hard drives are a good alternative to solid-state USB drives. The 4,200rpm drives weigh just 50g and come in 4GB, 6GB and 8GB capacities, costing respectively £87, £100 and £115.

Slotted disk

This portable hard drive, called a Media Buddy, has a multi-slot card reader with an LCD screen allowing you to transfer files from other devices. It comes in 30GB or 80GB versions, targeted at people who want to store digicam pictures on the move. Currently it's on sale only in the US at www.digitalfoci.com; prices start at \$229 (£132).



Talking photos

Talking stills look like coming onto the market 80 years after talking movies. An Italian company, Zanetti Studio, has developed a photo-printer called Speekysmart that puts onto a photograph a magnetic strip that can capture a few seconds of sound recorded at the moment the picture was taken. It is seeking a manufacturer for the device. HP is said to be working on a similar system.

Tiny advance

US researchers have created a single-molecule switch that could become central to next-generation nano-computers. The switch responds in 'predictable and stable ways' to an applied electric field. But the researchers have not yet figured out how to connect up the switch. For more see www.pcw.co.uk/2146390.

Dell flirts with buoyant AMD

Dell is to drop its Intel-only policy and is preparing to offer AMD-based machines in a bid to boost sales figures in the face of growing competition, according to Far East reports.

The market-leading PC seller was one of several companies named in an AMD anti-trust suit in 2005 that alleged Intel used unfair pressure, including coercion and payments, on manufacturers not to use rival processors.

Whatever the truth of this, Dell's Intel-only policy seems to

have rebounded. AMD outsold Intel in US stores for the first time ever in October with a market share of 49.8 per cent compared to Intel's 48.5 per cent, analysts Current Analysis reported.

Dell shares have dropped around 30 per cent this year and its growth has slowed down for six successive quarters, although it is still growing. Lenovo, Acer and HP are snapping at its heels and all offer a choice of Intel and (usually cheaper) AMD processors.

Now Dell has instructed its Asian suppliers, Hon Hai Precision Industrial, Asustek and Quanta, to use AMD processors in server, notebook and desktop machines, the *Taiwan Economic News* said.

No AMD-based computers are on sale at the Dell website, but the company has quietly begun to offer boxed AMD processors. Dell refused to comment.

US investment analyst Benjamin Reitzes predicted in November that Dell would suffer because of its rivals' use of AMD processors.

Flash moves by two-bit chip giant

Intel has launched a new memory chip using its Stratash technology, which uses multiple voltage levels to store two bits per cell, doubling the data density compared with standard Flash. The 90nanometre M18, which is the fifth Stratash generation,

increases the data density further with a die size just over half that of current 130nm products.

Analysts Semiconductor Insights said the new chips had been highly anticipated and that Intel had managed to 'double reading speeds,

triple write speeds and quadruple erase speeds' over previous NOR memory products. It will be used in phone handsets and PDAs.

The M18 is NOR memory, which is similar to D-Ram in that it can feed code directly to the processor. Intel has also moved to meet a growing demand for NAND memory, as used in devices such as memory cards which function more like hard disks; NAND data has to be fed to the processor via some kind of dynamic memory.

Most handheld devices use a mixture of the two but the craze for music players has led to a shortage of NAND. Intel has set up a joint company with memory specialist Micron to produce NAND chips; mostly, it appears, for Apple.

The two companies plan to invest \$2.8b (£1.6b) in IM Flash Technologies, which, as Kelvin Taylor observed in our Test Bed blog (<http://labs.pcw.co.uk>), surely has the most unintentionally hilarious name to appear for a while.

8GB Flash for takeaway systems

Transcend is offering high-speed Compact Flash cards and USB drives with a capacity of 8GB, both costing a recommended €709 (£476). Transcend said they both use single-level NAND silicon which is faster than multi-level.

The products are aimed initially at answering the increased storage needs of multi-megapixel digicams and their users. But some manufacturers hope people will start using them to carry their desktop setups and favourite applications around, using a technology known as U3, for use in any PC.

The new products use single-level NAND silicon



Intel power-saving hits your PC's performance

Power saving on AMD desktop processors is more effective than on equivalent Intels, which also take a performance hit if Enhanced Intel Speedstep Technology (EIST) is switched on, according to tests performed by PCW's Gordon Laing.

EIST has brought power saving to desktop machines that can cost

up to £120 a year in energy costs if you leave them on, says the Energy Saving Trust. More than one in three people leave their PCs on overnight, wasting £41m a year and producing an extra 220,000 tons of carbon-dioxide. Friends of the Earth has called for regulations to reduce standby consumption.

Gordon found that idling PCs draw the same power whether or not EIST is enabled. It kicks in when the processor starts to do some work. In theory EIST matches the clock rate and operating voltage to the needs of the tasks in hand, but in practice there is a speed penalty. See Hands on Hardware, page 140.

Turn your phone into a video gateway

Network specialist Westell has turned the home telephone into a media gateway with a product that can act as a hands-free Dect base station for standard and web voice calls, a broadband modem and router, an Internet terminal, a personal information manager and a videophone.

It's the latest attempt to resolve the long-running argument about whether the hub of the digital home will be a standalone device or incorporated into some other product such as the set-top box, the TV or the PC.

But the Westell gateway can be used as a slave to a master gateway if necessary. And the specifications have not been set in stone as Westell hopes to sell the product to cable or DSL operators and will configure it to their needs.

The US operator Verizon offers a version to customers for just \$149 (£86), which is not much

more than a cheap home router. The price is discounted because the company hopes to sell services and perhaps advertising via the device.

This is the advantage to the operator, said Vaughn Armstrong, market director of Westell UK. With broadband prices being pushed down by competition, operators can use the phone to push up their average revenue per user (ARPU).

Verizon uses the classic 'walled garden' approach that operators tried to push a decade ago in the hope of capturing users within their own portal. But even if a UK operator locks the Westell gateway into a portal, it still provides open web access to devices linked to it either by cable or an 11g wireless connection.

And a portal does have the advantage of simplicity. Amstrad claimed to have more than a million customers for the rather



more downmarket Em@iler phone, which is not networkable and is designed for technophobes.

The Westell gateway uses Windows CE and a quarter-VGA

The Westell media gateway is built round a broadband modem and four-port switch; the company hopes to sell it through DSL or cable service providers

colour screen (320 x 240), although a slightly wider 400 x 240 one is planned to enhance video playback. Another option is a built-in camera for video calls.

Built-in applications include a memo pad, email management, video email and logging of incoming and outgoing calls.

Projected services include news, sport and weather, games, listings and maps.

People are likely to be upgrading their broadband modems over the coming months to take advantage of ADSL2+; the Westell gateway could be a good choice if an operator offers it at Verizon-like discounts.

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DrayTek VoIP-equipped routers let you to use your broadband line to make and receive voice calls. Calls to or from any other VoIP-equipped users are completely free of charge (any SIP compatible device, software or network).

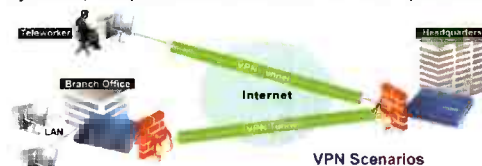
You can make low cost calls to regular phone lines too, using the DrayTEL PSTN gateway - calls to the PSTN are at very low DrayTEL rates (e.g. Europe/USA from just 1p/min) and DrayTEL will also provide you with a regular phone number to receive calls from regular phone users on. DrayTek VoIP routers are available for both ADSL and cable-modem broadband.

The phones connected to your Vigor can receive incoming calls via their SIP address from other Internet users or from the PSTN (the regular phone network) via your own DrayTEL telephone number.



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Specification subject to change. Facilities vary with model.

MS learns to love Linux

Much of the new functionality in Office 12, especially that aimed at improving information flow and collaboration, depends on a range of server applications.

A new product announced at the IT Forum, Microsoft Dynamics GP version 9 (formerly Great Plains), is designed to distribute customer and in-house information via an easy-to-use, Office-like interface. It is designed to work with Microsoft infrastructure products including Sharepoint Portal Server, CRM, Outlook and other Office products.

Also announced was Windows Virtual Server 2005 R2, an upgrade of the software that lets a physical server operate as several logically separate servers that can run 'alien' operating systems including Linux.

Ashim Pal, senior director of platform strategy in Europe, said this showed Microsoft had recognised that it had to coexist with Linux. 'R2 not only allows you to run Linux but it also lets you use Microsoft tools to manage Linux,' he said. 'This was a very big step for us.'

It seems you need third-party software to allow Linux to take advantage of Microsoft Operations Manager (Mom), which looks after Microsoft installations.

And, so as not to give the impression that the company is cosying up to Linux, Pal released details of a Microsoft-sponsored report showing its servers were more reliable than those based on open source.

Super charge

Also announced at the IT Forum was a second beta of Windows Compute Cluster Server 2003, designed for groups of PCs acting as a single supercomputer – an application for which Linux has been very successful.

Jeff Price, senior director of server product management, said it could also bring supercomputer power to the desktop. 'We imagine people such as engineers, with a high compute demand, could have a cluster of four or five PCs under their desk.'

Will Office 12 split up users?

Microsoft claims to be well prepared for the fact that companies and users will have to cope with two sets of document formats when next-generation Office 12 is released late in 2006. Formats have remained fairly stable for the past five years because of similar problems in past releases.

But Microsoft has so far said that filters to allow legacy software to use the new formats will be available only for more recent versions. It seems that this does not include Word 97, although executives at

Microsoft's IT Forum in Barcelona did not seem clear on the point.

This could cause confusion in organisations with thousands of computers, some of them antiques. It could also cause aggravation for private users when they receive a document they cannot open. Even if they have a modern version of Word they will need to download a filter, which is no big deal for the average PCW reader but is likely to confuse and perhaps anger naïve users.

The result could be that people who are not interested in the extra features offered by the new

formats will switch their defaults to the old ones, which would split the Microsoft culture between business users who need the XML features and those who don't.

But Jeff Raikes, vice-president of Microsoft's information-worker business group, said: 'We are confident that people will move quickly onto the new formats.'

And Erik Brown, a marketing executive for the group in Europe, said: 'We have learned from problems we had [with new formats] in the past. We will make sure it doesn't happen again.'

Key customers get a first look at the new suite

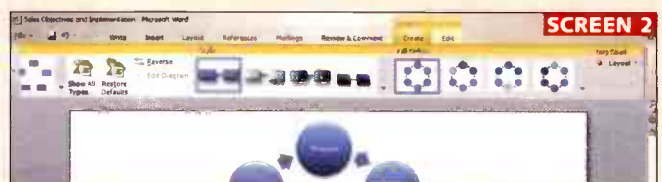
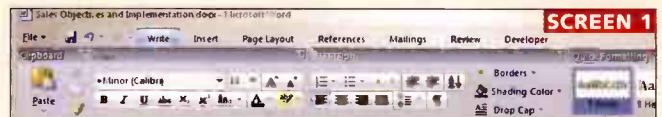
Microsoft has released the first beta version of Office 12, which will introduce the biggest changes to the world's most-used applications for a decade. The 'technical' beta will be available only to certain big customers, but a general release is expected early in 2006.

The Office interface has been revamped, replacing dropdown menus with toolbars that Microsoft believes will make it easier for users to access the full power of the product (see screens 1 and 2).

Office 12, due for release in 2006 at the same time as the next-generation Vista version of Windows, includes a range of new features for allowing people

in disparate locations to collaborate on projects. Microsoft believes this will be useful to

smaller companies with branch offices as well as large dispersed enterprises and teleworkers.



Screen 1 shows the opening command tabs for formatting in Word; screen 2 is a charting toolbar for Excel. Microsoft believes the reason only a few people use more than just a tiny fraction of Office features is that many are hidden away in the complex menu system

32bit servers consigned to history

Microsoft is to phase out 32bit versions of its Windows server operating system, the company has revealed. The first release of Longhorn, the server version of next-generation Windows Vista, will support both 32bit and 64bit hardware. But Release 2 of Longhorn, expected to launch in 2009, will be 64bit only, according to Bob Muglia, senior vice-president of Microsoft's enterprise-management group.

He told developers at the company's IT Forum in Barcelona that 64bit code runs 'most' 32bit

applications, often as much as 10 per cent faster. He admitted that companies would have to replace 32bit hardware to run the new version, but he said most were already switching to 64bit machines, even if they were running 32bit software.

'When you buy a server today it is going to be 64bit,' he said. 'The only exception is with really low-end machines that are designed for the desktop but used as servers.'

Exchange Server 12, Windows Compute Cluster Server 2003, and the small business version of

Longhorn will also be exclusively 64bit, Muglia said.

He stressed that speed and an extended address space were not the only advantages of 64bit. He claimed 64bit systems being used within Microsoft had proved more reliable than 32bit; they were also more secure because of a feature called Patch Guard, which prevented rogue code from interfering with the kernel code. This could not be done with 32bit code because a number of applications patched the kernel legitimately.

Exchange challenges Blackberry email

Companies are lining up to cash in on the success of Blackberry-style email-on-the-move services. Microsoft Exchange 12, which is due for release in early 2006, will provide native support for pushing email to mobiles, allowing companies to offer similar services using their own infrastructure.

Blackberry client devices from RIM have become very big in the UK and worldwide RIM devices enjoy almost a quarter of the PDA market. But the company faces a bruising patents lawsuit which could cost it up to \$1b to settle.

Meanwhile, messaging specialist Critical Path claims its Memova system, which can push email to almost any recently released mobile phone, has secured 150,000 subscribers in just four months since its launch in France.

No British mobile phone operator has yet taken up Memova, though

chief technology officer Mike Serbinis says O₂ is looking at it.

One reason for its rapid success in France is that SFR, the French arm of Vodafone, charges a flat €2.50 (£1.70 approx) a month for forwarding any number of messages from just about any consumer email service – Lotus Notes and Microsoft Exchange-based corporate email is not supported.

The system uses MMS, the multimedia version of the SMS

messaging system, which does not suffer the 160-character limit imposed on a text message. The policy on attachments would vary with the operator, but Memova is smart enough to recognise and cope with standard ones such as jpegs that most modern phones can process.

Very large attachments are likely to be stripped out, if only because many models could not cope with them. The system is targeted at the consumer market

but Serbinis says that many small businesses are also likely to be interested. He added that he suspected SFR's flat-rate charging could change when the system becomes established.

● Pentax Technologies has launched two mobile printers, Pocketjet3 BT and Pocketjet3 Plus BT, which allow direct printing from Blackberry handhelds and smartphones via a Bluetooth link. The two models print at 200dpi and 300dpi respectively.



One advantage of using Memova or Exchange push email is that you have a wider choice of clients including O₂'s recently launched XDA Mini S PDA. It boasts a Blackberry-style keyboard, which is slightly easier for typing than a numberpad. It runs Windows Mobile 5 and supports Wifi, as well as 3G links and lists at £399.99. We'll be doing a review in PCW next month.

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Open season on conspiracy theories

The new Office formats are not a plot to retain world domination, says Microsoft. But it is beginning to look rattled by growing calls for an open cross-platform standard. Clive Akass reports

There is no conspiracy, said Jeff Raikes, vice-president of Microsoft's business division and joint chief company mouthpiece, at its IT Forum in Barcelona. 'You pressmen like conspiracies because it gives you something to write about.'

We had pressed him about Microsoft's reaction to certain reservations the EC has expressed about the openness of new XML-based formats to be introduced with Office 12 in 2006. You could understand his irritation. He was detailing the biggest changes mainstream software has seen for at least a decade, monumental in scale, the coding equivalent of building a new city. Yet here he was having to answer questions about the software equivalent of the bricks.

Raikes and other Microsoft executives pushed the message that the company had seen the light on open systems, encouraging moves towards cross-platform interoperability and even embracing Linux (see page 22).

There is much to be said for Microsoft's position. It was perfectly within its rights to draw up its own XML schemas for the new formats and executives argued that it had a hard enough task restructuring its architecture without having to submit the building blocks to a lengthy standards process.

It is also true that the new formats, cheekily called Open XML, are far more accessible to users and rivals alike, not to mention being much better than the old ones: XML carries rich new layers of information that can be exchanged and understood by disparate platforms.

The EC, or rather that tiny part of it concerned with the exchange of documents between nations, wants open formats that can be read by any platform. It says the Microsoft formats are not truly open because they have not been

agreed in an open process by an independent body, and will not be updated and maintained by one. These are not trivial points. If the world is to have a lingua franca for documents it is not going to want one dictated by a single company.

The old Office formats became de facto standards simply because nearly everyone started using them. But they were born before the Internet went mainstream, at a time when cross-platform communication was of concern only to professionals. The EC is not the only organisation asking whether the next-generation standards should be established on a more formal basis.

Raikes compared the status of Open XML to the portable document format (pdf), which is 'open' but controlled by Adobe. But a more telling comparison is with the web page-description language HTML, a global standard set by the W3C organisation.

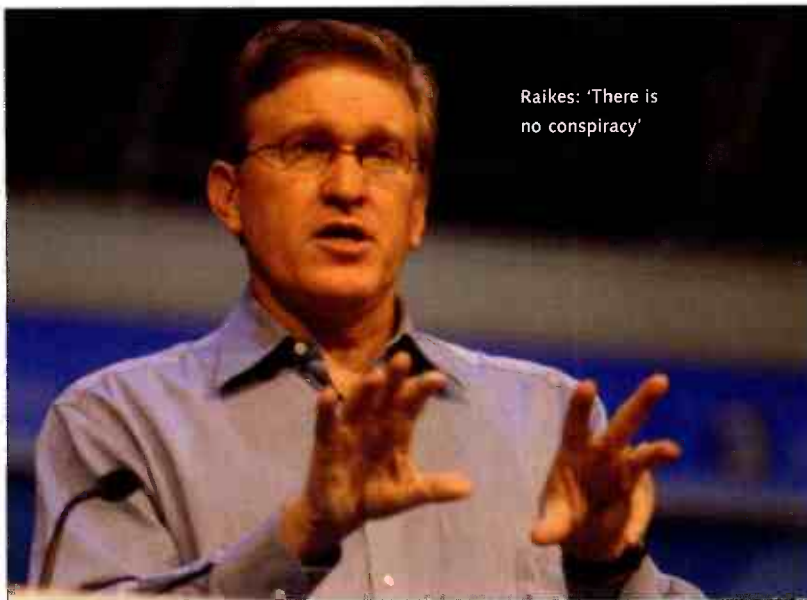
Microsoft has 'embraced and extended' this, and other web technology, to the point where there is a standard layer accessible to any browser, but a lot more that is unique to the Windows environment. This is probably the way a standard document format

would work out, covering general needs but leaving room for a wealth of dialects for different environments and needs. XML is well designed for this.

There is no reason elements of Open XML should not be subsumed into the Open Document specification drawn up by Oasis, an industry consortium whose members bizarrely include Microsoft, which has submitted its Open Document specification for approval by the International Standards Organisation.

Raikes' 'no conspiracy' outburst came when he was asked about a point raised at a recent Oasis forum in London: How can we be sure, given Microsoft's record as exposed in the US Department of Justice anti-trust case, that the company would not use secret XML tags, as it is said to have used secret Windows hooks in the past, to give its own software an edge over rivals? The possibility was cited as one reason for the need for a truly open standard. It was argued that rogue tags would be hard to spot in complex XML documents, which would be fully usable only by a system in the know.

This does not seem a likely scenario, if only because the world



Raikes: 'There is no conspiracy'

has moved on since the days when Microsoft's control of the de facto standard Windows environment helped it kill off rival office applications. Now the company is more interested in nurturing a host of third-party developers that use its software to create custom applications and services.

But the 'secret tags' idea does point up the ambiguous position of a company acting both as player and referee in the standards game, a position that may not even be in Microsoft's interest.

Ovum analyst David Mitchell argued at the

Oasis forum that Microsoft developers will want files that function in any system, not just a Windows environment. Could Microsoft have shot itself in the foot by going too far its own way?

It is tempting to conclude that Raikes will be perversely proved right: that the new formats will turn out to be more cock-up than conspiracy. But this is over the top: if a new standard emerges that is too useful to ignore, Microsoft could accommodate it without difficulty.

Yet Microsoft does seem rattled by the European reaction, as it showed shortly after the IT Forum when it submitted Open XML to the European Computer Manufacturers Association for approval as a standard (see page 14). Mitchell said this showed Microsoft has recognised the benefits 'of a constructive engagement with the wider software community' and would help it compete for contracts requiring open formats.

'It will potentially provide a defence against elements of the industry where there is irrational anti-Microsoft zeal,' he said.

But he added: 'The key issue is over who will have control over the standard, assuming that it is approved and adopted.'

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LETTERS

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★
LETTER OF THE MONTH

Print screen smoke screen

Why haven't computer keyboard manufacturers renamed the 'Print Screen' (PrtScn) key 'Copy Screen'? That is what it does. Calling it 'Print Screen' is still baffling many users, even those who have been using computers for a long time.

A recent incident at a meeting I attended has led me to write this letter. The two people opposite me were chatting before the meeting began and one of them put a photograph of a screen on the table to show his friend the problem he had with his computer, apologising because, as he said, it's difficult to take a good photograph of a screen. When I said

that all he needed to do was press the PrtScn key, he immediately said, quite logically, that he had, but that nothing had happened.

When I told him that it copies the screen and all one has to do is paste the picture into a document or graphics program, he remarked 'I've been using computers for 15 years, but no-one's ever told me that'.
Jean Elliott



Kelvyn Taylor replies: Another candidate for removal/renaming is the SysRq key, which has no practical use on a Windows PC (although it can be used in some Linux systems).

TABBED BROWSING

In your December 2005 edition you advised John Page to wait for Windows Vista and IE7 so he could have tabs in IE. If he wants this now he could download Maxthon (www.maxthon.com), which provides many features found in the other browsers but is really just a wrapper for IE so Active X should still work.

Matt Dale

Kelvyn Taylor replies: Thanks for the tip – also, if you download and install the MSN Toolbar (<http://toolbar.msn.com>), it adds tabbed browsing to IE.

RIP-OFF POST CHARGES

As a resident of Northern Ireland I feel there are a few injustices in the area of IT product delivery that need to be voiced. A few years ago, one was able to order from a variety of online retailers without incurring substantial surcharges. It seems that it is now fair game to add up to £15 extra for a delivery to the Province.

For example, Dabs charges £11.75 for NI delivery; Ebuyer

£15; Savastore £14.95; Novatech £14.10 and Microdirect £15.

This issue was first brought to my attention when I tried to buy a game for the Xbox from Ebuyer, which had been competitively priced at around £20. However, when I proceeded through to the checkout, this almost doubled, given the £15 surcharge to Northern Ireland. Such companies must ask themselves if it is justifiable to charge £15 extra for the postage of a small, light item to another part of the UK.

When you look at Royal Mail's rates, you will find that using Special (next day) Delivery, a 2kg parcel sent from London to Belfast with £500 compensation insurance, costs £6.95 in total – never mind the extra £10-£15 customers are asked to pay. I feel that it surely is profiteering on the part of such companies to charge such exorbitant surcharges. Thankfully, there are still a few places, such as

www.overclockers.co.uk, which maintain one charge for the whole of the UK.

The companies may argue that their delivery agents charge them more for 'overseas' delivery; I too can see the need to pay more for larger and bulkier items. However, I hardly think a PCI card or new processor would fit into such categories and hence would urge such retailers to reconsider their policy on behalf of all who live in 'outlying areas'.
Maurice Hall

NO GAMES CONSOLES

Nice to see all the new games consoles being sent out for Christmas, but I will not be buying any of them – ever. If I buy one I want to be able to buy it anywhere in the world, buy games anywhere in the world and use it anywhere in the world without Microsoft,



Should Sony dictate where you can use your PSP?

✎ Unless otherwise stated, letters sent to the Editor, PCW team or contributors will be considered for publication. Letters may be edited for clarity or length.

Sony or Nintendo telling me what I can and cannot do. Why should I be denied the right to buy and use these machines wherever I want to?

John Kent

PDA MISERY

I recently began investigating an upgrade of my PDA and, having used Palm products in the past, felt that I would have a look at its new Tungsten TX model. While impressed by the specification, and strongly considering a purchase, I thought I should check out the prices. During the course of my investigation I realised that UK Palm customers are paying a 67 per cent premium when compared to US prices. Expanding my search, it seems that everyone in the world pays significantly less than we do in the UK. Why is it that a product manufactured in the same factory costs so much more here? Is it just that manufacturers think in the age of the Internet we won't notice when we are being ripped off?

Stephen McDonald

VISTA ON LAPTOPS

Since reading your article on Windows Vista (PCW, December 2005) there has been one thing troubling me. If the minimum system specs are a 3GHz processor and 512MB of Ram, what is going to happen to ultraportable laptops? Most of these don't have processor speeds of more than 2GHz. So is the new Windows going to be inaccessible to laptop users, or is a different version being released?

Peter Budd

Kelvyn Taylor replies: Our apologies for not explicitly addressing the mobile requirements for Vista. Although Microsoft isn't publishing detailed requirements at this early stage, the documents available indicate that this problem is recognised and ultraportables will be granted some performance exemptions from the Vista logo certification programme.

By the time Vista appears, dual-core CPUs for ultraportables should

Trilateration determines your position when using sat nav systems

have arrived, which even if they don't have the nominal core speeds will still be perfectly happy running Vista. Current top-of-the-range single-core mobile processors should still be able to run Vista, as despite their lower core speeds they use other tricks such as larger cache memory to bring performance in line with faster-clocked desktop CPUs.

Vista will incorporate some clever built-in automatic benchmarking functionality (called Winsat) that applications can use to enable or disable performance-sensitive features depending on what the Winsat results are.

STITCH UP THE DUST

I read with interest Charles Moon's problem with dust (Letters, January 2006). We have two servers and five PCs in our workshop, and all suffer from dust ingress. We have taped up the case joints with duct tape and covered the front and back with the quilted fabric used in soft furnishings. You can buy this from fabric shops by the meter for peanuts. Cut to shape and taped down, it makes a very good filter – once it's dirty it is disposed of.

We have used this for the past three or four years and our PCs have never been so clean inside.

Dave Middleton

TRILATERATIONS

Your article on satellite navigation (PCW January 2006) was interesting. I have been using Tom-Tom Mobile with my Nokia 6680 phone for a while now. I have it mounted exactly between the two dials in my car where it doesn't obstruct the window and is in line with my view.

I have built a Bluetooth GPS receiver into the dashboard, it sits under the plastic, and comes on with the ignition so that it cannot be seen. I always take my phone with me, so that aids the security and the fiddling with things that stops people using such a system after a while.

However, I'm probably not the first to point this one out, but the



process of determining your position with satellites is trilateration. It differs from triangulation because, as you correctly point out, you know only the distance and not the direction of the satellite.

Triangulation works by knowing where the lines cross and to do that you need the direction.

I have built a Local Positioning System, which is very similar and works using sound for indoor positioning. We use this to help determine where people are for wearable computing, crime scene stuff and so on.

James Ross

Kelvyn Taylor replies: You're absolutely correct about trilateration – my only defence is that it's been a long time since I was a surveyor!

A REBUTTAL

I've been reading PCW on and off since the early 1980s when I used to type out all the ace program listings and convert them into 97 different varieties of Basic. But not all has been right with me of late.

I hate mobile phones, although the brick I carried around in the mid-1980s was kind of cool and ensured the car was waiting at the station when I arrived home. I've never been enamoured with photography, although I have a digital camera because it's better than waiting for prints. I hate mp3 players, although I've been ripping and cutting mp3s to CD-Rs for half a decade and still think it's cleverer than these overpriced fashion accessories.

PDAs are an abomination whose only function is to make business people look important.

Printers are just plain dull. I don't need to read group tests. Games are best left to game consoles (the clue is in the name). I abhor all the shenanigans involved in trying to get a PC to be a lounge accessory, and don't even get me started on all the tarring up of PC cases that aren't even destined for the lounge.

All of which has left me wondering why I continue to read the magazine.

Well, PCW January 2006 was another reminder why. What a superb article 'Windows Hacking' was. I played around for hours with all the software and articles that you pointed me to on the web which took me happily back to my ZX-81 days. You continue to deal those pocket aces that prevent me from folding. 'Windows Secrets' (June 2005) was another one in recent memory.

I guess I'll just have to put up with the monthly tech-fest in anticipation of those gems.

David Beare



This powerful image-editing package has an intuitive interface making it suitable for beginners but, thanks to the huge range of tools available, it will also keep advanced users happy. You can fix flaws such as red-eye as well as perspective and other settings. The package also includes Corel Photo Album to import and sort photos direct from your digital camera. For more information on Paint Shop Pro X, go to www.corel.co.uk.

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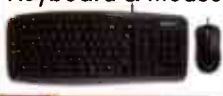
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THE ADVISER

COVER YOURSELF

- Keep good records; store all receipts in one safe place as proof of purchase is vital.
- Create a folder in your email client to store emailed receipts – and print a copy. Print spec sheets from websites as proof of an order.
- Get written quotes specifying components used.
- Use a credit card for purchases of £100 or more – credit card companies are liable if the vendor goes out of business.
- Do not try to repair faults – this invalidates your rights in the majority of cases.
- Think before buying expensive hardware outside the EU, because if something goes wrong, enforcing your rights is difficult. Shipping faulty kit back will be costly.
- Never cancel a direct debit or standing order as a means to resolve a dispute over payments or service. You may get a poor credit rating and face court action.

HOW TO COMPLAIN

- Keep records of who you speak to, along with any paperwork and emails.
- Stay calm – companies will respond defensively to abuse and shouting, regardless of whether you are in the right.
- If the dispute reaches an impasse, insist on escalating the complaint. Get a director's name and send correspondence by recorded delivery.

CREATOR BLUES

Following your favourable review, I bought a copy of **Roxio Easy Media Creator Suite 8**.

After installation it immediately blue-screened my Windows XP Professional PC. Fortunately I managed to recover by reverting to the last good configuration and tried a new installation, switching off my anti-spam and pop-up stopper applications and my anti-virus application and firewall. The result was another blue screen.

On the bulletin board at Roxio's website I discovered several threads containing complaints about the product that were similar to my experience. When I tried to call Roxio, the telephone directory service told me the number was ex-directory.

Paul Davis

Mr Davis also registered a complaint with the retailer that sold the product in the first place. To its credit, a full unconditional refund was offered. Meanwhile, The Adviser team contacted Roxio. After speaking directly to Mr Davis, the company said he had visited the US version of Roxio's website, where a number of complaints had been made about an early release of Creator 8, which had been patched before going on sale in the UK.

Roxio offered to arrange a telephone support call to guide Mr Davis through the installation. However, he decided to cut his losses, accept the refund and continue using the older version of Creator already on his PC for the time being.

It's a shame we couldn't get to the bottom of what caused the

PCW GIVES ADVICE ON YOUR RIGHTS

→ Send details of your dispute to theadviser@pcw.co.uk. Please provide a daytime telephone number so we can contact you if necessary.

fault, as a blue screen is not a trifling matter, but we should point out that this is the only complaint of such a serious nature PCW has received about the product.

As for that ex-directory number, it belongs to Roxio's marketing division – not much use to consumers in any event.

The contact details for support issues are available on the website at www.roxio.com/en/support/uk/contact. There is also an interactive online help feature.

promised it would review the situation.

Two months later, Mr Buckley told us the situation had improved, although he was a little frustrated that Demon still refused to acknowledge there had ever been a problem.

He contacted a local Trading Standards officer who advised him to write to the company asking for a response. Four weeks after posting the letter, none has been forthcoming.

Obtaining compensation from ISPs for loss of or intermittent services, let alone insufficient

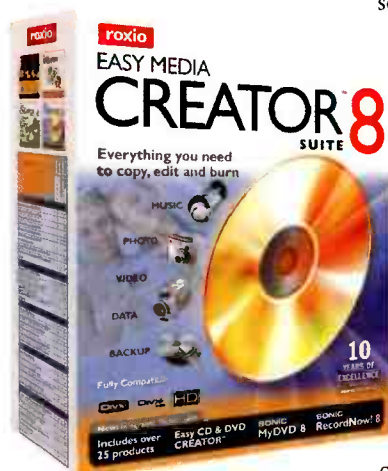
bandwidth, is difficult to achieve. The broadband contracts offered by all ISPs contain terms and conditions that permit them to continue charging for the service when faults or other problems arise.

The legal question is how long they can reasonably continue to do so before the service falls foul of the Supply of Goods and Services Act, which obliges suppliers to provide a reasonable level of care and skill.

If companies bleat that you agreed to terms that entitle them to charge you for a service of a lower quality than expected, then they can be in breach of the Unfair Terms in Consumer Contracts Regulations. It's worth mentioning this during your correspondence with companies.

Complaints are often complicated when an ISP delivers a service through BT's wholesale service, as the cause of the fault (if there is one) can be difficult to pinpoint. That doesn't affect your rights, though. Your contract is with the company that accepts payment from you, not its own suppliers.

If, like Mr Buckley, you find that a supplier continues to trot



DEMON CASE UPDATE

In the December issue of PCW, The Adviser team looked into some contentious issues apparently affecting some users of Demon's home broadband service. The service was advertised as providing up to 2Mbps/sec, which, as seasoned broadband users will know, is not a guarantee that customers will receive that level of bandwidth at all times.

A group of PCW readers, including Oliver Buckley, were getting significantly less than that so we spoke to Demon and the ISP said that rising contention issues were to blame as broadband grew in popularity. The company

out the company policy line or fails to respond to letters, contact one of the two trade bodies that ISPs are obliged to sign up to: Cisas (www.arbitrators.org/cisas/how_Apply.asp) or Otelo (www.otelo.org.uk). Both list member organisations on their sites, although ISPs may be listed under the name of the parent company. In Demon's case, this is Thus PLC and it is a member of Otelo.

Both organisations expect consumers and small businesses to have exhausted the complaints procedure with the company in question before they will intervene.

DELL CASE UPDATE

John Matchett wrote to us last month to complain that Dell had failed to supply the engineer visit he had paid extra for when buying a top-end PC to link it to his home network.

Meanwhile, other problems arose with the PC's soundcard. Following our intervention, Dell is now on the case, although things are not proceeding smoothly.

With the visit arranged, Mr Matchett stayed at home only to be called and told the engineer had got lost. Rather than call for directions, it seems the engineer simply attended another job.

Dell apologised and arranged another appointment but Mr Matchett was unable to be there in person. The card was replaced and Mr Matchett's wife signed a form to say the job had been done, although the engineer did not demonstrate it had been fixed. Mr Matchett said the problem remains, and Dell has arranged yet another visit.

CONTACT THE ADVISER

If you're involved in a serious dispute with a seller, send us a brief description of your complaint, name the company involved and provide an order number or other information that we can use to identify your order with the company. We cannot guarantee to resolve your dispute but we will try. We obviously cannot take on every case, but the answers we give should help readers to resolve their own disputes.

You can also get advice from Consumer Direct, a DTI-backed agency, at www.consumerdirect.gov.uk.

Views on refurbishment

Last December I purchased a Viewsonic VP171 LCD monitor, which failed in October 2005. When I called Viewsonic, the support engineer said a replacement was not immediately available, and that she would call back. I don't have a spare monitor to use in the meantime, so suggested I was even willing to pay a small amount to receive a slightly different model in working order.

Viewsonic later called to say a replacement was on its way, but when it arrived the base was damaged and the colour display was far below the quality of my original model. I called to complain and was told that no replacement model was available, so I would have to wait.

Peter Rawbone

Viewsonic offers a three-year on-site replacement guarantee, which entitles the owner of a faulty monitor to a replacement within that period. What is not always understood is that companies are obliged only to provide a like-for-like replacement, meaning that it need be only as good as the original model. What this translates into for buyers is that companies often supply refurbished displays – those repaired



after being returned. This is all very good and quite within the law, but only providing the refurbished monitor has been properly fixed and tested.

In this case, it would seem Viewsonic's testing fell short, and after a call from the Adviser team Mr Rawbone received fulsome apologies by telephone and the promise of a brand new monitor as compensation.

Mr Rawbone seemed quite happy with that, although questioned whether the newly supplied monitor should also have a three-year guarantee. When he asked, Viewsonic said the new display would be guaranteed only for the remainder of the original guarantee. As the company has already exceeded the bounds of the original guarantee this is quite legal, although we think it wouldn't have hurt Viewsonic to extend the warranty by a year. The upside is that Mr Rawbone has been given a brand new and updated model, so now has a better display than he did last year.

KNOW YOUR RIGHTS

- In England and Wales, the retailer must prove that faults found within six months of purchase are not inherent.
- Consumers should not suffer financial loss in order to repair a faulty item, so postage and courier fees should be claimed back if the fault is inherent.
- Companies are not obliged to repair goods damaged by accident or misuse.
- The contract of sale is between the buyer and the company that accepted your money. It can be quicker to deal direct with manufacturers, but do not let resellers bully you into this.
- Goods ordered online, by post or phone can be returned within a reasonable time under the Distance Selling Regulations. This is widely accepted as being seven days.
- Companies cannot charge for services they fail to deliver, regardless of any contract you have signed – the contract goes both ways.
- Benefits provided under extended warranties are an addition to your statutory rights, so buying one does not invalidate your consumer rights under legislation.
- Online auction sellers are only obliged to ensure goods are described accurately. However, individuals selling more than one of an item, and those listed as power sellers, may be classed as businesses rather than individuals.
- For more detailed information on consumer law in England and Wales, visit www.oft.gov.uk/consumer. In Scotland, visit www.scotscourt.gov.uk.



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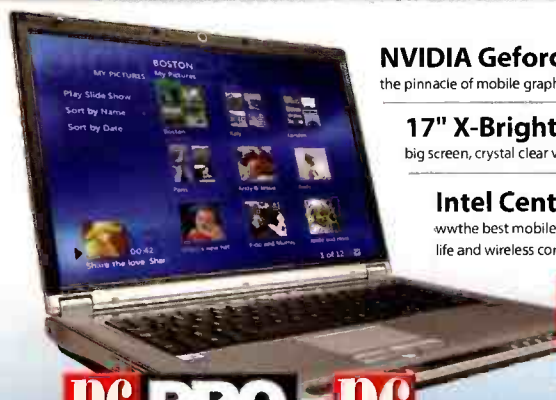


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Gordon Laing



gordonl@pcw.co.uk

Streaming ahead of the game

Microsoft's Xbox 360 has been keenly awaited by enthusiasts; but, as Gordon Laing explains, they are not necessarily gamers

By the time you read this, the Xbox 360 will be in the shops and a dedicated band of enthusiasts will either be delighted or dejected. I'm not talking about the gamers, though: I'm referring to the people who intend to use it for streaming media.

The promise of streaming media in the home has always fascinated me. I love the idea of having a computer with stacks of storage hidden away, packed with my entire digital music, movie and photo collections, and serving them out to screens and loudspeakers throughout my home.

Over the years since the concept was first discussed, the storage and networking requirements to make it a reality have fallen from the esoteric to almost pedestrian. But while the storage and transport technology is ready and willing, the streaming appliances that connect to

streaming existing content, it allows you to watch live TV using the tuners in your MCE PC, along with viewing the electronic programming guide (EPG) and scheduling recordings.

The reality of streaming live TV may not be that practical, since most MCE PCs only have two tuners, and there's a chance one or even both could already be occupied with a recording. But it's still a neat feature, and the ability to schedule new recordings using the guide is most welcome.

Microsoft promises the MCX aspect of the Xbox 360 will work pretty much straight out of the box with existing MCE 2005 systems. The only requirement for the MCE PC is that it must be running the latest Rollup 2 patch, available free via Windows Update. Read the update instructions carefully, as it can clash with an existing .Net update, and demands a second patch to be applied immediately afterwards.

Whether the Xbox 360 will be compelling as a main lounge system depends on how quickly it starts and quietly it runs. The good news is that the console can reduce the speed or number of cooling fans when running MCX, but it remains to be seen (or rather heard) how effective this is.

One advantage over connecting your PC directly to the TV is the console's ability to generate a high-quality RGB Scart signal. This has plagued media PC owners for years, who either put up with inferior video connections or get busy with a soldering iron and graphics timings.

The big worry, though, is compatibility. The Xbox 360 will stream MCE TV recordings, a handful of HD formats and also hopefully wma lossless, but what about DivX files or personal collections of DVD movies ripped to hard disks? How well the Xbox 360 integrates with these and third-party plug-ins for MCE will greatly influence its success within the media PC community.

I'm no games expert so can't comment on how the Xbox 360 will compare to its upcoming rivals – and it must be said that the Sony PS3 also promises impressive video capabilities. But if you own a Windows XP Media Center 2005 PC, the Xbox 360 promises to be a highly tempting streaming option. So long as it's sufficiently compatible and not too noisy, it will sell to people who never intend to play a single game on it. **PCW**

'It can act as a streaming appliance and scheduler for Windows MCE 2005 PCs'

our screens and speakers have so far had a bumpy ride. The main problem has been compatibility with specific media formats. For example, while most will happily decode basic mp3 music files, few if any will play lossless or protected wma files.

While this is a licensing issue, we shouldn't have to be involved in the politics. A streaming appliance should simply play all the common formats people spend months encoding their collections into. But even if you could decode them all, is streaming alone enough? With many PCs now used to record shows as they're broadcast, some means by which the streaming appliance could control the process would be welcomed – especially if the media PC is located in a basement or garage.

This is the promise of the Xbox 360, which can act as a streaming appliance and scheduler for Windows Media Center Edition (MCE) 2005 PCs. The Media Center Extender (MCX) concept was seen on the original Xbox but was only available in the US. There were unofficial and rather good free alternatives, but they needed a modified console.

With the Xbox 360, the MCX software may still require an MCE PC, but at least the software comes built into every console. As well as

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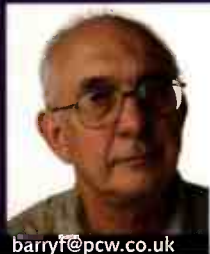
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Barry Fox



barryf@pcw.co.uk

Forget technology – it's money that talks

Hotels and various other venues seem determined to prevent any mobile communication that doesn't make them profits, warns Barry Fox

It's well nigh impossible now to buy a laptop without a built-in modem, RJ11 phone socket, Wifi card and RJ45 Ethernet port. In the US, motel signs proudly advertise 'Internet Access'.

We've come a long way since BT's bullying made Tandy Radio Shack disable the internal modem in the years-ahead-of-its-time laptop, the TRS 100. It's many years since I had to carry a screwdriver and crocodile clips to pull hotel phones and wall sockets apart and try and hook into the hot wires, or use a 300bits/sec acoustic coupler to send email from a rotary dial phone.

Most international airports have Wifi hotspots in the departure lounge. Kodak is now selling a digital camera with built-in Wifi. It automatically handshakes with the nearest hotspot, sends pictures by email and stores them in an online archive so that the camera memory can be wiped

'Hotels' arm-and-a-leg telephone revenue has disappeared as guests use cellphones'

and re-used. Kodak's bright idea could start a whole new product trend.

But Kodak is having to herd cats to get hotspot operators to co-operate with automated logon. Heathrow's BT Openzone hotspots have been taken over by T-Mobile and by the time a traveller has worked out how to buy an hour's airport access, or use an Openzone card or account, the flight is ready to leave.

Hotels whose arm-and-a-leg telephone revenue has disappeared as guests use cellphones see controlled Internet access as the new way to screw customers. 3G cellphones may mysteriously fail to get a signal, thanks to metallised windows.

The conference venues that host high-tech events are often still in the dark ages of IT. At the last IFA international consumer electronics show in Berlin, the press room was charging journalists high-profit prices for Wifi access. There were two dozen computers on which reporters could write stories and get on the Internet for free. But every one had a German keyboard, with a seriously different Qwerty and punctuation layout.

If I provided any English/American keyboards I would also have to provide Chinese and Russian

ones', said the large German IT manager who rules the roost.

IFA is now going annual, which may finally kill computer show Cebit. Watch out IT industry, you have been warned.

The Javits Centre in the New York boondocks recently hosted the Audio Engineering Society Convention. The press room had one laptop with Wifi access and for a lot of the time the Wifi did not work. The press room staff were calling the Javits IT staff and getting voicemail.

Soon afterwards I was at the Sofitel hotel in Paris for the DVD Forum Convention on high-definition DVD (HD-DVD). Nearly 200 top tech brass flew in from around the world. The first thing they wanted to do was check email. The room phones had non-standard wall sockets and no RJ11 dataports. Some rooms had an Orange France Wifi signal, some didn't. The Orange system refused to accept credit card payment and offered to send access codes by email, which cannot be received without an access code. The Help hyperlink did not link to anything.

Orange France claimed to accept other Wifi service scratch codes but didn't. On the Sunday night the lobby was full of tired travellers hunting for a signal. I bought the lobby's last two-hour scratch card for €10 (£6.84). I then had to decode the access by trial and error because the card used identical-looking zeroes, letter Os, ones and Ls.

The next day delegates were in the business centre paying €1 (68p) for three minutes' Internet access. So victory for the hotel.

The most worrying pointer to what we can expect came from the new Marriott Marquis hotel on Broadway in New York. It offers DSL for \$13 (£7.60) a day but I only wanted a quick email check. The room phone had a dataport. Dialling 9 for an outside line to an ISP worked from the phone keypad, but not directly from the port.

I beat the system with an RJ11 line coupler to connect the room line directly to the laptop. The same trick may work with an adapter that connects the modem to the handset cord.

But please beware. If the hotel phone system is all-digital, there may be high voltage on the wires that fries a laptop modem. And that would make a hotel manager's day. PCW

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Acer recommends Windows® XP Professional.

December/January 2005

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Guy Kewney



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When a PC becomes un-PC

We take for granted the fascination with new technology, but Guy Kewney is reminded that, like all crazes, it may pass

It was my pet theory (I hate to give up pet theories) that mp3 players have to be big. We're talking disk size here. My theory is that they have to be at least three times the capacity required to store every song you own.

When I explained this, a well-informed ethologist raised a question: 'What if listening to music in public became shameful?'

It turns out to be a question that isn't as easy to answer as you might think. But it inspired several other questions, all rather worrying.

The problem is (and I hate to be the one to break this to you), some PC users have started using their machines for entertainment rather than work. And I don't just mean games. I mean music, glamour pictures and even dodgy videos.

Now you've recovered from the shock of this revelation, let's ask: where do you imagine these degenerates go to indulge their private weirdness?

'In a decade, will we still care if we have PCs? Phones? Battery-operated robot pets?'

The answer is that it depends where you live. In American and European households, the privacy of the 'home office' or 'den' is where these unmentionable acts occur, but in Asia, where the family computer tends to be in the family living room, that would be gross bad manners. And so, if you go into an Internet café in Cambodia or Vietnam, you will have to be mentally prepared to be regarded as a bit of an oddball if you're doing email; everybody else will be downloading porn. That's where you do it – it would be unthinkable to do it anywhere else.

Now suppose manners change. Suppose that some time in the next five or 10 years it becomes the mark of the yob to let your phone ring in public and answer it. Or suppose game playing becomes the social equivalent of picking your nose; or that having an email account is taken as a sign of depravity. Just suppose, however unlikely you may feel it is today, that owning a camera phone is enough to get you arrested for suspected voyeurism, or worse.

I was asked this in all seriousness, because the ethologist I was discussing it with had come back

from a group trip to the Far East, where they discerned a serious social change occurring. Two things became apparent: first, the kids on Hong Kong streets and underground railways were no longer carrying Ipods. Instead of carrying an mp3 player and a mobile phone, they'd switched to a single unit – and apparently, the toy that has made this switch possible is the Sony Ericsson Walkman branded phone, which doubles as an mp3 player.

Second, in Japan, people do not make or receive phone calls in public. What you do is ask your friends to text you, and when the phone vibrates to let you know they want to call, you make your excuses and head into a private area.

For the past 30 years or so, computing pioneers have enjoyed doing novel and original things with their PCs, always feeling pretty sure that what was weird and esoteric today would be what everybody else was doing tomorrow. And the general computer user has indeed caught up with word processing, spreadsheets, presentation graphics and web chat, and is now expected to get blogging, to start contributing to social Wikis, folksonomy, tagging and, next, picture blogging. But what happens if the world decides not to?

It comes down to this: there are some things everybody does, in every age. We dress, not just to keep warm, but to impress. We sing, not just to be heard, but to join communities, and we support football teams for much the same reason. We maintain group links, we meet and talk. We don't just eat; we cook.

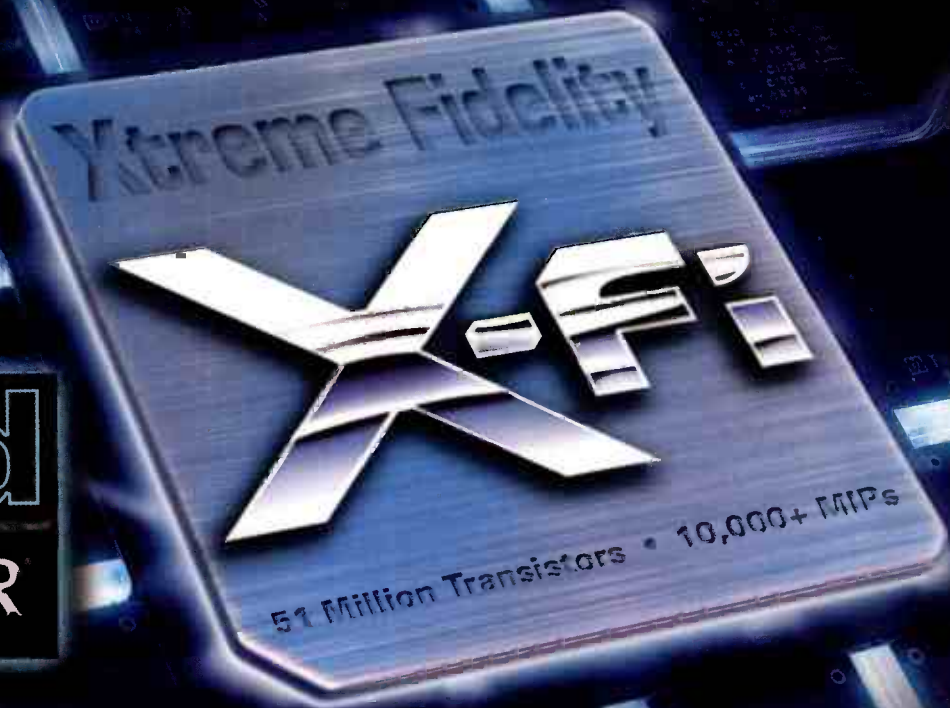
But we also do things simply because they are fads. Today's fad is gadgets. Is electronic gadget worship something that will be forgotten when the Olympics come to London – something as quaint and specialised as collecting chrome-plated toys to bolt on to your Vespa scooter?

I can remember when electric motors were cool – the early days of Black and Decker. Today, they aren't: flat-screen displays are cool, instead.

In a decade, will we still care if we have PCs? Phones? Battery-operated robot pets? These may not be silly questions. They may hold the key to where technology goes and, if it becomes unfashionable to buy batteries for a new toy, what on earth will the high-street shops be selling? **PCW**

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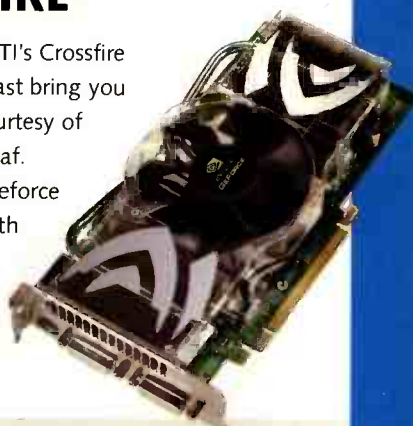


CAUGHT IN THE CROSSFIRE

Over the past few issues we've been talking about ATI's Crossfire technology (the rival to Nvidia's SLI) and we can at last bring you a review of a fully fledged two-card Crossfire PC, courtesy of Mesh. Can it match up to SLI? Has ATI left it too late? Find out overleaf.

Not to be outdone, Nvidia has released the 512MB version of its Geforce 7800 GTX graphics card. There's a full review on page 62, plus in-depth performance results at www.reportlabs.com.

If desktop PCs are just too cumbersome, read our group test of desktop replacement notebooks. You can't upgrade them as easily, but notebooks are more than a match for their desktop counterparts.



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OUR SCORING

Excellent ★★★★★ Very good ★★★★☆ Good ★★★☆☆ Below average ★★☆☆☆ Poor ★☆☆☆☆

OUR AWARDS

Editor's Choice: The best product in a comparative group test. Anything that wins this award is of better quality than its competitors.

Recommended: A product that combines great features, usability and value for money.

Great Value: Not the best in class, but a product that has superior features and performance for the price.

The business awards are used for products that are more suited to home offices or small businesses.



Editor's Choice



Recommended



Great Value



Editor's Choice
Business



Recommended
Business



Great Value
Business

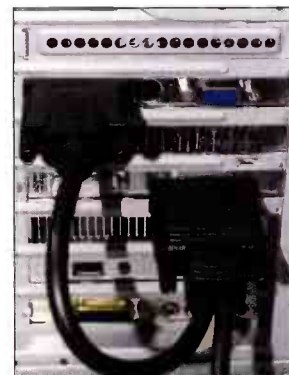


'The fastest laptops now rival their desktop counterparts for speed and can handle any application'
Read the group test, page 71

CROSSFIRE PC

Mesh Xtreme Fire

ATI's dual-graphics system is finally available – find out how it compares to Nvidia's SLI



The two Crossfire cards are linked externally

Finally, after more than a few delays, we have our hands on a fully working Crossfire PC in the form of Mesh's Xtreme Fire.

Crossfire is a dual-graphics system from ATI set to compete with Nvidia's already established SLI (Scalable Link Interface) technology. There are, however, some differences between the two. Dual graphics technology works by the two cards sharing the job of rendering images. SLI uses two different rendering methods – Alternate Frame Rendering (AFR) and Split Frame Rendering (SFR). In basic terms, the former means the two cards take turns in rendering a frame, whereas the latter splits the screen in two, with each card rendering the frames for its designated section.

Crossfire can use four different rendering methods. Along with AFR and a slightly different style of SFR, it also has Supertile at its disposal. The problem with SFR is it takes time to calculate the workload for each frame and split it evenly between the two cards. If you simply split the screen horizontally along the middle, the card responsible for the lower section might have to render characters, grass, bushes and trees, while the other card simply has to render a blue sky. Supertile avoids this by splitting the screen into 32 x 32 pixel-sized tiles and dividing odd and even tiles between the two cards. With the majority of objects larger than each tile, both cards will have roughly the same amount of work, negating the need for workload calculations.

The final rendering method is SuperAA (Super Anti-Aliasing). With single-card systems limited to 6x AA, ATI uses two-card Crossfire systems to achieve 14x AA.

Crossfire is physically different to SLI. Whereas SLI uses a small bridge to link two identical cards, Crossfire requires one to be a special Crossfire Edition. There are

two Crossfire Edition models available at the moment – the X800 and X850, which work with the X800/Pro/XL/GTO/XT and X850 Pro/XT respectively. The two cards are then linked externally via a DVI cable (see photo above right).

In the Xtreme Fire, Mesh supplies a 256MB Radeon X850XT along with a X850 Crossfire Edition. With such powerful graphics, you're going to need a pretty solid set of components to back it up. Mesh has opted for AMD's fastest dual-core Athlon X2 processor, the 4800+, and paired it with two 512MB sticks of PC3200 Ram.

In our tests, the Xtreme Fire achieved 9,641 in 3Dmark05 at 1,024 x 768. This is roughly the same as SLI systems we've previously seen with two 6800 Ultras (Nvidia's competitor to the X850). You can find more in-depth test results at www.reportlabs.com.

You start to see the full benefit of a dual graphics card setup such as this when you're running at high resolutions. Since most 19in monitors have a native resolution of 1,280 x 1,024, a 20in monitor is definitely required. Mesh ships the Xtreme Fire with a 20in Philips 200S4SS, which performs admirably.

Mesh has done a good job with the rest of the system. A 400GB hard drive provides ample storage space, while a dual-layer DVD burner complements a DVD combo drive. Software includes Microsoft Works 8.5 and a variety of Cyberlink multimedia titles.

Mesh has built a decent system around ATI's Crossfire technology while keeping the price down. What we really want to see is a system housing two of ATI's top-spec graphics card – the Radeon X1800XT. If the rumours are to be believed, X1800XT Master Cards should be available by the time you read this. Keep your eyes peeled for a review next issue. *Will Stapley*

Performance

PCmark 2005 **5,329**3Dmark05* **9,641**

* Tested at 1,024 x 768 in 32bit colour

Details

Price £1,878**Best price** www.pcw.co.uk/bestprices
Contact Mesh 0870 046 4747
www.meshcomputers.com

Specifications AMD Athlon X2 4800+ • 1GB PC 3200 • ATI Radeon X850 Crossfire Edition • ATI Radeon X850XT • 20in Philips TFT • 400GB hard drive • Dual-layer DVD writer • DVD combo • Logitech keyboard and mouse • Windows XP Home • Three-year on-site warranty

Verdict

Pros Good value; fast graphics
Cons Currently no Crossfire support for X1800XT

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall Mesh has built a decent system around ATI's Crossfire at a good price

★★★★★

CROSSFIRE PC

Evesham Blaze X850

It supports ATI's dual-graphics technology, but does that justify its price?



If you like the sound of ATI's Crossfire technology but want to do things one step at a time, you could opt for a Crossfire-ready system such as this effort from Evesham.

We've burrowed into the inner-workings of Crossfire in greater depth in our review of the Mesh Xtreme Fire (see page 46) but, suffice to say, it's ATI's retort to Nvidia's SLI technology.

With the Blaze X850, Evesham has plumped for an AMD X2 4200+ dual-core processor and 1GB of DDR PC3200 Ram. There are two free slots to increase

memory but, as supplied, the Blaze X850 achieved 5,112 in PCmark05 and a middling 213 in Sysmark 2004 SE. These scores indicate the Blaze X850 will be a capable, if not outstanding, performer in Windows when using most software applications.

Where it does slide, though, is with graphics. It may be Crossfire-compatible, but only one ATI X850 Pro 256MB card is included. Our 3Dmark05 benchmark tipped the Blaze X850 at 5,264, which will be fine for playing most games at respectable resolution, detail and anti-aliasing settings. To really benefit from this PC's capability, though, you'll need an X850 Crossfire Edition card, which will set you back around £260.

Other than that, it's a very standard PC. The Soundblaster X-Fi Xtreme soundcard and Viewsonic VX912 19in TFT impressed us, but everything else is run of the mill; 250GB hard disk, dual-format DVD writer, and the usual range of ports and sockets on front and back.

There's no TV-tuner but you do get Creative I-Trigue 2.1 3200 speakers, a Logitech Black Internet Pro Cordless Desktop, Microsoft Works 8, Roxio Easy Media Creator 7 and Bullguard Internet Security.

However, at a hefty £1,299, we think you can get much more for your money.

Luke Peters

Performance

Sysmark 2004 SE: 213



3Dmark05* 5,264



*Tested at 1,024 x 768 in 32bit colour

Details

Price £1,299

Best price www.pcw.co.uk/bestprices

Contact Evesham 0870 160 9500

www.evesham.com

Specifications Athlon X2 4200+ • 1GB PC3200 Ram • ATI Radeon X850 Pro • 19in Viewsonic VX912 • 250GB hard drive • Dual-layer DVD writer • DVD combo • Logitech keyboard and mouse • Windows XP Home

Verdict

Pros Crossfire ready; good monitor

Cons Expensive for what it is

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall It may have half an eye on the future, but it's an average PC at an above-average price

★★★★★

ENTHUSIAST PC

Vadim Fusion CS

A dream machine that only a lucky few will be able to make reality



A new name to us, Vadim Computers shows a commendable attention to detail when it comes to building a system. From an enthusiast's point of view, Vadim is a dream come true since every component, from the case right down to cable management, can be configured online.

The Fusion CS comes with an AMD X2 4800+ (2.4GHz) dual-core processor, overclocked to 2.6GHz. This sits on an Asus A8N-SLI Premium motherboard with 2GB of Corsair XMS C2PT DDR400 memory. It's a decent base for a powerful PC and resulted in a Sysmark 2004 SE score of 257 – one of the highest we've ever seen.

Also overclocked is a pair of MSI Geforce 7800 GTX graphics cards in SLI configuration. These run

at 480MHz/1.3GHz core/memory instead of the normal 430MHz/1.2GHz. If this sounds like too much overclocking, you can save yourself £100 and opt for the standard speed processor and graphics cards.

Another reason for the fast performance is the choice of storage, namely a pair 36GB Western Digital Raptor drives configured in a Raid 0 array. For general data storage, a 500GB Seagate drive is included.

All the overclocking requires a serious amount of both power and cooling. Once again, Vadim has opted for top-notch components – an Enermax Noisetaker AX PSU, Coolermaster Hyper 6 CPU cooler and Vadim's own Antarctic cooling option, which consists of a series of digitally controlled fans. The advantage of using such products becomes obvious when you hear just how little noise the system is making – despite housing no fewer than seven fans, it is very, very quiet.

Other features include the 20in NEC monitor, which lets you make the most of the two 7800 GTXs.

There's no denying it's ridiculously expensive, but if you want top performance and the best components, you're going to have to spend this sort of money.

Simon Crisp

Performance

Sysmark 2004 SE: 257



3Dmark05* 13,010



*Tested at 1,024 x 768 in 32bit colour

Details

Price £4,337.28

Best price www.pcw.co.uk/bestprices

Contact Vadim www.vadim.co.uk

Specifications AMD Athlon X2 4800+ 2.4GHz (2.6GHz) • 2GB PC3200 • 2 MSI Geforce 7800GTX • 20.1in NEC TFT • 2 36GB Sata 10,000rpm • 500GB Sata2 7,200rpm • 16 dual-layer DVD • 600w PSU • Logitech Dinovo keyboard • Windows XP Pro 64bit • 1yr C&R warranty

Verdict

Pros Build quality; components

Cons Price

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Only a few can dream of buying this machine, but it goes like a rocket

★★★★★



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PROSUMER DIGITAL CAMERA

Fujifilm Finepix S9500 Zoom

SLR-style camera with a 9megapixel sensor



The Finepix S9500 Zoom looks and feels like a digital SLR, but has many features of a high-end digital compact camera. With sales of digital SLRs increasing, it might seem odd for Fujifilm to release a camera such as the S9500. It has no through-the-lens viewfinder and doesn't support interchangeable lenses, yet it's only very slightly smaller than Nikon's popular D50 digital SLR.

The images it produces, however, are far from tiny. With an effective 9megapixel sensor the S9500 Zoom

has one of the highest pixel resolutions available in this price bracket. We were very impressed with the image quality, which under good lighting conditions was comparable to budget SLR performance.

While SLR purists will take some convincing, the use of an LCD viewfinder and tilting screen allows shooting from trickier angles and makes features such as video recording and a live histogram possible.

Although the lens is fixed to the camera, it offers a 10x optical zoom. You also get a manual zoom control and focus rings. Video can be recorded at 30fps (frames per second) in VGA (640 x 480) resolution and is streamed to either XD Picture Card or Compact Flash.

As a hybrid product, the S9500 Zoom has to appeal not only to potential purchasers of digital SLRs, but also to those who are looking at high-end compact models. The software is more suited to the latter. Features such as automatic downloading of images from the camera and basic image enhancement are undoubtedly useful, but any manipulation of raw images is omitted. Even basic adjustment features are not available in raw mode.

Excellent image quality and SLR-like handling means the S9500 Zoom will be attractive to those who want advanced features, but don't want to spend money on a full SLR kit.

Paul Monckton

Details

Price £469.99

Best price www.pcw.co.uk/bestprices

Contact Fujifilm 0870 084 1310

www.fujifilm.co.uk

Specifications 1/1.6in CCD • 9megapixels (3,488 x 2,616) • 10.7x optical zoom, 28-300mm (35mm equivalent) • 640 x 480 movie mode (30fps) • 1.8in LCD monitor • XD Picture Card and Compact Flash (16MB XD included) • 128 x 129 x 93mm (w x d x h) • 645g

Verdict

Pros SLR feel; great image quality

Cons Poor raw support; fixed lens

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall A serious alternative to entry-level digital SLRs

★★★★★

DIGITAL CAMCORDER

Canon DC20

A versatile device that can record, edit and burn to DVD



Canon's DC20 makes capturing and editing video easy, with or without a PC. By recording directly to 8cm DVDs, your footage can be played back immediately in a domestic DVD player or computer. It also doubles as a 2megapixel digital camera with flash and a full selection of shooting modes.

The DVD format offers many advantages over tape. You don't have to fast-forward or rewind, nor do you need to worry about accidentally recording over footage. You can also manipulate and edit your data

without time-consuming and laborious transfers from tape to PC.

Although compact and convenient to use, the DC20 has a vast array of functions, allowing you to organise and edit video clips, with video effects, basic titling and chromakeying. You can then remove the disc from the camera and play it back in your DVD player. The supplied Roxio MyDVD LE software provides extra DVD authoring capabilities on a PC.

With the included write-once media, the disc must be finalised before it can be read in a PC or DVD player. This takes about 10 minutes and, once performed, prohibits further recording on the disc. To realise the full power of the DC20 you'll need to buy DVD-RW discs, which cost about £8 each.

Although the range of features is impressive, we were a little disappointed with the image quality. Indoor shots showed considerable digital noise in both still and video modes, while compression artefacts were clearly evident during outdoor shoots. The supplied battery pack will only last for about 35 minutes of recording and takes two and a half hours to charge.

This camcorder is well designed and packed with features, but we would have expected a little better from Canon in terms of video quality.

Paul Monckton

Details

Price £599

Best price www.pcw.co.uk/bestprices

Contact Canon 08705 143 723

www.canon.co.uk

Specifications Direct to DVD recording • 2megapixel sensor • 10x optical zoom • In-camera editing • MiniSD card support • Image stabiliser • USB2 • Roxio MyDVD LE • 47 x 122 x 86mm (w x d x h) • 410g

Verdict

Pros Compact design; packed with features

Cons Poor image quality and battery life

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall A versatile camcorder with plenty of features, but lacks the image quality we expect from Canon

★★★★★

POCKET DIGICAM

Sanyo Xacti E6

Stylish compact camera, but it struggles with image noise



The specifications of the Xacti E6 make a good first impression. It has a 6megapixel CCD, which can be bumped up to 10megapixels with a bit of interpolation, 3x optical zoom, 3in LCD viewfinder and a chassis no bigger, or heavier, than a pack of cards.

For hassle-free photography, the Xacti E6 comes with the option of preset scene modes. There's also a Best Shot mode, which takes four consecutive shots and brackets the exposure. You can then choose which images you want to keep. Other features include manual focus and a 1cm macro for close-ups.

The shutter button is touch-sensitive, so simply by resting your finger on it, the camera will leap into action and adjust the likes of focus and exposure. More often than not the correct settings are calculated, but we still prefer the half-press shutter system employed by the majority of digital cameras.

With landscape, portrait and indoor shots, the Xacti E6 reproduced colour fairly well. However, even when shooting outside, many of our photos exhibited a lot of noise. It's normally only night-time or low-light shots that are affected by noise, so we were quite disappointed to see it in daylight images. The small 1/2.5 sensor crammed with six million pixels is most likely the root of the problem.

Navigating the menus is straightforward, but if you have large hands the small buttons could get fiddly. You'll need to buy an extra memory card to take a decent number of shots, as the 16MB internal memory is enough for just three photos at the highest resolution.

The Xacti E6 is a good point-and-shoot digicam, but the image noise will be a concern if image quality is important to you. If you're quick, the Xacti E6 comes with a free 512MB SD (Secure Digital) memory card, a Lowepro carry case and two-year warranty. This offer expires on Christmas Eve 2005.

Luke Peters

Details

Price £250

Best price www.pcw.co.uk/bestprices

Contact Sanyo 01923 246 363
www.sanyo.co.uk

Specifications 1/2.5in CCD • 6megapixel (3,072 x 2,048) • 3x optical zoom • 38-114mm (35mm equivalent) • 640 x 480 movie mode (30fps) • 3in LCD monitor • SD/MMC card slot • 98 x 23 x 60mm (w x d x h) • 134g

Verdict

Pros 3in LCD screen; good range of preset modes

Cons Grainy photos both indoors and outdoors

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall A reasonable pocket digicam for quick and easy photos, but it falls down where image quality is concerned

★★★★★

PHOTO PRINTER

Epson Stylus Photo R340

Preview, print and burn quality photos without a PC



New to Epson's extensive Stylus Photo range is the R340. It is a six-ink model comprising black, cyan, magenta and yellow, along with light cyan and light magenta cartridges for more realistic photo prints.

A 2.4in colour LCD screen sits on the front of the R340 and, with the multifunction card reader, allows for PC-free printing. Epson has also squeezed a CD burner into the printer. Once you've burnt your photos to a CD-R, you can use the R340 to print a label on the disc. You can also back up to lomega Zip disks.

Epson's installation guide is easy to understand and we got the R340 up and running in next to no time. In our tests, it took just under four minutes to print an A4 colour photo and, on Epson's Ultra Glossy paper, the quality was outstanding. Colours were rich and there was no visible banding.

Print speeds for plain text are rated at 15ppm (pages per minute) by Epson. Our own benchmarks returned a slightly slower 9ppm and 2.2ppm for a standard pdf.

Running costs are quite high. Epson quotes a life of 630 pages of text for the black ink and 430 pages for each colour cartridge – all at five per cent coverage. Replacements cost around £12 for each of the six inks.

The R340 incorporates some potentially useful features, but you have to ask yourself how often you'd use it to burn photos directly to CD or print without first previewing on your PC's monitor. If you are in the market for a high-quality printer with the option of printing independently of your PC, the R340 is a decent model at an equally attractive price. Alternatively, if you're purely after 6 x 4 photo prints, consider the excellent Epson Picturemate 100 (see Buyer's Guide, page 170).

Will Stapley



Details

Price £149

Best price www.pcw.co.uk/bestprices

Contact Epson 08702 416 900
www.epson.co.uk

Specifications Six inks • 5,760 x 1,440dpi • 2.4in LCD screen • Multifunction card reader (all major formats) • Pictbridge • CD writer • Bluetooth compatible • 120-page paper tray • 483 x 478 x 297mm (w x d x h) • 5.4kg

Verdict

Pros Excellent photo prints; range of features

Cons Expensive to replace all six inks

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall A high-quality photo printer with a good range of features

★★★★★

17IN MONITOR**LG Flatron L1732P**

Fast 4ms response time makes this an ideal choice for gamers

EXCLUSIVE

Feature-packed and with a super-fast response time, LG's Flatron L1732P is a versatile 17in monitor with high image quality and top gaming performance. As a direct replacement for the Flatron L1713P, the new model uses a TN panel and maintains the high 300cd/m² brightness of its predecessor, but offers an increased contrast ratio of 700:1, a wider viewing angle and a faster response time of just 4ms.

Housed in a smart silver-grey bezel, the panel is mounted on a fully adjustable stand that supports tilt,

swivel, height and pivot adjustments. An internal power supply is used and both VGA and DVI-D inputs are provided.

Four control buttons are tucked out of sight on the underside of the bezel, providing quick access to automatic setup, input selection, Lightview brightness presets and an intuitive on-screen menu. Above the power switch sits a big bright blue power indicator LED, which is both eye-catching and distracting – thankfully it can be turned off using the menu system.

A useful supplement to the on-screen menu is the included Forte Manager software, which gives you full control over the monitor from your Windows desktop. From here, you are guided through optimal configuration of your monitor's parameters. A calibration facility is included. This software also enables the auto pivot function, which rotates your windows desktop just a few moments after you rotate your monitor.

In desktop use we found the image quality of the L1732P to be excellent. Text is crisp and clear while colours are accurate – especially after calibration. The rated 170° viewing angle feels a little optimistic as brightness tails off noticeably at the wider angles.

Despite these minor irritations, this is still a quality 17in monitor

Paul Monckton

**Details****Price** £239**Best price** www.pcw.co.uk/bestprices**Contact** LG 0870 607 5544www.lge.co.uk

Specifications 17in screen • 1,280 x 1,024pixels • 4ms response time • 300cd/m² brightness • 700:1 contrast ratio • Auto pivot • Integral power supply • Dual input • 390 x 242 x 430mm (w x d x h) • 5.5kg

Verdict

Pros Good features; image quality; fast response time

Cons No speakers or USB hub; vertical viewing angle

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall A good choice for gamers with strong performance and a host of welcome extras

★★★★★

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20IN LCD TV

Acer AT2001

Well-priced, but lacks both widescreen and Freeview



Acer's AT2001 is a slimline, wall-mountable television that makes a good space-saving replacement for a traditional CRT-based TV.

At first glance you could be forgiven for mistaking it for a good-looking 20in LCD monitor. But while the inclusion of a standard VGA port might make you think you're getting a bargain PC monitor with a TV thrown in, a closer look at the specification confirms it is in fact a TV that happens to have basic provision for connection to a computer.

The main reason for this is its native 800 x 600pixel resolution. This is adequate for the built-in analogue TV receiver, but inappropriate for desktop use. Furthermore, it's very bright. At 450cd/m², desktop use will leave you with that 'sitting too close to the telly' feeling in minutes. A relatively wide, 160° viewing angle and 500:1 contrast ratio make for a pleasantly crisp image that's comfortably viewable from all areas of the room, while the 16ms pixel response time ensures no visible blurring from the LCD panel.

Given the relatively low resolution, this TV is obviously not HD ready.

As well as the VGA port, there are RF, composite video, S-video and Scart inputs along with a headphone socket. Separate audio inputs drive the integral 3w stereo speakers.

Automatic setup is straightforward, using a clear on-screen menu system. All five analogue terrestrial channels were found, but the supplied remote control is a little small and it's powered by a watch-style lithium battery – less convenient than standard AA or AAA cells when the time comes for replacement.

The AT2001 is a decent flat-panel TV, but we feel most would prefer to spend more and get a widescreen model with Freeview support.

Paul Monckton

Details

Price £349

Best price www.pcw.co.uk/bestprices

Contact Acer www.acer.co.uk

Specifications 20in LCD (800 x 600) • 160/120° viewing angle (horizontal/vertical) • Analogue tuner • 450cd/m² brightness • 500:1 contrast ratio • 16ms response time Composite video, S-video, Scart, RF, audio, VGA • Nicam • Teletext • 2 3w speakers • Remote control • 496 x 198 x 468mm (w x d x h) • 7.8kg

Verdict

Pros Bright image; low price; wall mountable

Cons 4:3 aspect ratio; not HD ready; analogue only

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall A low-cost, flat-panel TV that will save you space and give you a decent picture

★★★★★

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FrontPage Extensions	-	✓	-	✓	-	✓
E-commerce Software	-	✓	-	✓	-	✓
Virus & SPAM Filters	✓	✓	✓	✓	✓	✓
Powerful Webmail	✓	✓	✓	✓	✓	✓
Auto Responders	✓	✓	✓	✓	✓	✓
Control Panel	✓	✓	✓	✓	✓	✓
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Visitor Statistics	✓	✓	✓	✓	✓	✓
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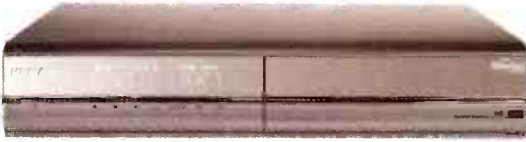
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PVR

Humax PVR-9200T

If you don't want to be tied to a Sky+ subscription, this Freeview recorder might be the answer



If you're attracted to the functionality of Sky+ but don't fancy signing up for a subscription, there are plenty of other PVR (personal video recorder) options.

Humax has just launched the PVR-9200T – a twin digital tuner PVR with a 160GB hard drive. Just as with Sky+, the twin tuner lets you watch one channel while recording another, or record two programmes simultaneously.

We have no quarrels with the design of the Humax. Thanks to its mirrored facade and silver chassis, it should fit in well with the rest of your home entertainment setup. The scrolling LED screen displays the current channel name along with other useful information.

What we didn't like was the interface. The further you delve into the menus, the more complicated and unintuitive it becomes – especially when accessing the seven-day EPG (electronic programme guide).

It's something you will learn to live with, but Humax would do well to improve on it.

Via a front-access USB port, it's possible to transfer recorded shows to your PC. You can also copy photos and music to the PVR-9200T. What you cannot do is move video from your PC to the PVR.

On the rear of the PVR sit both analogue and digital audio outputs along with two Scart sockets. If you don't have a Scart TV, the RF modulator lets you send the video through a standard coax cable. A slot on the front of the PVR allows you to subscribe to Top Up TV broadcasts – see www.topuptv.com for more information.

A small fan continues to cool the PVR, even when it is in standby mode. Unless there's absolutely no background noise, you won't notice it whirring away.

In our full-strength Freeview signal test, the PVR-9200T performed admirably and displayed a clear, precise image – albeit with the usual Freeview compression artefacts. It didn't cope quite as well in our low-strength test, so if you don't live in a strong Freeview area you may need to upgrade your aerial.

Although we'd prefer to see a more intuitive interface, the PVR-9200T is still a decent twin-tuner PVR with a host of useful features. *Will Stapley*

**Details**

Price £229

Best price www.pcw.co.uk/bestprices

Contact Humax 020 8547 4240

www.humaxdigital.com/uk

Specifications 2 digital tuners • 160GB hard drive • 2 Scart sockets • RF modulator • mp3, jpeg support • Analogue and digital audio-out • Top Up TV compatible • USB2 • 380 x 281 x 70mm (w x d x h) • 3.7kg

Verdict

Pros Dual-tuner; USB

Cons Can't transfer video to PVR; poor interface

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Plenty of features and looks great, but the interface lets it down

★★★★★

MEDIA PLAYER

Conceptronic Grab 'n' Go TV Media Player

A simple alternative to wireless media streamers



The Grab 'n' Go TV Media Player is aimed at those who want digital images, music and video on their TV, but don't necessarily have, or perhaps don't want to use, a wireless network.

It uses standard 3.5in hard drives (a smaller 2.5in version is also available) and we reviewed the 160GB model. About the size of a thick hardback novel, it supports USB On the Go (OTG) and has a remote control.

First impressions were positive as loading media onto the drive is simply a case of connecting it to your PC via USB and dragging across your chosen

files. Additionally, USB2 OTG lets you connect devices such as a digital camera for the immediate transfer of photos. This would make the TV Media Player a handy storage device when you are away, if only it were more portable and battery powered.

Once files are loaded, it connects to your TV via Scart, composite or S-video. The setup process didn't cause any problems, but the manual has no troubleshooting section, so if you do hit a snag you're on your own.

Some may see the Grab 'n' Go's hackneyed portability as a disadvantage. To update it with new content you must manually disconnect it from your TV and hook it up to your PC. But those who have previously had bad experiences of wireless media streamers may appreciate its relative simplicity. Whatever your opinion, an Ethernet port would certainly boost its appeal.

A range of formats is supported, including mpeg1/2/4, jpeg and mp3. Quality is as good as the original video and the TV you are playing it on.

We feel the Grab 'n' Go sits in No Man's Land – it's neither a bad nor a particularly good product. USB2 OTG is a neat addition, but it lacks any sort of network feature and is too bulky to be a portable device. *Rob Jones*

Details

Price £113

Best price

www.pcw.co.uk/bestprices

Contact Conceptronic

www.camtechsystems.co.uk

Specifications 160GB 3.5in hard drive • avi, mpeg 1/2/4, vob • mp3, wav, wma • jpeg • USB2 OTG • Pal/NTSC • 135 x 49 x 200mm (w x d x h)

Verdict

Pros Easy to set up; USB2 OTG

Cons No network feature; not portable enough

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall A simple way to transfer digital media to your TV, but the lack of any network support limits its appeal

★★★★★

AUDIO PLAYER

Packard Bell Audiosstar

Small and light, but it has fiddly controls and a high price



The Audiosstar is yet another portable audio player to hit the market. Housing 1GB of flash memory, it will hold roughly 320 tracks in mp3 and wma formats, including protected wma files. However, it's not compatible with Napster To Go, a service available to selected audio players that allows you to download unlimited songs to your player for £14.95 a month (see www.napster.co.uk).

The 1.8in screen will display jpeg images, but due to the low resolution we don't think many people will

take advantage of this. The poor viewing angles also hold it back.

Packard Bell has tried to jazz up the interface, but the garish colours and confusing icons don't do it any favours. The animated dancing girl prancing around while you listen to your tunes is bizarre and leaves you with the feeling Packard Bell was running out of ideas.

Another disappointment is the interface. Working your way around the various menus is ridiculously hard, despite having the manual to hand, and the whole device feels very unresponsive.

There's no FM radio, but you get a voice recorder and a line-in mp3 encoding feature. A basic version of Tetris is included, which should keep you amused for all of five minutes. At just 10 hours, battery life is low compared to most other audio players these days.

The Audiosstar's size and weight are good points, but when you consider that Creative's 1GB Zen Nano Plus can be picked up for £79, and the 2GB Apple iPod Nano is available for just £10 more than the Audiosstar, Packard Bell's latest creation looks shaky to say the least. Neither the Creative nor Apple model can display photos (not that the Audiosstar does a good job of it), but they're infinitely easier to use and, in our opinion, far better options.

Will Stapley

Details

Price £119

Best price www.pcw.co.uk/bestprices

Contact Packard Bell

www.packardbell.co.uk

Specifications 1GB flash memory • 1.8in display • mp3, wma support • jpeg support • Voice/line-in recorder • Equaliser • 10hr battery life • Earphones • Neckstrap • Carry case • 47 x 13 x 65mm (w x d x h) • 50g

Verdict

Pros Small; light**Cons** Poor design; too expensive; pointless features**Features** ★★★★★**Performance** ★★★★★**Value for money** ★★★★★

Overall Up against strong competition, this is a poor effort from Packard Bell

★★★★★

SATELLITE NAVIGATION

Evesham Bluemedia BM6380

Affordable GPS navigation complete with speed camera alerts



Using Destinator ND software and Navteq's maps, the Bluemedia BM6380 from Evesham joins the throng of low-cost satellite navigation devices. The unit can be operated using the array of buttons, the stylus, the remote or a delicate touch of a finger on the 3.5in screen.

If the flip-out GPS antenna can't detect any satellites (four are required for the unit to work), an external antenna can be purchased for £25, however this is something that's usually included with most sat nav kits. UK and Ireland maps are preloaded on a 256MB SD (Secure Digital) card and further European maps can be bought.

Many sat nav devices boast the ability to download speed camera databases to the device, but Evesham's is the first we've seen to come preloaded with such a feature. New speed cameras appear all the time, so this is a subscription-based service costing £30 a year. Upon registration you get six months of downloads free with no obligation to pay after the trial. We still feel the best way to avoid fines is to stick to the speed limit, despite the dubious claim that this sort of service makes you safer on the road.

During testing, the Bluemedia BM6380 performed well. Usability was hampered by reflections on the screen, but the voice instructions are clear and a safer alternative to glancing at the maps while driving. The map updated smoothly, although it occasionally took a while to pick up GPS reception.

Mp3 playback is also supported, along with photo slideshows, voice memos and alarms, but these are more checkbox ticks as opposed to features we see many people putting to good use.

Smaller and thinner than most other sat nav devices, this one from Evesham is certainly tempting. The extra features don't add much to its overall appeal, but if you're after a cheap satellite navigation it's worth a look.

Will Stapley



Details

Price £299

Best price www.pcw.co.uk/bestprices

Contact Evesham

www.bluemediagps.com

Specifications 3.5in screen • 192MHz processor • 256MB SD card • Integrated speaker/headphone socket • Remote control • Car mount/charger • Mains charger • USB sync cable • 118 x 16 x 69mm (w x d x h) • 158g

Verdict

Pros Cheap; small; good design**Cons** Reflections on screen**Features** ★★★★★**Performance** ★★★★★**Value for money** ★★★★★

Overall Some interesting features that you'll probably never use, but this a good budget sat nav system

★★★★★

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LCD PROJECTOR

Epson EMP-TW520

Quality projector with the all-important 'HD ready' tag



The cost of projectors has fallen dramatically in the past couple of years and you can now get a reasonable home or business model for well under £1,000. These low-cost projectors do have some limitations, though, such as the lack of support for high-definition TV (HDTV).

However, Epson's EMP-TW520 projector is officially HD ready. This means its 1,280 x 720 resolution is high enough to display a true HDTV picture in the 720p format. It also has the HDMI (high-definition multimedia interface), which is required for use with devices such as Sky's forthcoming HDTV set-top box, so the TW520 will be ready to plug and play when Sky begins its first HDTV broadcasts in 2006.

Other input options include composite, S-video, Scart and component video. There's also a VGA port, so you can connect pretty much any type of domestic video equipment, games console or PC to the projector.

Of course, the most important feature is image quality, and the TW520 performs exceptionally well. One of the outstanding features of Epson projectors is their high brightness rating. Most projectors need to be used in rooms that have been blacked out. That's fine for watching films at home in the evening, but it's a bit of a problem if you want to watch movies or other TV programmes during the day. Fortunately the TW520's 1,400lumens lamp is bright enough to allow you to watch it in daylight without having to run around shutting all the curtains first.

At just under £1,200, the TW520 is obviously more expensive than lower-resolution projectors, such as Epson's TWD1 (£899). However, its high resolution and support for HDTV make it an attractive alternative to large-screen plasma TVs – especially if you're looking forward to watching the World Cup in high-definition on Sky in a few months' time.

Cliff Joseph



Details

Price £1,199

Best price www.pcw.co.uk/bestprices

Contact Epson 08702 416 900

www.epson.co.uk

Specifications LCD projector • 1,280 x 720 resolution • 16:9 aspect ratio • 1,400lumens • HDTV ready • Composite, component, S-video • Scart, VGA, HDMI • 2,000hrs lamp life • Remote control • 125 x 406 x 310mm (w x d x h) • 5.2kg

Verdict

Pros HD ready; very bright; colourful image

Cons Quite large; expensive

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Not the cheapest projector, but HD support and excellent image quality will appeal to home-cinema fans

★★★★★

TRAVEL KEYBOARD

Think Outside Stowaway Bluetooth Keyboard

Wireless Qwerty typing on a PDA – with a few annoyances



The Stowaway Bluetooth Keyboard is a brushed aluminium foldaway keyboard that works with a number of different PDAs, as well as home-theatre PCs, tablet PCs and notebooks.

Once opened out it is 25cm long, about the thickness of your little finger, and has full-size keys on which to type. Although it is a Qwerty keyboard, Think Outside has compromised the layout of other keys in order to accommodate the small size – this can initially be confusing, especially if you touch type.

Despite setting it up as a UK keyboard, we found several symbols accessed via the green function or Shift buttons were wrong. This was very annoying as

it meant we had to go hunting for common keys, such as the pound sign and the @ key. Think Outside boasts that this product allows you to write emails, memos and surf the web easily, so this is really unforgivable.

Another annoyance is that the arrow keys have to be continually hit to move around your document. Holding them down will result in the cursor moving only once. It does come with a decent set of shortcut function keys for commonly used PDA programs, though, such as calendar and contacts, and you can customise a further 10.

This review was written on a train using an XDA II PDA with the keyboard on a table. It was pretty stable, although prone to wobbling when using keys at either end. However, even when the train was rocking it was easy to hit the correct keys.

Once paired, it works fine. You can detach the PDA holder and move it further away from you should you wish. When turning on the PDA, there is a delay of a couple of seconds before the keyboard will type. You can also buy a Bluetooth PDA mouse to accompany the keyboard (see www.pcw.co.uk/2145935).

The keyboard is sleek, light and looks good, and we want to like it but, for the price, the annoyances mentioned above must be addressed.

Rob Jones

Details

Price £69.99

Best price www.pcw.co.uk/bestprices

Contact Think Outside

www.widget.co.uk

Specifications Full-size Qwerty layout • 18mm key spacing • Bluetooth • 10 user-defined shortcut keys • Phone stand • Carry case • 251 x 148 x 13mm (w x d x h) • 160g

Verdict

Pros Small and light; large keys; Bluetooth

Cons Expensive; some keys don't function correctly

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall If the manufacturer resolves some of the annoyances this will be a good keyboard, but it's difficult to recommend as it is

★★★★★



NEC ND-4550

Price £35 **Contact** www.nec.co.uk **Overall** ★★★★★

Dual-layer DVD writing speeds are continuing to escalate, but finding the media required to cope with these speeds isn't easy. The ND-4550 from NEC is quoted as burning dual-layer discs at eight-speed, however DVD+R media currently only goes up to six-speed. DVD+/-R burning is available at 16-speed, which allows you to write 4.7GB in just under six minutes.

NEC has included DVD-Ram support on the ND-4550. Although not used a huge amount in the UK, it's the format of choice in Japan and, thanks to features such as on-the-fly editing, is more versatile than standard DVD+/-RW media.

We've always been impressed at how cheap NEC's optical drives are and, at £35, the ND-4550 continues the trend. Beige, black and silver options are available.

Will Stapley



Orange SPV M5000

Price From £199 **Contact** www.orange.co.uk **Overall** ★★★★★

Hot on the heels of the T-Mobile MDA Pro (PCW January 2006) is the SPV M5000 from Orange. If you're thinking it looks similar to the MDA Pro, you're right – it's the exact same handset. The only difference is the Orange logo and, of course, requirement for an Orange contract.

Featuring a flip-and-twist display, the 3G SPV M5000 runs Windows Mobile 5, giving you access to cut-down versions of software such as Excel, Word and Outlook.

With this Orange model you also get full access to the Orange World portal, which gives you up-to-date news, sports results, games and more.

Some people will find the SPV M5000 too big to use as a normal mobile phone, but there's no getting away from its huge range of features and usability.

Mark Wilson

AmacroX NB Kit

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www.Amacrox.com

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Philips Digital Photo Display

Price £170 Contact www.2techvisuals.co.uk Overall ★★★★★

Digital photo frames seem an obvious idea but, despite being around for some time, they've never really taken off. Since you're basically getting a miniature LCD monitor, pricing is the main obstacle.

Philips is attempting to breathe new life into the market with the Digital Photo Display. Powered by mains or internal battery, it accepts SD (Secure Digital), MMC (Multimedia Memory Card), Memory Stick and CF (Compact Flash) cards. Slideshow intervals vary in length from seconds up to days and the bright 7in (720 x 480) screen performs well.

It lacks some obvious features, including the ability to be wall-mounted and decent internal memory (the 12MB internal memory is next to useless), but we still think it's a decent effort. £170 seems a high price, but this is one of the cheaper digital photo displays available. *Will Stapley*



Supportplus Q-Be

Price 1GB £110, 512MB £85 Contact www.pcworld.co.uk Overall ★★★★★

The Q-Be is purportedly the smallest mp3 player in the world at 24mm in all directions. One side is devoted to a dazzling OLED (organic light emitting diode) screen. With no requirement for a backlight, the Q-Be battery can last up to 17 hours.

A graphic equaliser is included and we found the sound quality to be excellent. Mp3 and wma files are supported (though not those with licences), and you can buy the Q-Be in 512MB and 1GB guises.

Unfortunately, copying files to the Q-Be is rather slow – an entire album can take approximately four minutes to transfer.

The Q-Be is around £20 more expensive than Apple's 1GB Shuffle, but we love its miniature and stylish design, and it will definitely set you apart from the iPod masses. *Rory Reid*

BROADBAND BOOSTER

Hawking Technologies HBB1

Minimise gaming lag and VoIP interference



The majority of UK broadband users are still stuck at a relatively slow upstream of 256Kbits/sec. Although this doesn't matter when downloading music and video, outbound services such as VoIP and online gaming have to fight over what little bandwidth there is. With few budget routers offering QoS (quality of service) to ensure urgent packets get priority over others, performance can suffer. You'll notice this in the form of lag during online gaming and poor-quality VoIP calls.

The HBB1 is a compact device that sits between your Ethernet modem and router. It inspects each outbound packet that passes through, prioritising those such as VoIP and online gaming, while pushing the likes of FTP uploads and email to the back of the queue.

There's very little user involvement in the process. You plug it in and a series of LEDs tells you it's working. A basic web-based interface can be accessed, but there are few settings to play with.

We tested the HBB1 with positive results. While uploading an FTP file, we monitored VoIP quality using Testyourvoip.com's service. Through our standard connection we achieved a poor score of 2. When the HBB1 was hooked up, we got a far more impressive score of 4.4. Lag caused by outbound services during online gaming was similarly reduced.

If you use an integrated ADSL Broadband router you will need to buy extra kit, such as a switch to sit between the HBB1 and your ADSL router. For a PC to benefit from the HBB1 it must be physically wired to the switch and not bypass it by connecting wirelessly to the router.

QoS such as this is not new, and some routers offer it as standard. Its HBB1 is also rather expensive, but if your broadband setup allows it, the HBB1 will do a great job of optimising your connection. *Will Stapley*

Details

Price £49

Best price www.pcw.co.uk/bestprices

Contact Hawking Technologies
www.lowestonweb.com

Specifications 2 Ethernet ports • Power supply • LED indicators • Two-year warranty • 99 x 66 x 25mm (w x d x h) • 145g

Verdict

Pros Works well; easy to install and use

Cons Expensive; not designed for use with ADSL routers

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Does a good job of prioritising traffic, but requires extra hardware when used with ADSL modems

★★★★★

IP CAMERA

Mobotix M10M-Basic

A weatherproof, high-quality surveillance webcam with multiple uses



Few IP cameras offer the quality and capabilities of the M10M-Basic, even though it's the cheapest in the Mobotix range. It's housed in a weatherproof fibreglass-reinforced plastic chassis that's dustproof and protected against water jets, and it can withstand temperatures from -20°C to +60°C.

It certainly looks the part, with the aggressive, futuristic design looking as though it comes straight from a *Star Wars* set. It has a single fixed-focus wide-angle f2.8 lens, coupled to a 640 x 480 Cmos colour

image sensor, but there's no optical or digital zoom on this model. A telephoto lens can be added at extra cost.

The built-in web server supports DHCP, so there's no software to install, but a Quick Install utility helps with initial configuration. It uses an external power adapter, but Power over Ethernet is an added-cost option.

What stands out most is the stunning image quality and configurability of the camera. It supplied some of the best live images we've seen from an IP camera. Image processing in the camera automatically adjusts all images for sharpness, contrast, exposure and white balance. The more expensive models have full day/night vision capabilities, using a second infra-red lens.

There's a passive infra-red (PIR) movement sensor that can be set up to monitor certain areas of the field of view. Bright red LEDs on the front of the camera can be configured to, among other things, illuminate or flash when the sensor's triggered. Images from triggered or timed events can be uploaded to an FTP server or emailed.

Our only major complaint with the M101M-Basic is that the web interface is poor and doesn't hide features that aren't available in this model, which can be very confusing. Apart from that, it's a superb, if pricey, surveillance solution. *Kelvyn Taylor*

Details

Price £521.70

Best price www.pcw.co.uk/bestprices

Contact Mobotix www.mobotix.com

Specifications 640 x 480 Cmos sensor • 55° wide-angle lens • 10Base-T interface • 2MB image storage • 5 lux sensitivity • Video/PIR motion detector • FTP/email support

Verdict

Pros Unrivalled image quality; highly configurable

Cons Confusing interface; expensive

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall An outstanding IP camera for serious home or office surveillance requirements

★★★★★



Akasa All-in-one

Price £34.96 Contact www.cclonline.com Overall ★★★★★

If you are fed up with reaching behind your PC to connect your speakers, USB keys, camera and the like, the Akasa All-in-one could be the answer.

Fitting into a spare 5.25in drive bay, the All-in-one has a variety of ports all mounted in a stylish box. You get two USB2, one Firewire, three audio and a composite video port. A multifunction card reader and Serial ATA connectors are also provided.

A flap hides the ports neatly, while an LED panel indicates two fan speeds and a temperature reading. Four control buttons adjust fan speeds and the level for the temperature alarm (this can be set to monitor one of two zones). A variety of colours are available.

Overall Great if you're forever reaching behind your PC

Asus A8N-VM CSM

Price £67.74 Contact www.vadim.co.uk Overall ★★★★★

The Micro ATX format A8N-VM motherboard is the latest to use Nvidia's Geforce 6150 Northbridge, which in the case of this model is twinned with the Nforce 430 Southbridge. The board supports all AMD's Socket 939 processors, including the dual-core X2 range.

It's a compact, well laid out board with one slight exception – the Northbridge and its passive cooler are very close to the mounting bracket for the CPU cooler, making the fitting of a third-party cooling system tricky.

Along with four Dimm sockets, there are two PCI and two PCI Express slots (one x1 and one x16). The board also features integrated graphics with both VGA and DVI outputs.

Overall Lots of features and a good basis for a home theatre PC



Asus DRW-1608P2S

Price £34.50 Contact www.overclock.co.uk Overall ★★★★★

The DRW-1608P2S optical drive features fast burn times for dual-layer DVD as well as DVD-Ram. It can burn both flavours of dual-layer discs at eight-speed. Although 16-speed drives are available, you won't find faster than eight-speed dual-layer media at present. Single-layer DVDs can be burnt at 16-speed. DVD-Ram isn't particularly popular in the UK, but this drive accepts them and will write at five-speed.

A feature called Flextralink stops unusable discs caused by buffer under-runs, and Flextraspeed adjusts the writing speed depending on the media being used. DDSSII (Double Dynamic Suspension System II), an Asus-patented technology, reduces drive noise by stabilising the pickup head.

Overall Well-priced and some interesting features

Inno3D Geforce 7800 GTX

Price £330.10 Contact www.pcnextday.co.uk Overall ★★★★★

Inno3D's version of Nvidia's Geforce 7800 GTX is ideal if you don't want a large games bundle you will probably never use.

Aside from the Inno3D logo on the cooling fan, Nvidia's reference design hasn't been tinkered with at all. Clock speeds are left well alone with the core clock running at 430MHz and the 256MB of DDR2 memory trundling along at 600MHz (effective 1.2GHz).

The hardware bundle comprises a DVI dongle, two DVI-to-VGA adapters and a power adapter cable. Despite the low price, you do get one game, Colin McRae Rally 04. WinDVD Creator 2 and DVD5 are also included.

Overall Limited software bundle, but one of the cheapest 7800 GTXs available





Samsung Spinpoint P120S SP2504C

Price £80.11 **Contact** www.overclock.co.uk **Overall** ★★★★★

There are two Spinpoint P120 Serial ATA (Sata) hard drive models, the SP2004C, a 200GB disk, and the 250GB SP2504C. They come with Sata2 interfaces and are rated at 3Gbytes/sec. NCQ (Native Command Queuing) and an 8MB cache also come as standard.

The SP2504C uses two 125GB platters to achieve its 250GB capacity and has a spin speed of 7,200rpm. Samsung quotes a 8.9ms seek time for the drive.

Seagate's Noiseguard and Silentseek technologies make this an extremely quiet drive. It also runs cooler than many of its competitors, making it ideal for small form factor PCs.

Overall Not the fastest drive, but extremely cool and quiet

Sapphire Radeon X800GTO²

Price £158.57 **Contact** www.overclockers.co.uk **Overall** ★★★★★

The limited edition Sapphire Radeon X800GTO² is worth searching out if you like overclocking your graphics card.

Despite the X800 in the name, the X800GTO² uses the R480 core found in the X850XT, not the usual R430 core. This is because only 12 of the 16 pixel pipelines work straight out of the box, hence the X800 label. But with a Bios tweak (available on the web) you can enable the remaining four pipelines. Not only that, but with the standard cooling you can also overclock this board up to an X850XT and further. Some have managed to get cards running faster than X850XT Platinum Editions, but the one we had couldn't quite manage this.

Overall Stunning overclocking potential – if you can find one, buy it



Seasonic S12

Price £103.34 **Contact** www.overclock.co.uk **Overall** ★★★★★

Unlike most of its competitors, The 600w model in Seasonic's S12 range of power supplies doesn't come with any fancy lights or coloured panels. Finished in black, this PSU is continuously rated at 600w, which means it can run at full output for long periods of time.

Through the honeycombed rear panel you can see two hefty aluminium heatsinks that, together with the five-bladed 12cm fan, keep the unit cool.

The wiring loom contains a 24pin ATX power connector (a 24pin to 20pin adapter is also included), and both 4pin and 8pin ATX 12v connectors. You also get two 6pin PCI Express graphics connectors and six 4pin Molex connectors with quick-release clips.

Overall A little pricey, but a straightforward, high-powered PSU

Zalman FS-C77 Fatal1ty

Price £41.07 **Contact** www.overclock.co.uk **Overall** ★★★★★

Professional gamer Johnathan Wendel (aka Fatal1ty) continues to lend his moniker to a range of PC products, the latest being the FS-C77 CPU cooler.

Designed to match Abit's range of Fatal1ty motherboards, the FS-C77 is made from copper with a red finish. It also has a red LED fan to match the similar LEDs on the Fatal1ty motherboards.

Like its popular siblings, the CNPS-7700 Super Flower series, the FS-C77 is a massive circular cooler. However, instead of a low-speed 12cm fan, the FS-C77 uses a high-speed model. This allows for better airflow, which in turn means improved cooling for the CPU and surrounding hardware. It has fittings for socket 478, 775, 754, 939 and 940 processors.

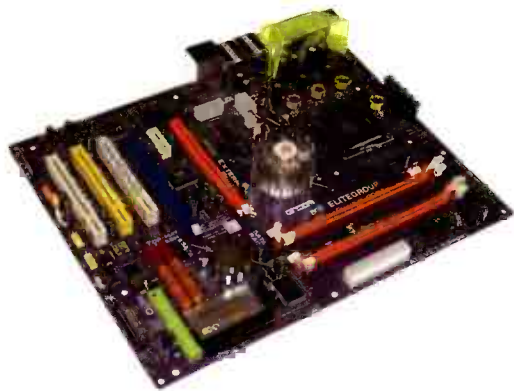
Overall Perfect for those with a matching Abit Fatal1ty motherboard



CROSSFIRE MOTHERBOARD

ECS PF22 Extreme

Feature-packed, well-priced board with Crossfire support



ECS is no stranger to innovative motherboards. The PF88 Extreme hybrid board, with its ability to run both AMD and Intel processors, springs to mind (see PCW August 2005).

The company's latest design, the PF22 Extreme, continues this trend, being the first Intel-based board to support ATI's Crossfire dual-graphics setup.

While the jury may be still out over the virtue of the Crossfire technology, it's always good to see a company offering alternatives to the usual ATI chipset

that, until now, has been the norm for Crossfire motherboards. The only cloud on the horizon for this board is that Intel's 975X chipset is fast approaching, and it may or may not support both SLI and Crossfire.

The PF22 is built on the now familiar ECS purple printed circuit board. It shares the same sparse look of recent ECS boards, which leads you to think it lacks features. Once again, though, this is far from the truth.

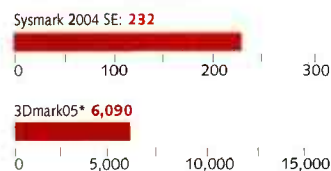
Built around Intel's 955X Northbridge and ICH7R Southbridge combination, the board supports all Intel's 1,066/800MHz FSB processors, including the Pentium D dual core, and has four Dimm slots supporting up to 8GB of dual-channel 667/533MHz DDR2 memory.

The Northbridge is cooled actively by a small fan while the Southbridge uses a passive heatsink. As the board uses the R version of the ICH7 Southbridge there is Raid support (Raid 0, 1, 5 or 10) for the four Sata2 ports controlled by the chipset. Another two Sata2 ports are controlled by a Silicon Image chip.

The PF22 is a well-featured board with Crossfire support. Sadly, we were unable to test the dual-card support in time for this review due to a lack of Crossfire Master Cards, but keep an eye on the Test Bed (www.pcw.co.uk/labs) for an update. *Simon Crisp*



Performance



*Tested at 1,024 x 768 in 32bit colour

Details

Price £123
Best price www.pcw.co.uk/bestprices
Contact PC Nextday
 www.pcnexday.co.uk
Specifications Socket 775 • 1,066/800MHz CPU support • Intel i955X Northbridge • Intel ICH7R Southbridge • 2 x16 PCI Express • x1 PCI Express • 3 PCI • Dual Gigabit Lan • 4 USB2 • 1 Firewire • S/PDIF in/out

Verdict

Pros Feature set; good price
Cons No SLI support
Features ★★★★★
Performance ★★★★★
Value for money ★★★★★
Overall The PF22 has a rich set of features, including Crossfire support, at a good price
 ★★★★★

GRAPHICS CARD

Nvidia Geforce 7800 GTX 512

More memory, enhanced cooling and top-notch performance



While ATI is struggling to get its flagship X1800 XT off the ground (see preview at www.pcw.co.uk/2143241), Nvidia has announced the brand new Geforce 7800 GTX 512.

Using the same G70 chip that was the driving force behind the 7800 GTX, this new model, as the name suggests, houses double the memory at 512MB. Clock speeds have also been given a boost. Whereas the 7800 GTX has a core clock of 430MHz, the 7800 GTX 512 runs at 550MHz as standard. However, as with

the 7800 GTX, we expect graphics card manufacturers to improve on this slightly. Memory clock speeds are similarly impressive – 850MHz DDR, which equates to a staggering 1.7GHz effective.

We ran our reference sample through the usual set of benchmarks. In most tests, Nvidia's new baby outpaced the ATI X1800 XT and you can find detailed results in the graphics section of www.reportlabs.com.

Conscious that gamers want low operational noise as well as top performance, Nvidia has spent a lot of time on the cooling system. Using a combination of heatpipes and an extra-large fan, it's incredibly quiet.

This sort of technology doesn't come cheap. Nvidia runs a well-oiled machine when it comes to making its new cards available on the day they're announced and the 7800 GTX 512 can be bought today for £516. Unless you're a hardened gamer who demands the best at any price, we'd recommend opting for a 256MB 7800 GTX, saving yourself around £200.

The 7800 GTX 512 scores points not just for being insanely fast, but also for its effective and quiet cooling system. It has managed to push the Radeon X1800 XT to the sidelines but, in the highly competitive world of graphics cards, we don't expect ATI to let Nvidia hog the limelight for long. *Will Stapley*



Performance



*Tested at 1,024 x 768 in 32bit colour

Details

Price £516
Best price www.pcw.co.uk/bestprices
Contact Scan www.scan.co.uk
Specifications 512MB • 550MHz core • 850MHz DDR memory (1.7GHz effective) • 8 vertex pipelines • 24 pixel pipelines • 2 DVI • S-video

Verdict

Pros Fast; quiet
Cons Expensive; only for hardened gamers
Features ★★★★★
Performance ★★★★★
Value for money ★★★★★
Overall This update on an already fast card lets Nvidia reclaim pole position in the graphics world
 ★★★★★

EXTRME

The Answer for Gamers



KN1 SLI Extreme

Socket 939 for AMD 64 X2 / Athlon 64 FX / Athlon 64 with HT technology, 2000 MT/s
Supports DDR400 Memory upto 4GB
Dual LAN with Giga-LAN and 10/100
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KN1 SLI Lite

Socket 939 for AMD 64 X2 / Athlon 64 FX / Athlon 64 with HT technology, 2000 MT/s
DDR400 Memory upto 4GB
2 PCI Express x16, 1 PCI Express x1
4x SATAII, RAID 0, 1, 0+1 and eSATA



KN1 Extreme / Lite

Socket 939 for AMD 64 X2 / Athlon 64 FX / Athlon 64 with HT technology, 2000 MT/s
DDR400 Memory upto 4GB
2 PCI Express x16, 1 PCI Express x1
4x SATAII and 2x SATA*, RAID 0, 1, 0+1

*is Extreme version only



nFORCE4-A939

Socket 939 for AMD 64 X2 / Athlon 64 FX / Athlon 64 with HT technology, 2000 MT/s
DDR400 Memory upto 4GB
1 PCI Express x16, 1 PCI Express x1
4x SATAII, RAID 0, 1, 0+1

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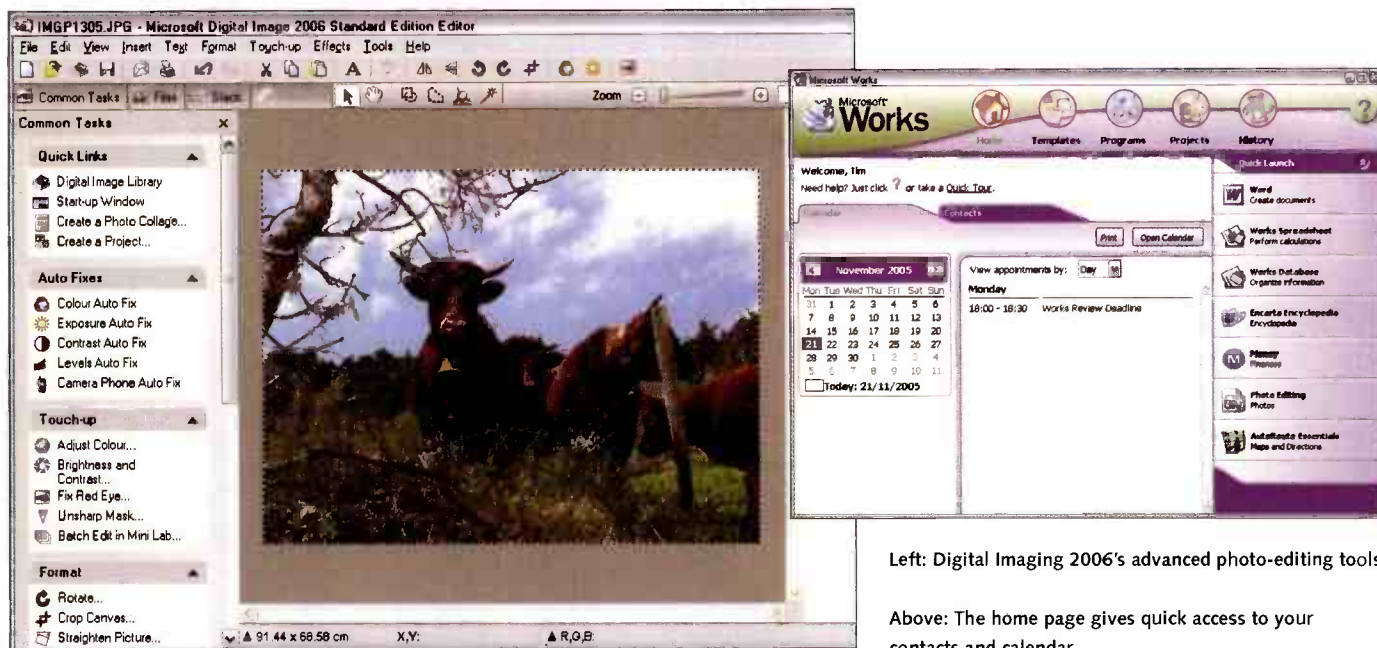
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OFFICE SOFTWARE

Microsoft Works Suite 2006

This latest version raises the bar for sub-£100 office suites



Left: Digital Imaging 2006's advanced photo-editing tools

Above: The home page gives quick access to your contacts and calendar

Although we're waiting with baited breath for the next version of Microsoft's Office suite, which is due out towards the end of 2006, the latest edition of Works Suite has just arrived.

Before looking at the package in detail, we'll briefly cover what's included. Brace yourselves, as there's a lot of software. Works itself is obviously here. Unlike Office 2003, Works is an integrated package covering spreadsheets, databases, a personal organiser and a bunch of task-based templates. Then there's Microsoft Digital Imaging (a competent image editor suitable for beginners), the navigation software Autoroute Essentials and Encarta Encyclopedia Standard. All these titles are 2006 versions. You also get Microsoft Money 2006 to sort out your personal finances and Pocket Streets for Smartphone or Pocket PC. If you've noticed we haven't mentioned word processing, don't panic. The Works Suite, unlike plain Works, which has its own word processor, comes with a full copy of Word 2002. All in all, it's a decent collection of software.

Once installed, the Works home page opens with a tabbed calendar and contacts pane – your current Windows address book will be added to the latter. Above this are chunky buttons providing quick access to templates. You'll find links to finance templates, programs and program-specific templates (such as a fundraising spreadsheet or a recipe database), projects including moving house or running a sports team that involve more than one program, and a history of recent files. If you'd rather launch a program directly, there's a set of quick-launch buttons on the right.

The spreadsheet component is fairly basic. Unlike in Excel, you can't have tabbed worksheets, but the 75 functions and 12 chart types should be enough for the

average user. Again, the huge range of available templates makes it all very easy to use, even for beginners. The database is a simple flat-file program, as opposed to a more advanced relational database system, but templates make it easy to keep track of your CD collection or wine cellar, for example.

Although it's not designed to compete with Adobe Photoshop, the Digital Imaging package has some useful features, such as buttons to automatically correct problems like poor exposure and colour balance. You get a professional-style 'unsharp mask' control that is used to sharpen a soft image. There is also a variety of extras in terms of frames, calendars, greetings cards and so on in which to house your photos.

Encarta is obviously a big draw. We were astounded when we first reviewed it back in 1993, and it's just as impressive today. Where else can you research your homework on Ovid and listen to a clip of Little Richard singing, all from one offline application?

Although online versions are available, the included Microsoft Autoroute offers more functionality and is faster than web-based route-mapping services. The maps cover the whole of Europe in great detail, and it delivers informative navigation instructions, complete with maps, almost instantaneously.

The addition of Word 2002, together with the Visual Basic for Applications programming language, raises the standard for a sub-£100 suite. This isn't the latest version, but since Word 2003 only runs on Windows XP, this will appeal to a wider user base.

Works Suite 2006 is a well-integrated, finely crafted suite crammed full of useful applications. The interface is intuitive and, if you do get stuck, there's plenty of help, including a comprehensive animated tour. *Tim Nott*

Details

Price £90
Best price www.pcw.co.uk/bestprices
Contact www.microsoft.com/uk
System requirements 200MHz processor • 128MB Ram • 1.5GB disk space • Windows 98SE or later (Windows 2000 SP4 or later for Encarta)

Verdict

Pros Complete office package; good price
Cons No relational databases; no Word 2003

Features ★★★★★
Ease of use ★★★★★
Value for money ★★★★★

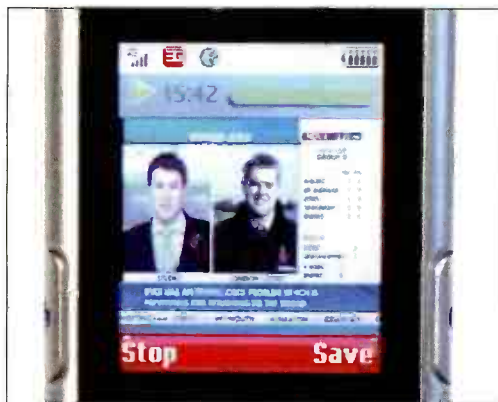
Overall It lacks advanced tools such as relational databases, but for most users Works Suite 2006 is the ideal office package

★★★★★

MOBILE TELEVISION

Vodafone Mobile TV

Watching Sky channels on your 3G phone sounds great, but find out if the reality lives up to the hype



Vodafone has teamed up with Sky to bring live TV direct to your 3G mobile. Although the line-up includes familiar-sounding channels, such as Sky One and MTV, programme schedules differ to those on standard Sky Digital. There are exceptions, such as a live stream of Sky News, but most channels consist of content designed specifically for this mobile service. However, arguments over additional rights required to beam hit shows, such as 24, over a mobile network means you will be missing certain programmes.

We were sceptical when we saw Sky Movies being advertised as one of the channels and, sure enough, it doesn't feature any full-length movies. Instead, you get previews, movie news and top 10 listings. Vodafone and Sky would have done well to label it Sky Movies News rather than Sky Movies.

We tested the service on a Sony Ericsson V600i and found the quality to be surprisingly good. Of course, the limited bandwidth of the 3G network means broadcasts are heavily compressed. This affects sound and video, but in most cases the two were well synchronised and certainly watchable. The quality of the live feed of Sky News, however, was noticeably worse than the quality of Sky One or MTV.

If you want to use this service on the go, such as when you're on a train, video quality will suffer. Slip out of 3G coverage and you will lose the feed.

Despite its drawbacks, Vodafone and Sky have done a good job of implementing the first permanent mobile TV service. By initially providing it free of charge, a decent honeymoon period has been guaranteed. Whether people are prepared to pay £5 for each channel pack (of which there are three) after 31 January remains to be seen. Full channel listings can be found at www.vodafone-i.co.uk/live/live_tv.html. *Will Stapley*

Details

Price Free until 31 January then £5 per package

Best price www.pcw.co.uk/bestprices

Contact Vodafone
www.vodafone.co.uk

System requirements 3G mobile phone • Vodafone Sim card (contract or pay as you go) • 3G coverage

Verdict

Pros Variety of channels; reasonable quality

Cons Few live streams; quality drops on the move

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

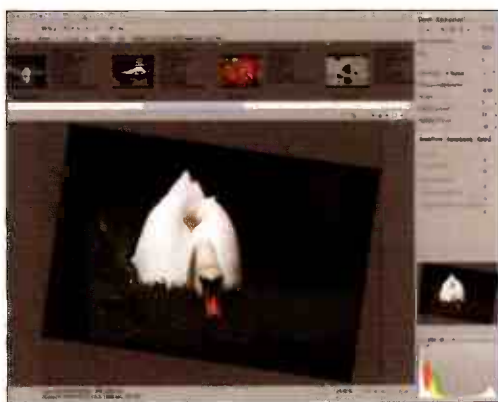
Overall A great way to watch TV on your mobile, but don't expect amazing quality or certain hit shows

★★★★★

IMAGE EDITING

Rawshooter Premium 2006

If you want to take full control of your digital photos, look no further



Rawshooter is a little-known program for editing and converting digital photos shot using the raw file format. The latest version is a more complete editing package than before with many new additions, but you are still likely to require software such as Adobe Photoshop for further editing.

The software is available as an Internet download and was straightforward and quick to set up. It comes with one of the better user manuals we've seen of late,

with a short walkthrough guide and an in-depth manual explaining the more advanced features.

The dropdown menus are icon- rather than text-based and take a little getting used to. You get basic functions aimed at raw files, so don't expect all the options available in Photoshop. You will also need to check online that it supports your camera's raw format.

Once you are used to the interface, you'll be able to adjust white balance, exposure compensation, shadow and highlight contrast, allowing you to fine tune an image. You can straighten wonky horizons, crop and make batch changes to a group of images.

Curves and levels tools, similar to those in Photoshop CS2, are also available, plus you can sharpen an image and suppress noise. There's no way of comparing a photo pre- and post-adjustment simultaneously on one screen, which is a shame.

The real beauty of Rawshooter is that permanent changes are made only to the converted files, saved as tiffs or jpegs. The raw file can therefore be returned to its original state with just one click.

A free 15-day trial is available, and between 15 December and 7 January, PCW readers can buy Rawshooter for a special price of \$69 (approx £40), using the code 'pcwxmas'.

Rob Jones

Details

Price \$99 (approx £57)

Best price www.pcw.co.uk/bestprices

Contact Pixmantec
www.pixmantec.com

System requirements Pentium III 800MHz • 512MB Ram • 250MB hard drive • Windows 2000/XP

Verdict

Pros Easy to use; powerful raw image editor

Cons Some functions are confusing; no simultaneous view of your photos 'before' and 'after' editing

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall A good-quality and flexible image editor, but will only suit those who shoot in raw format

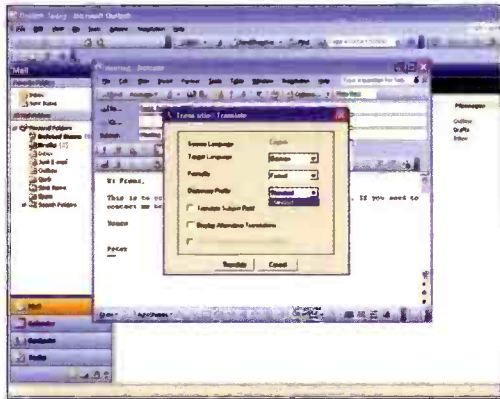
★★★★★



TRANSLATION SOFTWARE

Translution Pro

Converse with foreign contacts in a variety of languages



There are various free translators on the web, but they tend to offer a very basic approach to translation. Since linguistics is about much more than logical grammar patterns, this can cause problems.

Translution Pro aims to put a stop to confusing emails between friends and colleagues. To improve translation in specialist fields, custom dictionaries can be used and you can prevent certain words, such as names from being translated. The result is quick, accurate translations of emails, documents and web pages.

The software allows users to communicate with each other, in various languages, at the touch of a button. For example, a British user writing an email in English to colleagues in France and Spain would simply press the Translution button when sending the email. It will arrive in each recipient's inbox, automatically translated into their language. Similarly, incoming emails are translated into the user's language with a copy of the original attached. Defining the home language of each of your contacts is a laborious, but one-off process.

Translution is compatible with Outlook (not Outlook Express), Word and web pages viewed with Internet Explorer. When translating web pages you have to translate each page individually. An option to translate pages automatically would be useful.

Translution assures us of tight security, although businesses sending highly confidential emails may still be wary of a service that sends email to a third-party server.

Translution Pro translates to and from English, German, French, Italian and Spanish. Further languages, including Chinese and Arabic, will follow over the next 12 months. After a 30-day trial of Translution Pro, a light version can be used for free, offering translation of emails but not documents or web pages. Overall, it's a versatile, if expensive, translation application. *Anna Lagerkvist*

Details

Price £59.95 per year

Best price www.pcw.co.uk/bestprices

Contact www.translution.com

System requirements Pentium III 350MHz or faster processor • 256MB Ram • 100MB hard disk • Microsoft Outlook and Word (2000, XP or 2003) • Microsoft Internet Explorer (5.5 or later)

Verdict

Pros Hassle-free translation; plenty of features

Cons Expensive for home users; no auto web translation

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

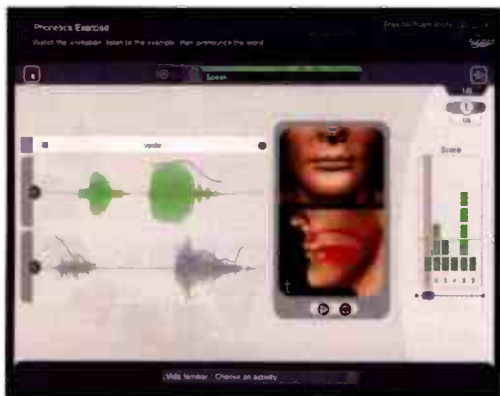
Overall Useful for businesses, but the free version will probably suffice for home users

★★★★★

LANGUAGE TUITION

Auralog Tell Me More

A thoroughly enjoyable way to learn a new language



If you've ever thought of learning a new language but have been put off by high tuition fees or bad experiences with self-teach methods, Auralog's latest Tell Me More series could be just what you're after.

Available in English, Spanish, German, Italian and French, Tell Me More gives you the option of following a set learning path (beginner, intermediate and advanced are available), or selecting the individual parts you want to learn. Most impressively, it can evaluate your grasp of the language and adjust your activities accordingly.

The biggest draw of Tell Me More is the speech-recognition component. Using the provided headset, you'll be asked to read out sentences and join in with conversations. Your pronunciation is graphically displayed in wave form to show you just how close, or far, you are from perfecting the language. It really is the next best thing to having a one-to-one session with a private tutor.

In total, there are 250 hours of exercises contained within the package. These are split into 37 types of activities within six workshops – lesson, cultural, vocabulary, grammar, oral and written. Should you come unstuck at any point, tutors on the Club Auralog website are on hand to steer you in the right direction.

A small but useful feature is the ability to create your own audio CDs using any of the data stored within the program – perfect for learning while commuting.

It's rare we come across a program as in-depth, well-designed, productive and thoroughly enjoyable to use as Tell Me More. When you take into account how much professional tuition costs, the £49 asking price seems very reasonable indeed. If you're just after a basic understanding of a language, the cheaper and less comprehensive Talk To Me series is also worth checking out. *Will Stapley*

Details

Price £49

Best price www.pcw.co.uk/bestprices

Contact Auralog www.auralog.com

System requirements Celeron 333MHz or higher • 128MB Ram • 80MB hard disk • Windows 95/98/ME/XP

Verdict

Pros In-depth; speech recognition; well designed

Cons Sheer depth of information can be intimidating

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall The next best thing to private tuition, and at a fraction of the cost

★★★★★



Samsung recommends Microsoft® Windows® XP Professional



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3D SHOOT-'EM-UP

First Encounter Assault Recon

An edge-of-your-seat FPS with horror elements



Left: Firing weapons in F.E.A.R. feels extremely convincing

Right: Objects in the game react to stimuli as you would expect them to in real life



First Encounter Assault Recon (F.E.A.R.) is one of the year's most anticipated first-person shooters (FPS). It puts you in the shoes of the newest member of F.E.A.R., an elite team of soldiers trained to handle unusual situations.

The action begins as Paxton Fettel, one of F.E.A.R.'s own members, mysteriously goes insane, develops a taste for human flesh and takes control of a battalion of cloned soldiers with whom he has developed a telepathic link.

It's up to you to put an end to this behaviour but, unlike most FPSs, the action in F.E.A.R. is hardly routine. From the off, you'll notice that the game has been heavily influenced by Japanese action and horror flicks, with *The Ring*, and just about anything by famed director John Woo, springing immediately to mind.

The game uses a host of visual tricks to scare you when you least expect it. You'll see split-second appearances of ghostly apparitions and objects falling mysteriously from shelves, while a creepy soundtrack of crying infants and the terrified screams of dying men create a genuinely unnerving environment.

We won't spoil the surprise, but you'll also encounter a creepy little girl named Alma, who – when she isn't using mysterious powers to mess with your head – is ripping soldiers to shreds with just the power of thought.

When the game's unbearable tension isn't making you shudder, its outstanding and frequent combat sequences will have your nerves jangling even more. Unlike many FPSs, firing the weapons in F.E.A.R. is a visceral experience – they're extremely convincing.

Bullets from the automatic weapons fire at an alarming rate, and will literally rip the environment to pieces. Dust, dirt and other particles are kicked up,

chunks are torn from walls, and the game's realistic physics engine means most objects you shoot or touch react as you'd expect them to – for example, enemy soldiers twitching violently in the last throes of death.

When you're not wielding twin pistols, rocket launchers, sub-machine guns, assault rifles and shotguns (plus a couple of extra surprise weapons), you can use some pretty cool combat techniques to dispose of your enemies. Momentarily run out of ammunition and you can use drop-kicks and a hugely impressive scissor kick to take down enemy soldiers.

Arguably your most important tool is your ultra-fast reflexes. If you find yourself flanked from all sides, pressing the Ctrl button slows the game down, creating a Matrix-like bullet-time effect. We've seen this technique used in numerous games, often to poor effect, but it works exceptionally well in F.E.A.R.

Far from being a throwaway feature that makes the game too easy, this slow-motion mode is an essential addition, as the enemy soldiers in F.E.A.R. are extremely clever. They'll hide behind objects while shooting, and will even push over tables or crates to create cover where none is available.

It's not all positive, though. The environments in F.E.A.R. can become rather repetitive, as can the occasional over-use of 'psychological' tricks to scare players. Also of concern is the amount of processing power required to run the game. It is playable on mid-range PCs, but to see it in its full glory you'll need the latest graphics card, plenty of Ram, and a fast CPU.

If you have the necessary hardware, we wouldn't hesitate to recommend F.E.A.R. It's more intense than *Far Cry*, rivals *Half-Life 2* for atmosphere, and is thoroughly engrossing from start to finish. *Rory Reid*

Details

Price £29.99

Best price www.pcw.co.uk/bestprices

Contact Vivendy Universal Games
www.vugames.co.uk

System requirements 3GHz processor • 1GB Ram • Windows 2000/XP/x64 • 64MB video card with T&L (transform and lighting)

Verdict

Overall An atmospheric, enthralling and genuinely unnerving FPS that rivals the best in the genre

★★★★★

FIRST-PERSON SHOOTER

Call of Duty 2

The king of WWII shooters returns for another tour of duty



The original Call of Duty (COD) proved successful because of its terrific level design, atmospheric soundtrack and one of the best multiplayer modes in any first-person shooter – so it's fair to say its successor, Call of Duty 2, has a lot to live up to.

From the outset, it seems little has changed for COD2; you play the game from the point of view of various soldiers representing different allied factions. You start as a Russian soldier fighting off the German

invasion of Moscow, before moving to represent the British Desert Rats in North Africa, finally ending up with the Americans in missions that include a D-Day raid on the cliffs of Pointe du Hoc.

There are notable improvements in COD2. For a start, the game has far better graphics than the original. It isn't as good looking as F.E.A.R (see review previous page), but it incorporates some great spot effects and a more polished overall look.

Other changes include the lack of a health meter. Whereas COD required you to collect medikits from fallen soldiers, getting shot in COD2 simply alters your vision slightly and increases your rate of breathing. Even if you've just taken a bullet to the face, you simply have to find somewhere to rest while your health is restored.

Some gamers may find this factor (plus COD2's lack of a cohesive plot) quite unappealing. However, there are several enjoyable and memorable moments in each campaign and the fairly regular change of scenery as you represent different allied factions ensures you don't get bored with one situation too quickly.

If you liked the original game, you'll love COD2. It doesn't greatly advance the FPS genre, nor is it as good as F.E.A.R or Half-Life 2, but it is certainly one of the best World War 2 FPS games to date. *Rory Reid*

**Details**

Price £44.99

Best price www.pcw.co.uk/bestprices

Contact Activision

www.activision.co.uk

System requirements 1.4GHz processor • 512MB of Ram • Windows 98SE/2000/ME/XP • 64MB video card 1.1pixel shader

Verdict

Overall Doesn't advance the genre as much as the original COD, but is a very worthy successor

**3D ADVENTURE**

Peter Jackson's King Kong

Experience the famous adventure through the eyes of Jack Driscoll and the giant ape himself



Peter Jackson's King Kong is the obligatory tie-in to the forthcoming Universal Studios movie. Most of the game, based in the 1930s, follows the exploits of Jack Driscoll, who travels to the mysterious and previously uncharted Skull Island to film a movie.

Once there he discovers the place is crawling with prehistoric creatures, including dinosaurs and, most notably, an enormous 30ft gorilla called Kong.

Playing as Jack, you'll have to capture Kong and take him back to New York City to be shown to the

public. Somewhat inevitably, though, he escapes and causes havoc in downtown Manhattan.

The game feels very much like a movie – mostly because a lot of it is scripted. In the early stages you almost feel as if you're on rails, going through the motions to reach your next objective.

As Jack, much of the game involves following your team, shooting a few bad things, and moving on to face the next threat lurking around the corner.

This will seriously reduce the likelihood of you wanting to play the game again once you've completed it, but it makes the initial experience quite entertaining.

A few times during the game we were genuinely startled by enemies, which was mostly due to the excellent graphics. All the characters look good and are well animated, and there's even some solid voice acting courtesy of Jack Black and the other members of the film's cast.

In some parts of the game you'll get to play the great ape himself. These sections are among the most enjoyable, but the game's developers have kept this to a minimum in order to promote a feeling of relative helplessness when playing as Jack.

This isn't the best 3D action-adventure game we've played, but it is good fun. *Rory Reid*

Details

Price £34.99

Best price www.pcw.co.uk/bestprices

Contact Ubi Soft

www.ubisoft.co.uk

System requirements 1GHz processor • 256MB Ram • Windows 2000/XP/x64 • 64MB video card with T&L

Verdict

Overall A decent movie tie-in with some enjoyable moments, but you won't want to play it more than once





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**ON TEST**

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Editor's Choice

'With notebook graphics becoming faster and more powerful, we're starting to see laptop gaming on a par with desktops'

The battle of the Titans

Need a laptop with some serious horsepower? Look no further as Luke Peters reviews eight desktop replacement models

Desktop PCs have historically been far quicker than high-end notebooks, but those days are over. The fastest laptops now rival their desktop counterparts for speed in all areas and can handle any application thrown at them. With this in mind, we challenged eight notebook manufacturers to show us their fastest, most powerful laptops.

One thing we discovered when looking round for potential entrants is how much the price has fallen for top-end models. Every laptop here costs less than £1,500, with some even coming in under the £1,000 mark. All bar one of the laptops has a 17in widescreen display, operating at a maximum WXGA+ resolution of 1,440 x 900; making Windows and applications look fantastic.

With notebook graphics also becoming faster and more powerful, we're starting to see laptop gaming on a par with desktops; especially with

the introduction of Nvidia's latest Geforce Go 7800 GTX, one of the PCW 2005 Awards for Excellence winners (see page 120).

Seven out of the eight laptops here also use Intel's Pentium M processor, which is a far cry from the bulky Pentium 4 processors that were used for powerful notebooks not long ago. As well as allowing even the most powerful laptops to be much lighter, mobile-specific processors are much quieter, which is great if you want to use your laptop in an environment where a low noise level is a requirement.

As always, we've tested each machine for its graphics, system and battery performance. However, as these laptops have been designed as desktop replacements, in choosing the winners we've also considered things such as I/O flexibility, ability to upgrade components such as Ram expansion and screen quality.



Acer Aspire 9504

Price £1,299 Contact www.acer.co.uk



Acer has made great inroads recently with affordable, yet good-quality notebooks. The Aspire 9504 is part of the media-centric 9500 series and uses bespoke software to compete with Windows XP Media Center Edition (MCE). Inside the well-designed chassis rests a 2GHz Pentium M 760 processor and 1GB of DDR2 Ram, with Sodimm slots to allow upgrades to 2GB.

Compared to some of the other models here, the 9504 performed well in Sysmark, achieving 164 overall and excelling in office productivity. We have seen other notebooks get scores of over 180, though. Its score of 2,773 in PCmark 05 was almost 1,000 points lower than the Evesham, which highlights the difference in processor speeds.

The 9504 comes with Acer Arcade – a lookalike alternative to MCE. There's a hybrid digital/analogue TV tuner that uses an external aerial. The 120GB hard disk is big enough for TV recording use and the slot-loading eight-speed DVD writer supports most popular disc formats. The dual-lamp Crystalbrite 17in widescreen display is sharp and there are DVI, S-video and VGA ports for connecting to a larger external display. There's also an S-video input socket for connecting external video sources. With 256MB of dedicated graphics memory, 3D performance was good, with a score of 2,744 in 3Dmark05 and an impressive 60.04fps in Far Cry.

There are no prizes for guessing it's a big lump. The full-size keyboard makes it 402mm wide, 40.7mm thick and 3.8kg. There are good I/O connectivity options; five USB2 ports, mini Firewire, an Express card slot and an S/PDIF port. A VoIP headset is also included, along with a software collection and Acer's 'Empowering Technology' software for tweaking system, performance and battery settings.

Verdict

Pros Acer Arcade multimedia suite; hybrid TV tuner; lots of software

Cons Big and heavy; average performance compared to others

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Great for multimedia tasks and offers plenty of disk storage. Super value and all-round good laptop

★★★★★



Multimedia buttons on the front allow you to control Acer's arcade software

Alienware Area-51 m5700

Price £1,399 Contact www.alienware.co.uk



Like many Alienware notebooks, the m5700 looks fairly menacing or, arguably, tacky, with its lid closed. It has raised rubber ridges on either side of the lid and a silver 'alien head' motif in the middle with glowing blue eyes. Inside, the m5700 isn't quite as impressive. The 'Xeno Gray' colour makes the notebook look like more of a business laptop than a powerful gaming machine. Nevertheless, it uses a fast 2.13GHz Intel Pentium M 770 processor, 1GB of DDR2

Ram and 256MB Nvidia Geforce 6800 Go graphics to obtain the second fastest PCmark05 score, a good Sysmark rating and the runner-up prize in the 3Dmark05 test. Battery life isn't bad either, lasting for two hours, 20 minutes running Windows productivity tasks and just over two hours for DVD playback.

Its gaming prowess isn't a patch on the Evesham submission, but this notebook will please all but the most hardened PC gamers. This graphics card also has the benefit of running slightly cooler than the Evesham's faster 7800 GTX, so there's less need for a noisy fan.

There are four shortcut keys towards the top of the keyboard that give quick access to a web browser, media player and email client, while a fourth lets you run the notebook in 'silent mode' by increasing or decreasing the speed of the internal cooling fans. You won't need to run the fans at their maximum speed when using desktop applications; but you will when playing 3D games. The 17in WXGA+ screen is of a good standard – but its native resolution of 1,440 x 900 means it won't fully exploit the potential of the graphics card. There's an optional upgrade to a WUXGA+ screen (£78), which operates at a crisper 1,920 x 1,200.

Connectivity is reasonable for external hardware, with four USB2 and one Firewire port, plus an Express Card slot instead of a normal PC Card slot. The 24/7 freephone technical support is a big plus point.



Verdict

Pros Fast graphics card for gaming; 24/7 technical support helpline; fast system performance

Cons Expensive; styling won't suit everyone

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall A powerful notebook that excels in applications and gaming. With a TV tuner and some decent software, it would have achieved better marks

★★★★★



The silver 'alien head' motif comes as standard

Asus A7VC

Price £1,399 **Contact** <http://uk.asus.com>



The Asus A7VC may be the biggest and heaviest notebook put forward for this group test, but its bulk isn't matched by its performance.

It uses Intel's 1.86GHz Pentium M 750 processor and 1GB of DDR2 Ram, which achieved a PCmark05 score comparable to that of the lightweight Samsung M50 and the cheaper Gateway 8550GB, both of which use a 1.73GHz processor.

Its graphics benchmark results were on a par with what we'd expect from its 128MB ATI Radeon X700 chip. We were left a little disheartened at the 34.41fps score garnered in Far Cry but it proved better than the similarly equipped Gateway.

However, this notebook costs £1,399, so what else does it offer? Well, its media-handling abilities impressed us. Like the Acer, it has a hybrid analogue/digital TV/FM tuner. To receive pictures, just connect the supplied mini-aerial.

It uses Asus' Mobile Theater software to allow PVR (personal video recorder) functionality, but TV reception isn't great with the mini-aerial. You can connect a standard 75ohm coaxial aerial cable via an adapter. The 100GB hard disk is a good size for a notebook with these features and data can be archived to disc using the eight-speed DVD writer.

Five USB ports are located on the rear, which keeps things tidy, and illuminated multimedia shortcut buttons on the front complement the infra-red remote control.

There's no sign of an Express card slot but there's an S/PDIF port for hooking up to a surround-sound decoder; you also get Bluetooth and 802.11g wireless connectivity; and, unusually, parallel and serial ports. A USB mouse and a two-year collect and return warranty are also included in the price.

Verdict

Pros Good hardware and software for PVR functionality

Cons Average system and games performance; bulky and heavy

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Jack of all trades but master of none, it's a little too expensive for what you get in terms of performance

★★★★★



The Asus has handy shortcut buttons for web and email access

Elonex Mediastar 1541

Price £1,398 **Contact** www.elonex.co.uk



Elonex was one of the first UK manufacturers to embrace Windows MCE, so it's no surprise to find that operating system on this notebook. What's better, the quiet 2GHz Pentium M 760 processor and 256MB Radeon X700 mobile graphics should in theory mean less disturbance when watching TV, video or playing games.

Price-wise, though, this notebook is a bit of a mystery. The 15.4in widescreen display is the smallest

here, the 80GB hard disk could have been a bit bigger considering it's an MCE notebook, and it uses 1GB of slower DDR333 Ram, which makes it hard to see where the extra expense is attributed. However, our lab tests put a different skew on things. In Sysmark, it was up there with the best of the bunch, getting a score of 163. PCmark05 and 3Dmark05 found it to be a mid-range performer with scores of 2,810 and 2,401 respectively. The analogue TV tuner means no free-to-air TV channels, but it does come with a tiny adapter for connecting a normal coaxial aerial lead. This is located on the back, along with two of the four USB2 ports. An 802.11g network adapter is built in but there's no Bluetooth.

Design-wise, it looks pretty smart. A huge hinge suggests this notebook won't be losing its display after a few knocks and, at 3kg, it's the lightest notebook here. The display itself feels a little flimsy, but is bright and copes well with moving images. The viewing angle could be better though, as colours and detail fade quickly if you're not dead centre.

Battery life was good, lasting two hours, 27 minutes for DVD playback. Talking of which, there's a dual-layer DVD writer for making backups or creating 8.5GB discs.

Although it performs well, we're still not convinced about the high price. Plus, there's no software included apart from a basic video-editing suite.

Verdict

Pros MCE installed; lightweight and portable

Cons Small hard drive and screen; expensive for what you get

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall For the price Elonex is charging, it could have used a 17in monitor and better components

★★★★★



The Elonex sports a huge hinge

Evesham Voyager C720

Price £1,449 Contact www.evesham.com



Although it's becoming a bit of a mantra, there's still no denying that Evesham offers great value for money when it comes to notebooks.

At £1,449, the Voyager C720 may be the most expensive here, but you get a 2.13GHz Pentium M 770 CPU, 1GB of DDR2 Ram and the fastest graphics card for notebooks currently on the market – Nvidia's Geforce Go 7800 GTX.

Combined, this hardware shone in our benchmark tests, gaining the fastest scores in PCmark05 and 3Dmark05. In fact, the 3D graphics results are the fastest we've ever seen in a notebook, beating the previous top dog, Dell's super-pricey Inspiron XPS.

Needless to say, the Voyager C720 performs just like a high-end desktop computer with all the 3D trimmings switched on. The only drawback is that the 17in display will only support a maximum resolution of 1,440 x 900, which won't push the graphics card to its fullest.

Where design's concerned, it doesn't match the looks of the Acer and Alienware models. At 45mm it's the thickest here and its ports and sockets are positioned around the case with, it seems, no real thought. There's a TV tuner port on the back but it's not connected to anything inside. This is an optional upgrade for those wanting to fit an internal mini-PCI TV tuner card.

The widescreen display has a good viewing angle and is fairly bright – not as good as the Acer or Samsung displays, but perfectly acceptable for general computing. DVI and S-Video sockets are included. A nifty multimedia panel on the front can control media playback too. The 80GB hard disk may sound small for this price but the eight-speed Sony DVD-writer is a useful addition. Plus, it comes with a lot of software and a good warranty to boot.

Personal
Computer
World
EDITOR'S CHOICE

Verdict

Pros Fast processor, superb graphics card; great overall performance

Cons Poor battery life; no TV tuner; heavy

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall Considering the blistering performance, huge screen and rounded feature set, the Evesham's price tag looks like a bargain despite a couple of minor shortcomings

★★★★★



Fast and powerful with a nifty front-mounted multimedia control panel

Gateway 8550GB

Price £950 Contact www.uk.gateway.com



A year ago, a 17in widescreen notebook would set you back £2,000 or more. Now we're seeing sub-£1,000 models from the likes of Gateway, the US company that has recently started selling PCs in the UK again after a long absence.

However, as expected, there are sacrifices, and where multimedia is concerned the 8550GB doesn't match many of the other notebooks here. There's no optical audio output, TV tuner, DVI port or Bluetooth.

It also uses the slowest processor here – Intel's 1.73GHz Pentium M 740 – but thankfully, 1GB of DDR2 Ram helps push things along. The scores in our lab tests suggest this notebook is an average performer. A score of 149 in Sysmark and 2,605 in PCmark05 means the 8550GB will run applications quick enough for most. Image, audio and video-editing professionals will want to look elsewhere, though.

The 17in glossy widescreen isn't as good as Sony's excellent X-Black technology but, for the price, it performs very well. Graphics are provided in the shape of a 128MB ATI Radeon X700. Although the 3Dmark05 benchmark score of 2,396 isn't a patch on desktop PCs and some of the other notebooks here, it's no slouch. The 100GB hard disk is a welcome surprise, though, as is the eight-speed dual-format, dual-layer DVD writer. It's unlikely you'll be lugging this 3.6kg lump around much but, should you need to, this laptop ran for just over four hours in our Mobilemark productivity test, and two hours, 26 minutes in the DVD playback test.

Connectivity options are limited but it does have 802.11g wireless networking, a 4-in-1 memory card reader and a VGA output. It also comes with Works 8, Cyberlink PowerDVD, Nero 6 Suite and a 90-day trial of McAfee Virusscan. Although it doesn't compete on performance terms with the competition, it's still great value for money.

Personal
Computer
World
RECOMMENDED

Verdict

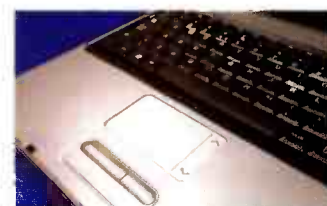
Pros Amazing price for what you get; big hard disk and useful software collection

Cons Mediocre performance; no Bluetooth or TV tuner

Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall If you're willing to sacrifice a drop in speed, this notebook offers fantastic value for money

★★★★★



Two buttons and a trackpad feature on the front of the Gateway

CONNECTING WITH SUCCESS

Today's mobility solutions from HP enable businesses to strengthen bonds with customers, increase productivity, streamline operations and drive competitive advantage.



For many aggressive small and midsize businesses, not being mobile may be the equivalent to marching backwards. These companies realise that their employees' ability to securely access information and transact business quickly while away from the office can give them a competitive advantage. Their logic is simple: mobility leads to productivity, and productivity creates business benefits and value.

Cookie Time is a perfect example of this trend. Based in Christchurch, New Zealand, Cookie Time manufactures, wholesales and distributes the number one biscuit brand in the country. To reach the largest possible marketplace, it uses 44 mobile distributors working a wide range of geographical domains.

A black HP Compaq nx6110 Business Notebook is open, showing a dark blue screen with a few icons. A hand is visible on the right, typing on the keyboard. The background is a blurred office setting with orange chairs and a desk.

HP recommends Microsoft® Windows® XP Professional

EASY ACCESS FOR YOU.

INTRODUCING THE HP COMPAQ nx6110 BUSINESS NOTEBOOK.

You aren't always thinking about protecting your company information. But HP is. Our HP Compaq nx6110 business notebook with Intel® Centrino™ Mobile Technology features exclusive HP ProtectTools, built-in software and hardware working together. So no matter who tries to be you, your HP notebook is made for the real you. And the HP Mobile Data Protection System helps safeguard your hard drive from shocks and bumps. That's data security every road warrior will love. Yet another breakthrough from the HP Smart Office Portfolio.

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A DEAD END FOR ANYONE ELSE.



Smart Advice > Smart Technology > Smart Services

Successful as it is, Cookie Time was not satisfied with the status quo. To maximise the effectiveness of its mobile distribution network, the company turned to HP and HP business partner ROCOM Wireless for an end-to-end mobile printing solution for its distributors' vans.

"Being mobile, we realised that our distributors would certainly be more effective if they had the ability to print and access data on the move," says Chris White, Cookie Time's manager of information systems.

Under the old system, Cookie Time distributors issued handwritten invoices to customers, entered sales details into a book, tallied invoices at the end of the day, then faxed or posted them back to the office. Once at the office, data would be re-entered by office staff.

So Cookie Time enlisted HP's help because, according to White, "HP was top of the list for us as the leader in imaging and printing technology. We naturally turned to HP when it came to looking for a reliable, effective solution that would bring value to our business."

BUSINESS BENEFITS

The resulting mobile digital printing solution consisted of an HP Deskjet 450 infrared- and Bluetooth*-enabled mobile printer installed in each distribution van, as well as SalesLink software for near-real-time access to order processing and inventory update information. Used in conjunction with smartphones, the mobile printers generate invoices and sales reports through infrared connectivity. The solution integrated easily with Cookie Time's existing IT infrastructure, minimising the burden on IT staff.

Says White, "As a robust, fully integrated and economical system, HP's solution has made life simple and has allowed our sales force to be truly mobile. And for its size, the HP Deskjet 450 has delivered on its promise of reliability, page economy and performance."

Cookie Time's business benefits have been many. Distributors save up to an hour a day and minimise inaccuracies, which allows them to spend more time with customers. Perhaps the most productive benefit of the mobile printing system is the ability to gather near-real-time market data that facilitates market analysis, decision-making and inventory planning.

The solution also has direct bottom-line benefits. White concludes, "We believe the benefits of building customer confidence, as well as collecting important sales data for decision making, would help us break even on our initial investments within 12 months and generate incremental sales in the future."

HP'S NEW iPAQ PCs

HP is expanding its mobile offerings, including new and enhanced HP iPAQ Pocket PCs and a mobile printer, to make it easier than ever for active professionals to stay connected and be more productive while on the go.

The introductions include the all new HP iPAQ rx1950 series Pocket PC, a stylish and affordable iPAQ combining integrated wireless* technologies, music, photo and digital video capabilities with a sleek design; an enhanced HP iPAQ hx2000 series Pocket PC, including the powerful HP iPAQ hx2790 with a biometric fingerprint sensor; and the new HP Deskjet 460 mobile printer, making printing from a notebook or handheld easy from virtually anywhere, and upgrades to Microsoft Windows Mobile™ 5.0 for select HP iPAQ models.

"HP is rising to meet the needs of a mobile world that is constantly evolving," said Ted Clark, senior vice president and general manager, Mobile Computing Global Business Unit, HP. "As work and play environments increasingly blend, HP is striving to deliver mobile solutions that address the diverse technology needs of our customers."

* A standard WLAN infrastructure, Wi-Fi Infrastructure, other Bluetooth-enabled devices, separately purchased equipment, and a service contract with a wireless airtime provider may be required for applicable wireless communication. Wireless Internet use requires a separately purchased service contract. Check with service provider for availability and coverage in your area. Not all web content available.

THE IT SIDE OF MOBILITY

Just as important to the success of any mobility solution is the IT side of the equation. IT professionals must deploy reliable, dependable, affordable mobility solutions that enhance the business. These solutions must be a natural extension of existing infrastructure, they must

augment key business applications, and they must be secure, manageable and easy to use. Otherwise, any solution – rather than enabling IT staff to support the needs of the business – will cause integration and support headaches.

One of the keys to the success of the Cookie Time solution was its easy integration with the company's existing IT systems. Another company that's reaping the rewards of an easy-to-use mobility solution is Middleton Lawn & Pest Control of Orlando, Florida.

Middleton has 23 branch offices across Florida to serve its 71,000 customers. In the past, servicing customers involved stacks of paperwork. Technicians created this paperwork in the field and posted it to a district office, where other employees would use it to update the central customer database. The old system also forced managers to wait up to five days for revenue and product-usage data, which negatively impacted customer service.

The company needed a reliable mobile solution that was easy for field technicians to use. It chose the HP iPAQ Pocket PC running FMC Software Solutions' SmartBiz Mobile, an application optimised for the lawncare and pest-control business. Now, when the technicians arrive for work, they download their day's route to their iPAQ devices via a wireless connection. Once they reach their job sites, they have access to all the customer information they need. At the end of the day, the technicians return to the office to upload their data to the company's HP ProLiant servers. That data is available to managers by the next morning.

With its back-office workload reduced 75 per cent, Reynolds estimates that Middleton saves \$10,000 per month, and that the project will pay for itself in less than a year. Since deploying the iPAQ devices, the company has added five technicians and 10 salespeople without increasing the size of its back office staff.

Working with HP reseller and agent PowerOne has helped Reynolds and his staff deploy new HP equipment easily. Middleton purchases equipment directly from HP's website. PowerOne then provides imaging services and delivery of the equipment to Middleton's branch offices, along with warranty support and networking services.

MANY CUSTOMERS, MANY IDEAL SOLUTIONS

Mobility, like most applications, must be shaped by business need – there is no 'one-size-fits-all' scenario. It starts with understanding business needs and objectives. Only then is it possible to determine the right mobility strategies and the right technology fit.

That fit may or may not initially include wireless solutions. As mobile technologies converge and connectivity options become more available, it will be easier to spot the right wireless opportunities. In the meantime, companies should remember that mobility is about solutions and solution providers that address business needs.

TICKET TO SUCCESS

With a long history extending back to 1871, Reading Football Club (RFC) has recently entered an exciting phase as a serious challenger for a place in the Premiership. It can also boast one of the country's most impressive facilities, the recently opened Madejski Stadium.

Today's football fans do not want to queue for long periods at turnstiles. Rapid entry to the stadium is part of the high standard of service that RFC wishes to offer supporters. RFC has become one of a growing number of clubs to install Fortress GB's Smart FC Scheme, which involves the use of wireless-enabled smartcards and smart tickets at automated turnstiles.

To provide fans with additional assistance once inside the stadium, RFC also needed a mobile solution that would enable staff to guide ticket-holders to the right seat.

"Supporters holding smartcards can book their seats over the phone or internet," said IT manager, Garry Hanson. "Because they don't have paper tickets any more, they often need reminding about seat numbers."

A secondary goal of the mobile solution was to help with the checking of cards and tickets for potential fraud. According to Hanson, access control is a major issue for football clubs. For example, one popular scam involves the purchase of child tickets by adults.

To address these challenges, RFC equipped stadium staff with wireless-enabled HP iPAQ H4150 devices that can

check seat numbers and other details by connecting to the Fortress database.

"We chose the HP iPAQ because it was lightweight, well protected and compatible with the Fortress system," said Hanson.

The HP iPAQs link in to a secure WLAN infrastructure whose installation was the



responsibility of ITP Limited. HP ProLiant servers provide the back-end server infrastructure, upgraded by ITP to support the smartcard solution. According to Hanson, these servers were chosen primarily for their reliability and performance.

The project won ITP a 'Technology Innovator of the Year' award from *Computer Reseller News*.

The HP iPAQ solution builds on the benefits of the Fortress Smart FC Scheme by enabling fans to be directed quickly and efficiently to the right seats. The server infrastructure plays an important part in this by ensuring consistently high performance even on the busiest of match-days. Overall, the solution enhances the fans' match-day experience and increases the chances that they will return to the stadium.

Said Hanson, "99 per cent of queries can now be dealt with at the gate rather than sending the customer back to the ticket office. This in turn stops pressure at the ticket office, so that people with queries don't slow down the process of selling tickets to a walk up crowd."

"The solution has been a great success and we are very satisfied with our HP iPAQ devices. Even at the busiest times, fans don't waste time queuing or struggling to locate the right seat," he said.

Another solution HP provides that makes it even easier to stay productive

while on the go is mobile printing tools. Downloadable for free, these include Mobile Printing Software for Pocket PC (www.hp.com/go/pocketpcprint) and the HP Mobile Print Driver for Windows (www.hp.com/go/mpd4w).

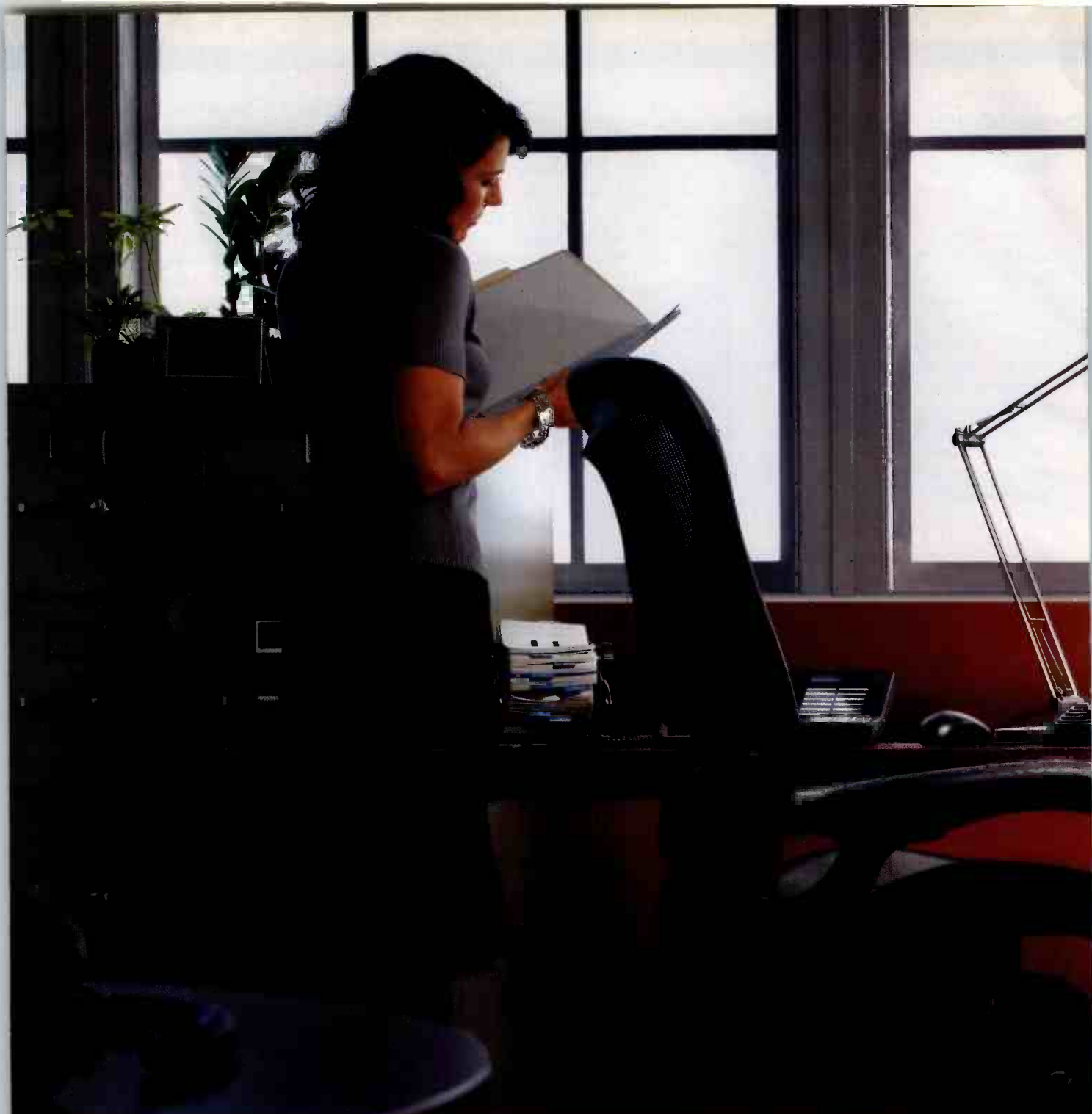
As we've seen, the power behind mobility lies in the ability to change the way work gets done, so employees are more productive and the business gets better results. Here are some common elements that small and medium sized businesses should demand from their solutions and solution providers:

- 1. Simplicity.** As illustrated by Middleton Lawn & Pest Control, easy-to-use solutions can free up IT staff time for more strategic projects. That's why HP mobility solutions offer simple ways for businesses to be more productive – from flexible purchasing options that make solutions easy to own, to local expertise that makes solutions easy to customise and implement.
- 2. Security.** Mobility solutions that don't protect data can jeopardise a business. That's why HP offers safer ways to help control and protect data while mobile. HP offers the latest encryption technology in its mobile devices as well as access controls on many of its products. And HP's PartnerONE network of over 200,000 local experts can help companies find the right security solution.
- 3. Seamless connectivity.** Mobility is all about enabling access to business-critical data. HP solutions provide better ways to connect across voice and data networks through features like self-sensing connectivity. HP also works with over 200 global network service providers, including T-Mobile and Starbucks.

THE HP MOBILITY VALUE PROPOSITION

HP has a vast repository of mobility experience and expertise. Its combination of technology partnerships, product offerings and global channel partners puts the company in a unique position to meet customer needs. HP's portfolio of proven, mobility-enabled products includes desktops, notebooks and handheld PCs, servers and storage systems, and networking and management software





PRESENTING THE HP COMPAQ dc7600 ULTRA-SLIM DESKTOP.

An open cubicle. An unwatched desktop. Sound like a security risk? Not if it's an HP Compaq dc7600 Business Desktop, powered by an Intel® Pentium® 4 Processor with HT Technology. Your data is vigilantly guarded by our exclusive HP ProtectTools. Security features are built into the desktop infrastructure, providing enhanced protection. Access is tightly controlled. Crucial passwords are stored in a secure file. And you can remotely control users' preferences and security settings. Having award-winning HP support available 24/7 further adds to your sense of security. Secure desktops, competitively priced. Yet another breakthrough from the HP Smart Office Portfolio.

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HP recommends Microsoft® Windows® XP Professional



IT MAY LOOK LIKE A TARGET.
IN FACT, IT'S MORE LIKE A VAULT.

Smart Advice > Smart Technology > Smart Services



designed to accommodate mobile customers without increasing IT's workload.

Services are also important. With HP's worldwide network of 70,000 partners, customers can access HP mobility services when and where they need them, from the provider of their choice. Through HP's certification programme, customers can expect consistent, high-quality service.

One company that provides a great example of HP end-to-end expertise and solutions at work is Sebaly Shillito + Dyer (SS+D), a legal professional association in Dayton, Ohio. So-so service, weak product warranties and increasing support costs from its old PC vendor prompted SS+D to seek a better solution.

SS+D turned to HP for a technology update, which included HP servers, notebooks, desktops and Tablet PCs, along with printers, scanners, projectors and networking equipment, all protected by extended warranties. The equipment is leased through HP Financial Services, so technology is kept fresh and payments are predictable.

"The improvements in hardware reliability alone have the potential of making the firm more profitable and more productive for its clients," says Beverly Shillito, SS+D partner.

This level of reliability has not come at the expense of the IT budget. According to SS+D information systems group manager Brian Clayton, "I'm working with nearly the same IT budget we had in 1999, but our production from that budget is probably four to five times what it was. Standardising on HP to update our IT has decreased help desk calls to our department by 75 per cent."

Today, HP mobility solutions are enabling remote and mobile workers to access information and business applications away from their desks. Employees are using this newfound advantage to work more productively, satisfy their customers better, and generate more sales. HP understands mobility. It also knows how to design hardware, applications and services that meet the needs of mobile workers and the IT departments that support them.

SPRING BOARD

Customer service can be a challenge for smaller businesses whose people spend a lot of time in the field.



It can be difficult to respond quickly to customer enquiries while continuing to make effective use of the available time to perform other tasks. For SpringBoard4Business Group Ltd, the solution to the dilemma lies in the innovative use of mobile technology.

The UK-based SpringBoard4Business Group provides corporate customers with training and marketing services. In the past, staff would devote time at the end of each day to dealing with emails and completing activity reports on their laptops. This meant that customers often had to wait until the next morning for a response to their communications.

To provide its field staff with a lightweight, versatile communications solution, incorporating mobile scanning functionality for use by marketing people, SpringBoard turned to HP.

"Our internal IT support function is very limited so it was important to find a supplier able to deliver an end-to-end solution," said Jason Burrows, group MD. "This criterion, coupled with the usability and reliability of the iPAQ range, meant that HP was the only real choice."

The solution is based on HP iPAQ 2210 devices, which link via GPRS handsets to an email and workgroup portal based on Microsoft Exchange. Real-time activity reporting is also enabled, with information entered onto customised forms being synchronised with a central database. Field marketing staff working in retail stores use Bluetooth-based data scanners that

communicate with central systems using the GPRS connection.

According to Burrows, the HP solution is making a big difference to SpringBoard's business by enabling people to respond more quickly to customer communications.

"Judging by the number of emails we receive thanking us for a fast response, customers really appreciate the improvement," he said.

Significant cost savings have also been achieved. For example, the cost of equipping a member of staff with facilities for scanning barcodes has fallen by 70 per cent. Also, real-time activity reporting improves efficiency and reduces administrative expenses. In addition, there has been an unexpected benefit in the form of a reduction of some £2,000 (€2,900) a month in mobile telephony costs due to the increased use of email. These savings already outweigh SpringBoard's initial investment in the solution.

Finally, staff are happier and more motivated because they no longer have to spend an hour or two at the end of every day working on their laptops.

"HP's mobile solution enables us to deliver a better service at lower cost. Given that we operate in a highly competitive market where the margins are narrow, this represents an important advantage," concluded Burrows.

To download a white paper on this topic, visit smartbusiness.vnunet.com



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Hi-Grade Ultinote A9700-3400

Price £998 Contact www.higrade.com



The Ultinote A9700-3400 is the only sub-£1,000 laptop in the group, apart from Gateway's submission. It's also the only model here that plumps for an AMD processor, namely a 2.2GHz Mobile Athlon 64 3400+.

There's 1GB of DDR2 Ram to bolster the processor but our lab results returned mediocre results when compared to the likes of the Evesham and Alienware. Just 1,815 in PCmark05 didn't impress us and suggests

Intel's mobile platform may be a better choice for performance.

The 100GB hard disk is a good size, especially considering MCE is pre-installed. But there's no integrated TV tuner. Instead, Hi-Grade supplies an external Hauppauge Win TV Nova-T-USB 2 digital TV tuner. It works just as well as an integrated tuner, but instantly takes up one of the USB ports – there are five others to work with, though.

The biggest downside is the graphics. The integrated 64MB ATI Radeon 200M just isn't powerful enough to run the latest games at any impressive detail level or resolution and wouldn't even complete our Far Cry frame-rate test. It scored 434 in 3Dmark05, which is by far the lowest score here.

The notebook itself is well designed, though, with most of the I/O connections positioned on the left side of the case. DVI, VGA and S-video ports are available at the back and can be employed if the 17in widescreen display isn't big enough for your audience. There's also an S/PDIF port.

The display is acceptable but doesn't represent colours as clearly or with the convincing detail of the Samsung, Gateway and Acer models.

It does come with the Openoffice suite, which makes it, along with the Acer, one of only two notebooks to supply a full office productivity suite.

Verdict

Pros USB digital TV tuner; Windows MCE and an AMD processor help keep costs down

Cons Underpowered graphics card means games are almost unplayable

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Still cheap for a 17in widescreen notebook but the graphics are a sore point, unless you're not interested in games

★★★★★



Connectivity ports are on the left

Samsung M50

Price £1,399 Contact www.samsung.com/uk



The M50 looks and feels like the most portable notebook here, even if it does have a 17in widescreen display. It may not have the most powerful innards, but credit has to go to Samsung for getting the weight down to an impressive 3kg.

At its heart is a 1.73GHz Pentium M 740 processor, but with only 512MB of Ram we were expecting an impact on its benchmark scores. However, the M50 surprised us by achieving results comparable to several

of the other notebooks here with faster processors and more memory. There are two Sodimm memory slots, so Ram can be expanded at a later date but, for the £1,399 price tag, we expected at least 1GB as standard.

The 128MB Nvidia Geforce 6600 graphics is comparable to a 128MB ATI Radeon X700, which features in many of the other notebooks here. However, the M50 attained the second lowest score in our 3Dmark05 benchmark. It will play games but not at a high resolution or with maximum detail levels switched on.

The display itself is very bright and, at its native screen resolution of 1,440 x 900, everything looks sharp. The thin trim around the screen also gives this notebook a professional no-nonsense air.

The ports and sockets dotted around the case are in no logical order but there is a full size Firewire socket. There's no DVI output, so any external visual connections will have to be analogue, using S-video or VGA.

It does have an integrated 5.1 speaker setup though, which sounded better than any of the other notebooks here in DVD movies and audio, but it still doesn't compare to the 'real' thing. Thankfully, there's an S/PDIF output for connecting to external surround-sound decoders. A multitude of media shortcut buttons around the keyboard make good use of the M50's sleekly designed chassis.

Verdict

Pros Very lightweight and good looking

Cons Only 512MB memory; no digital video output; expensive considering the specification

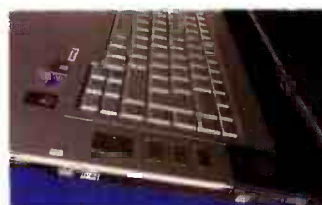
Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall With a faster processor, more memory and a bit more thought, the M50 could have scored a lot higher

★★★★★



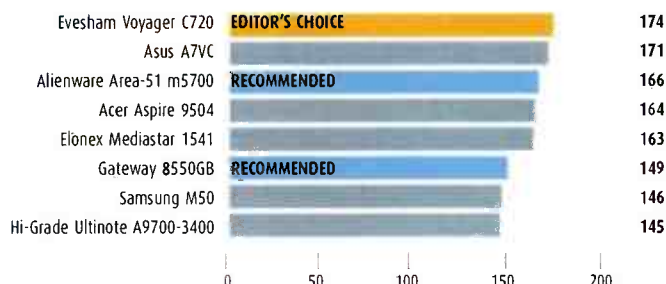
Thin and light but lacking in oomph

Lab results

As these laptops are intended to replace your desktop PC, our labs tests include the Cinebench 3D rendering test, which we'd normally reserve for desktop PCs.

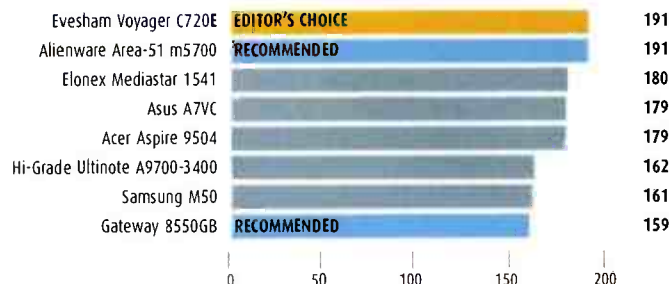
Sysmark 2004 SE (overall)

Bigger is better



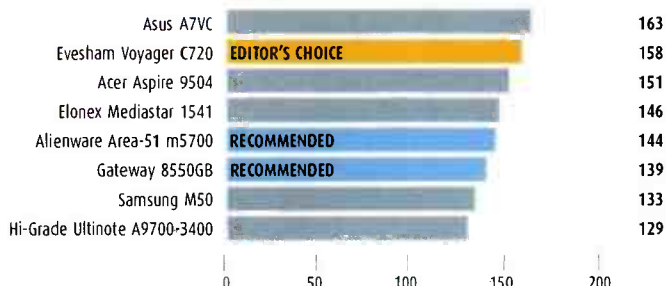
Sysmark 2004 SE Internet content creation

Bigger is better



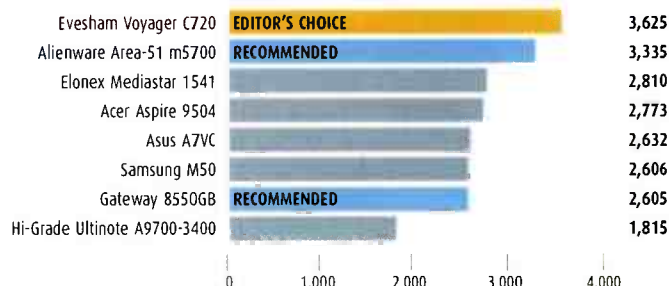
Sysmark 2004 SE office productivity

Bigger is better



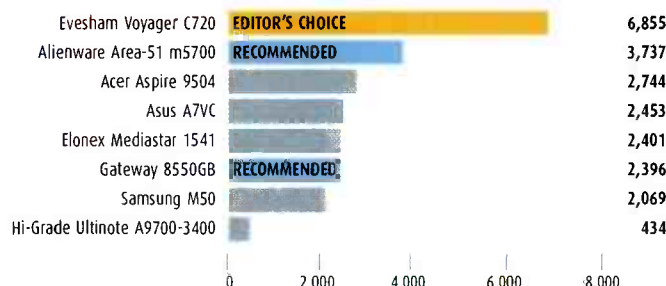
PCmark05 (overall)

Bigger is better



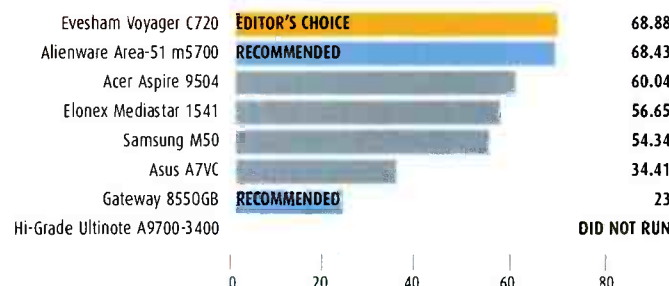
3Dmark05 (1,024 x 768 in 32bit colour)

Bigger is better



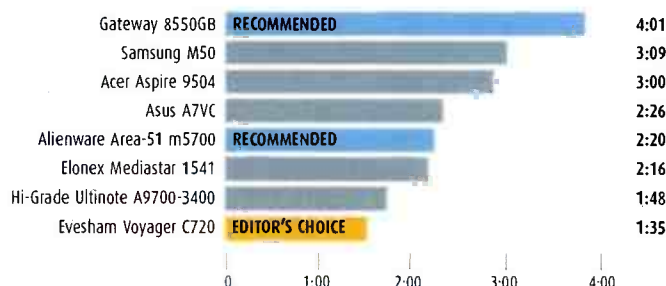
Far Cry (1,024 x 768 in 32bit colour)

Bigger is better



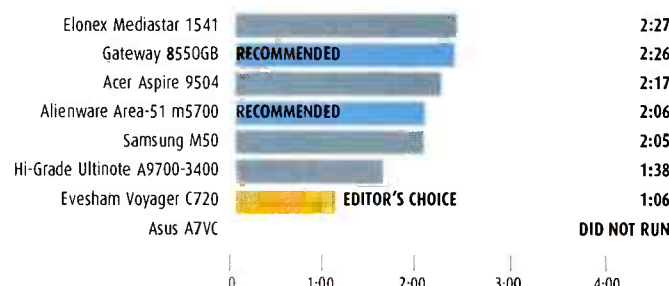
Mobilemark 2005 (productivity) (minutes:seconds)

Bigger is better



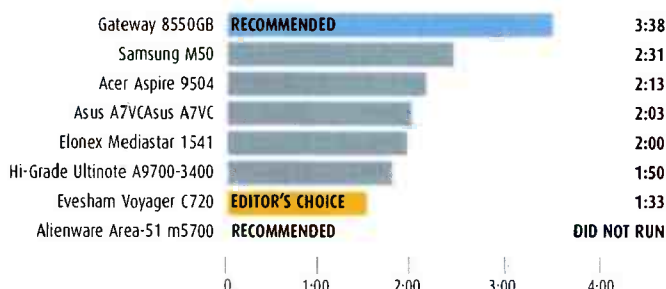
Mobilemark 2005 (DVD playback) (minutes:seconds)

Bigger is better



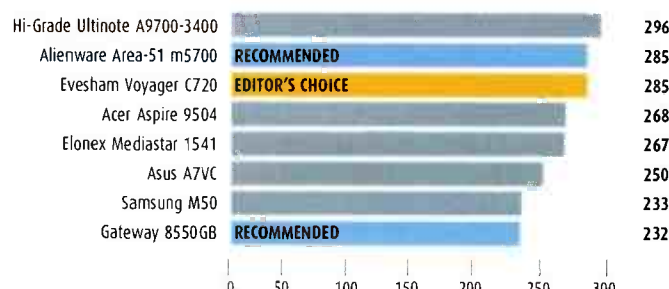
Mobilemark 2005 (reader) (minutes:seconds)

Bigger is better

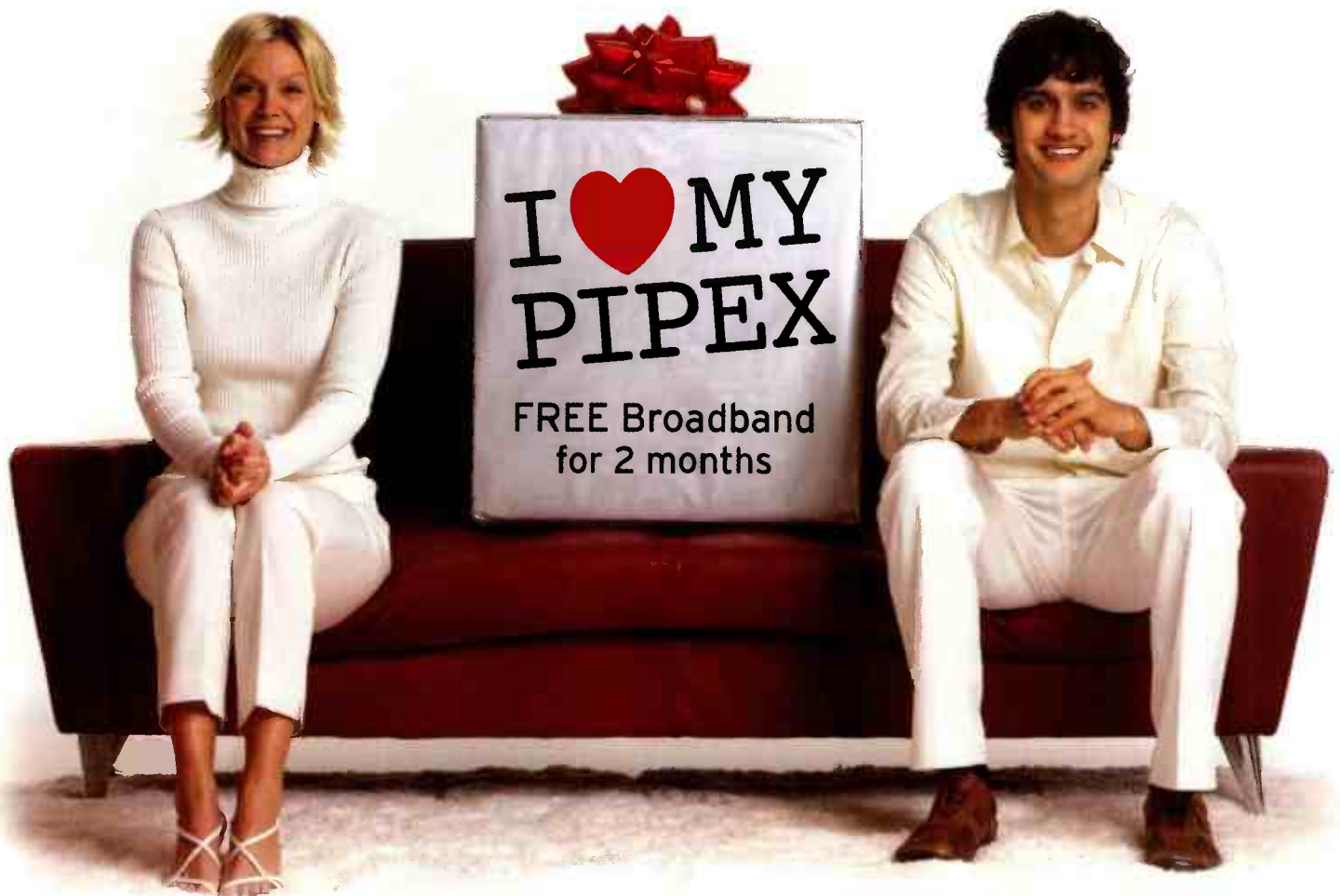


Cinebench (1 CPU)

Bigger is better



Please see page 117 for an explanation of how we tested the notebooks




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From FREE home phone calls to a FREE Golf lesson, the PIPEX Christmas Special has something for all the family. This superfast 2Mb broadband package is just £14.99 a month and includes 2 months of free broadband, a free modem, free set-up and 500 minutes of inclusive home phone calls every month.*

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Desktop replacement notebooks

			
MANUFACTURER	ACER	ALIENWARE	ASUS
Model name	Aspire 9504	Area-51 m5700	A7VC
Price inc VAT	£1,299	£1,399	£1,399
Sales telephone	0870 900 2237	0800 279 9751	0870 900 2237
URL	www.acer.co.uk	www.alienware.co.uk	http://uk.asus.com
HARDWARE SPECS			
Processor	Intel Centrino Pentium M 760 (2GHz)	Intel Centrino Pentium M 770 (2.13GHz)	Intel Centrino Pentium M 750 (1.86GHz)
Chipset	Intel 915PM	Intel 915PM	Intel 915PM
Available memory/type	1GB DDR2	1GB DDR2	1GB
Occupied/spare memory (Ram) slots	2/0	2/0	2/0
Max memory in this configuration	2GB	2GB	2GB
Hard disk manufacturer and model	Seagate ST9100822A	Fujitsu MHT2080BH	Fujitsu MHU2100AT
Hard disk size	120GB	80GB	100GB
No of Express Card slots	1 (Type 54)	1 (Type 54)	0
No of PC Card slots	1 (Type II)	0	1
No of Firewire/serial/parallel/PS/2 ports	1/0/1/0	1/0/0/0	1/1/1/0
No of USB ports	5	4	5
MULTIMEDIA			
Optical drive	Matshita UJ-8450	NEC DVD+RW ND-6650A	TSSTcorp CD/DVDW TS-L532A
Optical drive formats and speed (max)	8x double layer dual format	8x double layer dual format	8x double layer dual format
Sound chip	Realtek AC97	Realtek AC97	Realtek AC97
Graphics chip/memory	ATI Radeon X700/256MB	Nvidia Geforce 6800/256MB	ATI Radeon X700/128MB
Screen size and (maximum resolution)	17in widescreen (1,440 x 900)	17in widescreen (1,440 x 900)	17in widescreen (1,440 x 900)
OTHER INFORMATION			
Misc hardware/modem	Digital & analogue hybrid TV tuner and remote control, 5-in-1 card reader, 2.1 speakers and subwoofer, VoIP, DVI, VGA, S-video, S/PDIF	4-in-1 card reader, V.92 modem, VGA, S-video, S/PDIF	Digital and analogue hybrid TV tuner, 4-in-1 memory card, USB mouse, remote control, VGA, S-video, S/PDIF
Wireless technology	802.11 a/b/g, Bluetooth	802.11 a/b/g	802.11 a/b/g, Bluetooth
Weight (kg)	3.8	3.8	3.9
Dimensions (w x d x h) mm	402 x 286 x 40.7	406 x 290 x 28	405 x 309 x 34
Operating system	Windows XP Home	Windows XP Pro	Windows XP Pro
Bundled software	Acer Empowering Technology, Aspire Arcade, Acer Gridvista, Microsoft Works, Norton Antivirus, Adobe Reader, Cyberlink Power DVD, NTI CD Maker	Nero 6.6, PowerDVD 6, Alienguise	Asus Mobile Theater, Asus LifeFrame
Standard warranty (RTB = return to base, C&R = collect and return)	One-year international traveller's warranty	One year RTB 24/7 freephone technical support.	Two years C&R
SCORES			
Features	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★
OVERALL	★★★★★	★★★★★	★★★★★

Vendors of group test products are only obliged to sell them at the prices quoted here (which include delivery and credit card surcharges) for the life of this PCW issue. They may also change components under certain circumstances.



    				
ELONEX	EVESHAM	GATEWAY	HI-GRADE	SAMSUNG
Mediastar 1541	Voyager C720	8550GB	Ultinote A9700-3400	M50
£1,398	£1,449	£950	£998	£1,399
0870 780 1010	08707 299 785	08705 425 425 (Comet)	020 8532 6111	01932 455 000
www.elonex.co.uk	www.evesham.com	www.uk.gateway.com	www.higrade.com	www.samsung.com/uk
Intel Centrino Pentium M 760 (2GHz)	Intel Centrino Pentium M 770 (2.13GHz)	Intel Centrino Pentium M 740 (1.73GHz)	AMD Mobile Athlon 64 3400+ (2.2GHz)	Intel Centrino Pentium M 740 (1.73GHz)
Intel 915PM	Intel 915PM	Intel 915PM	ATI RS480M	Intel 915PM
1GB DDR333	1GB DDR2	1GB DDR2	1GB DDR2	512MB DDR2
2/0	2	2/0	2/0	2/0
2GB	2GB	2GB	2GB	2GB
IC25 N080A TMR04-0	Fujitsu MHT2080BH	Fujitsu MHU2100AT	Fujitsu MHU2100AT	Fujitsu MHT2080BH
80GB	80GB	100GB	100GB	80GB
0	0	0	0	0
1	1	1	1	1
1/0/0/0	1/1/0/0	1/0/0/0	1/0/0/0	1/0/0/0
4	4	4	6	4
TSSTcorp CD/DVDW TS-L532A	Sony DVD RW Q58A	QSI DVD+RW SDW-082	Sony DVD RW Q58A	TSSTcorp CD/DVDW TS-L632B
8x double layer dual format	8x double layer dual format	8x double layer dual format	8x double layer dual format	8x double layer dual format
Realtek AC97	Realtek AC97	Realtek AC97	Realtek AC97	Realtek AC97
ATI Radeon X700/256MB	Nvidia Geforce Go 7800 GTX/256MB	ATI Radeon X700/128MB	ATI Radeon 200M/64MB	Nvidia Geforce 6600/128MB
15.4in widescreen (1,280 x 800)	17in widescreen (1,440 x 900)	17in widescreen (1,440 x 900)	17in widescreen (1,440 x 900)	17in widescreen (1,440 x 900)
Analogue TV tuner, 4-in-1 card reader, V.92 modem, VGA, S-video	Analogue TV tuner, 4-in-1 card reader, V.90 modem, DVI, S-video	4-in-1 card reader, V.92 modem, S-video, VGA	Analogue TV tuner, 4-in-1 card reader, Bluetooth, DVI, VGA, S-video, S/PDIF, V.90 modem	/5-in-1, V.92 modem, remote control, SPDIF, VGA, S-video
802.11 a/b/g	802.11 a/b/g, Bluetooth	802.11 a/b/g	802.11 a/b/g, Bluetooth	802.11 a/b/g, Bluetooth
3	3.8	3.6	3.6	3
363 x 281 x 30	397 x 293 x 45	408 x 274 x 35	393 x 280 x 38	360 x 265 x 34
Windows XP Media Center	Windows XP Home	Windows XP Home	Windows XP Media Center	Windows XP Pro
Video-editing software	Microsoft Works 8, Roxio Easy Media Creator 7, Bullguard Internet Security, PC Angel, Big Fix Pro Active support	Microsoft Works 8, Cyberlink PowerDVD, Nero 6 Suite, McAfee Virusscan (90-day trial)	Openoffice	Nero Express, Norton Anti-virus, Cyberlink Power DVD
One year RTB	One year on-site, two years RTB	One year RTB	Two year C&R with accidental damage	One year C&R
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

Express Cards will do nicely

Two of the laptops (from Acer and Alienware) featured in this group test have supplemented, or even dispensed with, the traditional PC Card slot with its PCI-based Cardbus interface, and opted for the Express Card slot format. This is the newest standard for plug-in laptop cards formulated by the Personal Computer Memory Card International Association (PCMCIA).

The Express Card interface is a serial bus that connects directly to the computer's PCI Express and/or USB2 host controller, allowing cards to be developed for a much wider array of applications than is possible with the current Cardbus interface. But as with any new format, it's going to take quite a while before the old PC Card slot disappears. At the time of writing Express Cards are very thin on the ground, limited to a handful of Lan and Firewire adapters, plus a couple of memory card readers (you can see a list of certified products at the Express Card website, <http://tinyurl.com/7khpw>). Possibly of more immediate interest to this feature is the newly announced AverTV analogue TV tuner from Avermedia costing around £65. A digital (Freeview) version of this will launch early in 2006.

Express Cards come in two sizes: Express Card/54 and Express Card/34. The numbers refer to the width of the card (see picture). The larger /54 card is the same width as, but slightly shorter than, current PC Cards and has a distinctive notched shape. The smaller /34 card will fit into a slot designed for /54 cards, but not vice versa

The Express Card/34 is on the left, the Express Card/54 on the right. The Universal Express Card slot supports both types of card



– so for maximum flexibility you should look for a 'Universal Express Card' slot which will accommodate both sizes of card. The /34 slot is only intended for ultraportable systems where space is at a premium.

Other advantages of the Express Card format are lower power consumption and a lower cost for manufacturers – as the slot is connected directly to the system's host controller there's no need for an additional bridge chip such as is needed between a PC Card slots and the PCI bus controller. In practice this means one less software driver will be needed and, to the user, the connected devices will appear in Device Manager as though they are integrated onto the motherboard. You can also expect to see Express Card slots appearing in desktop systems – they offer a simple and flexible way for vendors to offer different optional features and let users upgrade a PC's capabilities without even opening the case. And no, Express Card slots are not compatible with PC Cards – so if you've a pile of old PC Cards you might need to pay a visit to Ebay.

Kelvyn Taylor

Editor's Choice

Editor's Choice Evesham Voyager C720

Recommended Gateway 8550GB • Alienware Area-51 m5700



Evesham Voyager C720



Gateway 8550GB



Alienware Area-51 m5700

Opting for laptop over a desktop PC might not strike a chord with veteran computer users. But judging by the benchmark scores and features in some of the models reviewed here, the argument has never been clearer. A 17in widescreen display won't replace your TV, but combine it with Windows MCE or media centre functionality and it could serve as an all-round entertainment and work device for students. Plus, with many offering digital video and audio outputs, hooking them to a larger screen and surround-sound system can be easily done.

We've decided to give our Editor's Choice award to the Evesham Voyager C720. It's the

most expensive but, as a desktop replacement, it's second to none. What really impressed us was its 3D graphics capabilities. The score it achieved left us impressed and cemented the fact that notebook gaming is now on a par with some of the best desktop PCs. How Evesham has also managed to cram in an eight-speed DVD writer, DVI port, plus heaps of software and a great warranty for just £1,449 is beyond us. The only slight downside is the 80GB hard disk, which could fill up quickly.

Our first Recommended award goes to the Gateway 8550GB. This year's resurgence into the UK market has seen Gateway launch some real value-added notebooks. It may not be the

quickest but it will do most tasks without any fuss. The 100GB hard disk was a surprise, as was the extensive software bundle. For £950, this notebook is a real steal. It may not have a TV tuner, but external USB models can be picked up for around £50 and could turn this cheap notebook into a media monster.

Winning the second Recommended award is the Alienware Area-51 m5700, a space-age laptop with great performance and an excellent support package. The styling won't suit everyone, but you do get a machine that's ideal for gamers or power users, with a widescreen 17in display we'd recommend upgrading to the high-resolution version if you've an extra £78 in your budget. **PCW**



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- NVIDIA® PureVideo™ Technology
- Microsoft® DirectX® 9.0 Shader Model 3.0 Support
- PCI Express/Serial ATA 3.0 Gb/s



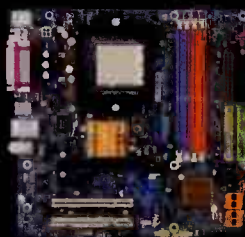
Security DNA

- NVIDIA® RAID & MediaShield™ Function
- NVIDIA® ActiveArmor™ Firewall
- Unique Feature - Xpress Recovery
- Norton Internet Security

i-DNA series

GA-K8N51PVM-T-9 NVIDIA Geforce 6150 Chipset

- AMD Athlon™ 64 X2/ Athlon™ 64 socket 939 platform
- Integrated NVIDIA CineFX 3.0 Graphics Engine
- Supports Dual Channel DDR400 memory architecture
- Supports NVIDIA SATA 3Gb/s and RAID 0, 1, 0+1, 5 function
- Provides world-class HDTV-out functionality
- Integrated Gigabit Ethernet solution with NV Firewall support
- Integrated IEEE1394 FireWire interface



i-DNA series

GA-K8N51GMF-9 NVIDIA Geforce 6100 Chipset

- AMD Athlon™ 64 X2/ Athlon™ 64 socket 939 platform
- Integrated NVIDIA CineFX 3.0 Graphics Engine
- Microsoft® DirectX® 9.0 Shader Model 3.0 support
- Supports Dual Channel DDR400 memory architecture
- Supports NVIDIA SATA 3Gb/s and RAID 0, 1, 0+1, 5 function
- Integrated Gigabit Ethernet solution with NV Firewall support
- Integrated IEEE1394 FireWire interface



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In graphic detail

Rory Reid takes a break from Half-Life 2 to explain graphics technology, SLI and Crossfire and how to choose a card, plus we put 23 cards of varying price and performance levels to the test

While many people hail the CPU as the most important PC component, many more would argue it's the graphics card that is most significant. After all, you probably won't notice the difference between a 2GHz and a 3GHz CPU, but the benefits of a high-end graphics card over a mid-range alternative can be more substantial – particularly for gamers.

It's not just games that require strong graphics performance. The next iteration of Windows, known as Vista, looks set to require fairly powerful graphics acceleration for its optional 3D interface, and even ordinary tasks, such as image and video editing, will place significant demands on your graphics hardware.

The good news is that the graphics card market is saturated with products. The two main players, ATI and Nvidia, offer cards to suit every budget, including motherboard-integrated solutions and discrete cards costing anywhere between £40 and £500.

Unfortunately, the sheer range of cards means that choosing one can be something of

a minefield. To help clear up some of the confusion, we've carried out an in-depth investigation into the graphics card market to help you decide which technology and products are right for your particular needs.

In PCW's Labs we perform benchmark testing on the latest graphics cards as they are launched. We've collated this data on as many cards as we could from all the major suppliers to provide you with an easy reference guide to how they compare – turn to page 94 and 96 for the full test results and specifications for each card. And don't forget you have 24/7 access to the latest test scores on yet more cards at our performance results site at www.reportlabs.com.

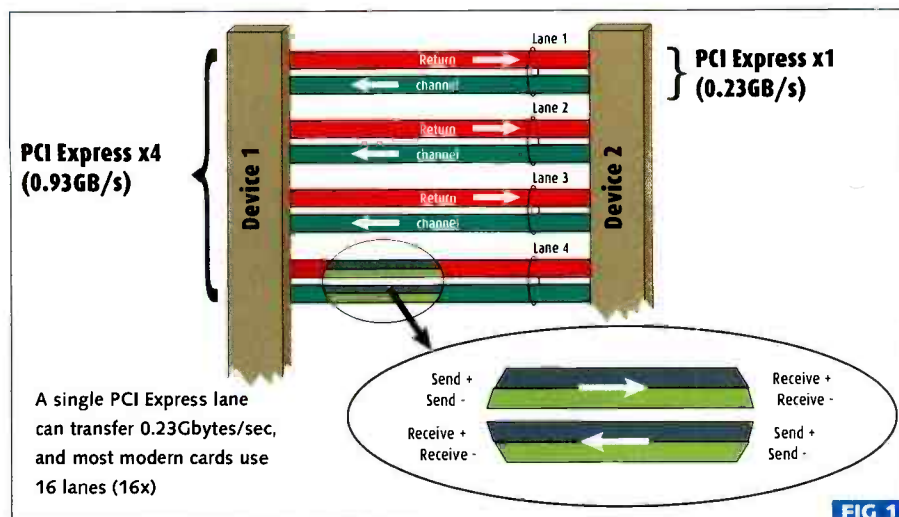
Over the next few pages you'll discover the science behind graphics cards, what factors affect their performance, and whether two cards really are better than one.

We'll even show you how to get the most out of your current card without spending a penny, and explain why some cards are better than others for playing particular games.

ON TEST

- 92** Choosing a card
- 93** Double trouble – SLI and Crossfire in depth
The software
- 94** Features table
- 96** Lab results
- 97** Editor's Choice

'To help clear up some of the confusion, we've carried out an in-depth investigation into the graphics card market'



In the beginning

The graphics card market is the fastest moving area of PC hardware but, like every other aspect of the computing industry, it had humble beginnings. Computers weren't originally designed to display demanding graphics, so the computing industry was content to let the CPU handle both ordinary computing tasks and graphics processing.

However, the demands of PC users have changed radically since the days of Space Invaders. The arrival of 3D games and other graphics-intensive applications means CPUs aren't powerful enough to handle everything. So it is now standard practice to offload graphics tasks to a dedicated graphics processing unit (GPU), leaving the CPU free for other system tasks.

Most people think of ATI and Nvidia as the leading vendors of graphics cards. In the world of high-performance cards, these rivals are certainly dominant, but it is Intel that is king of the graphics chip market as measured by volume shipments. This is solely due to the enormous number of graphics processors integrated directly onto motherboards that use Intel chipsets. These integrated chips will often have no dedicated video memory, but borrow from the main system memory in order to function, which may compromise the rest of your PC's performance.

Integrated graphics processors have historically offered appalling performance compared to their discrete counterparts, but recent chipset developments have allowed for far quicker integrated solutions, the best of which now include their own dedicated video memory.

Intel's Extreme Graphics II and ATI's IGP and IXP solutions are two of the best integrated solutions available at the time of writing. Both are fully compliant with DirectX 9, the latest iteration of Microsoft's low-level application programming interface (API) used for creating high-performance multimedia applications. As a result, they will happily run 3D graphics, even if not at the highest resolutions and detail settings.

While integrated solutions are adequate for casual gamers, more serious players will

prefer a discrete graphics card such as those made by ATI or Nvidia.

Both firms have been responsible for dozens of chip models over the years, but neither manufactures its own chips or cards – they are what's known as fabless semiconductor manufacturers. After the internal design process, standard reference cards are created at specialist third-party fabrication plants (fabs), and the resulting batches are tested and separated into speed bins where they will be classified as, say, an ATI Radeon X1600, Nvidia Geforce 6800 GT, and so on. This ensures your expensive new graphics card performs exactly as it should.

Neither ATI nor Nvidia sells graphics cards directly to the customer. Instead, partners such as MSI, PNY, or Gigabyte will take the reference designs and package and market them accordingly. Most board partners stick closely to the reference design of the chip manufacturers, but they have some leeway to stray from the default specification to differentiate their products.

Some cards, such as the XFX Geforce 7800 GTX, are overclocked as standard, and others, such as the HIS Excalibur X850s Iceq II, use radically different cooling solutions in order to run more quietly than the standard cards or improve their overclocking capabilities.

These deviations from the reference designs are the main reason that otherwise identical cards achieve different performance scores, and explains why lower-rated cards that have been overclocked achieve similar performance to their faster rivals.

CHOOSING A CARD

Interface to interface

There are dozens of cards, each claiming to improve your PC's gaming performance. The first step in picking the right one is to identify which type your PC can accept. The two main connector types are the AGP bus and the more recently introduced PCI Express. These buses determine the speed at which data can be sent to and from the graphics card, which in turn can affect how fast games run.

As the size and complexity of graphics increases, so does the need for a faster means of transferring these images between the graphics card and the rest of the computer. AGP is perfectly capable of handling games with complex graphics as it has a maximum throughput of 2.1Gbytes/sec.

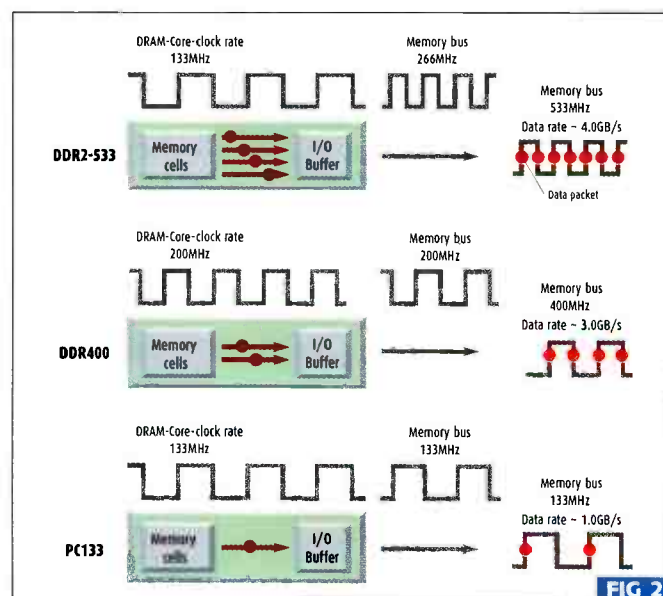
The need for a faster solution mainly arises when you want to carry out tasks such as video editing, which will typically involve larger, more complex images. As a result, graphics card manufacturers have begun developing cards that use the PCI Express bus, which offer speeds of up to 4Gbytes/sec (see figure 1).

GPUs and memory

The speed of the GPU in your graphics card is also important. This varies from card to card, with low-end models typically clocked at around 300MHz, and overclocked high-end cards reaching up to 800MHz.

Like CPUs, the number of transistors on a GPU helps define the processor's level of performance. The speed at which these transistors (miniature electronic switches) turn on and off is dictated by the GPU's clock speed. The more transistors a GPU consists of, and the faster they switch on and off, the faster your GPU is likely to run.

Another significant factor is the process by which GPUs are created. Most are made using



DDR and DDR2 memory relies on buffering to send more than one data packet per clock cycle

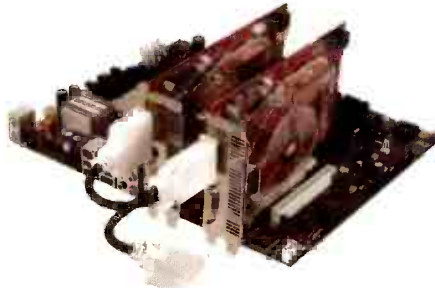
Double trouble – SLI and Crossfire in depth

In the late 1990s, having two graphics cards wasn't unusual. The now defunct 3dfx released a dedicated 3D accelerator card, the Voodoo2, that worked with your ordinary 2D adapter, but the dual graphics card approach disappeared with the emergence of single cards that could handle both tasks.

That's all been turned on its head recently with the advent of Nvidia's Scalable Link Interface (SLI) and ATI's rival Crossfire technology. The former has been around for some months now and works by linking two identical Nvidia cards using an SLI bridge – a small adapter that sits atop both cards.

SLI supports two main rendering methods. The first is a process known as alternate frame rendering (AFR), and involves one card rendering all the odd frames in an animation sequence, and another the even frames. The second, split frame rendering (SFR), allows both cards to render half the same frame, thus halving their workload.

AFR isn't possible in all circumstances, such as when one frame depends on the output of another. In this case, the Nvidia driver will try to use SFR. In our tests, SLI can produce up to 60 per cent better performance than a single



ATI's Crossfire uses an external dongle to connect the two cards – Nvidia's solution uses an internal link between the cards

card. But the benefits of the technology may not be apparent in some games, as it is often left to the Nvidia graphics card driver to decide whether AFR or SFR is the best technique. In some cases (depending on the game) SLI may yield no benefits.

Crossfire, ATI's response to SLI, works in a similar way. According to ATI, Crossfire will work with all games, offering an increase in frame rate or image quality. Unlike SLI, users won't need two identical graphics cards, but if you do have different cards, Crossfire will only work at the speed of the slowest one.

The connection between the two cards is external and resembles a standard DVI cable. Crossfire reportedly supports AFR, SFR and three other techniques: scissor rendering, Supertiling and Super anti-aliasing (SuperAA).

The scissor-rendering model divides the screen horizontally, with one card calculating the upper half of the scene and the other the bottom.

Supertiling is ATI's standard dual card mode and is said to work in all DirectX3D games and applications. The technique works by splitting a single frame into several small squares, with each card taking responsibility for processing an image in each square. The performance improvement seen in Supertiling mode can be minimal in games that don't need a lot of pixel shader processing. In OpenGL games such as Doom 3, Supertiling is completely ineffective.

The final technique, SuperAA, doesn't provide any increase in frame rate, but increases image quality without sacrificing speed. At the time of writing, few Crossfire cards are available, but ATI claims most of its models will support the technology by the time you read this.

a 0.13micron (130nanometer) fabrication process, meaning the transistors on the chip are separated by about one-millionth of a metre. Recently, tighter processes have been introduced for cards such as the 0.9micron (90nanometer) ATI Radeon X1800 XT. A smaller scale fabrication process results in potentially higher performance, lower power requirements and lower prices.

While most integrated graphics cards will borrow from main system memory, mid-range and high-end graphics cards use a type known as Graphics Double Data Rate (GDDR) memory. This is more expensive than standard DDR Ram, as it has lower power and heat dispersal requirements that allows the memory chips to run faster.

Most graphics cards quote their memory as having an effective clock speed, which is usually twice the memory's actual clock speed. This effective clock speed is the result of double data rate (DDR) memory sending two chunks of data over the memory bus during a single clock cycle (double pumped) (see figure 2).

Whereas standard DDR (sometimes called DDR1) memory designed for motherboards runs at an effective maximum of 400MHz, faster DDR2 memory runs at up to 533MHz, and the fastest type of GDDR memory, currently GDDR3, runs at around 750MHz with an effective speed of 1,500MHz.

Having high-speed memory isn't the only concern. As the size and complexity of images in

games increases, so does the need to have a fast and reliable means of transferring those images between memory and the GPU – particularly when running games at high resolution.

The amount of memory bandwidth available to a graphics card is calculated by multiplying the size of the memory bus by the speed of the memory. So a card using a memory bus that is 256bits (32bytes) wide with an effective memory clock speed of 1,500MHz would provide a memory bandwidth of 48Gbytes/sec.

It's all fairly complicated, but what you need to remember is that, all else being equal, the bigger the bandwidth, the less chance there is of having a bottleneck in the graphics card, and the faster your high-resolution games will run.

Pipelines and shaders

When a new graphics cards is released, many reviewers will probably relate the card's number of pixel shader pipelines to its relative performance. So what are they, and how do they work?

A pixel shader is a graphics function that calculates effects on a per-pixel basis. They allow programmers to control the lighting, shading and colour attributes of each pixel in any scene.

Whereas old-style graphics cards could only apply effects to whole entities such as single polygons or textures, pixel shaders can bring a greater amount of surface detail to graphics and provide great freedom to games developers to

help realise their artistic vision. The more pixel shader pipelines a graphics card has, the faster it can apply complicated visual effects to a scene.

Vertex shaders are similar to pixel shaders, except that they work on a vertex-only basis, applying effects to the corners (vertices) of polygons in a scene. They are particularly useful in complicated animations involving facial expressions or skeletal movement.

THE SOFTWARE

Having all this fancy hardware is one thing, but making the most of it is something else entirely. Read the back of any graphics card package and you'll see all manner of clever-sounding performance features that can do more to baffle than enlighten.

The features manufacturers incorporate in their cards mean very little unless games developers take advantage of them. Arguably the biggest differentiating factor is which API a games developer uses to create its game.

Most new titles use DirectX 9 API, including Half-Life 2 and Far Cry, but several titles use the historically popular OpenGL API, including Doom 3. In our experience, games using OpenGL run slightly better on Nvidia hardware, whereas DirectX games tend to fare better on ATI cards.






On the next few pages you'll find the specs of the 23 graphics cards we've tested, plus graphs to show how each of them performed in our benchmarks.

Graphics cards

LOW-END GRAPHICS CARDS

**Personal
Computer
World**
EDITOR'S CHOICE

MID-RANGE GRAPHICS CARDS

					
MANUFACTURER	ABIT	PNY	SAPPHIRE	SAPPHIRE	AOPEN
Product	RX600 Pro Guru	PNY GeForce 6200	ATI Radeon X1300	Sapphire Radeon X550 Silent Cooling	Aeolus PCX 6600GT DV128 Xtreme
Price inc VAT (ex VAT)	£84.59 (£71.99)	£59.99 (£51.05)	£37.99 (£37.86)	£38.54 (£32.80)	£129.19 (£109.95)
Telephone	01438 228 888	01784 225 700	0845 146 1720	01793 423 830	+49 (0) 2131 1243 710
URL	www.abit.com.tw	www.pny.com	www.sapphiretech.com	www.sapphiretech.com	www.planetmicro.co.uk
SPECIFICATIONS					
Interface	PCI Express	AGP	PCI Express	PCI Express	PCI Express
GPU (core code number)	RV380	Nv43	R515	RV370	NV43
GPU clock speed	432MHz	350MHz	450MHz	425MHz	550MHz
Memory size	128MB	128MB	128MB	256MB	256MB
Memory clock speed/effective	270MHz/540MHz	250MHz/500MHz	250MHz/500MHz	264MHz/528MHz	550MHz/1,100MHz
Memory bus size (bits)	128	128	128	128	256
No of vertex shader pipelines	2	3	2	2	3
No of pixel shader pipelines	4	4	4	4	8
DirectX support	9	9	9	9	9
No of DVI/VGA/S-video ports	1/1/1	1/1/1	1/1/1	1/1/1	2/0/1
SCORES					
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
OVERALL	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

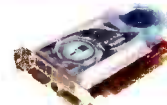
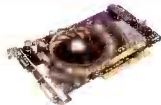
MID-RANGE GRAPHICS CARDS

**Personal
Computer
World**
EDITOR'S CHOICE

HIGH-END GRAPHICS CARDS

					
MANUFACTURER	MSI	NVIDIA	POWERCOLOR	SAPPHIRE	ASUS
Product	NX6800GT-TD256E	GeForce 6800 GS*	X800 GameFX 256	Radeon X800	Extreme N6800 GT
Price inc VAT (ex VAT)	£181 (£154.04)	N/A	£105.87 (£90.10)	£114.99 (£97.86)	£168.72 (£138.53)
Telephone	0870 120 4930	N/A	0870 444 4456	0845 146 1720	N/A
URL	www.msi.com.tw	www.nvidia.com	www.microdirect.co.uk	www.sapphiretech.com	www.asus.com.tw
SPECIFICATIONS					
Interface	PCI Express	PCI Express	PCI Express	PCI Express	PCI Express
GPU (core code number)	NV40	NV42	R430	RV430	NV45
GPU clock speed	400MHz	425MHz	412MHz	412MHz	425MHz
Memory size	256MB	256MB	256MB	256MB	256MB
Memory clock speed / effective	550MHz/1,100MHz	425MHz/1,000MHz	371MHz/742MHz	371MHz/742MHz	500MHz/1,000MHz
Memory bus size (bits)	256	256	256	256	256
Number of vertex shader pipelines	6	8	6	6	6
Number of pixel shader pipelines	16	12	12	12	16
DirectX support	9	9	9	9	9
Number of DVI/VGA/S-video ports	2/0/1	1/1/1	1/1/1	1/1/1	2/0/0
SCORES					
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	N/A	★★★★★	★★★★★	★★★★★
OVERALL	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

* Reference board


AOPEN
ATI
CRUCIAL
GALAXY
HIS
INNO3D

PCX 6600-DV128LP

Radeon X1600 XT*

Radeon X800 Pro

Geforce 6800 Glacier

Radeon X700 Pro IceQ II
Turbo Enabled

Geforce 6800 LE

£107 (£91.06)

N/A

£186.81 (£158.99)

£208 (£177.02)

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PCI Express

PCI Express

PCI Express

AGP

PCI Express

AGP

NV43

R530

R420

NV40

RV410

NV40

300MHz

590MHz

472MHz

351MHz

460MHz

300MHz

128MB

128MB

256MB

256MB

256MB

128MB

350MHz/700MHz

690MHz/1,380MHz

452MHz/904MHz

351MHz/702MHz

452MHz/904MHz

500MHz/1,000MHz

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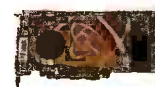
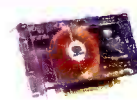
★★★★★

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★★★★★

★★★★★


ATI
GAINWARD
GECUBE
NVIDIA
NVIDIA
SAPPHIRE
XFX

Radeon X1800 XT*

Ultra 3500PCX
Golden Sample

Radeon X800 XL

Geforce 6800 Ultra*

Geforce 7800 GTX
512MB*

Radeon X850XT
Platinum Edition

Geforce 7800GTX

N/A

352.85 (£300.29)

£194.97 (£163.93)

N/A

£429.95 (£365.10)

£309.97 (£263.90)

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www.xfxforce.co.uk

PCI Express

PCI Express

PCI Express

PCI Express

PCI Express

PCI Express

PCI Express

R520

G70

RV430

NV45

G70

R480

G70

625MHz

470MHz

425MHz

425MHz

550MHz

540MHz

450MHz

512MB

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256MB

256MB

512MB

256MB

256MB

750MHz/1,500MHz

650MHz/1,300MHz

574MHz/1,148MHz

550MHz/1100MHz

900MHz/1,800MHz

590MHz/1180MHz

600MHz/1,200MHz

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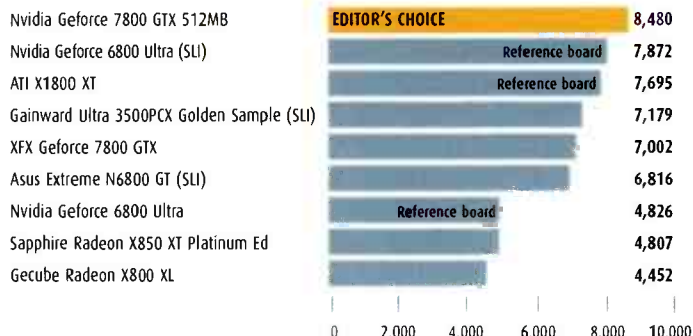
★★★★★

NOTE: Prices correct at time of publication, but may be subject to change. Check for latest and lowest prices at www.pcw.co.uk/bestprices

Lab results

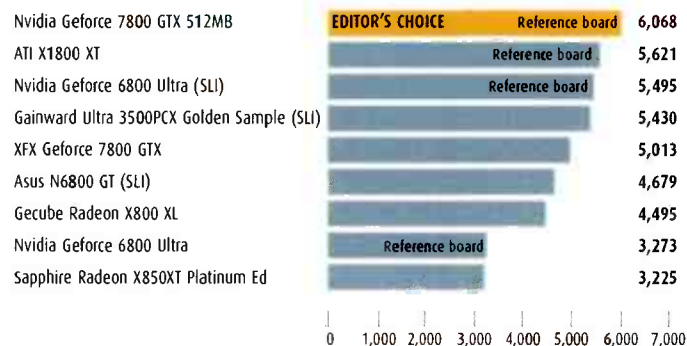
HIGH-END CARDS 3Dmark05 (1,024 x 768 4xFSAA, 4xAF)

Bigger is better



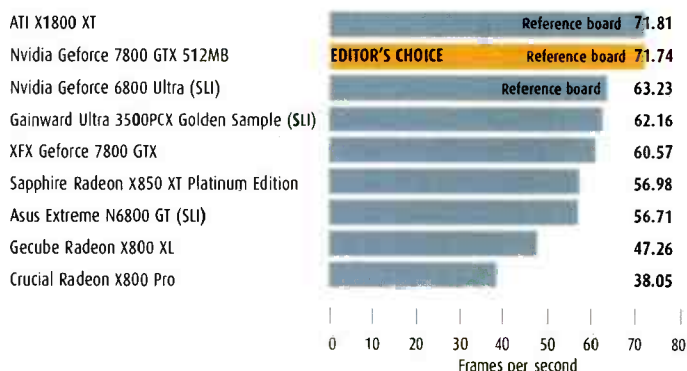
HIGH-END CARDS 3Dmark05 (1,600 x 1,200, 4xFSAA, 4xAF)

Bigger is better



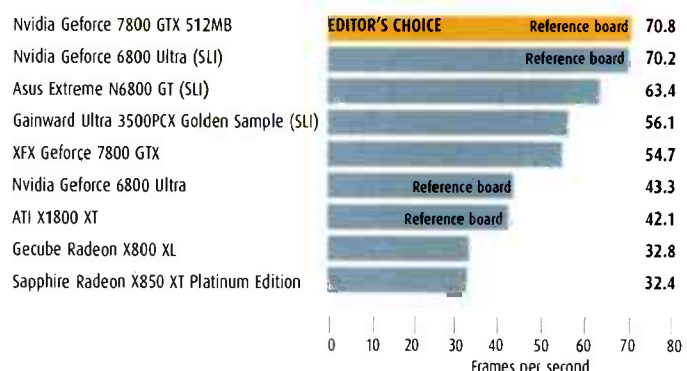
HIGH-END CARDS Far Cry (1,600 x 1,200, 4xFSAA, 4xAF)

Bigger is better



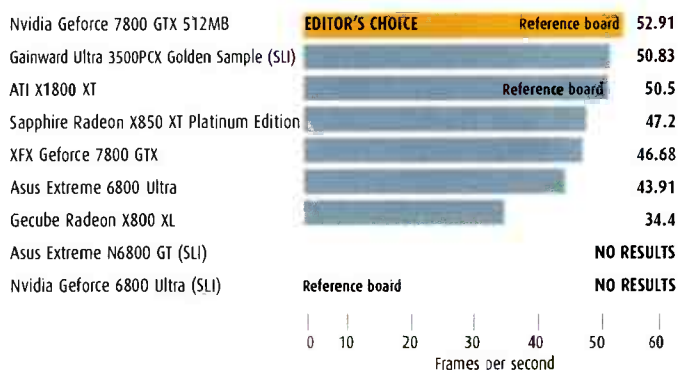
HIGH-END CARDS Doom 3 (1,600 x 1,200, 4xFSAA, 4xAF)

Bigger is better



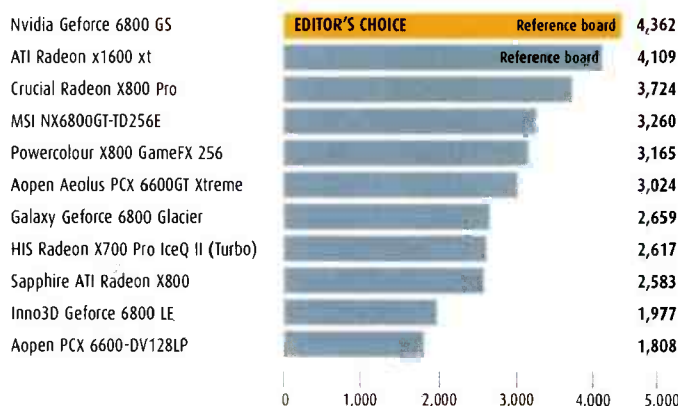
HIGH-END CARDS Half-Life 2 (1,600 x 1,200, 4xFSAA, 4xAF)

Bigger is better



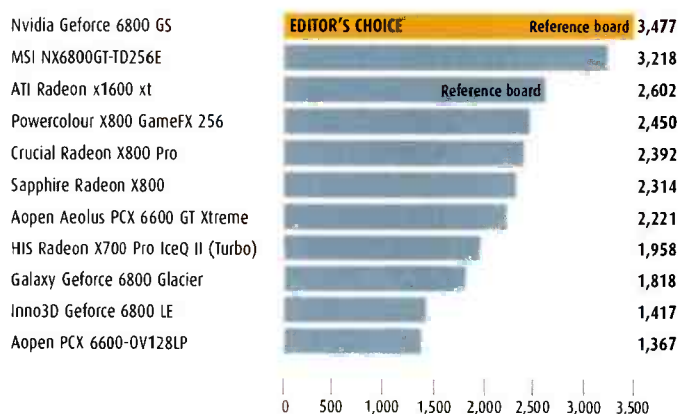
MID-RANGE CARDS 3Dmark05 (1,024 x 768, 4xFSAA, 4xAF)

Bigger is better



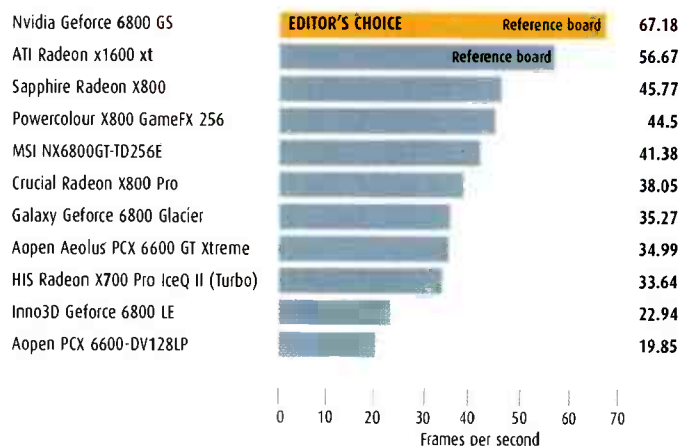
MID-RANGE CARDS 3Dmark05 (1,280 x 1,024 4xFSAA, 4xAF)

Bigger is better



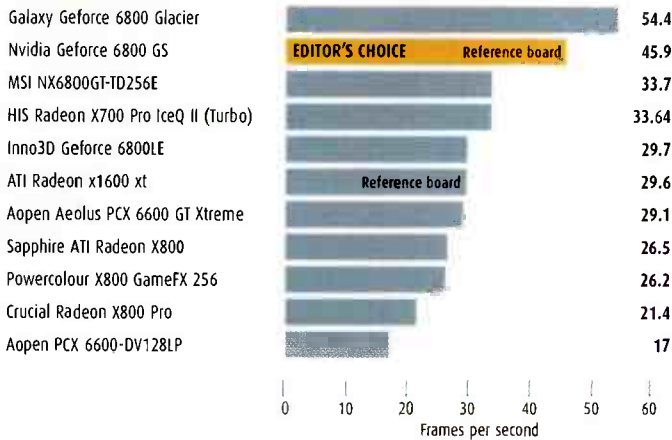
MID-RANGE CARDS Far Cry (1,280 x 1,024 4xFSAA, 4xAF)

Bigger is better



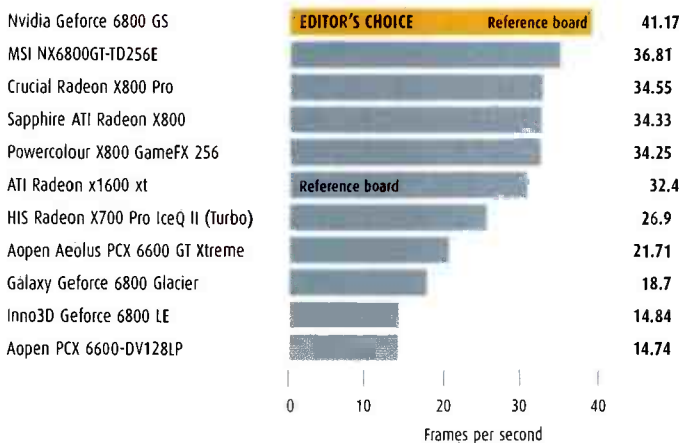
MID-RANGE CARDS Doom 3 (1,280 x 1,024 4xFSAA, 4xAF)

Bigger is better



MID-RANGE CARDS Half-Life 2 (1,600 x 1,200, 4xFSAA, 4xAF)

Bigger is better

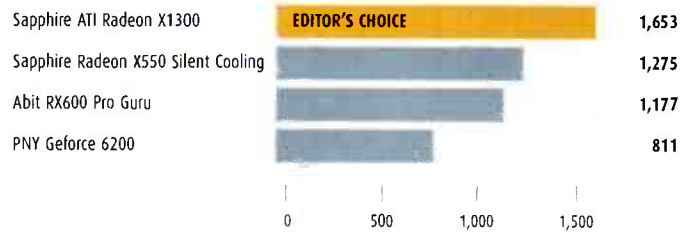


Key

FSAA = full-scene anti-aliasing
AF = anisotropic filtering
SLI = card tested in dual-SLI mode

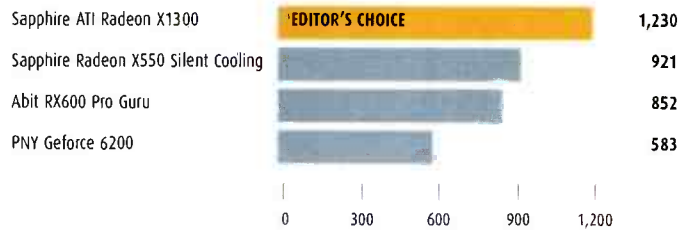
LOW-END CARDS 3Dmark05 (1,024 x 768 4xFSAA, 4xAF)

Bigger is better



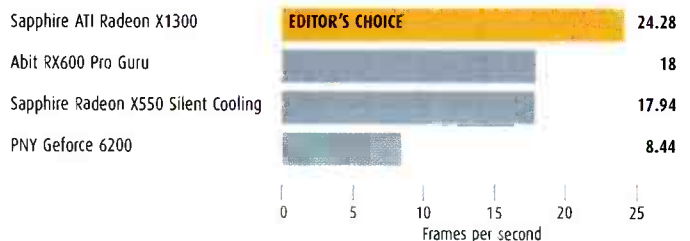
LOW-END CARDS 3Dmark05 (1,280 x 1,024 4xFSAA, 4xAF)

Bigger is better



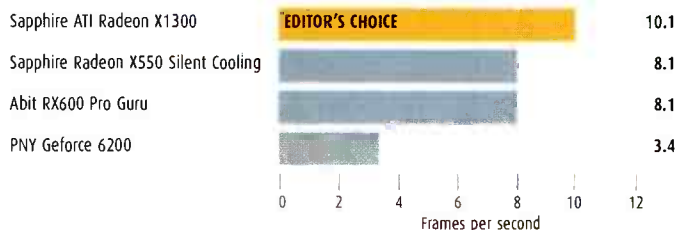
LOW-END CARDS Far Cry (1,024 x 768 4xFSAA, 4xAF)

Bigger is better



LOW-END CARDS Doom 3 (1,280 x 1,024 4xFSAA, 4xAF)

Bigger is better



Editor's Choice

Editor's Choice High end - Nvidia Geforce 7800 GTX 512MB •
Mid-range - Nvidia Geforce 6800GS • Low end - ATI Radeon X1300



Nvidia Geforce 7800 GTX 512MB



Nvidia Geforce 6800GS



ATI Radeon X1300

We've seen from this test that there's a lot to think about when choosing a graphics card. But it's important to remember that cards based on the same graphics chip will usually perform within a fairly narrow range, depending on whether they're overclocked or employ other minor tweaks and tricks to squeeze out a couple more frames per second.

This isn't a standard PCW group test, as we've included some reference cards that aren't

available to buy. So rather than recommending specific brands, we'll give our awards to the technology that best suits the needs of each of the three price/performance categories.

In the high-end/enthusiast category, the brand new Nvidia Geforce 7800 GTX 512MB wins our Editor's Choice award, even though ATI's recently released X1800 XT gave it a good run for its money. If you want ultimate performance and you have deep pockets, look no further.

Nvidia's Geforce 6800 GS is our Editor's Choice for the mid-range category. It's a very quick product that outperforms the competition in most areas, and is a great all-rounder if you can't afford a high-end card. The Radeon X1600 XT is a close second, but it doesn't match the outright performance of its Nvidia rival.

There's plenty to consider at the bottom end of the price spectrum, but our Editor's Choice is ATI's Radeon X1300. It's the only chip worth considering if you're on a very tight budget but still demand acceptable 3D performance.

The graphics card market is a constantly evolving one. ATI and Nvidia play a perpetual game of leapfrog with each other, so there's every chance your new graphics card will be playing second fiddle in just a few months. So bookmark the PCW performance results website (www.reportlabs.com) and keep ahead of the game. **PCW**

Further & Faster

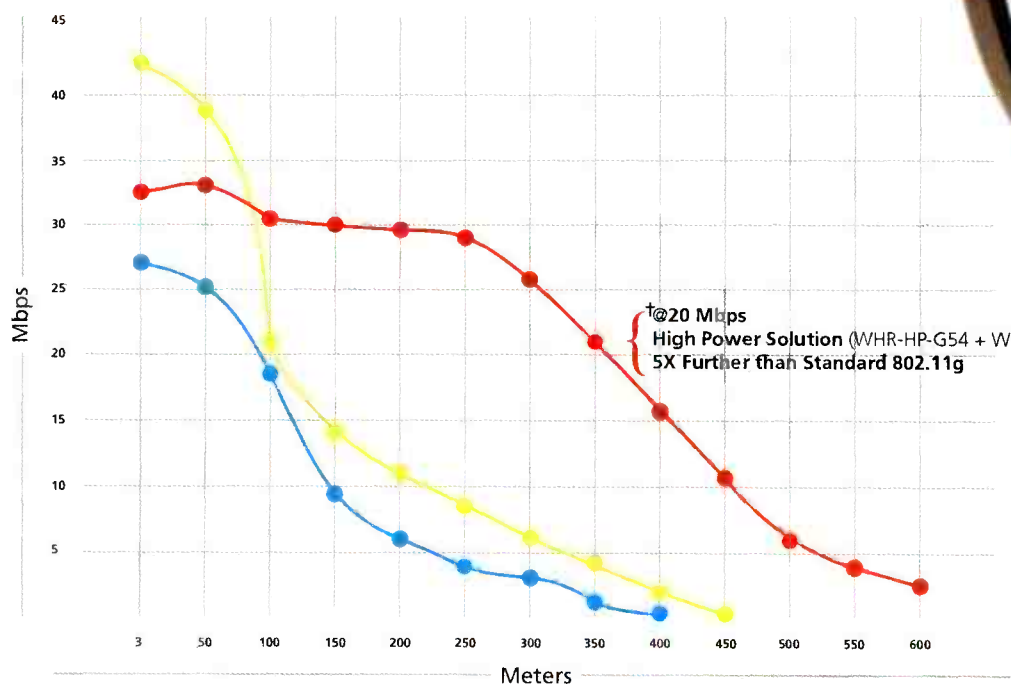
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Go further and faster! Eliminate dead spots while enjoying faster connections and extended range. Combine the new AirStation™ Turbo G High Power Wireless Cable/DSL Smart Router with Buffalo's AirStation™ High Power Wireless CardBus Adapter or Ethernet Converter to achieve ultimate performance for your wireless LAN.




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Products Tested

-  MIMO Solution 1. WZR-G108 & WLI-CB-G108
 High Power Solution (Turbo G) 2. WHR-HP-G54 & WLI-CB-G54HP
 Standard 802.11g 3. WBR2-G54 & WLI-CB-G54S

AOSS[®]

WHR-HP-G54
WLI-CB-G54HP



+Source: Buffalo Internal Testing 2005

PC1 (Client): Celeron 1.6GHz • 112MB • WindowsXP Pro SP1
PC2 (Server): Celeron 1.8GHz • 256MB • WindowsXP Pro SP1
Software: Chariot
PC1 has the wireless PC card, and PC2 is connected to an AP by wire.
Throughput transfer between PC 1 and PC 2 using Chariot (July 2005)
Wireless throughput and distance vary by testing environments.

Having *speed and distance problems* with your current wireless LAN?

If you already have a wireless network at home and are experiencing wireless range and speed problems, *Buffalo has the solution for you.*

★ When compared with standard 802.11g products

Step 1 Eliminate your dead spots by changing your client adapters!

Step 2 Extend range and increase performance even further by changing your wireless router.

Up to **2.1x**★ further than standard 802.11g

WLI-CB-G54HP



WLI-TX4-G54HP



Up to **5x**★ further when combined with Steps 1 and 2

Up to **1.8x**★ further than standard 802.11g

WHR-HP-G54



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ON TEST

- 102** Adobe Premiere Elements 2
- 103** AIST Movie DV 7
- 106** Cyberlink Power Director 5
- 107** Pinnacle Studio Plus 10
- 108** Ulead Videostudio 9

- 110** Table of features
- 111** Optimising video for handhelds
- 112** Editing high-definition video
Editor's Choice

A shift in focus

Whether your video is high definition or low resolution, digital editing is now easier to master than ever. Ken McMahon checks out five of the latest packages which have something for everyone

'The new releases of these applications include ease of use and productivity features, as well as enhancements for the more advanced user'

The way we shoot digital video is undergoing a major change. At one end of the scale, high definition technology promises a four-fold increase in resolution and the kind of quality that was previously only possible with professional broadcast equipment costing tens of thousands of pounds. At the other, the proliferation of video-capable mobile phones, stills cameras, PDAs and other handheld devices heralds an era of go-anywhere, shoot-anything clips which, though of low resolution and sketchy quality, are still worthy of editing. Somewhere in the middle, people are using standard definition DV camcorders to shoot and edit holidays, documentaries, training videos, demo reels and whatever else takes their fancy.

Digital video-editing applications are evolving to keep up with all of these trends. Three of the applications in this group test include support for the new high-definition HDV format (see box on page 112). It's early days, and with camcorders such as Sony's HDR-HC1 retailing at around the £1,000 mark it's not for everyone, but HDV is shaping up to be the future format for consumer digital video. If you shoot video with your mobile phone, or anything else that isn't a camcorder, you can now import, edit and export common formats using these applications.

Perhaps most importantly, the new releases of these applications include a raft of ease of use and productivity features as well as enhancements, such as keyframes, chromakey and picture-in-picture effects, designed to appeal to more advanced users.



Adobe Premiere Elements 2



Price £69.32 Contact www.adobe.co.uk



Left: Premiere Elements 2's revised interface with the new Properties panel and effects thumbnails

Below: DVD menus are now more customisable



When Adobe launched Premiere Elements 1 just over a year ago it got a rapturous reception. After all, here were all the best bits of Premiere Pro, Adobe's professional video-editing application, at a fraction of the cost. But despite Adobe's reputation for easy interfaces and its success with Photoshop Elements, Premiere Elements 1 had the feel of something stitched together and didn't work in the seamless way we expect from Adobe products.

With the release of Premiere Elements 2, Adobe has addressed those issues, extended support for input from video-capable devices other than DV camcorders and enhanced some of the existing features to make them more accessible to first-time video editors.

One of the biggest criticisms of version 1 was the amount of screen clutter generated by seemingly unending floating palettes. The redesigned interface locks all the panels together, so changing the size of one automatically resizes all the others and you can't lose some panels underneath others. This isn't as rigid as it sounds and you can still rearrange the panels by dragging them, but although workspace defaults are provided for capture, editing, titles and DVD authoring, you can't save your own workspace arrangements.

The capture applet has the usual scene detection options and can now be used to capture DV over USB2 from camcorders with a USB port as well as the more usual Firewire link. There's no support for HDV though. Adobe clearly doesn't share the view of Pinnacle, Ulead and Cyberlink that HDV camcorders will quickly drop to a price that will make them affordable for the masses. So, for now at least, if you're an HDV camcorder owner, Premiere Elements isn't for you.

Capture from other devices, such as mobile phones, DVDs and JVC's Everio hard disk camcorders is achieved using a new media downloader applet. This can import, among others .3gp and .3g2 files from mobile phones, mpeg1, 2 and 4, wmv and asf files.

The Effect controls panel has been replaced with a more user-friendly context-sensitive Properties panel. With a clip selected in the timeline you can make tonal and colour adjustments, set position and motion parameters for picture-in-picture effects, adjust clip opacity and change audio volume. There are one-touch buttons for commonly used edits such as opacity and audio fades and 90° rotates for video shot in portrait format. You can also create your own one-touch presets from settings applied using the Properties panel.

DVD authoring provides much better customisation options, but retains the ease of use of version 1. You can now add still or motion backgrounds and buttons, move and resize buttons and reformat text. Text reformatting is done using the Properties panel which has a convenient 'Apply to all' button for making global changes.

If you don't add chapter markers to the timeline prior to DVD authoring, there's nothing on which to base scene selection menus, so the program offers to do it for you. You can subsequently go back and edit these markers on the timeline and it's this kind of integration that makes all the difference when you're new to the process, or are pushed for time.

Other new features include Thumbnail previews for effects and transitions, audio waveform display in the timeline, a new Split Clip button and Project Archiver, which saves all the project resources in one location for easy transportation.

Verdict

Pros Pro editing tools now much more accessible

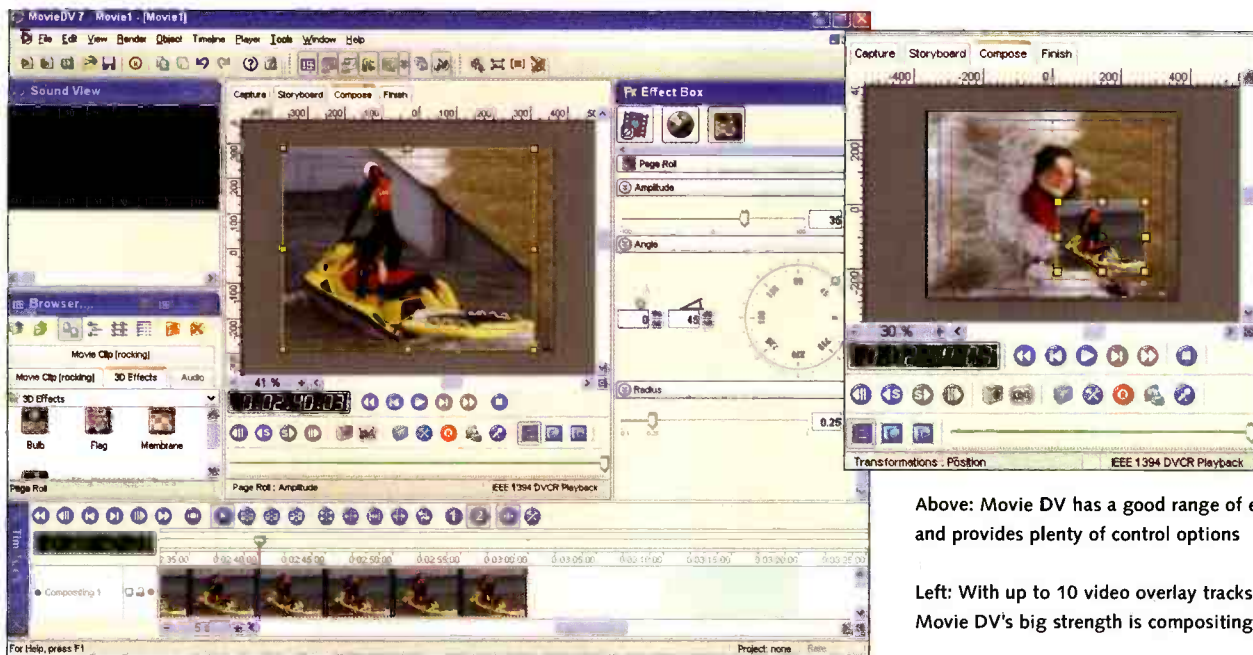
Cons Still a lot for beginners to take in

Features ★★★★★
Ease of use ★★★★★
Value for money ★★★★★

Overall Perfect for those with their own ideas about how their movies should look, but beginners shouldn't be put off
★★★★★

AIST Movie DV 7

Price €65 (£44 approx) **Contact** www.aist.com



Above: Movie DV has a good range of effects and provides plenty of control options

Left: With up to 10 video overlay tracks, Movie DV's big strength is compositing

We last looked AIST Movie DV back in 2004, when it was at version 4, so longstanding PCW readers will have heard of it. AIST is better known for its broadcast video products and, though it doesn't have the level of brand awareness that the other products in this group test can boast, it nonetheless has a very capable video-editing application in Movie DV.

The newly released version 7 looks very different to the version we reviewed two years ago. Gone is the bronze and green colour scheme, replaced by a look more in tune with Windows XP. Fundamentally though, the application hasn't changed in terms of how it works.

What sets Movie DV apart is that, as well as a broad and powerful set of video-editing tools, it places a high priority on compositing – overlaying video and graphics elements and editing the way they interact to produce multi-layered video compositions. In the professional video-editing world, most compositing is done using dedicated applications such as Adobe After Effects or Apple's Shake. While Movie DV's compositing tools don't come close to providing what these applications have to offer, you can achieve some very sophisticated effects that, with the exception of Premiere Elements, are well in advance of anything offered by the other applications reviewed here.

As far as the basics are concerned – trimming clips, assembling in the storyboard or adding them to the timeline, adding transitions and effects and voiceover narration or a backing audio track – Movie DV provides very capable tools but you'll need to have at least some video-editing experience or be prepared to put in a lot of learning time to get the most from them.

The interface is busy but well organised. Like Premiere Elements all windows, including a browser, storyboard, canvas and timeline, are interlocked and resize as a group when you change any one of them. Another similarity with Elements is the Effects box, which works a little like the Properties panel, allowing scaling, positioning and rotation of overlaid clips and other objects.

The storyboard and timeline windows are synchronised and this 'both at once' approach has some advantages over the 'either or' view provided by other applications. As you drop and arrange clips in the storyboard, you can see what's happening to them in the timeline. The timeline itself provides two alternative layouts, a single-track mode which superimposes transitions between abutting clips or A/B roll format which shows the 'internal' timeline with the transition track sandwiched between the two video tracks.

There's a good range of effects and transitions and, given the other advanced aspects of the program, it's no surprise that these can be keyframed. All this functionality comes at a cost – not all editing operations are obvious or intuitive and there is no online help, other than the accompanying pdf manuals. Movie DV would really benefit from a panel with context-sensitive advice on how to achieve common tasks such as adding titles and keyframing effects.

Another drawback for novice editors is that Movie DV has little to offer in the way of preconfigured content. Beyond a few title animations, four static picture-in-picture positions and a handful of effect presets, it's all your own work. A more serious problem for those looking for an all-in-one package, is the lack of any DVD authoring features, though you can save to mpeg2 for authoring with a separate application.

Verdict

Pros Excellent compositing; powerful editing
Cons Steep learning curve; no DVD authoring

Features ★★★★★
Ease of use ★★★★★
Value for money ★★★★★

Overall Good choice for those with some editing experience who are disappointed by what other consumer video editors have to offer

★★★★★

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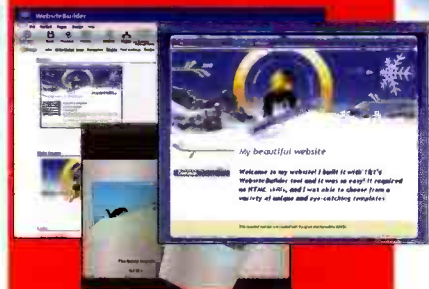
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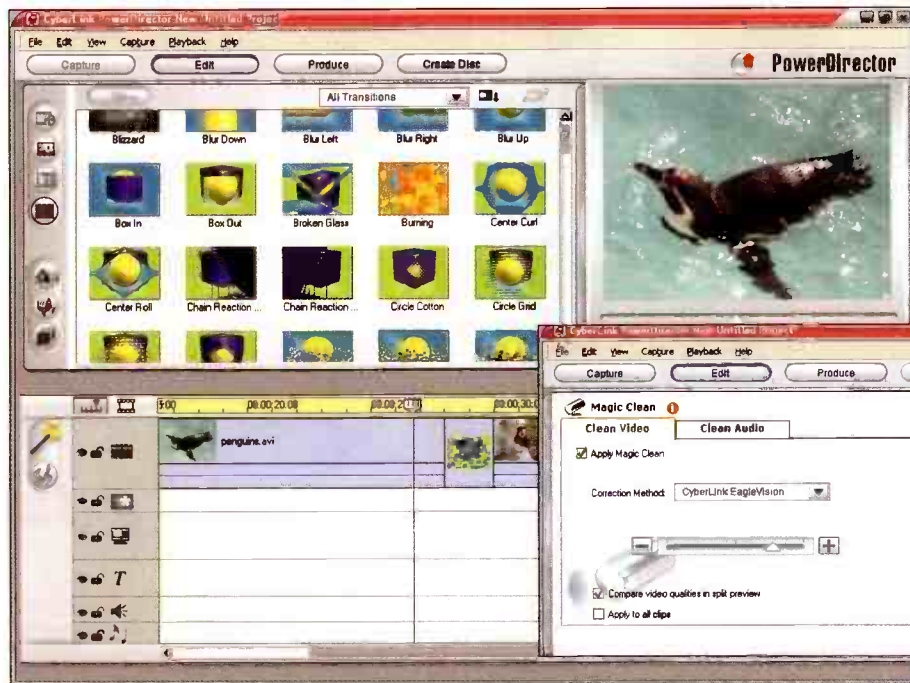
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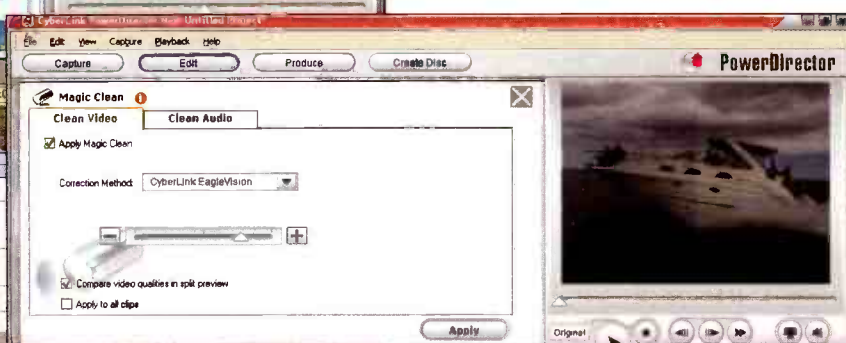
Cyberlink Power Director 5

Price \$89 (download, £51 approx) Contact www.cyberlink.com



Left: Power Director's 'no frills' workspace keeps it simple

Below: Magic Clean spruces up less than sparkling video and audio



Power Director is one of a stable of Cyberlink products that includes Power Producer and Power DVD. Its main selling point is that it's extremely easy to use. It lacks the sophistication of programs such as Premiere Elements, Studio and Videostudio and its interface could be described as 'no frills', but it nonetheless provides everything you need to capture, edit and author DVDs.

The capture module can be used to acquire material from any connected source including analogue ones connected to a capture card, a digital TV tuner, webcam and microphone as well as a DV camcorder of course. HD video can be captured as well as standard resolution DV. There are automatic and manual batch capture modes and you can convert captured footage to mpeg2 on the fly if you plan to record a DVD video.

The workspace adopts what's become pretty much a standard format, with a preview window on top and a timeline/storyboard strip along the bottom. A library window provides access to all your clips, effects, transitions, titles and other resources such as templates, voiceover recording and audio mixing.

The timeline provides four video tracks – a master for your video clips, one for picture-in-picture overlays, an effects track and a title track. There are two audio tracks in addition to the native audio – one for a voiceover recording and the other for backing music.

Power Director automates some processes, providing buttons alongside the timeline/storyboard. Magic Clean is a one-step enhancement filter that corrects tonal and colour problems and can also be used to remove audio noise. Magic Cut requires a little more user input, but effectively makes editing decisions on your behalf based on criteria such as subject

movement, scenes with zooming and panning, or scenes with dialogue. So you could use it, for example, to trim out all the excess footage from an interview. Magic Fix includes a new video stabiliser which reduces camera movement and is useful for handheld shots taken at high zoom magnifications.

Automatic editing of a collection of clips using a style template is not a new idea, Ulead Videostudio has had this feature for a while. Given that Power Director has come late to the party you'd expect its new Magic Style feature to be better than previous efforts, or have something new to offer, but you'd be disappointed.

It's not that it does a bad job, a collection of clips can be quickly and effortlessly turned into a movie complete with transitions, effects, graphic overlays and a backing track, all within a consistent themed style. Options include all the usual suspects including vacation, birthday, romance, baby, wedding and old movie. The fact that the clips remain in their existing positions and lengths restricts the creative potential somewhat, but you can always edit the results to get exactly what you're after. DVD authoring is straightforward, though with little potential for customisation. Before progressing to the DVD authoring module you need to set chapter points, but this can be done automatically at the beginning of each clip or at fixed intervals.

There's a good selection of menu templates which you can modify to a degree – by increasing the number of buttons per page or the button layout – but you can't add a new motion or still background image.

Power Director is an easy program to get the hang of and for beginners it provides a painless introduction. But if you attempt to go beyond the basics you'll quickly find yourself running out of options.

Verdict

Pros Easy to use

Cons Lacks more advanced editing and DVD authoring tools

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall Recommended for novices only

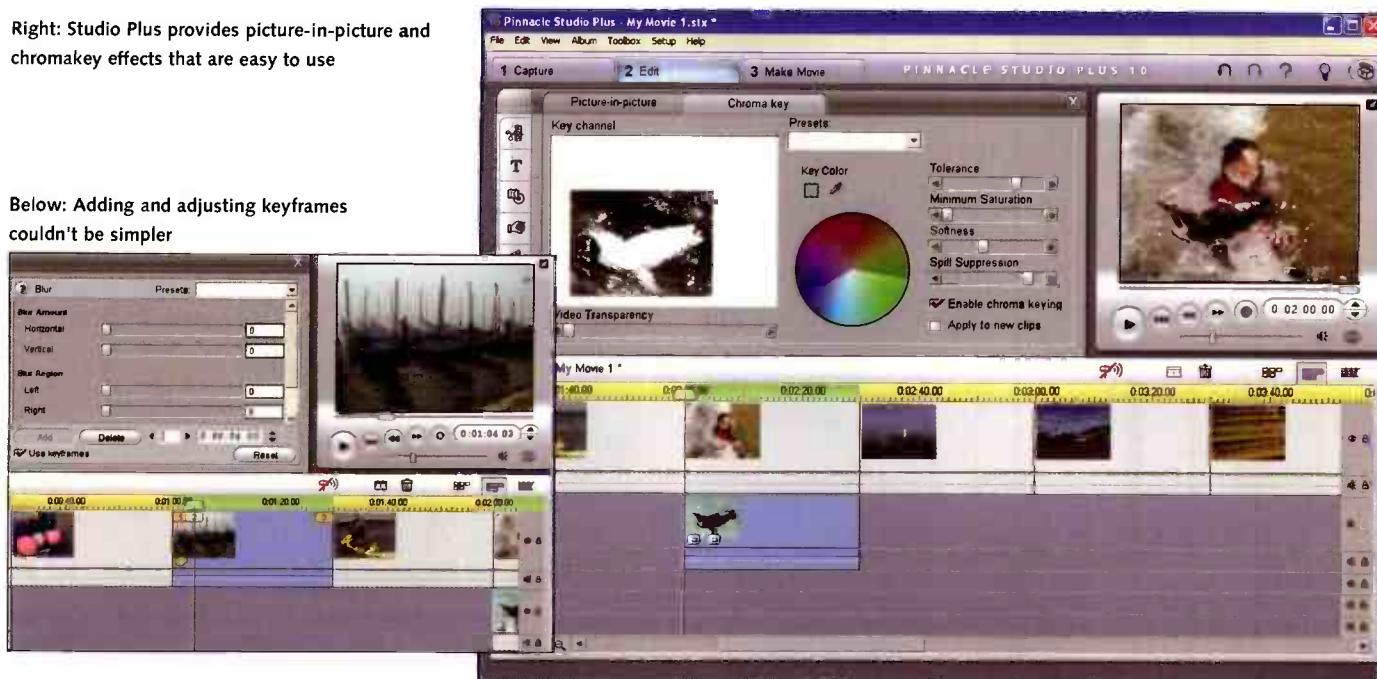
★★★★★

Pinnacle Studio Plus 10

Price £69.99 **Contact** www.pinnaclesys.com

Right: Studio Plus provides picture-in-picture and chromakey effects that are easy to use

Below: Adding and adjusting keyframes couldn't be simpler



Pinnacle Studio 10 is available in three versions – the basic version costs £49.99; Studio Plus (reviewed here), offers additional features including picture-in-picture overlays, chromakeying, speed adjustments and more versatile DVD authoring; and Studio Media Suite which includes extra photo album, audio-editing and DVD burning applications.

The studio interface uses tabbed panels to split the process into three stages – capture, edit and make movie. In Edit mode an Album provides access to your captured clips as well as transitions, titles, DVD menu templates, sound effects and other resources.

The movie window can display a storyboard or timeline view and there's also a text view option which simply lists the clips in sequence. The Player sits in the top left corner of the screen and can be expanded to provide full-screen playback.

One of Version 10's new features is real-time full-resolution previews. The success of this feature will depend to a large extent on the capabilities of your CPU and GPU, but on our test system this proved to be a disappointment with frames being dropped by the handful. Even with no effects applied playback was less than smooth, but this may have been a consequence of graphics card incompatibility.

On installation Studio warned that it couldn't run 3D video hardware acceleration on our Matrox P750 graphics card. That said, we don't see how this should adversely affect playback of unedited clips which wasn't a problem with any of the other applications. The dual screen output which diverts video previews to a second monitor worked very well, however.

One of the advantages of the Plus version is that it includes an overlay track which allows you to create

picture-in-picture and chromakey effects. These features alone are well worth the additional £20 and, unless you only want to do very basic editing we'd strongly recommend going for the Plus, in preference to the basic edition.

The chromakey filter is extremely simple to use; specify the colour you want to remove using an eyedropper, then fine tune the result using four sliders to control tolerance, minimum saturation, softness and spill suppression.

Studio has an extensive collection of effects and transitions. These include Stabilize, which effectively reduces the effects of camera shake, and Speed, which can slow down the action to a tenth of the normal speed or speed things up by a factor of five. The excellent Hollywood FX suite, which provides big scope for customisation is also included.

The fact that you can now use keyframes to modify effects over time means this new version provides more scope than ever for effects customisation. While they lack the sophistication of Premiere Elements keyframes, Studio's are exceptionally easy to apply.

Like Premiere Elements, Studio offers to create chapters for you when creating DVD menus and allows you to specify a minimum chapter length. DVD authoring is about as integrated as it gets, with the DVD menu added to the video-editing timeline. There's a good range of templates with ample opportunity for customisation, but occasionally holes appear in the interface. Some people may know what to do when presented with an alert box saying 'At least one VOB undercuts the minimum VOB length. DVD creation will not be possible', but most won't and, what's more, shouldn't have to.

Verdict

Pros Easy to use; good range of keyframable effects

Cons Sluggish; realtime preview only works with certain graphics cards

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall Good ease of use/power balance, but rough round the edges in places

★★★★★

Ulead Videostudio 9

Price £49.99 Contact www.ulead.co.uk



Left: Videostudio's picture-in-picture effects come with a wide range of animation presets

Below: New mask transitions with potential for customisation



The first thing to say about Videostudio 9 is that it really is very easy to use. Of all the applications reviewed here, only Videostudio really feels comfortable on a 15in display at a resolution of 1,024 x 768. Some applications cram window upon window into the workspace, which means you get plenty of tools, if you can find them. By contrast, Videostudio manages to comfortably accommodate a library panel, timeline/storyboard, an Options panel, and still find room for a massive preview window in the middle.

One reason it can do this is that it breaks the editing process into no fewer than seven discrete tasks – Capture, Edit, Effect, Overlay, Title, Audio and Share – the tools for which are accessed via a tabbed panel arrangement at the top of the screen.

This version of Videostudio adds two new capture tools, Quick Scan and a DV-to-DVD wizard. The first provides a quick perusal of all the clips on a tape, so you can choose which ones to capture, rather than the usual grab everything approach. Requiring even less effort, the wizard uses Quick Scan as the first step and virtually automatically takes you from there to a finished DVD complete with scene-based menus, titles, transitions and backing music.

If you prefer to get a little more involved in the process, you can assemble clips on the storyboard and add transitions in the edit tab. These tabs don't actually confine you to a single activity, they just ensure the right tools are available.

Clicking the title tab, for example, displays title styles in the Library and editing and animation options in the Options panel, but you can also select titles from the library pulldown menu.

In addition to the video track, Videostudio has an overlay track, for picture-in-picture and new chromakey effects, a title track, a voiceover track and a track for background music. In previous editions, keeping all these tracks synchronised could be problematic, but a new Ripple Edit mode allows you to make adjustments to one track while keeping everything else in sync.

There's a fair degree of scope for animating things such as titles, picture-in-picture overlays and other effects via the Options panel. Mostly, these are presented as ready-made presets, but they are incredibly easy to apply and there are plenty to choose from.

You can, for example, have picture-in-picture overlays and titles enter or exit from any direction and titles can be paused, so they are stationary for a short while, before exiting. Another title enhancement allows you to overlay several titles at once and apply different type and animation styles to each one. Some effects also offer keyframe control.

Videostudio has always been well endowed with a good range of effects and transitions and these have been supplemented by new mask transitions. These use a separate bitmap file to produce soft-edged wipes that are a lot more interesting than the usual barn door, push, pull and wipe style transitions you normally see. There's scope for customisation here as you can use your own bitmaps to create new transitions, though no information is provided on how this works.

There are lots of other additions and enhancements including new audio filters, support for animated Flash overlays, motion DVD menus and extended file import compatibility.

Verdict

Pros Very easy to use; good range of effects and transitions

Cons Limited customisation options

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall Top choice for the inexperienced, but more ambitious users could quickly outgrow it

★★★★★

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MANUFACTURER	ADOBE	AIST	CYBERLINK	PINNACLE
Product	Premiere Elements 2	Movie DV 7	Power Director 5	Studio Plus 10
Price	£69.32	€65 (£44 approx)	\$89 (£51 approx)	£69.99
Telephone	020 8606 4001	N/A	N/A	N/A
URL	www.adobe.co.uk	www.aist.com	www.cyberlink.com	www.pinnaclesys.com
FEATURES				
Minimum system requirements	CPU must support SSE2*, Windows XP Professional, Home or Media Center Edition with SP2, 256MB of Ram, 4GB available hard disk space, DVD-Rom drive, 1,024 x 768 16bit (XGA) display, DirectX 9 compatible display and sound drivers	Intel Pentium III/AMD Athlon 800MHz or higher (Pentium 4 recommended), Microsoft Windows 2000 SP4 or XP SP1, 256MB (512MB or more), 600MB free disk space for installation, CD-Rom drive, 32bit graphics card with OpenGL support, OHCI-compatible Firewire port to capture from digital sources, soundcard	Pentium 4 2.2GHz or compatible, Windows XP (SP2 required for HDV capture), 1,024 x 768 16bit display, 256MB of Ram, 5GB of free hard disk space	Intel Pentium or AMD Athlon 1.4MHz or higher, Windows XP, 512MB of Ram (1GB required for HD), DirectX 9 or higher compatible graphics card with 32MB VRam (128MB required for 720p HD, 256MB required for 1,080i HD), DirectX 9 or higher compatible soundcard, 1GB available hard disk space, DVD-Rom drive
CAPTURE				
DV capture/DV over USB2 capture	✓/✓	✓/x	✓/✓ (detected as webcam)	✓/✓
Analogue capture	✓	✓	✓	✓
Video import formats	avi (inc DV avi), DivX, mpeg1, mpeg2 (including .vob and .mod), 3GP, mov, wmv, asf	mpeg1, mpeg2, avi (inc DV avi) wmv, mov, DivX, gif, DIB	DV avi, HD mpeg2, DVR-MS, mpeg1, mpeg2, vob, vro, wmv, wmv-HD, mov, mod, DivX	avi (inc DV avi), HDV, mpeg1, mpeg2, DivX, mpeg4, wmv
Scene detection/HDV capture	✓/x	✓/x	✓/✓	✓/✓
VIDEO EDITING				
Overlay/picture-in-picture	✓	✓	✓	✓
Max video tracks	99	12 (compositing + A/B)	4 (video, effects, PiP and titles)	3 (video, overlay, titles)
Max audio tracks	99	8	3 (recorded with video, voiceover, music)	4 (recorded with video, voiceover, sound effects, music)
Colour adjustment/Slow/fast motion	✓/✓	✓/✓	✓/✓	✓/✓
Auto-editing wizard	x	x	✓	✓
Still image slideshows	✓	x (can import still images to timeline)	✓ (Magic Motion)	✓
Chroma-key/Effect plug-ins	✓/✓	✓/✓	✓/✓	x/✓
HDV editing/16:9 widescreen	✓/✓	✓/✓	✓/✓	✓/✓
Custom effects/transitions/Keyframes	✓/✓	✓/✓	✓/✓ (audio only)	✓/✓
Video output formats	mov, avi (inc DV avi) Windows Media, mpeg1, mpeg2,	mpeg1, mpeg2, avi (inc DV avi) wmv, mov, DIB, Flash, gif,	mpeg1, mpeg2, DV avi, DivX, mpeg4 avc, mpeg4 SP, wmv, Realvideo, mov	mpeg1, mpeg2, mpeg4, avi (inc DV avi), DivX, Realvideo 8, wmv, 3GPP
Frame grab	✓	✓	✓ (trim)	✓
Preset/customisable workspaces	✓/✓	x/✓	x/x	x/x
TITLING & AUDIO				
Titling editor	✓	✓	✓	✓
Preset/custom text effects	✓/✓	✓/✓	✓/✓	✓/✓
Preset/custom title animation	✓/✓	✓/✓	✓/✓	✓/✓
Audio import formats	mp3, aiff, wma, wav, Dolby AC3 (stereo)	CD Audio wav, wma, mp3, ogg	wav, mp3, wma	wav, mp3
Audio mixing/effects	✓	✓	✓	✓
Timeline waveform display	✓	✓	✓	✓
Rubber banding/Voiceover recording	✓/x	✓/✓	✓/✓	✓/✓
Dolby Digital (channels)	2	x	2	5.1
DVD AUTHORIZING				
DVD authoring/burning	✓	x	✓	✓
DVD menu templates	✓	N/A	✓	✓
Motion menus/Auto chapter markers	✓/✓	N/A/N/A	✓/✓	✓/✓
Dual-layer burning	✓	N/A	✓	✓
SCORES				
Features	★★★★★	★★★★★	★★★★★	★★★★★
Ease of use	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★
OVERALL	★★★★★	★★★★★	★★★★★	★★★★★

Note: Some supported video formats, in particular DivX and mpeg4, require the necessary codecs to be installed. *Adobe Premiere Elements requires CPUs that support the



ULEAD

VideoStudio 9

£49.99

01327 844 880

www.ulead.co.uk

Intel Pentium III 800MHz or higher, Windows 98SE, 2000, ME or XP, 256MB of Ram, 1GB of free hard disk space, 1,024 x 768 display, CD-Rom, Windows-compatible soundcard

✓/x

avi (inc DV avi), dat, DVD-video, DVD-VR, DVD+VR, FLC, fli, gif, mpeg1, mpeg2, mpeg4, Quicktime (mov, qt), swf, uis, vsp, Windows Media Video (wmv, asf)

✓/✓

5 (2 video tracks with native audio, titles, voiceover, music)

✓/✓

✓

✓

✓/✓

✓/✓

✓/✓

avi (inc DV avi), flc, fli, flx, gif, mpeg1, mpeg2, mpeg4 (inc PSP), Quicktime (mov, qt), rm, SD-video, uis, wmv (inc wmv-HD and Pocket PC), 3GP

✓

✓/x

✓

✓/✓

✓/✓

Dolby Digital Audio, mpa, rm, wav, wma

✓

x

✓/✓

2

✓

✓

✓/✓

✓

★★★★★

★★★★★

★★★★★

★★★★★

Optimising video for handhelds

The fact that software developers are including codecs and export wizards for mobile phones and other video-capable handhelds, is evidence of the fact that people want to do more with these devices than shoot a few seconds of video and play it back on the same device or send it unedited.

When shooting using a handheld device, in addition to taking the usual steps regarding composition, lighting, shot length and so on, there are some additional things you can do to ensure the best results.

Keep it short

Chances are you won't have a great deal of storage capacity, certainly not the hour per tape that DV affords, so keep shot length to a minimum – five seconds is a good rule of thumb.

Don't pan and zoom

Low frame rate video shot at 12 or 15fps (frames per second) doesn't deal well with fast camera or subject movement. High compression rates will make matters even worse. You can't always control subject movement, but you can avoid panning and zooming the camera during shooting.

Fill the frame

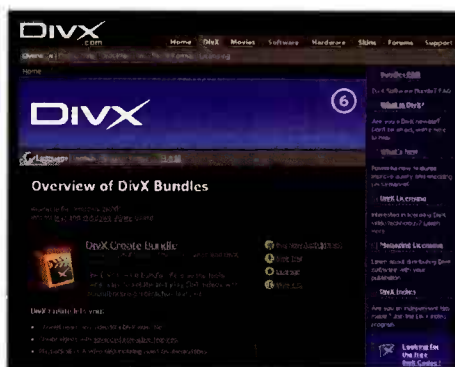
Video shot with mobiles and handhelds can be as little as 1/16th the resolution of Pal DV so get in as close as you can and fill the frame with the subject.

Avoid transcoding

If the output destination for video recorded on your mobile is DVD, you'll have no option other than to upsample it and transcode it to mpeg2. While it may have looked OK on your phone, it's not going to look terrific on your 42in plasma



Rotating portrait format video is easy enough, but you could probably do without those vertical black bars



If you want to encode and play back DivX movies, download the codec from www.divx.com

display or, come to that, even a small portable TV. But, if you plan to view the edited movie on the device you used to shoot it, use the original codec to encode it. Not only will this avoid quality loss, but you'll also reduce potential playback issues.

Get the right codecs

All the applications in this group test provide a variety of output options and most can export to Windows Media Video (wmv), Quicktime (mov), DivX, mpeg4 and the 3GPP mobile phone format. If you want to use the DivX codec you'll need to go to www.divx.com and follow the Download DivX link.

Why avoid portrait mode?

When shooting video with a phone camera or PDA, it's the most natural thing in the world to use the camera in portrait mode, after all, that's what you do when taking still pictures, so why not video? The answer is that most traditional movie output devices, TVs and cinemas, for example, have a fixed landscape format that can't be rotated, so your portrait video ends up being rotated by 90°.

The solution to this, obviously, is to rotate it back the right way. Until relatively recently, this was a less than straightforward process, but most video-editing applications now include a rotate feature. The problem is, that you'll have a tiny portrait image in the middle of a landscape screen with vertical black bars running down either side. You could of course scale the image up and crop the top and bottom, but phone cameras aren't noted for their image quality and resolution and this will make matters worse.

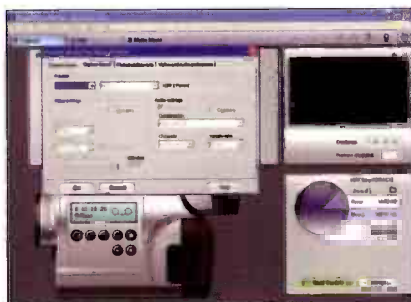
If your video is destined for a web page there's no problem – you can make it any shape you want, landscape, portrait, even square, but if you're producing a DVD or any other format that's going to be viewed on a TV, you'll save yourself a lot of bother by sticking with landscape and avoiding the temptation to rotate.

Editing high-definition video

HDTV is a high definition video format, jointly developed by Canon, Sharp, Sony and JVC that is recorded to the same miniDV cassettes used by standard DV camcorders. The first HDV camcorder to be produced was Sony's HDR-FX1, which was released in late 2004. Since then, there hasn't been a flood of HDV cameras, but Sony's recently released HDR-HC1, which currently sells for around £1,000, is the first HDV camcorder that's likely to be taken up by non-professional users and could signal the beginning of high-definition video recording for the consumer.

The HDV video frame has a 16:9 widescreen aspect ratio and two possible vertical resolutions – 720p (progressive) and 1,080i (interlaced). HDV cameras encode video in mpeg2 format: because the codec is more efficient than DV the data rate is the same as for the standard definition format – 25Mbps/sec – so it's possible to fit 60 minutes of footage on a standard miniDV cassette.

Of the five products reviewed here, three support HDV capture and, though Premiere Elements can't capture HDV, if you can get it in, you can edit it. If you are thinking about buying an HDV camcorder, aside from having software that supports



Pinnacle Studio Plus 10 captures and edits native HDV

HDV capture, editing and output, there are a few other things you'll need to think about.

The HDV format is more problematic for editing applications to handle. Whereas DV relies solely on intra-frame compression, The mpeg2 codec used by HDV also makes use of inter-frame, or temporal compression, which means that the image data in some frames needs to be generated with reference to adjacent frames. This makes it difficult to edit because, rather than individual frames, the editor needs to deal with groups of frames (GOPs) which can be 12 or more frames long.

If an edit – a cut, transition, special effect, or title overlay – falls in the middle of a GOP, the whole group, rather than just the affected frames needs to be rendered, with time and quality implication. Some applications, such as Adobe Premiere, transcode all the footage into an immediate format for editing to avoid these problems. The drawback with this is that all your footage will suffer slight degradation, regardless of whether it's edited or not. Ulead Videostudio 9 and Pinnacle Studio 10 take the alternative approach and edit native DV.

Another consequence of mpeg2 encoding is that you may find not all the usual capture functions are available. In Ulead Videostudio 9, for example, when capturing HDV, split by scene and DV Quick Scan are not supported.

Another thing to consider is your hardware setup. Although it has the same data rate as DV, the higher resolution of HDV – more than four times greater than standard definition DV – and the requirement to generate frame data on the fly, place a burden your graphic processor and CPU. In order to ensure a smooth workflow it's worth aiming for recommended, rather than minimum requirements.

Editor's Choice

Editor's Choice Adobe Premiere Elements 2
Recommended Ulead Videostudio 9



Adobe Premiere Elements 2



Ulead Videostudio 9

'There's no doubt that Premiere Elements can handle any task you throw at it'

In choosing the award winners, we've had to bear in mind that it's not simply a question of whether a particular application is right, but whether, given your level of experience and what you want to achieve, it's right for you.

Software developers spend a lot of time trying to get this balance right, so that beginners don't get put off and those with a little experience don't get frustrated by the software's limitations.

To manage this successfully, an application needs to have easy-to-use tools and a wealth of preset effects and features that can be used to produce results with little effort. It should be possible to go from raw DV, or whatever other

input format you're using, to DVD with no hiccups along the way. More advanced users require tools that give them the scope to express their creative vision. In terms of tools and features this means multiple video and audio tracks, keyframe control of effects and total control over every aspect of the editing and production process.

The only application to excel in both of these areas is Adobe Premiere Elements 2 which, accordingly, gets our Editor's Choice award. Based on Adobe Premiere Pro, and incorporating a great many of its tools and features, there can be no doubting Premiere Elements' capabilities; it can handle any editing task you throw at it.

The first release of Premiere Elements was criticised for its interface, but now that it's been locked down it works very well. The addition of the Properties panel simplifies the kind of edits that you make over and over – motion, opacity and volume changes and Adobe has added numerous other touches to make life easier for editors of all abilities.

While it's true that Premiere Elements isn't as simple as programs that provide a storyboard view and only one or two video tracks, beginners shouldn't be put off. Anyone prepared to spend some time understanding compositing will quickly get to grips with it.

Our Recommended award goes to Ulead Videostudio 9, which maintains its reputation for supreme ease of use while adding a raft of new features and enhancements – so many, there wasn't room to mention all of them.

Like Premiere Elements, Videostudio makes the process of getting from raw clips to final output easy. This new version adds two new features that further streamline the process – DV Quick Scan and the DV to DVD Wizard, which will be a lifeline for camcorder owners who want to get the 'best bits' onto a DVD with minimum fuss. **PCW**

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64



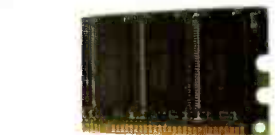
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Gaming on the go

Five pocket consoles put to the test by Jonathan Parkyn



Handheld electronic gaming has come a long way since those big bleeping bricks of the 1970s. Japanese video games giant Nintendo has remained the dominant force in the portable games console scene for nearly 25 years with its hugely popular Game Boy range. But a new era of mobile gaming is upon us with the launch of more powerful, multifunction devices, led by Sony's debut on the handheld stage, the Playstation Portable (PSP).

We round up the current crop of pocket consoles and pit them against each other in a handheld gaming deathmatch.

Gizmondo

Price £229 (£120 with Smart Ads) **Contact** www.gizmondo.co.uk **Overall** ★★★★★

It's fair to say that the Gizmondo has not had the smoothest of starts in life. Allegedly launched over a year ago, it wasn't until in June 2005 that we finally got to see one and try it out for ourselves. A limited initial release and a poor selection of launch titles hasn't helped the UK-developed console to gain back much ground since then. Despite a recent US launch and apparent interest from Microsoft as a possible Xbox portable, Gizmondo still has a long way to go before it's a serious contender to the Sonys and the Nintendos of this world.

On paper, though, the Gizmondo is an impressive alternative. Like the PSP, it can be used as a portable multimedia device, with mpeg4 movie and mp3 music playback. It also includes built-in GPRS and GPS technology, the former employed for text messaging only, rather than full telecommunications, and the latter offering satellite navigation (with the appropriate software) as well as potentially unique gameplay features. Also along for the ride are a VGA camera and some PIM (personal information manager) functions.



As for gaming, an Nvidia chip provides some sharp 3D graphics, while a growing catalogue of titles from industry stalwarts such as EA Games is slowly making the Gizmondo a realistic option.

Based on Windows CE, the system's interface is more than a

little quirky and takes a long time to start up. The console is also prohibitively expensive unless you opt for the Smart Ads system, which sends targeted advertising to users on the move and reduces the initial outlay by £100.

Nintendo DS

Price £89.99 **Contact** www.nintendo-europe.com **Overall** ★★★★★

A direct descendant of the multiscreen Donkey Kong Game and Watch, the dual-display Nintendo DS has been the subject of much misconception since its UK launch in 2005.

The silver folding clamshell looks clunky, almost as if it were a prototype rather than a finished production model. It is, nonetheless, extremely durable and perfect for younger gamers.

The DS doesn't present much in the way of added value. There's no movie or music playback and, while the system has built-in Wifi, wireless features are limited to messaging other DS devices.

Online gaming via wireless home networks is imminent, and Nintendo hasn't ruled out the possibilities of Internet browsing.

Technically, the DS is no slouch, with two processors and a 3D graphics chip allowing for some pretty good-looking games, such as Super Mario 64 DS. What really sets the DS apart is its touch-sensitive lower screen. Used in conjunction with either the stylus or wrist-strap thumb pad, the touchscreen offers not only an interesting way to control on-screen action, but also a completely new method of interacting with the software.



Many inventive games already take advantage of the DS' unique input system – Wario Ware Touched and Nintendogs, for example. If that wasn't enough, backwards compatibility with Game Boy Advance titles means there are hundreds of titles to choose from.

Many people have mistakenly assumed that the DS is Nintendo's attempt to go head to head with Sony's Playstation Portable. If anything, however, the DS simply further cements Nintendo's reputation for producing innovative, fun gaming platforms.

Nintendo Game Boy Micro

Price £69.99 **Contact** www.nintendo-europe.com **Overall** ★★★★★

While Sony has made portable gaming bigger and bolder with the PSP, Nintendo has gradually been shrinking the most successful games console in history (the Game Boy) to miniscule proportions. First released in 1989, the Game Boy has been treated to several makeovers. First came a colour screen, then the Game Boy Advance (GBA), followed by the smaller variation, the SP.

The Micro really is impossibly small – about the size of a mouth organ. Nintendo has managed to squeeze the same internal spec as

the original GBA into the diminutive device, although at just 2in the screen size has taken a bit of a hit. However, the backlit display is bright and colourful. A four-way directional pad, two fire buttons and shoulder triggers provide a familiar control system, while a headphone socket is included on the lower edge.

It's based on five-year-old GBA technology so the Micro isn't the most impressive console graphically. However, the GBA catalogue is enormous, including classics such as



the Pokemon, Zelda and Mario series, as well as simple but fun handheld versions of popular console titles such as Splinter Cell.

There are no extra features, just great-quality gaming on a pocket-

sized games console. As such the Micro seems a little overpriced, particularly when the backwards-compatible DS is only £20 more. It's hard to believe that gaming can get much smaller than this.

Nokia N-Gage

Price £99 **Contact** www.n-gage.com **Overall** ★★★★★

The current N-Gage is Nokia's second stab at securing a slice of the mobile gaming pie. But, rather than being a true multifunction console like the PSP or Gizmondo, the N-Gage still feels very much like a mobile phone handset first and a gaming device second.

Build quality is pretty poor. The unit is quite small, but oddly shaped for either a phone or a games console. This time around, it is at least possible to swap game cartridges without first having to remove the unit's battery. But the

new design still needs work – nasty and easily breakable rubberised caps protect the memory card slot on the underside of the unit and the audio sockets on top.

The screen is small and comparatively dark, while its vertical rather than horizontal positioning makes it feel curiously old fashioned. Without much in the way of processing power and no 3D graphics chip, games look and feel very underwhelming, even in comparison with those of the five-year-old Game Boy. Added to this,



the controls are unresponsive and the games catalogue pretty thin.

The N-Gage works best with games such as Atari Masterpieces Vol 1 – an anthology of old arcade classics such as Asteroids, Breakout and Millipede. But, since Java-based variants of this kind of game

can be downloaded to many standard mobile phones, it's difficult to see why anyone would want to invest in the N-Gage specifically. A bit of a compromise all round, the N-Gage is a brave attempt on behalf of Nokia, but it already looks and feels outdated.

Sony Playstation Portable

Price £179.99 **Contact** www.yourpsp.com **Overall** ★★★★★

After an achingly long wait, Sony's highly anticipated portable games console went on sale in September and sold out in the blink of an eye.

It's not difficult to see why. It might be the largest console on test, but it's certainly the best looking. The developers have made a good fist of replicating the Playstation's famous Dual-Shock control system (even down to a mini analogue joystick slider) and the unit is comfortable to hold. Technically speaking, it blows the competition away. With a powerful

3D chip running inside the machine, graphics are closer to those of the PS2, putting the system in a different league altogether. The current games catalogue is small but growing rapidly, with Grand Theft Auto: Liberty City Stories being the obvious highlight.

But the PSP isn't just a games console. With movie and music playback, photo browsing and Wifi Internet access, it's more like a portable multimedia device, which helps to excuse the elevated price tag. Games and movies can both be



bought on 1.8GB read-only UMDs (universal media disc), while you can also use the system's Memory Stick to transfer media from a PC to the device (see box on page 116).

The PSP's crowning glory is its 4.3in widescreen TFT display. Big

and beautiful, with high resolution and high contrast, it ensures games and movies look amazing. The power cell lasts for around five hours of play between charges, which is a little low but, battery life aside, the PSP is king of portable gaming. ➤

Movies on the move

As already mentioned, the PSP and the Gizmondo both double up as portable media players with the capability to play movies stored on memory cards. In both cases, users will need to convert video to the appropriate format and then physically transfer the file to the device. The Gizmondo comes with a USB cable, but PSP owners with no Memory Stick slot on their PC will have to invest in a USB cable or card reader separately.

The PSP can only play a very specific type of movie file (mp4) and has a very convoluted system of file naming. There are a few apps available online to help – check out the free PSP Video 9, for example, at www.pspvideo9.com. The forums at www.mobiledviant.com also provide some useful information on getting video onto Sony's console. Similarly, a quick search on www.gizmondoforums.com turns up a number of practical



suggestions for video-hungry Gizmondo owners.

As a reminder, it's worth pointing out that the transferring of copyrighted DVDs to either console is illegal.

Using a Memory Stick, you can transfer movies to your PSP

Editor's Choice

Editor's Choice

Sony PSP

Recommended

Nintendo DS

It's not difficult to pick a winner here. The

Sony PSP is by far the most versatile and powerful console on test, and it's a lot of fun too. The whole package, from the operating system to the physical design of the unit, seems to have had a huge amount of thought put into it. The net result is an extremely well-rounded portable multimedia device.

Those with a taste for both innovation and old-school thrills should seriously consider the Nintendo DS, which has some amazing touchscreen-based titles as well as GBA compatibility. It also happens to be half the price of the PSP and earns a Recommended award. Dedicated gamers will, of course, have to get both.

The N-Gage is something of a disappointment all round, while the Game Boy Micro offers little more than a size advantage. It would be foolish, however, to write off the Gizmondo just yet. It has huge potential, but only time will tell whether this is ever fully realised. **PCW**



Gaming devices

**Personal
Computer
World
RECOMMENDED**

**Personal
Computer
World
EDITOR'S CHOICE**

MANUFACTURER	GIZMONDO	NINTENDO	NINTENDO	NOKIA	SONY
MODEL	GIZMONDO	DS	GAME BOY MICRO	N-GAGE	PLAYSTATION PORTABLE
Price	£229 (£120 with Smart Ads)	£89.99	£69.99	£99 (varies with contract)	£179.99
Telephone	0800 731 1278	0870 6060 247	0870 6060 247	0870 0555 777	0870 511 1999
URL	www.gizmondo.co.uk	www.nintendo-europe.com	www.nintendo-europe.com	www.n-gage.com	www.yourpsp.com
SPECIFICATIONS					
Screen size	2.8in	2 x 3in	2in	2in	4.3in
Resolution	240 x 320	256 x 192	240 x 160	176 x 208	480 x 272
Colours	65,536	260,000	32,000	4,096	16.77 million
Processor	400MHz ARM9	1 67MHz ARM9 and 1 33MHz ARM7	16.78MHz Risc	104MHz ARM9	333MHz MIPS
Onboard memory	64MB	4MB	32KB	3.4MB	8MB
Battery life	3-4hrs	6-10hrs	6-10hrs	5-10hrs	5-6hrs
Media format(s)	MMC card	DS and GBA game paks	GBA game paks	MMC card	Memory Stick Duo, UMD
Speakers (stereo/mono)	Mono	Stereo	Mono	Mono	Stereo
Headphone socket	✓	✓	✓	✓	✓
Bundled accessories	Power adapter, headphones, pre-pay Sim card, USB cable	Power adapter, stylus, wrist strap	Power adapter, protective case	Power adapter, mono headset	Power adapter, headphones (with remote control), 32MB Memory Stick Duo, wrist strap, carry pouch, cleaning cloth
Other features	Camera, GPS, text messaging, plays movies and music	Wireless chat, touchscreen, microphone	Removable faceplates	Full mobile-phone functions	Plays movies, music, photos, wireless web access
Size in mm (w x d x h)	138 x 32 x 82	149 x 29 x 85	100 x 17 x 50	118 x 22 x 68	170 x 23 x 74
Weight in g	181	250	80	143	280
SCORES					
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
OVERALL	★★★★	★★★★	★★★★	★★★★	★★★★

How we test

Performance testing is an important part of PCW's reviewing process and to obtain our authoritative results we use the UK's best PC testing resource – VNU Labs. Here we explain why you can trust our results and give you a tour of our most frequently used benchmark programs.

One of the main reasons people upgrade their PCs is because their old model seems 'too slow'. But how do you tell whether the one you're going to replace it with is any faster? At PCW we take PC testing very seriously and we have the UK's best PC testing labs – VNU Labs – on tap to help us give you reliable, authoritative performance figures, to help you with your purchasing decisions.

It's true that speed isn't everything, but it's an important part of the buying equation, especially when there are so many components out there. As many of our PC group tests are based on price bands, checking the performance is even more important – if the core system is underperforming, you need to know before you part with your hard-earned cash.

In VNU's UK Labs, which is part of the European VNU Labs network, our staff have over 20 years of combined testing experience. We know all the perils and pitfalls of practical benchmarking and we contribute to the development of industry-standard benchmarks through our full membership of Bapco (www.bapco.com), the non-profit benchmark consortium. We are also a media member of the Futuremark Benchmark Development Program (www.futuremark.com). Listed below are the main benchmarks we use for testing PC systems and components.

- Bapco Sysmark 2004 SE – an application-based benchmark that tests real-world system performance.
- Futuremark 3Dmark03 – a 3D graphics benchmark designed to test the performance of DirectX 8 graphics cards.
- Futuremark 3Dmark05 – the latest version of 3Dmark that tests DirectX 9 3D graphics performance.
- Ubisoft Far Cry – we use the Fort level timedemo to see how graphics cards perform in a real DirectX 9 game.
- Futuremark PCmark05 – a synthetic benchmark used to test the performance of a PC's major subsystems.
- Bapco Mobilemark 2005 – used to assess the battery life of notebooks using real-world applications and usage scenarios.
- Test beds – we use standardised AMD and Intel-based test rigs to test components and peripherals.

There's more information about our testing procedures and benchmarks on our Labs site at www.reportlabs.com/testbed/bguides/benchmarks.php.



3Dmark03 is used to test DirectX 7/8 graphics cards

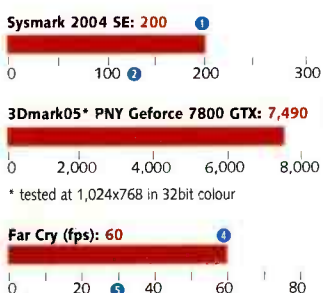


PCmark05 measures memory, processor, graphics and hard drive performance



3Dmark05 pushes modern graphics cards to their limits

Performance



- ① A score of 200 indicates that the system is twice as fast as the reference PC
- ② The reference PC (2GHz P4 512MB of Ram) scores 100
- ③ A Geforce 7800 GTX would score in the region of 7,490
- ④ A score of 60fps (frames per second) or higher is most desirable
- ⑤ A result of 30fps or above means the machine can produce playable frame rates at the tested resolution

PCSPECIALIST.CO.UK

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- Graphics Card 256MB RADEON X550 PCI Express + DVI + TV-OUT
- High-End ASUS® Motherboard Dual DDR, S-ATA, x16 slot, 3 PCI, 3 PCI-EX
- Six USB 2.0 Ports (4 Rear + 2 Front)
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- Sound Card High-End Onboard 8 channel sound
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- Graphics Card 256MB GEFORCE 7800GT PCI Express
- Motherboard ASUS® A8N-E: DUAL DDR, S-ATA, x16 slot, 3 PCI etc
- Six USB 2.0 Ports (4 Rear + 2 Front)
- DVD-ROM 16x DVD-ROM With 48X CD-ROM
- DVD Writer 4x +R Dual Layer DVD-Writer(16x +/-R) (& RW) + 40x CD-RW
- Sound Card High-End Onboard 8 channel sound
- Network Facilities 10/100/1000 Network Card
- Floppy Drive 1.44Mb Floppy Disk Drive

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- Memory 1024 MB DDR400 PC3200 Lifetime Warranty!
- Hard Drive SATA 200Gb (7200rpm 8mb cache)
- Second Hard Drive Hard Drive SATA 200Gb (7200rpm 8mb cache)
- Graphics Card 512MB RADEON X700 PCI Express + DVI + TV-OUT
- High-End ASUS® Motherboard Dual DDR, S-ATA, x16 slot, 3 PCI, 3 PCI-EX
- Six USB 2.0 Ports (4 Rear + 2 Front)
- DVD Writer 4x +R Dual Layer DVD-Writer(16x +/-R) (& RW) + 40x CD-RW
- High-End Onboard 8 channel sound
- Network Facilities 10/100/1000 Network Card
- Card Reader Internal 7 In 1 card reader with 1.44Mb Floppy Disk Drive

Video Editing

Base Unit

- INTEL® Pentium® 4 630 (64 BIT) 3.0GHZ 800mhz FS8/HTT/2MB
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- Graphics Card Integrated SIS Real 256E Graphics
- High-End ASUS® Motherboard Dual DDR, S-ATA, x16 slot, 3 PCI, 3 PCI-EX
- Six USB 2.0 Ports (4 Rear + 2 Front)
- DVD Writer 4x +R Dual Layer DVD-Writer(16x +/-R) (& RW) + 40x CD-RW
- Sound Card High-End Onboard 6 channel sound
- Network Facilities 10/100 Network Card
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PCW Awards 2005

THE WINNERS

- 121 Reader voted awards
- 122 Breakthrough product
Digital cameras
- 123 Printers
Monitors
- 124 Graphics cards
Motherboards
- 125 Processors
Digital home
- 126 Utilities
Networking
- 127 Video-editing software
Games
- 128 Reader prizes – find out if
you've won in our prize draw

What were the hottest, most innovative products of 2005? Find out as we reveal the winners of the PCW Awards for Excellence

Technology waits for no man, to misquote a famous phrase, yet sometimes the relentless pace of progress means that product excellence can become roadkill – rushing products to market that still have the rough edges showing, or are so full of bugs that endless service packs are needed to make them work properly at all.

The PCW Awards for Excellence are exactly what they say – recognition for those companies that have produced and maintained products that both you, our readers, and ourselves, as your proxies, believe offer the best-in-class performance, features and value for money – in short, all-round excellence.

Our awards, as always, comprise two sections – reader-voted categories and the PCW editorial awards, which are voted for by our writers and editors. In the reader categories, votes were cast via the PCW website and the response was tremendous – we'd like to say a big 'thank you' to everyone who took the time to participate. And as a further token of our gratitude, all of you who took part were entered into our massive prize draw giveaway – turn to page 128 to see a list of the lucky winners.

It was hard but pleasurable work choosing the nominees and winners for the editorial awards, and it's only when you start drawing up shortlists that you realise the sheer number and variety of great products available. Of course, not every product can be a winner, but to those who've made it, well done, and keep up the good work!



How you voted in this year's awards

You voted in your thousands for the companies and products you believe are the best in class. Here are the winners and runners up



Broadband ISP

Winner BT Yahoo www.bt.com

Nominees NTL www.ntl.com;

Tiscali www.tiscali.co.uk

BT was the clear leader and wins for the third year in a row, which is testament to the company's popularity. It's had its critics in the broadband sector, but once again has shown it offers a good combination of service and price.



Laptop manufacturer



Winner Dell www.dell.co.uk

Nominees Sony www.sony.co.uk;

Acer www.acer.co.uk

It is predicted that laptop sales will soon outstrip desktop PC sales, so this is an important market in which to win readers' hearts and minds.

All three companies here have a good reputation for making reliable laptops.

Office software

Winner Microsoft Office 2003 www.microsoft.com

Nominee Open Office www.openoffice.org;

Ability Office 4 www.ability.com

We rate Microsoft's Office suite highly. But it was also good to see so many votes for Open Office. It offers just about everything in Office, plus a few extras. And it's free. Although a distant third in the voting, Ability Office has received good reviews in PCW and was a popular feature on our cover disc in 2005.



Music download site



Winner Apple iTunes www.apple.com/uk/itunes

Nominee Napster www.napster.co.uk

We asked you which download site was best and the response was an overwhelming vote for iTunes. It is well-stocked with a massive choice in music and music videos, it's simple to use with an interface that ensures you can't go wrong.

PC manufacturer

Winner Dell www.dell.co.uk

Nominees Mesh Computers

www.meshcomputers.com

Evesham Technology

www.evesham.com

Dell is one of the most recognised PC brands, has massive sales volumes across the world, and a reputation for making solid, reliable PCs. Its prices seem to get lower every month and it dominates the market. However, it was good to see two British brands in the runner-up slots, including last year's winner in this category, Evesham.



Photo-editing software

Winner Adobe Photoshop CS2 www.adobe.co.uk

Nominee Adobe Elements www.adobe.co.uk;

Corel Paint Shop Pro www.corel.com

For serious photographers Adobe Photoshop CS2 is a stunning package that offers full control and editing of photos, but at a price. If your budget is tighter, Photoshop Elements is a great alternative with a growing reputation. Running close behind in the voting was Paint Shop Pro, which again comes with loads of features.



Anti-virus software



Winner Grisoft AVG Anti Virus www.grisoft.com

Nominees Norton Internet Security

www.symantec.com

McAfee Internet Security Suite www.mcafee.com/uk

AVG has carved a solid reputation, providing both free and commercial software to protect your computer, and was a clear winner.

Firewall software

Winner Zone Labs Zone Alarm www.zonelabs.com

Nominees Norton Internet Security

www.symantec.com

McAfee Internet Security Suite www.mcafee.com/uk

Zone Alarm comes with a strong reputation and is backed by a good free version should you prefer not to buy the commercial product. Norton and McAfee may be the more famous rivals in the security sector, but this year, you said Zone Labs was the best.



Anti-spyware software

Winner Spybot Search & Destroy www.safer-networking.org

Nominees Lavasoft Ad-Aware www.lavasoft.de

Microsoft Antispyware Beta www.microsoft.com

This was an incredibly close contest between Spybot and Ad-Aware.



Spybot is generally considered one of the best on the market, but, like its two closest rivals here, it is free and offers good protection.

Anti-spam software

Winner Norton Internet Security

www.symantec.com

Nominees Mailwasher

www.mailwasher.net

McAfee Internet Security Suite

www.mcafee.com/uk

Spam is the scourge of the Internet, but there is software to prevent it hitting your inbox. Norton was the best in your opinion, but voting was close and the other packages here are worthy nominees.



Breakthrough Intel dual-core CPUs



Intel and AMD have been showing us 'roadmaps' with dual-core processors on them for years, but in 2005 dual-core became a reality. With each core handling separate data threads, users can benefit from significant performance improvements when running multiple applications simultaneously. Developers can also improve the performance of their applications by adding threading capabilities to their software, providing additional performance for the latest games and multimedia software. Throw in Intel's Hyperthreading (HT) technology and you've got a dual-core processor that can cope with four simultaneous data threads.

Reviewed November 2005

www.intel.com

Digital cameras Nikon Coolpix S1



Pocket-sized cameras often have to compromise on features or image quality, but Nikon's Coolpix S1 manages to combine high quality and performance with an incredibly compact and lightweight design.

The camera's 5.1megapixel sensor produces excellent image quality, especially in the powerful macro mode, which captures even greater detail than a number of 6megapixel cameras we've seen. It's also got a 3x optical zoom and a further 4x digital zoom, along with a 640 x 480 video capture option. And all this is crammed into a compact case that's less than 20mm thick and weighs just 137g.

Reviewed August 2005

www.nikon.co.uk

Nvidia SLI

The idea of connecting two graphics cards to improve graphics performance has been resurrected by Nvidia with its SLI technology (Scalable Link Interface).

The concept was pioneered by the late, lamented 3dfx (now owned, not surprisingly, by Nvidia). Needless to say, the idea of two Nvidia graphics cards has massive appeal for the gaming fraternity, but it also has potential for Cad (computer-aided design) and design work, allowing designers to display large 3D graphics that can span two monitors.

Reviewed March 2005

www.nvidia.com



Airgo True Mimo wireless

This is something of an 'unofficial' breakthrough, as Airgo's True Mimo (multiple input, multiple output) technology is a contender to be part of the 802.11n wireless standard that has yet to be fully ratified. However, a number of manufacturers have already produced wireless routers that incorporate the Airgo chipset. A Mimo router or client uses multiple antennas to help transmit data more effectively through obstacles such as walls and partitions, which often cause problems in homes and offices.

Reviewed April 2005

www.airgonetworks.com

Canon EOS 350D

Digital SLR cameras are finally starting to come down in price to the point where they're attractive to amateur photographers as well as professionals. Canon's EOS 350D is a good example of the performance and quality you can now get for well under £1,000. This compact and lightweight camera provides outstanding 8megapixel image quality, and can comfortably shoot three pictures per second, allowing you to snap away to your heart's content.

Reviewed December 2005

www.canon.co.uk



Canon Powershot A520

Another impressive effort from Canon, the Powershot A520 provides good image quality and a wide range of features at a very affordable price. It has a 4megapixel CCD sensor and good 4x optical zoom, wrapped up in a compact and lightweight design.

The camera is also comfortable to use, and its wide range of preset shooting options makes it very easy even for less experienced users to produce great pictures. It's a versatile camera that doesn't cost a fortune.

Reviewed July 2005

www.canon.co.uk



Printers

HP Photosmart 8450



It's a little on the bulky side for a standard A4 printer, but that's the only drawback with this outstanding inkjet printer from HP. The Photosmart 8450 produces very good text when simply printing with black ink, but it's the printer's photo output that really makes you sit up and take notice. With a maximum resolution of 4,800 x 1,200dpi, the results when using good-quality photo paper are outstanding – and virtually indistinguishable from the prints you'd get from your local chemist. The built-in card reader and LCD also mean you can print straight from your camera.

Reviewed April 2005
www.hp.com/uk

Canon Pixma MP150

Multifunction devices (MFDs) are often derided as being jacks of all trades but masters of none, but Canon's Pixma 150 proves that an MFD can handle even demanding photo-printing work.

The device combines a scanner and inkjet printer at a cost of less than £70, yet its 4,800 x 1,200dpi resolution produces very good photo prints – all housed in a unit no bigger than an inkjet printer. It can't replace more expensive dedicated photo printers and there are better MFDs, but for those on a tight budget this is an excellent option.

Reviewed December 2005
www.canon.co.uk



Epson Picturemate 100

At just £100 when we reviewed it, the Picturemate 100 is one of the most affordable specialised photo printers around. Its four-colour printing system is complemented by an enhancement option that boosts its resolution to the equivalent of 5,760dpi.

This produces excellent prints, with rich colours and a fine glossy finish. Printing costs are attractive, working out at around 22p per print. We also liked the introductory material designed to help newcomers get started with photo printing.

Reviewed January 2006
www.epson.co.uk

Monitors

Acer AL1922HS



Large, high-quality flat-screen displays are now common and highly affordable, so it takes something special to stand out from the crowd. However, Acer's AL1922HS grabbed our attention straight away as it produced excellent image quality immediately, using just its factory default settings. The image quality is helped by the monitor's 600:1 contrast ratio, and we were also impressed by the 178° viewing angle, which provides excellent visibility. It's good to see Acer taking ergonomic issues seriously, too, allowing you to adjust the height of the stand, and rotate the monitor into portrait orientation.

Reviewed September 2005
www.acer.co.uk

LG Flatron L2013P

This attractively designed flat-screen display provides impressive image quality and a versatile control system. The maximum resolution is 1,600 x 1,200, which means it's equally suitable for designers and photographers who want to work with large, high-resolution images, or for business users who produce enormous spreadsheets. The straightforward control system includes a number of useful presets, which can be locked to prevent further adjustments once you've found the settings that you like.

Reviewed October 2005
www.lge.co.uk



Samsung Syncmaster 913N

Despite one or two minor shortcomings, such as the lack of DVI connector, the Syncmaster 913N is a good choice for anyone looking for an affordable flat-screen display. Its image quality is very good, and we liked options such as the 'Magicbrite' feature, which allows you to quickly choose preset brightness levels. A simple, elegant design and straightforward menu system add to its appeal and make it one of the best displays in the sub-£250 price range.

Reviewed September 2005
www.samsung.com/uk

Graphics cards

Nvidia Geforce Go 7800GTX



The desktop version of the Geforce 7800GTX currently holds the top spot as the most powerful graphics card around, and Nvidia has done an amazing job of producing this mobile version so quickly. The 'Go' version of the 7800GTX shares the same underlying architecture, with eight vertex shaders and 24 pixel shader pipelines. Only a minor adjustment to GPU and memory clock speeds has been needed in order to lower the power consumption and heat output to produce a graphics chip suitable for laptop systems – and the result is the fastest laptop 3D graphics we've ever seen.

Reviewed – tested in the Evesham Voyager C720 notebook, January 2006
www.nvidia.com

Aopen Aeolus 7800GTX

Most of the graphics cards that currently use Nvidia's 7800GTX chip are based on the company's own reference design, so they all tend to provide more or less the same features and levels of performance.

However, Aopen's Aeolus 7800GTX boosts the card's clock speed a little to give it some extra performance, helping it to turn in some impressive results. But in spite of this, the card still manages to keep the price lower than most of the other 7800GTX cards we've seen so far.

Reviewed October 2005
www.planetmicro.co.uk



Sapphire Radeon X800GTO²

It's not often we come across a product that exhibits as much value for money as this card. Despite the X800 in its name, this card uses the R480 core that's found in the faster Radeon X850XT graphics cards. To realise its full potential, you'll need to download a patch that enables four extra pixel pipelines and you'll then have an X850 on your hands for the price of an X800. Furthermore, you can overclock the board to perform like an X850XT without extra cooling. We expect these cards to be very popular, so if you see one, buy it immediately.

Reviewed February 2006
www.sapphiretech.com

Motherboards

Aopen i915GMm-HFS



A Pentium M motherboard won't give you top-notch games performance, but it can certainly provide the basis for an attractive and versatile home computer, and the i915GMm is the ideal choice for such a machine. It's got all the features you need, such as dual Ethernet, two PCI Express slots, integrated graphics and 7.1 surround sound and no fewer than eight USB2 ports. But for many people the most attractive feature will be the tiny, but highly efficient fan, which allows you to build a PC that makes almost no noise at all.

Reviewed July 2005
www.aopen.nl

Abit Fatal1ty AN8

Named after champion gamer, Fatal1ty, this motherboard is an overclocker's delight, and comes armed with a versatile Uguru Bios and a state-of-the-art 'outside thermal exhaust system'. The board takes the gamer's favoured Socket 939 Athlon 64 processor and includes three PCI-Express slots, and a somewhat over-the-top complement of 10 USB ports. Even hard disk performance is boosted, with features such as four Serial ATA (Sata) II ports. This is a good board, with enough Bios features to keep enthusiasts happy.

Reviewed August 2005
www.abit.com.tw



ECS PF88

Your first decision when buying a motherboard is normally whether you want to use an Intel or AMD processor. However, ECS gives you the best of both worlds with its PF88 motherboard, which can be used with either type of processor. The main processor socket is designed for an Intel Socket 775 processor, but a special slot on the motherboard allows you to insert a riser board that can hold an AMD processor. We were impressed with this board's performance in tests, and with the price too.

Reviewed August 2005
www.ecs.com.tw

Processors

AMD Athlon 64 X2



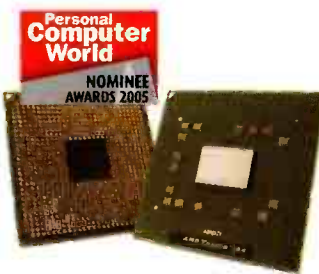
The benefits of dual-core processing are obvious – fitting two processor cores onto a single chip provides significant increases in performance, especially when running multiple applications simultaneously. However, AMD hasn't just given us a faster chip with its Athlon 64 X2 processor. Its support for 64bit software means that it's ready for future operating system and software upgrades. And, thankfully, the dual-core Athlon still has the same 939-pin design as older single-core Athlons. Just as important, though, is the fact that AMD offers dual-core performance at very competitive prices that home users can afford.

Reviewed www.reportlabs.com
www.amd.com

AMD Turion 64 Mobile

Marred only by a staggeringly obscure naming system, AMD's Turion processors provide impressive performance and power consumption for laptop systems. Like the earlier Mobile Athlon, the Turion 64 Mobile processor range performs well, thanks to the inclusion of features such as Hypertransport and AMD's Powernow intelligent power-management technology. The processor's improved power consumption provides longer battery life and makes it possible for manufacturers to design extremely thin and lightweight laptop systems.

Reviewed www.reportlabs.com
www.amd.com



Intel Pentium Extreme Edn

Not content with simply producing a dual-core processor, Intel has also incorporated its Hyperthreading (HT) technology into its flagship Pentium Extreme Edition 840 processor.

This means each core can effectively handle two separate data threads at a time, allowing the processor to deal with four data threads simultaneously. The end result is a dramatic performance boost when running games or complex multimedia applications – it's the ultimate in desktop processor power. See the components section in The Test Bed for full results.

Reviewed www.reportlabs.com
www.intel.com

Digital home

Archos AV400



There are several portable video players now available but, in our view, Archos still leads the pack with its versatile AV400. It has a high-quality 3.5in screen that provides very good video playback, and it can play most common video formats, including mpeg4, DivX and avi.

The AV400 is available with hard disk sizes ranging from 20GB to 100GB, so you've got plenty of room to store music, photos and even entire libraries of films. A handy little docking station makes it easy to connect to your home video setup and use it as a personal video recorder (PVR).

Reviewed June 2005
www.archos.com

Shuttle M1000

The Media Center PC concept is still struggling to find a place in our homes, but Shuttle's M1000 could be the product to change all that. This compact, slimline PC system is well designed and will look right at home in the front room next to your TV set.

It has twin TV tuners, multiple video outputs and 7.1 surround sound. As ever with Shuttle you have to dig deep into your pockets, but if you want a classy centrepiece for your digital home entertainment system then look no further.

Reviewed January 2006
www.shuttle.com



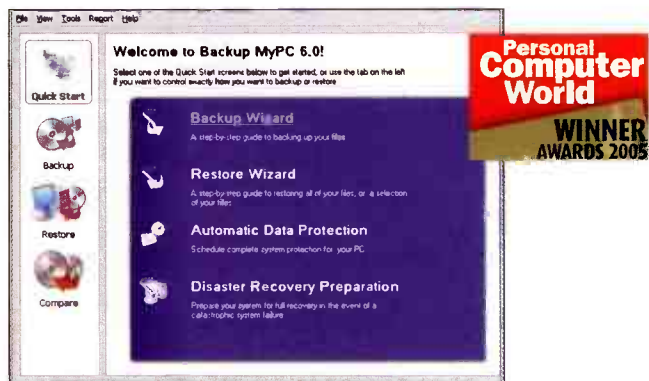
Homechoice

More than just an ISP, Homechoice offers the holy grail of convergence – the 'triple play' of digital TV, broadband Internet and telephone services all for a single monthly fee. You get 4GB broadband speeds along with dozens of digital TV channels, including Homechoice's unique 'replay' service, which provides true video on demand. A series of special 'replay' channels provide instant access to music videos and popular programmes such as *Frasier* and *Futurama* whenever you want to watch them.

Reviewed July 2005
www.homechoice.co.uk

Utilities

Roxio Backup My PC Deluxe 6



Backing up your important files is a tedious chore, so hats off to Roxio for making it as straightforward and painless as possible. This latest version of its Backup My PC software includes a number of wizards designed to quickly organise and schedule your regular backups, and to guide new users through the backup process.

The main Backup Wizard asks you whether to back up the entire PC or just specific files and folders, and it can create a 'disaster recovery plan' that will help you fix your PC and restore your files in the event of emergency.

Reviewed June 2005

www.roxio.co.uk

Google

In the past year or so, Google has evolved from simply being the best search engine on the Internet into a globe-straddling colossus with ambitions to challenge even the mighty Microsoft. In addition to its primary search engine, Google now offers the Google Desktop – a desktop search engine that can search the Internet or the contents of your hard disk with equal ease – along with other new features such as blogging and the utterly addictive Google Maps, Google Earth and Google Talk.

Reviewed November 2005

www.google.com



Orlogix WinCleaner

Even more tedious than backing up your work files are PC housecleaning chores such as deleting unused files and shortcuts or, alternatively, undeleting files that you've deleted accidentally. Thankfully, WinCleaner Complete PC Care provides a simple and affordable option for handling tasks such as these.

The 18 tools that make up this suite perform tasks such as disk error checking and defragmentation, a 'one-click clean-up', memory optimiser and removal of invalid Registry entries.

Reviewed July 2005

www.orlogix.com

Networking

Linksys Wireless G SRX



Networking companies have been quick to leap onto the Mimo (multiple input, multiple output) bandwagon, a possible precursor to the forthcoming 802.11n wireless networking standard. However, the Wireless G SRX from Linksys is the best of the Mimo wireless routers that we've seen so far. It maintains consistently high data throughput even when used in a mixed environment with older 802.11b/g clients. Our tests also showed that it continued to work efficiently over longer distances than a number of rival routers based on the same Airgo wireless chipset. It is also very easy to set up and install, making it a good choice for home users and small businesses.

Reviewed September 2005

www.linksys.com

Belkin Pre-N router

Belkin likes to concentrate on the home user market, and its Pre-N wireless router, the first to use Airgo's Mimo technology, is a good choice for home users, thanks to its low price and ease of use.

Like most routers it has a built-in firewall, but it also boasts additional parental control features, such as the ability to filter content and block unsuitable websites. That makes it an excellent choice for parents who want to set up a wireless network at home.

Reviewed September 2005

www.belkin.co.uk



Intertex IX66+ Airsip GW

At long last, Voice over IP (VoIP) has finally started to take off here in the UK, and there are now many companies offering VoIP services to home users. However, VoIP technology offers big savings on phone calls to business users as well, so Intertex has designed the ADSL Airsip GW VoIP router with a built-in SIP server that allows small business users to set up their own PBX to handle all their telephone and voicemail needs. It has loads of functionality, can handle 15 calls at the same time and wasn't that hard to set up.

Reviewed March 2005

www.intertexdata.com

Video-editing software

Adobe Premiere Elements 2



Like the highly successful Photoshop Elements, Adobe's Premiere Elements takes powerful tools from its bigger brother – the high-end professional Premiere video editor – and repackages them for home users. The program boasts a wide range of special effects, filters and transitions that allow it to outgun and overpower most of its rivals in the low-cost video-editing market. However, this latest version of Premiere Elements also concentrates on improved ease of use, with new options for importing media files and creating your own DVD menus and a more flexible interface that can be customised to suit individual users.

Reviewed February 2006

www.adobe.com/uk

Pinnacle Studio 10 Plus

Pinnacle's Studio software strikes a good balance between ease of use and powerful editing tools. The program's interface splits the editing process into a series of simple steps and allows you to progress through each step at your own pace.

However, this latest version also has some powerful features such as support for high-definition video and the ability to use your PC's graphics card to apply a wide range of eye-catching special effects.

Reviewed February 2006

www.pinnaclesys.com



Ulead Videostudio 9

Ulead's Videostudio isn't the most powerful video-editing program on the market, but its great strength is its admirable ease of use.

The program has the least complicated interface of any video-editing program on the PC, making it very easy for new users to get started and to experiment with their video projects.

It's also got a good range of special effects and transitions, along with a selection of templates for quickly and easily creating DVD menus.

Reviewed February 2006

www.ulead.com

Games

Half-Life 2



The spectacular success of the original Half-Life meant that Half-Life 2 was one of the most eagerly anticipated games of all time – and the six-year wait for its release only increased the burden of expectation. Remarkably, though, Half-Life 2 really did live up to the hype, with dazzling 3D graphics and a sophisticated physics system that gives gamers amazing freedom to interact with the virtual reality world inside the game. It wasn't just a technology showcase, though, as Half-Life 2 also drew you in with a skilfully told and well-paced narrative that maintained the suspense from beginning to end.

Reviewed February 2005

www.valvesoftware.com

F.E.A.R.

One of the most anticipated games of the year, First Encounter Assault Recon (F.E.A.R., for short) is an enthralling first-person shooter.

With a gruesome storyline, it's not a game for the fainthearted. If your PC can cope with it, F.E.A.R. will also deliver stunning graphics and is frighteningly realistic. Visual tricks and a thoroughly creepy soundtrack mean you'll be on the edge of your seat throughout the entire game. In short, it's one of the most captivating games we've played over the past year.

Reviewed February 2006

www.vugames.co.uk



GTA: San Andreas

Grand Theft Auto (GTA): San Andreas is very closely based on the two previous GTA games, but this is no bad thing. This outing improves on its predecessors thanks to an outstanding cast of renowned voice actors, and a strong storyline. It's an action-packed game and a must if guns and cars are your thing.

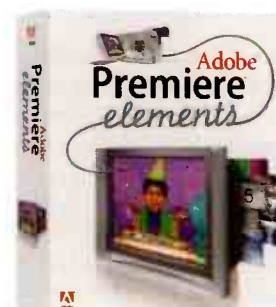
If you don't mind the fact that it is hugely violent and full of profanities, the cleverly designed missions and sheer enormity of the game ensures it will keep you amused for months on end.

Reviewed September 2005

www.rockstargames.com

Have you won one of these prizes?

Here's a recap of the fantastic prizes we offered to readers who participated in the voting for the PCW 2005 Awards for Excellence, plus a list of the lucky winners. Once again, we'd like to offer our sincere thanks to everyone who took part



First prize:

Mesh PC & Pipex broadband

This Mesh Matrix Prestige Plus PC is worth £999. It comes with an AMD 4000+ Athlon 64, 1GB of DDR 400 memory, a 300GB Sata hard drive, an ATI Radeon X800 graphics card, a 19in flat-screen monitor and 5.1 surround-sound speakers.

If the winner lives in an area where he can get broadband and is not locked into a current contract, as a bonus he will also get a year's free broadband service from Pipex, worth £14.99 a month. This is a 2Mbps/sec service with a 1GB download limit, plus the option of 500 minutes of telephone calls.

And that's not all; the winner also gets a copy of Adobe Premiere Elements worth £69, one of the best video-editing packages on the

market. In total, this great prize is worth over £1,080.

www.meshcomputers.com

www.pipex.net

www.adobe.co.uk

Winner Alastair Henderson

Nildram Broadband2go

The free 12-month broadband subscription for Nildram Broadband2go is worth £15.99 a month. This is a 2Mbps/sec service with a 1GB monthly transfer limit.

www.nildram.net

Winner Kevin Hardy

Ten Panasonic C10 network webcams

Help protect your home or business with a network webcam. You can pan and tilt the lens remotely and set it up to email you automatically should it detect movement.

Winners Roy Davies, Paul Sykes, Edward Walley, Andrew Fleming, Colin Cheetham, Thomas Gill, Geoff King, Alan Rule, Dave Charlton, Ian Hay

Four copies of Adobe Premiere Elements

Adobe's video-editing software offers a wealth of features for anyone who wants to give their home video a professional look.

www.adobe.co.uk

Winners M Ali, Philip Roberts, Elsie Roff, Martin Landon

Ten Fujifilm 512MB flash memory cards

Megapixels are on the increase, but these cards will give you plenty of room to hold your digital photos, or music files in your PDAs or smartphone. Each winner can

choose between Compact Flash, Secure Digital, Multimedia Card, XD Picture Card or Memory Stick.

www.fujifilm.co.ukw

Winners Robert Kletz, Tony Garrard, Alan Kerr, Larry Bawden, Phil Campbell, Lawrence Hughes, Matt Woolf, Ian Hull, Ros Wilkinson, James Mackay

Ten Personal Computer World remote control cars

Specially made for PCW, these Audi TTs are great fun to whizz around your home or office.

www.pcw.co.uk

Winners Tony Parry, Andrew Bingham, Roger Hatchman, Jill Mynard, Eric Baker, Paul Edwards, Steve Ward, Simon Harris, Andrew Bode, Derek Shirlaw



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The Fujitsu Siemens AMILO V2020

Super performance hits new heights

The AMILO Pro V2030 Edition is the professional companion for the price-conscious, casual user. This notebook is the ultimate balance of valuable performance and best-in-class mobility at very attractive prices. It features a large 15-inch display for a maximum viewing comfort and an ergonomic full-size keyboard. Ideal for users working both on the road and in the office, it features a built-in combo drive or DVD-writer, modem and LAN. The Wireless LAN module offers unlimited freedom of connectivity wherever you are.

- 15-inch display
- Intel Celeron M 360 1.4 GHz
- 256 MB RAM, 40 GB HDD
- DVD / DVD-RW
- Microsoft Windows XP Home Edition

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State of the nation

Since our last look at broadband, speeds and the number of services have increased. Nigel Whitfield reports on the state of play, TV over broadband, and our online reviews will update you on the performance of the packages we are testing

It's been six months since we reported the results of our broadband trial, where we tested and reviewed 15 packages, and discussed the technology's evolution. As part of our long-term look at how the packages are performing, we're revisiting broadband, catching up on the packages and investigating the changes we've seen in the technology in just half a year.

For many of the packages on test, we've seen a rise in nominal speeds during the months we have been testing them. When we began the test, many packages offered 512Kbits/sec or 1Mbit/sec services, but these have now been superseded. Try and sign up to a new service now, and often you'll find 2Mbits/sec is the base service. Here, you need to check the usage cap that applies to the service. Often there will be several, with prices rising progressively as the cap gets bigger. Capping is an emotive subject and, as we found in our last report, it is difficult to accurately point people to the cap that's right for them.

But there are decent guidelines that you can follow. The simplest is, if you are new to broadband, take whatever your current Internet usage is and at the very least, double it. That will give you some idea of the extra time you'll spend online. It then depends on your downloading habits. If you download lots of music and videos, go for a cap of 8GB or above. If it's general surfing, with a bit of music or video downloading, a smaller cap will suffice. And if you are just starting to make Voice over IP (VoIP) calls, don't worry too much as these eat very little bandwidth.

So, broadband is now fast – as any recent converts from dial-up will testify. But things move on in the Internet world, and there's an ever-growing stream of announcements about broadband, with companies such as Wanadoo offering bundles that include home phone calls, Sky making an offer for Easynet, more and more firms announcing their plans for connections of over 20Mbits/sec – a far cry from the 512Kbits/sec that BT thought most home users would be

happy with when it launched its ADSL service at the turn of the century.

Even now, in some areas of the country it's hard to get connected to even a basic broadband service, so how are some firms offering speeds 40 times as fast? And is there a catch? What's the benefit of these super-fast speeds for the ordinary user – is it simply a way to download the next mammoth Service Pack for Windows in record time, or will there soon be exciting new ways to use broadband?

The story so far

Before looking at where broadband is going, it's important to understand how we got to where we are now. Leaving aside cable TV-based services, which are only available to a relatively small number of people in the UK, broadband largely relies on one company – British Telecom. It owns the network of phone lines that link just about every building in the country. Though there have been a small number of firms operating networks in areas such as the City of London, by and large, if you want a wire into your building, it's going to be provided by BT. Its cables are under the street, and few other companies have the resources to dig up roads and lay fibre or copper cables unless they know there's a guaranteed profit at the end of it. So, for ADSL to appear in the UK, it had to be provided over BT's existing network.

To enable competition to happen, as well as providing a service itself, BT offers a wholesale ADSL product, which other companies then resell, either as a more or less identical carbon copy, or changing features – providing web space, or limited capacity, to differentiate their services. But at the core of it all is the BT network, offering a choice of three speeds – 512Kbits/sec, 1Mbit/sec and 2Mbits/sec – and two contention ratios, 20:1 and 50:1.

That looks decidedly conservative, when other companies are now offering 20Mbits/sec connections, but there is arguably some sense in BT's technological

conservatism, in that it can offer most of its services to most of the country; while it's still tricky in some rural areas – not least because ADSL technology itself depends on distance from the nearest exchange – it causes fewer headaches than if BT were to offer super-fast connections in some areas, but not others or offer services that might be unreliable on longer rural lines.

LLU – A new hope

If much of the UK's ADSL service is built on BT's network, how do other companies provide different speeds, contention ratios and other options? The answer is Local Loop Unbundling (LLU). This means that other companies have the right to request access to the wires that lead into your home or office, and to connect to them in your local phone exchange; they don't need to dig up the street and you're no longer stuck with BT for access to high-speed Internet services.

After a rocky start, with many companies complaining that BT was making it hard for them to participate in LLU as they'd like, that's changing. First, BT is reorganising, so that the local network is a separate company, which should deal with the rest of BT on the same terms as it does with other companies and second the possibility of offering new and improved services over the network is encouraging more companies to invest in LLU, on a much wider scale than before.

With first-generation ADSL, while BT may have been conservative in the services it offered, it wasn't that conservative – the technologies that make TV over broadband possible (see box on page 132) weren't as well developed as they are now, and the chief interest was the most lucrative business and high-spending home customers for broadband Internet services. So LLU happened in wealthy city areas, where investing in





sort of speed. BT is currently trialling an 8Mbps/sec service in some areas and aims to roll it out across the country.

The smaller ISPs rely on BT's network, but those we spoke to hadn't yet been informed of pricing and availability. Once BT formally launches the service, it'll have to be available to all the ADSL service providers.

Speed it up

That, though, is still only 8Mbps/sec. So where's the extra 12Mbps/sec coming from? The answer is ADSL2 and 2+. As the names suggest, these are enhancements to the standards

used to provide ADSL. There are numerous tweaks and improvements in ADSL2, including better power management, faster start-up and special modes to assist with simultaneous delivery of voice services over the DSL connection – as opposed to over the Internet connection that it provides.

However, the most important features for many users are the improvements in range, thanks to better tolerance of interference, and in speed, with a maximum rate for ADSL2 of around 12Mbps/sec. That can be doubled with support for bonding, where two lines are used together, or by using the latest standard, ADSL2+, which uses twice the bandwidth for carrying data, with a potential maximum speed of around 26Mbps/sec.

It's important, though, not to get carried away with the maximum speeds – in many cases, only those who live close to the exchanges will get the maximum speed. The speed of ADSL2, particularly ADSL2+, does fall off quite dramatically as the length of the phone line increases.

Even so, the opportunity to provide unbundled connections appeals to many companies – AOL, Be, Bulldog, UK Online, Video Networks and Wanadoo are just some of the companies investing in installing their own equipment, hoping in most cases not only just to provide high-speed net connections, but also cheaper phone links. New entrant to the arena BSKyB (see box on page 132) is hoping to complete the hat-trick with its purchase of Easynet, allowing it to offer the same 'triple play' of telephone, television and Internet connection as the cable companies.

Even where a service provider isn't looking to provide all these extra services themselves, as products such as Skype become more popular, and users become used to services such as video downloads from the iTunes music store, existing broadband speeds quickly start to become frustrating, especially if you have several PCs at home competing for the bandwidth.

Perfect symmetry

While faster ADSL is great for those downloading massive files, it's not the only broadband technology out there and alongside it some companies are offering SDSL (Symmetric DSL) too.

Despite a flurry of near identical press releases for each area where they've enabled an exchange for SDSL, BT's traditional reluctance to damage its leased-line business means that installing its SDSL service still costs hundreds of pounds.

As more companies provide unbundled services, the cost of SDSL connections should drop, just as ADSL has, and that will make it easier for home workers who need to send large files, or those who want to use remote backup systems.

This is because, despite the large increases in download speeds on offer, even the fastest tend to offer little more than double the upload speed of a standard BT ADSL connection. So while your download speed may be 2Mbps/sec, your upload speed may be just 256Kbps/sec. SDSL offers the same upload and download speeds.

Making any predictions about the state of the Internet is always tricky, but after a slow start, it's clear that there's serious momentum building behind the LLU process.

That in turn should mean that – at least for a significant number of people in the UK – there will be a wider range of faster connection options, making it easier to use media-rich Internet services.

Don't expect plain sailing though; it's still early days for ADSL2 and ADSL2+; many companies are just starting to dip their toes in the LLU water, and it could be months before they reach an exchange near you.

And experience shows that where two or more companies have to deal with one another to get your net connection working, there's ample opportunity for confusion and buck passing, as customers of some LLU providers have already discovered.

Twelve months from now, many readers will have access to faster broadband, but we can't promise that the journey there will be entirely smooth. **PCW**

equipping a single exchange could net a company a reasonable return.

Now, though, there are other reasons to invest. Not only should the changes to BT's structure make it easier for companies to connect up to the local loop, but new technologies also make it potentially more lucrative.

One of the most obvious of those is VoIP, with which regular PCW readers will be familiar, but probably it's not itself enough of a reason for companies to invest. BT is planning a major network overhaul to build the 21st Century Network (21CN) which will be based on IP technologies. In essence, instead of ADSL piggybacking on a voice line, your voice phone service will be just one service provided via the Internet connection.

Although none of the LLU operators is yet running a VoIP service, many of them are offering to route your phone calls through their networks; France Telecom's Wanadoo (see review at www.pcw.co.uk/2146339) – shortly to take on the Orange moniker – is one of the most prominent and is aiming to provide LLU-based services to exchanges that service 40 per cent of the population within the next 12 months.

With its unbundled service, Wanadoo will be offering speeds of 8Mbps/sec, in line with many other LLU providers that have been steadily increasing the speeds available over ADSL. But from spring 2006 it's likely that you won't need to switch ISP to get that

TV over broadband explained

One of the most interesting announcements lately has been the decision of satellite broadcaster BSkyB to invest in Easynet. One of the longest established ISPs in the UK, Easynet has also been heavily investing in Local Loop Unbundling (LLU), putting its own equipment into exchanges around the country, allowing it to offer a wider range of broadband services than is possible over the BT wholesale network.

While satellite television is still growing, and will get an extra boost from the start of high-definition services on Sky during 2006, take-up is slowing. By buying into a broadband ISP, Sky hopes to position itself to offer television over broadband – an area that BT is also looking to move into in 2006.

Cable TV is a broadband medium, but BT and Sky will be looking to use a different technology – IPTV, or television over an Internet connection. A look at even some of the lower-quality channels on Freeview shows that you need several megabits per second to deliver full-screen TV using the mpeg2 compression that's used for current satellite and terrestrial services. This is well beyond the capability of a broadband link that's going to be shared with other computers in your house, not to mention other people linked to the same telephone exchange.

Thanks to more advanced video compression – particularly the mpeg4/AVC system, otherwise known as H.264 – the amount of bandwidth needed can be reduced to between a half and a third of what's necessary, with similar picture quality – or higher definition pictures, using the same capacity as standard definition.

But to make that possible, and ensure that congestion on the network doesn't result in *Eastenders* pausing at random or pixellating, IPTV providers need reliable bandwidth, ideally under their own control – which is why Easynet is attractive to BSkyB. With a reliable direct connection to each user's set-top box, real video on demand is a reality; instead of a satellite channel showing a blockbuster movie with 15-minute staggered starts, IPTV will allow you to stop and start when you like. It will be like having a PVR with a massive hard disk at the end of your broadband line.

It's not yet clear what sort of service Sky will offer. It could simply provide movies on demand, or a version of its satellite service for people who can't put up a dish; BT intends to offer a service combining a Freeview receiver for off-air channels with TV on demand via the broadband link.



Homechoice offers fast broadband access and better quality pictures

Here and now

This technology isn't just something on the horizon, though; around 10,000 users in London are accessing it already, through Video Networks' Homechoice service, which operates over an ADSL connection. When it was launched, the service used mpeg2, like Freeview, and the speed of the Internet connection available from the box was only around twice that of a modem. But Homechoice is now built entirely on mpeg4/AVC, allowing faster broadband access and better quality pictures. As well as live TV, movies and music on demand, Homechoice offers 'replay TV' so that recent episodes of popular programmes such as *Coronation Street* can be called up whenever you want – no more having to set the video.

For the moment it's available only in London – but parent company Video Networks has announced that it's planning to expand nationwide, taking advantage of LLU to place its equipment in more exchanges over the coming year. It's also rumoured that BSkyB is considering a bid for Homechoice, which for its part maintains that it is not for sale. Whether that's true or not, by this time next year there's likely to be a choice of at least two, and possibly three companies providing TV over broadband, with a range of premium and free channels, plus on-demand access to movies, music and popular recent shows.

Also due in 2006 is a neat technology using mpeg4, from French company Neotion (www.neotion.com). The Neotion Cam is designed to fit into the Common Access slot found on most digital TVs and some set-top boxes, and converts mpeg4/AVC video on the fly into mpeg2; that means it can be decoded by an existing set-top box or TV. One version of the Cam includes Ethernet connectivity, allowing the current generation of kit to work with future IPTV systems.

Innovating Auntie

While many of these solutions rely on better quality, faster broadband to deliver

television in real time, that's not the only way of getting television over broadband. The BBC, which has a long track record of experimenting with new technology, and already makes many radio programmes available online, is trialling its new Interactive Media Player (IMP).

The IMP system is designed to let you search for and download programmes and other BBC content, storing it on your computer – so unlike IPTV systems, you won't need a special set-top box to watch things. You also don't need a super-fast broadband link, because it's not designed to provide video on demand, or live feeds of programmes.

Instead, it uses technology similar to the peer-to-peer file sharing networks to spread the load of distributing content between all the users who access the service. You can download and watch material for up to seven days after it's



Search and download BBC programmes with IMP

been broadcast, and even move some of it to mobile devices – though you can't share it with people who don't have the IMP software, and it won't be accessible to people outside the UK.

The trial ends in December, and the BBC Governors will then decide if the service should be officially launched, and the extent of the material that will be available. While not perhaps as exciting as instant TV on demand via high-speed Internet connections, for many people it may be that the BBC's IMP is the immediate future of TV over broadband.

ISPs currently on test by the PCW team

ISP	PACKAGE	CONTACT URL PCW ONLINE REVIEWS	SALES TELEPHONE	MONTHLY FEE	SETUP FEE	MAX DOWNLOAD/ UPLOAD SPEEDS (KBIT/S/SEC)	MONTHLY CAP	IP ADDRESS	TYPE OF SERVICE	CONTENTION RATIO	SUPPORT HOURS/COST	CONTRACT (MONTHS)	ROUTER/MODEM INCLUDED?
AOL	Platinum	www.aol.co.uk www.pcw.co.uk/2146321	0800 376 5432	£29.99	Free	2,048/256	None	Dynamic	IPstream	50:1	8am-midnight every day/free	12	Modem ⁽¹⁾
BT YAHOO	Option 4 - Power Surfing	www.bt.com/broadband www.pcw.co.uk/2146322	0800 389 8714	£29.99	Free	2,048/256	40GB guideline	Dynamic	IPstream	50:1	24/7/0845 number ⁽⁵⁾	12	Wireless router
BULLDOG	Interactive	www.bulldog-broadband.com www.pcw.co.uk/2146323	0800 056 6745	£29.50	£60	8,192/400	None	Dynamic	LLU	40:1	9am-8pm Mon-Fri, 10am-4pm Sat/free	1	Modem
ECLIPSE	Flex Home 500	www.eclipse.net.uk www.pcw.co.uk/2146325	01392 333 333	£23.95	Free ⁽¹⁾	512/256 ⁽²⁾	None	Dynamic	IPstream	50:1	8am-8pm Mon-Fri, 9am-5pm Sat/01392 number	1	✗
FREEDOM 2 SURF	Connect Home	www.freedom2surf.net www.pcw.co.uk/2146326	0870 242 3758	£24.99 ⁽³⁾	Free ⁽³⁾	2,048/256	10GB	Dynamic	IPstream	50:1	9.30am-5.30pm M/W/F, 9.30am-8pm Tu, Th/ 0870 number ⁽⁵⁾	12 (3)	✗
HOMECHOICE	Max Pack	www.home-choice.co.uk www.pcw.co.uk/2146328	0800 072 4454	£49.99	£1 ⁽¹⁾	8,192/288	None	Dynamic	LLU	20:1	8am-11pm every day/ 0845 number ⁽⁵⁾	12	Router
LIXXUS	Lixx Startbasic	www.lixxus.co.uk www.pcw.co.uk/2146329	0845 456 6303	Pay as you go	£58.75	2,048/256	None	Static	IPstream	50:1	9am-5:30pm Mon-Fri/ 0845 number ⁽⁵⁾	1	✗
NILDGRAM	Broadband 2go	www.nildram.net www.pcw.co.uk/2146331	0870 1608 602	£15.99	£47	2,048/256	2.5GB	Dynamic	IPstream	50:1	24/7/ 0870 number ⁽⁵⁾	1	✗
PIPEX	Pipex 1000	www.pipex.net www.pcw.co.uk/2146332	0870 909 8000	£23.99	Free	2,048/256	None	Dynamic	IPstream	50:1	9am-8pm Mon-Fri, 9am-6pm Sat/0845 number ⁽⁵⁾	1 (4)	Modem
TELEWEST	Broadband Complete	www.telewest.co.uk www.pcw.co.uk/2146333	0845 142 0220	£25	Free ⁽¹⁾	1,024/128	None	Dynamic	LLU	Not specified	24/7/ 0845 number ⁽⁵⁾	1 (4)	Cable modem
TESCO	Broadband 512K	www.tesco.net www.pcw.co.uk/2146334	0845 650 8000	£14.97	Free	512/256	None	Dynamic	Data-stream	50:1	8am-midnight every day/ 50p per minute	12	Modem
TISCALI	Broadband 2Mb	www.tiscali.co.uk www.pcw.co.uk/2146335	0800 107 9000	£17.99	Free	2,048/256	None	Dynamic	Data-stream	50:1	8am-midnight every day/ 0870 number ⁽⁵⁾	12	Modem
UK ONLINE	Broadband 8000	www.ukonline.net www.pcw.co.uk/2146336	0800 053 0606	£29.99	£50	8,192/400	500GB	Dynamic	LLU	33:1	24/7/ 0845 number ⁽⁵⁾	12	Wireless router ⁽¹⁾
VIRGIN	Plan One	www.virgin.net www.pcw.co.uk/2146337	0845 676 0762	£24.99	Free	2,048/256	20GB	Dynamic	Data-stream	50:1	24/7/25p per minute	1	Modem
WANADOO	Heavy User	www.wanadoo.co.uk www.pcw.co.uk/2146339	0870 010 2462	£27.99	Free	2,048/256	30GB	Dynamic	IPstream	50:1	24/7/ 0870 number ⁽⁵⁾	12	Wireless router ⁽¹⁾
ZEN	ZenADSL Home 2000	www.zenadsl.com www.pcw.co.uk/2146340	0845 058 9000	£34.99	£47	2,048/256	None	Static	IPstream	50:1	8am-8pm Mon-Fri, 9am-5pm Sat-Sun/0845 number	1	None

Notes: 1 = Time-limited offer; 2 = Can be increased to 2Mbps/sec; 3 = One-month contract available with installation fee and reduced monthly fee; 4 = Cancellation fee of £58.75 applies if you leave during first 12 months; 5 = 0845 — 3p/min weekdays 6am-6pm, 1p/min all other times; 0870 — 7.51p/min weekdays 6am-6pm, 3.75p evenings, 1.5p/min weekends

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GETTING ORGANISED

Organising digital photos is something that's very close to my heart – recently I scanned in several hundred old pictures on a rainy Saturday afternoon and, having early access to Ken McMahon's Digital imaging column, actually managed to catalogue them all using the excellent Photoshop Elements. He's got some great tips for keeping tabs on your photos and they're not just applicable to Elements users.

Niall Magennis' Sound column this month shows you how to give your music recordings some serious sonic punch, using clever dynamic range compression tricks used by professional studios. Musical purists might like to close their ears at this point...

Finally, there's some good news for spreadsheet devotees this month – we've expanded Stephen Wells' popular column to two pages, and he takes full advantage of the extra space by walking you through the many ways of extracting information from data lists in Excel.

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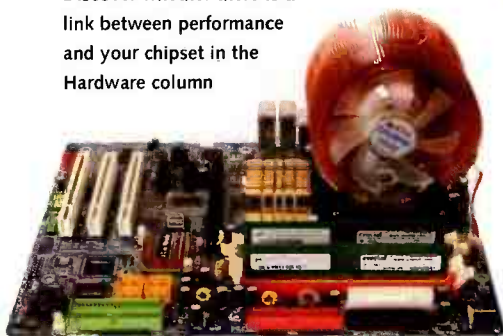
The final versions of Jbuilder and Visual Studio 2005 under the spotlight; plus more on Foxpro

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Discover whether there is a link between performance and your chipset in the Hardware column



Dynamic range compression can add the professional touch to your tracks. Find out how in Sound

Advice from our experts

Finding foxes and slaves and calculating interest are just some of the problems solved

HARDWARE

Rollup, rollup to install MCE update



Rollup 2 for Windows XP MCE now recognises radio stations broadcast using DVB-T digital terrestrial TV, although they don't appear in the radio section

Q I've built my own Media PC using Windows XP Media Center Edition 2005 and like to keep it updated with the various patches Microsoft releases. Having read several scare stories on a number of forums, though, I'm reluctant to install the latest Rollup 2. Is there a special trick to installing it?
Dave Knowles

A Rollup 2 for MCE 2005 (reviewed in PCW, January 2006) brings a number of new features including support for radio stations broadcast using DVB-T digital TV, streaming to the X-Box 360, and improved DVD authoring, along with implementing stricter DRM (digital rights management) for channels that support it. Concerns over DRM aside, it's a worthwhile update for any user of MCE 2005, but as you rightly point out, many early adopters have experienced problems.

Rollup 2 for MCE 2005 requires .Net framework 1.1 and 1.1 SP1 to be installed first and, while Windows update can do all this for you automatically, it may clash with an update already on your system. So

before selecting Rollup 2 from Windows Update, open your Add/Remove Programs Control Panel and tick the box to show updates.

If you see a Hotfix for .Net numbered 886904, you must uninstall it before proceeding. You can download Rollup 2 from Windows Update. Full details can be found at <http://support.microsoft.com/?kbid=900325>. Once installed and restarted, you'll then need to revisit Windows Update to download a critical patch to Rollup 2. See <http://support.microsoft.com/kb/908250>.

After this has been installed, restart your PC, launch Media Center and set up the TV signal and Guide again from scratch. This retuning process is necessary to pick up the digital radio channels if you're using DVB-T tuner cards, but only takes a few minutes. These radio channels sadly don't appear in MCE's Radio section though; you'll need to select them from the Live TV section or the Guide instead.

Our MCE test system strangely needed the drivers reinstalled for the soundcard after the first Rollup download, but found what it needed when we pointed it to Windows Update.

WORD PROCESSING

Word about dates

Q Once a year I run a Word Merge document which extracts information from an Access 2000 database. I generate about 100 sheets on five different Word forms with data, including dates, coming from the Access database. In previous years using Word 2000 this has worked fine, the dates appearing in dd/mm/yy format.

During 2005, however, I switched to a new computer and moved to Word version 2002. The merge function seems to operate with a different setup procedure, as the dates now appeared in US format – mm/dd/yy. Despite searching I could find no control that allowed me to set up the date format.

Fortunately I was able to run the merge set on another computer which still had Word 2000 and all was fine. However, it would be useful to know how I could use Word 2002 and gain control of the formats.

Mike Morley

A You can control this from the Word documents used for the merge, by including a date 'picture' in the relevant merge field codes. First you need to go to Tools, Options, View and tick the 'Field codes' box. You'll then be able to see and edit the merge field codes. To force a UK-style date you need to add the "dd/mm/yy" picture. So, for example a merge field named 'Mydate' should appear as:

```
{ Mergefield MyDate \@ "dd/MM/yy" }
```

(Key: \ code string continues)

This will force a date of the form 25/12/05 – you can use other pictures for other formats, such as "d MMMM yyyy" which will return 25 December 2005.

WORD PROCESSING

My quick brown fox has escaped

Q Years ago, in the days of Word 6, I had a template that did just one job: I opened a new document based upon the template and it at once filled itself up with one line of 'the quick brown fox etc' in lower case and another in upper case in every font installed on the computer. I suppose it contained an autorun macro that did the job. It is beyond me to create such a macro unaided, can you come up with something similar?

Sarah Birkin

A This macro code will work:

```
Sub Fonty()
Dim Fonttotal, Sampler$, n
Documents.Add
Fonttotal = FontNames.Count
Sampler$ = "Jackdaws love my
```

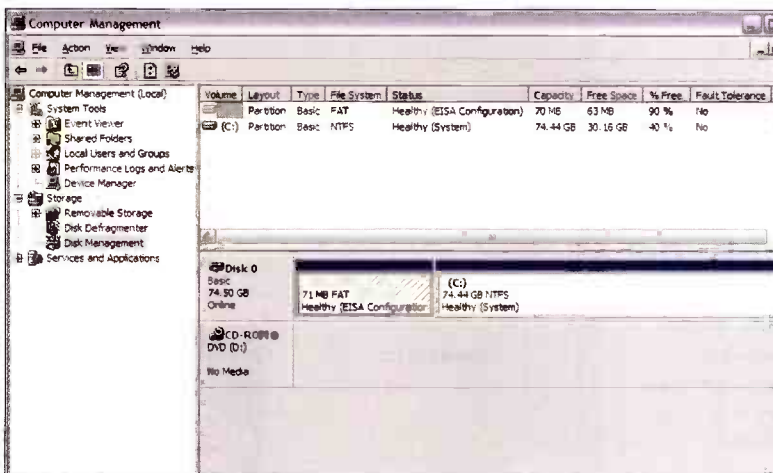
```
big sphinx of quartz" & vbCrLf
For n = 1 To Fonttotal
With Selection
.Font.Name = "Arial"
.TypeText Text:=FontNames(n) &
& " ":
.Font.Name = FontNames(n)
.Font.Size = 12
.TypeText Text:=Sampler$ & vbCrLf
End With
Next n
End Sub
```

(Key: < code string continues)

Obviously you can put anything you want as 'Sampler\$'. The macro prints the font name in Arial rather than its own font, as otherwise symbols fonts such as Wingdings would have illegible names. If you want it to run automatically, create it in a new template and change the first line to Sub Autonew().

HARDWARE

Where's my slave gone?



To partition and format disks under Windows XP, type 'compmgmt.msc' in the Run menu

Q I recently connected an old 6GB hard disk as the slave to my main 70GB hard disk, but although it shows up in the Bios, Windows XP is unable to see it. What do I need to do?

Raman Mistry

A Once a disk is recognised by your Bios, you'll need to partition and format it for use in Windows. To do this in XP, enter 'compmgmt.msc' in Run from the Start menu. Click Disk Management and the right-hand pane will show a graphical view of the disks in your system.

You should now see your main 70GB hard disk and the secondary 6GB model. Right-click the space in this smaller 6GB disk and choose New Partition, then follow the instructions to partition and format it. Be careful that you're partitioning and formatting the correct disk, though, as this process will wipe it clean.

In addition, you should consider fitting this second disk as a slave to your optical drive, or on an unused IDE channel, as it may otherwise impact the performance of your main hard disk.

SPREADSHEETS

Counting Sams

Q Is there a formula in Excel that will add up the number of people with specific names in a column to save me having to keep counting them manually?

Dave Pearce

A You could do this with the COUNTIF function. If you have a list of names in the range B2:B100 and you want to count the number of times Sam appears, in another cell enter

=COUNTIF(B2:B100,"Sam")

SPREADSHEETS

Dates in a range

Q I have a list of dates in Excel, all in 2005. How can I count the number that fall between 15 April and 15 June?

Alex Tye

A Use the very flexible COUNTIF function in a formula. Name the range of dates, Dates. Then in a cell away from the list enter

=COUNTIF(Dates,">15/4/05") -

COUNTIF(Dates,">=15/6/05")

(Key: < code string continues)

WORD PROCESSING

Location, location

Q If I use Tools, Options in Word and change the location of My Documents to a networked drive, this is not mirrored by the toolbar on the left in File Open. I searched through HKEY_CURRENT_USER in the Registry but have had no success. Clicking the My Documents button either reverts to the default Windows location or brings up a blank dialogue. Surely there must be some way to configure the dialogue or should I be looking further down the Registry to find the right value to edit?

Rob Barnes

A The answer lies not in Word but in Windows – right-click on the My Documents desktop icon, choose Properties, and you can change the location on the 'Target' tab.

WINDOWS

Shutdown shortcut

Q In Windows 98SE, I could shut down or restart with a shortcut to Rundll32.exe shell32.dll,SHExitWindowsEx n, where a value of 1 for n shut down the PC (after prompting to save any open unsaved files) and a value of 2 restarted. Other values of n did different things. None of these commands work since upgrading to XP SP2 – is there a way round this? *Peter Crowther*

A The 'Shutdown' command will help. When used with the -s switch it will shut down the PC. The -r switch restarts. In both cases, you get 30 seconds to change your mind by typing 'shutdown -a' into the Start, Run box or a command prompt to abort the shutdown. Typing 'shutdown' by itself (without the quotes) at a command prompt will list other options.

HARDWARE

Monitor mayhem

Q I want to buy a 7800GTX SLI system which only has DVI connectors. My Sony G520 20in CRT monitor only has analogue VGA connectors. Is there an adapter that will let me use my old monitor with this new system? *Steven Welch*

A DVI plugs may have been designed to transport digital video signals to monitors with DVI ports, but the specification optionally supports legacy analogue signals that can drive old monitors.

To drive an analogue monitor you'll need a graphics card with a DVI-I connector, as these support both digital and analogue signals. Graphics cards that use DVI-D plugs will only output digital signals. Check before you buy.

If you have a graphics card with a DVI-I port, you'll need an adapter to connect it to your analogue monitor. Some graphics cards come with one, but if yours doesn't, you can buy a suitable DVI-to-VGA adapter from Maplin (www.maplin.co.uk) for £16.98. This will then work with an existing analogue VGA cable.

DIGITAL IMAGING

Balancing act

Q One of the joys of my current digital camera (Canon G2) is that it offers several colour temperatures, although I only use two – daylight and tungsten.

My problem is that I sometimes forget to switch between them and end up with indoor photos taken in daylight that are very yellow, and vice versa, outdoor photos that are very hard with a bluish tinge.

Once downloaded to the PC I have played with altering things to try to get them right and wondered if you could advise on what correction method would be best (I use Photoshop). *Steve Burrows*

A This is a straightforward colour correction issue that can easily be fixed. If you were using film, you would use colour correction filters to enable you to use film balanced for daylight or tungsten light in the 'wrong' conditions. An 85b orange filter allows you to use tungsten film in daylight and an 80a is used when shooting in tungsten lighting with daylight-balanced film.

You can do the same thing retrospectively in Photoshop to



correct images shot using the wrong colour balance settings. Select Image>Adjustments>Photo Filter and use the Warming Filter (85) to correct photos shot outdoors on a tungsten white balance setting and the Cooling Filter (80) for shots taken indoors with a daylight white balance setting.

If the colour balance still isn't quite right, change the density setting in the photo filter dialogue box to apply more or less correction, or you can apply the filter as an adjustment layer and reduce the layer opacity.

Alternatively, if you shoot using the Raw format, you retain all the file information. So if your white balance is wrong, you can correct it by simply adjusting the colour temperature in Photoshop.

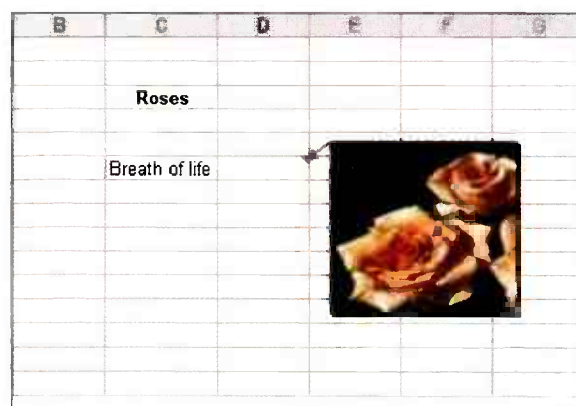
Correct white balance problems in Photoshop using photo filters

SPREADSHEETS

Adding an image

Q Please tell me how I can put a picture into an Excel comment box. Can it be done? Is there any help from Microsoft as to what to do? *Maureen White*

A First, using suitable image-editing software, such as Microsoft Photo Editor or the free Irfanview (www.irfanview.com), reduce your picture to a size of about 150 x 200 pixels. Then start Excel in the usual way. Right-click on the cell where you want the picture and choose Insert Comment. Remove your name if it appears in the box. Point to the outer edge of the box and a cross made up of four arrows will appear. Right-click and choose Format Comment and then the Colours and Lines tab. Under Line, Colour, choose No Line. Click



down the Fill Colour arrow and choose Fill Effects and then the Picture tab. Click the Select Picture button and choose your picture. OK out.

You may have to pull down the bottom of the picture to compensate for any distortion, or pull out the side. Under the View tab of Options on the Tools menu choose Comment indicator only. Then the picture will only appear when you point to the cell.

It's easy to add a picture to a comment in Excel

SPREADSHEETS

Gathering interest

Q My credit card company statements say that it charges a monthly interest rate of 1.52 per cent or an annual rate of 19.9 per cent on standard balances and 1.66 per cent monthly or 21.9 per cent a year on cash balances. Could you tell me how to use Excel to calculate and check those monthly rates from the quoted annual rates? Incidentally, the company doesn't say that the annual rate is an APR.

Diane Borough

A It looks as though the company compounds interest monthly and that the annual rate is an APY. An APR (Annual Percentage Rate) does not take compounding into account. An APY (Annual Percentage Yield) does.

The formula you need is $((1+i/n)^P)-1$ where i is the nominal interest rate expressed as a decimal, n is the number of periods compounded, and P is the period for which you wish to find the interest. First go to Add-Ins on the Tools menu and check the Analysis ToolPak. If it's not listed load it from your Excel or Office disc. To find the nominal rate equivalent of the compounded rate of 19.9 per cent, on a clean worksheet, enter 12 in cell B4 representing 12 periods of compounding and enter the following formula in cell B3:

=NOMINAL(19.9%,B4)*100

To find nominal annual interest rate			
	STANDARD	CASH	Formulas
3 Nominal annual interest rate (i)	18.29	19.97	
4 No. of times a yr compounded (n)	12	12	
5 Compounded annual rate	19.90	21.90	$((1+i/n)^n)-1$
Equivalent monthly interest rate			
8 No. of periods compounded	1	1	
9 Rate for period	1.52	1.66	$((1+i/n)^{1/P})-1$

How to calculate interest on your credit card

The result is 18.29 per cent. Enter in B5:

=(((1+(B3/100)/B4)^B4)-1)*100

This just confirms that your compounded rate of interest is 19.9 per cent if the nominal rate is 18.29 per cent. Enter 1 in B8 because initially you want to see what the interest rate is after one month. Then in B9 enter:

=(((1+B3/B4)^B8)-1)

This will tell you that the monthly rate of interest is 1.52 per cent. The caret mark (^) means to the power of and is usually found above the 6 on a standard keyboard. If you are not interested in the rate for three or six months, simplify the formula to

=(((1+B3/B4))-1)

Similarly, for the cash balances:

=NOMINAL(21.9%,C4)*100

in cell C3; and 12 in C4. Drag the formula in B5 over to C5 so it reads **=(((1+(C3/100)/C4)^C4)-1)*100** in C5 and drag B9 to C9 so it reads **=(((1+C3/C4)^C8)-1)**

or **=(((1+C3/C4))-1)**

confirming that this monthly rate is 1.66 per cent.

DATABASES

The new order

Q I am building an order database in Access. I have written a query to pull up the most recent order (the one with the highest order number) and then I base a report on the query. But the query is very specific and has to be rewritten each time. Is there any way to make it more general?

SELECT ORDER.OrderID, ORDER.OrderDate, ORDER.OrderValue FROM [ORDER] WHERE (ORDER.OrderID)=6;

(Key: < code string continues)

Brian Williams

A There are a couple of ways of doing this. For example, you can use a query of the general format:

SELECT ORDER.OrderID, ORDER.OrderDate, ORDER.OrderValue FROM [ORDER] WHERE ORDER.OrderID=(SELECT Max(ORDER.OrderID) FROM [ORDER]);

This should work in many different databases engines, although you need to check that they have a function called MAX and, if not, look for a substitute.

However, Access queries also have properties that you can set, one of which is 'top Value'. If you set this to the value 1, place the OrderID field as the left-most one in the query and sort it in descending order, then the query should return just the top value for OrderID.

SPREADSHEETS

X causes sort problems with ISBN numbers

Q I work in publishing and spend a lot of time looking at spreadsheets containing ISBN references (10-digit numbers ending in a check digit which can be 0-9 or X). Whenever I try and sort a column of ISBNs, any ending in 'X' always get

Try reformatting to sort ISBN numbers

BookID	Title	TopicID	CopyrightYear	ISBNNumber	PublisherName
83	46 Traditional English Gardens	9	1987	0-297-79071-4	Weidenfeld and Nicolson
84	92 Lanning Roger and his Gardens	9	1987	0-297-79369-1	Weidenfeld & Nicolson
85	59 Sissinghurst	9	1990	0-297-83043-0	Weidenfeld & Nicolson
86	68 Architecture of London	8	1992	0-297-83114-3	Weidenfeld & Nicolson
87	70 Georgia O'Keeffe	8	1993	0-300-06576-5	Yale University Press
88	100 Good Plant Guide	9	1991	0-304-30736-X	Cassell
89	91 Clematis	9	1995	0-304-31140-5	Cassell Educational
90	162 Edwin Lutyens	6	1986	0-312-23919-X	Academy Editions
91	161 This Old House	6	1980	0-316-17702-4	Little, Brown and Company
92	273 The Lord God Made Them All	4	1980	0-340-27254-6	Reader's Digest Association
93	340 Starting Your Own Business	2	1993	0-340-32090-7	Consumers' Association
94	46 Making of the English Landscape	9	1988	0-340-39871-6	Hodder Stoughton
95	39 Design Source Book	9	1986	0-356-12006-8	Macdonald Orbis
96	37 Architecture Source Book	9	1989	0-356-17503-0	Macdonald Orbis

sorted separately and appear in a group at the bottom. Is there any way I can get Excel to sort the numbers so those with an X appear in the correct sequence?

Daniel Ruff

A In the Excel database shown in the screen (left) the ISBN references column is formatted General. Sorting on that field comes out as shown in the screen. In ascending order, Excel sorts numbers first, then text, logical values, errors and finally blanks. After an entry ending in X it moves on to the next number sorting from the left. Try reformatting.

LET US HELP YOU

All our experts welcome your queries. Please respond to the appropriate address below

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Performance performance@pcw.co.uk

Sound sound@pcw.co.uk

Spreadsheets spreadsheets@pcw.co.uk

Visual programming visual@pcw.co.uk

Web development webdev@pcw.co.uk

Windows win@pcw.co.uk

Word processing wp@pcw.co.uk



Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Hardware column.

Email hardware@pcw.co.uk

Please do not send unsolicited file attachments.

Speedstep revisited

To discover if reduced performance is linked to chipsets, we tested EIST using an Intel one

A modern PC switched on for several hours each day could easily become one of the greatest consumers of power in your home or office. Recognising this, processor manufacturers are now implementing power-saving technologies borrowed from portables that allow a system to recognise idle periods and automatically reduce consumption.

Over the past few editions of Hands on Hardware, I've been putting these power-saving technologies to the test. In December's issue I tried AMD's Cool'n'Quiet technology used in the Athlon 64 range. Last month I compared it to Enhanced Intel Speedstep Technology (EIST), featured in selected Pentium 4 and Pentium D processors.

Both technologies operate on the same principle: they recognise idle periods and automatically reduce the clock multiplier to bring down the overall processor clock speed. By doing so, they can temporarily reduce the core voltage, which in turn greatly reduces power consumption and produces less heat. This technique has been exploited by mobile processors for some time.

In tests over the past two issues, AMD's Cool'n'Quiet proved more effective at saving power than Intel's EIST. Cool'n'Quiet also had no negative impact on performance when under load, whereas, worryingly, EIST reduced overall performance in last month's tests. Thinking this may have been due to the Nvidia Nforce chipset on the motherboard tested, I've retested EIST this month using a motherboard with an Intel chipset.

Testing EIST

For comparative purposes I used exactly the same components as last

Gigabyte's GA-8I945P motherboard was used for this month's power consumption tests. It's pictured here fitted with Crucial memory and a Pentium 4 660 topped by Zalman's CNPS9500-LED heatsink



month, apart from switching the Gigabyte GA-8N-SLI Pro motherboard (Nvidia Nforce 4 SLI chipset) for a Gigabyte GA-8I945P motherboard (Intel 945P chipset).

The GA-8I945P was fitted with 1GB of Crucial DDR2 memory, a Gigabyte NX66256DP Nvidia Geforce 6600 PCI Express graphics card and a Pentium 4 660 (3.6GHz) processor cooled by

Zalman's CNPS9500-LED. The system was running Windows XP Media Center Edition 2005 on a Seagate Barracuda 7200.8 Serial ATA hard disk. A Maplin power meter connected between the PC's power supply and the mains socket was used to measure power consumption (see www.maplin.co.uk).

With Windows' power-management settings set to Always On and the processor clocked normally at 3.6GHz, the system scored 212 in Sysmark 2004 and took 13 minutes and 40 seconds to encode a 12.5-minute mpeg2 vob file into the DivX format. Last month's identical components in the motherboard with the Nvidia chipset scored 218 in Sysmark and 13 minutes, 24 seconds for the DivX encode.

Interestingly, the Intel chipset motherboard consumed less power than the Nvidia model: when idle

Making the most of EIST

To enable an EIST-compliant system, you'll need to set Windows' Power Control Panel to Minimal Power Management. The properties of My Computer will then show the clock frequency as 2.77GHz.

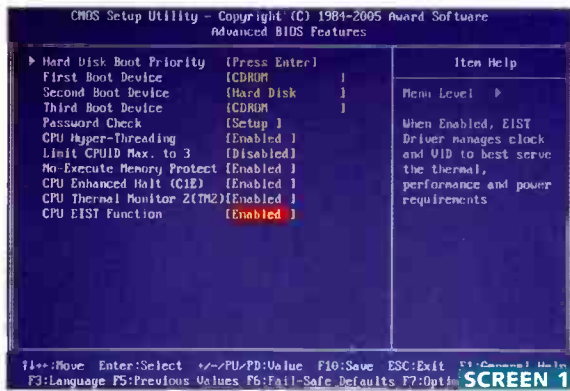
Enhanced Intel Speedstep Technology (EIST) is featured on all 6xx series Pentium 4s and 8xx series Pentium Ds apart from the 820 and 840 Extreme Editions. It allows the processor to be automatically clocked down to 2.8GHz when idle, then back to its full speed under load. This effectively happens instantaneously.

To take advantage of a processor with EIST, you'll need a Bios and chipset that support EIST, along with a motherboard that supports dynamic voltage identification (Dynamic VID); you'll also need to enable C1E (see main article) and EIST if offered in the Bios. You'll need an

operating system that supports EIST, such as Windows XP SP2.

EIST is disabled by default in SP2, so to switch it on you'll need to select Minimal Power Management from Windows' Power Control Panel. To turn it off, select Always On from the Power Control Panel. To verify EIST is enabled, open the Properties of My Computer, where you'll see the processor's model listed as usual, but below it the clock speed will read 2.77GHz.

Many websites claim that to enable EIST you'll need to select Portable/Mobile, rather than Intel's instruction of Minimal Power Management. In our tests with desktop configurations this made no difference to performance or power consumption, so we'd recommend sticking with Intel's official instructions of Minimal Power Management.



in Windows, they consumed 97 and 115w respectively, which rose to 193 and 198w respectively when encoding the video. This is an impressive difference for the Intel chipset when idle – it also explains why the Nvidia chipset ran much hotter and required a fan under most circumstances.

I then enabled EIST according to Intel's instructions (see box). This time both the Intel and Nvidia chipset systems suffered from a reduction in performance, taking 14 minutes, 54 seconds, and 14 minutes, 28 seconds respectively to encode the same video file into DivX – around a minute longer for each.

Interestingly, while the power consumption during the encoding process had remained fairly consistent, it varied considerably once EIST was enabled. The Intel chipset system jumped between 154 and 187w, while the Nvidia chipset system jumped between 148 and 201w. The high figures were the same as the highs without EIST, but the low figure was now much lower. EIST was certainly saving power, but with a subsequent hit on performance.

Last month, I noticed the power consumption when idle had stayed the same regardless of EIST. With the Nvidia chipset motherboard, the power consumption when idle remained at 115w, whether or not EIST was enabled. The situation was the same with the Intel chipset motherboard, where the system consumed 97w with or without EIST. This was a concern since, ideally, you'd want the power saving to kick in when idle but not affect performance when under load.

Understanding EIST

To better understand what EIST is doing and make sense of the results, you need to know the exact clock speed and core voltage at any time.

In order to exploit Intel's C1E and EIST power-saving technologies, you'll need to enable them from your motherboard's Bios settings. Some chipsets may not offer this option

The excellent CPU-Z utility allows you to do just this, and it can be downloaded from www.cpuid.org; I used it to monitor the processor clock and core voltage in real time during idle periods and the DivX encoding process.

The first surprise when you run CPU-Z on a modern Pentium system is discovering that the clock speed is reported as 2.77GHz when idle, whether or not EIST is enabled. Activity then brings this up to the normal speed of the processor, such as the 3.6GHz of the Pentium 4 660 on test.

This reduction in speed without EIST is thanks to an earlier Intel power-saving technology called C1E Enhanced Halt State. Like EIST, this can also recognise idle periods and reduce the clock speed to 2.8GHz using a 14-times clock multiplier. According to Intel, however, EIST features many more voltage levels than C1E.

With Windows' Power Control Panel set to Always On, thereby

disabling EIST, CPU-Z reported that this month's test system consumed 1.136v and 94w when idle. Under load, the voltage varied between 1.264 and 1.312v, with the power consumption rising to between 192 and 194w.

With EIST enabled, CPU-Z reported the same configuration as consuming an identical 1.136v when idle, but between 1.104 and 1.312v under load, explaining the widely varying power consumption of 154 to 187w.

Power saving at a price

Judging by the results, EIST certainly offers a wider range of voltage settings than C1E, and by using the lower ones it can consume less power. Unfortunately, though, EIST doesn't seem to save any more power than C1E while idle, and instead appears to make its savings during periods of load. By doing so – on the motherboards I tested, anyway – this resulted in slower performance.

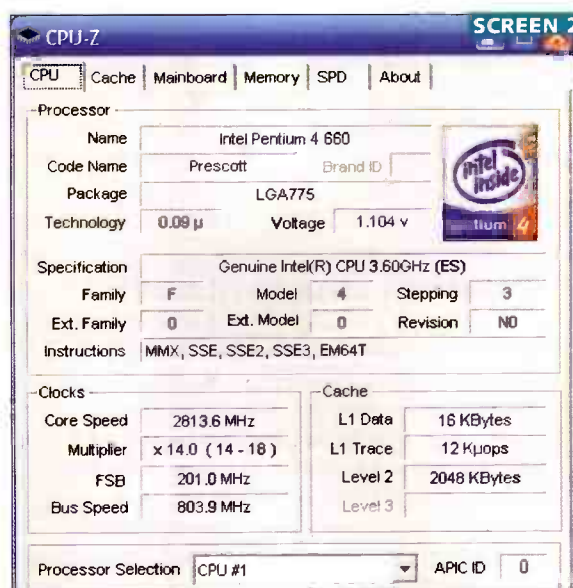
Personally speaking, I'd like a system that saves power when idle but isn't compromised in performance when the application demands it. Intel's earlier C1E power-saving technology will do this, clocking down to 2.8GHz when idle but running at full speed when required. AMD's Cool'n'Quiet does the same, although with a far greater saving when idle.

Unfortunately, EIST, while saving more power than C1E, does so at times when you want the processor's performance. In the systems I tested, it effectively reduced the maximum performance of my 3.6GHz processor to one running closer to a 3.2GHz system. The decision is, of course, entirely up to you, but I would not bother enabling it on either of the systems tested. C1E offers the same saving when idle, without any compromise under load.

As for the chipsets, the Intel 945P motherboard consumed an impressive 18w less than the Nvidia Nforce 4 SLI when idle and didn't require a fan, while the Nforce delivered slightly faster scores and, of course, supported SLI. Next month I'll return to the granddaddy of dynamic underclocking, the Pentium M, and see how its power-saving technology compares with traditional desktop solutions. **PCW**



Maplin's plug-in mains power and energy monitor allows you to measure how much power a device is consuming



The CPU-Z utility can reveal the processor clock speed and core voltage in real time. Here EIST has been enabled, allowing the processor to clock down to 2.8GHz (using a multiplier of 14 times) and run on 1.104v



Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Performance column.

Email performance@pcw.co.uk

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Stress management

Constantly stretching performance causes strain, so find out how to ease the pressure

Overclocking can be a great way to squeeze extra performance from your processor, but many people are concerned by the risk of permanent damage or reduced lifespan to their components. Traditional overclocking techniques place the processor under increased strain the whole time the system's powered up.

So several manufacturers now offer the facility to dynamically overclock your processor when under load but return it to normal speed during less demanding periods. Gigabyte's CPU Intelligent Accelerator 2, or CIA2 for short, is a prime example.

CIA2 in practice

I used the same configuration as in this month's Hardware column to test CIA2: a Gigabyte GA-8I945P motherboard with 1GB of Crucial DDR2 memory, a Gigabyte NX66256DP Nvidia GeForce 6600 PCI Express graphics card and a Pentium 4 660 processor cooled by Zalman's CNPS9500-LED. Tests were run under Windows XP Media Center Edition 2005 on a 400GB Seagate Barracuda 7200.8 Serial ATA hard disk.

Clocked normally at 3.6GHz with Windows power management set to Always On, this configuration scored 212 in Sysmark 2004 and took 13 minutes and 40 seconds to encode a 12.5-minute mpeg2 vob file into DivX.

When manually overclocked to 3.79GHz using a 210MHz front-side bus, the system scored 223 in Sysmark 2004 and 13 minutes, three seconds for the DivX encode. Manually increasing the bus to 220MHz to drive the processor at 3.96GHz saw the scores rise to 231 in Sysmark and 12 minutes, 27 seconds for the encode.

I didn't need to increase the core voltage for either overclocks, but each was keeping the processor in its overclocked state at all times, so I



returned to the Bios pages, set the bus back to 200MHz and enabled the lowest CIA2 mode of Cruise (see screen 1). The system rebooted fine although, unlike manual overclocking, the PC reported the speed of the processor had not changed from its default 3.6GHz. This was expected, though, as CIA2 should only overclock the processor when the application places it under full load.

I re-ran Sysmark under Cruise mode and it scored 225 – far higher than the 212 of the standard 3.6GHz speed and slightly higher than the 223 I achieved with a manual overclock to 3.79GHz.

To see what CIA2 was doing, I ran the CPU-Z utility, available from

Gigabyte's CIA2 dynamic overclocking modes are selected from the Bios

www.cpuid.org, during the DivX encode. Under load, CIA2 in Cruise mode increased the bus to 214.8MHz, overclocking the processor to 3.86GHz.

Once the load had reduced, the bus was dropped back to 200MHz. The Pentium 4's C1E reduced power facility also kicked in as normal (see Hardware, page 140), reducing the multiplier from 18x to 14x, with the resultant processor clock falling to 2.8GHz.

I then tried CIA2's Sports mode, which increased the bus and processor clocks to 218.9MHz and 3.939GHz respectively, scoring 228 in Sysmark and taking 12 minutes, 31 seconds for the DivX encode. Sadly the faster Racing, Turbo and Full Thrust modes of CIA2 failed to boot with my hardware configuration.

Performance benefits

CIA2 is a great implementation of overclocking. It'll push your processor when required, but clock it back to normal during idle periods, giving you performance benefits of overclocking without leaving components stressed at all times. The downside is it only works with Gigabyte motherboards, and remember any overclocking is undertaken at your own risk. **PCW**

Secrets of CIA2 revealed

Gigabyte's CIA2 claims to intelligently detect CPU load and automatically overclock your processor when the application demands it. Once CPU load decreases, the processor is automatically relocked to its normal level, thereby eliminating undue stress.

CIA2 differs from the original CIA by detecting CPU current and temperature and, unlike the single-step increase of other manufacturers, offers three acceleration stages depending on the load and demand; see <http://tinyurl.com/aywyf>.

CIA2 is enabled and adjusted in the motherboard Bios, under the Motherboard Intelligent Tweaker, MIT section. By default CIA2 is disabled, but you can change it to one of five different modes. Cruise mode automatically increases the CPU speed by five to seven per cent, Sports by seven to nine per cent, Racing by nine to 11 per cent, Turbo by 15 to 17 per cent, and Full Thrust by 17 to 19 per cent.






CIA2 applies this increase to the bus speed, which in turn forces the processor to run faster thanks to its clock multiplier figure. Choose the desired mode, then Save and Exit the Bios to apply the changes.

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Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

→ Comments welcome on the Windows column.

Email windows@pcw.co.uk

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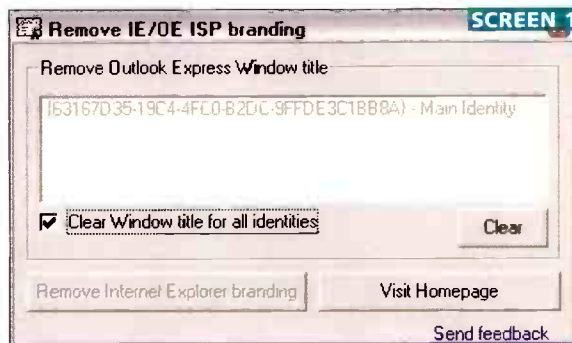
An unbranding exercise

Remove manufacturer names from IE and OE; and experiment with Autohotkey

It's a frequent annoyance that computer manufacturers and ISPs will install 'branded' versions of Internet Explorer and Outlook Express with their own name in the title bar. Fortunately, it's fairly easy to remove this branding, and there are several ways of going about it.

We've mentioned IE Personalizer and Outlook Express Tweaker previously. But the developers appear to have abandoned these products, and the former doesn't seem to work with Windows XP. To unbrand IE, open the Start Run box and type: **rundll32.exe iedkcs32.dll, Clear** exactly as written, then press Enter. We haven't found an equivalent trick for Outlook Express, so you will need to edit the Registry. Having taken simple precautions with a System Restore point, go to HKEY_CURRENT_USER\Identities\{GUID}\Software\Microsoft\Outlook Express\5.0, where GUID is a long hex string identifying each user.

In the right-hand pane, delete the WindowTitle string value, or change it to something else. Repeat for other users. To change rather than remove the IE branding, go to HKEY_CURRENT_



USER\Software\Microsoft\Internet Explorer\Main and look for the entry 'Window Title' (with a space) in the right-hand pane. Double-click on it to edit its value or delete it to revert to the 'Microsoft Internet Explorer' title.

If all this seems like too much hard work, you'll find a little utility to strip branding from IE and OE at <http://windowsxp.mvps.org/ie/ispunbrand.htm>. This has the bonus of being able to (optionally) unbrand all OE identities with one click (see screen 1).

Use this simple utility to strip 'branding' from Internet Explorer and Outlook Express

Search me...

We've often taken the lame built-in search facilities of Windows to task in

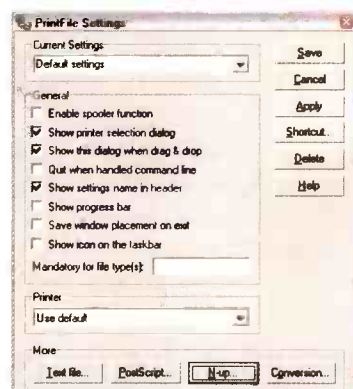
this column and looked at alternatives. XP users have the Indexing Service, which, although faster and more flexible than the 'Search Companion', has the user-friendliness of a cornered rat. We covered this in detail in December 2003, and better free search utilities are now available. Microsoft has its own – MSN Desktop Search, aka Windows Desktop Search, and rivals include Yahoo, Copernicus, Agent Ransack and, of course, Google. I've long been a fan of Google's web search, so I gravitated to its desktop search fairly naturally. However, I've also tried the Microsoft offering and at the time of writing had both installed. Neither was the latest version, so I thought I'd upgrade both to the current version and compare them. The Microsoft version is a much bigger download (9MB to Google's 1.4MB), which may be an issue if you don't have broadband.

In the latest versions (2 for Google, 2.05 for Microsoft) the latter seems to win hands down on configurability. Google has a rather awkward preferences dialogue, which opens in a browser where you can choose from a list of file types and exclude drives or folders by adding a URL (I found this confusing when specifying folders on my own disk). Microsoft has a far more polished way of presenting preferences, with a tree view on the left and the relevant options on the right, like the XP version of TweakUI.

What's more, the options are more wide-ranging. For a start, you can specify folders on an opt-in basis. Since a lot of my searching involves looking up stuff from past Hands on columns, I can opt to index the folders containing these and skip folders full of irrelevant stuff. You also get finer control over the file types you want indexed and those you don't. There are several other options – first, if you don't want the index (which can run to tens or

A user-friendly solution to prn issues

Further to Mike Greene's query in October's Question time concerning .prn files, Michael Farrow suggested a utility called PrintFile written by Peter Lerup. It is more user-friendly than a command prompt and has features such as the ability to handle Postscript, plain text and binary .prn files as well as lots of exciting options. It's free at www.lerup.com/printfile. James Moffatt suggests Mike opens .prn files in a text editor (Notepad will do) to check they are plain text before printing.



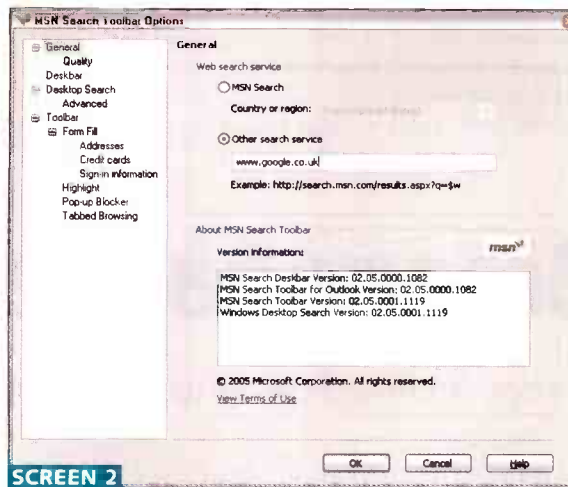
A better way of treating .prn files

even hundreds of megabytes) stored in the default location under your C: drive profile, you can specify another location. Another great option – which is most self-effacing for Microsoft – is that you can specify any search engine you like for web searches – you don't have to use MSN (see screen 2).

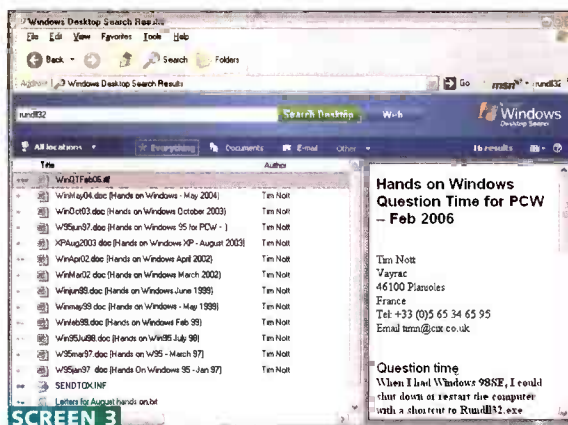
By default, indexing is paused when you are using your computer, but you can override this setting, though it may slow things down. Google will only index when the computer is idle. I also prefer Microsoft's presentation of results. Whereas Google has a similar look to a web search, Microsoft gives you columns showing the file name, properties and so on (see screen 3).

When I updated the Google desktop search, I found it had 'helpfully' installed the French-language version as I was using a French ISP. I had to uninstall this and restart before being able to replace it with an English version as Google.com redirects itself automatically to Google.fr.

Another little-known limitation of Google Desktop is that it only indexes the first 5,000 words of a document, so if you use longer documents you may find you don't get all the results you should. Although the MSN search has several 'ways in' – from the system tray, from a Taskbar toolbar, or from an Explorer toolbar – it misses the screamingly obvious, which is supplanting the existing XP 'Search Companion'. If you're using Google Desktop Search, you can implement this with a free plug-in, which you'll find at www.bytegems.com. Once you've installed this (and logged off and back on) you'll find the Start Menu search command, the Explorer search button and Windows key & F all start the Google Desktop search in



SCREEN 2



SCREEN 3

Top: You don't have to use MSN to search the Internet

Bottom: MSN Search results give you a preview

the same space the Search Companion previously occupied (see screen 4).

What you lose in terms of animated dogs is more than compensated for by the speed and general competence of its replacement.

Hot stuff

Although I'm not a real programmer, I've had a lot of fun – if that's the right word – messing around with batch files, macros and Windows Scripting. So this month I've been playing with an open-source free utility called Autohotkey. This, as the name implies, lets you set an action to a key combination. To take a couple of simple examples in the first tutorial,

this one-line script:

#n::Run, Notepad

launches Notepad when you hold down the Windows key and press n, and:

#space::Run, ↵

http://www.pcw.co.uk

(Key: ↵ code string continues)

launches the PCW website in your default browser.

In these two examples, the hash represents the Windows key, n the n key and space the spacebar – note that you type the word space rather than a space. There's more than just creating keyboard shortcuts – another fairly simple use is to create text macros.

#s::Send, Yours ↵

Sincerely, {Enter}Tim Nott

This sends the text after 'Send,' to the current application – which obviously needs to be some kind of text-editing program. Note that {Enter} performs a CR/LF, just as if you had pressed the Enter key.

It's a bit reminiscent of the old Windows 3 Recorder utility, but far more versatile – you can manipulate windows, send mouse clicks and much, much more. You can get user input, assign and manipulate variables, do mathematical operations, control the clipboard, and manipulate files, folders and the Registry. Comparing it to the Windows Scripting Host is like comparing an electric circular saw to a breadknife. And, like the saw, it can be dangerous if you don't know quite what you are doing – which I freely admit to at this point. It is, however, a fascinating tool, and this column will be returning to it when I'm more proficient. You can download it from www.autohotkey.com.

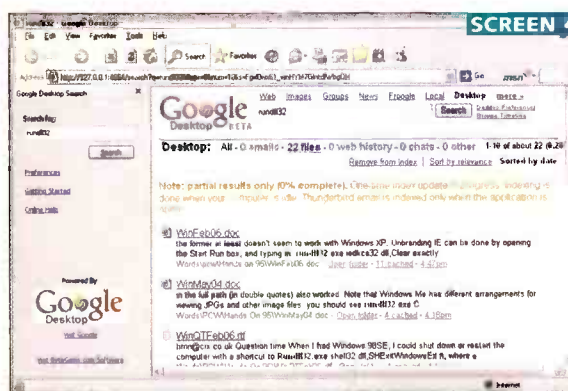
A better briefcase

Reader Vivian Dunn brought a new Powertoy to our attention. Synctoy was launched in beta form in early August 2005, and a release version is now available that adds a few more features, such as the ability to type in UNC paths. It's primarily designed for digital images, although it can be used with any files, and it works with pairs of folders. It's for XP only and you'll find it at <http://snipurl.com/gtd2>. Be warned that you have to jump through the hoops of a rather tedious 'validation process' to verify that your copy of Windows is genuine before you can download Synctoy. And while I'm in kicking mood, it would be better if Microsoft could come up with a more informative file name for the download than 'Setup.msi'. **PCW**

Test your XP IQ

Reckon you know your way around Windows XP fairly well? Microsoft has provided two 'online assessments' – one each for XP business and home users. You'll find them at <http://assessment.learning.microsoft.com/test/home.asp> and, while they aren't quite as much fun as the pub quiz, they are fairly stretching. We couldn't get them to work in Firefox so had to use Internet Explorer, and no, we didn't get full marks.

Replacing the XP Search Companion improves speed and competence



SCREEN 4



Barry Shilliday has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but his in free time he prefers to travel the world – and snap it with his camera.

→ Comments welcome on the Linux/Unix column.

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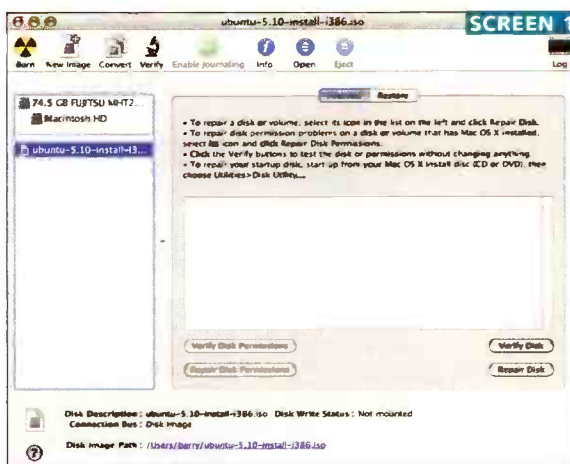
In the first of a two-part series, find out how to install the popular Ubuntu Linux

If you've kept up to date about Linux, you'll have heard about the Ubuntu Linux distribution. A little over a year on from its first release, Ubuntu has had a huge amount of success. The first release came in October 2004 and was codenamed the Warty Warthog. Six months later came the Hoary Hedgehog, and one year on the Breezy Badger arrived. The immense popularity of Ubuntu is surprising given its short lifetime, but once you use it you might see why. This month we begin a two-part series looking at installing Ubuntu and setting it up for an average desktop user.

The first step is to get hold of the installation CD. There are three ways to do this: the easiest is if you have the DVD edition of this month's PCW – simply copy across the CD image to your hard drive. Alternatively you can download the image from any one of Ubuntu's many servers. Head over to www.ubuntu.com/download for a list of servers and pick the PC (Intel x86) install CD. On a 2Mbps/sec broadband connection the download should take around 45 minutes. The final option is to order a free CD from Ubuntu's website. You'll receive a CD free of charge but will have to wait at least two or three weeks for delivery. Go to <http://shipit.ubuntu.com> to order.

Burning the CD

If you've downloaded the CD image or copied it from the cover DVD you'll now need to burn it to a blank disc. An ISO image file is a replica of an entire disc stored as one large file. You must not burn the file the normal way, as this would only copy the single file across. Instead you need to burn the image directly. If you're using Windows you can do this with software such as Nero by choosing 'burn image' (or similar), otherwise download 'ISO Recorder' from



<http://isorecorder.alexfeinman.com/> and follow the instructions.

If you've already got Linux installed, the quickest way to burn an image is directly from the command line. Log in as root and run:

```
# cdrecord dev=/dev/cdrom   
driveropts=burnfree image.iso
```

(Key: < code string continues)

Replace 'image.iso' with the name of the image, which if unchanged from the server should be 'ubuntu-5.10-install-x86.iso'.

Finally, for OSX users, run the Disk Utility, drag the ISO image file into the left-hand pane, select the image and click 'Burn' (see screen 1).

Top: Burning the CD image with OSX

Bottom: The boot-up splash screen

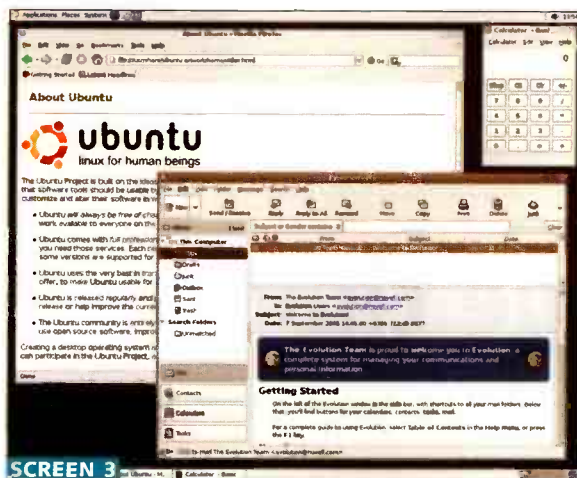
Getting started

With the CD ready it's time to get the installation started. This takes place in two phases: first the disk is set up and the files are copied across, then after a reboot the packages are extracted and configured and the system boots up ready for use (see screen 2). Insert the CD into the drive, and make sure the PC is set to boot from CD before the hard disk; if the CD is ignored at boot-up you can change these settings in the system Bios. It's very unlikely you'll need to use any special settings here, so just hit Enter to start the process.

The first few steps are simple enough: choose a language and a location. The install program then suggests a sensible option for the keyboard setting, though you can change it if required. Next a few packages are loaded from the CD and the network is detected. If you have more than one network interface installed (quite common on recent motherboards) you will have to choose which one to use, otherwise the program immediately attempts to configure itself with DHCP.

We always strongly recommend using a broadband router and modem combined for Linux since it makes life considerably easier; if you've got this equipment, Ubuntu should detect your network and configure itself automatically. Otherwise you can enter static network information manually.

Next up is the hostname which your machine should be known by. Unless you have special circumstances you can enter whatever you like here – just enter a single word. If no network can be detected you can still go ahead and install Ubuntu and either work as a standalone machine or save the network configuration for later.



Disk setup

The partitioning section is the part that tends to confuse and scare away most people. If you want to dual-boot with Windows you can configure it here. Dual-booting involves having a full Windows and a full Linux installation present separately on your hard drive with the option to boot either at start-up. If you've got a blank hard drive and don't wish to use Windows at all you can go ahead with the installation without any worries – this is the usual case for people installing Windows onto a PC and it's just as easy with Linux.

To dual-boot you will need some free unpartitioned space on the hard drive. Ubuntu can resize your Windows partition to make room for itself, or you can use a commercial program such as Partition Magic. Always back up your data before resizing a partition: while it should certainly be safe there are always risks (a power failure during the process could be disastrous). The minimum amount of space you need is around 2GB, but that won't leave much room for extra files and new applications, so go for as much as you can.

The partition utility allows you to create and delete partitions and set up more complex features such as logical volumes and software Raid. Unless you're an expert it's best to stick with a basic setup. You should have one partition for the root filesystem (listed as '/') and one partition for swap, or virtual memory. Traditionally this would be at least equal to the amount of memory the PC has, but with memory sizes going into the gigabytes that's no longer necessary. Anything up to 1GB should be more than adequate.

The utility will detect all partitions it recognises on the hard drive and assign

Ubuntu's standard desktop: here we see Firefox and Evolution

PC partitions explained

A PC hard drive is split into partitions. Under Windows these appear as drive letters, in Linux they are mounted onto the filesystem under directories. A disk can have four primary partitions; in Linux these are referenced with the numbers 1 to 4. One of the primary partitions can be treated as an extended partition, which itself can be broken into many logical partitions. In Linux, logical partitions have the numbers 5 and upwards. Each partition is entirely separate from the rest and acts effectively like a separate hard drive. Linux needs at least one partition for itself, and ideally another for a swap (virtual memory) area.

Linux names IDE drives with the 'hd' prefix, and SCSI and most Serial ATA drives with 'sd'. A letter

then identifies the physical hard drive, followed by a number to reference the partition. So 'hda1' refers to the first IDE hard drive and its first primary partition; hdb5 refers to the second hard drive's first logical partition.

The standard MBR bootloader installed by Windows boots any primary partition that is marked as active, but will not boot a logical partition. Grub (the Linux bootloader) does not have this limitation. Be warned that installing Windows onto a hard drive will overwrite the MBR bootloader without warning, so install Windows before Linux on dual-boot systems. Alternatively install the Linux bootloader onto a primary partition and set that partition to be active, leaving the Windows MBR in place.

mount points to them so you can access the partitions from Linux. Select a partition and choose the mount point option to disable it if you don't want to access the filesystem. Other advanced options such as the label and reserved blocks can be ignored. When everything is done you'll receive a warning that the disk is about to change and partitions are to be formatted. Make sure the configuration is correct before proceeding.

Now that the disk is ready, the installation program copies across the remaining software packages and asks

for some final configuration details. Enter the time zone (a sensible suggestion is offered) and create a new user: this is an administrator user who has access to the 'root' account. Finally the bootloader, Grub, must be installed. You can choose to place it on the Master Boot Record (MBR) of the hard drive or on another partition or boot device (such as a floppy). Most people will choose the MBR. See the 'PC partitions explained' box above for more information. Once Grub is installed, the system reboots for the final stage.

Installing updates requires no effort at all



Finishing up

The first boot-up involves installing all the packages that were copied across. Depending on your monitor you may be asked to provide some screen resolutions. If you're using an LCD screen make its native resolution the highest available, and this will then be the default. After about 10 minutes or so the login manager should appear and the installation is complete. Log in with your new username and start getting to know Ubuntu (see screen 3). A window will pop up to tell you updates are available – these are automatically downloaded and installed (see screen 4).

Next month I'll show you how to add extra software to enable mp3/aac and DVD playback and look a bit deeper into Apt, the rather wonderful software management system. PCW



Ken McMahon is a freelance journalist and graphic designer. His involvement with digital cameras began with a Commodore 64. He graduated to Macs and now works mostly with PCs.

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Bring order to image chaos

Get to grips with your digital photo collection before it overwhelms you

In our December 2005 group test of photo-editing applications, every program, with the exception of open-source image editor The Gimp, included facilities for organising and searching collections of photos. Often this is handled by integrated album or organiser software that allows you to arrange photos into collections, rate them, display thumbnail views and even carry out simple editing tasks, such as rotating or 'quick enhance' routines.

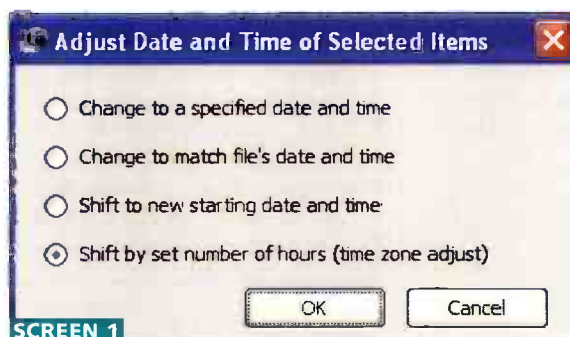
However, the main thing these applications do is keep your photos organised, back them up and allow you to add information to them so you can find them more easily when they're not so fresh in your memory.

Digital photos are cheap, so we tend to take a lot more of them than we did in the days of film. Add to this the fact that, perversely, no matter how rubbish they are, it's hard to bring yourself to delete them, and digital photo collections can quickly grow to terrifying proportions.

Album software provides the solution to this problem, allowing you to organise any number of photos so you can easily locate the shot of you with the bloke out of that TV show (which one was it?) that you had a passer-by take on Brighton pier (or was it Southend) three summers ago, or maybe it was last Christmas?

In this column I'm going to outline some of the things you can do with an album application to help you keep track of your digital photos and make them easier to manage. Specifically, I'll look at renaming a folder of images, changing the date and time stamp, adding IPTC metadata, plus adding and searching using keyword tags.

If you're not using an album application, understanding how these features work may convince you why you should be. If you already are, then



they'll help you with some of the most fundamental and useful tasks you can use the software for.

I'm going to use Adobe Photoshop Elements 4, but most of this can be achieved in a similar fashion using any of the photo-editing programs from the December group test (with, as already mentioned, the exception of The Gimp).

Renaming a folder of images

In the absence of any other information, the filename is a useful way of telling you about a photo; even holiday_001.jpg tells you more than DSCF_001.jpg. I used to change the filenames on digital photos as a matter of course, but with metadata this is becoming less important and I don't bother any more. If you set your camera to use continuous filenames – when you format the card or insert a new one it continues in sequence rather than going back to 001 – you'll avoid duplicates, but duplicate filenames aren't a problem for Elements as long as they are in different folders.

Elements Photo Downloader gives you the option of renaming files on import. You just specify the new 'base' filename and all files are given that name with a number suffix starting at 001. If you want to rename files that are already downloaded and

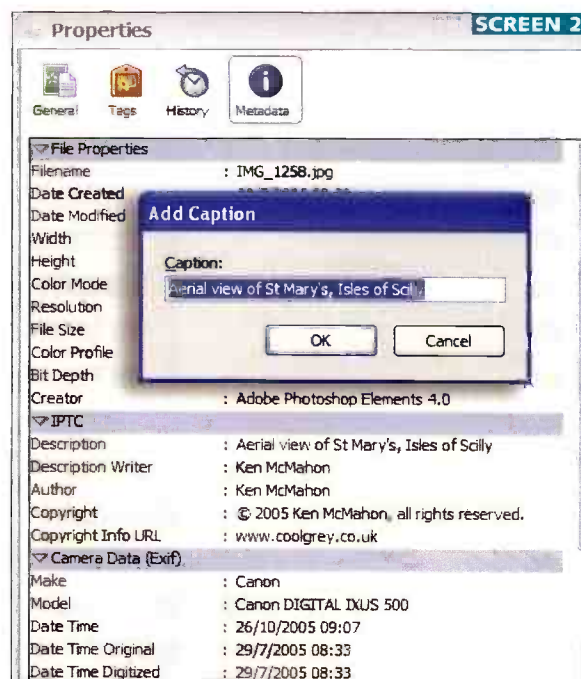
catalogued, select them in the thumbnail pane and choose 'rename' from the file menu.

Change date and time

If you don't set the date and time on your digital camera, all the photos you take will be date stamped with the same initial date and time setting. This may seem like no big deal, until you come to use an application such as Photoshop Elements to catalogue and keep track of your pictures. One of the big advantages of Elements Organizer and similar applications is that you can arrange photos in date order. There's also a Date view option that displays photos superimposed on a calendar layout.

Of course, none of this will work if every single one of your photos carries an identical date and time stamp. It will merely appear that the first of January 1999 was a very busy day for

Elements Organizer provides no fewer than four methods for adjusting the date and time stamp on digital photos



Add Caption inserts data into the IPTC Description field

you. But even if you have a year's worth of photos all with the same date, providing you have a rough idea of when they were all taken you can remedy the situation.

Elements provides four options that cover pretty much every scenario (see screen 1). The first simply changes the information to a new date and time that you specify. If you run this on a batch of photos they will still all have the same date and time, but it will at least bear a closer relation to the date on which the photos were taken.

The second option is to change the date and time fields to match the date and time of the file. Though not the time the photo was taken, provided you downloaded the images close to the time they were shot, this will provide a good date approximation.

Option three is the one to use for the most common problem when your camera date and time isn't set, or is set incorrectly, but the clock is still running. In this case the date and time will be meaningless, but the interval between photos will be accurate, so, if you can establish the correct time for the initial shot, you can shift all the others by the same amount.

The final option is for another pretty common situation. You get back from a trip abroad and discover that the time stamp on all of your photos is out by several hours because you forgot to adjust the camera clock to account for the time difference. 'Shift by set number of hours' does exactly that.

Adding IPTC metadata

In addition to assigning keyword tags to photos, Elements Organizer allows you to add and edit IPTC metadata. IPTC is the International Press Telecommunications Council and IPTC metadata is simply a standard format for embedding metadata such as author, copyright, caption and description details into digital images.

There's a crucial difference between adding metadata to images and assigning keyword tags. Metadata is embedded in the image. When you copy the file and give it to someone else the metadata goes with it and if, at some point in the future, you decide to upgrade from Elements, say to Adobe Creative Suite or a professional digital asset management application such as Extensis Portfolio, your new application will be able to read the metadata and organise your photo collection accordingly.

Microsoft goes Raw

Photo-editing applications have been quick to provide support for proprietary camera Raw formats. You can view Raw files from popular camera manufacturers in Photoshop Elements, Paint Shop Pro, Microsoft Digital Image Suite 2006, Serif Photo Plus 10 and Ulead Photo Impact 11. But one thing you haven't been able to do, until now, is view Raw image thumbnails in Windows Explorer.

The good news is that with Microsoft's Raw Image Thumbnailer and Viewer you can do just that. The bad news is it only supports a small number of Raw formats, namely Canon's .crw, .cr2 and .tif and Nikon's .nef.

This wouldn't be a huge drawback were it not for the fact that Adobe's dng format, about the nearest thing there is to a camera Raw standard, is not supported either. But, if you shoot Raw with a Canon or Nikon camera this Power Toy is well worth downloading.

While it's true that most of us who shoot Raw are going to be using either the camera manufacturer's viewer and converter software, or one of the editing and cataloguing applications mentioned above, it's still

convenient to be able to view a folder of Raw thumbnails in Explorer.

There are two components, a Windows XP shell extension that provides thumbnail rendering, printing and metadata display; and a Raw image viewer application that works in a similar fashion to Windows Picture and Fax viewer.

To get the download and the accompanying white paper go to www.microsoft.com/windowsxp/using/digitalphotography/prophoto/raw.msp.



Microsoft's Raw Image Viewer works with Canon and Nikon Raw files only

Keyword tags, on the other hand, are stored and maintained in a database which links them to files on your hard drive or on removable media. Other than that, they have no connection with the images that they reference. Elements does, however, have a very useful feature which converts keyword tags into metadata, which I'll come to in a moment.

You can use Elements Organizer to add a caption to a photo which is added to the IPTC description field (see screen 2). Select a thumbnail and choose Edit, Add Caption, and write the caption in the Add Caption dialogue box. Then press

Alt & Enter to display the Properties dialogue box and you'll see the caption you just added in the IPTC description field.

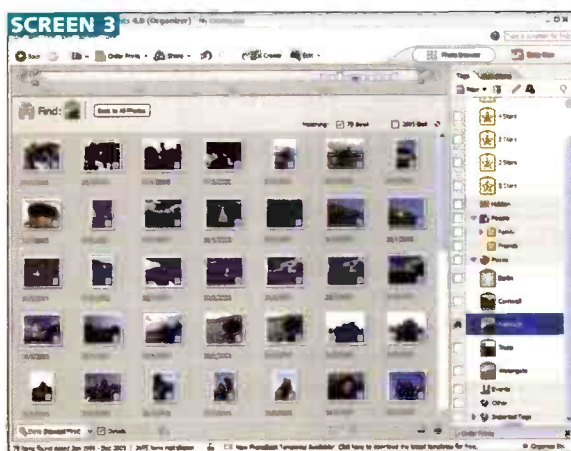
Add and search keywords

The Elements Organizer uses a tagging system to apply keywords to individual images and groups of photos. This makes life simpler because you'll use the same keywords for family, friends and familiar places over and over and instead of having to repetitively type in these words you can just select the tags.

Searching for tagged images is also very straightforward. You simply check the box next to the tag in the Tags panel and all the photos with that tag are displayed (see screen 3).

Selecting File, then 'Write Tag Info to Files' writes all tag information to the Keyword IPTC metadata field and I'd recommend you do this. Having the keyword information embedded in the file is a much more robust option than the tenuous database link that Elements tags provide. Tags provide the ability to quickly search for photos in Elements Organizer, metadata ensures that the information remains intact should you copy, move, edit, or otherwise change the file. PCW

Keyword tags make light work locating specific images





Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

→ Comments welcome on the Word processing column.
Email wp@pcw.co.uk
Please do not send unsolicited file attachments.

Learn your signature tune

Adding a digital signature to your Word documents can ensure extra protection

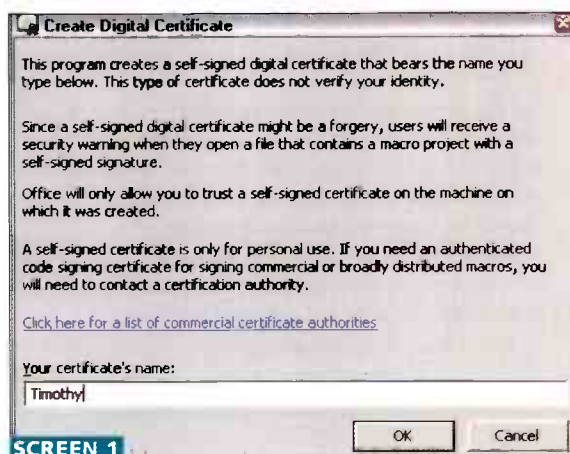
Most Word users will know that you can stop others from modifying a document by password-protecting it as read-only. The method of doing this depends on your version of Word. In Word 97 and 2000, you go to Tools, Options, Save and type a password in the 'Password to modify' box. You'll be asked to confirm the password, and when the document is next opened, a dialogue will appear stating that the document is 'reserved' by the author and offering the choice of supplying the password or opening the file read-only.

Although the user will be able to edit the file without the password, they won't be able to save their changes. This, however, offers less protection than meets the eye, as the user can 'Save As...' with a different file name. The new document will still be password-protected but it will contain

Eagle eyes

Reader Bill Alexander notes that in reply to Jane Melville's query in December's Question time, apparently MSO1033.ac1 is the autocorrect library for both UK and US English. My mistake – the UK version is MSO2057.ac1.

Gerald Rhodes offers another way to count the words in a selection – rather than the whole document – in Staroffice. In November's column we showed how this could be done with a macro. Gerald's method involves a fine piece of lateral thinking – copy the selected text into a new document and go to File, Properties, Statistics to get the word count. The new document can then be discarded.



SCREEN 1

the changes made. Reader Mike Sherwood therefore asked if there was any way to remove the 'Save As...' command. Although this can be easily done via Tools, Customize, it can just as easily be undone.

In Word 2002 (aka Word XP) the password protection is in Tools, Options, Security, but the same caveat applies to making 'Save As...' copies. In Word 2003 things are beefed up somewhat, as you'll find you can't edit the document at all – if you try to, a message appears in the status bar saying: 'This modification is not allowed because the document is locked'. The user will need to hit the 'Stop Protection' button on the task pane and supply the password to perform any editing. This is a step in the right direction, but there is nothing to stop a user copying the contents into a new document which they could protect with their own password.

So how can anyone be sure that a file is the original and not a modified copy? One method available to Word 2002 and 2003 users is to append a digital signature to the original. For individuals or small businesses whose main concern is to protect the integrity of documents, you can do a good job using 'Self-certification'.

Creating a self-signed digital certificate is useful

First, look in the Microsoft Office program folder and open the Office 11 or 10 folder. Here you should find a file named Selfcert.exe. If it is not present then you need to run Office Setup, Add/Remove features and add the 'Digital Signature for VBA projects' tool. Run Selfcert.exe and supply a name, as requested for the digital signature and click OK. This creates a digital signature (see screen 1).

To use the signature on a document go to Tools, Options, Security and click the 'Digital Signatures...' button. In the next dialogue, click 'Add'. After some confirmations about saving the document and switching views, you'll get a list of signatures, which should just consist of the one you created.

Select and OK this and the other dialogues. Your document is now signed. If you then make amendments and save the file, you'll get a message that the signature will be removed, so you need to finalise it before signing. The good point is that anybody trying to 'Save As...' the file will also remove the signature, so the absence of a signature will indicate that the document may have been tampered with. As an added bonus you can also sign your VBA projects (macros) and other users can add your signed macros to their 'trusted' list. Paradoxically though, you can't add your own signature to the 'Trusted' list on your own PC, but users of other PCs can and they can then verify that subsequent documents are the real thing. To 'trust' a signature, the user should open the signed document then go to Tools, Options, Security, Digital Signatures. The originator's signature will be in the list. Selecting it and clicking 'View certificate' will produce another dialogue with an 'Install Certificate...' button. This starts the Certificate Import Wizard – just follow the prompts and defaults. **PCW**

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Stephen Wells is a freelance journalist and a regular contributor to computer magazines. He's been writing PCW's Spreadsheets column for over 10 years.

→ Comments welcome on the Spreadsheets column.

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Fact-finding mission

Some easy ways to gather information from data lists

Spreadsheet users frequently need to total items in a list which meet certain criteria. Excel 97 introduced the Conditional Sum Wizard, an Add-In that helps you create the right formula to do this. Excel still includes the wizard but unfortunately many users don't realise it's there.

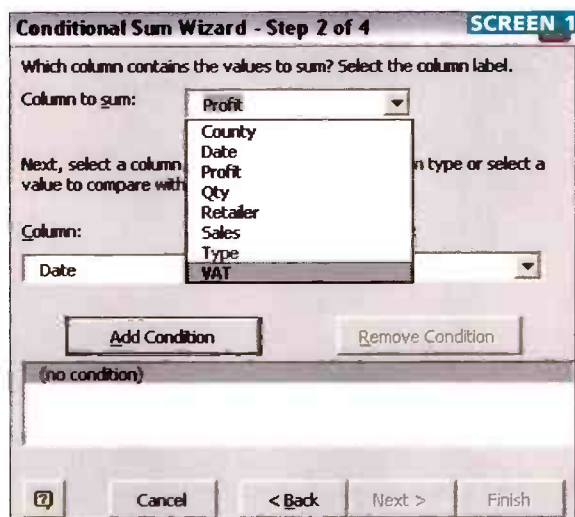
For an example of a list, or simple database, we'll use a floral wholesaler's record of sales to garden centres in three counties: Essex, Norfolk and Suffolk. Let's say the wholesaler wishes to see which of the three counties has been the most profitable to his company so far this year and which the least profitable.

Click on any cell in the list and choose Add-Ins on the Tools menu. Check the Conditional Sum Wizard box and OK. If this Add-In isn't listed, load it from your Excel or Office CD. Go back to the Tools menu and now the Conditional Sum Wizard will be included. Choose that and the Step 1 dialogue box will be displayed and the only available box in it will show by default the range of your list. If it doesn't, type it in, including the record labels, click Next and move on to Step 2.

If you click the arrow next to 'Column to sum:', you'll see a list of the records. Pick the label, Profit (see screen 1). Below that, in the 'Column:' box, choose Date. In the 'Is:' box choose > (more than). In the 'This value:' box click the arrow and pick the last date shown in 2005.

Click the Add Condition button and then go back to the 'Column:' box and pick County. In the 'Is:' box choose the equals sign. In the 'This value:' box choose Essex. Click the Add Condition button (see screen 2).

Now we have asked the wizard to total the profits for Essex for all dates



in 2006. Click Next and move to Step 3 where you have a choice of just entering the formula the wizard has created or the formula plus the county to which the answer applies. Make the latter choice and click Next.

In the fourth step you make a choice of cell where you want the last excluded date entered. This should be several rows or columns from your list. Here it's A50. In the fifth step choose the cell where you want the county name displayed, say B50. In the sixth step you make your choice of cell for the total to appear, say C50. Logically, it's the adjacent cell to the county name (see screen 3)

The formula created for you by the wizard, will be displayed in

Add the limiting conditions before totalling selected records

Choosing the data field to total selected records

the Formula Bar. In the example given the formula for Essex is:

```
{=SUM(IF($A$2:$A$42>A50, IF($B$2:$B$42=B50, $H$2:$H$42, 0), 0))}
```

(Key: ⌘ code string continues)

In this case the complete list is in the range, A2:A42. The last date to be excluded is in A50. The County field of all the records is in the range B2:B42 and Essex is in B50. The Profit field of all the records is in the range H2:H42. The curly brackets mean it is an array formula which looks at each cell in a range individually.

If you entered the formula yourself you would have to use Ctrl & Shift & Enter instead of Enter. Here the wizard does it for you.

So what the formula is saying is if any record shows more than 28/12/05 in the Date field, and shows Essex in the County field, then add the figure in the Profit field to the total. The formula is interactive so if you change Essex in cell B50 to Suffolk the profit total to date in 2006 for that county will show in the adjacent cell.

Using the Autofilter

Excel offers various ways of creating selective totals. Here's another way, using filtering.



	A	B	C	D
49				
50	28/12/05	Essex	£10,220	
51	28/12/05	Norfolk	£14,000	
52	28/12/05	Suffolk	£19,740	
53				

SCREEN 3

In the View menu click Status Bar to make sure this bar is displayed at the foot of your screen. Click on the row number, 1 on the far left of the screen. On the Data menu choose Filter, Autofilter. Dropdown arrows will appear beside each field name along row one. Click the Date field arrow and then Custom. Use the arrows in the Custom Autofilter dialogue box and make a choice so it reads Date is greater than 28/12/05. In this example that's the last date listed in 2005. Click OK. Then click the County field arrow and choose Essex.

Highlight all the figures shown in the Profit field column by clicking on the column letter (in this example it's H) and Excel's Autocalculate feature

'Excel offers various way of creating selective totals'

will display the total for Essex so far in 2006 in the Status Bar (see screen 4).

When creating lists remember to have only one on a worksheet. Leave at least one blank column and one blank row between the list and other data.

Make sure any hidden rows or columns are displayed before making changes to the list. When rows and columns in a list are not showing, data can be deleted inadvertently.

Counting records

Very often you need information beyond that of fiscal interest. A list of sales can be analysed in a number of ways. We'll stay with the example of the floral wholesaler's record of sales. Let's say we are at the end of 2006 and we want to find the number of sales between 31 March and 30 June. Click on the column letter A press Ctrl & Shift & F3. You'll see a dialogue box called Create Names. By default it will read Create names in top row. Click OK or press Enter.

I recommend you keep your analytical results away from your data, open another worksheet and in cell A2 of it enter **Number of sales between**. In B2 enter your From date,

Results provided by the Conditional Sum Wizard

Checking a value in a cell

A cell address may provide an efficient way of referring to a cell in a spreadsheet but when editing a spreadsheet, it can be taxing to try and remember what was in B4, M18 or Z25.

It's also a nuisance to have to go back and forth clicking on cells mentioned in formulas to see what they contain. Excel, at least, offers a way to instantly see what such cell

addresses refer to. Supposing you have a formula such as `=SUM(IF(Type=B6,IF(Retailer=D6,1,0)))` and you wish to double-check what was entered in cell D6. Display the Formula Bar. Drag the mouse over D6 to highlight it. Press the function key, F9 and instantly the value in that cell is helpfully displayed.



31/3/2006. In C2 enter **and**. In D2 enter the To date **30/6/2006**. When using a spreadsheet, no matter how you format a date cell, it's a good idea to always enter years with four digits. In cell E2 enter `=SUM(IF(Date>B2,IF(Date<D2,1,0)))` and press Ctrl & Shift & Enter instead of Enter because this is an array formula. Excel will add curly brackets to indicate it understands that.

The answer shown in screen 5 is small because this is a short list created to just give an example. Let's continue to assume we're at the end of the year and today's date is 31/12/2006 and we want to know how many sales were made in Suffolk in the second

half of the year. Create the name County on the data sheet just as you did for creating the Date name. On the information sheet enter in cell A4 **Number of sales for 2nd half of 2006 in**. In B4 enter **Suffolk**. In G4: `=TODAY()-180`

You can format this cell's font white, assuming the background is white, if you want to hide it. In cell C4 enter `=SUM(IF(Date>G4,IF(County=B4,1,0)))` and press Ctrl & Shift & Enter.

You could also make Names out of the Type and Retailer fields and see, for example, how many sales of trees were made to Nina's Nurseries.

In A6 on the information sheet put **Number of sales of**. In B6 enter **Trees**. In C6 put **to** and in D6 type **Nina's Nurseries**. In F6 enter the formula

`=SUM(IF(Type=B6,IF(Retailer=D6,1,0)))` and press Ctrl & Shift & Enter.

Using the Conditional Sum Wizard, the Autofilter or creating your own array formulas are not the only ways Excel offers to cull information from a data list. There are all the database functions like DSUM, DCOUNT, and DGET.

There are Pivot tables which we covered in the August 2005 column or, for illustrated extracts, Pivot charts, described in the September issue.

There is also the Descriptive Statistics option of Data Analysis found on the Tools menu and described in last November's column. So in other words there's something for everybody. **PCW**

Using Autofilter and Autocalculate to achieve the same result

	A	B	C	
1	Date	County	Type	
20	10/2/06	Essex	Trees	Ste
23	28/2/06	Essex	Trees	Lar
27	22/3/06	Essex	Plants	Mo
35	5/5/06	Essex	Trees	Aur
36	11/5/06	Essex	Shrubs	Lar
39	29/5/06	Essex	Trees	Ste
41	8/6/06	Essex	Trees	Nin
42	14/6/06	Essex	Trees	Arb

F6	=SUM(IF(Type=B6,IF(Retailer=D6,1,0)))			
1	Number of sales between 31/3/06 and 30/6/06 16			
2	Number of sales for 2nd half of 2006 in Suffolk 6			
3	Number of sales of Trees to Nina's Nurseries 7			

Count specified items on the data list



Niall Magennis has been dabbling in Midi and digital audio since the days of the Atari ST. He writes for a number of music magazines and lives in London in a flat overrun with music equipment.

→ Comments welcome on the Sound column. It returns in the April issue. Email sound@pcw.co.uk Please do not send unsolicited file attachments.

The big squeeze

Use dynamic range compression to add a professional punch to your tracks

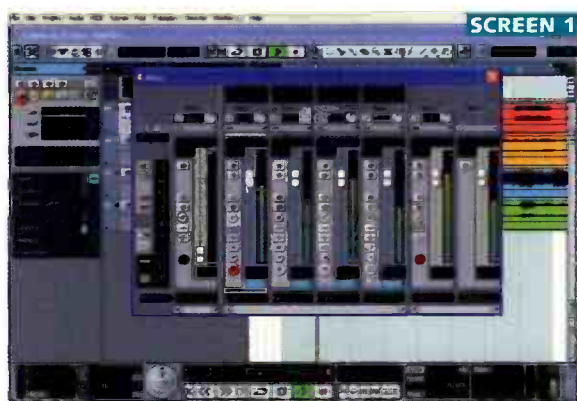
It doesn't matter whether you produce classic rock, nose-bleed techno or frothy pop tunes; you'll be aiming for the same thing with your music, and that's for it to sound punchier than a heavyweight title fight.

Generally the more 'in-your-face' you can make your music sound, the more instant appeal it will have to the listener. But if you compare your tracks to those on a professionally produced album, the professional tracks probably sound louder and more immediate. Even when both are played back at the same volume, the professional tracks seem to be more sonically aggressive. The difference is usually down to the fact that professional tracks have been run through a compressor.

Because of the way our brains process sound information, if you play two identical tracks back to back at different volumes we'll generally agree that the louder one sounds better and more exciting. Of course, when mixing you can't just crank up all the sounds as this will lead to mix that's a distorted mess (see screen 1). But over the years, studio engineers have found a way to add more 'apparent volume' to tracks by playing around with the dynamics of a recording.

Extreme settings

Most of the time you'll want to use compression as a subtle effect – you want it to make your mix sound better, but you don't want its influence to be too noticeable. But you can also use more extreme compression in an artistic way. Extreme settings can often give a track a breathing or pumping sound. Many dance tracks use this type of extreme compression to make the music pump in time to a 4/4 beat.



They manipulate the track's dynamics using a compressor. A compressor works by reducing the dynamic range of your music. Essentially it reduces the difference between the peak and the trough volumes in your mix. The result is that the overall mix has a more even volume level with fewer spikes. Because of this you can increase the overall volume of the track without introducing distortion. The result is a track on a CD or an mp3 file that sounds louder and more exciting than it did before.

Pump up the bass

This month we're going to look at how you can use a compression plug-in to help you give your mixes a bit of extra

'oomph'. We're going to use Cubase SX in our example, but the tips and settings can be translated to pretty much any compressor plug-in in any audio application, as most compressors feature very similar controls.

We're going to use a sample tune with drums, bass, vocals and guitar (see screen 2). We'll look at how you can first compress these tracks individually, then apply a touch of added compression over the entire mix. We'll be working in Cubase SX but you should be able to apply the principles we're using here to any sequencer or multi-track recorder.

Let's first look at the drum track. Select this on your mixer and then add in the VST Dynamics plug-in (see screen 3). Click on the Compressor button to activate it. With our drum track we want the snare and kick drum sound to be more heavily compressed than background percussion, so we first need to set a threshold value on the compressor of around -14dB. Once the threshold is set we need to use the ratio control to set the level of compression that is applied. In this case, we want the drums to be heavily compressed, so set the ratio at 7:1. Usually with drums you'll be working with ratios of between 5:1 and 8:1.

On drum tracks you usually want the initial hit of the sound to pass through relatively unprocessed, then for the compressor to kick in on the remainder of the sound to fatten it up. Start by setting the attack level to around 5ms and then set a short release value of 10ms; or you can just set the release value to Auto. To finish tweaking the track use the MakeUpGain control to bring the volume back up to a suitable level (see screen 4).

The second half of the rhythm section is the bass line. In most modern music a bass line will either be played on a bass guitar or on a synth.

Top: To create a great sounding mix you need to get to grips with the compression plug-in

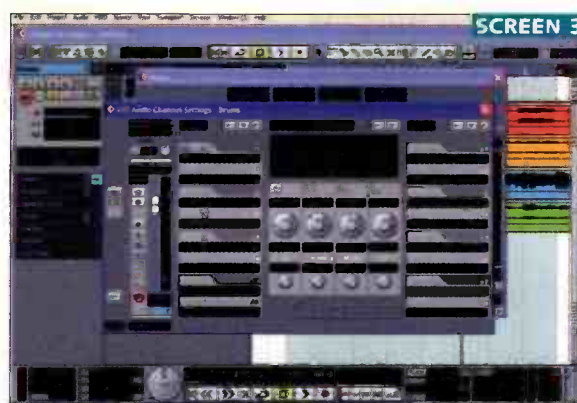
Bottom: Our sample tune is very simple with just drums, bass, guitar and vocals

The difference significantly affects how you should apply compression, as live instruments generally need a fair amount of compression, whereas synthesised sounds don't. With a live bass guitar track you should set the threshold level at around -5 or -6 and then use a heavy ratio of around 8:1.

Normally with a live bass track you'll need to set an attack level of between 4 and 10ms; however, if the bass sound has a more percussive attack you'll want a slightly longer setting to let the percussive element of the sound through uncompressed. On the release side you should be looking at a setting of around 10ms. However, sometimes you can just switch the release to Auto and the compressor will take care of the release time itself.

As a general rule, synth sounds are already compressed to some extent, so you're unlikely to need to crank up the controls. Normally you'll just use a bit of extra compression to try and beef up the sound a bit more. If you're working with a synthesised bass sound try setting the threshold control somewhere between -4 and -8 and then crank the ratio value to the 4:1 mark.

Just as with live bass sounds, if your synthesised bass has a percussive element at the start you'll want to let it pass through relatively uncompressed, so use an attack time of 10ms or over. If the sound doesn't have a percussive element at the start try a setting more in the region of 6ms. You can then set the release value to either 10ms or try using the audio setting. As with the drum sounds, you can use the MakeUpGain control to increase the overall volume of the track to bring it into line with the rest of your mix.



Top: The Dynamics Plug-in in Cubase SX includes a compressor



Bottom: We want our drums heavily compressed so we're using a ratio of 7:1

principles you can follow. You'll generally need to use less compression on a male singer's voice than on a female singer's vocals. In general for vocals you'll want to set a relatively low threshold value of around -5db, then use a ratio setting in the region of 3:1.

With the threshold and ratio values locked down, start working on the attack and release settings. Vocals require a very fast attack, so set the compressor to its fastest possible speed. For the release value, use the Auto setting or enter a value of around 160ms. When you're done, use the MakeUpGain control to bring the track level into line with the rest of the mix.

Now we have all the individual tracks sorted we can turn our attention to tightening up the overall mix. When working on a full mix, be careful that you don't use too much compression and end up squeezing all the life out of the track. Dance music is generally heavily compressed, but with other forms of music the effect of the compressor should be quite subtle. On your full mix try using a fast attack of about 0.1ms and then set the release value to the fastest possible setting or switch on the Auto control.

Under normal circumstances you won't want to compress your track too heavily, so select a conservative value of between 1.5:1 or 2:1. You want the compressor to be working on most of the track most of the time, so set the threshold level quite low at -1 to -9db.

All these values are only given as guide settings. Each piece of music will need to be compressed in a different way. The only way to judge whether the settings you are using are working effectively is to use your own ears. **PCW**

For guitars you need to have a very fast attack time

Once you have the bass line sorted out, you'll need to start on the guitar track. For this track you need to set the attack level to the absolute fastest speed. In VST Dynamics the fastest setting is 0.1ms. Next set the release value either to Auto or set it to 10ms. Enter a setting of 12db for the threshold value and then set the ratio between 3:1 and 5:1 (see screen 5).

Vocal gymnastics

How you compress your vocal tracks will depend a lot on the style of the singer, but there are some basic



Noise gates explained

Compression is a dynamics effect, but it isn't the only dynamics effect you'll find in your sequencer. You'll also find other effects including noise gate plug-ins. A noise gate works like a compressor, except it operates in reverse. The gate only allows sound above a certain threshold through. All sound below the threshold is reduced to total silence. Noise gates are mainly used to stop hiss and background noise getting onto recordings. When an instrument isn't playing, the gate cuts out any hiss or hum from the circuitry. However, some gates have a sidechain input that lets you feed another signal into the gate to cause it to open and close. This can create stuttering effects where the gate is opened and closed rapidly, or be used to 'duck' a signal when a DJ wants to talk over a record.

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- Q - Does fast 3 cars purchase all the cars before the competition starts?
A - All cars are ordered from the manufacturers before we start selling tickets.
- Q - If I win can I chose whether my car is left or right hand drive?
A - You will see on the website details on the specification it will for example say Aston Martin DB9 (right hand driver/left hand drive also available but colour and specification may vary).
- Q - How are the competitions judged?
A - All the competitions are witnessed by a solicitor from a UK law firm as well as a representative of fast3cars. This is done by a draw with all the entries in a barrel. We have been told that customers prefer this element.
- Q - How will I know if I win?
A - We display the results and details of the winner on our website.
- Q - Can I buy more than one ticket?
A - You are allowed to buy as many tickets as you like 13 is the most we have had at one time some people enquire about buying large quantities as they can make it a tax deduction so if they win the car they have a good investment. We haven't looked into this ourselves but some companies have looked at buying large amounts of tickets and said that it suits them.
- Q - I live abroad so what happens if I win the car.
A - Fast3cars will ship the car to the winners country of residence. There are of course some conditions regarding this and please read the terms and conditions when you purchase your ticket. If you have any further questions please do not hesitate to contact us. Full details are available on the Website - www.fast3cars.com For every ticket sold a percentage is given to charity.

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Alan Stevens has implemented and supported networks for over 25 years, working for IT vendors, system integrators and customers. He now mostly researches and writes about networking matters.

→ Comments welcome on the Networks column.
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Protect your network

When your Lan is connected to the Internet, it's time to get serious about security

The most common question I'm asked by users of home and small business networks is: how do I connect my network to the Internet? The second is: how do I protect my network against hackers, viruses and other threats when I do? Having discussed the connectivity and sharing issues in recent Hands on articles, it's time to turn the spotlight onto security and look at what you need to do to protect your Lan from harm.

Firewalls first

The first and most obvious need is a firewall, to inspect traffic as it passes between your network and the outside world. Any suspicious activity can then be stopped at source to prevent things such as open port scans and denial of service (DoS) attacks. Also, most firewalls let you block applications, including FTP and Telnet, which can be misused to copy files and connect to individual network machines without your knowledge.

Once available only to large corporate users, firewalls are now cheap and easy to come by. Most Internet routers come with one built in, and there are plenty of affordable standalone products, often with additional VPN (virtual private networking) and other security features. They can, and do, vary in effectiveness, making it important to look for the magic 'stateful packet inspection' label now considered to be the best technology you can get. You should, if possible, stick with firewalls certified by an independent testing authority such as ICSA Labs (www.icsalabs.com).

Ease of configuration is important – some can be fiendishly difficult to get right, particularly if you're into Internet games and peer-to-peer file sharing. Firewalls from consumer-oriented vendors, such as D-Link and Netgear, will have specific options to



allow such traffic through, but on business-focused products you'll be expected to create custom rules to handle the packet filtering yourself. Those rules can be very complicated and assume an advanced knowledge of TCP/IP services and ports.

Likewise, if you're hosting your own web, FTP or email server you'll want to be able to configure the firewall to allow unsolicited traffic through. Again, this isn't always a standard option, so look for support for a so-called DMZ (demilitarised zone) where public-facing systems can be isolated from the rest of the network either physically, using separate Ethernet ports, or logically via the firewall software.

Finally, make sure your firewall is turned on. It's not uncommon for router vendors to ship their products with the firewall disabled, leaving the local network totally unprotected. Similarly, although the firewall itself may come switched on to protect against DoS and other easily identified attacks, you'll often find it configured with just a single rule allowing everything else through (see screen 1).

Also, make sure you change the default administrator password on your router/firewall. You'd be amazed how many networks I've connected to where I was able to browse to the management interface and change anything I wanted.

Check your protection type

While on the subject of firewall protection it's important to mention network address translation (Nat) implementations. Often found on low-cost routers, these don't always do

what you might expect. Indeed, for the most part, all you get with a Nat firewall is the ability to reassign the sending address of packets issuing from the local network to the public Wan port on the Internet router.

Because IP addresses are hidden, a degree of protection is afforded by this approach, but a proper firewall that inspects packet contents is still required because DoS and other attacks can still cause problems, plus trojans and spyware can still get onto a network in an email or on the back of an innocuous-looking web download, then bypass the Nat protection altogether.

It can be difficult to establish exactly what type of protection you have, especially on cheaper routers. If you can't find specific firewall options and/or rules that can be set from the management interface, you may well just have Nat. In this case you should either change to a router with proper firewall support or consider adding a dedicated firewall appliance alongside.

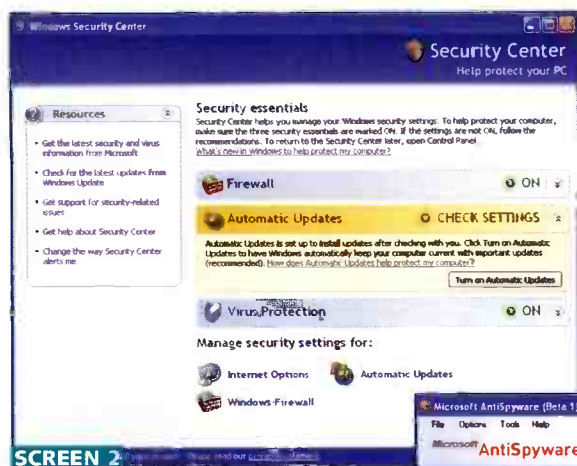
Bear in mind that a firewall will only protect users from threats carried over the Lan and, even then, only while physically connected to that network. Infections can also be transmitted by floppy or optical discs or USB storage devices, not to mention what can be picked up when connected to the net at

There are plenty of affordable firewall products to choose from, such as the popular D-Link DFL-700 with VPN server and other security features built in. Most Internet routers also have firewall options

Your Internet router may have a firewall built in, but it's of little use unless it's turned on and the administrator password changed to stop the settings being altered



SCREEN 1



SCREEN 2

home through wireless hotspots and other connections. A desktop firewall is still needed (see screen 2). The free software included in Windows XP fulfils this need and there are third-party additions from firms such as Symantec for earlier Windows versions.

Protect yourself from viruses

As well as a firewall, it goes without saying that you're going to need virus protection on your network, although it's not unusual to find out-of-date implementations or no provision at all.

On a small home network, the anti-virus software typically shipped with each new PC will be more than adequate, and easy to keep up to date over the Internet. You'll have to pay to renew the subscription sooner or later, but it shouldn't cost more than a few pounds. There are also some good free options, such as Grisoft's AVG Anti-virus Free Edition (<http://free.grisoft.com>), plus PCW regularly carries such software on its cover discs.

Where several PCs are involved, however, installing and maintaining desktop anti-virus software can be a chore, so it's worth looking for solutions designed specifically for network use. All the leading vendors, including McAfee, Sophos, Symantec and Grisoft, have such products with scanners that can be distributed and managed centrally, along with updates that can be downloaded to a single system (usually a server) for local distribution.

Look for anti-virus scanners that can be deployed at the Internet gateway. These can be implemented in the form of gateway server software or as self-contained security appliances between the Internet router and the LAN. Either way viruses can be screened out before they get to users' PCs, but you'll still need individual desktop scanners, as viruses can be spread by other means, especially on

Left: A network firewall by itself may not be enough. Mobile users will also need a desktop firewall and other security measures to protect them when connecting to the Internet in other ways

Below: Microsoft Antispyware and other desktop tools are a good way of protecting individual machines against keyloggers, browser hijackers and other spyware infections, but on a network can be difficult to manage



SCREEN 3

notebooks which can be taken out of the office. I'll be looking at network anti-virus management next month.

Spyware solutions

Most anti-virus scanners will let things such as key loggers, pop-up generators and other spyware through intact, often with devastating results. Perhaps not in the same obviously destructive way as with a virus, but bad news all the same, with blended attacks – where spyware and viruses are combined – becoming increasingly common.

To combat this, a growing number of anti-spyware products is being released, with most designed to be deployed on individual PCs. Many are commercial products, often from anti-virus vendors, but there are freeware/shareware tools such as Ad-aware (<http://www.majorgeeks.com/download506.html>) and Spybot Search and Destroy (<http://www.saler-networking.org/en/download>) that can be very effective at identifying and removing spyware infestations.

Microsoft is getting in on the act with its Antispyware tool. This can block as well as remove spyware and, at the time of writing, was available as a free beta download, although that's likely to change when the final version is released (see screen 3).

As with anti-virus solutions, desktop tools aren't always the best way to keep spyware off a network. An increasing

number of products is being released to block spyware at the Internet gateway, using software or custom appliances. To date most of these have been aimed at large enterprise customers and priced accordingly, but that will change as the technology matures.

Staying up to date

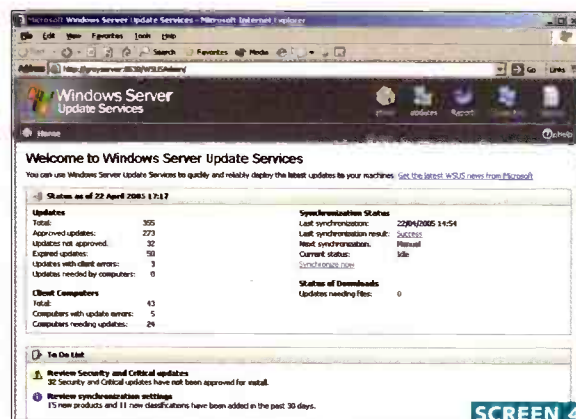
Keeping software up to date doesn't mean buying new versions as soon as they're released, but making sure what you have is free from bugs and vulnerabilities that could be exploited by hackers, virus writers and the like. We've all heard about these flaws and the increasing regularity with which they're found, making it important to keep up to date with any patches.

With Windows 2000 and XP this is now easy to do, using the Automatic Updates option built into the OS. If you want to manage the patching process yourself, there's software available for free download from the Microsoft website. Called Windows Server Update Services (WSUS) (see screen 4), it lets you download patches and other updates to a network server where they can be tested before being made available to PCs on the LAN. That way you avoid everyone downloading patches, and you can check for compatibility issues ahead of release.

Another plus with WSUS is that it can be used to distribute updates for other Microsoft products beyond the core operating system, such as Office, making it a tool well worth having.

Other security tools

The more astute will have noticed I've left out a host of security issues and solutions from this column. I haven't mentioned encryption or wireless networking, spam, phishing or intrusion prevention, or more than touched on blended threats. Rest assured I'll be visiting these and other security topics in future issues. PCW



SCREEN 4



Mark Whitehorn is one of those lost souls who actually likes databases. He splits his time between consultancy, writing, working for two universities and tinkering with old cars.

→ Comments welcome on the Databases column.
Email database@pcw.co.uk
Please do not send unsolicited file attachments.

Curing dependency

Continuing last month's normalisation theme, here's an in-depth explanation of 3NF

Last month I introduced normalisation, a topic with a reputation for being both difficult and obscure. This month I hope to continue convincing you that, in fact, it's based on common sense and offers a simple cure for certain classes of database problems. We've already talked about first and second normal form (abbreviated to 1NF and 2NF) so let's move on to third normal form, 3NF.

Last time we started with a simple database that recorded which students were signed up for which course. One of the tables stores information about courses (see screen 1). However, you'll notice that, for each course, it stores the name and the room number of the lecturer giving the course. Since one lecturer can teach many courses it follows that the lecturers' names and room numbers are repeated many times: every time a record contains the name John Clark it also contains K14. There's data in this table that's repeated and therefore redundant. It wastes space and has the potential to introduce errors (it is easy to miskey K14 as, say, K1\$). Normalisation is about removing this type of problem, so let's see how it applies to this particular situation.

As explained last month, 2NF says there should never be a dependency between a column in the 'body' of the table and a column that forms part of the primary key. (A table can be divided into key fields and the rest, with the rest forming the body of the table.)

The problem such a dependency produces is cured by creating one or more new tables and moving the data

'Normalisation offers a simple cure for certain database problems'

SCREEN 1

CourseID	Course	Lecturer	RoomNumber
1	Introduction to Philosophy	John Clark	K14
2	French 101	Elaine Dupont	K8
3	Greek Philosophy	John Clark	K14
4	Introduction to Accountancy	Ken Street	M4
5	Small Business Accounting	Ken Street	M4
6	French in the 17th century	Elaine Dupont	K8

Record: 1 of 6

SCREEN 2

CourseID	Course	LecturerID
1	Introduction to Philosophy	1
2	French 101	2
3	Greek Philosophy	1
4	Introduction to Accountancy	3
5	Small Business Accounting	3
6	French in the 17th century	2

Record: 1 of 7

into them until the dependency is eradicated (a process gloriously known as 'lossless decomposition').

3NF says that there should never be a dependency between two columns in the body of the table. The Course table breaks 3NF: the data in RoomNumber depends upon the data in Lecturer. In other words, if I start to create a new row in the table and insert the words 'John Clarke' in the lecturer field, you know that I'm going to put K14 in the room field. Similarly, if I put K14 in the RoomNumber field, you know what's going to be put in the Lecturer field. Therefore, there is a dependency between these two fields that are within the body of the table; so we know this table violates 3NF. Again, the cure is really simple: we move the lecturer and room data into a separate table (see screens 2, 3 and 4).

As I said last month, one way of looking at the entire process of normalisation is that it tries to ensure information about one class of object is always stored in one table. Lecturers form a separate class of object, just as courses and students do, so creating a

Top: The original Course table which breaks the rules of 3NF

Bottom: The Course table in its improved form, with no repeated data

new Lecturer table also fits with our overall plan for good normalised database design (see screen 5).

And there we have it: 1, 2 and 3NF in all their glory. A brief summary seems in order here.

- 1NF: each column must contain a single unit of data. More technically put, the data in a table must be atomic.
- 2NF: if a table has a primary key made up of more than one column, no column in the body of the table must be dependent on only part of a primary key.
- 3NF: there must be no dependencies between columns in the body of the table.

It's clear that 2 and 3NF seek to remove dependencies (you might also

This shows the design of the new Course table

SCREEN 3

Field Name	Data Type	Description
CourseID	AutoNumber	
Course	Text	
LecturerID	Number	

Field Properties

Property	Value
Field Size	50
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Allow Zero Length	Yes
Indexed	No
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Smart Tags	

SQL and the minefield of user access

In the November issue I answered a reader's question in Hands on Question time. Alan Davies said his company had a major database and that he was very familiar with SQL. He wanted to send SQL queries directly against the database, but the IT department refused his request. He asked: 'What is "common practice" in these situations?'

I replied that it is highly common practice not to allow such access, and went on to explain that not only can users type commands that delete entire tables, but also that it is possible to run queries that will completely glue the system down because they attempt to return 10,000,000,000,000 rows.

I have been soundly (but politely) taken to task by several readers for this. For example, Tony Cowderoy said that he was saddened to read the rather dogmatic response to Alan Davies' letter. He, and others, went on to say that this kind of response puts up barriers between the IT department and end users that can be very harmful to the performance of a business.

He suggests those companies that allow controlled end-user access to database query tools usually get far more value from their systems than those that do not, and suggests the keys to making this work are:

- Read-only database access
- Proper training
- Resource limits, which on most modern systems can be imposed on a per-user basis, to prevent a disastrous impact on performance
- Treating users as the responsible and intelligent adults most of them are.

He finishes that, in the end, the IT department is only the custodian of the data, not the owner of it. It is a pity when IT people lose sight of that.

I could not agree more with these sentiments and (despite initial appearances) I don't see any conflict with the answer that I gave to the question. The question Alan asked wasn't: 'How should this work in a perfect world?', but: 'What is common practice?'. There is no

doubt in my mind that it is very, very rare for a company to allow employees to send raw SQL to a production database, for the very reasons I stated last month.

If you ask: 'Should the IT department remember it is the guardian of the data and not the owner?', I would answer: 'Absolutely'. The IT department should not only allow the best access it can, but it should actively try to make that access as easy for the users as possible.

But I don't want to sound as if I am worming my way out of this, so let's have the crunch question. 'Mark, do you normally allow users to type raw SQL against a production database?' Not normally, no. I think my job as a database systems manager is to allow the best possible access to the data for the greatest number of users for the greatest period of time. Such a task is a balancing act. If, for example, I back up the data, I inevitably impact the access in some way or other. But I have to back it up for the long-term benefit of all users.

My default position would not be to allow the average user to type SQL against a production database. Have I varied that position for certain people? Yes. Would I set this as common practice in a database under my control? Absolutely not. Do I think that the senior managers (who pay me) would want me to do this? No. Would I do it if they told me to? Of course I would. Would I expect the database to function optimally for the users if this was done? No. Do I understand that this ends up looking control-freakish? Of course I do.

In the end I think this clash of IT and business is more about perceptions and presentation than fact. One of the main problems here is that IT departments often don't articulate why they are protecting a database, which is why those protections are seen as restrictions. I certainly agree that most of the fault lies with the IT departments and I think that part of the cure is to encourage IT departments to treat users as the responsible and intelligent adults most of them are (just as Tony said), and explaining decisions to them. However, the fact that explaining IT decisions is difficult was demonstrated by the way I singularly failed to do so in November!

hear them termed 'functional dependencies') and that could leave you with the impression that functional dependencies are a bad thing. This is certainly not the case; some are bad (the ones we have just removed), but others are actively encouraged. The clever part of normalisation is that, by removing the bad functional dependencies, the only ones left are the good ones, which are the functional

dependencies between columns in the body of the table and the entire primary key. So, in a well-designed table, every column in the body of the table is completely dependent upon the entire primary key.

Now just two statements can describe the goals behind 1, 2 and 3NF:

- 1) Each column must contain atomic data
- 2) Every column in the body of the table must be completely and

exclusively dependent upon the entire primary key.

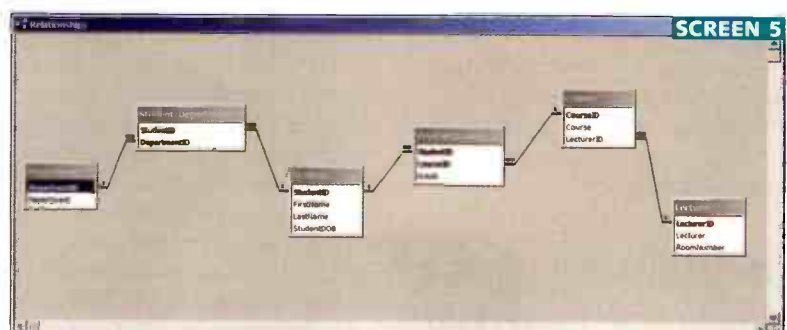
But what about those other strangely named types of normal form I mentioned last month? Boyce-Codd, Fifth, Domain-key, Restriction-union... you're probably asking whether I'm going to discuss them, and should you be worried about them? The answer to both questions is no. See next month's exciting column for the reason. PCW

SCREEN 4

CourseID	Course	LecturerID
1	Introduction to Philosophy	1
2	French 101	2
3	Greek Philosophy	3
4	Introduction to Accountancy	1
5	Small Business Accounting	2
6	French in the 17th century	2

LecturerID	Lecturer	RoomNumber
1	John Clerk	K14
2	Elaine Dupont	K8
3	Ken Street	M4

Here you can see how the LecturerID field is used to show which lecturer teaches a course



The diagram above shows the relationships between all six tables

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Tim Anderson is an IT journalist and software developer, and began writing for PCW in 1993. Since his first Commodore Pet, he has acquired expertise in Rad programming, Windows and the Internet.

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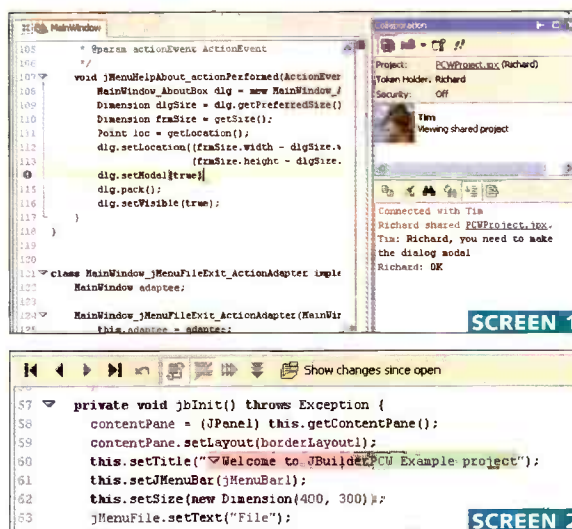
The Eclipse of Jbuilder

The final versions of Jbuilder and Visual Studio 2005 revealed; plus more on Foxpro

Borland has released Jbuilder 2006, the last version that will use the Borland IDE known as Primetime. There will be future versions of Jbuilder: the next edition is in preparation, codenamed 'Peloton', but it will be built on the open-source Eclipse platform and will therefore be a very different product. Eclipse is all-conquering right now; vendors everywhere are abandoning their home-grown IDEs and switching to Eclipse. Another recent Eclipse convert is Zend, whose Zend Studio product is the nearest thing to an official development tool for PHP. Zend is joining the Eclipse Foundation as a Strategic Developer, which is likely to mean that Zend Studio, like Jbuilder, migrates to Eclipse.

Maintaining an IDE is expensive, and the logic behind moving to Eclipse is that the infrastructure is already in place, saving a large proportion of the development cost. Another benefit is developers will already be familiar with Eclipse, easing the learning process for any particular plug-in. It looks like two IDEs are going to account for the majority of programming in the industry, with one being Eclipse and the other Microsoft's Visual Studio.

Borland then has little choice but to move to what is becoming the standard Java IDE. Even so, it is not altogether welcome news. Jbuilder is a good product, and was at one time the market leader. An important technical difference is that Jbuilder uses Java's Swing framework for its GUI, whereas Eclipse uses SWT, which requires additional native libraries for each platform it supports. There is no problem coding Swing applications with Eclipse, but SWT can cause problems even in the IDE. One complaint is that it works best on Windows and less well on Linux or the Mac. It is a shame Primetime is heading for retirement.



This also makes Jbuilder 2006 something of a hard sell. Users may want to wait for the Eclipse version coming later in 2006, or even move to Eclipse now. On the other hand, Jbuilder is as good as ever, and there is a case for staying with this classic IDE. Jbuilder 2006 is now hosted on JDK 5, and should be usable for a long time yet.

The most interesting new feature is called peer-to-peer collaboration (see screen 1). It is inspired by a principle of Extreme Programming (XP), an influential methodology for agile development. 'Write all production code with two people sitting at one machine,' says XP guru Kent Beck in his book, *Extreme Programming Explained*. 'Pair programming is a dialogue between two people simultaneously programming. Pair programmers keep each other on task, brainstorm requirements, clarify ideas, take initiative when their partner is stuck and hold each other accountable.'

In practice, pair programming is one of the least adopted parts of XP. People find it hard to accept that they are not halving productivity, and don't like the idea of sitting for extended periods at

someone else's desk. But Jbuilder's peer-to-peer collaboration lets you do pair programming without moving around. Two or more people can work on the same code with a full view of every edit their partner is making. You can't edit the same file simultaneously. One person holds a notional token, which means they have control of the project. Others will be in Follow mode, which means they see the same view of the editor that the current token-holder sees. Integrated chat lets you discuss the programming effort, and you can send files and debugging traces to your peers. Your peers may be on the local network, or remote users, and there is an option to encrypt the data for security.

Peer-to-peer collaboration is a feature of all the Jbuilder editions, including the free Foundation version, although Foundation users cannot collaborate over the Internet. Pair programming is likely to remain a minority taste, but it is also a neat way to troubleshoot a development roadblock if you don't mind being watched while you work.

Active Difference Editing (screen 2) is also new in Jbuilder 2006. In this mode, the editor keeps track of all the changes you have made since opening the file, or since you last saved it, according to your preference. You can also select a base version using Jbuilder's built-in local history. Viewing these differences makes the code harder to read, but fortunately you can easily show or hide them with the Active Difference toolbar.

There are also some new refactorings, including the useful Introduce Parameter (screen 3). This is where you find you can improve your code by converting an expression within the body of a method into a parameter passed to the method. You can now right-click the expression, choose

Top: Peer-to-peer collaboration in Jbuilder 2006 lets you watch and comment on what your partner is doing to the code

Bottom: The Jbuilder Active Difference toolbar lets you show and hide recent changes

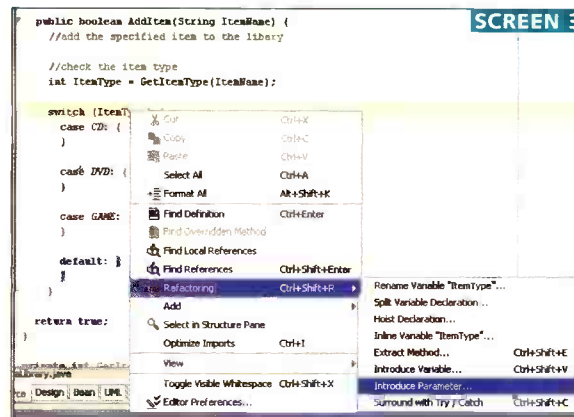
Introduce Parameter, and have Jbuilder add a parameter of this type to the method and to any code that calls it.

Jbuilder 2006 is a decent, though minor, upgrade, with improvements to J2EE, Javaser Faces and overall application server support, as well as these editor enhancements. It is hardly a must-have for owners of the previous version, unless you want to dive into pair programming. It makes better sense for those who have skipped a few versions. The Foundation edition is a great free Java IDE. From another perspective, this is the last version of a classic and highly productive Java editor, so grab it while you can.

Visual Studio 2005

It is interesting to contrast Borland's frequent small Jbuilder upgrades with Microsoft's approach to Visual Studio where there is a long time between versions, but the differences are much greater. The final release of Visual Studio 2005 last November came after what seemed like an eternity of alpha, beta and preview releases, which means most Windows developers already know its key features. This is only the Express and Professional editions: the Team Suite that includes many collaboration, testing and quality control features will not arrive until some time in the first quarter of 2006.

A lot is resting on the new Visual Studio, since it includes the final release of .Net Framework 2, which is



Introduce Parameter is a handy way to refactor your code

an integral part of both SQL Server 2005 and even Windows Vista. The Windows Presentation Foundation (WPF), which uses an XML language called XAML to define a user interface, rests on top of .Net 2. Although there may be an update to .Net 2 on the release of Windows Vista, it is only intended to be minor. XAML will also be coming to Windows XP.

There is no XAML yet to be found in the final Visual Studio 2005, but this is still an essential toolkit. It also introduces the free downloadable Express editions and the free SQL Server Express. Early impressions of the new release are positive: several projects converted easily to the new format, although there is inevitably a problem with any third-party components that are not yet available for the updated platform. One disappointment is that Windows Forms

applications do not appear substantially faster or slimmer, in terms of memory resources, than in Visual Studio 2003. This has been an issue for developers coming from Visual Basic 6 or Visual C++, who find desktop Windows applications tend to be slower and consume more memory when ported to .Net. This does suggest that Windows Forms will never compete well with native code for applications that have a demanding GUI.

It is possible Microsoft is reserving its best efforts here for XAML and the DirectX-accelerated .Net work you can do with WPF. That is fair enough, but it also means Win32 tools such as Delphi and VB 6 will still be attractive where you need the best GUI performance. That does not mean Windows Forms are unusable. In many cases performance is good enough, and it allows full access to all the other .Net goodies. You can also get dramatic performance gains by judicious use of the native Win32 API through Platform Invoke. **PCW**

Resources

Jbuilder

<http://Borland.com/jbuilder>

Book: *Extreme Programming Explained* by Kent Beck. Addison-Wesley, ISBN 0-321278-65-8

Visual Studio

<http://microsoft.com/vstudio>

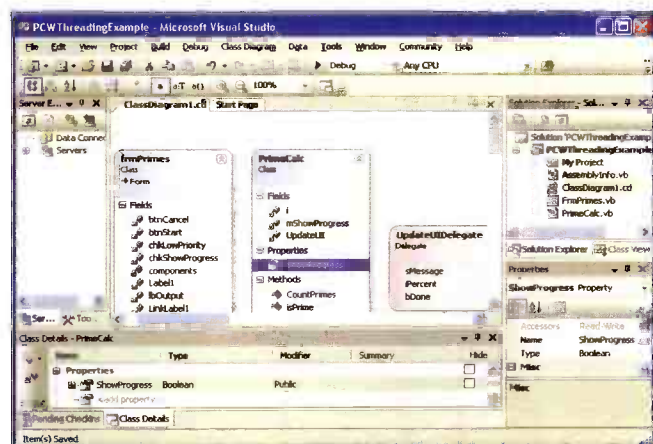
Making sense of Foxpro forms

We featured Visual Foxpro in December's Visual programming column. This prompted reader Judah Arotzky to write, saying: 'Nice to see an article on Foxpro, I thought everyone had forgotten it.' The email goes on to ask how to integrate forms created in the Foxpro designer with program code, and notes that: 'In Visual Basic, the code for the form can be saved as pure Ascii and subsequently modified if required. In the Foxpro form designer, although the code is saved in a *.scx file, this file contains a large number of non-printable characters.'

You can display a Foxpro form with the DO FORM statement. This is similar to calling the show method on a form variable. If the form has a windowtype of Modal, the code will wait on the DO FORM statement until the form is closed. If the form is Modeless, the form remains on screen but DO FORM exits immediately. A common pattern is to display one or more forms with DO FORM, then call READ EVENTS, which asks Foxpro to continue processing events such as menu or button clicks. The READ EVENTS statement does not return until CLEAR EVENTS is called from anywhere in the application.

The files that define Foxpro forms are more accessible than they first appear. Forms designed in the form designer are simply database tables. To view them, type USE ? in the Foxpro command window. In the Open File dialogue, select All Files in the Files of Type dropdown.

Then select a saved form such as Form1.SCX. You can then browse and even modify the table that defines the form. This is not an officially supported technique for designing forms, and the schema is not properly documented, but some developers have used this technique to process their form designs programmatically.



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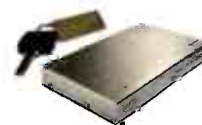


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Available Models:

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Blue Eye Pro
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E&OE July 05

How to buy the best products tested by our Labs

This Buyer's Guide is a comprehensive listing of the best products PCW has tested across a range of areas, helping you to make the best decision when you're planning a purchase. Over the following pages you'll find products, their verdicts and ratings, plus information on where you can read the full review.

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Prices are for guide purposes only and may be subject to change

HOW TO BUY: PCs

Many of the choices you are faced with when buying a PC are covered in the following pages. You need to think about the graphics card, memory, onboard sound or separate soundcard, size and type of hard disk, CD burner or DVD burner and so on.

Once your budget is set, the starting point is the CPU (central processing unit), because it is the brains of your PC.

Intel and AMD offer a bewildering number of processors. The differences between the CPUs are in technical details that don't necessarily mean much to end users. Pricing is also competitive, with AMD PCs generally cheaper than comparable Intel models.

Budget PCs come with Intel's Celeron or AMD's Sempron CPUs. These are aimed at undemanding users. If your needs are for word processing tasks and surfing the Internet with some low-end gaming or image editing, a PC running either of these processors is fine. You won't need a huge hard disk - 80GB will be plenty - coupled with between 256MB and 512MB of Ram and a low-end graphics card, or even onboard graphics for the truly undemanding. You'll be fine with onboard sound, and can expect to pay up to about £500, depending on your monitor.

In the mainstream desktop market it's Pentium 4 and Pentium D versus AMD's Athlon XP and Athlon 64. The chief



Mesh Xtreme Fire

£1,878 ★★★★★
Reviewed February 06
www.meshcomputers.com

This is the first PC we've seen that includes two Crossfire cards. Great value for money.



Vadim Fusion C5

£4,337.28 ★★★★★
Reviewed February 06
www.vadim.co.uk

Insanely expensive, but well built and you can reconfigure it to bring the cost down.



Shuttle M1000

£1,422 ★★★★★
Reviewed January 06
<http://eu.shuttle.com>

This is a high quality, well-designed Media Center PC, although it is expensive

difference is that older Pentium 4 and Athlon XP models are 32bit CPUs, while some newer Pentium 4s, the Pentium D and Athlon 64 are 64bit models. To take full advantage of this, you need a 64bit operating system and applications.

More memory can be supported by 64bit systems - 32bit Windows or Linux systems are limited to 4GB of Ram, whereas a 64bit Windows or Linux system can support 128GB. Data is also moved in larger chunks, allowing a theoretical speed advantage.

AMD and Intel offer high-end processors with the Pentium Extreme Edition and Athlon FX ranges, both aimed at the hardcore gaming market. They also have dual-core CPUs. These processors effectively act as two CPUs in one and offer superior performance.

If you're choosing a PC running the above CPUs, other considerations come

down to your needs. If you store lots of music, video or photos, go for a big hard disk - 200GB or above. Memory will help speed up applications, so aim for 1GB or above and don't drop below 512MB. The latest games demand the latest graphics cards, but for most people, cards that were new six to 12 months ago will be powerful enough. And look at the CPU's cache memory, which helps eliminate data bottlenecks.

Most PCs are Windows XP, and the Home Edition is fine. If it's for a small business or you need features such as remote access, buy XP Professional. Few PCs are sold running Linux, and we'd recommend only the technically confident buy a Linux-only system. Linux can always be installed later. Finally, don't overlook the monitor, especially if you're using the PC for gaming or imaging; buy the best you can afford.

BUYER'S GUIDE

145 PRODUCTS
REVIEWED TO MAKE
YOUR BUYING
DECISION EASIER

GRAPHICS CARDS

1		HIS Radeon X700 Pro IceQ II £93.94 ★★★★★ Reviewed February 06 www.hisdigital.com	HIS uses the IceQ II cooling system to deliver excellent performance at a good price.
		Sapphire Radeon X800 £114.99 ★★★★★ Reviewed February 06 www.sapphiretech.com	A decent PCI Express card based on ATI's X800 series with 256MB of Ram.
		Sapphire Radeon X1300 £37.99 ★★★★★ Reviewed February 06 www.sapphiretech.com	Great budget card with a core clock of 450MHz and 128MB of Ram.
1		Gecube Radeon X850XT Uniwise £269.97 ★★★★★ Reviewed May 05 www.gecube.com	A single-slot design using Gecube's own cooling system, and it offers good performance.
		Powercolor Radeon X850XT Platinum Edition £320 ★★★★★ Reviewed July 05 www.powercolor.com	Based on ATI's fastest Radeon processor, this card will run the latest games with ease.
		Gecube X850XT Platinum Edition Uniwise £307 ★★★★★ Reviewed January 06 www.gecube.com	High-end performance and quiet cooling for AGP motherboards.
1		Galaxy GeForce 6800 Glacier £208 ★★★★★ Reviewed February 06 www.galaxy-hk.com	Nvidia GeForce 6800 card using older AGP technology instead of PCI Express.
		Aopen Aeolus GeForce 7800 GTX £364 ★★★★★ Reviewed October 05 www.aopen.com	Uses the latest 7800 GTX chipset from Nvidia and is one of the cheapest versions around.
		HIS Radeon X850XT Platinum Edition IceQII £370 ★★★★★ Reviewed June 05 www.hisdigital.com	Making use of the IceQII efficient cooling system, this is a quiet and super-fast card.
1		Nvidia GeForce 7800 GTX 512 £516 ★★★★★ Reviewed February 2006 www.nvidia.com	This card has an updated 7800 GTX chipset with a massive 512MB of Ram.

HOW TO BUY

Most graphics cards are based on either the Nvidia GeForce or ATI Radeon family of chips. Each has their strengths and both offer state-of-the-art image acceleration and comparable features.

Performance improves as you move up a range. Top chips offer more features and draw more pixels or textures in a single pass than cut-down, lower-cost options. All current graphics processors are fine for office work, but hardcore gamers favour Nvidia's GeForce 6800 or new 7800 series and ATI's Radeon 1800XT and X850 XT chips.

Ensure the card you buy can display favoured resolutions with at least a 75Hz monitor refresh rate to avoid eye strain from flicker (if using a CRT monitor).

There are usually three clock speeds quoted (in megahertz). Core clock is the internal speed of the graphics processor. Memory speed (or memory clock) is the speed of data transfer between the graphics card's onboard memory and the graphics processor. Ramdac speed is the capability of the digital-to-analogue converter that provides the graphics output from the card.

Graphics cards use their own dedicated video memory to store data, images and textures. The more you have, the better the performance. A card with 64MB is fine for office tasks, but we

recommend at least 128MB or 256MB for the latest games and video applications.

Around £40 will buy you a GeForce FX 5200 or Radeon 9200 card with 128MB of Ram, which is good for 2D action/strategy games, image editing and less demanding 3D games.

To play 3D action games smoothly, look at £100-£150 cards. Serious gamers should consider the GeForce FX 6800 GT at £280-plus, Radeon 850 XT at £320-plus, or FX 7800 GTX at £350-plus.

Depending on the motherboard, you'll need an AGP or PCI Express graphics card. PCI Express is the newest interface standard, offering up to double the bandwidth of an AGP 8x slot for even faster and more complex graphics. Both ATI and Nvidia offer PCI Express versions of most of their cards. Nvidia also has its SLI (Scalable Link Interface) technology that lets you use two PCI Express graphics cards in SLI-enabled motherboards for ultimate performance. ATI's rival technology Crossfire is due soon.

Look for support for both analogue (VGA) and digital (DVI) displays, and S-video and composite video outputs for use with TVs. Some 'all-in-one' cards have a built-in TV tuner and video-capture options, so you can save money rather than buying separate cards.

NOTEBOOKS

1		Sony Vaio VGN-TX1HP £1,499 ★★★★★ Reviewed December 05 www.sony.co.uk	A stylish, well-designed notebook with exceptional battery life and a wealth of features.
		Evesham Voyager C720 £1,499 ★★★★★ Reviewed February 2006 www.evesham.com	Great gaming notebook with a 17in display and GeForce Go 7800 graphics.
		MV Mobeus 1.4 Celeron £586 ★★★★★ Reviewed October 05 www.go-mv.com	A highly portable, feature-packed notebook that's also very affordable.
1		Gateway 8550GB £950 ★★★★★ Reviewed February 2006 www.uk.gateway.com	This is a quality desktop replacement notebook at an even better price.
		Asus W5A £1,408 ★★★★★ Reviewed December 05 www.asus.com.tw	An easy-to-use, stylish and well-equipped notebook with great performance.

HOW TO BUY

Notebooks have caught on like wildfire with consumers thanks to plummeting prices and massive marketing campaigns. However, there are so many options that it's easy to get confused.

Decide what you want your notebook for. If it's for occasional use, running some office applications, accessing the Internet and email, then almost any low-cost notebook will do the job. If it's for gaming or running video-editing software, you will be looking for a notebook with a large 15in/17in screen - possibly widescreen - a high-end Nvidia or ATI graphics chip, 1GB of memory and an 80GB (or bigger) hard disk.

In the low-cost arena, Intel has its Mobile Celeron chip and AMD has Sempron. In the midrange/high-end space, there are Intel's Mobile Pentium 4 or Pentium 4 chips, while AMD offers Mobile Athlon 64 and Athlon 64. Expect to find these in desktop replacement systems and those used by gamers.

For the best in performance with power-saving technology, go for Intel's Pentium M or AMD's Turion 64 processors.

Any notebook you get should have in-built Bluetooth and Wifi connectivity, a 30-40GB hard disk drive, 512MB of Ram, 14-15in screen, USB2 or Firewire ports, DVD/CD-RW combo drive and three to four hours' battery life.

MOTHERBOARDS

1		ECS PF88 £64.63 ★★★★★ Reviewed August 05 www.ecs.com.tw	The PF88 is feature-packed and compatible with both Intel and AMD processors.
2		Aopen i915GM-HFS £79 ★★★★★ Reviewed July 05 www.aopen.com	The HFS makes the ideal platform for building a quiet, power-efficient Intel PC.
3		Asus A8N-SLI Deluxe £98 ★★★★★ Reviewed April 05 www.asus.com	A good, all-round AMD SLI board that is packed with plenty of features.
4		ECS 915-A £61.81 ★★★★★ Reviewed June 05 www.ecs.com.tw	All the features you'd expect from a modern Intel-based motherboard and outstanding value for money.
5		Asus K8N-E Deluxe £59 ★★★★★ Reviewed November 04 www.asus.com	A tidy AMD board with lots of room around the major components and a wide range of features.
6		EpoX 8HDA3+ £79.92 ★★★★★ Reviewed July 04 www.epox.com	An AMD board that stands out from the crowd thanks to its dual LAN and external SATA support.
7		MSI 945P Platinum £99 ★★★★★ Reviewed November 05 www.msi.com.tw	An Intel board that features DTS Connect, so you can output true DTS surround-sound audio.
1		Gigabyte GA-8N-SLI Royal £149 ★★★★★ Reviewed October 05 www.giga-byte.com	Featuring an Nforce4 chipset, this model from Gigabyte supports all Intel 775 processors.
2		Abit Fatal1ty AN8 £119.80 ★★★★★ Reviewed August 05 www.abit.com.tw	This AMD board has enough flexibility and Bios features to keep overclockers happy.
3		ECS PF22 Extreme £123 ★★★★★ Reviewed February 06 www.ecs.com.tw	A good range of features including dual graphics support courtesy of ATI's Crossfire technology.

HOW TO BUY

The motherboard dictates the type of processor you can use, how well the other components communicate, the features on offer and future upgrade potential.

Cheap boards limit processor support, graphics and expansion options. Around £70-£100 gets you the latest technologies.

Most desktop and tower cases use a standard ATX-size motherboard but, if you're building a small system, look at compact MiniATX or MicroATX designs. If using an existing case, make sure you buy the right form factor.

Your choice is also dictated by the processor. You'll need Socket 775 for current Intel processors, Socket A for AMD Athlon XP or Duron, and Socket 939 for an Athlon 64. The Athlon 64 FX series requires Socket 940. If using an older CPU, check the socket type.

We would recommend an Intel P4 or Athlon 64 for a good all-round system. The Athlon 64 can address one terabyte of Ram (1,000GB) and handle difficult calculations with relative ease.

The new generation of processors also change the way data is transferred. Whereas P4s rely on the motherboard chipset to shuttle data between processor and memory, Athlon 64s avoid this by integrating the memory controller into the CPU die.

Divided into northbridge and southbridge, the chipset handles the communication between all the components and dictates the features on offer. Today's leading chipset manufacturers include Via, Silicon Integrated Systems (Sis), ATI, Nvidia and Intel. Chipsets can include integrated graphics.

Today's motherboards mainly use DDR or DDR2 Ram, available in 200, 266, 333 and 400, 667 and 800MHz modules.

Also consider the number of slots available. Fit dual in-line memory modules (Dimms) in pairs if the chipset supports dual-channel operation.

The latest boards support both older IDE and new, faster Serial ATA (Sata) hard disks. Check the number of connectors available for both.

Some chipsets provide Raid support, so data can be spread across two drives for extra performance or backups. SCSI controllers can be found on more expensive boards, or be added with expansion cards.

Also important is the number of USB2 and Firewire sockets for external add-ons. You may need serial, parallel and PS/2 interfaces if using older legacy peripherals. Look out, too, for onboard Ethernet networking, a built-in 56K modem and onboard sound. The latter is fine for all but audio buffs or avid gamers.

SOUND CARDS

1		Creative Audigy 4 Pro £179.99 ★★★★★ Reviewed July 05 http://europe.creative.com	This updated version of Audigy 2 has fantastic performance and a good software bundle.
2		Creative Soundblaster X-Fi Elite Pro £249 ★★★★★ Reviewed November 05 http://europe.creative.com	This latest Creative offering has a variety of features, but will take time to be fully supported.
3		M-Audio Revolution 7.1 £99 ★★★★★ Reviewed July 05 www.m-audio.com	An excellent mid-priced soundcard offering great audio quality, but gamers might be disappointed.
4		Hercules Fortissimo IV £44.99 ★★★★★ Reviewed July 05 www.guillemot.co.uk	If you're looking to upgrade your system, but have a limited budget, this is an excellent option.
5		Terratec Aureon 7.1 Universe £114 ★★★★★ Reviewed July 05 www.terratec.com	We wouldn't recommend this over the Audigy 4 for gamers, but musicians may be tempted.

HOW TO BUY

Many PCs have built-in surround sound on the motherboard. Some support six-channel (5.1), others eight-channel (7.1) and the sound quality is fine for most people.

If you want a dedicated soundcard for playing and making CDs and mp3s, DVDs and games, most will fit the bill.










Entry-level soundcards support 16bit-quality sound recorded or played back at 44.1KHz, which is CD-quality. The next step is 24bit sound at higher sampling rates of 48KHz or 96KHz, recommended for those creating music or playing DVD movies with THX surround or Dolby Digital EX 6.1 or 7.1 sound formats. More cards now also support 24bit 192KHz

playback, required for the DVD-Audio music format.

The signal-to-noise (SNR) ratio, measured in decibels (dB), is the amount of sound you expect (signal) versus that which you don't (noise). Decibel ratings range from 60dB to over 100dB and the higher the dB rating, the better.

Most cards share many similar options, such as microphone-in, line-in/line-out, line-out, Midi/joystick port, CD-in and headphones connectors. Newer cards also have high-speed Firewire ports. Audio enthusiasts should look for S/PDIF (Sony/Philips Digital Interface) -in and -out, to connect speakers via a single optical or coaxial cable and get higher quality digital sound.

HARD DRIVES

INTERNAL	1		Seagate Barracuda 7200.7 160GB NCQ £92 ★★★★★ Reviewed December 04 www.seagate.com	Good performance with an 8MB cache and 8.5ms seek time – and you can buy bigger capacities.
	2		Seagate Barracuda 7200.8 (ST3400832A) 400GB £186.96 ★★★★★ Reviewed July 05 www.seagate.com	This massive 400GB drive offers impressive capacity and an 8ms seek time.
	3		Hitachi Deskstar 7K250 (250GB SATA150) £88 ★★★★★ Reviewed May 04 www.hitachi.co.uk	Those needing a large SATA150 drive will find this a great bargain.
	4		Samsung Spinpoint P120S £80.11 ★★★★★ Reviewed February 06 www.samsung.co.uk	This isn't the fastest drive on the market, but it is extremely cool and quiet.
	5		Western Digital Caviar WD1600JD (160GB SATA150) £72.61 ★★★★★ Reviewed May 04 www.wdc.com	With dual power connectors this drive will suit users transitioning to SATA technology.
EXTERNAL	1		Maxtor Onetouch II Firewire 800 300GB £179 ★★★★★ Reviewed November 05 www.maxtor.com	A good-quality 300GB USB and Firewire hard drive that comes with backup software.
	2		Lacie Safe Mobile Hard Drive 80GB £149 ★★★★★ Reviewed December 05 www.lacie.co.uk	Featuring a fingerprint reader for security, this 80GB external hard drive would suit business users.
	3		Buffalo Linkstation 120GB £240 ★★★★★ Reviewed October 04 www.buffalotech.com	If you want easy-to-use external network storage, this is a great choice.
	4		Smartdisk Firelite 80GB £189.98 ★★★★★ Reviewed October 04 www.smartdisk.co.uk	Available with either USB or Firewire interfaces, it's a great performer at an attractive price.
	5		Siwara SW Pocket 20GB £246 ★★★★★ Reviewed October 04 www.hki-systems.co.uk	Excellent software and a miniature form factor make this a great product.

HOW TO BUY

If you're building a high-performance system, buy the fastest drive you can afford; if you just want lots of capacity then slower drives offer better value.

OEM or 'brown box' drives are cheaper – this is the bare drive without the extras, such as cables, included in retail boxed versions.

The transfer rates in today's Ultra ATA drives are 100Mbytes/sec (133Mbytes/sec for Maxtor drives), while Serial ATA (Sata) drives are rated at 150Mbytes/sec. Check the seek times, spindle speed, buffer size and the areal density of the platters (disks).

Usually in milliseconds, seek time is how long a drive's heads take to find data on the disk. The speed at which the spindle holding the disks spins ranges from 4,200rpm for a notebook drive to 15,000rpm for some SCSI drives. Generally, faster speeds give better performance.

The larger the buffer (cache), the more recently written or stored data is held in the drive's memory, resulting in less time seeking the data on the disk.

Areal density is the amount of data stored on a given area of a drive's platter. The more data per square centimetre (gigabytes per platter), the less disk movement is required to bring it under the heads.

Originally Integrated Drive Electronics (IDE), then Enhanced IDE (E-IDE), this common parallel interface is usually written as ATA (AT Attachment), modified with speed improvements in recent years to Ultra ATA/xxx, where xxx is the peak bandwidth in Mbytes/sec. To differentiate Ultra ATA from SATA, the term Parallel ATA is used.

Faster SATA drives are more expensive than Parallel ATA. SATA uses two pairs of high-frequency cables, working at low voltage.

SCSI (Small Computer System Interface) drives are technically no different to ATA drives, but support up to 16 devices on a single channel and you can have multiple channels in a PC. The disadvantage, though, is price.

Most motherboards support Raid (Redundant Array of Independent Disks), which connects multiple drives, to improve performance or provide fault tolerance.

One problem you may hit is the inability to access the new drive's full capacity. Some older Bioses only support drives up to 137GB. This may be solved by updating the PC's Bios. Retail boxed disks often come with software to fool the Bios into recognising the disk, or you can buy a separate disk controller card, which fits into a PCI slot.

DVD DRIVES

	1		NEC ND4550 £35 ★★★★★ Reviewed February 06 www.nec.co.uk	Great-value DVD writer that can burn dual-layer in both formats, along with DVD-Ram support.
	2		Toshiba SD-R6472 £83.42 ★★★★★ Reviewed September 05 www.span.com	A slimline dual-layer DVD writer that performs well and is perfect for small form factor PCs.
	3		Philips DVDR16LSK £59.99 ★★★★★ Reviewed October 05 www.philips.co.uk	An excellent Lightscribe-capable dual-layer DVD burner that's very keenly priced.
	4		LG 12X Super Multi DVD £116.99 ★★★★★ Reviewed January 05 www.lge.co.uk	Good-value external USB2/Firewire rewriter with all-format media support.
	5		Plextor PX-716A £105 ★★★★★ Reviewed April 05 www.plextor.com	This dual-layer DVD burner combines good performance and a decent software package.

HOW TO BUY

DVD drives have largely replaced CD-Rom, CD-R and CD-RW drives in all but a few entry-level PCs and notebooks. Many systems still offer DVD-Rom drives as secondary drives – used for playback of discs only – while a growing number have a DVD writer or rewriter for burning your own DVDs as the main system drive.

DVD burners can be divided into internal and external drives. Internal drives are cheaper than their external counterparts, but require a level of knowledge so you can install them yourself. You can opt for one of the external offerings which can be hooked up simply via USB2 or Firewire.

Most drives are multi-format, meaning they can write to all key media types, so make sure yours supports DVD+R, DVD+RW, DVD-R and DVD-RW discs. Newer double and dual-layer drives can write to new discs which can store 8.5GB versus the 4.7GB capacity of existing discs. This is useful for backing up your DVD movie collection or chunks of your hard drive on a single disc.

The dual-layer drives cost little more than single-layer drives, so are a good investment. The same cannot be said for the cost of dual-layer discs. A branded, dual-layer 8.5GB disc will cost around £3.75. Rewritable dual-layer discs will not arrive until the end of 2006.

DIGITAL CAMERAS

1 COMPACT		Canon Powershot A520 £239 ★★★★★ Reviewed July 05 www.canon.co.uk	Perfect for those who want a versatile and easy-to-use digicam without spending a fortune.
		Nikon Coolpix S1 £229 ★★★★★ Reviewed August 05 www.nikon.co.uk	Small enough to fit in the tightest of pockets – and quality images to boot.
		Casio Exilim Zoom EX-Z57 £229 ★★★★★ Reviewed August 05 www.casio.co.uk	Another quality compact, with the added bonus of a manual focus and a 2.6in monitor.
		Konica Minolta Dimage X1 £299 ★★★★★ Reviewed December 05 www.konicaminolta.co.uk	8megapixels, image stabilisation and a stylish and compact design, but indoor shots can be noisy.
2 PROSUMER		Fujifilm Finepix S9500 Zoom £469.99 ★★★★★ Reviewed February 06 www.fujifilm.co.uk	A serious contender to entry-level digital SLRs with a 10x zoom and 9megapixel CCD.
		Fujifilm Finepix S7000 £299 ★★★★★ Reviewed June 04 www.fujifilm.co.uk	Great design and loaded with features, this camera performs well and is a delight to use.
		Canon Powershot PR01 £400 ★★★★★ Reviewed July 04 www.canon.co.uk	A well-designed camera for the serious user who wants stunning photos.
		Nikon Coolpix 8700 £402 ★★★★★ Reviewed July 04 www.canon.co.uk	Features an impressive 280mm telephoto lens and 30fps (frames per second) movies.
1 DIGITAL SLR		Canon EOS 350D £799 ★★★★★ Reviewed December 05 www.canon.co.uk	This is a hugely capable digital SLR camera that won't disappoint.
		Konica Minolta Dynax 5D £649.99 ★★★★★ Reviewed December 05 www.konicaminolta.co.uk	A very usable camera, although it's a little weighty. Anti-shake mechanism is excellent.

HOW TO BUY

Decent 4-5megapixels point-and-shoot digital cameras start from about £150, while enthusiasts looking for flexibility can buy a new fully featured digital SLR for under £600.

In general, the higher the megapixel count of a digital camera's sensor – and the bigger the sensor's physical size – the more detailed the images.

Four to 5megapixels is good for 8 x 10in or larger prints. The quoted 'effective' pixels number is the camera's true megapixel resolution.

Forget digital zoom and concentrate on the optical zoom, which zooms in on the subject and produces a better-quality image. Digital zooms simply crop into the centre of the picture.

Also be wary of interpolation – a technique that mathematically inserts new pixels in between existing ones. It can result in blurry pictures.

The minimum optical zoom is typically 3x; about 35-105mm. If buying an SLR, multiply a lens size by 1.6 to get its true focal length, so a 100mm lens is 160mm when put on a digital body.

Look at the selection of automatic or preset picture modes for standard shots, portraits, night shots and landscapes, plus macro modes for close-up photography.

Movie modes aren't as good as even a basic camcorder, but are fine for short movie clips to play on your PC. Check how many frames per second (fps) they offer – most are 15fps, but some are 30fps, which means the video will be smoother.

Experienced photographers will want manual controls for aperture and shutter priority, white balance and focusing. Good cameras should also provide quick and easy access to image quality, resolution and format settings.

Built-in flashes are fine for everyday shots, and many include a red-eye reduction mode, but cameras with a hot-shoe for external flashes will allow much greater illumination and control over lighting.

Check start-up time because cheaper models are likely to take longer to be ready from switch-on. And check shutter lag, as there may be a delay between pressing the button and taking the photo.

Many models use NiMH (nickel-metal hydride) rechargeable batteries, but lithium batteries typically last longer. Also, smaller cameras often mean smaller capacity batteries.

Finally, remember digicams must write the image onto flash media before taking the next shot, and the better quality the card, the faster this will happen.

CAMCORDERS

1		Sony DCR-HC19E £297.87 ★★★★★ Reviewed September 05 www.sony.co.uk	An excellent low-cost camcorder with a touchscreen LCD and good video software.
		Canon MV850i £349 ★★★★★ Reviewed September 05 www.canon.co.uk	Simple to use and good quality, although it doesn't come with video-editing software.
		Panasonic VDR-M55B £499.99 ★★★★★ Reviewed December 05 www.panasonic.co.uk	Expensive, but being able to burn footage direct to DVD makes it easy to use.
		Samsung VP-D453 £280.84 ★★★★★ Reviewed September 05 www.samsung.co.uk	An attractive, compact camcorder with a good range of features and decent-quality images.
		Panasonic NV-GS21 £322.54 ★★★★★ Reviewed September 05 www.panasonic.co.uk	A robust model with good image quality and a wide range of connectivity options as standard.

HOW TO BUY

Smaller camcorder designs are easy to carry, but can be awkward for larger hands.

The MiniDV format is usually in mid-range to high-end models. Digital-8 is entry-level and plays analogue Hi8 and 8mm tapes.

Some digicams record directly to DVD-R/RW and Ram, or solid-state memory cards. The amount of data needed for quality video makes the latter impractical. Sony's tiny MicroMV is a better alternative. Cassettes are smaller than MiniDV and it stores video in mpeg-2. Files are smaller for editing, but you'll need software that accepts this type of data.

Look at optical zoom and forget digital zoom. Around 10x is

normal, with up to 20x for more expensive models.

To transfer edited images back to tape you'll need a DV-in and out Firewire (Ilink/IEEE 1394) port. Otherwise DV-in is fine to transfer footage to your PC.

Built-in microphones are susceptible to noise, so look for a 3.5mm jack or an accessory shoe and use a separate mic.

Most digicams take still photos, but limited resolutions mean you're better off with a dedicated stills camera. In addition, look for image stabilisers (optical is better than digital) and a good range of AV connectors. Some camcorders have a USB port, so they can be used as a webcam.

PRINTERS

1 PHOTO PRINTERS		Epson Picturemate 100 £100 ★★★★★ Reviewed January 06 www.epson.co.uk	This is a high-quality photo printer that is both cheap and easy to use.
		Canon Pixma IP5000 £129 ★★★★★ Reviewed June 05 www.canon.co.uk	If it's pixel-perfect printing you're after, look no further than the IP5000 – a real bargain.
		HP Photosmart 8450 £170 ★★★★★ Reviewed April 05 www.hp.com/uk	HP's Photosmart 8450 is a bulky printer, but it's capable of producing stunning photo prints.
		Epson Stylus Photo R340 £149 ★★★★★ Reviewed February 06 www.epson.co.uk	Excellent-quality prints and the ability to function without a PC.
2 MULTIFUNCTION DEVICES		Brother DCP-310N £99 ★★★★★ Reviewed February 05 www.brother.co.uk	Complete range of scanning and printing features, along with an Ethernet port for network usage.
		Canon Pixma MP150 £69 ★★★★★ Reviewed December 05 www.canon.co.uk	Photo quality might not be the best, but as a budget MFP the MP150 is a great buy.
3 LASER PRINTERS		Dell 1600n £236 ★★★★★ Reviewed September 05 www.dell.co.uk	A good multifunction mono laser, perfectly suited to small or home offices.
		Canon LBP-5200 £224 ★★★★★ Reviewed October 05 www.canon.co.uk	A great-value colour laser printer that's both small and capable of delivering quality prints.
		Dell Laser Printer 1100 £93 ★★★★★ Reviewed November 05 www.dell.co.uk	A cheap mono laser printer, but it comes with a relatively small starter toner cartridge.
		HP Laserjet 1020 £89 ★★★★★ Reviewed August 05 www.hp.com/uk	A great home laser printer that's fast, good quality and is one of the cheapest lasers available.

HOW TO BUY

If you don't need colour, consider a monochrome laser or LED printer. The latter tend to be cheaper and may last longer than a laser, but LED printers have a fixed resolution and can't take advantage of software-based resolution enhancements.

If you print hundreds of pages a week, a laser is the best option as they're cheaper and more reliable for high-volume printing. If you print a few pages a month, buy a cheap colour inkjet. If printing high-quality colour photos, buy a good photo printer.

Look for the manufacturer's quoted 'duty cycle' – this is how many pages a month the machine can handle. Choose a duty cycle three or four times larger than your expected average usage. Also check the printer's 'engine life' or 'total print volume' – after this expires, the printer's on borrowed time and uneconomical to repair.

Quoted printer speeds often refer to the speed the printer pushes a blank sheet of paper through the mechanism; for documents they tend to refer to lower quality settings. PCW's tests use real documents and photos, giving a better idea of print speed.

For serious inkjet photo printing, consider higher-end models that use six, seven or eight colour cartridges. Normal

inkjets use three colours (cyan, yellow and magenta) plus black, while specialised photo printers add extra shades to improve colour fidelity. Cheaper models often combine three colours in a single cartridge, which is not as economical as using separate cartridges for each colour.

Some 'convertible printers' use four separate black cartridges for longer-life mono printing and you can replace three of them with cyan, magenta and yellow cartridges for colour printing.

Laser models for business use often have a large number of paper-handling options. They're usually modular so you can add features as required. They also have a wider range of interface options and consumables.

You'll often find bundled software with a printer. Their quality varies, but there can be some useful programs.

The quality and usability of the driver software is vital, but it's difficult to assess before buying. Check PCW's reviews and online forums (www.pcw.co.uk/forums) and read the manufacturer's technical support site for any known problems.

Third-party or refurbished consumables generally work fine, but can cause problems with quality and reliability. Your warranty may not cover the use of non-approved consumables.

FLATBED SCANNERS

1		Epson 2480 Photo £79 ★★★★★ Reviewed February 05 www.epson.co.uk	It's rather large, but is easy to use and includes a transparency adapter.
2		HP Scanjet 3770 £69 ★★★★★ Reviewed February 05 www.hp.com/uk	You get plenty of scanning options, plus it's fast and produces good image quality.
3		Mustek Bearpaw 4800TA Pro II £69 ★★★★★ Reviewed February 05 www.mustek.com	Simple to install and it includes a built-in transparency adapter with automatic cropping.
4		Visioneer Onetouch 9220 USB £99.99 ★★★★★ Reviewed February 05 www.visioneer.com	You get plenty of features for your money, and it produces good-quality scans.
5		Canon Lide 35 £59 ★★★★★ Reviewed February 05 www.canon.co.uk	Compact, stylish with some useful software, but it doesn't include a transparency adapter.

HOW TO BUY

Flatbed scanners are the simplest way of digitising your old photos. Whether you just want to back them up on your PC, email them, stick them on a website or edit them, just hook up a scanner to your PC or notebook and off you go.

That said, not all scanners are created equal and there is a huge choice out there. Here are some key features to look out for to make it easier.

A good scanner will connect via USB2 or Firewire. Try and avoid older models offering USB1.1 since large scans can take a while to transfer to your PC. It should also offer at least 48bit colour depth and a resolution of

2,400 x 2,400dpi. This is more than enough for scanning photos or documents.

Also look out for a 35mm slide adapter for scanning slides or, even better, an automatic film loader that allows you to insert your film negatives or slides for simple scanning and enlargement.

On the software front, see if your model comes with tools that allow you to fix and edit the photos. This can include anything from removing red-eye, to colour restoration and eliminating dust and cracks. Some entry-level models even come with a cut-down version of the leading professional editing software, Adobe Photoshop.

ROUTERS

1 WIRELESS/MODEM		Netgear 108 ADSL router £159 ★★★★★ Reviewed April 05 www.netgear.co.uk	If you need a Super-G router with built-in ADSL modem, this offering from Netgear is great value.
		Ozenda 11g ADSL Router £70 ★★★★★ Reviewed November 04 www.ozenda.com	Ozenda has come up trumps – wireless ADSL doesn't get any easier than this.
		3Com Office Connect ADSL Wireless 11G £59 ★★★★★ Reviewed August 05 www.3com.co.uk	A wireless ADSL router that's good for Soho environments and simple to set up and configure.
1 WIRELESS		Linksys WAG54G (wireless) £76 ★★★★★ Reviewed August 05 www.linksys.com	This 802.11g wireless model offers advanced features for home and professional users.
		Netgear WGT634U £106 ★★★★★ Reviewed August 05 www.netgear.co.uk	Good design, high quality and easy configuration make this a great wireless choice.
		Draytek Vigor 2600G £151 ★★★★★ Reviewed August 05 www.draytek.co.uk	With plenty of options, it's designed for users looking for advanced settings.
1 VOIP		Belkin Wireless Pre-N router £119.99 ★★★★★ Reviewed April 05 www.belkin.com	Excellent coverage and easy installation and configuration make this a great product.
		Intertex IX66+ ADSL Aisip GW (wireless VoIP) £269.08 ★★★★★ Reviewed March 05 www.intertex.se	For a small business needing multi-user VoIP telephony, the Intertex IX66+ is hard to beat.
		Zoom Zoomtel X5V £100 ★★★★★ Reviewed March 05 www.zoom.com	For a no-fuss VoIP solution at home, the Zoomtel X5V is worth considering.
		Draytek Vigor 2500V £139.83 ★★★★★ Reviewed March 05 www.draytek.co.uk	A great wired router for those wanting to reap the benefits of VoIP telephony.

HOW TO BUY

The router is at the heart of any home network. Costing less than £100, they are an inexpensive way to exploit the advantages of being able to share information between the computing devices in your home.

A router is a simple networking device to which you connect your PCs and notebooks using a network cable. They often include built-in firewalls and other security measures, making them ideal for protecting your PCs from intruders.

The router connects to your broadband modem, as long as your modem uses an RJ45 Ethernet connection – most routers don't support USB modems. Special broadband routers, also called ADSL gateways, come with built-in ADSL modems. If your broadband is provided via a cable company's set-top box, you should buy a standard router without a built-in modem.

Once hooked up, your devices can share the broadband connection as well as swap data and let you play networked games. Wireless (Wifi) routers are increasingly popular in the home market, allowing devices to remotely connect to the Internet and each other without the need for cables – but wireless routers also usually have ordinary network (Ethernet) ports to let you connect non-wireless devices.


Wireless standards

802.11b This was the first and, until recently, the most common wireless variant used. With transmission speeds of just 11Mbps/sec it is also the slowest. It also used the 40bit Wireless Equivalency Privacy (Wep) security protocol, which was found to have a number of holes. An updated version of this, 802.11b+ boosted speeds to 22Mbps/sec.

802.11g This is now the mainstream standard in use, offering more respectable data transfer speeds of up to 54Mbps/sec – although in reality speeds are much lower. It also uses the more robust Wifi Protected Access (WPA) security protocol. Both 'b' and 'g' products can work together, which is handy if you have older 802.11b kit you still wish to use on your home network.

802.11n This is still in the process of being officially ratified and will not arrive in its final form until next year. It promises real data transfer speeds of 100Mbps/sec and, theoretically, up to 300Mbps/sec as well as increased range. At the moment there are two competing groups battling for supremacy. There are already numerous 'Pre-N' or 'Mimo' routers available that offer significant data transfer speeds over 'g' routers.

SPEAKERS

1		Creative Gigaworks S750 £237 ★★★★★ Reviewed April 04 http://europe.creative.com	Although no Dolby Digital encoder is included, the sound quality and construction are superb.
		Logitech X-530 £59.99 ★★★★★ Reviewed July 05 www.logitech.co.uk	Sleek design, great sound quality and a performance that belies the bargain price.
		Hercules XP55-101-Black £99.99 ★★★★★ Reviewed July 05 www.guillemot.co.uk	Excellent build quality, easy to set up, lots of power and a fantastic remote control.
4		Creative Inspire T7900 £99.99 ★★★★★ Reviewed July 05 http://europe.creative.com	A 7.1 surround system with surprisingly good sound quality, but it won't cost you a fortune.
		Logitech Z-5500 Digital £279.99 ★★★★★ Reviewed July 05 www.logitech.co.uk	With a built-in Dolby Digital decoder, this set also delivers impressive audio performance.

HOW TO BUY

PC speakers have come a long way, with most manufacturers now offering 2.1, 5.1, 6.1, 7.1, and even 8.1 packages.

Here are three things to watch for when you're looking to buy. First is the output, often expressed in watts. Try to look beyond the manufacturer's statements, as they can be misleading. For instance, a 125w output might comprise a 100w sub-woofer and five 5w speakers. You may see speaker output quoted as PMPO (Peak Music Power), which relates to the maximum output that can be achieved under perfect conditions and is misleading. Lastly, there is RMS (Root Mean Square), which is expressed in watts, for example











total 200w RMS. This is a better reference for overall power, but not perfect.

Impedance is measured in ohms and tells you how much of an electrical load a speaker presents to the amplifier.

The higher the impedance, the less power the amplifier needs to drive it. The average on most speakers is 8ohms. If lower than 8ohms the amplifier has to work harder to drive the speakers, which can result in distortion.

Frequency response refers to a speaker's tonal qualities and its ability to reproduce sounds at different frequencies. Speakers listed as having a response of 20Hz-20KHz are the most common for PC speakers.

MONITORS

1	17IN		LG Flatron L1732P £239 ★★★★★ Reviewed February 06 www.lge.co.uk	Fast response times make this 17in panel a good choice for gamers.
2			Samsung Syncmaster 173P £237 ★★★★★ Reviewed November 04 www.samsung.co.uk	Ergonomic, with a good picture quality, if slightly under-saturated, and the screen is very adjustable.
			Viewsonic VP171B £229 ★★★★★ Reviewed November 04 www.viewsonic.com	The VP171B has great picture quality, but the viewing angles are slightly restrictive.
1	19IN		Acer AL1922HS £279 ★★★★★ Reviewed September 05 www.acer.co.uk	The AL1922HS offers a great balance of features, performance and price.
2			CTX S966A £219 ★★★★★ Reviewed September 05 www.ctxeurope.com	Excellent value for money and looks a lot more expensive than it really is.
3			Samsung Syncmaster 913N £229 ★★★★★ Reviewed September 05 www.samsung.co.uk	A great combination of features and quality for this 8ms model, but lacks DVI connectors.
4			Viewsonic VP191b £349 ★★★★★ Reviewed July 05 www.viewsonic.co.uk	It has a fast 8ms response time, easy-to-use menus and excellent picture quality.
1	20IN+		LG Flatron L2013P £549 ★★★★★ Reviewed October 05 www.lge.co.uk	Well designed, high-performance monitor, with ergonomic features making it good for prolonged use.
2			Viewsonic VP201 £530 ★★★★★ Reviewed August 04 www.viewsonic.co.uk	If you need a high-resolution 20in panel, the VP201 is a good choice.
3			Fujitsu-Siemens Scenicview P20-2 £492 ★★★★★ Reviewed August 05 www.trace.co.uk	Fairly good all-rounder for the price, good clarity, but didn't accurately render some tones.

HOW TO BUY

CRT (cathode-ray tube) monitors are less fashionable, mainly due to the rapidly dropping prices of TFT (thin-film transistor) flat-panel models. But CRT technology is more than 100 years old and has a lot of strengths. CRTs are bulky, heavy and power-hungry, but are now excellent value for money.

Resolution is the number of graphics elements displayed on a screen. Known as pixels, they are generated by your graphics card. In any TFT or LCD, each pixel is composed of three sub-pixels coloured red, green and blue. In a CRT the pixels are spread in a grid across the screen separated by a distance called the dot pitch. The smaller the dot pitch, the sharper the image.

With TFTs, each pixel is composed of three rectangular thin-film transistors. The number of pixels equals the 'native' resolution; a 1,024 x 768 TFT will have exactly that number of pixels horizontally and vertically.

CRTs usually have a higher resolution than a TFT of the same size and work perfectly at any standard resolution up to the quoted maximum. Running a TFT below its native resolution can result in a poor picture.

Check your TFT's native resolution meets your needs - gamers wanting 1,600 x 1,200 will probably need an expensive

20in model - most 19in panels are currently limited to 1,280 x 1,024 and budget 14/15in models might only support 800 x 600.

Modern TFTs can be viewed from a wide range of angles vertically and horizontally, but anything over +/- 45° makes no difference in normal use.

Response time is the time taken for a pixel to reach maximum brightness - 12-25ms is typical - faster is better. Some newer monitors now have response times of 4ms or 8ms.

TFTs have high quoted contrast ratios, but this is often a maximum figure. Evenness of lighting is more important than the overall brightness specification.

The ISO 13406-2 standard specifies minimum requirements for display contrast, viewing angle, brightness, reflections, flicker, contrast and defective pixels. You may see the standard incorporated in a TUV label with the words 'Ergonomics Approved' or 'ISO 13406-certified'. The TCO'95 and '03 standards cover electromagnetic emissions, noise and ergonomics - ensure the monitor has at least one of these. ISO 13406-2 has stringent standards for defective pixels. Only Class I TFTs are guaranteed no defective pixels - most consumer models are Class II. Some manufacturers offer some dead pixel guarantees with Class II TFTs.

TV TUNERS

1		Nebula Digtiv £99.95 ★★★★★ Reviewed August 05 www.nebula-electronics.com	This external USB2 tuner has a built-in web server to let you share TV over your network.
2		Twinhan Magic Box £69.99 ★★★★★ Reviewed August 05 www.twinhan.com	A stylish external USB2 tuner with good software and an attractive price.
3		Terratec Cinergy 400 TV £89.99 ★★★★★ Reviewed March 05 http://en.terratec.net	A PC Card-based analogue tuner with good software, it's a great buy for laptop users.
4		Visionplus VisionDTV £69.99 ★★★★★ Reviewed November 04 www.twinhan.com	A bargain price and top-notch features make this a must-buy USB2 digital TV tuner.
5		Avermedia Avertv DVB-T USB2 £84.99 ★★★★★ Reviewed August 05 www.averm.co.uk	The Avertv impressed us with its sheer simplicity, and its small size makes it ideal for notebook users.

HOW TO BUY

Internal TV tuners require a PCI slot. External options connect via USB and are easier to set up. Hi-speed USB2 is often needed and devices typically require Windows ME, 2000 or XP. Check if you run Windows 98 or NT.

A Freeview digital tuner offers the best channel choice, picture and sound, but may need an outdoor aerial or a wideband aerial (you can check at www.freeview.co.uk). Analogue terrestrial TV tuners may give better results if using an indoor receiver. If a digital tuner receives radio it doesn't always mean digital audio broadcasting (DAB) support. Look for Teletext and subtitle support.

Digital tuners record to disk for maximum quality; analogue signals need to be digitally encoded - look for mpeg-2 hardware for realtime video and audio encoding; cheaper tuners need your CPU to do this in software.

Most analogue systems let you capture video from a VCR or camcorder. Look for composite or S-video connectors and stereo phono inputs. Typically, an hour of mpeg-2 video uses up to 2GB of disk space. VHS-quality mpeg-1 gives just over an hour on a CD.

Better TV cards have personal video recorder functionality, letting you pause, fast forward and rewind live TV, and have an electronic programme guide to record shows to your PC.

DIGITAL MUSIC PLAYERS

1		Apple iPod £219 ★★★★★ Reviewed January 06 www.apple.com/uk	All the usual iPod features but now with the ability to play video.
2		Creative Zen Nano Plus £99 ★★★★★ Reviewed December 05 http://europe.creative.com	1GB flash player that houses a radio, voice recorder and mp3 encoding from a line-in source.
3		Apple iPod Nano £179 ★★★★★ Reviewed December 05 www.apple.com/uk	Small and thin, this 4GB flash player isn't as fully-featured as some but it looks great.
4		Apple iPod Shuffle £89 (1GB); £69 (512MB) ★★★★★ Reviewed May 05 www.apple.com/uk/ipod	Small yet perfectly formed, it's easy to use, has good sound and is set to be a big hit.
5		Iriver H340 SE £339 ★★★★★ Reviewed January 05 www.epinx.com	A good all-round player with a colour screen and built-in FM tuner.

HOW TO BUY

The mp3 music format recently celebrated its tenth birthday and in that short space of time it has revolutionised the music industry. On the way, it has spawned a global market for digital music players, none more famous than Apple's iPod and related offerings.

There are two main categories that players can be divided into: Flash memory-based players, which range in size from 256MB to 1GB and mini hard drive-based models, which run from 4GB to 60GB. Prices for a 256MB player start as low as £20 rising to around £300 for a 60GB player. In terms of songs, the difference is the ability to hold 40 on one and 15,000 on the other. If you just

want something for using on-the-move, then Flash-based players are the way to go, since they are very small and light.

The software used in many players determines how easy it is to use in terms of tracklisting and organising songs.

If you need a portable record store, then start by looking at the wide range of 4GB-6GB players and, if that's not enough, head for the 20GB, 40GB and 60GB models. Ensure whatever you buy supports playback in different formats. The ability to listen to FM radio and record voice is also a bonus. Most importantly, check out the battery life, since this can vary wildly between similar devices.

SMARTPHONES

1		T-Mobile MDA Pro £139 ★★★★★ Reviewed January 06 www.t-mobile.com	A well-designed smartphone that's absolutely loaded with features.
2		Sony Ericsson P910i Econtract dependent ★★★★★ Reviewed December 04 www.sonyericsson.co.uk	The Symbian-powered P910i has heaps of features and impressed us a great deal.
3		Sony Ericsson D750i Econtract dependent ★★★★★ Reviewed December 05 www.t-mobile.com	It's no substitute for a digicam, but this 2megapixel camera phone is packed with features.
4		Sony Ericsson V800 Econtract dependent ★★★★★ Reviewed March 05 www.sonyericsson.co.uk	Light, easy to use and with a great screen, the V800 is a great way to explore the benefits of 3G.
5		Orange SPV C550 Econtract dependent ★★★★★ Reviewed November 05 www.orange.co.uk	A good smartphone, in terms of functionality, but being Windows-based it's annoyingly slow.

HOW TO BUY

Smartphones are essentially mobile phones that can do a lot more than send texts and make calls. They are increasingly popular because you get both phone and PDA functions in a single device.

There are two key types of smartphones - those that look roughly like slightly bigger mobile phones and those that are essentially PDAs with voice functionality (BlackBerry, Palm, Nokia, etc). We will look primarily at the mobile phone smartphones. They usually boast small colour screens and allow you to send email, access the Internet, run third-party applications, use instant messaging software and sort out your calendar and contacts. Even

better, all of this information can be synchronised with your PC or laptop and some even allow you to store and play mp3s, take photos and shoot video.

There are two main operating systems in use: Symbian and Microsoft's Windows Mobile 2003, the latter with a new version due. Symbian controls the lion's share of the market at the moment and its key partner, Nokia, ships over 50 per cent of all smartphones. These smartphones are general-purpose devices and suitable for all the above tasks in moderation.

If you are a heavy email user or plan to work on documents on the move, then consider a PDA-style smartphone with a keypad.

PDAS

1		Dell Axim X50v £304 ★★★★★ Reviewed May 05 www.dell.co.uk	A good PDA, with a great VGA-resolution screen, which is perfect for multimedia use.
2		Asus My Pal A730W £356 ★★★★★ Reviewed July 05 www.uk.asus.com	A fully-loaded Pocket PC, with a large set of utilities at a reasonable price.
3		Palm Tungsten T5 £279 ★★★★★ Reviewed March 05 www.palm.com	Another sterling Tungsten upgrade with great new features, let down only by having no Wifi.
4		HP IpaqRX3715 MMC £224 ★★★★★ Reviewed November 04 www.hp.com/uk	A fantastic Pocket PC with some great features, but the camera's viewfinder could be better.
5		Palmone Zire 72 £169 ★★★★★ Reviewed August 04 www.palm.com	Provided you don't mind the styling, the Zire 72 is a cheap, yet powerful PDA.

HOW TO BUY

A PDA, or personal digital assistant, is essentially a handheld computer. The PDA market is not as clear cut as it once was, as newer devices with voice capabilities have now arrived. For our purposes, handhelds do not include smartphones.

There are two main types of devices: those that run the Palm operating system and those that run Pocket PC from Microsoft. Both have their advantages, but if you want familiarity, go with a Pocket PC-based device, since it will run versions of common Microsoft applications.

If you plan to write a lot, consider a model with a keyboard. Otherwise, go for a

pen-based device which is typically half the price and offers an on-screen keyboard or has handwriting recognition features.

Most PDAs use memory for storage, so look for a device with 64MB or more, if possible. Storage can be boosted using flash memory cards in the SD card slot. Newer devices now have tiny hard disk drives with capacities of up to 4GB.

Most PDAs come with colour screens for viewing photos and media files. If watching video is a priority, go for one with the highest screen resolution. For the best in connectivity, opt for a model with in-built Bluetooth and wireless networking or Wifi technology.

PORTABLE MEDIA PLAYERS

- 

Archos AV400 20GB
£314.99 ★★★★★
 Reviewed June 05
www.datamind.co.uk
 A great alternative to Microsoft-based models, offering more features than the competition.
- 

Archos Gmini 400 20GB
£239.99 ★★★★★
 Reviewed June 05
www.datamind.co.uk
 A scaled-down version of the AV400, it's portable, with great battery life and an array of features.
- 

Digital Cube I-Station 20GB
£329.99 ★★★★★
 Reviewed July 05
www.datamind.co.uk
 A 20GB model with an FM tuner and mp3 recorder, it also supports a wide range of video formats.
- 

Hauppauge PVMP 20GB
£399 ★★★★★
 Reviewed June 05
www.hauppauge.co.uk
 The PVMP offers a large 7in widescreen display, perfect for watching movies.
- 

MSI Megaview 566 20GB
£250 ★★★★★
 Reviewed June 05
<http://msicomputer.co.uk>
 A lightweight media player that will happily record from a video source.

HOW TO BUY

Portable media players (PMPs), also called personal video players (PVPs), are the big brothers of mp3 players with video capabilities thrown in. You may also come across the term Personal Media Center (PMC), which are players built around Microsoft's Windows Mobile operating system.

PMPs, like many larger mp3 players, are based on mini hard disk drive technology and usually start at around 20GB. They allow you to watch movies, view photos and play music files. A good model will support mpeg-2 and 4, wmv and DivX movie formats, as well as mp3, wav, asf and wma audio files. Some

can also receive and record FM radio and voice.

They come in a variety of sizes, with screens ranging from just over 2in to around 4in. The most common screen size is around 2.5-3in. Thanks largely to the screen and the mini hard drives, PMPs weigh a bit more than, say, an iPod, but at 150-300g they're not going to be too heavy to carry around. Many of the features on these devices are similar, from screen size to hard disks and supported formats. What sets them apart is weight, screen resolution, movie playback quality and battery life.

Test them out, if possible, or check out the PCW reviews before splashing out.

PERSONAL VIDEO RECORDERS

- 

Plexor ConvertX PVR
£151.56 ★★★★★
 Reviewed June 05
www.plexor.be
 The ConvertX is an external analogue tuner that can also record from most video sources.
- 

Twinhan Magic Box
£69.99 ★★★★★
 Reviewed August 05
www.twinhan.com
 Another PC-based stylish external USB2 tuner with good software and an attractive price.
- 

Kiss DP-558
£293.75 ★★★★★
 Reviewed October 05
www.kiss-technology.com
 A networkable PVR that lets you play Internet radio, although it has only got an analogue tuner.
- 

Mustek DVD R580
£244.87 ★★★★★
 Reviewed September 05
www.mustek.com
 Lots of features and connectivity options in this combo DVD recorder/hard disk standalone PVR.
- 

Humax PVR-9200T
£229 ★★★★★
 Reviewed February 06
www.humaxdigital.com/uk
 Twin digital tuners and a 160GB hard drive make this a great choice.

HOW TO BUY

The personal video recorder (PVR), also known as a digital video recorder (DVR), is a device that records TV onto a hard drive in digital format. Unlike video and DVD recorders, there is no need for tapes or disks.

Tivo launched the world's first PVR in 1999 and most PVRs use the mpeg format for encoding video. Unlike VHS recorders, PVRs give you the ability to pause live TV, instantly replay scenes just watched while continuing to record and, most importantly, skip through adverts.

In the UK, Sky+ PVRs dominate the market, with other players, including Tivo and Telewest, trailing a long way behind.

The first thing to consider when buying a PVR is the size of the hard drive. Try going for one with a minimum of 40GB, but 80GB would be better. Most will come with a single Freeview tuner for getting free digital TV signals, but an increasing number are arriving with two. This means you can watch one channel and record another or even record two different channels while watching a previous recording.

At the heart of any PVR is the electronic programme guide (EPG). It's needed for selecting all the things you want your PVR to record. The better the EPG, the more intuitive your PVR becomes, recording programmes by itself based on your previous choices.

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BACKUP SOFTWARE

1	Roxio Backup My PC Deluxe 6 £34.99 ★★★★★ Reviewed June 05 www.roxio.co.uk	Takes the mystery out of backups and is ideal as a simple solution to protect PC files.
2	Acronis True Image 8 £29.99 ★★★★★ Reviewed February 05 www.phoenixglobalsoftware.co.uk	This easy-to-use disk imaging package should be part of every PC owner's toolkit.
3	X Drive \$99.50 per year for 5GB ★★★★★ Reviewed October 05 www.xdrive.com	A flexible, simple-to-use and attractively priced online backup service.

HOW TO BUY

Backing up important data is something a lot of home users, and homeworkers, fail to take seriously. Until, of course, they lose everything and have no way of getting it back. In order to avoid such a calamitous event, consider some form of backup solution now.

Most of the leading backup packages cost between £30 and £50. A good solution will allow

you to do full hard disk backups, as well as single files and folders, plus let you schedule backups of data that's changed since the last full backup was executed. They should be easy to install and set up.

Backups should be easy to restore and retain the original file organisation. Any solution should be able to write backups to your hard drive, external hard drives and blank CD/DVD discs.

DIGITAL IMAGE-EDITING SOFTWARE

1	Adobe Photoshop Elements 4 £69 ★★★★★ Reviewed December 05 www.adobe.co.uk	A great choice for home users looking for an image-editing package that's easy to use.
2	Adobe Photoshop CS2 £538 ★★★★★ Reviewed June 05 www.adobe.co.uk	Still the undisputed leader for professional photo editing, but its high price will put most off.
3	Corel Paintshop Pro X £99.95 ★★★★★ Reviewed December 05 www.corel.co.uk	Power, sophistication plus ease of use make this great for beginners and experienced users.

HOW TO BUY

Many digital cameras come bundled with some form of basic photo-editing software, but to move on to the next level you really need to start using a dedicated editing package.

For good mid-range programs, prices range from free for open-source programs such as Gimp, up to about £90.

Look out for features including advanced colour correction,

lighting controls, automatic photo-fix wizards, scratch and blemish remover, multiple undo options, special effects, layers and templates. The software should also let you create slideshows, publish to the web, save in many different formats and archive images to CD/DVD discs.

Most importantly, there should be extensive help files, FAQs, tutorials, web forums, email and phone support.

MEDIA CREATION SOFTWARE

1	Roxio Easy Media Creator 8 £59 ★★★★★ Reviewed January 06 www.roxio.co.uk	Intuitive media editing suite to sort, enhance and share all your digital media.
2	Pinnacle Studio Media Suite £89.99 ★★★★★ Reviewed March 05 www.pinnaclesys.com	A massive amount of software for your money, including an excellent video editor.
3	Nero 7 Premiere £49 ★★★★★ Reviewed January 06 www.nero.com	Not the easiest to use, but plenty of useful features and great DVD authoring capabilities.

HOW TO BUY

This is the software you need for burning CDs and DVDs. Most new PCs and DVD burners come bundled with some kind of media creation software. A good product will allow you to burn audio and video content onto CDs and DVDs, back up data, create electronic photo albums, and make your own DVD menus and labels.

Bundled versions are usually limited, or 'lite', versions of

leading brands such as Nero, Roxio Easy Media Creator, Intervideo WinDVD or Pinnacle CD/DVD Creator, among others. You can usually upgrade to the full version online and save about 20 per cent or more on what you would pay for a standalone version.

Prices for standalone media creation software start at £20 for basic CD/DVD authoring software and rise to around £60 for the most advanced suites.

PC MAINTENANCE/UTILITY SOFTWARE

1	Orlogix Wincleaner Complete PC Care £34.99 ★★★★★ Reviewed July 05 www.orlogix.com	If your system is running slower than it should, this package will help restore its performance.
2	Allume BoostXP £19.99 ★★★★★ Reviewed May 05 www.allume.com	BoostXP makes tweaking your system much easier than doing it manually.
3	System Mechanic 5 Professional £49.95 ★★★★★ Reviewed April 05 www.itred.com	As well as performing PC maintenance, this product includes firewall and anti-virus software.

HOW TO BUY

Just like your car, PCs need regular maintenance to keep them in good working order. There are tools within Windows that can help, but a dedicated suite of maintenance or utility software should do a better job.

Utility software often comes with a virus scanner, but you may already have one, so concentrate on one with the following features. It should offer a simple

overview of system and application performance, the ability to clean out the Registry and restore it easily if any mistakes occur, defragment the hard disk drive and memory, and optimise application performance. It should have some form of reporting and let you simplify the control of key Windows settings.

Other common tools will back up data, recover deleted files and speed up your Internet surfing.

PC SECURITY SOFTWARE

1	Bitdefender 8 Professional Plus £39.99 ★★★★★ Reviewed August 05 www.bitdefender.com	An easy-to-use suite that includes two years of free updates and 24/7 live online support.
2	F-Secure Internet Security 2005 £38.95 ★★★★★ Reviewed June 05 www.f-secure.co.uk	A well-priced, professional product that provides good all-round protection.
3	Zone Labs Zone Alarm Security Suite 6 £49.95 ★★★★★ Reviewed November 05 www.zonelabs.com	A comprehensive product that offers excellent Internet security, including spam filtering.

HOW TO BUY

You cannot own a PC or laptop today without taking adequate security measures. The Internet may have opened up many opportunities, but it is also a dangerous place for an unprotected PC. In order to cover yourself, both online and offline, you will need a decent security software suite which combines numerous utilities to tackle different threats.

Popular brands include those from Zone Labs, Trend Micro, Norton and McAfee.

A good security suite should include a firewall, email scanner, spyware checker, anti-virus and anti-spam tools.

Prices for some of the best tools start at around £35 and usually include a year's online updates. After a year you will need to pay a yearly subscription to keep your software up to date.

OFFICE SOFTWARE

1	Microsoft Office Professional 2003 £459 ★★★★★ Reviewed May 04 www.microsoft.com/uk/office	Sets the standard for office suites for those prepared to pay the price.
2	Openoffice.org 2 Free ★★★★★ Reviewed July 05 www.openoffice.org	New features and improved compatibility make this a genuine alternative to Microsoft Office.
3	Microsoft Works 2006 £90 ★★★★★ Reviewed February 06 www.microsoft.com/uk	Comprehensive office package suitable for most home users. Great value for money.

HOW TO BUY

Office software generally refers to word processors, spreadsheets, presentation software and email utilities. Microsoft Office dominates this arena. But most new PCs come bundled with Microsoft Works Suite 2005, which has Word, Works Database, Spreadsheet and a range of home packages.

To upgrade to a full version of Microsoft Office will cost around

£150. Many will not need the functionality of Office though, and the Outlook Express email software shipped with all Windows PCs is enough for most users. If you can wait, then do so, since Microsoft plans to launch Office 12 in July 2006. But don't forget the competition either: products such as Ability Office, Star Office and the free open-source version, Open Office, are available.

VIDEO-EDITING SOFTWARE

1	Adobe Premiere Elements 2 £69.32 ★★★★★ Reviewed February 06 www.adobe.com	The best video-editing package available for beginners and intermediate users.
2	Pinnacle Studio 10 £69.99 ★★★★★ Reviewed February 06 www.pinnaclesys.com	Suitable for novices or intermediate users, Studio 10 is a good budget option.
3	Ulead Videostudio 9 £49.99 ★★★★★ Reviewed February 06 www.ulead.co.uk	Simple yet thorough, Videostudio offers plenty, whatever your level of expertise.

HOW TO BUY

This is a must for anyone hoping to turn hours of camcorder footage into tightly edited, watchable movies. There are a lot of packages to choose from, but new tools geared towards the novice are popping up in all of them. Not only are they making it easy to get your movies onto DVD, but a wider range of tools allow you to personalise what you've shot.

Basic packages cover capture, storyboarding, timeline video editing and template-based DVD authoring. More advanced software will let you create a wide range of special effects and are aimed at the home movie enthusiast. Prices start at around £40, but it's important to find a package with good help files - video-editing software often assumes a lot of prior knowledge.

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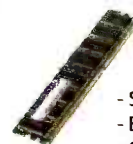


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PRODUCT INDEX

Below is a list of every product reviewed by PCW over the past three months, to help you find the full reviews quickly and easily in your back issues.

Key: ★ Editor's Choice ★ Recommended ★ Great Value All scores are out of five

COMPANY	PRODUCT	ISSUE	SCORE	COMPANY	PRODUCT	ISSUE	SCORE	COMPANY	PRODUCT	ISSUE	SCORE
★ 3Com	Superstack 3 Switch 4400-PWR	Nov 05	4	★ Filemaker	Filemaker Pro 8	Nov 05	4	★ NEC	ND-3540A DL (DVD writer)	Nov 05	5
★ AA	Navigators (GPS)	Jan 06	3	Focus Multimedia	Language Translator	Dec 05	4	Nero	7 Premium (editing suite)	Jan 06	4
Abbyy	Abbyy Finereader 8 (DCR)	Dec 05	4	★ Focus Multimedia	Redshift 5.1 Deluxe Edition	Dec 05	5	Netgear	SC101 Storage Central	Jan 06	3
Abit	Fatal1ty AN8 SLI (graphics card)	Dec 05	4	Foxconn	915PL7AE-8EKRS (motherboard)	Nov 05	4	★ New Tech Products	Cordless VoIP/Dect Dualphone	Jan 06	4
ACDsee	8 Photo Manager	Dec 05	3	Foxconn	Tuckaway (barebones case)	Jan 06	4	Nikon	D50 (camera)	Dec 05	4
★ Adobe	Photoshop Elements 4	Dec 05	5	Frey Technologies	SageTV 2.2	Jan 06	3	Noadware	Noadware 3	Nov 05	1
Advent	DHE 1000 (Media Center PC)	Dec 05	4	FSP	Zen 300W (PSU)	Nov 05	4	Dlympus	E-300 (camera)	Dec 05	4
★ Akasa	EVD120 (cooler)	Dec 05	5	Fujifilm	Multijet Quality Paper	Nov 05	-	Drange	SPV C550	Nov 05	4
Alienware	Aurora 5500 (PC)	Dec 05	4	Fujifilm	Multijet Premium Paper	Nov 05	-	★ Panasonic	BL-C30 (network webcam)	Nov 05	4
ALK	Copilot Live 6 (GPS)	Jan 06	3	Gecube	X850XT PE Uniwise AGP	Jan 06	4	Panasonic	Toughbook CF-51 (laptop)	Dec 05	2
Aluria Software	Spyware Eliminator 4	Nov 05	2	Genius	Maxfire G-08XU (game controller)	Jan 06	3	Panasonic	VDRM558 DVD (camcorder)	Dec 05	4
Antec	Titan 550 (PC case)	Dec 05	4	GNU	The Gimp 2.2			ParetoLogic	Xoftspy 4.15	Nov 05	1
Aopen	Aeolus PCX6600GT-DVD128				(photo-editing software)	Dec 05	3	PC Nextday	Zoostorm 4400+ Dual Core PC	Nov 05	3
Aopen	Xtreme (graphics card)	Dec 05	4	Google	Google Talk (Beta)	Nov 05	3	PCTools	Spyware Doctor	Nov 05	3
Aopen	MZ915-M (motherboard)	Jan 06	4	Gsec	Prodigy Pro (router)	Jan 06	4	PC World	PC Line A4 Premium Glossy	Nov 05	-
APC	Wireless Mobile Router	Nov 05	4	Hercules	Wireless Router	Nov 05	4	Pentax	"ist DL (camera)	Dec 05	4
★ Apple	Imac G5	Jan 06	5	HP	Pavilion m7151.uk (PC)	Jan 06	2	Pentax	Optio S5z (camera)	Nov 05	3
★ Apple	Ipod	Jan 06	4	HP	Photosmart 2575 (MFD)	Jan 06	4	Philips	Brilliance 190B6CG (TFT)	Dec 05	3
Apple	Ipod Nano	Dec 05	4	HP	Photosmart 3210 (MFD)	Jan 06	4	Phoenix Direct	Phoenix Direct ink	Dec 05	-
Asus	Extreme N6600GT Silencer	Dec 05	4	HP	Photosmart 475 printer	Jan 06	4	★ Pinnacle	Studio Plus 10 (video editing)	Jan 06	4
★ Asus	W5A (laptop)	Dec 05	4	★ HP	Premium Plus Photo Paper	Nov 05	-	PNY Technologies	Geforce 7800GTX (graphics)	Nov 05	3
Asus	X-Mars CPU fan	Dec 05	4	HP	Procurve Switch 2626-PWR	Nov 05	4	Realviz	Stitcher 5 (photo software)	Jan 06	4
★ ATI	Radeon X1800 XT (graphics)	Dec 05	5	HP	PSC1410 (MFD)	Jan 06	3	Rock Direct	Rock Hardbook	Nov 05	4
Axis	207 (network webcam)	Nov 05	2	Hi-Grade	Notino C2200 (laptop)	Dec 05	3	★ Route 66	Mobile Britain 2006 (GPS)	Jan 06	3
Black Bean Games	Gary Grigsby's World at War	Dec 05	4	HP	NC4200 (laptop)	Dec 05	3	★ Roxio	Easy Media Creator Suite 8	Jan 06	5
BTC	SG104A (audio player)	Jan 06	3	Inkcycle	Inkcycle ink	Dec 05	-	Ryman	Photo Gloss	Nov 05	-
Bulletproof Soft	Spyware/Adware Remover 9.2	Nov 05	1	Intellect	Prodesk A64/3200+ (PC)	Jan 06	3	Ryman	Professional Quality Ultra		
★ Canon	EOS 350D (camera)	Dec 05	5	Jessops	Jessops ink	Dec 05	-		Heavyweight Photo Glossy	Nov 05	-
Canon	MP150 MFD	Jan 06	4	★ Jessops	Photo Inkjet 4 Glossy	Nov 05	-	Serif	Photo Plus 10 Studio Pack		
★ Canon	Photo Paper Plus Glossy	Nov 05	-	Jet Tec	A4 High Quality Photo Glossy	Nov 05	-		(photo-editing software)	Dec 05	4
Canon	Photo Paper Plus Pro	Nov 05	-	Jet Tec	A4 Premium Photo Glossy	Nov 05	-	★ Sigma	SD-10 (camera)	Dec 05	4
★ Canon	Pixma MP150 (MFD)	Dec 05	4	★ Jet Tec	Jet Tec ink	Dec 05	-	Showshifter	3.12 (TV software)	Jan 06	5
Canon	Powershot S80 (camera)	Jan 06	4	Kodak	A4 Inkjet Ultima Picture Glossy	Nov 05	-	Shuttle	M1000 (Media Center PC)	Jan 06	4
Canon	Selphy CP710 (printer)	Jan 06	4	Kodak	A4 Everyday Picture Paper	Nov 05	-	Snapstream	Media BeyondTV3 (TV software)	Jan 06	3
Cellink	BTST-9000D (headset)	Nov 05	2	Konica Minolta	Minolta Dimage X1 (camera)	Dec 05	4	Sonic	DVDit 6 (video-editing s'ware)	Dec 05	3
★ Chillblast	Fusion X2 4400 GTX (PC)	Nov 05	4	★ Konica Minolta	Minolta Dynax 5D (camera)	Dec 05	4	Sony	DPP-FP50 (printer)	Jan 06	3
Coollect	Coollect	Dec 05	2	Lacie	Safe Mobile Hard Drive	Dec 05	3	Sony	HDR-HC1E HD (camcorder)	Nov 05	4
★ Corel	Paint Shop Pro X	Dec 05	4	Lavasoft	Adaware SE Plus	Nov 05	2	Sony	PSP (games console)	Dec 05	4
Creative	Inspire P5800 (speakers)	Jan 06	3	Lexmark	C524 (printer)	Jan 06	4	Sony	SNC-M1W (network webcam)	Nov 05	3
Creative	Inspire T7900 (speakers)	Jan 06	4	Lexmark	P450 (printer)	Jan 06	3	Sony	Vaio VGN-TX1XP (laptop)	Dec 05	5
Creative	Soundblaster X-Fi Elite Pro	Nov 05	4	Lexmark	P6350 (MFD)	Dec 05	3	★ Sony Ericsson	Ericsson D750i (smartphone)	Dec 05	4
★ Creative	Zen Nano Plus 512MB	Jan 06	5	Linksys	X7170 (printer)	Jan 06	4	★ Sourceforge	Media Portal (TV software)	Jan 06	4
Cube 24/7	Aurora (PC)	Nov 05	3	★ Logitech	WVC54G (network webcam)	Nov 05	3	Speed	i640 (webcam)	Jan 06	3
Cube 24/7	Cube247 Omega PC	Jan 06	3	Lumicon	Cordless Desktop S 510	Nov 05	5	★ Sports Interactive	Football Manager 2006	Jan 06	5
Cyberlink	Powercinema 4 Digital Tuner				LDC-82823 (camera)	Jan 06	3	Spybot	Search and Destroy	Nov 05	3
	Edition TV software	Jan 06	4	★ Macromedia	Studio 8	Nov 05	4	Storcase	Data Express (backup hardware)	Nov 05	3
Deep Silver	Chrome Specforce	Nov 05	3	★ Maxtor	Onetouch II Firewire 800	Nov 05	5	Symantec	Norton IS 2005 Antispyware	Nov 05	2
Dell	Laser Printer 1100	Nov 05	4	McAfee	Antispyware 2005	Nov 05	2	Take 2 Interactive	Serious Sam 2	Dec 05	3
Dell	Optiplex GX620	Nov 05	4	McAfee	Internet Security Suite	Dec 05	4	THQ	MotoGP: Ultimate		
Dell	Photo Printer 540	Jan 06	2	Medion	Pro (TV software)	Jan 06	3		Racing Technology 3	Dec 05	4
Destinator Tech	PN (GPS)	Jan 06	2	★ Medion	Pentium D 2.8GHz (PC)	Nov 05	4	★ T-Mobile	MDA Pro (phone)	Jan 06	4
D-Link	DCS-530DG (network webcam)	Nov 05	3	★ Mesh	Matrix Vector Xmas (PC)	Jan 06	4	Tomtom	Navigators 5 (GPS)	Jan 06	2
Dream'eo	Enza (Portable Media Center)	Jan 06	3	Mesh	Matrix Xtreme PCW PC	Nov 05	3	Toshiba	Libretto U100 (laptop)	Dec 05	2
DRK	MXL Desktop Recording Kit	Jan 06	4	Mesh	Titan PCW (PC)	Nov 05	4	Ufly4less	Ufly4less.com	Nov 05	4
ECS	PFS Extreme (motherboard)	Jan 06	4	★ Microsoft	Antispyware Beta	Nov 05	4	Ulead	Photo Impact 11		
Edimax	AR-7024WG ADSL Modem/Router	Jan 06	2	Microsoft	Digital Image Suite 2006				(photo-editing software)	Dec 05	3
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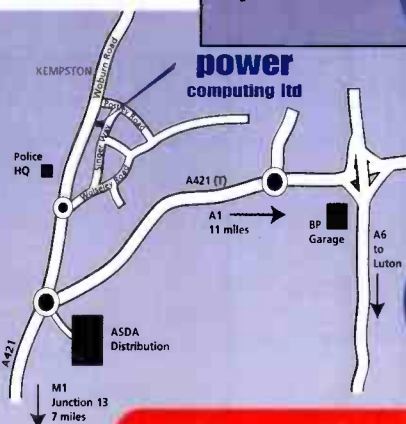
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- Patriot 3440E - powerful system with twin SATA Drives
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- 2x PS2 ports, Serial & parallel ports
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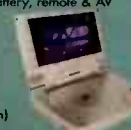
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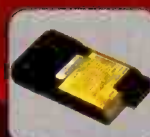
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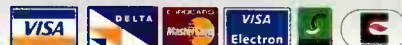
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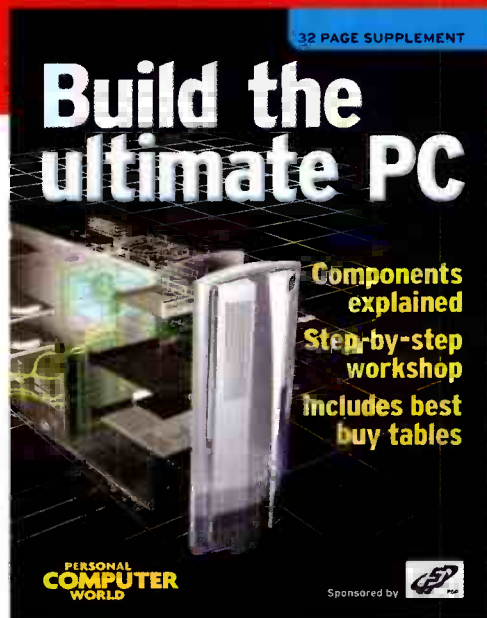
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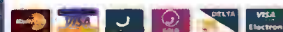


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INFORMATION

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Registration Obtain your serial code by clicking 'Register this Copy' within the splash screen when you start Xara XS

Xara aims its products at a broad spectrum of people, so you can learn to use them quickly whether you are a professional graphic artist or a novice looking to learn.

Although illustration software can sometimes seem to be inflexible, slow and difficult to use, Xara claims to have ironed out these problems with XS 2. The software is easy to use from the word go. Take the interface, for instance. Rather than use floating palettes and flyout options, Xara XS takes a much cleaner approach, so that on opening the program it doesn't look any more complicated than if you were about to start using Windows Paint.

Don't think, however, that because it's simple it must be basic – there's plenty of power available. You could draw with a range of pre-set Quickshapes, or opt for freehand tools, which come with a wide range of brushes for artistic effects (and it's easy to create more). Both Freehand and Shape objects can be moved around easily and resized by dragging their handles.

Any object you create can be manipulated with the tools on offer. The customisable Transparency tool adds great effects in seconds; there's a Fill option to flood objects with pre-set fills or designs, or a bitmap of your own; a Blend tool to merge objects; a Mould tool that distorts options around a pre-set shape, and more. Plus, all these options work with any text objects you create, making it

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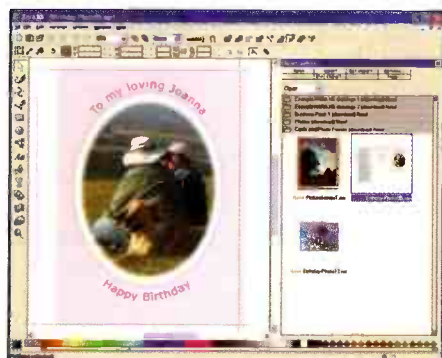
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Xara XS is well worth installing for its drawing options alone, but the program features don't stop there. Web graphics support tools to create web buttons and navigation bars, with XS generating all the HTML and Javascript you'll need. The animated gif builder, image maps and image slicing features are handy, too, and Dreamweaver integration (version 3 or higher) makes it easy to edit your XS-created graphics.

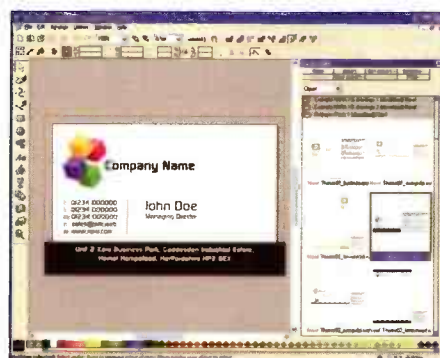
Although it's a little hidden among all the other features, don't miss the Xara Photo Editor. This offers the most commonly required tools, such as a one-touch photo enhance to tweak brightness, contrast, colour and sharpness; red-eye removal; and crop and rotate options. This will help adjust your pictures and improve them for displaying.

Xara XS saves the original of any image you've manipulated and all the edits you've applied. Re-open a photo and it will work from the original again, so no image quality is ever lost, no matter how many times you save and reload. And, because the original is always to hand, you can redo any change you've made, even recovering the cropped parts of a photo.

Great graphics, no matter what your artistic skills



1 If you have problems drawing basic geometric shapes, full-scale illustration software probably feels a little intimidating. But downloadable clipart means everyone can get something out of Xara XS. Click Utilities > Galleries > Clipart gallery > Get Clipart, then explore some free sample images and projects.



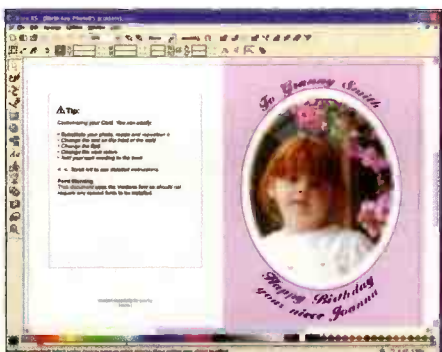
2 Xara can change what's online, so we can't guarantee you'll get a particular template, but you can expect an interesting variety of graphics. We had a sample photo frame and birthday card template, for instance, with a Business Pack that had business cards, compliments slips and letterheads.



3 You might find a sample illustration you want to re-use, like this camera, or you can edit any aspect of the image, but try the Layer Gallery first (Utilities > Gallery > Layer Gallery). If the drawing uses layers, you'll be able to selectively disable them here, for instant, effective customisations.



4 You can create an attractive poster by adding a little text to a bundled illustration. Check its right-hand tick box to make an existing layer editable, or click New... in the Layer Gallery to add a new one, then select the Text tool and start typing. Feel free to change the default 12pt Times New Roman settings.



5 To produce a customised greeting card, start with a template from the Cards section of the clipart gallery (see step 1). Double-click to load and follow the instructions on screen. You can customise the text, fonts, colours and photos. Here's a customised version of the card seen in step 1.



6 Whatever graphics you're producing, it's important the files are as small as possible. Click File > Export, give your file a name and click OK to see the various optimisations. The combination of palette tweaks, bitmap size selection and jpeg-quality settings make this an ideal way to produce efficient web graphics.

UPGRADE OFFER SAVE OVER 35% ON XARA XTREME

NEW FEATURES

Feather tool blends object edges
Compatible with Photoshop plug-ins
Bevel tool produces 3D bevelled edges
Extra picture editor features
High-quality pdf export
Bundled plug-ins, clipart, textures, fonts

Xara Xtreme takes everything you'll find in XS and adds a whole lot more, such as major new effects. The Bevel tool gives any object an apparently raised edge, customisable with different bevel types, size, light angle and elevation. The Shadow tool offers even more control and produces some ultra-realistic effects, while the Feather tool smoothly blends objects together.

Elsewhere, you'll find the Picture Editor gets new effects and features. If this is too basic, then try the new Live Effects tool. This lets you use Xara and Adobe plug-ins to produce a wide range of professional visual effects.

Xtreme also comes with a media CD containing 250 fonts, 500 textures, a variety of document templates (greeting cards, invitations, certificates and so on) and thousands of clipart items. Your finished masterpiece can now be exported to pdf along with many other graphics formats.

The list price for Xara Xtreme is about £53.33 but, as a special deal, you can upgrade for only around £33, saving over 35 per cent. Visit www.xara.com/xtreme and order the program, entering your XS registration email and password to qualify for the discount, but be quick - this offer only lasts 60 days from your original registration.



Paragon Drive Backup 6

Protect your valuable data with this fast, reliable backup system

Running a backup will never be the most entertaining use of your time, but that doesn't make it any less essential; especially with the increase in viruses, trojans, worms and other malware. A good backup system is your best possible insurance against disaster.

Install Paragon Drive Backup 6 and you'll immediately be able to run complete image backups of any hard drive, which is also convenient if you're upgrading hard drives and need to make a copy. You can selectively copy individual partitions – useful if you keep your data separate from Windows or your applications.

Copying even a single partition may take a while, so Paragon Drive Backup includes an incremental image feature. You still have to make one complete backup initially, but after

that the program will only copy new files or ones that have changed since the last backup. This can be a huge time saver, and means running Drive Backup can be just as fast as a conventional file-based backup system.

Restoring backups is convenient because you're not restricted to restoring a complete image. A bundled Image Explorer enables you to explore any backup image and restore whatever files or folders you like.

The program includes basic partition manager functionality, can back up your images to CD or DVD without needing third-party burning software, and includes a scheduler to automate common operations. It also has a bootable CD image, which you can use to restore a previous backup if your PC won't start.

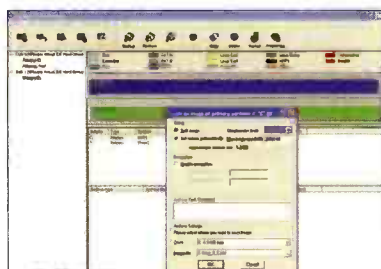
INFORMATION

System requirements Windows 98 or later, 18MB disk space

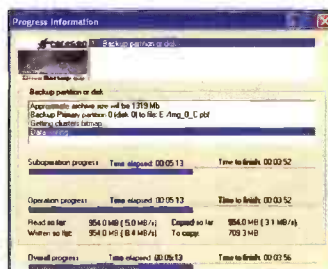
Contact www.drive-backup.com

Registration <http://registration.paragon.ag/pdb>

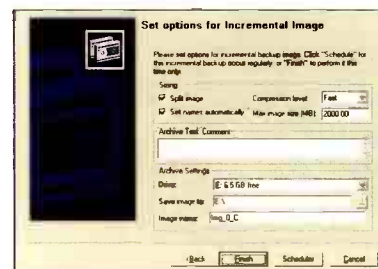
Use incremental images for fast data backups



1 Performing incremental backups can be a great time saver, but you still have to carry out a full backup first. Choose your partition in the left-hand drive tree, click Partition > Create an Image of Partition, and choose a destination for the image file. Other useful settings here include the ability to password-protect your images, but leave these for now.



2 Click OK, and you'll find nothing happens. This is because, like many partition-related tools, Drive Backup queues your commands rather than performing them immediately. Click Operations > View Pending Changes to see the commands waiting to be processed, and choose Apply to apply them. Then leave the program to work, because the first backup always takes a while.



3 After you've changed a few files and created a few new documents, try a faster incremental backup instead. Click Wizards > Incremental Backup > Next, click Browse, and point the program at the image you created earlier. Click Next > Next, then select Scheduler if you'd like to run incremental backups automatically, or Finish if you prefer to keep manual control.

OFFER

NEW FEATURES

Creates bootable backup images
Improved wizards
Supports Windows 2000/XP
Dynamic Disks
Recovery Media Builder tool
Partition Undelete Wizard
Enhanced Recovery CD interface

20 PER CENT OFF PARAGON PRODUCTS

The latest version of Paragon Drive Backup includes useful features such as the ability to create bootable backup images and added support for Windows 2000/XP Dynamic Disks. Or you could opt for the Professional Version, which comes with extras such as Net Burn (share your CD/DVD burner over the network) and Boot Corrector (fix unbootable PCs by checking the Registry, partition table, master boot record, Boot.ini file and more).

Drive Backup Personal normally costs around £42 including VAT and the Professional Edition is nearer to £70, but you can save 20 per cent on these (or any other program in the Paragon range) by using the discount coupon code sent to you with your registration email. Decide what you'd like to buy at www.paragon.ag, follow the 'Order Online' link, and enter your coupon code. The offer expires seven days after your original registration.

Conceptdraw Project 1.3.6



**FULL
VERSION**

INFORMATION

System requirements 128MB Ram, Windows 2000/XP, 20MB disk space

Contact www.conceptdraw.com

Registration Enter your details at www.conceptdraw.com/registration/cdproject_special.php

If the task list and Gantt chart isn't enough, Project also provides comprehensive HTML reports on your project's performance

Most people think project-management software is aimed at big corporations, but there's much more to it than that. The basic management principles involved are just as useful with personal projects, so whether you're building an extension, organising a holiday or planning a wedding, Conceptdraw Project has the tools to help.

The process begins with you breaking down your main project into a list of smaller tasks. A wedding plan might involve booking the church, planning a reception, choosing the caterers and so on. Conceptdraw Project makes it easy to enter your list of things to do, and you can break these down into subtasks.

The software lets you assign start dates and deadlines for each task, which helps you get them in order and gain a feel for how long the project will take. Conceptdraw Project offers a Gantt Chart view of your project data, too – a graphical representation that immediately reveals where any bottlenecks might be.

You can also build up a list of resources available for tasks, from helpful friends to services you need to buy in (such as a hire car or caterer for a wedding). Resources can be priced to give you an idea of costs, and a wide range of management reports will keep you up to date on current (and projected) project performance.

UPGRADE OFFER

CONCEPTDRAW PROJECT 2

The latest version of Project adds extras such as an individual calendar for each of your project resources, perfect for scheduling purposes. The Reports module has been reworked, too, and can now export reports in rtf and Excel formats.

Normally priced at \$179, you can upgrade for only \$79 (around £49). If you're interested in taking advantage of this offer, head over to www.conceptdraw.com/en/purchase/project/upgrade.php, choose Conceptdraw 1.x Standard from the list and enter your 1.3.6 registration code to get this special deal.

Paragon Easy CD/DVD Recorder



**FULL
VERSION**

INFORMATION

System requirements 64MB Ram, Windows 98 or later, 12MB disk space, CD or DVD burner

Contact www.paragon.ag

Registration Follow the instructions during registration or point your browser at <http://registration.paragon.ag/er3>

This lightweight mastering program will have your data backed up with the minimum of effort

Burning data CDs or DVDs can be a complicated business, as you wade through dialogue boxes packed with a mass of irrelevant options. Paragon Easy CD/DVD Recorder is simple to use and will enable you to make speedy data backups with the minimum of mouse clicks.

After launching the program, click Next to create a data disc, choose a recording drive (if you have more than one) and click Next again. Use the 'Add file' and 'Add Dir' buttons to add whatever files and folders you'd like to save, then click Next > Start to burn your disc. This is CD mastering pared down to the absolute minimum.

Occasionally the shortage of options may go too far but Easy CD/DVD Recorder does have a few extra features hidden away, just for

emergencies. Check the 'Expert Mode' box on the opening screen and later you'll get to choose the file system for your disc (ISO9660 Level 1 or 2, ISO9660 + Joliet Unicode extensions, UDF 1.02). There's also an option to create bootable discs from an image of your choice, and you can turn various writing settings on or off as required (write sub-channel data, and so on).

The program is also smart enough to present extra options when necessary. Insert a disc that already has one or more recorded sessions, for instance, and you'll see another screen with various multi-session options. Easy CD/DVD Recorder is simple, but that doesn't mean limited, and the chances are it has all the data disc creation features you'll need.

OFFER

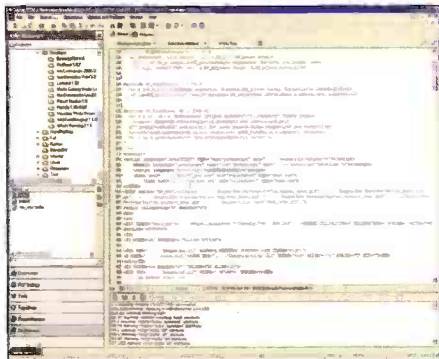
SAVE 20 PER CENT ACROSS THE PARAGON RANGE

As a registered owner of Easy CD/DVD Recorder, you're entitled to 20 per cent off your next Paragon purchase. There's plenty to choose from, with utilities for hard drive backup, partitioning, encryption, secure deletion, data recovery and more.

Check out these and many other tools on the Paragon website (www.paragon.ag). If you find one you like, enter the discount coupon code on your Easy CD/DVD Recorder registration email to get the 20 per cent discount.

Make sure you're quick, though – this offer expires only seven days after registration.

Web management toolkit



Generally, everyone who has an Internet connection through an ISP also has a homepage as part of that setup. Most of us don't know what we can do with our free website, as we don't use that space. However, you don't have to make your website public. Why not use it to store and show your favourite digital photos, write a blog for your friends, use it to host your personal files between office and home, or simply turn it into a test bed for your up-and-coming commercial website?

We've put together a suite of tools that will enable you to design, create, test, upload and then manage your website. Whether you want

INFORMATION

System requirements Windows 98SE or higher, Internet connection, homepage

Contact Various, see disc interface

Registration None required

Program your website, or simply use a Wysiwyg editor and it will do everything for you

to design your own site, create a blog or simply upload a photo gallery, everything is provided.

If you're comfortable with basic HTML, you may want to use Matrix Y2K 2005 to program your site. If you've never designed a web page, we've provided a Wysiwyg (what you see is what you get) editor, Wysiwyg Web Builder 2.6.4, so you can point and click and generate pages. Choose a colour palette with Quick Colour Picker 2.0.2.1, and check your pages will work in most web browsers with CSE HTML Validator Lite 7.01.

When you're ready to test your site, Baby ASP Web Server 2.7.1 lets you preview it from your computer without having to go online.

NEXT ISSUE

YOUR COMPLETE SECURITY TOOLKIT

If you've just bought a new computer, perhaps as a generous Christmas present, you'll be keen to start browsing the Internet. Your computer may have been shipped with a very basic configuration to protect the machine from all the security hazards you may encounter online.

On next month's cover disc will be a comprehensive security toolkit that will ship with a firewall, anti-virus protection, anti-spam technology, anti-phishing protection and much more. Plus the tools will be the best on the freeware market, so you can be assured your computer is safe.

Photoshop Album Starter Edn 3.0



INFORMATION

System requirements Pentium III 500MHz or better, 128MB Ram, Windows 2000 SP4/XP SP2, 50MB disk space, IE6 or later, DirectX 8.1 or later, Quicktime 6.5.1 or later

Contact www.adobe.co.uk/products/photoshopalbum/starter.html

Registration Complete the form displayed during installation

Photoshop Album helps you find all your pictures

There's no shortage of tools to organise your digital photo collection but, as you'd expect from an Adobe tool, this is a cut above the rest.

There's a long list of ways to import your images into Album. It can automatically grab files from My Pictures, look in other folders that you specify and search your system for compatible files, as well as directly importing pictures from most scanners, cameras, mobile phones, memory card readers and more.

The presentation of your pictures is excellent. Forget the fixed thumbnail size of Windows Explorer; Photoshop Album thumbnails can be dynamically resized using a slider, and the

Calendar View groups your images according to the day they were taken.

The software includes basic photo-editing tools. Once the picture is just as you want it, you can customise it with notes, captions and tags – all searchable through the Find tool – which will help you find and group your photos later.

You can share your finished photos online for free, thanks to Album's integration with the Kodak Easyshare Gallery. With options to create slideshows on your PC, or pdf slideshows you can email to others, as well as support for other formats such as video and audio files, this is one of the better photo organisers on the market.

UPGRADE PHOTOSHOP ELEMENTS 4

Adobe Photoshop Elements 4 contains some ingenious automation that makes the program even easier to use.

The Face Tagging feature detects and tags photos that contain people, and red-eye problems are removed as images are imported.

Selection of objects gives you more editing control, new special effects and caption features liven up your photos, and you can then turn them into animated gifs for the web.

It is priced from £59.29 for the downloadable version (broadband is required as it's 537MB). Go to the Adobe site: www.adobe.co.uk/products/photoshopelwin/main.html.



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Reader Offers

This month's special exclusive deals for PCW readers...

CANON IXUS i5

The seductive design, superb quality and range of colours makes the Canon Digital Ixus i5 a great choice for budding amateur photographers.

Together with cutting-edge technology and an ultra-slim body in a choice of four colours, the Digital Ixus i5 has a powerful 5megapixel CCD giving you photo-quality prints up to A3 size.

The Digid processor gives the Digital Ixus i5 superb processing power that results in incredible image clarity, responsive camera controls and fast, accurate auto-focus.

Canon's high-performance precision optics enable the Ixus to capture a scene with incredible clarity, contrast and detail.

Relive special moments with friends by shooting VGA-quality movie clips with sound recording and playback, and achieve great results with confidence in a wide range of shooting situations. There



are five scene modes, including night snapshot, indoor and portrait. You can also indulge your creative side with five photo effects, including sepia, black and white and vivid colour.

Printing your photos is now as easy as taking them. Connect your camera to any Pictbridge-compatible printer, push the Print/Share button and within seconds you'll have a full-colour print you can keep and enjoy.

For editing and retouching your shots, managing and laying out albums and creating slideshows, you get Canon's comprehensive Zoombrowser EX (for Windows) and Imagebrowser (for Mac). You can then compile your own online gallery with 100MB of free space on the Canon Image Gateway.

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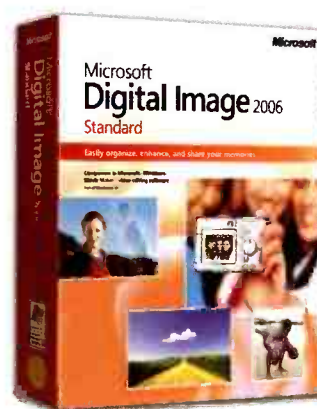
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Digital Image 2006 is ideal for new digital camera users who want a simple way to organise, enhance and share their digital photos. Its intuitive and powerful tools and one-click auto fixes help make everyday digital photography a snap.

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RRP

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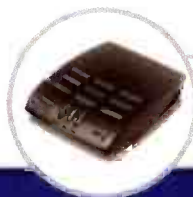


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COMPETITIONS

WIN! Vietcong 2 and an Advent gaming PC

The first-person shooter (FPS) is among the most popular game genres on the PC, and one of the most respected games of this ilk is Vietcong 2. If you haven't already snapped up a copy, now's your chance to win one, plus a powerful Advent gaming PC to play it on.

Vietcong 2 (the next instalment in the million-plus selling Vietcong franchise) is set against the background of the 1968 Tet Offensive, in and around the ancient city of Hue (pronounced Who-ay), during the Vietnam war. It is brought to life through a gritty story compiled from first-hand accounts and

memories of Special Forces and Infantry servicemen stationed in Hue during the assault.

The player will take the role of a US captain tasked with escorting a US war reporter covering the traditional New Year (Tet) festivities in Hue during a ceasefire. Here you can follow the progress of the infamous Tet Offensive, from joyous New Year celebrations in the US compound, through bloody conflict across 14 distinct locations, to the final push to reclaim the Imperial Palace and the city of Hue.

Also included is a Vietcong campaign, in which the player can take the role of a young

Vietcong conscript fighting the South Vietnamese Army in the rice fields and jungle around his village, eventually becoming a Sergeant in the Hue Uprising and storming the Imperial Palace.

This is a pretty complex game that demands some decent hardware, so 2K Games is also giving the winner an Advent T9304 PC. This machine uses a 3.2GHz Pentium 4 processor, 1GB of Ram and a 128MB ATI Radeon X740XL graphics card, so you can run games in their full glory.

For a chance to win Vietcong 2 plus the Advent T9304, answer the question below and follow the instructions on how to enter.



How much Ram is in the Advent T9304 PC?

- a) 1MB
- b) 1GB
- c) 512MB

How to enter

For your chance to win Vietcong 2 and the Advent PC (page 206) or Civilisation 4 and the Sony PC (page 207), go to www.pcw.co.uk/Competition and follow the instructions.

The competition opens on 15 December 2005 and closes on 20 January 2006.

Rules of entry

These competitions are open to readers of PCW, except for employees (and their families) of VNU Business Publications and 2K Games. PCW is the sole judge of the competitions and the Editor's choice is final. Offer applies to residents of the UK and the Irish Republic only. Entrants must be over the age of 18 and only one entry per household will be accepted. Winners will be

WIN! Sid Meier's Civilization 4 and a Sony PC

Not content with giving away an Advent PC and a copy of Vietcong 2, the very generous folks at 2K Games are also giving away a copy of Sid Meier's Civilization 4 – the third sequel to one of the biggest selling PC games ever (over six million to date). And that's not all – you'll get a stylish and powerful Sony Vaio desktop PC to play it on.

Developed by Sid Meier, the latest instalment features new ways to play and win, plus new tools to manage and expand your civilisation, all-new easy-to-use mod capabilities, and intense multiplayer modes and options.

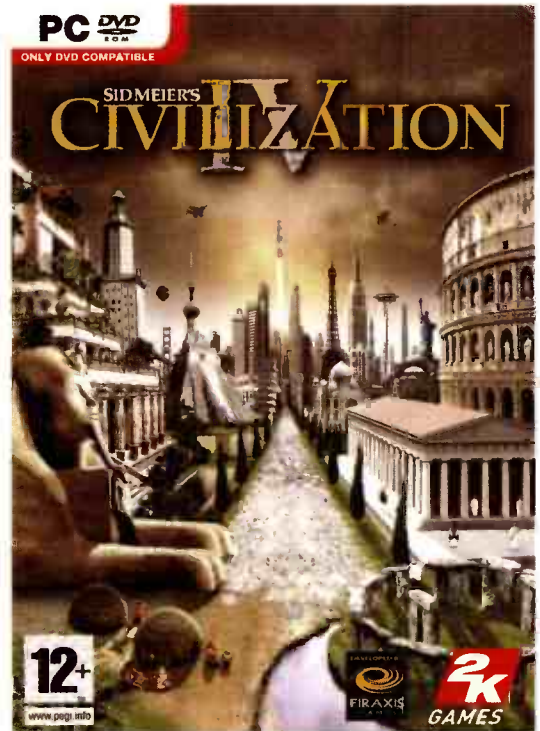
Civilization 4 has already been heralded as one of the best games of 2005, scoring incredibly well in the mainstream gaming press. It lets you play as a political leader such as Gandhi or Julius Caesar in a fictional bid to take over the world, beginning in the stone age and going all the way through to the space age.

How you achieve this goal is entirely up to you. You can use force to conquer and assimilate your neighbours, or devote your resources to researching advanced technology for the improvement of your society. Every aspect of building a city and a thriving

civilisation has been incorporated into this hugely addictive game.

The winner of this competition will also receive a Sony Vaio V3S desktop PC. This powerful machine features a 3.4GHz CPU, 512MB of Ram, a 250GB hard drive and a dual-layer DVD rewriter drive.

The Vaio V3S has a high-resolution 20in TFT monitor, and 2K Games is also giving away a Logitech Cordless Rumblepad II joystick with vibration feedback. For your chance to win, answer the question below and follow the instructions on how to enter.



selected at random from all correct entries received. No cash alternative is available in lieu of prizes. VNU will use all reasonable endeavours to notify the winner(s) within 14 days of the close of the competition. VNU reserves the right to substitute the prize for one of greater or equal value if circumstances make this unavoidable. Prizes will be dispatched by the competition sponsor(s) and the winner(s) name(s) and address(es) will be provided to the

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December winners: Jose Allen wins the copy of Mangofile4 Network3, with three user licences and a Kodak i30 scanner.

The runners-up who win a copy of Mangofile 4 Personal Plus are: Steve Knight, Shoyeb Lakhi, Janet Lawrie, Chris Leitzell, James Liversidge, Terence Rourke, Rita Roberts, Brian Saker, David Scott and Michael Whitehand.

The MSI Megabook S270 was won by Stuart Porter.

How many copies has the Civilization series sold?

- a) Over two million
- b) Over three million
- c) Over six million

On the web

www.pcw.co.uk

PCW is not just a great monthly magazine, we also have a website carrying news, reviews, features, analysis, downloads, competitions and blogs written by us and our sister VNU titles. The website is updated daily, to help keep you abreast of the latest, most important events and new products hitting the market.

The screenshot shows the PCW website interface. At the top, there's a navigation bar with links like 'Hardware', 'Software', 'Buyers Guides', 'Best Prices', 'Best Buy', and 'Dell shop'. Below this, there are several featured sections: 'Hardware' with a list of products like Digital Cameras, Firewalls, Flat Panel monitors, Graphics Cards, Hard Drive, Inkjet Printers, Motherboards, MP3 Players, Notebooks & Tablets PCs, Optical Drives (CD/DVD Drives), Palm PDAs, Routers, Scanners, Speakers, Windows PDAs, and Wireless; 'Software' with a list of products like Antivirus & Firewalls, Backup Tools, Desktop Tools, Internet Tools, Linux, Office Applications, Operating Systems, and Privacy Tools; 'Latest Reviews' featuring an Epson Stylus Photo R1800; 'BEST PRICES' listing various products like Sony VGN Desktop PC, Ebuyer LM17C 17" TFT, Dell Dimension 3000, HP HX4700, HP HX6110, Dell Inspiron 1200, Acer Aspire 3002LC AMD, Fujitsu Amilo A 7640, Sony VGN-FS285E, Acer AS1691WLMi, Sony VAI0 VGN-B1VP, and Sony VGN-PS215B; 'Deal of the week' for a Mesh computer; 'MARKETPLACE' for great deals on inkjet cartridges, PCs, PDAs, web hosting and more; and 'WORLD Direct' for click for some great offers and discounts.

The Test Bed

Rapidly developing a cult following, the Test Bed is our labs blog, written by the team who test and review products. It gives you regular updates on the latest gossip, technology trends and products. We also have a performance area, where product test results can be compared so you can see how well rival products fare against each other – no other PC magazine in the UK offers such an interactive service. Our database of products is growing daily, making it the most comprehensive tool you will find and the perfect complement to our new Buyer's Guides and reviews.

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PCW Interactive

You may recognise some entries in this blog from our Letters pages, but they're published here first, letting you add your views. The Customer Services section is also very popular. Here you can comment on how manufacturers have performed and if you would recommend them.

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Check out the latest 20in displays

Data recovery software

We've all been there: turn on the PC only to be greeted by the dreaded 'No operating system found' message. But don't panic, as we've tested six of the best utilities that claim to be able to recover your lost data.

Memory

In our special guide to memory we explain why one of the cheapest upgrades for your PC can also be one of the most effective. We've also compared dozens of different modules to see how they perform.



Get the lowdown on memory

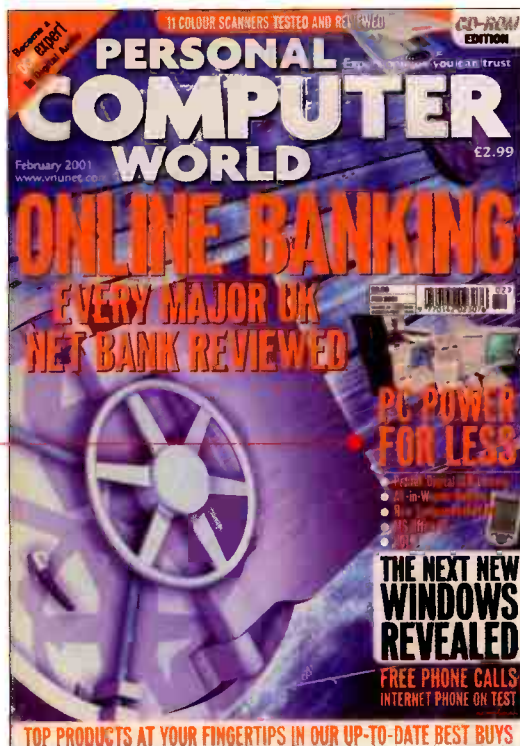


**There's lots more in March's PCW
DON'T MISS IT...**

FEBRUARY 2001

With the Christmas sales in full flow, we challenged manufacturers to submit a PC they considered excellent value for money for this issue's group test. The price limit was set at £1,200 excluding VAT so the choice of systems submitted was pretty varied.

The winner, Atlas' Meridian A1000 PCW, wasn't the quickest PC in this test, but it struck the best balance between cost and features. It had a good-quality 17in monitor and Digitheatre surround-sound speakers, and a 'more than capable' Videologic soundcard.



From the archives: Take a look at the important events in technology five, 15 and 25 years ago.

Online banking is second nature to most computer users these days, but in 2001 it was still a daunting prospect for many. We tested 20 online banks, and found some sites were imaginative and fast while others were slow and dull. The winner was Cahoot for its combination of style and substance. We also liked Egg and Smile, which were given our Highly Commended award.

Clive Akass tested one of the first VoIP (Voice over IP) phones on the market, the Net2Phone YAP Phone. Now there are plenty of Internet telephony services that don't require a special handset and/or headphones, but the YAP offered both, albeit with a £10 charge for the USB phone. To use it, you had to buy time, much as you do today with pay-as-you-go mobile phones.

FEBRUARY 1991

Fifteen years ago, the Qubie 486/25 faced the AST Bravo 486-25 in what appeared on the cover to be a fencing match, competing with each other as 'Cheap 486 rivals'. PCW writer Peter Jackson tested the machines against each other, in a challenge of the 'name-brand' PC versus the 'assembler'. He decided that, performance-wise, the two machines were practically identical, despite the Qubie's slightly faster hard drive and the AST's superior memory read and write operations. However, he

concluded that the Bravo was more affordable than the Qubie, which had more expensive parts resulting in a more costly buy in the long run, when the machine needed replacements and/or upgrading.

1991 saw the debut of Logitech's Mouseman series of newly designed ergonomic mice. These were geared towards reducing the number of computer users who were developing repetitive strain injuries due to badly designed mice. Chris Cain recommended the Mouseman highly in his article exploring the history of the mouse, first used as part of the Apple Lisa system.

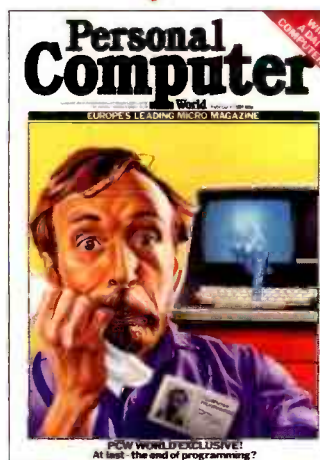


FEBRUARY 1981

Back in 1981, PCW ran with the world exclusive: 'At last – the end of programming?' This was a report about a 'program that wrote programs', aptly named The Last One. Developed by David James and Scotty Bambury from Somerset, it was set to revolutionise programming. Back then people called it a program editor, but it wasn't as limited as RPG, Filetab or even Perl. It was easy to learn and free from acronyms, abbreviations and codes. All input was in plain English and only the results came

out coded. Once the design details had been keyed in, program generation took only minutes. PCW's David Tebbutt was excited about this, for not only was it original, but it was also British.

Up for benchmarking was the Vector Graphic VIP. Conforming to the popular style at the time, it was a computer built into a VDU. Our reviewer Stephen Withers liked the look of the machine and its ease of use. Running CP/M over the six-slot \$100 motherboard, he found that the VIP was a solid performer and could be upgraded, but didn't offer value for money at £2,125.



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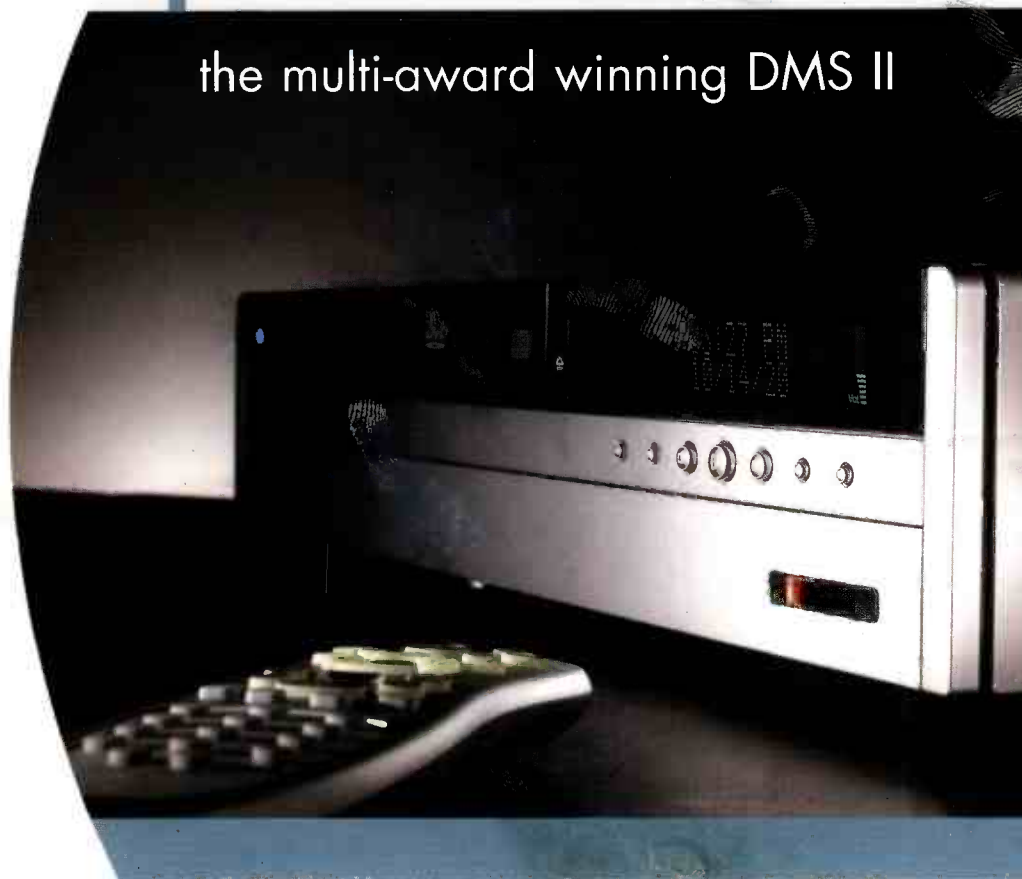
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