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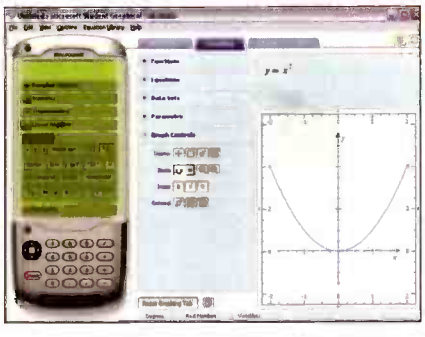

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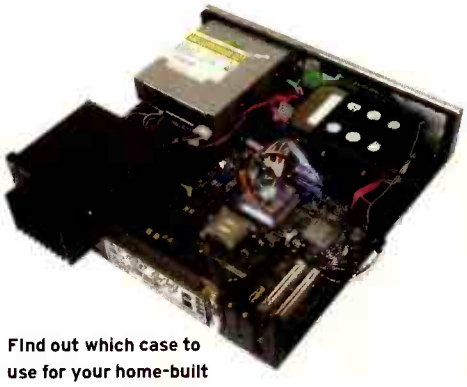

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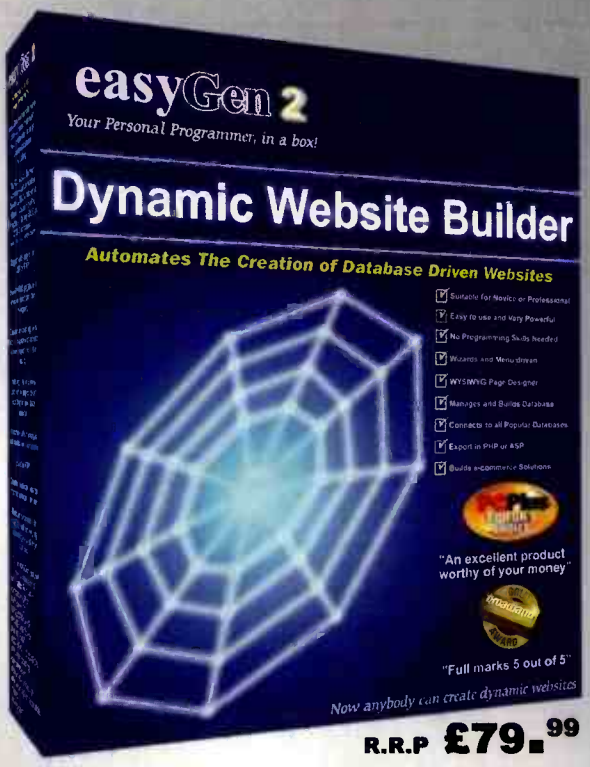

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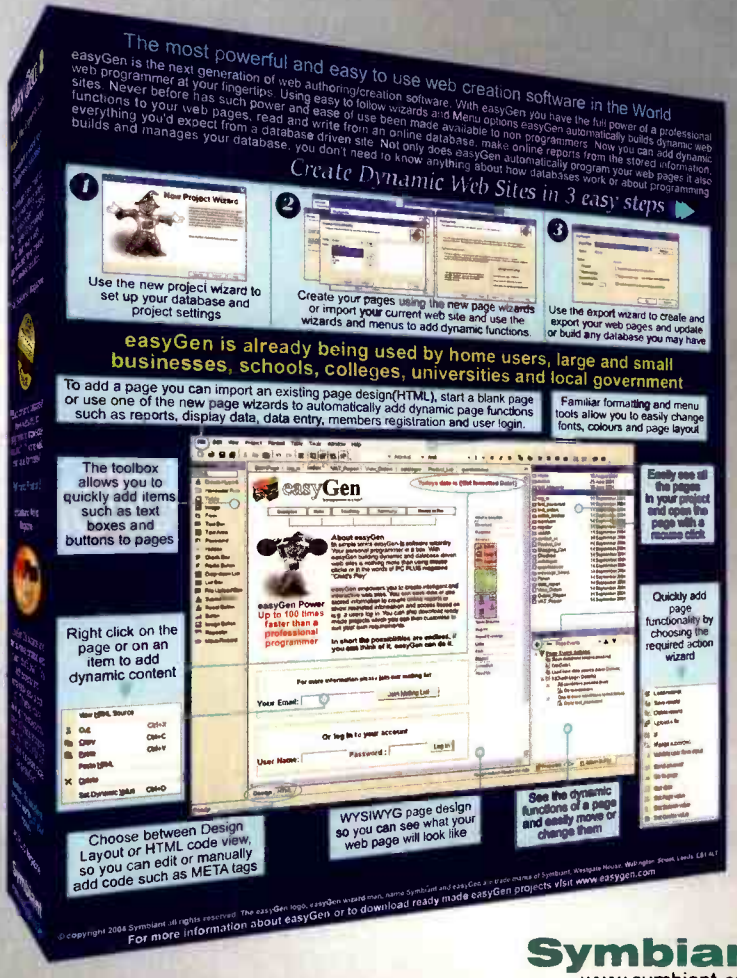

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What's in store now Time's up

Kelvyn Taylor considers the implications after the collapse of one of the IT industry's biggest brands

The recent high-profile demise of the Granville Technology Group and the associated Time and Tiny brands is something that is going to take a long time to unravel, if recent Internet reports about the complexity of the group's structure are to be believed. Already a local MP, Nigel Evans, has asked in Parliament for an investigation into why the group had apparently not issued any financial figures since 2003. But what is certain is that customers and suppliers have little choice but to wait and see if there's going to be anything left in the financial pot at the end of it.

I've known the Time/Tiny brands almost since their inception and over the years they've taken an awful lot of flack. Yet to continue selling anything up to half a million PCs and laptops a year, they must have been doing something right. What they excelled at in the late 1990s was making affordable PC bundles for novice users, offering lots of cheap but useful software, help videos and offering face-to-face buying advice in their many retail outlets. We've had a fair number of grumbles from readers over the years about the company's after-sales service, but not really any more than you'd expect from a company selling so many PCs. Whatever the reasons behind the failure, the pressing question now is how the sizeable gap in the market is going to be filled: will buyers move to other well-established UK manufacturers, head en masse for the high street computer stores or simply buy from the big global direct brands?

Although we can't answer that question, one thing we do know for certain is that, whatever company you choose to buy products from, there's always the chance of something going wrong, whether it's simply a late delivery or something more serious such as a broken, unsatisfactory or incorrect product. And from an customer's point of view, the fact that, say, 99.5 per cent of a company's complaints are dealt with satisfactorily is cold comfort if you're one of the 0.5 per cent. Many of us don't really know how to proceed when things go wrong, which is why this month we have a special feature explaining your rights as a consumer.

Starting on page 69, we'll guide you through the legislation and give you pointers on how to deal with intransigent customer service departments. And starting next month (coinciding with the launch of *PCW*'s brand-new look – see pages 26 and 148), we'll be introducing a regular section where we focus on helping readers with their problems, so if you're stuck in what seems like an endless loop with a vendor, let us know by sending an email with the gory details to letters@pcw.co.uk. We can't guarantee a result, but we'll certainly do our best.

Meanwhile, in this month's issue, we have another great selection of reviews, news and practical advice, including a look at the world of open-source software for Windows. The open-source movement has long been associated with the world of Linux, but we were surprised and delighted to find just how much free software is available for the Windows platform – everything from Photoshop replacements to complete web-editing packages. We've picked 55 of the best, starting on page 75, but this is only a tiny fraction of what's available – once you start looking around you'll wonder why you ever paid for software.

Our PC group test this month investigates bargain laptops. We were, once again, surprised to discover the quality and features on offer from models costing less than £600. If you're looking for a low-cost laptop for university, college or simply to free you from your desk-bound PC, we have eight great models for you to put on your shortlist.

After-sales service
Know your consumer rights and find out how to resolve disputes – see page 69

Bargain laptops
You'll be amazed what you can get for £600 or less – see page 83

'The pressing question now is how the sizeable gap in the market is going to be filled'

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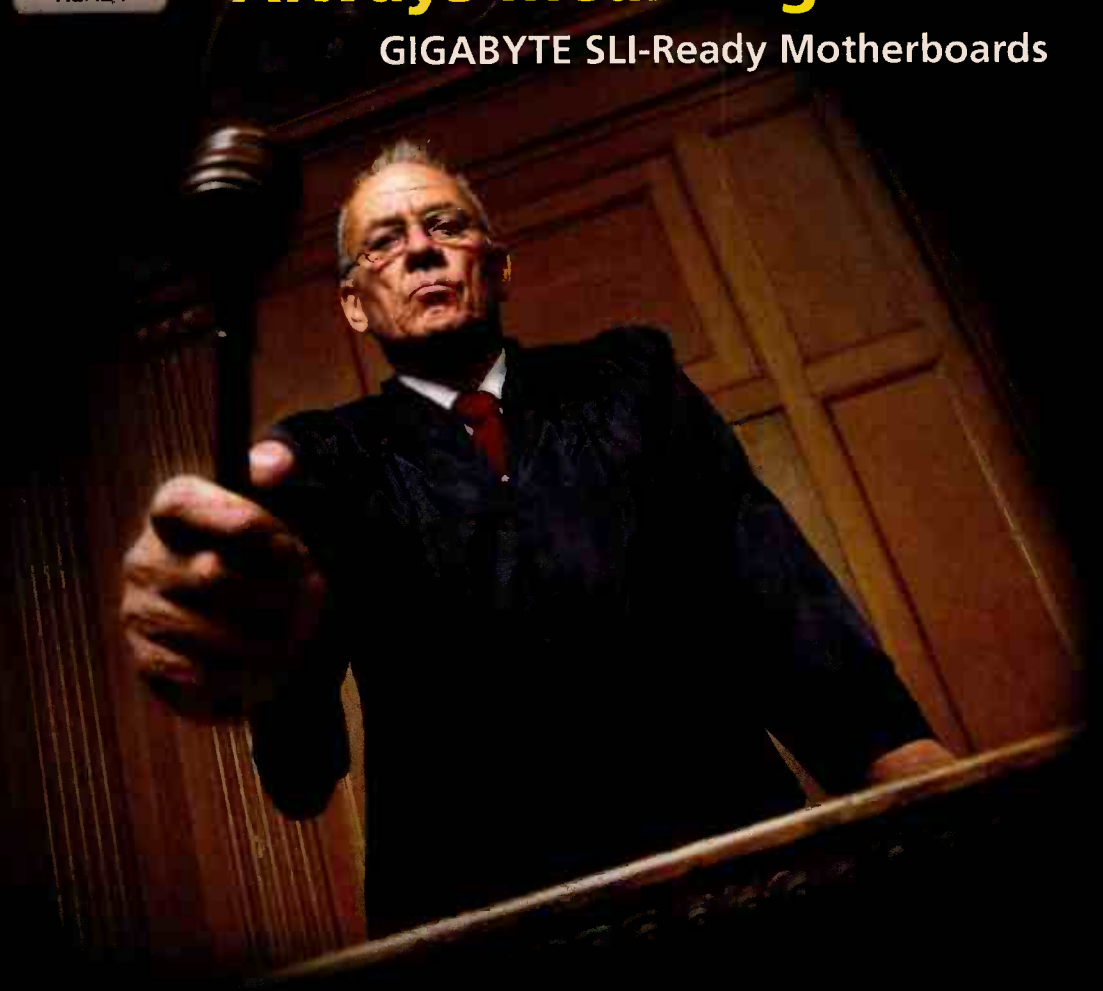

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News

EDITED BY CLIVE AKASS

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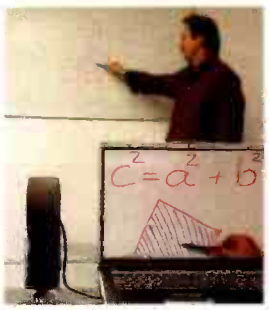
24 **Cutting edge vision aids**

People with poor hearing and sight have been at the cutting edge of human-computer interface development. Some aids, like the magnifier and telescope, pictured below, could have a wider use.



Microsoft unveils Vista

Microsoft has released new beta code of the operating system it expects to run on PCs for the next decade – and revealed that it will be called Windows Vista.

It is set for release late next year in 32bit and 64bit versions, although the company expects all new PCs to be 64bit well within the lifetime of Vista.

Microsoft first started talking about the OS, codenamed Longhorn, two years ago. It suffered numerous delays and Microsoft will have to pull several features from it to make the release date. A new file system called WinFS, which makes it easier to find documents, will be delivered through a post-launch update.

Other new features include Live Icons, which show the contents of documents and a technology called Metro, which appears to duplicate some of the functions of Adobe Acrobat and its .pdf format.

There will also be new security features, although again some may be delivered in updates. A feature called 'Secure Startup' will be the only element to ship at launch time.

Microsoft will provide additional details about Vista at its Professional Developer Conference on 13-16 September in Los Angeles. An online Microsoft video showed that the tagline for the new operating system will be: 'Clear, confident, connected: bringing clarity to your world'.

Microsoft executives Brian Valentine and Kevin Johnson, Group Vice President, act as cheerleaders for the Vista announcement in Atlanta

Microsoft unveiled the new name on Thursday at Microsoft Global Briefing, the company's annual sales meeting in Atlanta. The beta has been released almost exclusively to developers working on applications for the OS.

Performance is impossible to assess on unoptimised beta code, but tests of the file system and data management in pre-beta Vista code have been favourable.

Vista will be Microsoft's first fully featured operating system for 64bit client computers: the 64bit version of Windows XP offers limited driver support. Microsoft says the 32bit Vista will run on 'mid-range' XP computers, but the company has a history of under-specifying hardware for new products.

It promised that Windows 95, the earliest version of the current Windows generation, would run in the 4MB of Ram that was standard in most PCs at the time. In fact, most PCs needed an expensive upgrade to 16MB.

New chips for AMD

AMD has launched two new processors aimed at the value and mainstream market. The 2GHz Athlon 64 X2 3800+ offers dual-core operation without the price penalty of the X2 4800. For test results on the new chips, see http://labs.pcw.co.uk.

Sudoku code

Software developers are cashing in on the Sudoku craze. One package is reviewed on page 65, another, Sudoku Ace, is available at www.altrixsoft.com and Sudoku Master costs £14.99 from www.electric-software.co.uk.

End of a dream as Time collapses

The collapse of Britain's biggest home-grown PC company last month shows how hard it is for even relatively large companies to compete with giants such as Dell that survive by taking small profit margins on huge turnovers.

Less than three years ago directors of Granville Technology, fresh from buying up the troubled Tiny group, visited *PCW* full of enthusiasm for their plans. They told how they would create jobs and deliver low-cost products without stinting on quality or support.

It all sounded a little too good to be true, but the intention seemed real enough. Now the group, which traded under the Time brand, has been forced to shut its 78 Computer Shop stores and close its Burnley assembly plant, with 1,500 people facing redundancy.

The group, which produced 500,000 computers a year, is said to have been losing £1m to £2m a month since the start of this year. Joint administrators Andrew Hosking, Martin Ellis and Les Ross, of Grant Thornton UK LLP, said in a statement: 'The Group has fallen victim to the continued price deflation in the personal computer market.'

Some funding has been set aside to provide limited warranty cover. Kapersky, which provided anti-virus software bundled with the group's PCs, said it would continue to provide updates.

Customer support numbers were still being answered and a helpline for customers was set up on 0870 381 7097. Non-urgent enquiries should be sent to enquiries-time@gtuk.com.

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Bargain laptops
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EU investigators raid Intel

European investigators raided offices of Intel and some of its customers in the wake of an AMD lawsuit accusing the chipmaker of anti-competitive practices.

But a leading analyst accused AMD of using the suit to wage a media war against its main rival. Martin Reynolds, vice president and fellow at Gartner Research, said the AMD filing was 'surprisingly readable for a legal document', as if it had been crafted for a media campaign.

AMD alleges that Intel pressured 38 manufacturers, including Dell, HP and Sony, to favour its microprocessors. One of the places raided by EU investigators was the UK headquarters of Dell, which is noted for its exclusive use of Intel chips.

AMD applauded the move, which is related to its case only in that it has backed EU anti-trust investigations. Thomas M McCoy, AMD executive vice president of legal affairs, said Intel could not 'escape the consequences of its anti-competitive actions.'

But Reynolds said Intel could argue its market dominance was due to innovation and aggressive capital investment, rather than to monopolistic behaviour.

He said that AMD's claims of 'old-fashioned threats, intimidation and knee-capping' by Intel would, if true, merit action irrespective of Intel's status as a possible monopoly.

Microsoft ruling delayed

A decision on Microsoft's appeal against an EU anti-trust ruling is likely to be delayed by a year after the removal of a judge who wrote an article calling some law clerks 'ayatollahs of free enterprise' for the influence they exert over judges. The case will now be heard by 13 judges in the European Court of First Instance's Grand Chamber, headed by its president Bo Vesterdorf.

Lumix takes a new aspect

Panasonic says its new 8.4megapixel Lumix DMC-LX1 is the first digital camera with a 16:9 aspect ratio.

It packs a 4x optical zoom (equivalent to 28mm to 112mm on a 35mm film camera) and can also shoot in a conventional 4:3 format.

The LX1 is one of three new Panasonic compacts announced last month, all incorporating Optical Image Stabilising technology to counter the effects of camera shake. The others are the 6megapixel DMC-FX9 with a 3x optical zoom and the 8megapixel

DMC-FZ30 with a 12x optical zoom. Details are at www.panasonic.co.uk.

Russian spammer pays ultimate price

Net abusers have been having a hard time of it recently. Not least Vardan Kushmir, one of Russia's best-known spammers, who was found beaten to death at his Moscow apartment.

Kushnir had bombarded just about every email box in the country with adverts for his language school – but this was not the motive for his murder.

Police were quoted as saying he had met three women in a nightclub and invited them to his flat, where they drugged him. He was then killed in a scuffle with the women's accomplices when he was woken by their arrival.

Kushnir was responsible for many tens of millions of junk emails. He caused so much irritation that two years ago Russia's then communications minister, Andrei Korotkov, had Kushnir's office swamped with 1,000 phone calls in a morning.

Some reports of his death lacked the usual sympathy for a murder victim. One headline read: 'The ultimate solution to the spam problem.'

Rather less drastic was the fate of 24-year-old Gregory Straszkiewicz, who was caught piggybacking wireless networks to get web access. He was fined £500 at Isleworth Crown Court under sections 125 and 126 of the Communications Act 2003, which bans the use of wireless networks by those who do not subscribe to them.

He is the first person to be prosecuted for hijacking a Wifi signal, a practice known as so-called 'war driving'.

Police said that he was caught outside a building in a residential area holding a wireless-enabled laptop.

Sunny outlook for solar pack

It looks like an ordinary backpack but it is another heartening sign that solar energy may finally be going mainstream. The H2 series packs are designed for Ipod users and has a control pad on one shoulder strap and a microphone on the other, allowing you to switch between listening to music or making or taking a call via a Bluetooth mobile phone.

You can charge a phone, Ipod or Bluetooth module using the solar panels on the backpack, and circuitry switches power to the device that needs it most.

But with solar-powered garden lamps now on sale for a fiver, it can't be long before solar roofs become financially viable.

● Bluetooth stereo revolution, see page 21
www.oneilleurope.com

Piracy check circumvented

Hackers took less than a week to circumvent a new Windows check on the legitimacy of software of users downloading security updates.

The Windows Genuine Advantage 1 check that went live last month could be disabled simply by pasting a Javascript command into the browser address box.

Users of pirated Windows copies can get security updates without passing the WGA check, but it also unlocks access to a set of applications that Microsoft values at $450 (£252 approx). Pirate users are also offered the chance to buy a legal licence.

Microsoft says it will block the hack. See **www.pcw.co.uk/2140577** for more on this story and details of the hack.

Colour arrives on flexible screens

We've seen pictures of flexible screens like this for a couple of years but they have yet to translate into viable products.

This one from Fujitsu is colour, though, and is bistable – that is the pixels flip between one of two positions and remain in that state without the need for power. Philips and HP have also demonstrated 'e paper' technologies.

But Fujitsu says its screen produces more vivid colours than conventional LCD screens as it uses separate red, green and blue layers rather than filters to produce colour (see above).

Net power to get cheaper

Power-over-Ethernet (PoE) products that simplify the installation of devices like surveillance cameras and wireless access points are beginning to fall in price, though they are still targeted at corporate markets.

D-Link has launched a 100/100Mbits/sec Ethernet switch capable of delivering up to 15.4w, as well as data from any of its 24 ports. The DES-1526 costs £499.83 ex VAT.

D-Link marketing manager Balvinder Singh Phull said the company had no plans at present to sell PoE switches with a smaller number of ports for homes and small offices.

The big advantage of PoE is that only a single cable needs to be run to client devices. These either have to be PoE-enabled or used in conjunction with an adapter costing about £30.

www.dlink.co.uk

BT's dual answer to Skype

A phone to be launched next month epitomises the cataclysmic changes and baffling economics that characterise telephony today. The Motorola V560 can act as a standard quad-band GSM phone using the Vodafone network away from home and as a standard wireless phone when you return.

In fact it uses a Voice-over-IP link rather than an old style telephone line but, as you can make and receive calls on the same number, the effect is the same. The phone is part of a package called BT Fusion, open to BT broadband subscribers.

When you sign up you are given the V560 plus and a device that doubles as router for a Wifi home network and a Bluetooth hub that functions much like the Dect base station of a home wireless phone.

You are charged standard Vodafone rates when you make a mobile call and BT Together rates for calls via your local network – 5.5p an hour off peak and 3p a minute peak. The V560 switches modes when within range of its base station, but if you are still on a mobile call you continue to pay standard rates. However, if you initiate a call at the base you still pay the lower rate if you continue it outside.

Wifi Fusion phone 'next year'

This is the V560 phone with the Bluetooth/Wifi hub that is being offered as part of the BT Fusion service. BT chose Bluetooth for the local wireless link because it is much more battery friendly. Wifi VoIP phones are already available for corporates who use their internal networks for voice as well as data. The Zultys phone, featured on page 27, lasts for four hours of use but is bulkier than most mobiles.

BT is testing Wifi phones and is expected to offer models next year.

Steven Evans, chief executive of BT's converged mobility portfolio, said: 'This was the easiest way to do the charging. There will probably be some people who take care to call from their homes but we think it will balance out.'

BT seems remarkably laid back about the transition to VoIP, which you would think would threaten its dial-up revenues. It is encouraging the transition with its PC messaging client BT Communicator, as well as Fusion. 'We regard VoIP as a natural progression,' Evans said, pointing out that it still represents only a tiny fraction of voice traffic.

He said VoIP is more of a threat to mobile operators who don't want their voice and data revenue streams 'cannibalised' by people charging voice calls to their 3G data bills.

But how can BT expect paid-for VoIP services like Communicator and Fusion to compete with the likes of Skype that charge nothing at all for IP-to-IP connections?

Evans agrees that Skype will take some business but says its peer-to-peer model will not be financially viable if everyone came to use it because someone would have to pay for 'all those bits and bytes' travelling the network.

He points out that you need a laptop or connected PDA to use Skype on the move and the number of those is tiny compared the number of mobile phones globally. And Skype, unlike mobile phone operators, is not going to be able to give PDAs away to hook people into its services.

Boingo offers hotspot VoIP

Hotspot provider Boingo is offering Skype users, who are said to number 45 million across the globe, discounted Wifi access at its 18,000 sites worldwide. Charges in the US during the pilot phase are £4.50 per month or £2 for two hours. Boingo's unlimited data service costs £14 per month.

Skype users can already make free phone calls at hotspots in major UK railway stations. Mark Blowers, senior analyst at Butler Group, said the extension of Skype beyond the desktop was 'clearly a growing threat to mobile and fixed line carriers.'

Gizmo enables VoIP on Dect phone

A Manchester company is selling a gizmo that lets you use a standard Dect hands free phone to make a Skype or Messenger call.

The £16.49 ex VAT device links the Dect base station to your audio card and uses the USB port for power.

Software allows you to dial directly from your phone handset, distinguishing local VoIP numbers, hotkeys and standard phone numbers for VoIP-to-PSTN calls. However it does not, as it stands, allow you to use the handset to switch between VoIP and standard calls but a manual switch is available. Go to www.ukcorporatetelecom.net.

Videocams get hard disks

Shrinking high-capacity hard disks have begun to transform video cameras in the way that they have already changed portable music players.

JVC has announced four hard disk-based camcorders that can store between five to seven hours of DVD movie-quality video, eliminating the need for removable storage.

The entry-level Everio MG20 and MG30 models have 20GB and 30GB disks respectively, but are otherwise identical, with an 800,000-pixel sensor and a 25x optical zoom. The MG50 also has a 30GB disk, with a 1.33megapixel sensor and f1.2 superbright lens; but the optical zoom is just 15x.

These three are due to ship this month. The fourth, the Everio GZ-MG70, with a 2.12megapixel sensor and a 30GB disk, is due to ship later in the year.

JVC's range may make removable storage redundant

All models have a fast USB2 port, an SD (Secure Digital) slot for storing still images (though these can be held on the hard disk), and a 2.5in LCD screen.

The devices use 1.8in hard disks, similar to those used in portable music players, that JVC claims can store more than 40 hours of 'Internet quality' video.

But there are snags. You would need to take a laptop on holiday to dump your data if you expect to take a lot of video – and you'd need one with 30GB of space. The data could also take half an hour to transfer, even if using a fast USB2 drive.

UK prices have yet to be announced, but you can get a reasonable idea from the fact that the MG50 is listed in the US at $999 (£546 approx).

Reflex reaction

Fujifilm claims its Finepix S9500 combines the advantages of a single-lens-reflex (SLR) camera with those of a digital compact. We have yet to see an automatic focusing system that matches the ease, speed and precision of an SLR manual control, so we are still to be persuaded.

But the S9500 does have the equivalent of an SLR's 28-300m and a 9megapixel Super CCD sensor, and with a 0.8-second start-up time, it should be responsive enough to capture unexpected shots. The price should be available by the time you read this.

DrayTek Broadband Firewall/Routers

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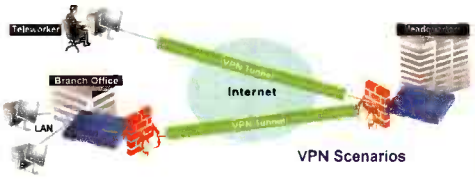
With the convenience of a wireless LAN you still want to protect both your data and your bandwidth. DrayTek Vigor wireless routers provide several independent methods of wireless security for encryption and client authentication, including WPA/WPA2 and 802.1x.

Various of our models now support WDS (Wireless Distribution System), allowing you to use your router as a wireless bridge or repeater, increasing the range of your primary wireless base. For details of DrayTek's wireless LAN solutions, visit our web site.

Firewall & VPN Facilities

The Vigor's famous Virtual Private Network (VPN) facilities enable you to link branch offices together or teleworkers to head office, easily, simply and securely. You can run up to 16 tunnels simultaneously, allowing remote users to access shared drives, data and other resources using your broadband connection. DrayTek VPNs use industry standard encryption systems, compatible with most other vendor's products.



VPN Scenarios

DrayTek's firewall facilities help defend your network and PCs not only against intrusion but also Denial-of-Service attacks and can block specific web site (by URL keyword), ActiveX components and other potentially harmful web content. Flexible IP filtering is also provided as well as comprehensive reporting facilities. See the DrayTek web site for details of all firewall and other features.

Voice-over-IP (VoIP)

DrayTek VoIP-equipped routers enable you to use your broadband line to provide additional phone lines to make and receive voice calls. Calls to/from other VoIP-equipped users are completely free, and you can make low cost calls to regular phone lines too, using the DrayTEL PSTN gateway. 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.

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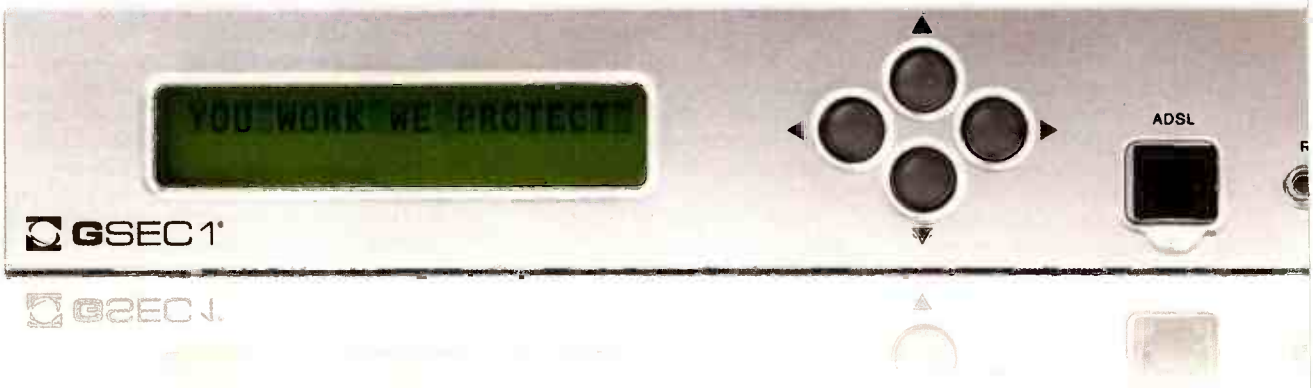

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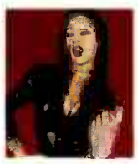

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the brother-in-law

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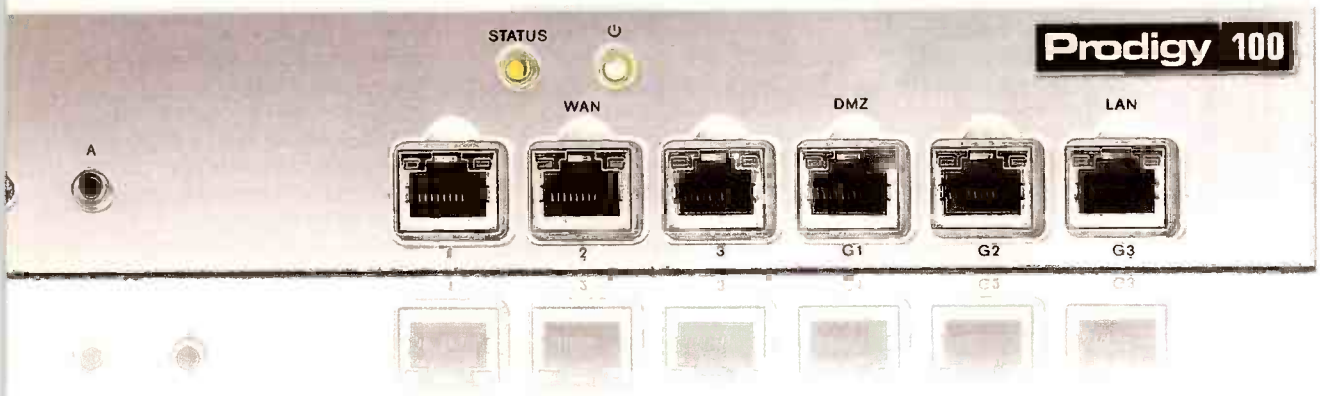

Death of OS that rivalled Windows

The final curtain has been called on one of the most famous and costly spats in computing history, with the announcement by IBM that it will stop support for its OS/2 operating system on 23 December next year.

The move came shortly after Microsoft agreed to pay $775m to settle an anti-trust case, including claims related to OS/2 and IBM-owned Lotus Smartsuite. The dispute stemmed from the early days of the PC when Microsoft was generally perceived to have shafted IBM over operating system development.

IBM inadvertently kick-started Microsoft by giving Bill Gates the contract for writing the operating system for the original PC, announced in 1981. The success of the PC, due more to IBM's market dominance than to its design, took nearly everyone by surprise.

A major snag of the first PCs was that you had to close one application to use another.

IBM promised a true multi-tasking operating system for the second-generation PC, the 16bit 2086-based AT, and Microsoft was contracted to co-develop what would become OS/2. Gates wanted to wait for the 32bit 3086, for which he began to develop Windows 1.

Microsoft would deny that it deliberately went slowly on OS/2, but its swing towards Windows brought it power enough to defy its mighty partner.

By the time the text-based OS/2 version was released in late 1987, Microsoft's graphical Windows 1 had been out for two years and Apple had been offering GUI-based computing for four years.

How *PCW* announced Warp in December 1994

When Windows 3 was launched in 1990, Microsoft was still officially working on OS/2, but so slowly that IBM split off from the company and took over work on version 2. Microsoft transmuted what was to have been OS/2 version 3 into Windows NT.

IBM's OS/2 Warp 3, released in 1994, was the first operating system with native Internet support. It never challenged Windows, despite a loyal fanbase, and the fact that it was considered by many to be technically superior.

The last version was published in 1996. IBM has advised the few remaining OS/2 customers to switch to Linux.

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Bluetooth stereo revolution

Devices are finally emerging that allow the same Bluetooth headset to be used both for telephony and for listening to music in stereo. All conform to a specification called A2DP (Advanced Audio Digital Profile), which was approved a few months ago. Many use a chip from Britain's Cambridge Silicon Radio that supports Bluetooth's new Enhanced Data Rate of 3Mbits/sec.

What seems at first sight to be a minor development could have a profound effect on the design of portable smart devices, as it allows them to be left in a pocket or bag and removes the necessity for them to be small enough to be held to the ear.

This in turn could facilitate the use of larger batteries and screens, with support for more functions, allowing the standard mobile to evolve into something more like a portable multimedia computer.

It could also lead to the much predicted demise of Apple's Ipod, at least in its present form, as there is little point in carrying a separate phone and music player. Apple has denied rumours that it plans a telephony-enabled Ipod

Clockwise from top: Itech's Clip5 headset; Nokia's headset with FM radio; the Siemens SL75 phone; A2DP-compliant Imuff bluetooth headset for Ipods

but it must be closely monitoring the sales of phone players, particularly with the launch this month of the A2DP-enabled Sony-Ericsson's W800i Walkman.

But A2DP does not require the phone and player to be in the same device and at least one compliant headset, Imuffs (see above) from Wi-gear, are designed specifically for use with the Ipod and any Bluetooth mobile phone.

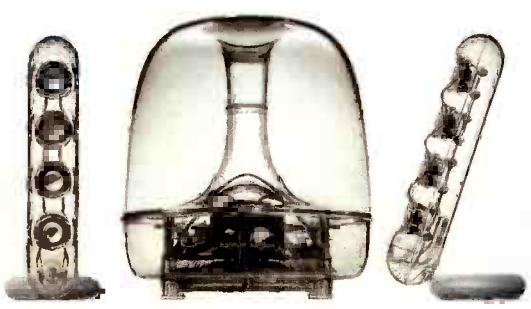
Samsung is reported to be planning the release of a player-phone with a 30GB hard disk next year. It is also co-developing with Audi a system that allows an A2DP mobile to play music on the car stereo as well as act as a hands-free car phone.

Other A2DP phones on sale or about to hit the market include Nokia's 8800 and 8801 and the Siemens SL75. Motorola plans to launch 'several' 3G phones supporting the profile this autumn.

A2DP headsets include models from Sony-Ericsson, Nokia, Siemens and I-tech.

New players climb Ipod bandwagon

Apple last month showed off a whole range of products from third-party vendors that are design to be used with the music player, including these striking transparent Harman Kardon speakers (right), which sounded as good as they look.



Great looking: Harman Kardon's transparent speakers for Ipods

The company announced that half a billion tracks had been sold through its Itunes music store, which is designed for Ipod users. But there are now 300 other sites selling music, including 190 in Europe, according to the International Federation of Phonographic Industries.

It reported that legal music downloads grew threefold in the first half of this year, while illegal downloads on peer-to-peer networks rose by just three per cent.

The one sign that the Ipod bandwagon may be slowing down came from HP, which announced that it is to stop selling the music players under its own brand. 'The Ipod does not fit within our current digital entertainment strategy,' consumer technology spokesman Ross Camp said.

● Apple has upgraded its low-cost Mac Mini desktop and Ibook laptop lines. The Minis get 512MB instead of 256MB of Ram as standard and there is a new model with a DVD burner. The 1.42GHz model gets Wifi and Bluetooth as standard.

Ibooks get a new trackpad that facilitates scrolling, a Thinkpad-style motion sensor that protects the hard disk and a faster processor.

>> Sleep on cue

Version 3.50 of a utility called Smartsleep, from the Czech company Dextronet, allows you to schedule shutdowns, reboots, log offs, suspends, hibernation, screen blackouts, and file execution as well as to define screen messages.

A limited trial version can be downloaded from **www.dextronet.com.**

The full version costs $19.95 (£10.90 approx) or $49.95 (£27.31) for an unlimited site licence.

>> Food advice

Picky eaters can have professional advice to hand with a free utility called Mypyramid, which offers guidance from the US Department of Agriculture.

It runs on Palm OS or Pocket PC PDAs and smartphones, as well as Windows PCs and can be downloaded from **www.skyscapeonhand.com/mypyramid.**

>> Square One

Palmone has now officially changed its name back to Palm, though few of its customers appeared to be aware that the brand had changed when the hardware and software arms of the PDA pioneer split into separate companies.

The software division became Palmsource, which sold Palmone the rights to the Palm name.

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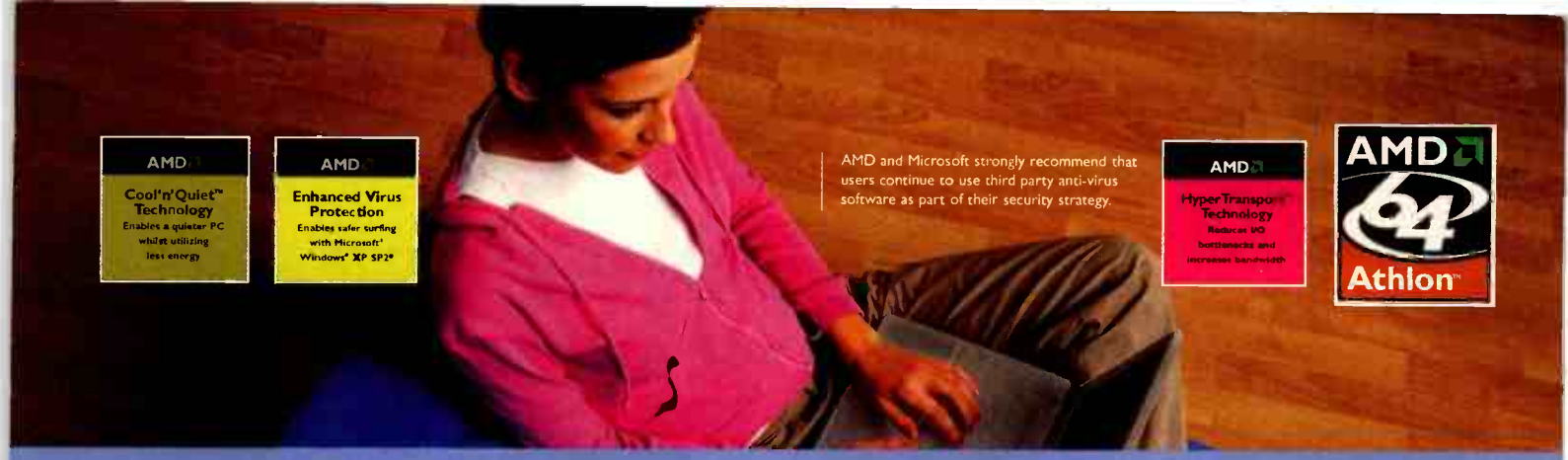

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IBM dual-core one in the eye for Apple

IBM has unveiled a dual-core version of its 970FX PowerPC processor – just weeks after Apple, the highest-profile user of the architecture, announced that it is switching to Intel.

The new 970MP offers nearly double the performance of the 970FX (or G5, as Apple calls it) at a given clock speed, despite the overhead involved in yoking the two cores together. This is partly because each core has 1MB of dedicated L2 cache, compared with 512MB of a single-core 970FX.

Apple justified its switch to Intel's x86 architecture (*PCW*, August, page 16) by saying that PowerPC used too much energy and lacked a good upgrade path. One of the first Intel-based machines it is expected to bring out is a portable based on Intel's Pentium M chip and Centrino platform.

As if in reply, IBM also announced a low-power version of the single-core 970FX, consuming between 13w and 15w at frequencies between 1.2GHz and 1.6GHz on what IBM calls 'typical tasks'. Intel's fastest Pentium M processors have a thermal design power (TDP) of 27w – but that is the maximum consumption going flat out, and the typical drain will be much less.

The dual-core 970MP has power-saving features that are now standard on Intel, such as the ability to match operating voltages and frequencies to the task in hand; one core is powered down completely if not needed, a feature already flagged for Intel mobile dual-cores.

IBM is quick to point out that Apple is just one of many PowerPC customers. The architecture is used in low-end servers, as well as the soon-to-be-released Nintendo Revolution and Xbox 360 gaming consoles.

Faster Itaniums

Intel has recently released two Itanium 2 processors with a 667 front-side bus.

They provide 65 per cent more bandwidth on the data highway linking them to the system memory. Earlier versions had a 400MHz FSB.

Cutting-edge vision aids

Necessity is mother of invention at the human-machine interface

People with sight and hearing problems have become pioneers in the development of the human-computer interface as they harness IT to ease their lives.

They were among the first people to use speech recognition, voice control and text-to-speech because the inevitable limitations and teething problems were minor compared with the difference the technology made to their lives.

Hearing-aid technology led to noise-cancellation headphones, and an exhibition called Sight Village in Birmingham last month showed that technology for the poor-sighted can also have a wider application.

Several companies showed electronic magnifiers consisting of scrollable cameras linked to screens of various sizes and designed to show enlarged views of text. Some mouse-like models fed their images into a PC, laptop or, in the case of a £99-model from a company called Bierley, a TV.

Bierley also offered USB versions, at £275 for mono and £369 for colour including software, which were considerably cheaper than similar devices at the show. Prices are high in these niche markets – partly because of the customisation required – but VAT-exemption and grants are available to people who need the products.

The Read Anywhere system (left) reads aloud as it scans and can be carried in a backpack; Bierley mouse scanner (below right) sends images to a PC; and the HK4 (bottom) can zoom in on distant objects, as well as magnify text to ease reading

One device that could come down in price if it were mass-produced for a wider market was the HK4 camera, which doubles as a magnifier and a telescope. The one pictured above is designed to help poor-sighted pupils see a whiteboard, but if you turn it over and flip the lens it becomes a magnifier. It can cost nearly £2,800, but supplier Steller Technology has cheaper portable versions that come with their own screen or plug into a laptop.

Various desktop systems are available that can read text straight off a printed page, but portable versions are scarce. Visionaid showed one called Read Anywhere, which is basically a scanner and the innards of a PC in one box. It can store bookfuls of pages, so that you can scroll back and forth using a keypad.

The current £2,995 model is for completely blind people, and lacks a screen, but Visionaid plans a version into which you could plug a display. It would, of course, be possible to do the same thing with a scanner and a laptop, but you'd need to tailor software for the task and there was none on show at Sight Village.

Scansoft showed its Speechpak utilities that read out SMS and screen messages on Series 60 and Series 80-based mobile phones.

Go to the web version of this story at **www.pcw.co.uk/2140554** for links to suppliers, including some not mentioned here. **CA**

Smooth words ease reading

This screenshot shows how text remains smooth-edged and unpixellated even at 32x magnification using Zoomtext 9, the coming version of a package aimed at helping poorly sighted people use computers. The view of a Windows hand-cursor hovering over a hyperlink takes up the entire screen. The maximum magnification using Zoomtext 9 is 36x, but the code is currently available only in beta.

The latest full version, 8.1, costs £310 for the magnifier, which goes up to 16x, or £430 with a utility that reads out the screen text. Details at www.soundandsound.co.uk.

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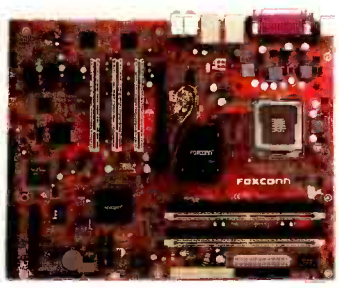

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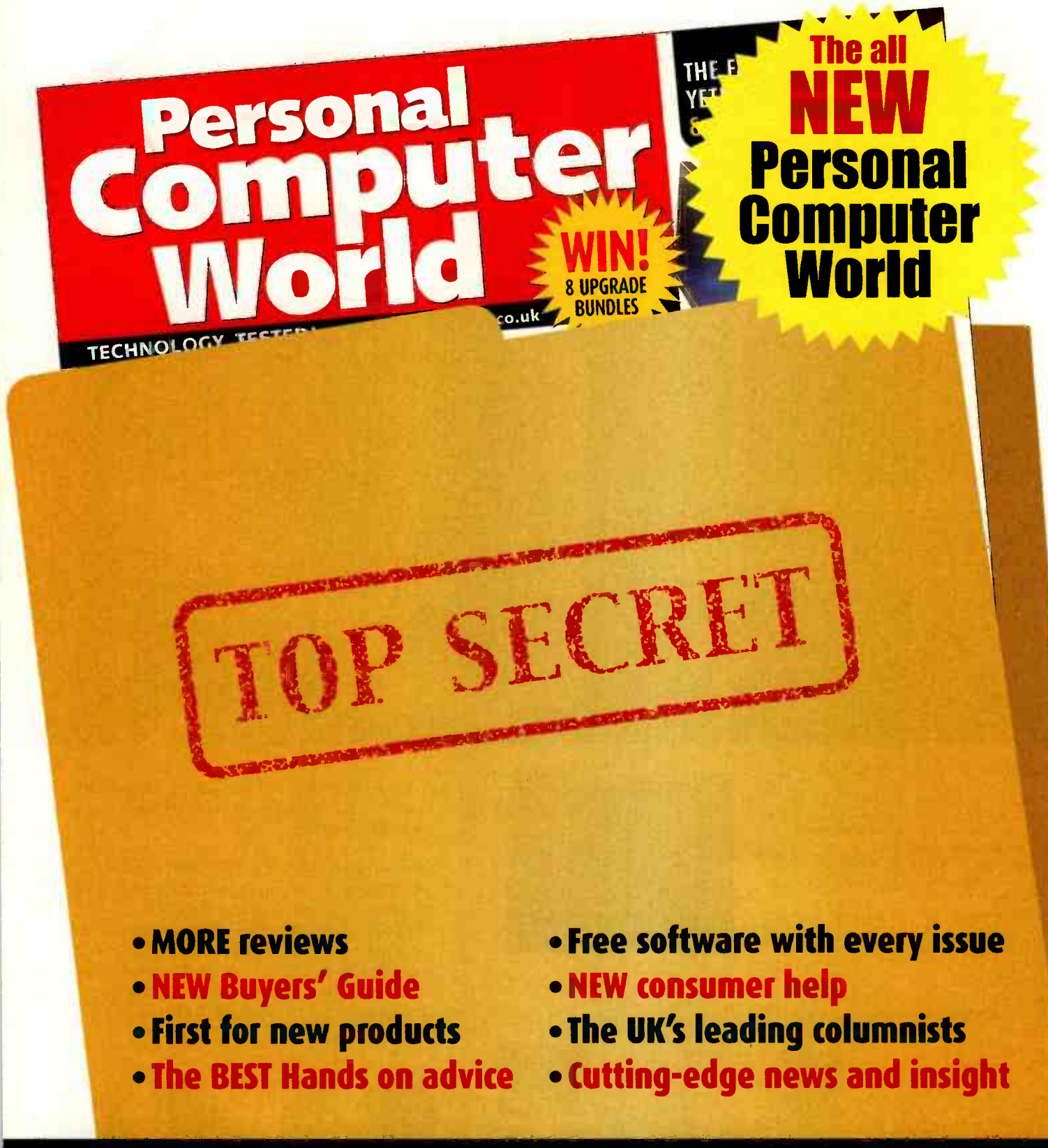

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Enter the wireless web

An emerging standard could allow Wifi access points to link up to form a self-configuring network capable of bypassing the hard-wired Internet.

The 802.11s standard, being drafted by a US IEEE task group, allows for the routing of IP packets wirelessly from node to node over the best available route. The immediate use is to provide web access to a campus or neighbourhood using a single fixed trunk line, eliminating the need for expensive hard-wired links to individual premises.

But if 11s were supported by all access points, local Wifi networks could mesh together to create something approaching a wireless Internet. However, it is unlikely that existing equipment could be upgraded to support the standard, and coverage would never be global. At least 11s would provide an extra communications layer to make the web even more resilient.

Meshing can go even further by establishing Mobile Ad-hoc Networks (Manets) among mobile devices such as phones and PDAs, allowing them to bypass the fixed and cellular systems in densely populated cities. It is not clear whether 11s will cover Manets.

Several proprietary mesh systems are already in use, but they cannot interoperate. The IEEE's 802.11s task group has been given 15 proposals from various companies and industry groups, but there is said to be quite a lot of common ground and a draft standard should be available next year.

One proposal comes from the Wi-Mesh Alliance, whose members include Philips and Nortel. Mark Whitton, vice-president of Nortel's Wireless Solutions, said: 'Wireless users expect secure seamless access anywhere, anytime, and the new standard proposed by the Alliance is designed to enable mesh WLans to meet those expectations.'

The new standard adds yet another letter to the alphabet soup that is the family of Wifi standards: it includes the basic 11a, 11b, 11g and emerging 11n communication modes; 11i security, 11h European enhancements, and 11e for Quality of Service.

Going walkabout with Wip 2

A Voice-over-IP (VoIP) phone that allows you to use a Wifi link to connect to the network has been released by Zultys Technologies.

The Wip 2 phone gives you all the functionality of a desktop IP phone, but provides up to four hours of operation between charges. UK-born Iain Milnes, who founded US-based Zultys in 2001, said no other phone of this type offered the same range of features and battery life. It will work with any system using the SIP protocol and supports voice encryption, presence alerts, paging and conferencing.

He admitted the phone was a little larger than most mobiles. 'But this has a full day of usage, so you can walk around all day without having to charge it.'

Milnes said the VoIP market differed in the US, in that buyers were less interested in cost savings because calls were so cheap there anyway. 'They're much more interested in the business efficiencies VoIP brings.'

Serious crime eclipses teenage kicks

Rewards are no longer effective in helping to track down the writers of rogue code, say security experts. This is despite the $250,000 'bounty' from Microsoft that led to the arrest of the German teenager who wrote the Sasser and Netsky worms that caused billions of dollars worth of damage worldwide.

Sven Jaschan was shopped by two friends and Microsoft says it will offer more rewards in the event of major outbreaks.

But Jaschan's case was child's play that got out of hand and there has been a shift from cyber-vandalism to 'genuine crime', according to David Cole, director of product management for Symantec Security Response.

Criminals are making small adjustments to existing malware in an attempt to slip past filtering software in sophisticated small-scale attacks that make large rewards unsustainable, he said. 'We are moving out of the Wild West mode where we put bounties on people's heads, to a more traditional law enforcement model that mimics what we have outside cyber-space.'

Criminals use worms and viruses for identity theft or to create 'botnets' of 'zombie' PCs to send spam or launch distributed Denial of Service attacks. Identity data can fetch up to $100 per person, depending on how detailed the information is, and botnets comprising a few thousand PCs are rented out for several hundred dollars a week.

Cole pointed out that so far there had been only three so-called 'category 3' threats like Sasser this year, compared with 43 in 2004.

>> Phone Q

Motorola has unveiled this Blackberry-like phone that is said to be half the weight of any other handset with a full Qwerty keyboard. The Motorola Q is based on the ultra-thin design of its Razr phone and uses Microsoft's latest Windows Mobile 5.0 software.

>> Group mail

Sproqit has announced a workgroup version of its email-on-the move system that lets you use smartphones and other handhelds to view Outlook in boxes on remote PCs. Sproqit Workgroup Edition, which costs £584 for a five-user licence, differs from the personal edition in being server-based, rather than requiring a user's desktop PC to be switched on. It supports up to 50 users.

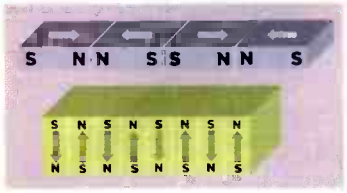
Sproqit functions only as a viewer, so that no information is duplicated or held on easily lost handhelds. But users get email as soon as it arrives at their inbox.

>> 2Mbit Wimax

A 2Mbits/sec symmetric broadband service using wireless Wimax links will be available to businesses in Central London from this autumn. The £295-a-month service will use wireless rooftop antennas to link into backhaul lines and could extend to other cities, according to Robert Condon, chief executive of provider Libera.

>> Car Windows

Microsoft has released Windows Automotive 5.0, a version of its Windows CE 5.0 operating system that is tailored for use in car navigation, entertainment and communication systems. A new toolkit will enable developers to create 3D graphics and advanced navigation displays.



>> Vertical media

A Japanese company has begun what it says is the first commercial production of hard-disk media that uses 'perpendicular' recording to gain a data density double that of conventional devices.

The media from Showa Denko KK (SDK) will initially go into 1.8in drives, storing 40GB per platter, for mobile phones, PDAs and music players. The company is also making 0.85in disks for mobile phones.

Conventional hard disks store data as tiny magnets with the north and south poles aligned horizontally. With perpendicular recording, the poles are aligned vertically so they can be stacked more densely (see diagram above).

>> Scenic view

The BBC has become one of the first organisations to exploit the data-capture possibilities of mobile-phone cameras. Plaques at 100 locations on Britain's coastline will contain bar codes that can be snapped and sent to the BBC, which will send back audio and text information on the area.

The trial, in conjunction with HP Labs and Gavitec, will feature in the BBC 2 series *Coast*. Software for Series 60-based camera phones is free to download from www.bbc.co.uk.

>> Web by wire

IBM is testing a system of delivering data over electricity supply lines, initially as a way of reading household meters remotely. The trial, for Houston-based Centerpoint Energy, could be a cheap way to provide home web access.

Devices that convert wiring inside buildings into networks are now hitting 200Mbits/sec, but there are concerns about radio interference from both the local and wide-area systems. A similar system is being piloted in Winchester.

One screen gives two views

Two people can share one LCD monitor at the same time to perform separate tasks using technology announced by Sharp.

The twin view is produced by superimposing what is called a parallax barrier over the screen, which has the effect of projecting separate images at different viewing angles. Sharp suggests that one user might be working as a PC screen while another watches a video.

It might also be a way to make your boss (or parents, in the case of children) think you are working, when really you are playing a game or surfing the Internet.

A similar idea has been used to produce 3D screens, presenting a slightly different image to each eye to give a stereoscopic effect.

Sharp also announced an LCD that allows you to change the maximum viewing angle of a screen, for instance to shield your work from prying eyes on an airplane.

The screen, developed with the help of researchers at Sharp Microelectronics labs in Europe, uses an extra liquid-crystal layer that can control the direction of emitted light. Sharp says the idea can also be used to stop criminals seeing cash-machine screens.

Philips announced a similar system, developed at its European labs (see below).

Philips puts pictures on your pillow

Philips has unveiled products and prototypes using cutting-edge technologies developed at its European research facility. Prototypes include a pillow and a backpack, which use photonic textiles with embedded organic LED screens that can act as low-resolution displays.

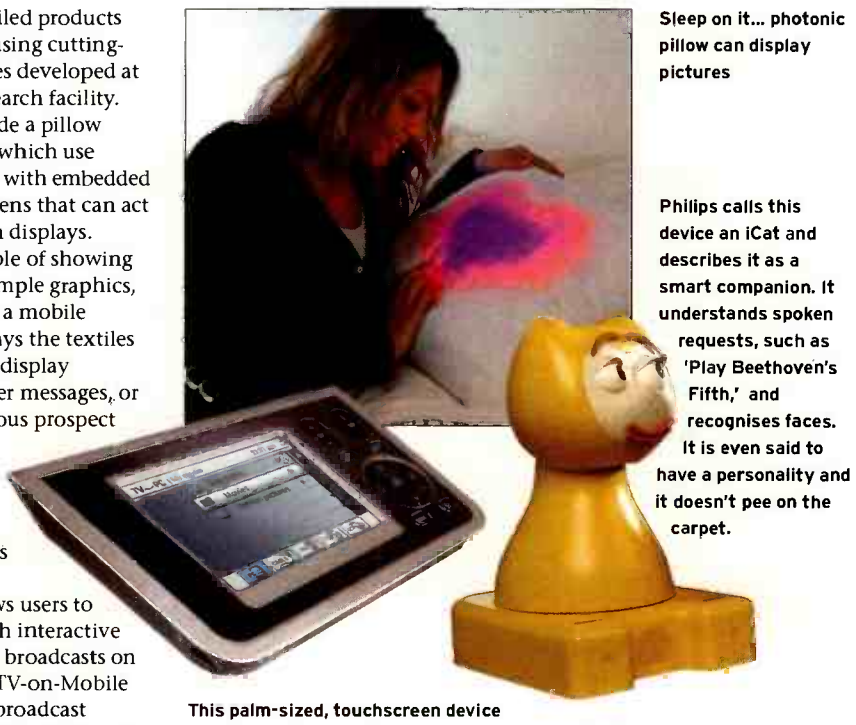
Both are capable of showing light patterns, simple graphics, and text sent via a mobile phone. Philips says the textiles could be used to display wake-up reminder messages, or the more ambitious prospect of a fabric-based wallpaper with programmable designs.

The company's TV-on-Mobile technology allows users to receive and watch interactive digital television broadcasts on mobile phones. TV-on-Mobile uses the DVB-H broadcast specification, which is based on the DVB-T signal and used for digital terrestrial TV in Britain.

TV-on-Mobile trials to send video streams in a format suitable for mobile phones are currently under way in Berlin, Helsinki and Pittsburgh.

A full-scale 16-channel DVB-H trial planned for the UK is set to include music, news, sports, drama and cartoon programmes.

Pixelplus and Naturalmotion picture-enhancement techniques, proprietory technologies found on high-end Philips displays, have been adapted to improve video quality at low frame rates on mobile devices.



Sleep on it... photonic pillow can display pictures

Philips calls this device an iCat and describes it as a smart companion. It understands spoken requests, such as 'Play Beethoven's Fifth,' and recognises faces. It is even said to have a personality and it doesn't pee on the carpet.

This palm-sized, touchscreen device is designed to control any consumer electronics device past, present and future using a Wifi and infra-red connectivity. It has a database of control codes for all known IR devices and can easily learn others, according to Philips. The RC9800i multimedia remote control will be available in September for €499 (£333)

The company also revealed how Near Field Communication (NFC) technology can be used to connect or control devices simply by touching or holding them next to each other. One product was an NFC-key that opens car doors and starts the ignition as the driver approaches. It is set to be used on the forthcoming BMW 7 series.

NFC can be used to simplify the setting up of other wireless links. Philips says it could be used to pair Bluetooth handhelds simply and quickly by holding them next to each other, or connect notebooks to a Wifi network simply by placing them on an NFC panel.

Rory Reid

Google evicts squatter

Google has won a victory against 'typo-squatting' – the use of addresses close to those of much-used sites.

It was granted the rights to the variations googkle.com, ghoogle.com, gfoogle.com and gooigle.com after the US National Arbitration Forum ruled that the registrant, Sergey Gridasov, did not have legitimate interests in names which were 'confusingly similar' to Google's.

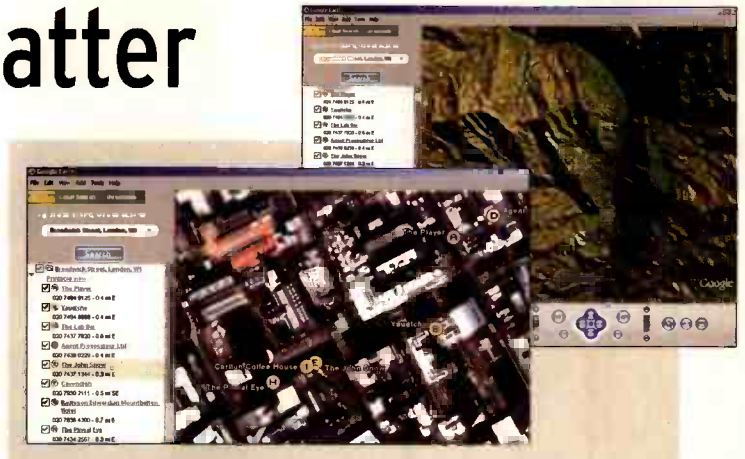
Typo-squatting has long been used to exploit accidental hits, with results ranging from the irritating to the sinister. Many squat sites are simple portals seeking click-through revenues; others offer porn, or 'phish' for banking details by posing as the site the victim intended to visit.

The World Intellectual Property Organization, commenting on a similar case in 2003, said: 'Typosquatting is inherently parasitic and of itself evidence of bad faith.'

Edward Phillips, company solicitor at Britain's Nominet registration organisation, said catching even a small fraction of the traffic generated by a site such as Google could be valuable.

He added: 'There is no way to prevent this totally, so on a practical level it is up to registrants to register variants on their name which they feel may be at risk. For instance, Nominet has registered 'wwwnominet.org.uk' and 'n0minet.org.uk'.'

Phillips said it is possible to take typo-squatters to court on the basis of trademark law. Alternatively, Nominet's dispute resolution service can order the transfer or cancellation of domains that cause 'confusion'.



World in your hands

Google Earth is one of the best free downloads to appear for years. It lets you view satellite images from just about anywhere in the world – including places you could not buy a map for.

You can zoom in and out and 'fly' from one country to another. Places are identified by name and in major western cities you also get points of interest; in US cities, you even get 3D walkthroughs. The interface is so well designed you can use it almost without thinking.

The download is just over 10MB and you need a broadband connection because it streams images over the web.
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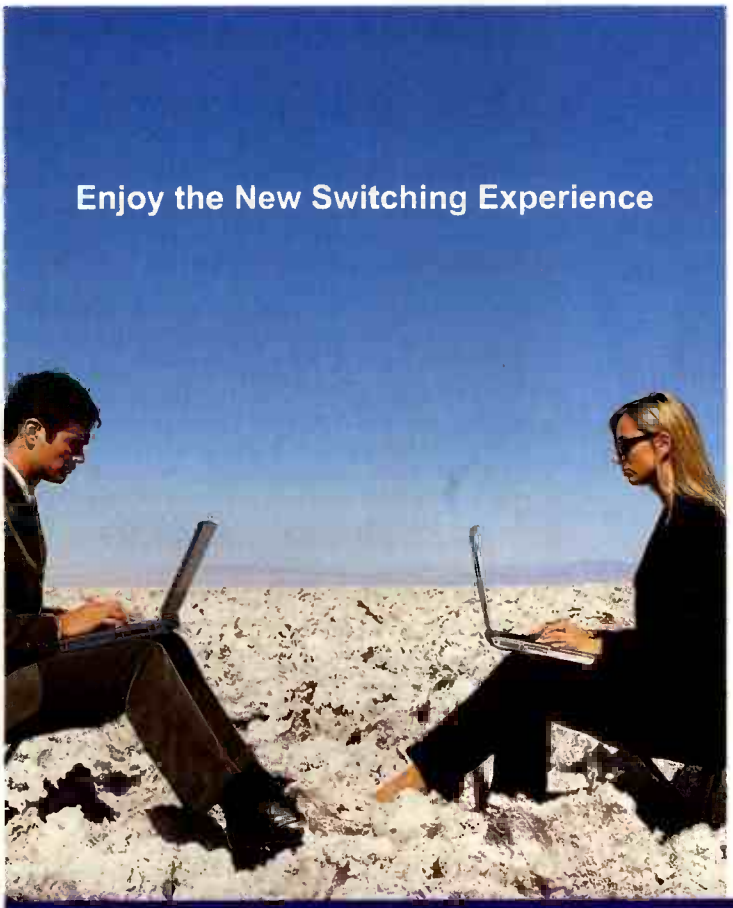

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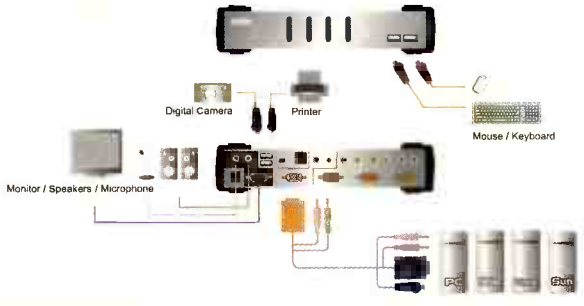

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Letters

The personal touch >

As a home PC builder for family, friends and myself, I have appreciated the recent increase in the number of articles in *PCW* on PC building. Like many readers I often get the 'You know about computers. What do you recommend for...'. For a system I start by asking their budget and then tell them how much they really need to spend.

Obviously there are 'sweet spots' for PC purchases and *PCW* seems to pick them well. I read with interest the £799 PC group test as this coincided both in timing and price point with my friend's request.

Having read the article I was aware of the specification to expect. Then it was off to the various manufacturers' websites. What is immediately apparent is that the PCs you test are often 'specials' for the magazine review. Using the website configuration tools will result in a PC costing much more. Warranty prices will often hike up the price, as does delivery charge.

Is a DIY PC cheaper than a pre-built model?

I can't resist pricing up my own-build machine and, interestingly, it is possible to construct a PC for a similar price to those reviewed. Obviously my PCs don't come with on-site support, but all parts normally come with a one-year manufacturer's warranty and many parts are so cheap and reliable these days that it is easier just to replace them if they go wrong.

Now to the main reason for this letter: it would add something to your PC reviews if you did a sidebar of your equivalent 'home built' PC each time you did a group test. Lots of potential PC buyers may be interested, especially if they have read your 'Build it yourself' articles and want to do something with a personal touch.

David Matthews

Kelvyn Taylor > The prices in our PC group tests always include delivery and VAT: make sure you point this out to the vendor (and mention *PCW*) when ordering. And thanks for your suggestion – do any other readers think this would be useful?

Speed con? >

I've always wondered just how important it is to get the latest all-singing processor rather than one a rung or two down.

It's interesting to look at advice on how to upgrade an old computer. The prevailing wisdom is to boost Ram first, then hard disk size. As to swapping the processor – apparently it's not worth the hassle and cost for the small performance increase.

If that's true of a system that's now second-hand, wasn't it true when that same machine was new? Yet people would have paid far more for the fastest machines of

WIN!

The author of the Letter of the Month will win a Trust Bluetooth Wireless Tablet BT446.

With a stylish and ergonomic design, the tablet can be used for activities such as drawing, sketching, picture editing and handwriting. The tablet connects via Bluetooth (adaptor not included), so you won't have any trailing wires getting in the way. You can find out more about the Bluetooth Wireless Tablet and other Trust products at www.trust.com or by calling 0845 609 0036.

Letter of the month

Yes please, Mac

In reply to the letter 'No Thanks, Mac' (*PCW*, September 2005). I have been running a dual boot Windows XP/Linux computer for the past four years. Windows was so dire that I was only using it for genealogy, personal finance and some website building, everything else being done on Ubuntu Linux. Having read the write-ups, I have now invested in a Mac Mini.

What a revelation! Apple has even copied the KDE bouncing icons, just to make me feel at home. Seriously though, Tiger is just a joy to use. Mail filters out my junk mail to about 98 per cent accuracy, better than any email software I have previously used. I use Moneydancer, for my personal finances, ably replacing Quicken. I still use NVU for my web work and Heredis takes care of my genealogy.

Installing an application is so easy, I had to read the instructions through twice, 'open the disc image, drag and drop the icon into the applications folder', that's quicker even than Debian's 'apt get install'. I can still use the right-click button on my mouse, for copy/paste, as I used to in Linux/Windows. Spotlight finds saved work in seconds. If I need a calculator, one click on Dashboard and there it is.

If a Mac application freezes, simply right-click on the application icon in the dock and select 'force quit', no long list of running processes. The trouble is I have to use Windows XP at work and put up with the stupid notifications – 'You have unused icons on your desktop' and 'your computer may not be virus protected'. What's a virus?

Derek Smith

the time. And isn't the logic just as true for today's new machines? Lots more money for the very top flight, but not a huge speed benefit. In fact, isn't the stress on processor speed just a con?

Kevin Overbury

Kelvyn Taylor > As ever, it depends on what you want to do with your PC. Email and web browsing are fine on even some real antiques – for example, at home I use a 500MHz Pentium III laptop with 96MB of Ram as my 'sitting in the garden listening to music and browsing the web' machine. Yet creating (or even playing) DVDs requires much more CPU horsepower than that system can provide and editing photos is painfully slow.

IT help for the elderly? >

I have an elderly relative in the UK who is virtually house-bound and who, in an effort to keep up with her family in New Zealand via email, has been persuaded to purchase a computer. Unfortunately the level of assistance for her appears to be minimal and she has struggled to manage with only very occasional help from a well-meaning but not very technical friend.

In New Zealand everyone over 55 years of age can pay a small subscription of around £5 a year to join the 'Seniornet' organisation. This has branches throughout the country where they can access a large variety of personally conducted tutorials at a small added cost plus have the daily support of their peers.

The success of Seniornet has enabled thousands of seniors to establish themselves as competent computer users with the corresponding improvement to their lifestyle.

Having searched online, it was a complete surprise to find that a similar system does not appear to operate in the UK and I am writing to enquire whether there is any move to establish Seniornet in England. I am certain it would spread rapidly and be a godsend to those elderly users for whom mobility and access to assistance are a real problem.

C Jarvis

Pixel disappointment >

I recently built a quiet yet powerful PC using the reviews and information from both your magazine and the Internet. There has been one major disappointment – the monitor.

I chose a Viewsonic VP171B-2 for the combination of response time, viewing angles and height adjustment. The screen is absolutely superb except for one faulty pixel. It's not dead, which would not be too bad, but stuck on bright red. It is about a third of the way down the screen and slightly off centre so in a very noticeable place. Because it is red it is very obvious whether watching movies, playing games or in general use. I have tried to ignore it but I can't. I am so disappointed as it means my new PC is not the pleasure it could have been.

I emailed Microdirect who sent back an email explaining how it is a Class 2 product and so it was not returnable under warranty. So, it appears I am stuck with it. I cannot sell it without mentioning the known fault and so I am faced with potentially buying a brand new monitor to replace my brand new one.

Please print all or part of this letter to let your readers know the risks in buying a Class 2 monitor.

Jonathan Beard

Check the ISO pixel tolerance before you buy a monitor

Kelvyn Taylor > Pixel faults are unfortunately unavoidable in TFT manufacture and to get a zero-defect panel you need to look for an ISO13406-2 Class 1 rating – however, these are usually more expensive and intended for professional use. ISO13406-2 has strict allowances of different kinds of pixel faults, assessed on a 'per million pixels' basis. The fault you describe sounds like a Type III fault (a single subpixel fault) and Class 2 panels can have up to five of these per million pixels. So it is well within the ISO tolerance and not technically a faulty product. Viewsonic's policy on subpixel faults is in accordance with ISO13406-2, although it has a zero defect policy in regard of complete pixel faults (a permanently on or off group of red, green and blue subpixels). For more information on ISO13406-2, see www.nec-mitsubishi.com/specials/online_englisch/iso. Viewsonic's policy is online at www.viewsoniceurope.com/UK/Support/warranty.htm.

Taming web pages >

Why do web pages print with the right-hand edge missing? Over the years I've used many printers on many web pages and, recently, unless the page is laid out with all the text centred, the last word or fraction of a word is omitted down the right margin.

Can it be that all web pages are designed around American letter page size, which is slightly wider than A4? I've just tried a new HP laser printer using 'Zoomsmart' (scaled to fit A4) which perfectly reduces an A3 Excel spreadsheet to A4 portrait size but which cannot tame a web page. I, and several thousand others, would be very grateful for for your insight into this phenomenon.

Colin Benson

Kelvyn Taylor > As you've found, many web pages are poorly designed for printing and IE lacks a 'shrink to fit' option. One way of getting around this is to minimise the print margins – choose Print Preview and press Alt & U to get to the page setup. The Firefox and Opera browsers both offer 'shrink-to-fit' printing, but we've found that even these don't always give perfect results.

Dis-integrated >

I think you should ask for the *Boy's Book of Acronyms* next Christmas. In your hard drives Buyers' Guide (*PCW* compact edition, August 2005) you state incorrectly that IDE stands for Intelligent Drive Electronics, in fact it's Integrated Drive Electronics; SCSI is Small Computer Systems Interface (not a serial in sight) and although a case can be made for Redundant Array of Independent Disks, I am 99 per cent sure it was originally inexpensive disks. Maybe I should get out more.

Chris Parsons

Kelvyn Taylor > Duly noted and corrected. Raid has a chequered history, but as you rightly remember, the first paper defining the various levels of Raid did refer to 'inexpensive disks'. Maybe we should stay in more...

Peer pressure >

I found Alan Stevens' Q&A article on VoIP (*PCW*, August 2005) interesting. It was certainly good to have an independent look at the scene, but in reality it did not take us much further forward than your booklet a few months back. It is also unfortunate that it failed to define or address the main problem that is holding back wider public use – the question of 'peering'.

If you enrol with one service supplier, you may have no means of using VoIP to call a person using a different supplier. Some service suppliers have collaborated to allow connections between their respective users (they call it 'peering') and these links are specified on their websites. Unfortunately it appears that the main one, Skype, does not mention this feature on its website and I've not been able to extract the information from the company by email.

I suggest that until there is universal peering, widespread public use will remain at a low level. I seem to recall similar situations in the past. Eventually the suppliers will all have to get together – why not now?

David Boswell

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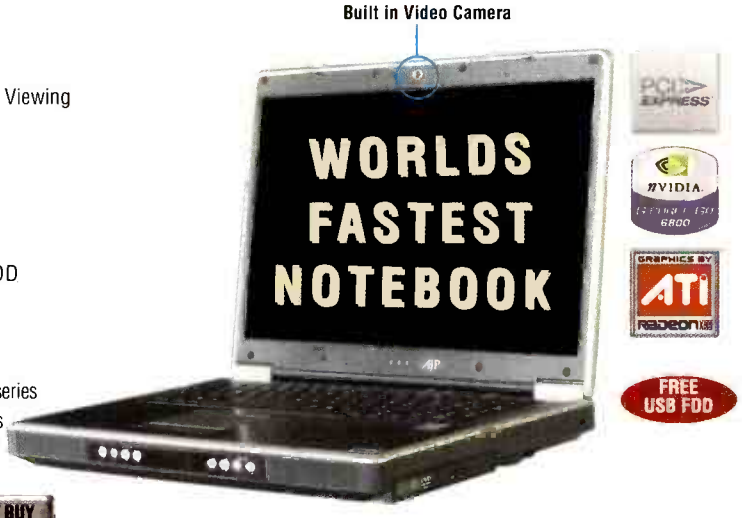

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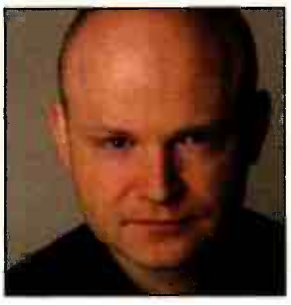

gordonl@pcw.co.uk

When a sweet spot proves not so hot

If you're thinking of buying a 42in TV and connecting your PC, Gordon Laing suggests you think twice

Every product range has a sweet spot where a particular model delivers especially good value. Dropping to the next model down rarely saves much, while upgrading to the next one costs you more. It's all down to component supply, market demand and, of course, manufacturing volumes.

As the manufacturers gear up for autumn/winter sales, nowhere is this better illustrated than large-screen plasma or LCD TVs, whose sweet spot over the next year is the 42in category – give or take an inch or two. Dropping to 37in saves you little apart from space, while the next step up to 50in requires a significantly higher investment.

I believe one of the big selling points of a large LCD or plasma screen is the possibility of connecting a PC. After all, most are equipped with analogue VGA or digital DVI ports.

I'm not suggesting word processing on the big screen, I'm talking about occasionally using it for playing PC games, viewing digital photo slideshows or as the display for a Media Center system – and I'm sure many *PCW* readers in the market for a new big TV have had the same thought.

But while plasma and LCD TVs with their cornucopia of interfaces may seem equipped for almost any source, there's more to delivering a decent PC image than having the right plug. This would be obvious if we were talking about PC monitors, yet even the most basic specifications, such as native resolutions and aspect ratios, are often glossed over when discussing big-screen TVs.

'No-one will appreciate looking 33 per cent wider in a slideshow of digital photos'

Most stores will simply say that if it has a PC plug, it will work with a PC. But as anyone who's bought a flat panel monitor knows, native resolution is a crucial specification. This refers to the number of pixels on the panel itself, such as 1,280 x 1,024, and while a panel can be driven at other resolutions, this involves scaling with often undesirable image artefacts. For the best quality you should always drive a panel at its native resolution. No-one would argue with this in the PC monitor market, yet trying to do the same with a large-screen, flat-panel TV can be fraught with problems and compromise.

In the past, many TV panels sported native resolutions which weren't supported by PC graphics cards. If you were willing to tweak you may have been able to generate a custom mode using special software such as Powerstrip, but for most people it was way too complicated.

More recently, many large-screen TVs have offered resolutions that match standard PC modes, such as 1,024 x 768. At the same time, updated graphics card drivers have become more flexible, offering a wide array of modes designed to drive HDTVs. Both developments allow more screens than ever to be driven by PCs at their native resolution, but the result may not be what you hoped for.

PCs expect monitors to have square-shaped pixels. So if a PC was generating a 1,024 x 768 desktop, it would assume a standard monitor shape with a squarish 4:3 aspect ratio. But many TVs use rectangular pixels. Several 42in HD-ready plasma displays may use 1,024 x 768 resolution, but stretch it across a widescreen 16:9 shape using rectangular pixels.

This is not a problem when viewing standard video sources such as TV or DVD, but connect a PC configured to 1,024 x 768, and its desktop, along with anything on it, would be stretched. The situation's no better with plasmas featuring a native resolution of 1,024 x 1,024.

I hate seeing 4:3 sources stretched to fit a widescreen TV, and if you're running a slideshow of digital photos, no-one appreciates looking 33 per cent wider.

No problem, say the manufacturers: either switch the display to 4:3 mode, or drive it with a genuine widescreen PC resolution, such as 1,280 x 720. Both avoid undesirable stretching, but the first involves wasting much of the screen area with thick black bars running down each side of the image, while the second may fill the screen but avoids the native resolution, involving unwanted scaling.

At this point, most manufacturers or retailers roll their eyes and say they represent a tiny market. That may be true, but I don't think it's unreasonable to demand a display that can fill the screen with an unstretched, unscaled PC image – especially on a set that costs at least £2,000.

If you agree, you should be looking for a TV with a genuine widescreen resolution that can be driven by a PC – something with square pixels and a native widescreen resolution of, say, 1,280 x 720 or 1,368 x 768. But these specifications seem to eliminate every HD-ready plasma at the 42in sweet spot. 50in plasmas will do the trick, as will many LCD TVs, but most of those great-value 42in HD plasmas are infuriatingly hobbled in my view.

Rectangular pixels make no difference for viewing normal sources such as TV, movies and games – this is how most people will use 42in plasmas. But if you want to connect your PC, for the best results you must use a screen with a native widescreen resolution and square pixels.

This issue concerns only a small minority, but I believe this includes many readers of *PCW* for whom the inability to show an uncompromised PC desktop on a high-end TV is a deal-breaker. Sadly this means Media PC fanatics will either have to avoid the 42in plasma sweet spot or accept a quality compromise. ■

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What are online firms so afraid of?

Gives us a telephone number – don't hide behind anonymous email addresses, demands Guy Kewney

Recently, a friend ordered a book from Amazon. It didn't arrive. Complaints to an email address produced instructions to 'check the status of your order' which, of course, showed that it had been delivered.

Another friend was sent an email by her (American-based) accountant. It didn't arrive. Similar things happen all the time, because nothing's perfect. What made these two incidents worth pulling together here is that, in each case, the injured party found there was nobody to talk to.

In the case of Amazon, there is, indeed, a customer relations department. You'd like to speak to them, I dare say, when things go badly wrong.

Forget it: to quote Ellen Hobbs, the Editor of Cliche Ideas (**http://clicheideas.com/amazon.htm**): 'You certainly won't find it on their site. In fact, it only shows up on the page that appears immediately after you place an order. You can, however, find it on my site... I'm including all the customer service contact information that I can find.'

And she includes Amazon's UK customer service number. It's a free-to-call 0800 number. So why does Amazon hide it so well?

Being a journalist, I had a phone number for Amazon anyway; the press department. I spent five seconds asking them to help. They said: 'Call this number' and gave me the customer service number. And then: 'But whatever you do, please don't publish it!'

As you can tell from Hobbs' website, Amazon is far from being alone; she has numbers for Ebay and Paypal, too. And the associated stories are enough to make your hair stand on end.

Verizon, for example, blocks UK email addresses. The company does it, seemingly, at whim. The only way to get through to it is via email; all you get back is a pro-forma statement that they don't block UK emails.

Recently, a small company called My Wifi Zone popped up on my wireless news site and gave itself a plug – how to use its (free) software to block rogue war-drivers from using your broadband. I downloaded, installed and completely failed to operate this software. Reluctant to dismiss the company as a fake (or worse!), I sent it an email via the only means of contact given on its website – a form. Response: zero. Is the software genuinely useful? Or is it going to be a white elephant with no function? Or, even more sinister, will it turn out to be spyware in a year's time? I have no way of finding out.

Is this sort of thing more common with Internet companies than the old bricks-and-mortar brigade? My experience suggests it is. Which raises an interesting question: why?

In some cases, I suspect it's simply indolence. 'If we had a phone number, we'd get complaints, so all customer service calls divert to a pager,' as Dilbert might say. That's common to all Dilbertian corporations.

But I think there is a real problem with web-based companies; their business model was put together in a software development environment, not a customer development environment. Exceptions? Sure, there are plenty – but not enough.

My friend's book had indeed been delivered. The courier had arrived when nobody was at home, and put the brown cardboard box neatly in the green 'recycle this' box. Someone at the Council got a rather nice scanner for nothing. Verizon has been proven to block whole ranges of IP addresses simply because it can't be bothered to waste time doing any actual work, and pick the individual ISPs which are causing spam problems. In both cases, nobody can drive to their offices and stand on the doorstep until a real human being looks at the evidence and says 'we're sorry'.

'If we had a phone number, we'd get complaints, so all customer service calls divert to a pager'

Of course, if a journalist does get through to a real person, they apologise. Profusely. In person, at the highest level. And the gist of it always is: 'We're really sorry, but we trusted the information our computer gave us, and assumed you were lying.' They don't phrase it like that, of course! You get pompous corporate-speak: 'I presume that the agents with whom you spoke did not realise that it truly was an error on our part which caused the problems.'

If only you had a chance to speak to someone! Usually, a quick phone call sorts it all out. But will they let you have the phone number? Forget it.

In the case of Amazon, you get letters promising that the situation will be redressed. John Clark, executive customer relations, wrote to one aggrieved user: 'The phone numbers for Customer Service are at a few places on-site, but I agree that their presentation is inadequate. Again, I can only act retroactively, but I will share your feedback with the appropriate persons as indicative of a way in which we are letting our customers down.'

That was January. It's still letting its customers down, and there's no sign it really cares. It's no way to run a respectable business, retroactively or otherwise. Mr Bezos – I suggest you type this link into your web browser: **http://tinyurl.com/bcqc5** – it's a book called 'Customer service on the Internet' – it may help you, and us. And sell a copy to Verizon and Ebay while you're at it.

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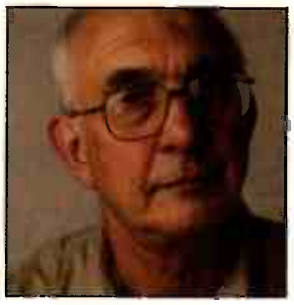

Keys, codes and unplayable discs

Hollywood's great hope in the war against DVD hacking is to launch soon. Barry Fox has some good and bad news

barryf@pcw.co.uk

Hollywood sees blue laser as a way to save face after DVD's copy protection, CSS (Content Scrambling System), was defeated. A hacker simply sucked the encryption keys out of a legitimate player and grafted them into the DeCSS disc copy software. Using new keys on DVD discs would have made them unplayable on all existing players.

The DVD Forum, which backs HD-DVD blue laser, has now formally adopted the Advanced Access Content System (AACS), and the rival Blu-ray disc system is likely to use something similar. I set out to learn more about AACS.

AACS was developed by Intel, IBM, Panasonic, Microsoft, Sony, Toshiba, Disney and Warner. It is 'renewable' if hacked. It uses 'broadcast encryption' for one-way delivery of new keys, and revocation of hacked keys, without the need for a phone line.

Cryptography Research of San Francisco has been warning that this will leave some legitimate players unable to play some legitimate discs. So I asked the Motion Picture Association of America (MPAA), which represents the Hollywood studios, whether, after keys have been revoked, a player will still play old discs but not new ones? Or will it only play new discs, not old?

The MPAA didn't know and referred my question to the AACS consortium. Here are the facts.

There will, of course, be two types of HD-DVD player: standalone boxes like today's DVD players, and PC software players such as Windows Media Player or Real. All these players hold partial key codes that handshake with partial key codes on the movie discs to generate a full unscrambling key whenever a disc is put into a player.

Every copy of the same version PC player software has the same key. Although the software keys are well protected (by tamper-proofing the player software), the AACS guys know that anyone who extracts a key from a software player will then be able to use it to write DeAACS software. So every six months or so there will be 'proactive renewal' of software player keys. Users will be invited to download a new version of their PC player software, with new keys.

Then, after around three months, the old keys will be routinely revoked. People who have not updated their player software will be unable to play new discs.

If a software key is hacked and crops up in DeAACS disc-copying software, the key will be urgently revoked by issuing a new version of the PC player software with a fresh key. Users will be warned to download the new version or their PC player software will stop playing new discs.

Hardware keys work very differently. Each hardware box has a unique key code – so two otherwise identical Acme XYZ100 players will have different keys. It will be hard to get the key out of the player, but not impossible (for example, by physically tampering with the chips and using an electron microscope). So the hardware keys have been designed not to work within a software player.

If a hacked hardware key is used to build illegal hardware (which is unlikely, as it will be quite easy to track down the culprits) all the illegal hardware would effectively be clones of the one hacked player box. So revoking the one hacked key – again by code on a movie disc – will effectively disable the original player and all the cloned hardware. None of this hardware will be able to play or copy new discs; but it will continue to play old discs. It's unlikely the owners of hacked players will dare complain.

The worst case scenario is a Class Attack where a piece of widely distributed software, written by a hacker, could compromise a range of hardware players by sucking out their keys. Hacked keys would then become available too quickly for AACS revocation to keep up.

'Windows Media Center PCs won't play HD-DVDs if owners don't update the software'

This is why Cryptography Research developed Self-Protecting Digital Content (SPDC), which works with AACS. Software on the movie disc would 'sniff' the player model, decide whether to play a disc, and display a notice telling the owner how to get online or phone help.

'Professional pirates, or Joe Sixpack with an unauthorised disc copy program on their PC, will not phone,' said Paul Kocher, CR's president and chief scientist. 'Owners of players and PCs that are legitimate but bugged will get a free fix. We believe that the right approach is to provide next-generation optical media formats with protection by using both AACS and SPDC.'

But at a recent meeting of the DVD Forum's experts in Venice, SPDC was voted against because the Forum worried about adding too much complexity. So HD-DVD will launch at the end of this year with AACS only.

PC players will rely on continual updates to stay working and hardware players will be made more 'robust' against attack. AACS is not saying how, but one recently patented trick is to put sensitive chips inside a wire cage that shields against snoop radiation and makes the chip self-destruct if anyone tries to break through the cage.

The bad news for Microsoft is that people will find their Windows Media Center PCs stop playing HD-DVDs, if they aren't PC-savvy and don't update the software.

The good news for all of us is that HD-DVD's regional coding will not be tied to AACS. So, as now, we should still be able to buy players that play imported movie discs.

Reviews

EDITED BY WILL STAPLEY

EXCELLENT ★★★★★ VERY GOOD ★★★★★ GOOD ★★★★★ BELOW AVERAGE ★★★★★ POOR ★★★★★

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Find out if the speed of Acer's Ferrari 400SWLMi notebook matches its stylish looks

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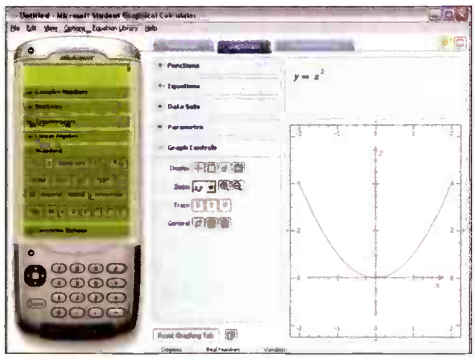
If you need a tiny screen with a touchscreen, this device from Lilliput could be just the thing



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Microsoft Student 2006 is a great educational resource to help teenagers with their homework

We've got a couple of PCs with a difference this month. First up is Cube247's Taurus system (see review opposite). Featuring no fewer than three 19in TFT monitors, you'll have a huge combined desktop resolution of 3,840 x 1,024. The monitors might not be made by a leading brand-name company, but the price of the system is surprisingly low. The second PC is the Lumina from Elonex. With a staggering 40in TFT display, it's a Media Center system like no other.

If neither of these grab you, perhaps Evesham's ridiculously fast gaming PC will appeal. It houses two Nvidia Geforce 7800 GTX graphics cards in an SLI (Scalable Link Interface) configuration (See also our group test of 7800 GTX graphics cards in this issue). Combine this with AMD's Athlon FX-57 processor and you've got a blazingly fast system. Turn to page 42 to find out how well it fared in our 3D benchmarks.

Security is big business and biometric devices are appearing on all manner of PC equipment. You'll find fingerprint readers on kit such as mice, USB keys and notebooks, and we've got a full round-up of the latest biometric products on page 46.

Media streaming is nothing new, but the Sonos Digital Music System is unlike anything else we've seen. Serving as a music streaming system for your entire house, it's both stylish and feature packed. One thing's for sure though – it's not cheap. Check out the review on page 44.

Carrying on the wireless networking theme, US Robotics recently released its Maxg range. It doesn't make use of Mimo or Super G technology, but it's still able to offer greater bandwidth and range than 802.11g kit.

You'll also find the usual selection of PC components (fans, cases, power supplies, motherboards and more) in this month's reviews, along with LG's latest 20in monitor and a 7in touchscreen display from Lilliput.

Microsoft's Student 2006 package heads our software section. Aimed at students aged between 12 and 18, it's designed to integrate with Microsoft Office (so you'll need to buy a copy if you don't already have one), and it serves as a basis for research and completing homework assignments.

Finally, we've reviewed Grisoft's AVG Plus Firewall package and an interesting Napster-style service from Metaboli that offers for legitimate game downloads.

Sub-£600 notebooks
Free yourself from your desk with one of these great-value laptops. Turn to page 83

Open-source software
55 essential Windows tools – for free! To find out more go to page 75

MULTI-SCREEN PC

Cube247 Taurus

The widescreen concept is taken to new extremes

No, this isn't a multiple-exposure error by our photographer. The Taurus is the latest in a line of computers from Cube247 that uses three separate TFT monitors.

Far from being superfluous additions, the Taurus' multi-monitor setup has its advantages over a single large display. All three screens can be used to separately display the same image but, more usefully, your PC desktop can span across all three for a combined resolution of 3,840 x 1,024.

This provides a far greater desktop area, allowing for three maximised application windows or scores of smaller windows. This configuration also benefits gamers. In titles such as Microsoft Flight Simulator 2004, players can use each screen for a separate view. The Taurus also includes a digital TV tuner card, so you could use one screen as a semi-permanent TV display, with the other two working as normal.

Unfortunately, Cube247 doesn't quite get it right with the Taurus. The problem lies in its choice of monitor – an important decision if you're supplying three of them in one go. The Taurus uses the relatively unknown 17in Difusion F176 displays. Each has a thick outer bezel, which places a wide border between each screen. Another slight issue is that they're let down by relatively poor reproduction of colours near peak white, but unless you're an image professional you shouldn't notice any real problems.

The Difusion F176 also lacks a DVI-I digital input connector, relying instead on the standard analogue D-Sub alternative. Although image quality is similar, you'll find that monitors supplied with an analogue signal will occasionally require auto-calibration.

Rather than using a graphics card with three or more discrete output ports, Cube247 has opted for a 256MB PCI Express ATI Radeon X700 Pro card, with one analogue and one digital output. The primary monitor (usually positioned in the middle) is connected to the card's DVI port via an analogue adapter, while another is connected to the analogue port. The third screen is connected to an analogue port linked to the motherboard's integrated graphics card – courtesy of the Radeon Xpress 200 chipset. Not the most elegant method of connecting three screens, but it works. Inexperienced users may find it quite confusing to begin with, but Cube247 supplies instructions to all Taurus customers on how to connect the monitors correctly.

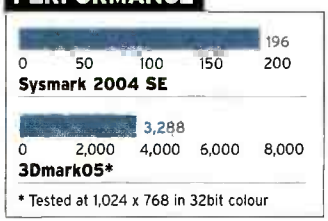
The rest of the PC is very ordinary in contrast, but we were pleased Cube247 didn't skimp on the core components. At the heart of the PC is a 3.4GHz Pentium 4 CPU paired with 1GB of DDR400 Ram from memory specialists Corsair. This provides good performance across a range of applications, as indicated by its Sysmark 2004 SE score of 196. A pair of 200GB Seagate hard drives supply ample storage space and are configured in a striped Raid array. This improves performance but, as with all striped Raid configurations, if one of the disks fails, you'll lose all your data. A Raid-1 configuration mirrors the two drives and offers a more secure form of storage, but the amount of space on offer is effectively halved. If you plan on amassing a large media collection, for example by using the integrated Twinhan digital TV tuner to record shows, you will want all the storage space you can get. The Taurus also comes with a 16 speed dual-layer DVD rewriter, so you can make large backups of your multimedia files if space becomes tight.

The Taurus package is rounded off with a Microsoft wireless keyboard and optical mouse desktop set and the Creative Inspire P5800 six-channel speaker system.

This is the first PC we've reviewed with three monitors as standard. Although demand may be low for this type of setup, the multiple screens can benefit all sorts of applications. Cube247 could have implemented it slightly better, but the Taurus is a decent effort.

Rory Reid

PERFORMANCE



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

DETAILS

RRP £1,499 (£1,275.75 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Cube247 0870 242 1179
www.cube247.co.uk
SPECIFICATIONS
Intel P4 3.4GHz with Hyperthreading • 1GB DDR400 Corsair Ram • 2 200GB hard disks • 3 17in TFTs (16ms) • Sapphire ATI Radeon x700 Pro 256MB PCI Express • Twinhan Digital TV card
PROS High combined resolution
CONS Thick bezel on monitors
VERDICT
Could have been implemented better, but the Taurus is a solid multi-display computer

FEATURES	★★★★☆
PERFORMANCE	★★★☆☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★☆☆

DUAL-SLI PC

Evesham Decimator 78FX

Two 7800 GTXs make this a beast for graphics and ultra-fast gaming

If you thought last month's Mesh Matrix Titan FX57 GTX was powerful in the graphics department, check out Evesham's latest effort.

Incorporating not one, but two Innovision Nvidia Geforce 7800 GTXs in a dual-SLI (scalable link interface) configuration, you can take it from us: this machine is seriously fast when it comes to 3D gaming. Usually we'd detail other specifications first, but in this case it's only right we head straight to the benchmark results.

Mesh's single 7800GTX PC clocked up 7,703 in 3DMark05 last month, but with its two 7800 GTXs, this Evesham astounded us with a score of 12,273, which makes our previous top dogs look lethargic. In real-world testing, results were similarly impressive with Far Cry notching up 83.05fps (frames per second).

Helping the Decimator 78FX to achieve these results is the latest AMD processor – the Athlon 64 FX-57. Unlike the dual-core Athlon X2 series, the FX-57 is a single-core CPU. You shouldn't get too despondent, it's still blisteringly fast, but if you're in to multi-threaded applications, such as video editing or 3D graphical rendering, you might want to opt for a dual-core PC. Two 512MB PC3200 Dimms provide the FX-57 with 1GB of Ram, the bare minimum we'd expect with a system of this ilk.

Sysmark 2004 SE doesn't concern itself with powerful 3D graphics, but the score of 229 is still 10 points more than last month's Mesh, which housed the same processor. The main reason for the 10 point increase is down to the hard drives in a striped Raid configuration, which allows for faster disk access. With both Maxtor Serial ATA drives offering 250GB of storage, you've got half a terabyte of disk space to play with.

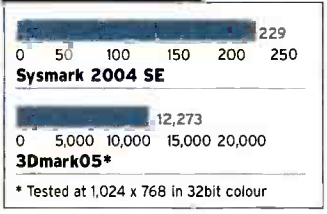
Evesham's stylish and robust case always impresses us. With its front-panel display, which details temperatures, fan speeds and the date and time, it would be a travesty to hide it under your desk. Unlike the cases used by most PC vendors, you won't see this case used by anyone other than Evesham.

As with Mesh's 7800 GTX system last month, Evesham has elected to supply a 19in TFT. The Viewsonic VX924 has an impressive 4ms response time, but it's the native resolution of 1,280 x 1,024 (the same as most 19in monitors) that disappoints.

With such outstanding graphical performance, any serious gamer would demand a 20in TFT with a resolution 1,600 x 1,200. That said, we can understand how Evesham might want to keep the already sky-high price down.

Audio is handled by Creative. You'll find an Audigy 2 ZS sound card inside the PC and Creative's Inspire T7900 7.1 surround-sound speakers. Precisely the kind of audio setup required to take advantage of what the Decimator 78FX has to offer.

PERFORMANCE



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

It's taking some time for the major PC manufacturers to start submitting the new 64bit version of Windows, and Evesham has decided to stick with XP Home Edition – keeping the price down was probably a consideration here. You don't get any other software packages as standard, but Evesham provides a decent warranty. Two years' worth of onsite maintenance is followed up by a third year return to base.

If you like the sound of Evesham's Decimator 78FX, the price tag may be enough to put you off – £2,699 is a lot to spend on a PC. With Mesh's single-7800 GTX system last month, which housed very similar components and an extra 1GB of Ram, coming in at £1,000 cheaper, we feel this Evesham is a little overpriced.

The impressive case, greater storage and second 7800 GTX obviously push the price up, but we didn't expect this to be by more than around £600.

Will Stapley

DETAILS

RRP £2,699 (£2,297.02 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Evesham 08701 609 500
www.evesham.com
SPECIFICATIONS
AMD Athlon FX-57 • 1GB PC3200 Ram • 2x Geforce 7800 GTX graphics cards • 2x 250GB hard drives • Sony dual-layer DVD burner • 19in Viewsonic VX924 • Creative Inspire T7900 speakers • Windows XP Home • 2yrs onsite, 1yr RTB
PROS Ultra-fast gaming; decent case
CONS 20in monitor would be better
VERDICT
Two 7800 GTXs provide this PC with awesome graphics power, but most gamers would demand a 20in TFT

FEATURES	★★★★☆
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★★☆

MEDIA CENTER PC

Elonex Lumina

Much more than a 40in screen

It may look like a high-end TV, but the Lumina is a PC at heart. At the rear of the 40in TFT panel is a 3GHz Pentium 4, 1GB of Ram, a 400GB hard drive and ATI Radeon 9600 graphics. Windows XP Media Center Edition 2005 enables you to watch and record TV, listen to music, and browse photos on a PC via an easy-to-use interface. Elonex ships a TV tuner that can be used either as an analogue or digital model, but you can't use both as the same time – so you can't watch one channel while recording another.

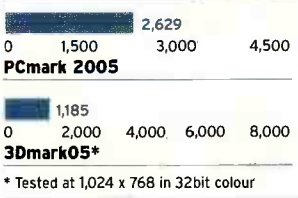
Given the cost, we expected the Lumina's screen to be of a high standard and we weren't disappointed. A range of inputs enable you to use the screen as a standard TV without launching the PC. However compression on digital Freeview broadcasts resulted in noticeable artifacts not usually apparent on smaller screens. This improves when playing high-definition content from the hard disk, and the few dropped frames were probably the result of the modest CPU.

The extensive range of ports doesn't include a DVI or High Definition Multimedia Interface (HDMI) connector, so it's not compatible with forthcoming HD broadcasts from Sky. And the integrated speakers were unforgivably quiet.

It's hard to recommend the Lumina, which is a shame, as it is the most stylish Media Center PC we've reviewed. But, given its price and the lack of an HDMI connector, we'd advise you to wait for an updated model.

Rory Reid

PERFORMANCE



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

DETAILS

RRP £3,675 (£3,127.66 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Elonex 0800 0374 444
www.elonex.co.uk
SPECIFICATIONS
P4 3GHz • 1GB of Ram • 400GB hard drive • 40in TFT • 1,366 x 768 native resolution • 800:1 contrast ratio • ATI Radeon 9600 • Digital/analogue TV tuner • DVD rewriter • Memory card reader • 802.11b/g
PROS Good-quality screen
CONS No HD connectors; single tuner
VERDICT
A great idea, but let down by number of factors including lack of support for HD broadcasts

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

TURION NOTEBOOK

Acer Ferrari 4005WLMi

It's got the looks, but what about speed?

Another year, another Acer Ferrari notebook powers its way into PCW. Unlike previous models, the Ferrari 4005WLMi makes more of an effort to live up to the hype generated by its name.

Like the sports car, it looks stunning. The black carbon-fibre lid is subtler than the garish red of previous versions, while the case is very sleek.

Under the hood sits an AMD Turion ML37 processor purring away at 2GHz, supported by 1GB of Ram. In our labs, the 4005WLMi scored 138 in Sysmark 2004 SE and 2,713 in PCmark 2004 – both are respectable for such a notebook, but certainly not jaw-dropping.

The 15.4in widescreen display performs well, as do the graphics. Powered by ATI's 128MB Mobility Radeon X700 chipset, the Ferrari achieved a 3Dmark05 score of 2,411.

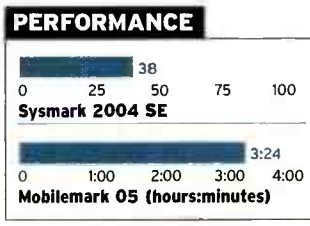
Dotted around the sides of the case are all the usual ports and sockets, including four USBs, a mini Firewire and a 5-in-1 memory card reader. There are also options for connecting the 4005WLMi to an external display, in the shape of VGA, DVI and S-video ports.

Bluetooth, 802.11g and a dual-layer DVD burner are all present. Battery life ran to a reasonable three hours and 24 minutes in our Mobilemark test.

The Ferrari 4005WLMi is a well-designed notebook but, while Acer has tweaked the Ferrari's engine, it's still not in pole position in the world of portable computing.

Luke Peters

PERFORMANCE



DETAILS

RRP £1,409.99 (£1,199.99 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Acer 0870 853 1000
www.acer.co.uk
SPECIFICATIONS
AMD Turion ML37 processor • 1GB Ram • 100GB hard drive • ATI X700 128MB graphics • Dual-layer DVD • 802.11g • Bluetooth • XP Professional • One-year warranty • 363 x 256 x 34mm (w x d x h) • 2.86kg
PROS Stylish; comfortable to use
CONS Should perform better
VERDICT
Better than its predecessors and a good-quality notebook, but the Ferrari could do better in the speed stakes

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

MUSIC STREAMING

Sonos Digital Music System

Fill your home with music like never before

It's not often we see a piece of kit that makes our jaws drop, but the Sonos Digital Music System did exactly that.

It's far more expensive than any other streaming device we've seen, but then it's aimed at a difference audience. Whereas the Negear MP101 or Pinnacle Showcenter will send music on your PC to a single set of speakers, the Sonos serves as a wireless music system for your entire home. Best of all, it's remarkably easy to set up.

Simply connect a Zoneplayer (the receiver) to your router and hook it up to some speakers – each Zoneplayer houses a 50w per channel amp. Point the server software at your music collection and you're away. Up to 32 wireless Zoneplayers can be connected at once, each controlled by a single, and very stylish, wireless remote with a 3.5in colour display. The remote is used to navigate tracks, adjust volume levels in each zone and specify what tracks should be playing where – the same track can be played in each zone without echoing.

Just about every audio format is supported, but not wma files with DRM. It will, however, connect to Internet radio stations. Most important of all, sound quality is exceptional.

Impressively, music can even be encoded on the fly from Zoneplayer's line-in port. Plug in an audio source to one Zoneplayer and it will broadcast to the rest in real time.

One annoyance is that a single Zoneplayer must always be connected to your router via an Ethernet cable (not wirelessly).

At £899 inc VAT for the introduction package (two Zoneplayers and the remote), it's incredibly expensive. Then again, it's always going to cost a lot to share mp3s throughout your house in this way, and the Sonos does a terrific job.

Luke Peters

DETAILS

RRP £899 (£765.11 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Sonos 0808 234 6596
www.sonos.com/uk
SPECIFICATIONS
Zoneplayer: Line-in • Line-out • 50w RMS per channel • 4-port switch (10/100) • 260 x 209.5 x 113mm (w x d x h) • 4.5kg
Remote: 3.5in backlit colour display • 2-5 day battery life • 165 x 24.5 x 97mm (w x d x h) • 360g
PROS Simple set up; sound quality
CONS Expensive; no DRM support
VERDICT
A truly amazing music streaming device, but incredibly expensive

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★★☆

PERSONAL VIDEO RECORDER

Kiss DP-558

Record TV, play DVDs and surf the web

Hard disk video recorders will fight for top spot on many Christmas lists this year, but they're not just about recording TV shows – many come with additional features. The Kiss DP-558 doesn't just operate as a PVR (personal video recorder), it also allows you to play media files stored on a PC, access web pages and play DVDs. Unlike the Mustek R580 (reviewed *PCW* September 05, p71), you can't burn DVDs with this model.

The player itself is about the same size as a Sky+ box, but looks a lot like its ugly sister. It houses just a single analogue receiver, so you'll need a separate Freeview box if you want to receive digital TV. Recording is a simple, one-button task and will archive your selection to the 80GB hard disk. You can't change channels while recording as there's only one tuner, but you can choose from six recording quality settings (between 21 and 102 hours total recording time). Navigating your recordings is easy once you've figured out the remote control.

Attaching the player to the Internet via the Ethernet socket opens up the EPG (Electronic Program Guide) and allows you to browse Kiss web pages for, among other things, Internet radio stations. As the DP-558 has its own IP address, you can also remotely schedule recordings and manage the contents from any computer with an Internet connection. A wireless option is, however, sadly lacking.

DivX, mpeg4, mpeg2 and Xvid video are all supported, while connection options include Scart, composite and component video. Digital audio is also available. Everything considered, the DP-558 has some quality features, but almost £300 is a bit steep for a PVR that can't receive Freeview and has only one TV tuner.

Luke Peters

DETAILS

RRP £293.75 (£250 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Kiss **www.kiss-technology.com**
SPECIFICATIONS
80GB hard drive • 10/100 Lan • Formats: DivX, Xvid, mpeg2/4, mp3, ogg, jpeg • Inputs: coax, Scart, composite, component, S-video • Outputs: coax, Scart, composite, component, S-video • Audio: analogue, digital (coax and optical)
PROS Can be networked; connection options
CONS One tuner; no DVD burner
VERDICT
A good idea, but the lack of tuners and no integrated digital TV is a big turn-off

FEATURES	★★★☆☆
PERFORMANCE	★★★☆☆
VALUE FOR MONEY	★★☆☆☆
OVERALL	★★★☆☆

MULTIFUNCTION DEVICE

Lexmark P4350

Good design and quality prints

The P4350 is Lexmark's newest multifunction device (MFD) and the design is an improvement on previous models.

Combining a flatbed A4 scanner with an inkjet photo printer in a sleek and stylish case, the P4350 will also produce colour photocopies. The memory card reader built into the control panel spanning the front of the unit grabs image files from every major memory card format, while a USB socket enables you to print photos direct from a Pictbridge digital camera.

A range of image manipulation features make getting the most from your photos simpler. Dedicated resize and rotate buttons at the front of the unit allow you to alter the dimensions and orientation of photos, while the menu button gives access to basic image-editing settings, print quality and paper size options.

Images can also be previewed on the 1.7in colour LCD screen or printed as an index sheet of thumbnail images. The inclusion of a page preview button to the left of the display lets you print draft photos before moving on to the more expensive photo paper for the final print.

The printer houses a three-colour cartridge (cyan, magenta and yellow) along with a photo cartridge (light black, light cyan and light magenta). Image quality was good and on a par with other MFDs, but not a patch on the capabilities of more expensive dedicated photo printers. As far as photo print speeds go, the Lexmark won't break any records. Waiting more than six minutes for an A4 colour photo at top-quality settings can be a real drag.

The Lexmark P4350 might not be able to produce pixel-perfect prints, but you do get a lot for your money.

Emilie Martin

DETAILS

RRP £116.33 (£99 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Lexmark 08704 440 044
www.lexmark.com/uk
SPECIFICATIONS
4,800 x 1,200dpi printing • 600 x 2,400ppi scanning • 6-colour printing • Memory card reader • 1.7in colour display • 100-page input • USB2 • 4.8kg • 435 x 334 x 177mm (w x d x h)
PROS Good design; compact
CONS Print speeds
VERDICT
Well-designed multifunction device that produces good-quality photo prints and houses some useful features

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

COLOUR LASER PRINTER

Canon LBP-5200

Decent output at a reasonable price

The price of colour lasers has now dropped enough to make them worth considering for large volume printing. The LBP-5200 is the latest, and cheapest, addition to Canon's Laser Shot range.

Cheap doesn't have to mean nasty and the LBP-5200's features surprised us. It's capable of churning out mono text at a rate of 19ppm (pages per minute), which is Canon's claimed print speed, but doesn't take into account the 24 seconds for the first page to appear.

Colour images mixed with text took a bit more processing time. When we printed 10 pdf documents they arrived in two minutes, 44 seconds, which equates to around four pages per minute (ppm). A full A4 colour image took 38 seconds to print.

Print quality was impressive considering the printer's cost. Black text was sharp, accurate and legible at all point sizes tested (2-100pt). Colour graphics were good and largely free from the laser hatching effect.

Colour photo quality was admirable, but lacked the depth, clarity and richness of inkjet printing. Canon's Automatic Image Refinement (AIR) technology, which allows an equivalent printing resolution of 9,600 x 600dpi, helps out, but if you're after photo prints then an inkjet's your best bet.

One slight downside is the 125-sheet paper feed, which is exposed to the elements and feels slightly flimsy. Paper has to be removed if you want to print envelopes and suchlike. A 250-sheet cassette and a network module are optional. Running costs are average, with toner at around £45 for the three-colour cartridges and £52 for black toner, lasting 2,000 pages and 5,000 pages respectively at 5 per cent coverage.

Overall, the LBP-5200 is a quality laser at a good price.

Luke Peters

DETAILS

RRP £224 (£190.64 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Canon 01737 220 000
www.canon.co.uk
SPECIFICATIONS
600 x 600dpi • 19ppm mono, 4ppm colour • Toner: 2,000 pages (colour), 5,000 pages (black) • 125-sheet paper tray • A4 printing • 8MB Ram • USB2 • 482 x 451 x 325mm (w x d x h) • 17kg
PROS Good quality and reasonable running costs
CONS No paper cassette or network as standard
VERDICT
Good quality, speed and price, but lacks some basic features

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

MINI ROUND-UP

Biometric devices

Too many passwords to remember? Let your finger help you out

Originally the stuff of James Bond and science fiction films, devices that recognise a user by their face or fingerprints are now a reality. Today, biometric technology is making its way into just about everything, from office buildings and health clubs, to notebook PCs, keyboards and mice. Even more amazing is that it's not expensive – you can add a biometric peripheral to your system for about £30. As well as replacing or supplementing traditional methods of security, biometrics can make devices easier to use. Instead of having to remember umpteen different passwords for your favourite websites, for example, you can identify yourself quickly and easily by placing your finger on a small scanner. Here we round up the latest biometric products designed to increase both security and convenience.

APC Biometric Password Manager and Mouse

APC's Biometric Password Manager and Mouse products are designed to replace passwords with a fingerprint-recognition system. The former comprises a small fingerprint reader, known as a Biopod, while the latter integrates this into a standard two-button wheel mouse. Both come with Omnipass password management software from Softex.

Setting up is straightforward and extra-long USB cables make it easy to connect either device to a PC housed under a desk. Once you've installed both the hardware and software, the enroll wizard takes you through the process of recording your fingerprints.

Omnipass starts by assigning your prints to the master Windows password, but it's just as easy to replace website or email login details. That said, while it worked fine with Internet Explorer, Omnipass doesn't work with Firefox; however, an update is planned.

The software supports up to 20 users and can be used to encrypt files and folders, but there is no option to automatically re-encrypt an encrypted file after it has been edited.

Both products work well, and once you get used to them it's hard to go back to typing passwords, but the mouse isn't as comfortable as some other designs.

RRP Password Manager £34.99 (£29.77 ex VAT); Mouse Password Manager £40.99 (£34.88 ex VAT)
PRODUCT INFORMATION APC 0800 279 9254 **www.apc.com**
★★★★☆

Lenovo Thinkpad T43P

Lenovo recently acquired IBM's PC division and has incorporated biometric fingerprint security into selected Thinkpad models. Not only can it be used to prevent unauthorised users from even starting the machine, but also for replacing passwords and data encryption.

Our T43P came with a 2.3GHz Pentium M processor, 1GB of Ram and 128MB ATI Mobility FireGL graphics. Performance was fast and responsive; the system scored a PCmark 2004 score of 2,924.

Lenovo's hardware and security software combination lets you add print protection to control system booting, Bios and hard disk access, Windows and website logins. While the software isn't as easy to set up as Omnipass (used in the Motion tablet on the opposite page) when managing multiple passwords, the Thinkpad comes highly recommended, but it isn't cheap.

RRP £2,549 (£2,170 ex VAT)
PRODUCT INFORMATION Lenovo 0870 608 4465
www.lenovo.com/think/uk/en/
★★★★☆

Microsoft Wireless Intellimouse Explorer with Fingerprint Reader

Microsoft claims this product is not intended as a security device. As with the fingerprint reading keyboard, it's designed simply to save users from the nightmare of having to remember too many passwords. Unlike APC, Microsoft has placed its scanner on a wireless receiver instead of on the mouse itself.

The included Digitalpersona software makes short work of capturing your fingerprints, though the process didn't go quite as smoothly as with Softex's Omnipass and we had to press the rubberised scanner quite hard to register.

Once you've scanned at least two fingerprints, logging on to Windows is just a matter of putting your finger on the reader. Replacing application and web passwords is just as straightforward.

During testing, the system worked well, but recognition took a couple of attempts. We had compatibility problems with Firefox and our system was noticeably slower on start-up.

RRP £79.99 (£68.07 ex VAT)
PRODUCT INFORMATION Microsoft 0870 6010 100 **www.microsoft.com/uk**
★★★☆☆

PDAlok

PDAlok is a simple but effective password system that uses biometrics signature authentication to protect your data. After just a few minutes of easy training the program can prevent unauthorised access to your handheld by requiring the user to sign their name on screen with the stylus.

The software learns the unique way that you write your signature rather than simply matching the graphic and, in tests, it rejected all attempts at forgery. However, it sometimes took a couple of goes for the real signature to be recognised.

RRP £19.99 (£17.01 ex VAT)
PRODUCT INFORMATION Romsey Associates 01252 328 661
www.pdalok.com
★★★☆☆

Sony Microvault 256MB

Sony's Microvault is perhaps the most James Bond-style gadget in this round-up. The USB flash stick offers 256MB of storage that can be split between a general area on the drive and a fingerprint-protected secret drive. You can also use the in-built fingerprint scanner to replace website passwords, encrypt files both on the drive and on your PC's hard disk, and add extra protection to your screensaver.

Sony's software makes it easy to manage passwords and secure data, but the process of logging into websites with your fingerprint isn't as straightforward as with Microsoft's or APC's products. The device itself is also more suited to notebooks than desktop PCs as it really needs USB port at desk level to be convenient.

RRP £60 (£51.06 ex VAT)
PRODUCT INFORMATION Sony 01932 816 739 **www.sony.co.uk**
★★★☆☆

Motion Computing LE1600

Motion Computing's LE1600 (see September *PCW*, page 60, for a full review) combines biometric fingerprint security with the flexibility of a Tablet PC. It offers a 1.5GHz Pentium M, 12in screen, Bluetooth connectivity and a 30GB hard disk. Standard systems come with 512MB of Ram, but ours featured an extra 256MB, pushing the price up by £53. It managed a score of 2,362 under PCmark 2004.

The Tablet uses the Omnipass software for fingerprint recognition and a straightforward setup wizard makes it easy to replace your Windows, website and email logon details with a biometric password. Once set, you simply slide the desired digit across the scanner window on the chassis of the Tablet. Passwords can be updated or removed at any time and your fingerprint can also be used for file encryption.

In all, this is one of the best Tablet PCs we've looked at in a long while, and the added security is a definite bonus.

RRP £1,773 (£1,509 ex VAT)
PRODUCT INFORMATION Motion Computing 02476 311 685 **www.motioncomputing.co.uk**
★★★★☆

Biometrics explained

Simply put, biometrics centres on the idea of identifying people through biological properties and characteristics. Most of the products here employ fingerprint recognition, but other biometric techniques include iris and face scanning, voice recognition and even examining the dynamics of your handwriting.

All of these techniques require the user to first identify themselves; for example, by placing a finger on a print reader and entering their relevant details. This is then processed and held as a template in a database. This template can then be compared with future samples in order to verify the identity of the user.

It's difficult to put a percentage figure on the accuracy of these systems. So much has to be taken into account, including the rates of false acceptance and rejection. However, a study in the US by the National Institute of Standards and Technology, which compared 34 products, showed that the best fingerprint-based systems had a false accept rate of just 0.01 per cent.

In theory, DNA comparison should be the ultimate biometric test. However, at present this isn't an automated process that can be performed quickly and it is impossible to distinguish between identical twins.

Many consider iris or retina scanning to be more accurate. But even these systems can be fooled by pictures and biometric scanners have no way of knowing if the subject is actually alive.

With fingerprint readers now appearing on inexpensive peripherals and iris scanners being used in areas such as airports, it's clear that biometric information is set to play an increasing role in the future of security.

Chris Cain

20IN TFT MONITOR

LG Flatron L2013P

Ergonomic design and good performance

The 20.1in Flatron L2013P is the latest in LG's huge range of TFTs. The models vary from home LCD TV products to budget and high-end office, up to leading-edge designer models.

The 13 series, of which the L2013P is the largest member, fits in towards the cheaper end of its Premium and Style range. Offering an ultra-narrow bezel, a swivel, pivot and tilt screen, along with a height-adjustable stand, this TCO-03-certified monitor delivers all the ergonomic features required of the modern office. Its stylish yet unobtrusive appearance would also look very good in the home, although it does not come with a USB hub or speakers.

It's good to see that style continues through to the on-screen menus, which are simple to use and easy on the eye.

To keep meddling fingers away from your carefully calibrated settings, you can optionally lock out all control adjustments. Curiously, even without this lock in place, colour adjustments usually available in both analogue and digital modes remain locked out when using the DVI connection. LG's dedicated Light View button offers quick access to preset settings for various different image types under day and night conditions.

Its 1,600 x 1,200 pixel resolution and 178° viewing angles are combined with a 16ms response time, which is more than adequate for all but hardcore gamers. Both analogue and DVI cables are included.

Our tests revealed impressive image quality. With its smooth gradations and rich colours, the L2013P joins good performance with style and just the right level of features for anyone who finds that a resolution 1,280 x 1,024 is simply not enough.

Paul Monckton

DETAILS

RRP £549 (£467.23 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
LG 01753 491 500 **www.lge.co.uk**
SPECIFICATIONS
20.1in display • 1,600 x 1,200 resolution • 16ms response time • Contrast ratio 500:1 • Brightness 250cd/m^2 • TCO-03 certification • 178° viewing angle • D-Sub and DVI inputs • 446 x 448 x 242mm (w x d x h) • Class II LCD panel
PROS Good image quality; adjustable, with wide viewing angles
CONS No USB hub or speakers
VERDICT
Well designed, high-performance monitor with ergonomic features, making it suitable for office or prolonged usage

FEATURES	★★★★☆
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

19IN TFT MONITOR

Iiyama Prolite E481s

Faster and brighter than before

Too new and late to make it into September's round-up of 19in TFT monitors, Iiyama's revamped Prolite E481s has arrived, faster and brighter than before.

The model name may have remained the same, but with its contrast ratio increased from 400:1 to 700:1, and the 25ms response time now reduced to just 8ms, the updated E481s delivers significantly improved performance at a reduced price.

Also available in silver and ivory, our review model came in black. Its plain but smart finish houses a pair of stereo speakers and seven accessible controls, including auto, brightness and contrast buttons. These are accompanied by a rather over-bright blue power LED.

The on-screen menu is a bit confusing. Icons are not labelled and you're left to guess which button to press. An sRGB colour mode is provided, but it's marked simply 's'. Other options, such as gamma control, are labelled Mode1 or Mode2, with no explanation of what they are.

In reducing the pixel response time, a compromise has been made on the viewing angle, which is reduced from 176° in both directions to 150° horizontal and 135° vertical. The improved brightness and contrast ratio are especially beneficial for multimedia or distance viewing.

In our lab tests, the Prolite E481s delivered high-quality image and video reproduction.

To be sure of getting the new, revamped version of the E481s, make sure the part number ends in W3S, not W2S.

The Prolite E481s is a capable TFT with good image quality, but the price just seems too high. If this doesn't bother you, the Prolite H481s offers an identical specification and, for just £20 extra, you get a height-adjustable and pivoting stand.

Paul Monckton

DETAILS

RRP £300 (£255 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Iiyama 01438 745 482
www.iiyama.com/uk
SPECIFICATIONS
19in • 1,280 x 1,024 resolution • 8ms response time • Brightness: 300cd/m^2 • Contrast ratio: 700:1 • Viewing 150°/135° (horizontal/vertical) • D-Sub and DVI inputs • 418 x 196 x 411mm (w x d x h) • 5.5kg
PROS Response time; brightness
CONS Limited adjustment; high price and poor menus
VERDICT
Good performance, but poor on-screen menus and high price go against it

FEATURES	★★★☆☆
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★☆☆

7IN TFT

Lilliput 629GL-70NP/C/T

Tiny monitor with a touchscreen control

The diminutive 629GL-70NP/C/T from Lilliput is a widescreen 7in TFT monitor with touchscreen control and a variety of input and power connections.

It comes with a removable monitor stand with lockable tilt, a 12v external power supply and a car power adapter. A single custom connector breaks out into a bundle of cables providing power, audio, VGA and a pair of composite video inputs which support both Pal and NTSC standards. You also get a stylus and credit card-sized infra-red remote control.

Primarily aimed at in-car use, the 629GL uses a 7in panel with a native screen resolution of 800 x 480, which is ideal for the display of information, such as satellite navigation maps, music control systems or DVDs.

Despite its size, the bright display makes it pleasantly watchable, while the built-in touchscreen – a must for operation on the move – is fully compatible with Windows.

Compared to its predecessor, the 619BG, this model has an updated physical appearance, including larger illuminated control buttons, is slightly narrower and uses a more matt, anti-reflective screen coating. This coating has the unwelcome side-effect of blurring the screen image and the 619GL appears significantly sharper under normal viewing conditions. For indoor use, we would recommend buying the 619GL, which will still be available, in preference to the new model.

As a second monitor on a desktop PC, the 629GL is an ideal place to put status windows, such as instant messenger contacts and email notifications. It's also highly portable, making it ideal for moving between PCs, and convenient for direct connection to digital cameras and camcorders.

Paul Monckton

DETAILS

RRP £185 (£157.45 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Lilliput 0845 006 8868
www.carcomputer.co.uk
SPECIFICATIONS
7in screen • 15:9 aspect ratio • 800 x 480 • Brightness: 400cd/m² • Contrast ratio: 200:1 • Viewing angle (h/v): 130°/105° • Touchscreen • Remote control • VGA D-Sub, 2 composite video, audio • USB • 188 x 33 x 125mm (w x d x h) • 4.4kg
PROS Highly portable; touchscreen
CONS Image quality slightly blurred
VERDICT
An unusual but versatile display, with a clear, bright screen and a variety of uses

FEATURES	★★★★☆
PERFORMANCE	★★★★☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★★☆

MEDIA PLAYER

Freecom Mediaplayer-3

Play your media everywhere you go

The Freecom Mediaplayer-3 is a small, portable device that lets you watch video and view images on a television, as well as listen to music through a hi-fi.

Unlike standard external hard disks, the Mediaplayer-3 decodes multimedia files internally and features a variety of output ports. The unit can be hooked up to your video and hi-fi through a variety of outputs, including S-video and digital S/PDIF audio. We tested it using multimedia files created with a variety of codecs at different sample rates, and were impressed with its playback abilities. DivX and Xvid are among the wide range of formats supported.

Physically, the Mediaplayer-3 is an attractive device. Not much bigger than a standard external hard drive, it features a front-facing control panel along with a remote. The main control menus are shown on your external display or television, but it also has an integrated LCD screen, which is useful for browsing audio while the device is connected to a hi-fi.

The Mediaplayer-3 has its drawbacks, though. The internal cooling fan can get a little noisy and is annoying if you're browsing photos. The device is also somewhat expensive. The 250GB version costs £279 – far more than a standard external hard disk of the same capacity.

Prices start at £209 for the 80GB version, but expect to pay £379 for the larger 400GB version. Wireless streaming media players are cheaper, but they can also be harder to set up and are far less reliable.

If you want the flexibility of being able to share your entire multimedia collection on any display or stereo in the world with the minimum of fuss, the Mediaplayer-3 gets the job done.

Rory Reid

DETAILS

RRP £279 (£237.45 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Freecom 01423 704 700
www.freecom.com
SPECIFICATIONS
250GB 7,200rpm hard drive • Dr DivX video-encoding software (full version) • Video: DivX, Xvid, mpeg1/2/4, vob, avi • Audio: wma, mp3, ac3, ogg, asf • Photo: Jpeg • Composite/component, S-video • Analogue and digital audio • USB2 • 36 x 128 x 207mm (w x d x h) • 1kg
PROS Hassle-free media playback; range of supported formats
CONS Noisy cooling; expensive
VERDICT
Pricey, but simple and effective

FEATURES	★★★★☆
PERFORMANCE	★★★★☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★★☆

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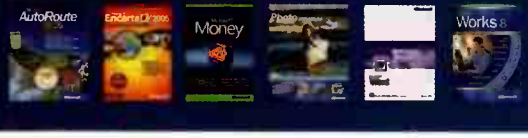
Only available at the time of purchase of a new Evesham system. RRP's taken from www.amazon.co.uk on 16/03/05. Supplied software titles are OEM versions not full retail versions. Product pictures are for illustrative purposes only.



Price does not include delivery which is £34+VAT (£39.95) for PCs, £16.98+VAT (£19.95) for notebooks, FREE for peripherals - UK mainland only. All systems and upgrades are subject to availability. Prices correct at date of publication. Price and specifications subject to change without notice. Finance is subject to status. Evesham's Terms and Conditions apply and are available on request. Actual products may not match photographic representations. Technical Support opening hours are Monday to Saturday 9:00 to 17:20. On-site warranty applies to UK mainland only, monitors are covered directly by the monitor manufacturer. Featured systems are based upon the original award winning specification. Bundled versions of video cards, sound cards and software are not full retail

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- 256MB ATI Radeon X800GT PCI Express graphics
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- 256MB NVIDIA® GeForce 6200 graphics with TurboCache™ technology*
- 17" flat panel TFT display
- Multi Format Dual Layer DVD Writer (16x) / CD-RW (40x) drive
- 7.1 channel surround sound (on-board)
- Creative Sound Blaster SBS260 speakers
- Microsoft keyboard and optical wheel mouse (black)

10/100 network connection - 6xUSB2.0 - Tool free case (Xpider or Sleek) 453x222x495mm - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - BullGuard Anti Virus software with Firewall, Online backup and FREE 90 day updates - **Floppy drive and modem are optional**

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- Microsoft® Windows® XP Home Edition
- 512MB DDR RAM, 333MHz
- 40GB 5400rpm hard drive
- 15.4" WXGA widescreen TFT display (1280x800)
- 128MB ATI Mobility Radeon X700 graphics
- DVD/CD-RW/Dual Layer DVD-RW drive
- Wireless Mini PCI 802.11bg (54Mbps) LAN
- Bluetooth
- Built in media card reader (MMS, MS, SD)
- 8 cell Li-Ion battery (life up to 2.5hrs approx.)
- Weight - 2.8kg
- Dimensions - 355mmx255mmx30mm

4xUSB2.0, Firewire, VGA, PCMCIA Type II x 1 - 10/100 LAN, v90 56k modem - built-in audio & speakers - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - BullGuard Anti Virus software with Firewall, Online backup and FREE 90 day updates

£799 inc VAT (£680.00 ex VAT)

- AMD Turion™ 64 Mobile Technology MT-37
- 80GB, 5400rpm hard drive

£899 inc VAT (£765.11 ex VAT)

Voyager C510

"Highly recommended. Great performance"

- Intel Pentium M processor 740 (1.73GHz, 2MB L2 cache, 533MHz)
- Microsoft® Windows® XP Home Edition
- 512MB DDR2 RAM 533MHz
- 60GB Serial ATA 5400rpm hard drive
- 15.4" WXGA widescreen display (1280x800) (Upgrade to WSXGA 1680x1050 for only £49.99)
- 128MB NVIDIA GeForce Go 6600 PCI Express graphics
- DVD/CD-RW/Dual layer DVD-RW drive
- Wireless Mini PCI 802.11abg (54Mbps) LAN
- Built in media card reader (MMC, SD, MS-Pro)
- 8 cell Li-Ion battery (life up to 4hrs approx.)
- Weight - 2.9kg
- Dimensions - 357mmx276mmx35mm

5xUSB2.0, Firewire, VGA, TV-out, PCMCIA Type II x 1 - 10/100 LAN, v90 56k modem - built-in audio & speakers - Audio DJ music control buttons - Microsoft Works 8.0 - CD/DVD creation software, Video editing and DVD playback software - BullGuard Anti Virus software with Firewall, Online backup and FREE 90 day updates

£999 inc VAT (£850.21 ex VAT)

- Intel Pentium M processor 750 (1.86GHz, 2MB L2 cache, 533MHz)
- 80GB, Serial ATA 5400rpm hard drive

£1056 inc VAT (£898.727 ex VAT)

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packs, and the software features on-line documentation. Hard disk capacities are quoted in thousands of millions of bytes and are prior to installation of operating systems and other applications. e2go models are those that we try to keep in stock for immediate despatch. As part of our staff training some telephone calls may be monitored. AMD, AMD Athlon and AMD Duron are trademarks of Advanced Micro Devices. Intel, the Intel Inside logo, Celeron and Pentium 4 are trademarks of the corporation. *NVIDIA® TurboCache™ technology shares the capacity and bandwidth of dedicated video memory and dynamically available system memory for turbocharged performance and larger total graphics memory. Featured systems available until the 30/09/05. E&OE.

WIRELESS ROUTER

US Robotics Maxg Router

802.11g with enhanced range and speed

High-speed wireless kit is flooding the market at the moment and US Robotics is the latest to release a new range. Maxg claims to achieve theoretical speeds of 125Mbits/sec, more than twice that of 802.11g and 17Mbits/sec faster than most Mimo (multiple input, multiple output) and Super G kit. Actual throughput is always lower and US Robotics claims 35Mbits/sec is possible.

Keen to distance itself from Super G, which can cause problems with nearby 802.11g networks, US Robotics has ensured Maxg doesn't include any form of channel bonding. The popular Mimo route hasn't been taken either; instead, Maxg uses digital signal processing techniques based on 802.11g to improve speeds.

During testing, we achieved speeds of just over 30Mbits/sec, although this was only over a distance of five metres in a pure Maxg environment. Throughput decreases as you stray from the router, but another benefit of Maxg is increased coverage. Fifty per cent greater coverage than 802.11g is possible, which roughly equates to about 70ft indoors.

It's worth noting that most Mimo kit, such as the Netgear WPN824, is capable of almost doubling this coverage.

The enhanced performance rapidly disappears if you add 802.11g kit to your Maxg network, so it's best to buy Maxg adapters for all your PCs. Maxg PCI cards, PC cards and USB sticks all cost £44.99.

Other interesting features include a USB socket, which allows any USB printer to be used as a network printer, and automatic prompting to set up wireless security. Performance isn't as impressive as some Mimo kit, but it comes at a good price and includes some decent features. An ADSL modem version is expected soon.

Will Stapley

DETAILS

RRP £84.99 (£72.33 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
US Robotics **www.usr.com**
SPECIFICATIONS
Maxg wireless • 802.11g • 4 10/100 Lan ports • Wan port • Wep, WPA, WPA2 • Upnp • DHCP • 321 x 184 x 86mm (w x d x h)
PROS Cheap; USB port; good security
CONS Slightly slower than some Mimo kit
VERDICT
Comes equipped with some good features and has automatic prompting for wireless security and integrated USB port

FEATURES	★★★★☆
PERFORMANCE	★★★☆☆
VALUE FOR MONEY	★★★★★
OVERALL	★★★★☆

VOIP ROUTER

Netgear TA612V

Phone calls over the net, but there's a catch

VoIP (voice over IP) looks set to revolutionise the way we make telephone calls, but the speed at which it catches on depends largely on the ease of migration from standard phones.

Netgear recently added the TA612V Broadband Adapter to its already bulging portfolio of network kit. In essence, the TA612V lets you use an ordinary telephone to make VoIP calls, even when your PC is turned off.

However, the TA612V has a fatal flaw. When first browsing its web-based interface, we noticed that, although there's a VoIP section, it's impossible to alter any of the VoIP settings. We were then dismayed to discover the TA612V is locked down to Sipgate's VoIP service. The installation procedure requires you to register with Sipgate (555 free minutes are credited to your account). Soon after, all your settings will be downloaded to the TA612V – painless setup, but there's no choice of VoIP provider.

As far as quality goes, we have no issues. Sipgate's service offers excellent call clarity and there's very little lag. The TA612V is designed to be attached direct to an Ethernet broadband modem, so if you're planning to integrate it with your current router you'll have to fiddle with firewall settings to get it to work.

The TA612V does a great job of making VoIP easy to set up and use but, by locking it to Sipgate, its appeal is limited. Worse still is the utterly misleading packaging. It talks about a 'Free VoIP service' being included, but we didn't get the impression use of Sipgate was compulsory. Only under the system requirements on the side of the box does it confirm this. It's fine if you're happy with Sipgate, but if you switch VoIP suppliers that's £80 down the drain.

Will Stapley

DETAILS

RRP £79 (£67.23 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Netgear 01344 397 021
www.netgear.co.uk
SPECIFICATIONS
2 telephone sockets (with adapters) • Wan and Lan ports • Locked to Sipgate VoIP service • Firewall • DHCP • 171 x 113 x 22mm (w x d x h) • 300g
PROS Easy to set up; uses normal phones
CONS Locked to Sipgate; difficult integration with other routers
VERDICT
A good product, but it's difficult to recommend as you'll be tied down to a single VoIP service

FEATURES	★★★☆☆
PERFORMANCE	★★★★☆
VALUE FOR MONEY	★☆☆☆☆
OVERALL	★★☆☆☆

I-Tech Bluetooth VKB

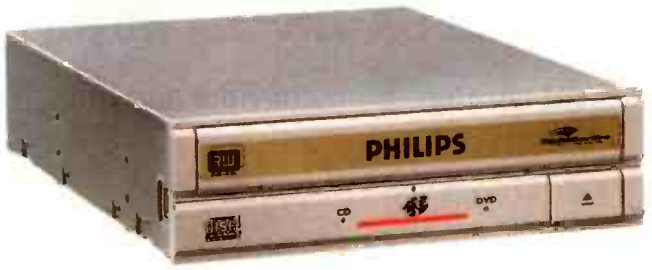
A keyboard like no other, the VKB projects a keyboard onto any flat surface. Using both infra-red and laser technology, it allows you to tap away on it like a standard keyboard. When we first looked at the VKB back in the April issue of *PCW*, we commented that a wireless version was required. A few months down the line and I-Tech has released a Bluetooth edition.

Compatibility is limited to selected phones, PDAs and Pocket PCs (check the website for a full list). The manual (all two pages of it) could be vastly improved upon, but fortunately we had no problems pairing it to a variety of PDAs.

Limited compatibility and the price hold the Bluetooth VKB back, but it's still an intriguing gadget.

Will Stapley

RRP £129.99 (£110.63 ex VAT)
PRODUCT INFORMATION Internity 0870 162 1620 **www.internity.co.uk**
PROS Small; good alternative to a keyboard
CONS Limited compatibility; expensive
★★★☆☆



Philips DVDR16LSK

The Lightscribe technology, which uses lasers to burn image labels on to Lightscribe-compatible discs, is still attracting manufacturers, despite its slower writing speed and higher cost per disc.

Philips has used Lightscribe in the DVDR16SLK, which is attractively designed and has both dual-format and dual-layer compatibility. Two lights on the drive indicate either CD or DVD access. Writing speeds are 16-speed for DVD+R, eight-speed for DVD-R and 2.4-speed with DVD+R dual-layer. A full-sized image takes about 25 minutes to burn, but text-only images appear much faster.

The drive comes with a decent bundle. You get three Lightscribe CD-Rs and Nero Ahead Suite 6. Although Lightscribe won't appeal to all, at under £60 you can't argue with the price.

Will Stapley

RRP £59.99 (£51.06 ex VAT)
PRODUCT INFORMATION Philips 020 7949 0069 **www.philips.co.uk**
PROS Cheap; good bundle
CONS Lightscribe won't appeal to all
★★★★☆

Sennheiser RS 130

Wireless headphones give you increased flexibility, mobility, and remove the hassle of trailing leads wherever you go. Sennheiser's stylish RS 130 headphones have switchable surround sound and work well for hi-fi, PC and TV use. Using FM wireless transmission, their range is an impressive 150m. Sound quality is superb, with no background hissing noises.

The base station incorporates a charging function, with a single charge of the batteries offering up to 22 hours of use. The headphones are well designed, comfortable and lightweight at just 275g. They are a little tight, which can become uncomfortable if you're wearing glasses. But, all in all, this is a great set of headphones offering high-quality sound and for a very reasonable price.

Anna Lagerkvist

RRP £99.99 (£85.10 ex VAT)
PRODUCT INFORMATION Sennheiser 01494 551 551 **www.sennheiser.co.uk**
PROS Quality sound; comfortable; good value
CONS Manual retuning sometimes needed
★★★★☆

Wacom Volito2 pen tablet

The Volito2 pen tablet offers many of the facilities of Wacom's professional models at fraction of the price. It measures 25 x 25cm, with an A6 drawing area that maps to your screen via a USB port. You can use the two-button pen instead of a mouse to navigate your computer, which is handy if you suffer from mouse-related repetitive strain injury (RSI) – though Wacom is careful to state that it does not guarantee relief.

The main point of Volito2 is to facilitate drawing, of course. The pen is pressure sensitive, enabling some subtle effects with the aid of the bundled Artrage software, which can simulate various brushes, pencils and paints. The pad lacks the feel of paper, but the pen beats a mouse for freehand drawing.

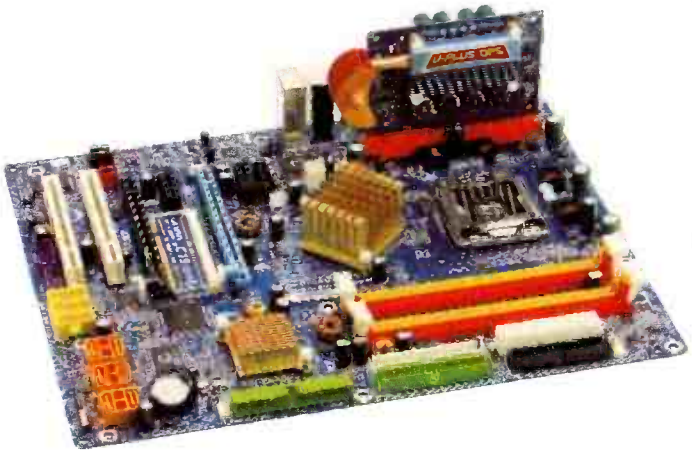
Clive Akass

RRP £35.99 (£30.63 ex VAT)
PRODUCT INFORMATION Wacom **www.my-volito.com**
PROS Affordable; works well
CONS Not good for handwriting
★★★☆☆

SLI MOTHERBOARD

Gigabyte GA-8N-SLI Royal

A great combination of Nvidia and Intel



Nvidia has finally joined forces with Intel to provide Nforce chipset support for its processors. The first result of this new agreement is the Nforce4 (Intel Edition) chipset. Gigabyte has wasted no time in implementing this in the form of the GA-8N-SLI Royal – the latest model in its new i-DNA (Intelligent dual-nano architecture) series of boards.

The board supports Socket 775 Intel processors with 533, 800 and 1066MHz FSB speeds and backs this up with four Dimm slots supporting a maximum of 4GB of DDR2 533 or 667MHz memory. The Nforce4 (Intel Edition) chipset also supports dual-channel asymmetric memory, so you get dual-channel performance even if you populate three Dimm slots.

The Nforce4 (Intel Edition) chipset has both a northbridge and southbridge. Both are passively cooled, but Gigabyte supplies a cooler for the northbridge, if you want to push the board when overclocking.

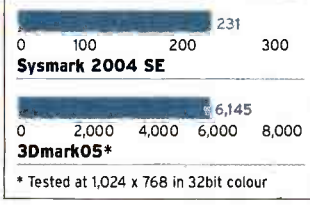
Unlike the current crop of Intel-based boards, Gigabyte has built two ATA controllers on the GA-8N-SLI Royal, so you can use four ATA devices without resorting to any of the four Sata II ports.

Two further Sata II ports and a single ATA port are controlled by a Promise Raid controller. You also get dual Gigabit Lan, 7.1 audio and dual Bios chips.

Gigabyte's GA-8N-SLI Royal shows the combination of an Nvidia chipset and Intel CPU works and works well.

Simon Crisp

PERFORMANCE



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

DETAILS

RRP £148.64 (£126.50 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION Scan 08707 554 747 **www.scan.co.uk**
SPECIFICATIONS
Socket 775 CPU (1066, 800, 533MHz FSB) • Nvidia Nforce4 (Intel Edition) • 4 memory slots • 2 x16 PCI-E slots (SLI) • 2 x1 PCI-E slots • 2 PCI slots • 2 Gigabit Ethernet • 3 parallel slots • 6 Sata slots • 4 USB2 ports
PROS Well featured; quality chipset
CONS All the features push the price up
VERDICT
Although more expensive than an AMD SLI board, the combination of Nvidia and Intel works remarkably well

FEATURES	★★★★½
PERFORMANCE	★★★★½
VALUE FOR MONEY	★★★½☆
OVERALL	★★★★½

PC CASE

Akasa Eclipse-62

Conservative looks, but quality design

Some cases attract your attention with outrageous styling or a variety of multi-coloured panels but, every so often, one comes along that's so well built it needs neither of these. The new Eclipse-62 from Akasa falls into the latter category.

The first sign of quality is the impeccably applied satin black effect, which extends even to the inside of the case. As you would expect from a master of PC cooling like Akasa, plenty of attention has been paid to airflow dynamics inside the Eclipse-62. Built around a sturdy 1.2mm thick aluminium chassis, the case is a little wider than standard models. The extra space aids the flow of air and, unlike most others, the Eclipse-62 can be used with 120mm fans, which make for improved and quieter cooling.

Behind the push-open door on the front of the case sits a bay holding two USB2 ports and an expansion plate. Many motherboards come with an Firewire or USB I/O plate that usually sits in a spare PCI slot on the back of the case. Thanks to this front-access plate, not only are the I/O ports easily reached, but it also saves you wasting a PCI socket.

For easy access to the internals, both the side and top plates are removable and held in place by thumbscrews, as are the expansion plates. Plenty of drive space is available with four 5.25in and two 3.5in bays – a further seven 3.5in bays are found internally.

As far as value for money goes, it's hard to criticise the Eclipse-62. £88 really isn't that much to spend on such as well-built case.

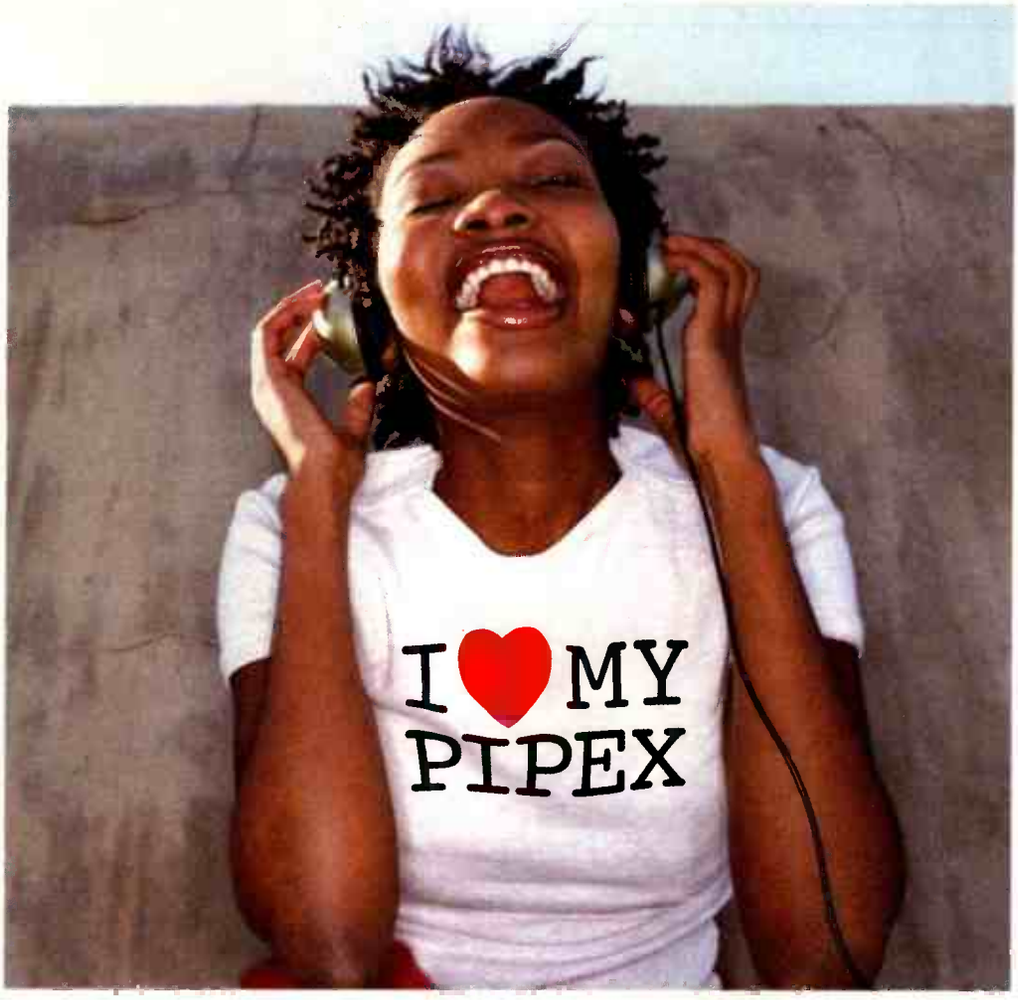
Although it doesn't sport an unusual design or zany colour scheme, the Eclipse-62 is a well-built case with decent features at a great price.

Simon Crisp

DETAILS

RRP £88.07 (£74.95 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Overclockers 08704 430 880
www.overclockers.co.uk
SPECIFICATIONS
Aluminium casing • Slide-out motherboard plate • Tool-free side panels, motherboard plate and expansion plates • 4 x external 5.25in bays • 2 x external 3.5in bays • 7 x internal 3.5in bays • 2 x front access USB2 • 1 x front access expansion plate
PROS Build quality; cooling
CONS Styling
VERDICT
Not the prettiest case around, but well built and includes some great features

FEATURES	★★★★★
PERFORMANCE	★★★★½
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



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*A cancellation fee of £58.75 applies to all services with free set-up should you cancel within first 12 months. **Local and National numbers starting with 01 and 02. †5Gb monthly usage allowance.

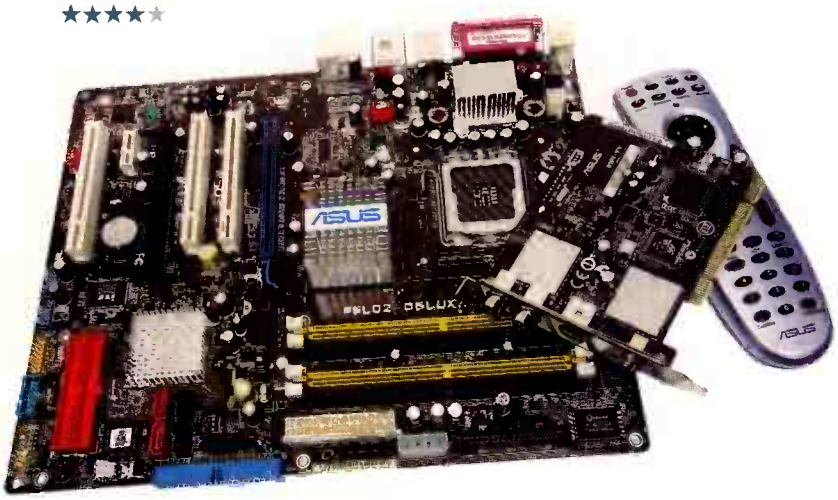
Asus P5LD2 Deluxe/EU-P3

Based around Intel's Socket 775 and latest I945P chipset, the P5LDL2 Deluxe from Asus is about as feature-rich as motherboards get. This version also includes a combined Wifi TV card with remote control.

Although you get two x16 PCI Express graphics slots, this isn't an SLI (Scalable Link Interface) board. Instead, the primary slot works at full speed while the other, which Asus calls a Universal PCI Express slot, runs at either two- or four-speed (at four-speed it disables the single x1 PCI slot). All of which means the board can support quad displays.

The rest of the feature list is equally impressive. 1066, 800 and 533MHz FSB (front-side bus) speed support, up to 4GB of DDR2 400, 533 or 667 memory, four Sata (Serial ATA) 3Gbytes/sec ports (Raid 0, 1, 5 and 10 catered for), as well as support for external Sata drives (Sata on the Go), eight-channel audio and Gigabit Ethernet.

RRP £121 (£102.98 ex VAT)
PRODUCT INFORMATION Scan 0870 755 4747
www.scan.com
★★★★☆



Zalman Reserator 1 Plus

If the idea of water cooling your PC sends you running for cover, maybe Reserator 1 Plus from Zalman will help change your mind. The Plus is the latest version of Zalman's passive water cooling system that now includes a VGA water block in addition to the original CPU water block. The rest of the kit comprises the Reserator pump unit (the name is a mix of reservoir and radiator), a 4m length of Silicone tube, and an expansion plate with two drilled holes for the tubing. The all-important Flow Indicator and a bottle of anti-corrosion coolant additive are also included.

RRP £186.83 (£159 ex VAT)
PRODUCT INFORMATION Quiet PC 0870 321 4620
www.quietpc.com
★★★★☆

Akasa Amber Series Quiet fans

Available in 8, 9.2 and 12cm sizes, Akasa's Amber Series of case fans offer good airflow but, more importantly, they do it quietly. As you might expect the 12cm version offers the best blend of airflow – 44.8CFM (cubic feet per minute) and quoted 18dBA while spinning at just 1,400rpm. All come with crystal-clear surrounds and, unsurprisingly, amber-coloured blades. Akasa provides three- and four-pin power adapters, and mounting screws with each fan.

RRP 8cm: £4.64 (£3.95 ex VAT)
9.2cm: £8.17 (£6.95 ex VAT)
12cm: £10.52 (£8.95 ex VAT)
PRODUCT INFORMATION Overclockers 0870 443 0880
www.overclockers.co.uk
★★★★★

Akasa Powerplus 550W

Although marketed as a server-class power supply, the Powerplus 550W PSU from Akasa is aimed at anyone looking for a high-output, quiet and well-built power supply that conforms to the latest standards. It comes with four 12v rails, 24-pin EPS (entry-level power supply specification) power connector, nine four-pin Molex connectors, dual PCI Express six-pin connectors (for SLI and the upcoming Crossfire systems) and four Serial ATA connectors. The unit is cooled by a single, dual-ballbearing 80mm fan.

RRP £81.08 (£69 ex VAT)
PRODUCT INFORMATION Overclock 0870 141 7161
www.overclock.co.uk
★★★★½

Antec V-Cool

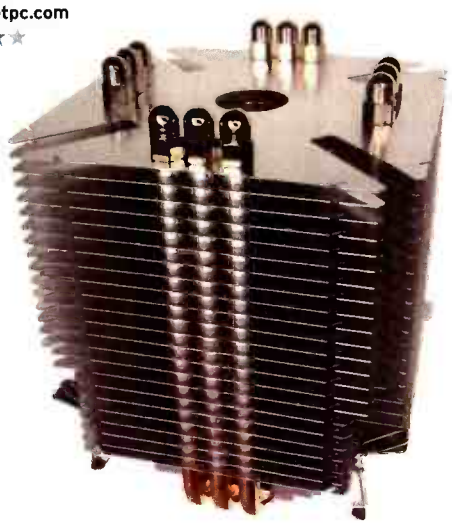
Fitting a third-party graphics card cooler normally means prising off the standard cooler and praying you don't damage the GPU in the process. With Antec's V-Cool there are no such worries. However, you may be concerned about how much space it takes up. Being a two-slot cooling solution, adding it to a card that already takes up two slots means losing a total of four PCI slots. The cooler consists of an extendible plastic duct and a three-way switch on the expansion plate that controls the fan speed. As a consequence, the graphics card has a greater supply of cool air. As is standard practice these days, the fan is illuminated by blue LEDs.

RRP £10.52 (£8.95 ex VAT)
PRODUCT INFORMATION RL Supplies 01923 896 996
www.rlsupplies.co.uk
★★★★½

Scythe Ninja

Apart from some great product names, Scythe stands out from other cooler manufacturers because of the sheer size of its products. Its latest offering, the Ninja, is a passive CPU cooler, weighing 650g and standing an impressive 150mm high when upright. The Ninja uses six copper pipes to dissipate heat, but we have a few words of warning regarding this cooler. Although it's compatible with Socket 748, 775, 754, 939 and 940 CPUs, you have to be careful using the Ninja in its passive state. If you are using it with a standard Pentium 4 Northwood or an Athlon 64 3500+ processor or lower, then you should be fine, but any higher powered processor will require the optional 120mm fan.

RRP £41.13 (£35 ex VAT)
PRODUCT INFORMATION Quiet PC 0870 321 4620
www.quietpc.com
★★★★½



Gigabyte 3D Aurora

The 3D Aurora, Gigabyte's first foray into the world of PC cases, is made from aluminium. The front bezel is a mix of an aluminium door and silver plastic casing. The door hides five 5.25in and two 3.5 drive bays, all of which are tool-free. Also tool-free are the expansion plates (held by a metal clip) and a side panel (held by thumbscrews). The motherboard back plate is a fixed design.

For cooling, Gigabyte has installed three 120mm quiet fans in the 3D Aurora – two in the rear panel (one stacked on top of the other), while the third draws air through the front bezel. Should you want to use a water cooling system with the 3D Aurora, the rear panel of the case is pre-drilled for the necessary tubing.

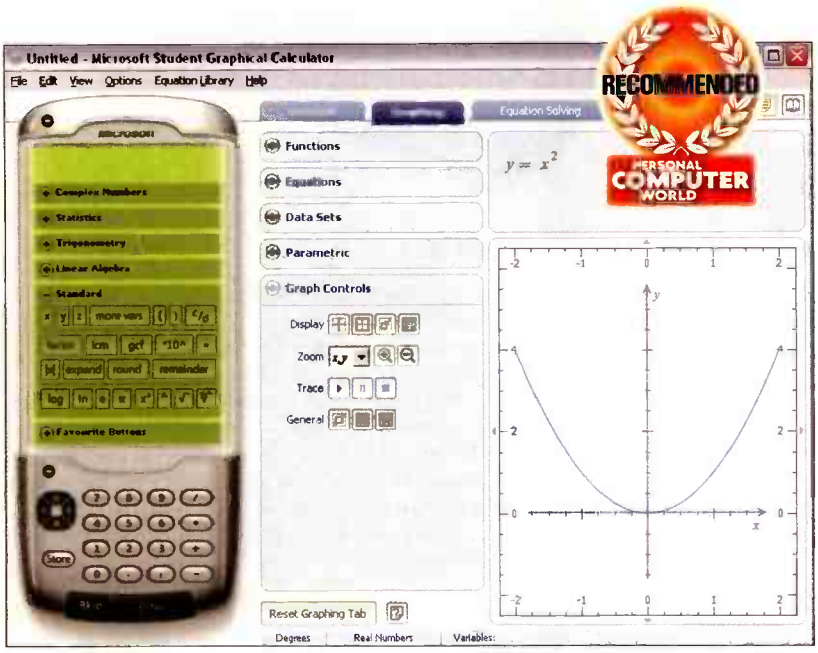
The 3D Aurora has one Firewire, two USB and two audio ports tucked neatly away on the right front-hand side of the case.

RRP £85 (£72.34 ex VAT)
PRODUCT INFORMATION Scan 0870 755 4747
www.scan.com
★★★★½

EDUCATION SOFTWARE

Microsoft Student 2006

Now there's no excuse for your children not to do their homework



The calculator can help plot graphs and solve equations

In an independent survey commissioned by Microsoft, 44 per cent of parents highlighed homework as a source of tension and family disputes, with maths the biggest problem of all. Apparently, 70 per cent of children look to their parents for guidance in this subject, but a third of parents feel completely unable to help. We won't bore you with the rest of Microsoft's statistics; however, you'd be hard pushed to deny that encouraging homework is an important part of helping your child progress through school.

Microsoft has released its brand new Student 2006 package to help. Aimed at students between the ages of 12 and 18, it promises to increase both productivity and academic success. The interface is unmistakably Microsoft. Clear menus and simple icons make the whole package easy to navigate. The help files could be more informative, but you're unlikely to need them that often.

Invariably, the hardest part of any homework assignment is getting past the dreaded first blank page. To help students kick off their work, Student 2006 houses what Microsoft calls Learning Essentials. Integrating directly with Microsoft Office (both XP and 2003), Learning Essentials places a new menu in Word, Excel and Powerpoint. This menu provides access to a wealth of information on subjects such as how to write essays, what sort of information should be included and how to structure your work. Using simple instructions, the Learning Essentials component is undoubtedly one of Student 2006's major selling points.

It also helps out those studying French, German or Spanish, providing quick access to foreign letters and accents, spelling and dictionaries.

A range of templates also helps to get work off the ground. You'll find guides on creating essays in Word, presentations in PowerpPoint, such as conversation topics and class debates, as well as pre-designed charts for setting up clubs and fundraising activities in Excel. Similar templates are available free online from a variety of sources, including Microsoft itself, but having a wide range in one easy-to-access place should be enough to encourage students to make full use of them.

If you're one of the 33 per cent of parents who struggles with maths, the graphical and scientific calculator could well be your saviour. Even if you're a dab hand at calculus and geometry, it will come in handy. With the ability to solve complex sums, plot graphs and even solve equations, the calculator element of Student 2006 is an incredibly useful tool. Thanks to the worksheet, all calculations are clearly laid out and can be printed for future reference.

A year's subscription to MSN Encarta Premium is also included with Student 2006. This huge encyclopedia, which includes videos, images and audio, is just as useful to adults as it is to children. A one-year subscription to Encarta Premium currently costs £19.99, which you'll have to cough up in a year's time. You'll still be able to use the reference library on your PC, but without a subscription, but you won't be able to receive any new updates via the Internet.

Before you rush out and buy Student 2006, be aware that if you don't already have a copy of Microsoft Office 2003 or Office XP, you'll have to purchase one in order to use the Learning Essentials element of the package. The Student Edition of Microsoft Office 2003 (a slightly cut-down version of the standard Office 2003) is available for around £115

It's a shame you can't use it with other office-style products but, in fairness to Microsoft, there's no way it could develop a similar package to integrate with the likes of Open Office and Ability Office.

As expected, the Internet plays a large part in Student 2006 – dial-up is manageable, but we'd certainly recommend at least a 512K broadband connection to make full use of the online components.

It's also worth pointing out that it's only available on DVD, so those with just a CD drive will need to upgrade.

Student 2006 won't perform miracles and is only there to aid homework – it will not act as a substitute for teaching. However, with features such as the Learning Essentials tools and access to everything Microsoft Encarta has to offer, Student 2006 serves as a great platform for homework assignments and comes thoroughly recommended.

Will Stapley

DETAILS

RRP £54.95 (£46.77 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Microsoft 0870 60 10 100
www.microsoft.com/uk
SYSTEM REQUIREMENTS
500MHz processor • 430MB hard disk • 256MB of Ram • DVD-Rom drive • Windows 2000/XP • Office XP/2003 (for Learning Essentials tool)
PROS Guides students through assignments; wealth of information
CONS Learning Essentials requires Microsoft Office
VERDICT
Student 2006 serves as a great platform for a variety of homework assignments

FEATURES	★★★★★
EASE OF USE	★★★★★
VALUE FOR MONEY	★★★★½
OVERALL	★★★★★

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For product Information please refer to www.msicomputer.co.uk

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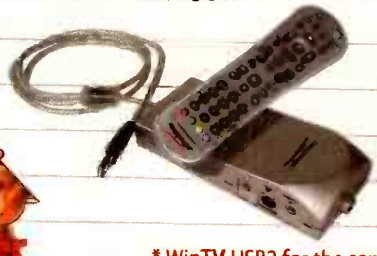
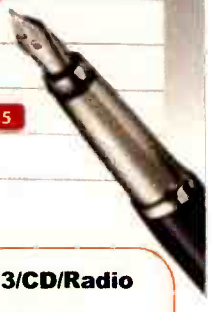


£37.44 Ex

£43.99 Inc

www.savastore.com/10278615

* WinTV USB2 for the same price as WinTV USB when purchased with any desktop or notebook computer



CAMERAS

Acer CR-5130 - 5MP 3x Zoom

£77.99 Ex

£91.64 Inc

5 MP

www.savastore.com/10280156

Part #	Description	Ex VAT	Inc VAT
10281757	Canon IXUS 700 – 7.1MP, 3x Zoom Camera	£235.00	£276.13
10281908	Pentax Optio WP - 5MP, 3x Zoom Waterproof	£153.99	£180.94
10281405	Tripod for digital cameras/camcorders	£5.10	£5.99

MONITORS

Sony SDM-S74EB 17" DVI Monitor

£149.95 Ex

£176.19 Inc

£50 OFF

* When purchased with any Aries PC (see advert)

www.savastore.com/10281143

Part #	Description	Ex VAT	Inc VAT
10281541	Acer AL1512BM 15" Black Multimedia LCD	£91.55	£107.57
10275843	Sharp LL172AB 17" Black Multimedia LCD	£131.10	£154.04
10279997	Samsung SM913N 19" 8ms Silver LCD	£168.98	£198.55

MP3 PLAYERS

H&B CA-5555 Car MP3/CD/Radio

£65.00 Ex

£76.38 Inc

180W

www.savastore.com/10282061

Part #	Description	Ex VAT	Inc VAT
10281406	Toki 128MB MP3 Thumb Player	£18.99	£22.31
10281336	Apple iPod Mini 4GB MP3	£110.60	£129.96
10278200	Archos Gmini 400 20GB MP3/WMA/WAV	£159.50	£187.41

PRINTERS

Canon PIXMA Photo Printer

£56.66 Ex

£66.58 Inc

4800X1200

www.savastore.com/10277679

Part #	Description	Ex VAT	Inc VAT
10274562	Epson Stylus Photo R200 5760x1440 dpi Photo	£48.32	£56.78
10277274	Samsung ML-2250 20ppm A4 Mono Laser	£83.49	£98.10
10276272	HP PSC1410 Multifunction Printer/Scanner/Copier	£51.75	£60.81

GPS

Acer n35 Pocket PC with GPS

£198.95 Ex

£233.77 Inc

3.5" DISPLAY

www.savastore.com/10280174

Part #	Description	Ex VAT	Inc VAT
10281759	Tom Tom Go 300 Portable GPS Navigation	£311.00	£365.43
10281710	Mitac Mio 269 PDA with GPS Sat Navigation	£321.00	£377.18
10282671	Fujitsu Siemens Pocket Loox	£355.00	£417.13

NOTEBOOKS

Toshiba Satellite Pro L10 Notebook

£385.00 Ex

£452.38 Inc

24/7 SUPPORT

* For details see www.savastore.com/247

www.savastore.com/10282712

Part #	Description	Ex VAT	Inc VAT
10281476	Acer Aspire 3002LC Semp 2800+, 256M, 60G, 15"	£371.00	£435.93
10281461	Fujitsu Amilo Pro V7010 C2.53, 256M, 40G, 15.1"	£378.00	£444.15
10282672	Sony VAIO FS285E C370, 512M, 80G, 15.4"	£575.00	£675.63

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*Assembly time will vary
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Sempron Motherboard & 2.4GHz CPU

£72.95 Ex
£85.72 Inc

+128 MB RAM

www.savastore.com/10277598

Item	Description	Ex VAT	Inc VAT
10277589	Celeron 2.8GHz / 256MB DDR Motherboard Kit	£89.95	£105.69
10277591	Pentium 3.0GHz / 256MB DDR Motherboard Kit	£159.95	£187.94
10275596	Athlon64 3000/512MB DDR Motherboard Kit	£159.95	£187.94

MOTHERBOARDS

MSI K8N Neo4 Platinum Motherboard

£67.95 Ex
£79.84 Inc

16X PCI-EXPRESS

www.savastore.com/10280376

Item	Description	Ex VAT	Inc VAT
10280379	MSI 915GM-FR Skt775 PCI-E 128MB Graphics	£52.92	£62.18
10277469	Foxconn CK804K8MA Skt 939 NForce4 PCI-E MATX	£39.95	£46.94
10280141	Asus A8V Deluxe Athlon 64 Skt939, ATX	£52.92	£62.18

PROCESSORS

AMD Athlon 64 3000+ Skt 939 CPU

£84.50 Ex
£99.29 Inc

COOL'N'QUIET

www.savastore.com/10281616

Item	Description	Ex VAT	Inc VAT
10276285	Intel Celeron Processor 330 2.66GHz 533MHz	£46.35	£54.46
10282282	AMD Athlon 64 X2 4200+ 2.2GHz Skt 939	£289.95	£340.69
10280288	Intel Pentium 4 530J HT 3.0GHz 800MHz Skt 775	£97.85	£114.97

MEMORY

Savavalue 256MB USB Flash Drive

£9.75 Ex
£11.46 Inc

1/3 OFF

www.savastore.com/10234420

Item	Description	Ex VAT	Inc VAT
10263983	Aries 512MB PC3200 184pin DDR RAM	£26.95	£31.67
10278647	512MB SD (Secure Digital) Memory Card	£16.95	£19.92
10281407	23-in-1 Memory Card Reader/Writer USB2	£6.99	£8.21

GRAPHIC CARDS

Sapphire 9600 Pro AIW + FREE Game

£69.99 Ex
£82.24 Inc

FREE GAME

www.savastore.com/10282529

Item	Description	Ex VAT	Inc VAT
10281115	Aries 256MB Radeon X800XT AGP VIVO DVI	£222.99	£261.19
10276875	Sapphire 256MB Radeon X800 Pro AGP VIVO DVI	£179.99	£211.49
10279351	Connect 3D 256MB Radeon X600 Pro PCI-E TV DVI	£52.08	£61.19

NETWORKING

NETGEAR ADSL Wireless Router + FREE USB ADAPTOR

£77.99 Ex
£91.64 Inc

802.11g

www.savastore.com/10279789

Part#	Description	Ex VAT	Inc VAT
10281070	Belkin WiFi Router 125g + PCI Adapter	£61.99	£72.84
10278183	DLink DSL-G604T WiFi Router + USB Adapter	£49.80	£58.52
10280686	K-Corp SuperG Router	£37.15	£43.65

OPTICAL DRIVES

LG DL16x DVDRW +/- & DVDRAM

£25.75 Ex
£30.26 Inc

ALL FORMATS

www.savastore.com/10281455

Item	Description	Ex VAT	Inc VAT
10282724	Iomega Super DVD +/- RW DL USB2.0 + 5Discs	£69.99	£82.24
10281260	LaCie 16x DL DVD +/- RW with Lightscribe USB2.0	£67.20	£78.96
10281534	Sony DW-Q28A DL 16X DVD +/- RW Internal	£25.50	£29.96

INTERNAL HDDs

Seagate Barracuda U100 80GB HDD

£30.20 Ex
£35.49 Inc

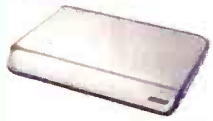
SMART

www.savastore.com/10262267

Item	Description	Ex VAT	Inc VAT
10273870	Western Digital Caviar 160GB 8MB 7200 SATA	£46.40	£54.52
10281883	Maxtor DiamondMax 200GB 8MB 7200 PATA	£49.35	£57.99
10278941	Maxtor DiamondMax 10 200GB 8MB 7200 SATA	£49.95	£58.69

EXTERNAL HDDs

Western Digital Passport 40GB USB2.0 Portable HDD



£51.95 Ex
£61.04 Inc

ONLY 240g

www.savastore.com/10282142

Item	Description	Ex VAT	Inc VAT
10278848	Seagate Pocket Hard Drive 1" 5GB USB2.0 HDD	£75.74	£89.01
10278127	LaCie 80GB 5400RPM Firewire & USB2.0 HDD	£95.32	£112.00
10278239	Maxtor One Touch II 250GB 7200RPM USB2.0	£125.45	£147.40

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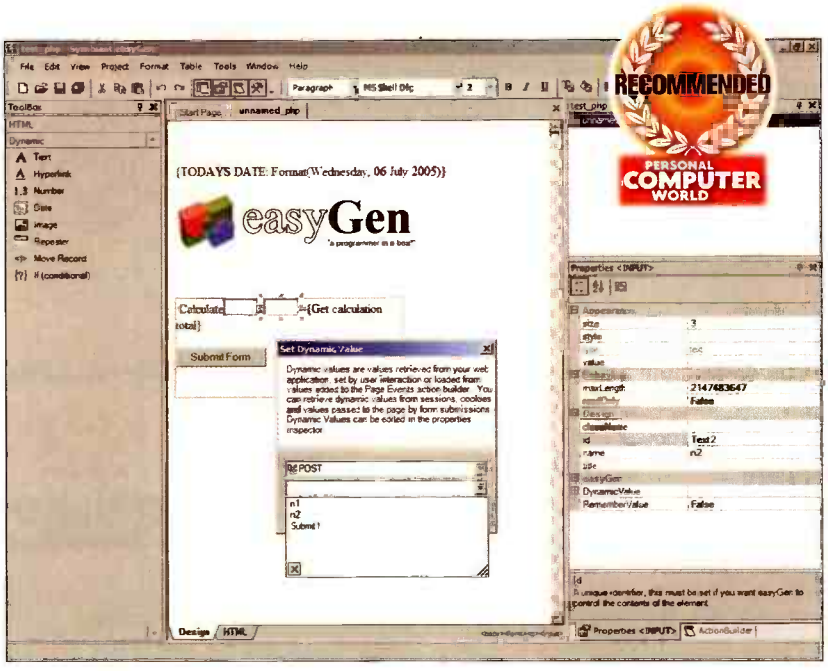
WEB DEVELOPMENT

Symbiant Easygen 2.2

Take the hassle out of creating a database-driven website



Easygen will not only create the database for you but it will also write the code needed to make it function

Building your own website is never an easy task and there could be a lot riding on the design and functionality, especially if it's a commercial venture. If you've also got to sort out how to link your site to a database, for example when setting up an online store, things can start to get particularly tricky.

Whether you build websites for a living or want to create a new site with extended functionality, Symbiant's Easygen is sure to be of interest. In essence, it speeds up the process of developing a database-driven website by creating the links between your site and the database, and generating all the necessary code.

Typical uses include creating an online shop and setting up a members-only area on a commercial website. You don't need to know how to create the database, nor do you need to know how to write the code required to make it function with your site. Easygen does all the hard work for you.

It takes a bit of practice to use Easygen to its full potential, but Symbiant has gone to great lengths to ensure that the learning experience is as easy and straightforward as possible. To help you get to grips with Easygen, a selection of animated tutorials, ranging from initial setup through to creating a full ecommerce website, can be downloaded from Easygen's website.

To get the most out of Easygen's program you should have some idea of what creating a website involves. If terms such as PHP, ASP and MySQL are completely foreign to you, then it's a good idea to develop some degree of background knowledge.

The beauty of Easygen is that, while it helps to know what these languages are, you won't need to know the details of how to program in them. Unlike products such as Microsoft Frontpage, Easygen will generate all the code for you, leaving you to concentrate on the design and function of your pages. You can even swap between PHP and ASP after the site has been created, making it easy to migrate between Unix and Windows servers. The database can also be created as you go, requiring no programming skills whatsoever.

Easygen is ideally suited to anyone who already has a website consisting of static pages. It allows you to import your data and add dynamic content, without the need for any sort of programming.

Version 2.2, which is a free upgrade to owners of all versions of Easygen 2, adds many new features. The page editor has been improved to support a layout grid, while the toolbox has been enhanced, providing faster and easier access to the various tools.

One of the most important additions in this new version is the text builder, which can replace specific strings in static text. In other words, you can create customised web pages tailored to individual users or automatically generate personalised emails when creating a mailshot. These pages could contain user-specific data, such as a statement of account or notification of an online purchase. You create the standard text and Easygen fills in the rest automatically.

Another new feature is the Online Calculations tool. With this you can create a form which takes values from the user, or from your database, and then performs calculations on them. An example of this could be to calculate VAT prices or shipping costs on the fly.

Version 2.1's Report Wizard could perform similar functions, but now calculated fields can be added anywhere in a user-designed page without having to generate a pre-designed report containing the data.

As a prerequisite you'll need a web server to use Easygen. This server could be local, provided by your ISP or, as in most cases, rented through a web-hosting company. If you don't currently have access to a web server, Symbiant provides web hosting services – visit www.symbiant.co.uk for pricing and more information.

With many other minor enhancements and improved compatibility with Mozilla Firefox, Easygen 2.2 is a significant upgrade to an already powerful utility. Its price is deceptively low, and plug-in modules are similarly inexpensive – the Shopping Suite is £49.99 and others start from just £14.99.

With a single copy of Easygen there are no licensing restrictions on size or on the number of sites you create.

If you want to design a feature-rich site without having to get bogged down with the likes of SQL and PHP, Easygen 2.2 is well worth the money.

Paul Monckton

DETAILS

RRP £79.99 (£68.08 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Symbiant 0113 237 3954
www.easygen.com
SYSTEM REQUIREMENTS
133MHz Pentium or equivalent
• Windows 98 (XP preferred)
• 64MB Ram • Internet connection
PROS Simple to use; relatively cheap
CONS Won't replace your web-editing package
VERDICT
An easy way for beginners and advanced users to add dynamic content to their sites

FEATURES	★★★★☆
EASE OF USE	★★★★☆
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

ANTI-VIRUS/FIREWALL

AVG 7 Plus Firewall

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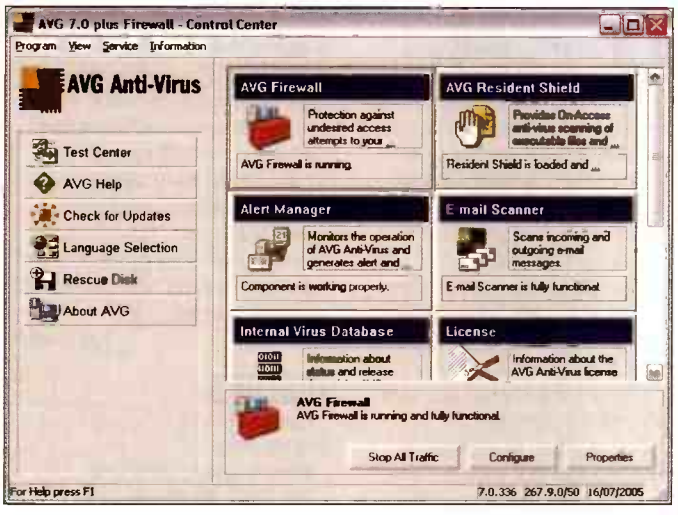


You can access and configure any of the features - including the AVG Firewall, Alert Manager and E-mail Scanner - from within the Control Centre

Last time we looked at AVG's anti-virus package, we reviewed the free version of the software. We were pretty impressed by the breadth of features offered, but felt the heavy-handed marketing was irritating and the lack of tech support could be a problem. The priced version suffers from neither of these problems.

But that's not the only change – in its latest release AVG has added firewall protection to its anti-virus package to offer a greater level of PC security, while retaining the budget price.

The antivirus package is still AVG 7, so it is essentially the same as the free version. You get all the tools you would expect, including virus scanning of hard drives, emails and removable media, regularly updated virus definitions, a Virus Vault to quarantine detected bugs, and a scheduler to automatically check for problems on your PC.

What's new is the firewall. This is set up when you first use the software by a configuration wizard, which checks which programs always need access to the Internet or network, to ensure they aren't stopped by the firewall. You can reset these rules in the future.

When the firewall is up and running it prompts users whenever an application attempts to communicate on a network port, users can then choose whether to allow or deny access, and a permanent rule will be created on this basis.

Overall, a well-featured security package and the two-year licence is a real bonus.

Laura Jones

DETAILS

RRP £39.99 (£34 ex VAT) for single-user version; £17.99 (£15.30 ex VAT) upgrade price includes new 2-year licence; £103.40 (£88 ex VAT) for five-user version

PRODUCT INFORMATION
AVG **www.grisoft.com**

SYSTEM REQUIREMENTS
Windows 98/ME/NT4/2000/XP
• 200MHz Pentium processor
• 64MB of Ram

PROS Price; two-year licence

CONS Interface could be clearer

VERDICT
AVG plus Firewall provides all the tools you need to keep your PC safe. It also costs less than Norton Antivirus alone and comes with a two-year licence.

FEATURES	★★★★★
EASE OF USE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

GAMING DOWNLOADS

Metaboli

The world's first games-on-demand service

Metaboli allows subscribers to download PC games from a central server to play on their home computers. It works in a similar way to the Napster music download service, but most of the browsing is done via the Metaboli website instead of a separate application.

Two subscriptions are available; the Essential Collection, priced at £6.95 per month and the Ultimate Collection at £12.95 per month.

At the time of writing, the Essential Collection provided access to 31 games (valued at over £500), while the Ultimate Collection had 48 games with a total RRP of £1,000.

As with streaming audio files, you need only download a fraction of a game's data files before you can start playing. All the remaining files are then downloaded in the background.

Unfortunately the number of titles available via Metaboli is relatively small, and new titles seem to be added fairly slowly. Metaboli says some games will be available for download at the same time as their normal shop release, but we found many of its 'new' games were up to three months old.

Like Napster, downloads are rendered unplayable if you stop subscribing. Metaboli has no minimum contract, so users could subscribe for a month at a time, gorge themselves on games they'd otherwise never play, and then cancel or continue their subscription.

Games on demand has been a long time coming and this proves the concept works. But the future of Metaboli depends on publishers taking it to heart.

Rory Reid

DETAILS

RRP Essential Collection: £6.95 per month; Ultimate Collection: £12.95 per month

PRODUCT INFORMATION
Metaboli
www.metaboli.co.uk

SYSTEM REQUIREMENTS
Dependent on game • Broadband Internet connection

PROS Flexible subscription plans; works well

CONS Small number of games; speed of new releases

VERDICT
Lacks some of the latest releases, but we'd recommend it to serious and casual gamers

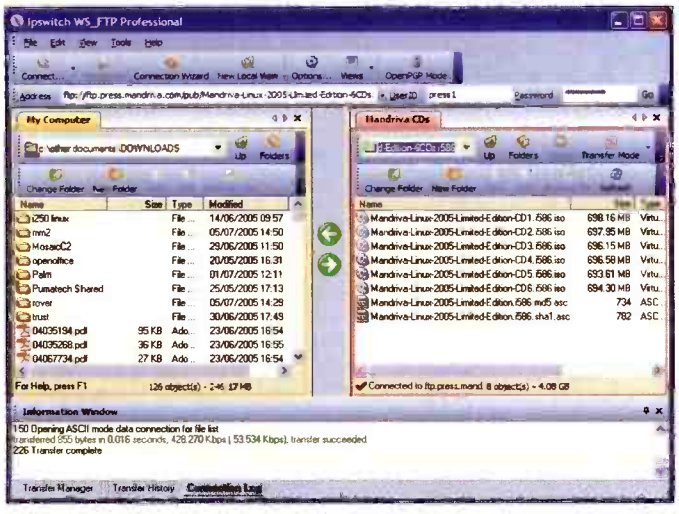
FEATURES	★★★★★
EASE OF USE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

Metaboli lets you download games direct from the website, without the need for a separate application, but some may find the latest games unavailable

FTP UTILITY

Ipswitch WS_FTP Pro 2006

Feature-rich file transfer client



The latest version allows local and remote folder locations to be saved and later retrieved – ideal for users working across multiple websites

If you're frequently transferring data to and from an FTP site, a decent FTP utility is a must. Basic FTP access is built into Internet Explorer, but it's very restrictive. WS_FTP Professional 2006, from Ipswitch, makes transferring files via FTP a breeze and it supports both http and https.

The latest version of WS_FTP offers a wide range of new tools, not least the ability to save workspaces. This process saves both the local and the remote folder locations so they can be quickly retrieved – a highly useful feature if you're managing several websites simultaneously.

It's also possible to link local and remote folders if they have the same folder structure, which eases navigation. The Synchronisation tool takes the drudgery out of this task and there is a search tool to look for files on the remote site.

If you frequently need to perform unattended file transfers, the transfer schedule feature will be useful. It's also possible to add scripting to cope with any errors that may crop up.

Other useful features include email notifications to inform others when transfers have been completed and the ability to pause downloads.

Security is always an issue when transferring files, so the support for 256bit encryption should give you peace of mind. You can also clear the connection history and disable password saving if you wish.

For simple FTP transfers, this package is overkill, but for those who frequently upload and download files it's perfect.

Tim Smith

DETAILS

RRP £36.70 (£31.23 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Ipswitch
www.ipswitch.com
SYSTEM REQUIREMENTS
32MB Ram • 8MB disk space • Windows 98SE/ME/NT/2000/XP
PROS Good interface; many useful utilities
CONS Advanced features not useful to ordinary users
VERDICT
A powerful ftp utility with a great interface but overkill for simple file transfers

FEATURES	★★★★☆
EASE OF USE	★★★★☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★★☆

SATELLITE NAVIGATION

Destinator PN

Satellite navigation for Pocket PC

Destinator PN is a software-based PocketPC satellite navigation system with streetmaps for Western Europe and major roads for the rest of Europe. The UK maps take up 128MB, but you'll need a hefty 1.5GB of space if you want to install all of the data. You'll also need a GPS receiver. We tested the software with a Bluetooth receiver (which can can be picked up for around £80), but Destinator PN can use USB or serial connections.

The map can be viewed in both 2D and 3D, with the latter making it easier to visualise the road ahead.

An interesting feature of the Destinator PN is its text to speech function, which will read out full road names during navigation. For example, instead of: 'Turn left on to the A23' it will announce: 'Turn left on to London Road.' The text to speech voice isn't as clear as the standard voice, but it's a more natural way to be directed.

Destinator PN can calculate routes by entering town and street names or by importing addresses directly from the contacts book.

During testing, the voice commands were generally timely, but on one occasion a turning was announced too early. However, routes are quickly recalculated after a wrong turn, without resorting to unnecessary U-turns.

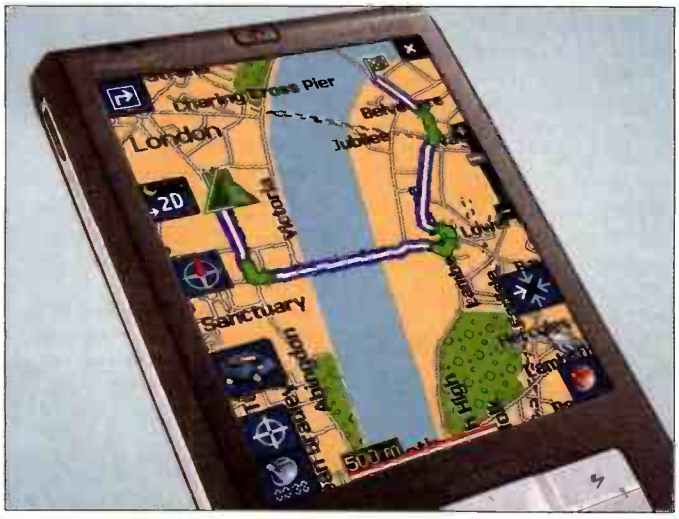
We expect most people to opt for a standalone satellite navigation system, but if you want to add extra functionality to your PocketPC, Destinator PN is worth considering.

Tim Smith

DETAILS

RRP £99.00 (£84.25 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Destinator
www.destinatoreurope.com
SYSTEM REQUIREMENTS
PocketPC with Windows Mobile 2003, 2003SE • 64MB of Ram • Storage card (256MB recommended) • GPS receiver (Bluetooth, USB or serial)
PROS Range of maps; text-to-speech
CONS Requires GPS receiver
VERDICT
You'll need to purchase a separate GPS receiver, but the text-to-speech function is a real bonus

FEATURES	★★★★☆
EASE OF USE	★★★☆☆
VALUE FOR MONEY	★★★★★
OVERALL	★★★☆☆



Destinator contains maps for the entire of the UK, all you need to do is enter a postcode with street name and it will calculate the best route for you

Easy Wireless

In an effort to replace the wireless network tool that comes free with Windows XP, BHV Software has come up with Easy Wireless. The interface attempts to be more graphical than Microsoft's Wireless Zero Configuration (WZC) and you get to see the actual signal strength of each available network, but there are few other unique features.

Easy Wireless works as an alternative to WZC, but information on the box suggests handling wireless networks will be made easier. Quite simply, we don't agree with this claim. The interface is different, as is the process of connecting to other networks, but it doesn't make things any easier. It's fine if you simply want an alternative to WZC, but if you think Easy Wireless will give you a range of new features, think again.

Will Stapley

RRP £24.99 (£21.27 ex VAT)
PRODUCT INFORMATION BHV **www.bhv-software.co.uk**
PROS Works well
CONS No real benefits compared to WZC
★★☆☆☆

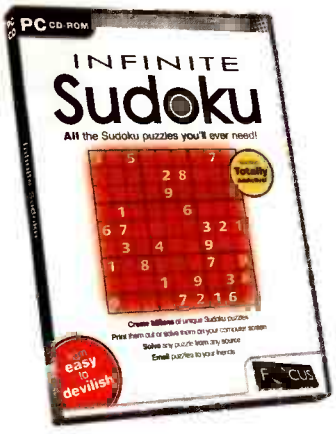
Navicore Personal

The Navicore Personal turns any Symbian Series 60 or Series 80 phone into a navigator. Using a tiny GPS receiver built round a low-drain Sirf III chip, it registers a satellite signal even in cities.

UK maps and software are provided on a 256MB SD (Secure Digital) card, leaving around 100MB free for your personal use. We had no problems establishing a Bluetooth link between the receiver and a Nokia 6630 provided for the review. Inputting place names for route planning is facilitated by software that narrows its choices as you type. The phone gives you audible, timely directions as you drive and reroutes quickly if you divert. It can walk you round cities but is not suitable for off-road rambling – Navicore says a later version this year should support that.

Clive Akass

RRP Series 60: £199 (£170.20 ex VAT), Series 80: £249 (£212.76 ex VAT)
PRODUCT INFORMATION Navicore **www.navicoretech.com**
PROS Low-cost GPS for suitable phones
CONS New and upgraded maps to cost around £100
★★★☆☆



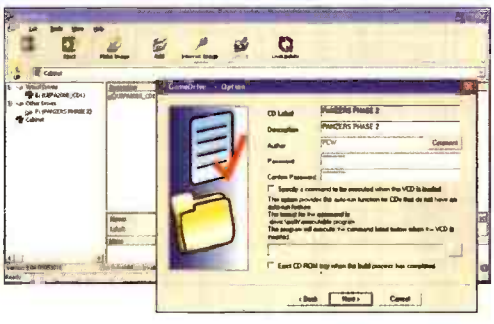
Infinite Sudoku

Sudoku fever is gripping the nation, so it was only a matter of time before a PC version came out. If you're new to Sudoku, the challenge is to fill every horizontal and vertical line, as well as each of the smaller sub-grids, with the numbers one to nine. Depending on the difficulty level chosen, a number of squares will already be filled in to get you started.

Infinite Sudoku provides an endless supply of puzzles and each one can be printed. Four levels are available, from easy to devilish, as well as junior versions for younger players. If you become stuck, you can opt to highlight incorrect numbers or retrace your steps to rectify mistakes. There's also a panic button should your boss be lurking. A word of warning though; it's seriously addictive.

Anna Lagerkvist

RRP £9.99 (£8.50 ex VAT)
PRODUCT INFORMATION Focus Multimedia 01889 570 156 **www.focusmm.co.uk**
PROS Hours of fun for a decent price
CONS More puzzle options would be good
★★★★☆



Gamedrive 9

Gamedrive lets you run PC games without having to insert the original disc. It works by imaging (copying) a CD and mapping the contents to a virtual drive on your PC. This can then be used as if it were the original disc. Multiple discs can be imaged, so you won't need to swap CDs mid-game.

The software isn't compatible with all games, but we tested a large selection and it worked with most titles. It also allows you to distribute and download game images over a Lan or the Internet, although this feature should be used responsibly. If you're prone to losing or damaging CDs and don't mind sacrificing some hard drive space or you just want to reduce the hassle of inserting a disc every time you play a game, then Gamedrive 9 is ideal.

Rory Reid

RRP €29.99 (£21 approx)
PRODUCT INFORMATION Orlogix **www.orlogix.com**
PROS No need for CDs when playing games
CONS Doesn't work with all titles
★★★★☆

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HIGH-END PC

Mesh Matrix Titan FX57 GTX

REVIEW September 2005, p55 **RRP** £1,643.83 (£1,399 ex VAT) **PRODUCT INFORMATION** Mesh 0870 0460 4747 www.meshcomputers.com

Combining AMD's latest Athlon 64 FX-57 processor and Nvidia's Geforce 7800 GTX graphics card, this is a high-performance PC. Despite the impressive spec, the price tag is surprisingly low.

GAMING PC

Evesham Decimator 78FX

REVIEW October 2005, p42 **RRP** £2,699 (£2,297.02 ex VAT) **PRODUCT INFORMATION** Evesham 0870 160 9500 www.evesham.com

If you're into 3D gaming, this is the PC for you. With two Geforce 7800 GTX graphics cards, it scored 12,273 in our 3Dmark05 benchmark. Other components include an AMD FX-57 CPU and 1GB of Ram.

BUDGET PC

Mesh Matrix Eclipse PCW

REVIEW September 2005, p112 **RRP** £799 (£680 ex VAT) **PRODUCT INFORMATION** Mesh 0870 0460 4747 www.meshcomputers.com

This is one of the few budget PCs with SLI technology, so you can add a second graphics card for faster performance. It also features an Athlon 64 3500+, 512MB of Ram and 200GB storage space.

BUDGET NOTEBOOK

Acer Aspire 3022

REVIEW October 2005, p84 **RRP** £580 (£493.62 ex VAT) **PRODUCT INFORMATION** Acer 0800 161 3060 www.shopacer.co.uk

Despite its modest price tag, the Aspire 3022 is an excellent performer and is packed with features. It has a fast AMD Sempron 2800+ CPU, 512MB of Ram and a Radeon X600 PCI Express graphics card.

TURION NOTEBOOK

Evesham Quest Roma T37

REVIEW September 2005, p56 **RRP** £899.98 (£765.94 ex VAT) **PRODUCT INFORMATION** Evesham 0870 160 9500 www.lowestonweb.com/quest

Battery life isn't great, but in terms of value for money the Quest Roma T37 is hard to beat. Among other features, it includes a 15.4in screen, ATI Radeon Mobility graphics and an 80GB hard drive.

DESKTOP REPLACEMENT

Mesh Pegasus 17.1in 3700+

REVIEW August 2005, p53 **RRP** £1,219.65 (£1,083 ex VAT) **PRODUCT INFORMATION** Mesh 0870 04604747 www.meshcomputers.com

This features an Athlon 3700+ processor, 1GB of DDR memory and a 128MB Radeon 9700 graphics card. Combined with a 100GB hard drive and dual layer DVD rewriter, it's a great desktop replacement.

PROJECTOR

Infocus X2

REVIEW September 2004, p51 **RRP** £799 (£680 ex VAT) **PRODUCT INFORMATION** Infocus 08000 286 470 www.infocus.com

It might be a bit on the heavy side, but considering the price tag of just £799, the Infocus X2 impressed us a great deal. Colours were well represented and text was superbly crisp.

PORTABLE MEDIA PLAYER

Archos AV400

REVIEW June 2005, p54 **RRP** £314.99 (£268.07 ex VAT) **PRODUCT INFORMATION** Datamind 0870 770 0848 www.datamind.co.uk

Capable of playing back all manner of video and audio formats, the AV400 from Archos is also able to record video and audio directly as well as function as a fully-fledged personal video recorder.

19IN FLAT-PANEL MONITOR

CTX S966A

REVIEW September 2005, p99 **RRP** £219 (£186.38 ex VAT) **PRODUCT INFORMATION** CTX www.ctxeurope.com

There's no height adjustment or DVI port on the S966A from CTX but, thanks to its great image quality, we still feel this panel is the best value-for-money 19in monitor currently available.

PDA

Palmone Zire 72

REVIEW September 2004, p106 **RRP** £199
(£170 ex VAT) **PRODUCT INFORMATION**
Palmone 0118 974 2700 www.palmone.com/uk

We weren't expecting much from the Zire 72, but were pleasantly surprised by its excellent picture quality, the 1.2megapixel camera and great performance.

POCKET PC

T-Mobile MDA Compact

REVIEW July 2005, p67 **RRP** £209.99
(£178.71 ex VAT) **PRODUCT INFORMATION**
T-Mobile 0800 956 5001 www.t-mobile.co.uk

The MDA Compact offers an extra-large screen, Bluetooth connectivity and comes with Pocket versions of popular Microsoft products. A great Pocket PC and mobile phone package.

MULTIFUNCTION DEVICE

Brother DCP-310CN

REVIEW February 2005, p54 **RRP** £119.99
(£102.12 ex VAT) **PRODUCT INFORMATION**
Brother 0870 830 4037 www.brother.co.uk

Although print quality isn't the best we've seen, the DCP-310CN is a good compact all-in-one unit, has the added benefit of being able to hook up to a network and comes at a decent price.

MP3 PLAYER

Apple Ipod

REVIEW January 2005, p129 **RRP** £207.99
(£176.17 ex VAT) **PRODUCT INFORMATION**
Apple 0800 039 1010 www.apple.com

Easy to use and undeniably stylish, the Ipod sets the standard which all other mp3 players follow. Available in a variety of storage options, the only factor that lets it down is battery life.

LASER PRINTER

Dell 1600n

REVIEW September 2005, p69 **RRP** £236
(£200.85 ex VAT) **PRODUCT INFORMATION**
Dell 0870 907 5818 www.dell.co.uk

Laser printers have plummeted in price recently, and this Dell 1600n offers scanning, faxing and mono laser printing for just £236. More importantly, both scan and print quality are excellent.

INKJET PRINTER

Canon Pixma IP5000

REVIEW June 2005, p60 **RRP** £169
(£143.83 ex VAT) **PRODUCT INFORMATION**
Canon 08705 143 723 www.canon.co.uk

The new Pixma IP5000 fires out 1picolitre drops of ink, enabling it to reach new levels of detail. It takes just 35 seconds to print a 6 x 4 photo and, thanks to an extra black ink, they look great too.

MOTHERBOARD

ECS 915-A

REVIEW June 2005, p70 **RRP** £61.81
(£52.50 ex VAT) **PRODUCT INFORMATION**
ECS 0870 4000 111 www.directfrom.com

The Intel-based 915-A offers three types of graphics: integrated, AGP and PCI-Express. The board is well designed and allows for a wide range of upgrades. At just £61, it's a real bargain.

HIGH-END SPEAKERS

Creative Gigaworks S750

REVIEW April 2004, p48 **RRP** £330
(£280.77 ex VAT) **PRODUCT INFORMATION**
Creative www.creative.com

Coming with a wireless remote control, 210w sub-woofer and seven satellites at 70w each, these THX-certified speakers from Creative can completely immerse you in sound.

SOUNDCARD

Creative Audigy 4 Pro

REVIEW July 2005, p110 **RRP** £179.99
(£153.18 ex VAT) **PRODUCT INFORMATION**
Creative http://europe.creative.com

The Audigy 4 Pro is an upgrade of the impressive Audigy 2 series. The main difference is the new digital to audio convertors, which provide a better signal to noise ratio. The price reflects the quality.

KEYBOARD AND MOUSE

Microsoft Optical Comfort Edition

REVIEW April 2005, p74 **RRP** £79.99 (£68.07 ex VAT)
PRODUCT INFORMATION Microsoft 0870 601 0100
www.microsoft.com/uk

This wireless keyboard from Microsoft has a comfortable ergonomic design and comes with a quick-zoom control and an impressive wireless optical mouse.

DIGITAL TUNER

Nebula Digitiv

REVIEW August 2005, p58 **RRP** £99.95
(£85.06 ex VAT) **PRODUCT INFORMATION**
Nebula 01689 897 090 www.nebulaelectronics.com

The Digitv is more than just a Freeview receiver for your PC. It also includes a built-in web server so you can schedule recordings remotely as well as stream broadcasts across your local network.

GRAPHICS CARD

Powercolor X850XT Platinum Edition

REVIEW July 2005, p70 **RRP** £370.07
(£314.95 ex VAT) **PRODUCT INFORMATION**
Overclockers www.overclockers.co.uk

This ATI card features a 540MHz core clock, 590MHz DDR memory clock and 256MB of DDR3 Ram running through a 256bit memory bus. In short, it's one of the fastest cards around.

Best Buys >> For the latest best prices go to www.pcw.co.uk/bestprices

DIGITAL VIDEO CAMERA

Canon MV850i

REVIEW September 2005, p62 **RRP** £349
(£297.02 ex VAT) **PRODUCT INFORMATION**
Canon 01737 220 000 www.canon.co.uk

The Canon MV850i is one of the most user-friendly camcorders we've tested. Thanks to its Easy mode, filming is hassle-free, and the quality of recordings is impressive.

DIGITAL CAMERA

Nikon Coolpix S1

REVIEW August 2005, p111 **RRP** £279.99
(£238.29 ex VAT) **PRODUCT INFORMATION**
Nikon 0845 4500 155 www.nikon.co.uk

The Coolpix S1 is not only a very small camera, but it's also capable of taking detailed, high-quality shots. It also features a 5megapixel CCD, 3x optical zoom and comes at a decent price.

HIGH-END DIGITAL CAMERA

Canon Powershot Pro1

REVIEW July 2004, p62 **RRP** £799
(£680 ex VAT) **PRODUCT INFORMATION**
Canon 08705 143 723 www.canon.co.uk

This well-designed 8megapixel prosumer digital camera is loaded with features, including a 7x optical zoom and remote control. It also takes stunning photos.

DVD-RW

NEC ND-2510A

REVIEW November 2004, p75 **RRP** £49.93
(£41.91 ex VAT) **PRODUCT INFORMATION**
NEC 020 8752 3665 www.nec.co.uk

The NEC ND-2510A doesn't come with any bundled software or free discs, but this 8.5GB dual-layer DVD is great value for money. At under £50, it's a real steal.

MEDIA CREATION SOFTWARE

Roxio Easy Media Creator 7.5

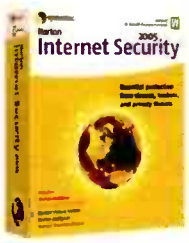
REVIEW July 2005, p72 **RRP** £69.99
(£59.57 ex VAT) **PRODUCT INFORMATION**
Roxio www.roxio.co.uk

With a wide range of audio, video, photo and DVD tools, this package represents excellent value for money and would suit those in need of a complete multimedia suite.

PC SECURITY SOFTWARE

Norton Internet Security 2005

REVIEW February 2005, p80 **RRP** £54.99
(£46.80 ex VAT) **PRODUCT INFORMATION**
Symantec 01628 592 222 www.symantec.co.uk



Providing protection from viruses, hackers and other privacy threats, as well as parental controls and anti-spam features, this is one of the best products to ensure your PC is both safe and secure.

OFFICE SOFTWARE

Microsoft Office Professional 2003

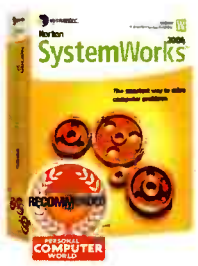
REVIEW May 2004, p150 **RRP** £459 (£390.64 ex VAT)
PRODUCT INFORMATION Microsoft 0870 501 0100
www.microsoft.com

This office suite offers a host of features, including a revamped version of Outlook. There are cheaper options available, but Microsoft's Office 2003 is the clear market leader.

PC MAINTENANCE SOFTWARE

Norton Systemworks 2004

REVIEW March 2004, p68 **RRP** £64.99
(£55.31 ex VAT) **PRODUCT INFORMATION**
Symantec 01628 592 222 www.symantec.co.uk



If you want to keep your PC healthy and safe, Norton Systemworks 2004 certainly gets the job done, and at the reasonable price of a penny short of £65 to boot

BACKUP SOFTWARE

Roxio Backup My PC Deluxe 6

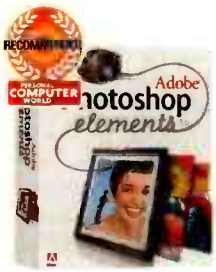
REVIEW June 2005, p82 **RRP** £34.99
(£29.78 ex VAT) **PRODUCT INFORMATION**
Roxio 01908 278100 www.roxio.co.uk

Take the pain out of securing the data stored on your PC. Thanks to a clean and usable interface, and the help of various wizards, Backup My PC Deluxe 6 simplifies the whole process.

IMAGE-EDITING SOFTWARE

Adobe Photoshop Elements 3

REVIEW January 2005, p83 **RRP** £69.33
(£59 ex VAT) **PRODUCT INFORMATION**
Adobe 020 8606 4001 www.adobe.co.uk



If you can't afford the full version of Photoshop, Elements 3 is a good alternative. Building on the huge success of Elements 2, it's loaded with features and is great value for money.

VIDEO-EDITING SOFTWARE

Adobe Premiere Elements

REVIEW January 2005, p148 **RRP** £69.33
(£59.00 ex VAT) **PRODUCT INFORMATION**
Adobe 020 8606 4001 www.adobe.co.uk

Based on Adobe Premiere, the industry standard video-editing package, Premiere Elements is perfect for home users who want to edit their videos quickly and effectively without spending a fortune.

MUSIC CREATION SOFTWARE

Steinberg Cubasis VST 5

REVIEW March 2004, p67 **PRICE** £59.95
(£51.02 ex VAT) **PRODUCT INFORMATION**
Pinnacle Systems www.pinnaclesys.com

This sound-editing tool takes a bit of getting used to, but with a huge range of plug-in effects and a decent collection of virtual instruments, you'd be hard pushed to find a better package at this price.

Acer recommends Windows® XP Professional.

August2005

www.pleasing.it - ADV

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Acer Aspire L200

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- AMD Athlon™ 64 Processor 3200+
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[1] is enabled by Microsoft® Windows® XP SP2

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Acer recommends Windows® XP Professional.

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Acer, like Ferrari, is the technology driver of tomorrow. Both produce desirable, eye-catching and devastatingly fast products that embody the passion, spirit and experience of years leading the competition. The magnificent carbon fibre casing of the Ferrari 4000 conceals the very latest AMD 64-bit technology, full wireless connectivity and widescreen monitor. Powerful, dark and purposeful, the Ferrari 4000 has the presence of a true champion.

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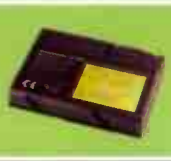
Acer Battery Packs



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Wales: **Azteq Ltd** Newport 01633 213122 • **Asis Computing Ltd** Swansea 01792 411088 info@asis.co.uk • **Dinas Computer Services** Cardiff 029 2023 1445 iain@dinascomputers.co.uk • **Gaia Technology** Bangor 01248 352459 johnb@gaia-tech.com

Northern Ireland: **Computer Warehouse** Ballymena 02825 652255 info@computerwarehouse.co.uk • **Computer World** Armagh 028 375 10002 sales@computerworlds.co.uk

England - Midlands: **A2Z Computer Products Ltd** Loughborough 01509 215435 kevin@a2zcomputers.co.uk • **Ballicom International Ltd** Coventry 0870 751 5054 • **Cavendish Computer Centre** Leicester 0116 251 0066 cavcomcen@hotmail.com • **Computerlink (Leicester) Ltd** Leicestershire 0116 2333 993 sales@computerlink.co.uk • **Coventry Computer Centre** Coventry 0870 441121 sales@covcom.co.uk • **Enabling Computer Supplies Ltd** Stafford 01785 243111 shaunh@enablingtechnology.net • **JAL Computers** Stoke on Trent 01782 848100 sales@jal.co.uk • **Logical Computers** Warwickshire 01789 296200 pcpancho@logical-computers.co.uk • **Mansfield Computers** Mansfield 01623 631202 rita@mansfieldcomputers.co.uk • **Microplus Solutions** Tamworth 01827 68080 • **Spa Computer Centre** Royal Leamington Spa 01926 337648 psb@spacomputers.com • **The Computer Factory** 2 branches-Shrewsbury/Birmingham 01939 234882

England - North: **Aindale BMS Ltd** Huddersfield 01484 518899 sales@aindale.co.uk • **Alan Kelsall Computer Services (AKCS)** Cumbria 01946 64288 alan@alankelsallcomputerservices.com • **Aztech Computers** 01484 308500 • **Barry Bennett Ltd** Bolton 01204 534 311 geoff@barrybennett.co.uk Black Box Lancaster 01524 389300 • **Easy Computers** Huddersfield 0845 226 2235• **Halifax Computers** Halifax 01422 257777 sales@halifaxcomputers.co.uk • **Hi-Tec Computer Services** Bradford 01274 626379 neil@hi-tecbradford.co.uk • **KTD Office Equipment** Cumbria 01539 733288 sales@ktdonline.com • **Logical Computer Supplies** Yeadon 0113 210 7000 sarah.farrar@logcom.com • **Microtec 99 Ltd** Oldham 01706 694000 sales@microtec99.co.uk • **Microtech Services Ltd** Wakefield 01924 215661 sales@microtechservices.co.uk • **Middlestown PC's Ltd** Wakefield 01924 260615 info@middlestownpcs.co.uk • **Mighty Micro - 2 branches** Macclesfield 01625 423170 mm-macc@mighty micro.co.uk and Manchester: 0161 224 8117 sales@mighty-micro.co.uk • **Models and Computers+** Lincolnshire 01205 365102 • **Netcomp Computers Ltd** Sheffield 0114 258 4414 • **Performance Computers** 3 branches in North Yorkshire - Darlington/Richmond/Northallerton 01609 772442 • **Pudsey Computers** Leeds 0113 204 7750 sales@pudseycomputers.co.uk • **Qualcom** Sunderland 0191 523 9988 sales@qualcom.co.uk • **Simons Computer Supplies Ltd** Lincoln 01522 883636 jerry@simonscomputers.co.uk • **Sel Computers** Cumbria 015395 33222 • **User friendly Computer** Warrington 01925 232424 sales@userf.co.uk • **Yarm Computers** Yarm charles@yarmcomputers.co.uk

Islands: **HTL Computers** St Helier 01534 878788 Southside Computers St Sampson 07781 131131 • **Southside Computers** St Sampson Tel: 01481 241155 southsidecomputers@cwgsy.net • **Tech Supplies** St Helier 01534 722452 sales@tech.co.je • **TH Colebourne** Isle of Man 01624 673482 sales@colebourne.com • **Waltons** Isle of Man 01624 614536 sales@waltons.com

Suggested street prices valid from 18/08/05 to 22/09/05

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A2

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A3

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AMD Turion64 MOBILE TECHNOLOGY

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Acer AL1951a

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- 20"Widescreen Multimedia TFT
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Acer AL2032wm

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- 17" Multimedia TFT LCD
- Resolution 1280 x 1024
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A4

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nVidia G6600 256MB PCI Express, Microsoft® Works,
Speakers, Modem, 9-in-1 Card Reader

- AMD Athlon™ 64 Processor
  - Cool'n'Quiet™ Technology
  - Enhanced Virus Protection Technology¹
- Microsoft® Windows® XP Media Center 2005
- 1024MB DDR
- 160GB SATA HD
- Audio O/B
- DVD-RW
- 56K Modem / LAN
- nVidia G6600 256MB PCI Express
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- 1* Year collect and return

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A5

acer POINT

Acer Projectors

The Future of Digital Imaging

Acer PH110
16:9 Widescreen Projector

PH110

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1100 Ansi lumen (800 in ECO), 2000:1 contrast, 30db noise, 2.3Kg, 2000 hrs lamp life (3000 in ECO), Keystone correction, Inbuilt speaker

Acer PD125
The freedom of mobile power

PD125

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DLP, XGA (1024 x 768) resolution, 2000 Ansi lumen (1500 in ECO mode), 2000:1 contrast, 30db noise (27Db in ECO mode), 2.4Kg, 2000 hrs lamp life (3000 hrs in ECO mode), S-Video and Composite inputs, Keystone correction, Inbuilt speaker

Acer Digital Cameras

Capturing your Digital Life

Acer CR8530

8 Megapixel

£ 229 INC VAT
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8MP, 1.8" CCD sensor, 3x optical zoom, 4x digital zoom, 2.5" LCD TFT, 64Mb SD Card inc., Video recording 320 x 240@ 15fps, Battery support 140 photos, Rechargeable lithium battery, Max resolution 3264 x 2488, ViewFinder

5 Megapixel

Acer CE5330

£ 99 INC VAT
£ 84.26 EX VAT

5MP, 3x Optical Zoom, 16MB Internal Memory, 2.0" LCD, 100 Photo Battery Support, Movie Recording Function, 8 Scene programmes, Carry case included

A6

www.acer.co.uk

WORDS: PAUL ALLEN

Lay down the law

Many of us have bought a faulty product and have been refunded accordingly. But when a retailer refuses to budge, make the law work to your advantage

Consumers in the UK are protected by a set of laws that aim to ensure fair trading. But as a result of today's numerous and varied avenues for trading, such as discount stores, markets, the Internet and even car boot sales, consumers are often unsure, or simply unaware, of their rights under consumer law.

In this feature we set out your rights and outline some of the ways in which disputes can be resolved. We'd like to be able to say that all the advice offered in this feature is legally binding and definitive, but corporate lawyers would boil us in printer's ink for making such a claim, especially as there are many variables. In addition, much of the advice offered applies to the UK and Wales, so readers in Scotland should double-check their position at **www.scotcourts.gov.uk** (see screenshot, right).

Consumer protection law is not a set of absolute guidelines and guarantees that operate on the understanding that the customer is always right. The laws afford reasonable redress to those with a genuine grievance, but defend retailers that trade lawfully. And while some aspects of consumer law provide clearly defined remedies in specific circumstances, much of it is merely a set of guidelines for dispute resolution.

A comprehensive site on Scottish consumer protection laws

There are few black and white answers, and many of the legal points covered here are in the context of how a judge in the small claims court (properly called the Small Claims Track, or the Sheriff's Court in Scotland) might interpret the situation.

For consumers buying hardware and software the number of variables that can cause faults is far higher than in most other consumer purchases. There are no special rules for IT goods, and proving to a judge that an item failed because it was inherently faulty rather than because it had been misused or damaged by third-party elements such as applications or malware, could be tricky, especially as the majority of judges are not renowned for their technical acumen. So up front we'll say that a court hearing should be the last resort and should only be pursued when all other avenues have failed.

Know it all

Knowledge is power, and like all clichés this is grounded in truth. Shop assistants, call centre staff and complaints departments generally have well-rehearsed lines to deal with dissatisfied customers. While many give accurate answers that are within the law, many also attempt to fob off complainants with nonsense about 'company policy'. No company that operates a retail business is immune from consumer protection law; company policy is usually an idea of how the company would prefer to handle complaints, not a barrier to your rights. Understanding what these are and how best to invoke them is your best defence against poor products and service. It's amazing how quickly a company changes its approach to a complaint once the customer starts to explain exactly why they are in the right.

Burden of proof

The Sale of Goods Act (SGA) is the daddy of consumer protection law and tends to focus a retailer's attention. It is not the consumer's enforcer, however, for it sets out responsibilities as well as rights.

The SGA was amended in March 2003 and now gives buyers extra rights. With a clarity typical of the legal establishment, the new measures are called the Sale and Supply of Goods to Consumers Regulations 2002, which we'll shorten to the Regulations, and cover purchases made from the 31 March 2003. The Regulations state that goods must be of satisfactory quality, safe to use and fit for the purpose for which the seller knows you are buying them.

That last aspect is key for technology buyers because it means that consumers must be aware of the abilities and limitations of a device or application. If you bought, for example, a Windows Media Center PC and later found that it was not possible to connect it to an existing television because the graphics card did not have a Scart output, getting a refund or exchange would mean proving that the retailer knew the PC was intended for a composite display.

Ram is another example: if the memory bought is incompatible with a PC, you can't expect a refund unless the shop said it would work in your PC. The best way to safeguard against this is to research what you need and communicate this clearly to the seller. For expensive items, we recommend obtaining a specification sheet that describes components, so you have proof if the hard disk in a new PC turns out to have half the capacity you paid for. On the subject of proof, always keep receipts safe because other rights become difficult to enforce without a proof of purchase.

Judging fitness for purpose is clearer. Devices must match the description given to them, so a PC sold as suitable for creating DVDs must have a DVD writer. Items that simply won't start up properly or have failing components, such as a DVD writer that won't eject or fails to read discs, are simple enough. In this situation, you must inform the retailer within a reasonable amount of time and arrange for it to be returned.

What is meant by 'reasonable' in the Regulations is not defined, but speed is of the essence. Most companies accept seven days from the date of purchase as reasonable for good bought in person, although mitigating circumstances could lengthen this – an illness for example. For online, telephone or mail orders, the period starts from the receipt of goods. Our advice is to unpack and try out any purchase as soon as possible. It's not reasonable to return an item to the shop because of a change of heart. Some retailers offer this facility, but it is a courtesy, not an obligation. Nor can you complain about defects that were noted at the point of sale (items sold with cosmetic blemishes, for example) or faults that should have been evident on reasonable inspection. The law assumes that visitors to shops have the time to inspect goods to a limited degree and, where possible, it's worth asking to see the actual item rather than a display version.

The key change in the Regulations is that in the first six months from purchase consumers do not have to prove that an item was faulty when received: it is assumed that the fault existed at manufacture. If the retailer wishes to refuse a repair or replacement, it must prove that the fault did not exist. Repairs should not inconvenience the

The Office of Fair Trading can offer helpful buying tips

Top tips for buying

- **Use a credit card to pay for items that cost more than £100. If something goes wrong, say if the company goes into liquidation, then the card issuer is liable and you can claim a refund from them. Try not to pay by cash wherever possible and check your receipt to see what it actually says. Note: this applies only to purchases of up to £30,000. Items bought with debit cards do not have this protection.**

- **Buy from within the EU. Technically speaking, your rights apply when buying from anywhere, but try telling a Texas-based software developer that you intend to take it to Guildford Crown Court!**

- **Do a Google search on the exact model name and number of an item. Product lines that are poorly designed always find infamy on message boards. Read a mix of messages and reviews, but don't let a small number of complaints put you off. Even the best companies can turn out a dud on occasion.**

customer, which means they should be provided reasonably quickly and at no extra cost. If you have returned a bulky item by post or courier, this cost should be refunded, unless the goods are found to be fault-free or have been damaged by the actions of the consumer. If you accidentally drop your new digital camera and return it for a repair, expect a charge for parts, labour and delivery.

Refunds for the purchase cost are trickier to obtain: to demand an instant refund the consumer must prove the fault is inherent. This is likely to involve getting an independent report from, say, a PC technician, and any usage of the item would be taken into account. This applies generally to items that have been used for a few weeks or more before the fault becomes apparent. And the longer it has been used, the less likely you are to obtain a refund. In most cases it's better to request a replacement or repair.

Some retailers will ask you to send items back to the manufacturer, but they have no right to do this. Your contract of sale under the SGA is with the company that accepts your payment. In practice, it is often quicker to deal with manufacturers direct, especially if goods have been bought from chain stores, but if legal action is required, the retailer is ultimately responsible.

Manufacturer warranties, which normally cover the first year after purchase, are an extra protection and not a replacement for rights under the Regulations.

Claims for refunds made after six months from purchase are generally to do with durability; ie, how long should an item last? This is difficult to answer, but indications can be found in the item's price and use. An expensive external hard disk would be expected to last longer than a cheap one, and a cheap laser printer used to produce thousands of fliers each week would have a shorter acceptable lifespan unless it was sold as having that ability.

All the points made so far assume that the item is being used properly. It's not possible to get repairs or refunds for items that have been accidentally damaged or mistreated. This is where it gets difficult for PC buyers.

If you complain

- **Keep detailed records. Get specification sheets for expensive items, especially PCs. Establish one storage point for all receipts, even an old biscuit tin – you never know when they might be needed. Print out email receipts and spec sheets from online shops. Make a note of any calls made to companies in chronological order and who you spoke to.**
- **Remain calm. Disputes are frustrating, but losing your cool empowers the retailer. Remember that support staff are rarely directly responsible for your problem. They are entitled to respond defensively to shouting and abusive language. If you are getting nowhere on the phone, ask for the postal address of someone to whom the complaint can be escalated, and send letters by recorded delivery.**
- **Don't try to repair faulty hardware, especially immediately after purchase.**

Help and advice

The government organisations listed below offer help and advice on resolving a variety of disputes.

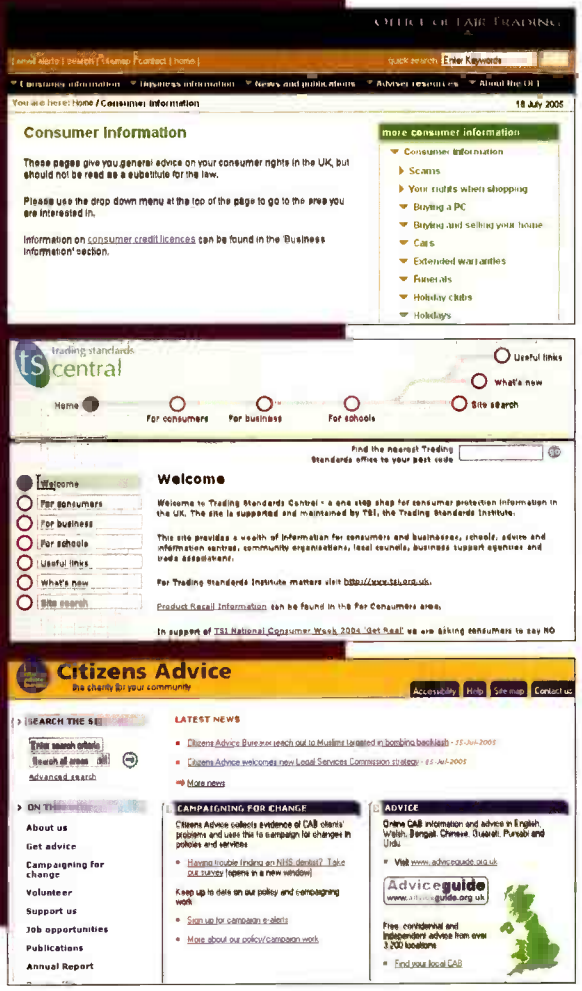
The Office of Fair Trading (OFT) does not deal with individual complaints but instead offers a wide and comprehensive range of leaflets that set out rights and responsibilities clearly in specific situations. The OFT can also refer callers to the appropriate service. Contact 0845 722 44 99.

The Trading Standards Institute provides training for trading standards officers in local authorities around the country. The amount of funding provided, and therefore the level of guidance a consumer can expect to receive, is determined by the council but, again, there's plenty of general information available.

The Citizens Advice Bureau can offer free advice on all consumer matters.

The Legal Services Commission offers advice and links to specialist legal services for England and Wales.

Office of Fair Trading:
www.oft.gov.uk/consumer
Trading Standards Institute:
www.tradingstandards.gov.uk
Citizens Advice Bureau:
www.citizensadvice.org.uk
Legal Services Commission:
www.legalservices.gov.uk



Due care

Attempting to fix an item can scupper your rights. *PCW* readers are unlikely to be daunted by the idea of opening a case and attempting to diagnose the problem, but if an engineer working on behalf of the retailer later discovered that components had been removed, or added, the company would most likely refuse or make a charge to repair the device.

Third-party software installations (programs not provided with the PC at sale) or tweaks to the computer's settings can also cause strife. PC vendors insist that most support calls and claims for repairs and refunds are caused by one of two things: the inability to use a piece of software which is interpreted by the user as a fault, and deleting files, tampering with settings or mistreating hardware. That's why all support calls begin with a standard procedure to reset or reformat a device. While it's frustrating to go through this, attempting to bypass such checks on the grounds that you are a knowledgeable PC user might count against you. *PCW* has spoken confidentially to support engineers and learned that this is often noted on support logs – the implication

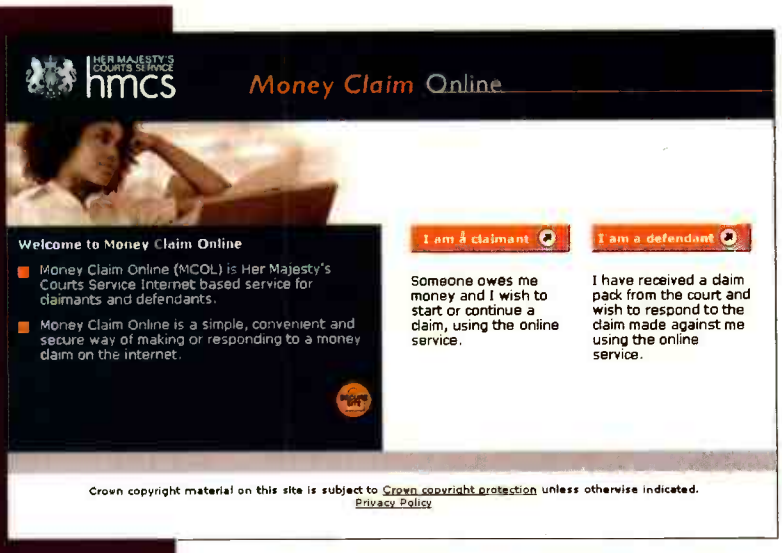
Online claims

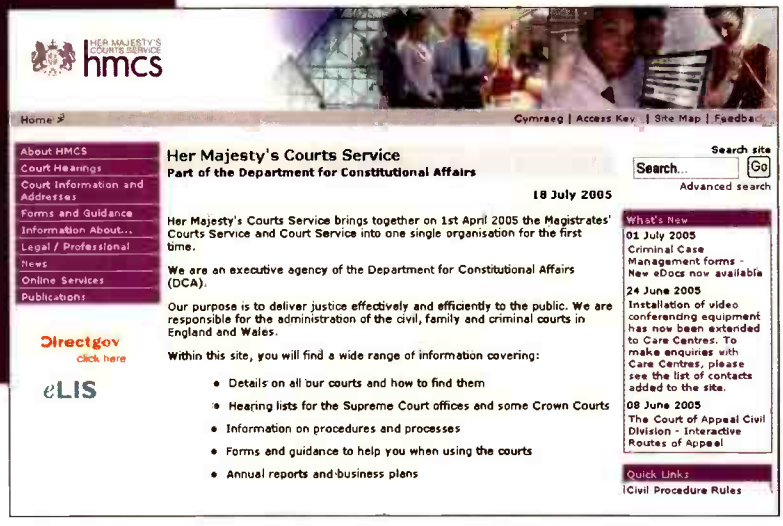
Before you start legal action, take a day to cool down and think about the situation objectively. Ask yourself these questions: Have I acted properly at most stages? Has the retailer broken any consumer laws? If so, which? Most importantly, do I have the written evidence to prove this? Finally, is it worth it?

The sad truth is that for minor losses it simply isn't worth starting court actions. You may believe it will lead to vindication, but courts are unpredictable, and it's necessary to invest time and money in a claim. Another thing to consider is your chance of getting payment. If a company has gone bankrupt, you may very well obtain a judgement against them yet find yourself at the end of a very long line of debtors.

If you are confident your complaint is justified, then starting a claim is simple. Visit www.moneyclaim.gov.uk and register as a claimant. You must file the claim against the person (director or owner) or company at their business address. You will be asked to submit an account of the full circumstances of the claim. If the case proceeds original documents will be required for court.

You must also decide on a figure to claim: be realistic. Claim for costs such as postage, carriage and the purchase price, but don't claim compensation for distress or inconvenience. Compensation can only be paid for provable expenses, such as loss of earnings, and the court will not simply take your word for it. We recommend you read the advice listed at www.hmcourts-service.gov.uk/online services/mcol/ index.htm.





Her Majesty's Court Service Money Claims website is a secure and convenient way to make a money claim against a company

being that self-proclaimed 'power users' are more likely to have stuck an oar in at some point. Companies will play by the book and it's best to go along with it at first.

If a basic reset does not solve the problem, claim a repair or replacement. We also advise you to make a note of exactly what you are sending back. If a component is causing a problem, copy any ID details you can from XP's Device Manager.

We've been told by readers that components which retailers claim to have replaced occasionally come back with the PC after a simple hard disk reformat. Remember that replaced components must be of comparable quality – you couldn't insist on having the latest incarnation of a technology to replace a faulty one, only something comparable in quality to the technology available when the item was first sold to you.

Most OEMs use components salvaged from returned PCs for repairs, and this is perfectly acceptable providing that component works and is fit for the purpose for which it was originally sold.

Sale away

There is much confusion about buying second-hand goods or items in a sale, but the basic rules are clear. You have the same rights in both instances when buying from traders, with the exception that any defects must be pointed out at the time of sale. Traders are distinguished from private sellers, and this is another sticking point. Typically, traders are those individuals or companies that sell more than one of an item – those with stock. This applies to many sellers on online auction websites, particularly those listed as Power Sellers, as well as those at computer fairs and even the infamous car boot sale. Traders who pose as private sellers are breaking the law and should be reported to a local Trading Standards office (find your nearest at **www.tradingstandards.gov.uk**).

Fault line

Companies will often try to sell additional insurance because they earn lots of money from it. It's important to note that extended warranties, like manufacturer's guarantees, add to your rights but they do not affect your general rights under legislation. Some readers have told *PCW* that retailers refuse to consider claims for repairs made later than a year from purchase, often on the grounds that the item isn't covered by an extended warranty. This is tosh.

The point we made earlier about durability applies here. If a £20 webcam loses its sight after a year and a day, commit its remains to the nearest recycling centre and have a drink in its memory. But a £700 LCD TV that goes dead after the same time could be said to have been cut down in its prime.

Under the SGA you have six years to raise a claim, although that does not mean, as is sometimes mistakenly believed, that all goods have to last that long (in Scotland the term is five years from discovery of the fault). This applies to components too. A £500 laser printer might be expected to last a long time but the drum within it has a shorter life span, which is noted under the Regulations as 'fair wear and tear'. The key thing is that consumers are made aware of this and so the life expectancy of certain components is often listed in specifications. But if the

drum in our example caused problems before the end of its claimed lifecycle (normally measured in completed prints as a rule), you could make a claim that it was inherently faulty.

Many consumers order goods online or by phone. When doing so the basic rules detailed in the SGA apply but consumers are afforded extra rights under the Distance Selling Regulations (DSR). It's obviously not possible to inspect goods for quality when buying at distance, so those rules provide an easy get-out clause for consumers. You can simply refuse the goods, providing this is done in a reasonable time. Again, this period is not defined, but most retailers accept returns within seven days.

Consumers are protected from pressure selling tactics by the DSR, but if an item ordered from a distance has faults, it's usually best to return it within seven days rather than getting bogged down in the vagaries of the SGA. There are two things to look out for: some retailers attempt to charge a 'restocking fee' for such returns. This is illegal, so don't pay it. Returns under DSR are simply a fact of commercial life for traders who sell online or by phone. Second, some retailers state that goods made to order are not eligible for DSR returns. This may be true for items such as hand-engraved jewellery, but the OFT has decreed that it does not apply to a computer built from a selection of standard components. So a PC that is specified from a list of varying hard disk sizes, memory and graphics capabilities cannot be considered as made to order.

Are you being serviced?

Broadband is not a product; it is a service and is regulated in law by the Supply of Goods and Services Act (SGSA). The most common complaint we receive about ISPs is when a service works poorly, or not at all, and the customer does not wish to pay. ISPs go into a sort of legal denial when this happens and say only one thing: you have signed a contract and must pay for the full term. Not true: the SGSA states that customers must honour contracts, but only if the service as promised has been supplied with 'appropriate care and skill'. If this not true, you don't have to pay.

However, this does not mean simply stopping a direct debit. This is more likely to lead to a bad credit rating from which you may not recover fully. Instead, escalate the complaint properly and remind the company that it is breaching not just the SGSA, but quite possibly the Unfair Terms in Consumer Contracts Regulations. Broadly, these say that contracts cannot be used to avoid responsibility if something goes wrong or impose unfair commercial penalties.

If you subscribe to broadband over the phone or by applying or upgrading online, DSR also comes into play. In practical terms, you have seven days to change your mind, and this period begins only when the documentation that sets out the terms and conditions of the service is received in writing (not by email).

When faced with disputes, the average UK consumer's gut instinct is to dig in their heels and consider it the trader's responsibility to resolve the situation. The customer is, after all, always right. That's a great idea but the best way to get a result is to be proactive.

If you contact a company with a complaint, keep records of all telephone conversations, noting names of employees spoken to, dates and times. Store emails and receipts safely as

Keep a record of all the phone calls you have made to the company

facts carry more weight than your memory of a conversation. Above all, remain calm. The scripted approach that many companies bring to bear on complaints, coupled with poor communication and record keeping, can turn the mind to dark thoughts. The international language of the baseball bat may seem tempting, but you might as well whack yourself round the face for all the good it will do. Aggressive or abusive behaviour, in writing, on the phone or in person, enables the company to sideline your complaint. Support staff are more likely to invest some effort on your behalf for the price of a little civility, especially if you can explain where the company's actions have transgressed the SGA or other relevant laws.

Some disputes can't be resolved quickly, so the next stage is to escalate the complaint with the company or a trade association. Forget the phone and email at this stage: get the address of the company's complaints department or managing director's office. Send letters outlining the complaint with supporting documents, set a realistic deadline for a response and send the letter by recorded delivery. Customers of ISPs have other avenues to pursue: all ISPs are obliged to belong to a trade association that provides a dispute resolution service. Check whether yours belongs to ISPA (**www.ispa.org.uk**), CISAS (**www.arbitrators.org/cisas**) or OTELO (**www.otelo.org.uk**). All three sites provide advice on rights and means to bury the hatchet.

Finally, if every effort has been stonewalled then legal action may be your only resort. It is now easy to submit a claim online – the box on the previous page explains how to do so. Judges will expect other options to have been attempted first, and will probably look kindly on those who have made a reasonable effort to solve the problem first.

The law is a strange beast, so make it work on your behalf. Although we haven't covered every possibility in this feature, the basics are here to help you understand when it is appropriate to make a complaint, what restrictions or obstacles you may encounter and how to progress a complaint once you've got the ball rolling.

Do you need help?

Next month *PCW* launches its customer help section. If you are having a problem, let us know and we will try to help you resolve it. Send an email, outlining the problem and your contact details to letters@vnu.co.uk

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55 Windows tools for free

Open-source programs offer security and versatility – and they won't cost you a penny. What's more, they are worthy rivals to paid-for products

WORDS: CHRISTOPH HOFFMANN, HEIKO MERGARD

Open-source software is fashionable, a fact borne out by 25 million downloads of the Firefox browser, and the market-leading position enjoyed by Linux for web servers. It's also widely believed that open-source software (OSS) is safer than proprietary programs. There are two reasons for this: first, the programs' source code is open so anyone can find and close security loopholes; second, because OSS is not as widely distributed as Microsoft programs, it is not subject to so many attacks from hackers. This situation might change, though, if OSS becomes more popular.

OSS is mostly associated with Linux, and Windows OSS developers have lived in the shadows. Windows projects do exist, as you can see if you visit the open-source website at www.opensource.org or www.sourceforge.net. This feature highlights a collection of OSS for XP, and there's a complete list of 55 of the best on page 80. If you've bought the DVD edition of *PCW* you'll find much of the software on the cover disc.

Real alternatives for free

Among the best open-source programs are classics such as the versatile Open Office, and graphics application The Gimp, which you can transform on a Mac into a Photoshop lookalike with Gimpshop.

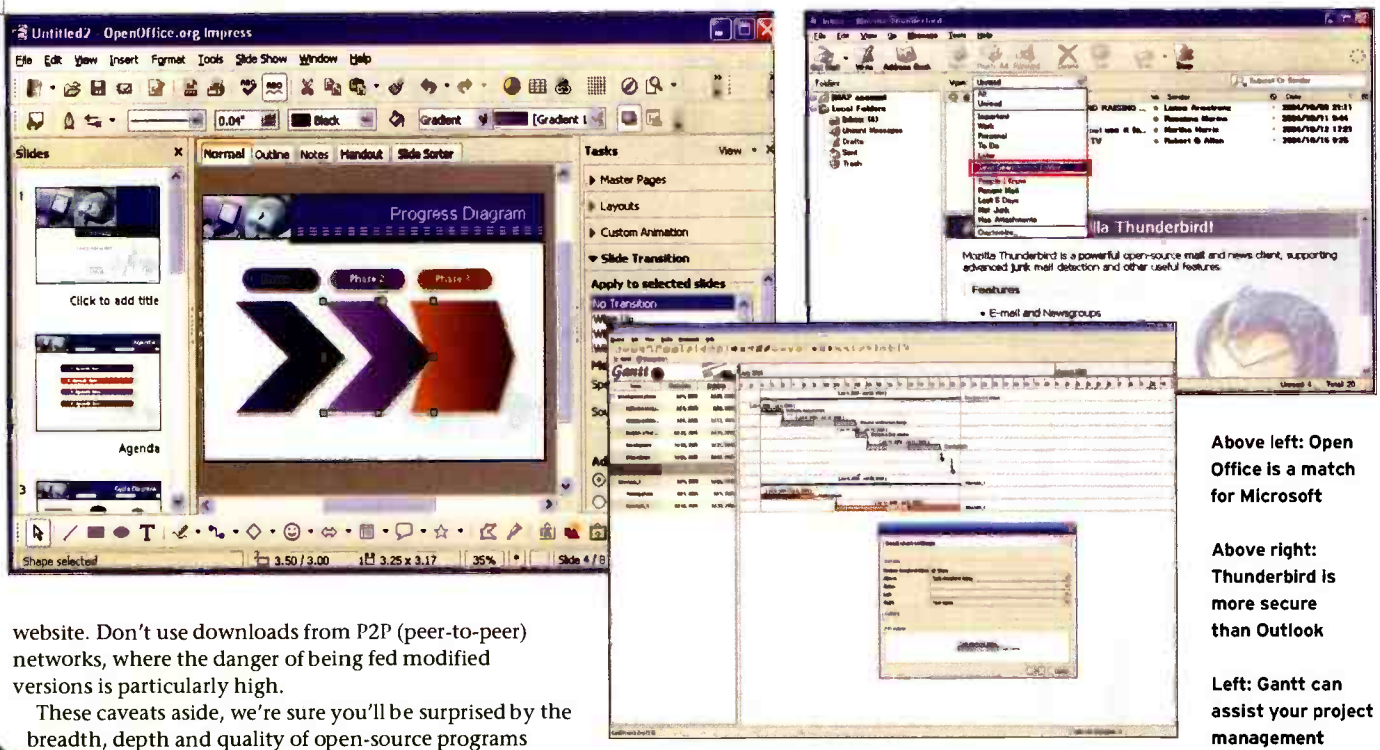
NVU, a simple alternative to Dreamweaver, is included in our top 55, as is a competitor to Microsoft's XP Media Center Edition in the form of Media Portal. We've also included exciting programs for project management, audio editing, pdf conversion, instant messaging, FTP, encryption and system monitoring, as well as a web server. OSS has become so good and so versatile that you can fully equip a productive PC using only these products – at no cost. Sun, IBM, Novell, Red Hat and even Microsoft have released the source code for many of their own programs and thereby have opened the door for further adaptation and development. For example, Novell's Hula (www.hula-project.org) is a free collaboration server with an email client, calendar and address book for up to 250,000 users.

Licence questions

But what does open source really mean? Basically, software counts as open source if the program code is available in a readable and understandable form and can be made executable using a compiler. After compilation, you should be able to copy, distribute and use as many copies as you want, so that the program can be used either commercially or privately on as many computers as required – without licence fees being payable. The basic principles are listed in detail in the Open Source Definition (OSD), which you can find at www.opensource.org/docs/definition.php. Typically, OSS uses the terms of the GNU GPL (GNU General Public Licence). However, there are some programs that declare themselves as being open source, but in reality are not. For example, the PGP Corporation (www.pgpi.org) describes its encryption programs as open source, however, the source code can be viewed but modification and redistribution are not allowed as it's based on the patented IDEA algorithm.

Be on your guard

Just as with commercial programs, you run the risk of being a victim of a malware attack when using OSS: it's possible for a hacker to modify the source code, for example, to include back doors in order to gain access to your system. You should therefore only load OSS from trusted sources, preferably from the official project



Above left: Open Office is a match for Microsoft

Above right: Thunderbird is more secure than Outlook

Left: Gantt can assist your project management

website. Don't use downloads from P2P (peer-to-peer) networks, where the danger of being fed modified versions is particularly high.

These caveats aside, we're sure you'll be surprised by the breadth, depth and quality of open-source programs available for Windows XP. Read on to get more information about our favourite picks.

Open Office 2 Beta: Office suite

The developers are completing the switch from version 1.1.4 to 2.0 and have equipped this office suite for Windows, Linux and Mac OS with numerous improvements and new functions for word processing, spreadsheets, presentations and databases.

Apart from cosmetic alterations to the interface, usability improvements and compatibility with Microsoft Office files, there is a new file format, Oasis, which should soon be supported by other programs. Network and user-defined installations are possible, which is very useful for IT administrators setting up clients on a network.

For the first time Open Office contains its own database components (HSQLDB), in order to create and manage new databases. Of particular interest to corporate users are the improved SQL functions and database connectivity using LDAP (Lightweight Data Access Protocol).

In the word processor, it's now easier to create new style templates, and revamped dialogue boxes make using the program more intuitive. There's a new macro protection system for added security, and sections of text in a document can be concealed from the curious. The spreadsheet can cope with nested cells and process up to 65,000 rows, improving compatibility with Excel. Like previous versions, Open Office 2.0 includes Impress for presentations – Open Office's equivalent to Powerpoint.

Open Office (**www.openoffice.org**) is a good alternative to the Microsoft Office suite, both for office and home use – with the bonus that there's no need to buy a separate pdf writer, as Open Office includes one already. For home users, Microsoft Office is rarely justifiable economically, which could lead to an increase in Open Office's importance.

Thunderbird 1.02: Email program

Microsoft's email clients, Outlook and Outlook Express, are widely regarded as unsafe because they lack security features and support active scripting. Switching to Mozilla Thunderbird is one option.

The changeover is made easier by a wizard that can import messages and addresses from Outlook and Outlook Express. In Thunderbird you can access all important functions quickly via buttons in the toolbar. The program is easy to use and the interface can be individually configured using Themes. The quick search function, with which the current mailbox can be searched by Sender name or Message title, is very useful.

Messages can be displayed in threads, so all sent and received messages on the same theme are grouped into one easy-to-follow view. Thunderbird also incorporates a trainable spam filter and an RSS reader.

Its Imap (Internet Message Access Protocol) support works well, and you can add extra functions using plug-ins available for download from **https://addons.mozilla.org/extensions**.

Ganttproject 1.11.1: Project planning

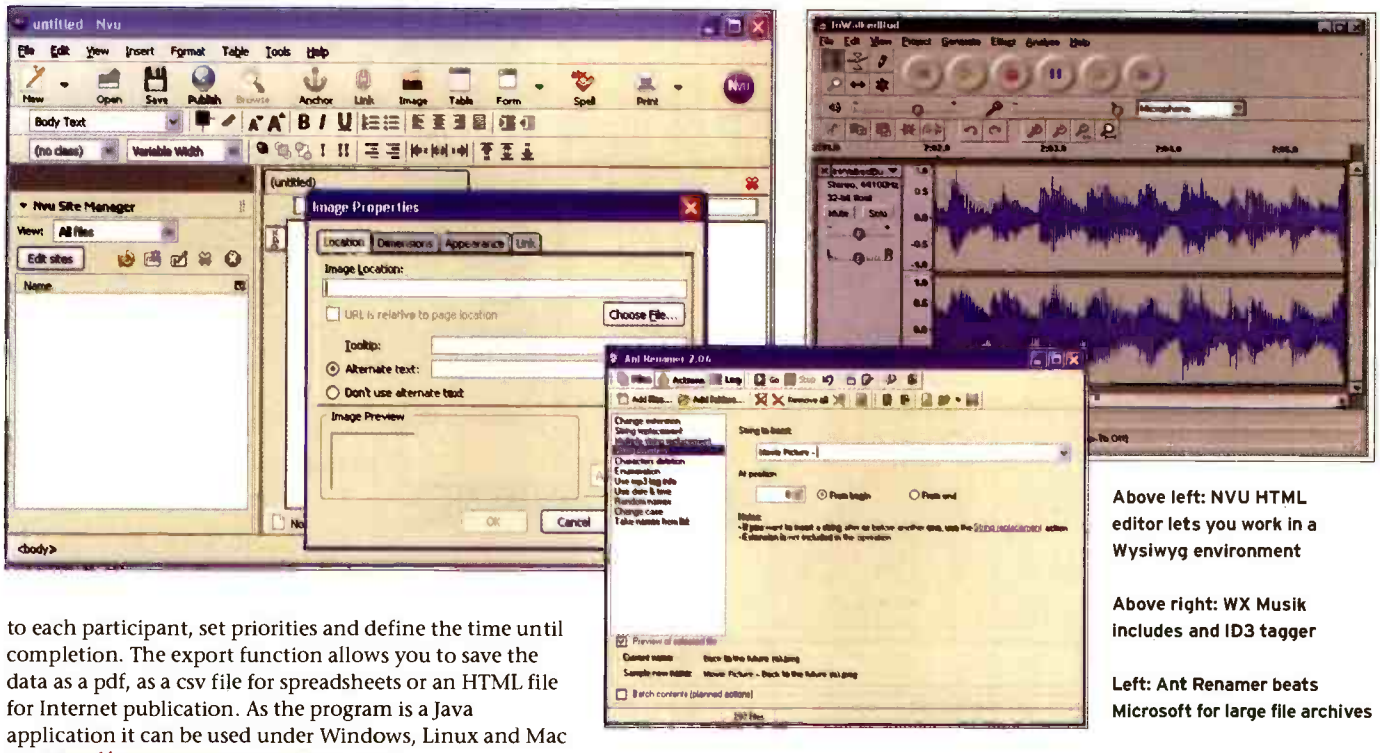
You can use this software to specify timings for projects and keep a check on available resources. To do this the components of the project are arranged hierarchically and linked to people and dates. Each part of the project is displayed in a bar chart which shows each task and its scheduled and actual progress. You can allocate tasks

The source for open-source software

The search for open-source software is not as easy as it might seem, because a lot of download portals offer both freeware and open-source software without differentiation and just describe things as 'free'. The most reliable place to look is the Sourceforge.net website (http://sourceforge.net). Programmers can register (which costs $39 (£22) per year) and receive their own subdomain URL, usually in the form projectname.sourceforge.net. The same price is paid by registered users who can then make use of extended search features and direct download links using fast mirror servers as well as gaining access to source code.

Software in abundance

The provisions of the GNU General Public Licence (GPL) have brought more than 42,000 projects into the light – in total more than 98,000 projects are hosted. Further search filters can be applied to the operating system, interface, language and development status in order to find the project you're looking for quickly.



Above left: NVU HTML editor lets you work in a Wysiwyg environment

Above right: WX Musik includes and ID3 tagger

Left: Ant Renamer beats Microsoft for large file archives

to each participant, set priorities and define the time until completion. The export function allows you to save the data as a pdf, as a csv file for spreadsheets or an HTML file for Internet publication. As the program is a Java application it can be used under Windows, Linux and Mac OS (**http://ganttproject.sourceforge.net**).

WX Musik 0.4.1: Sound jukebox

You can use this software to manage and play back a database of your music files with the integrated player. Mp3, ogg, wma, aiff, wav, ape, mpc and flac file formats are supported, as well as Internet audio streams.

After installing the software under Windows or Linux, you need to create a library, to which you add directories containing music files. You can also add scans of album covers as png, gif, jpg or bmp files. The audio tracks in the library are shown with additional information such as the song name and album title, artist name, track length and bit rate. The program arranges tracks into categories, such as the 50 last-played or the 10 tracks in the current playlist with the highest ratings.

When played back, songs can be faded into each other with the cross-fader. Useful extras include an ID3 tagger with automatic functions and a search function with logical queries. There is also a web-radio receiver with a customisable list of stations (**http://musik.berlios.de**).

NVU 1.0: HTML editor

NVU has its roots in Netscape. As a further development of the rather poorly specified Netscape Composer, the current version of NVU also meets professional requirements. Just like the commercial web editors Frontpage or Dreamweaver, this program – available for Windows, Linux and Mac OS – is based on a combination of direct source-code editing and design in a Wysiwyg environment.

The program conforms strictly to W3C (World Wide Web Consortium) standards and generates very compact code, which can be purged of errors and unnecessary ballast.

With both spelling and grammar checkers, various themes for user interface customisation and extensions, you can configure NVU as you want it.

You can also create and save templates, and there is an FTP client so the pages can be automatically placed on a web server and edited there (**www.nvu.com**).

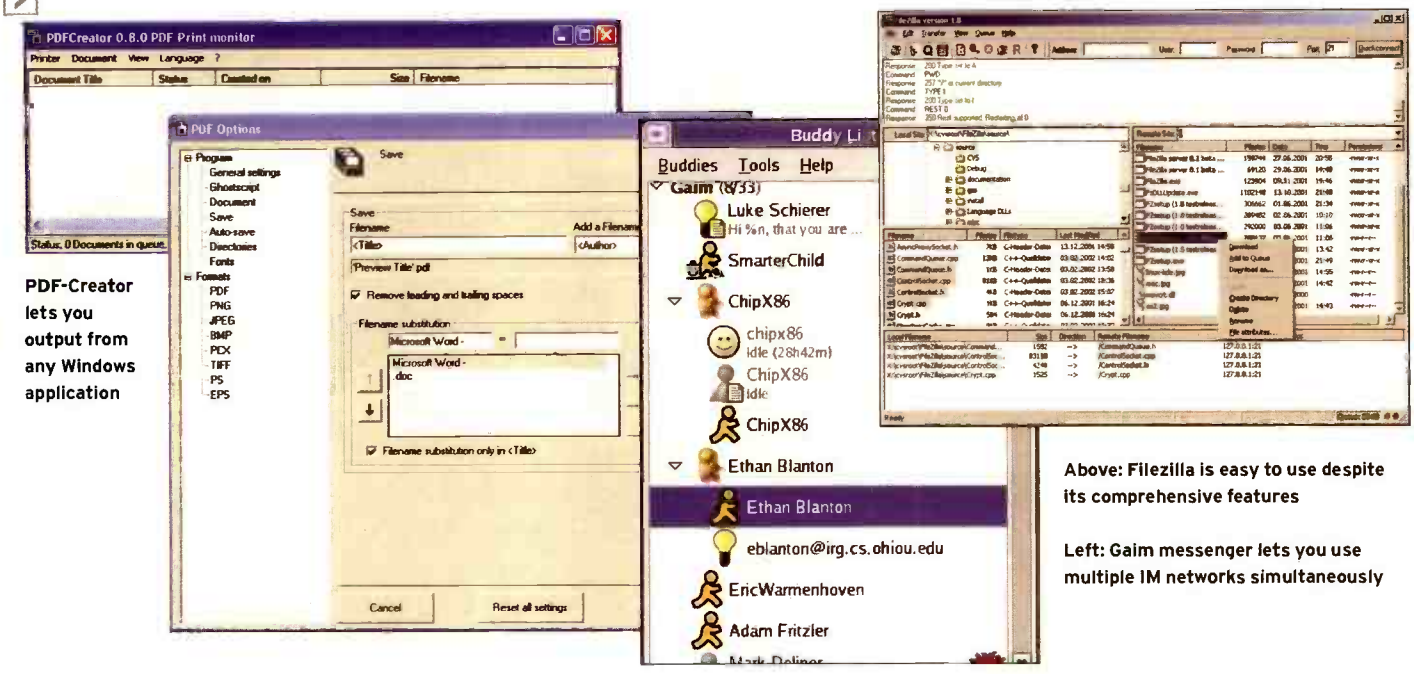
Audacity 1.2.3: Audio file editor

With the help of this easy-to-use multitrack audio editor you can record and play back music and edit, import and export audio files under Windows or Linux. When editing, sections marked with the mouse can be cut, copied or inserted. You can insert whole audio files into the currently open file using the Project/import audio command. Extended functions allow you to mix and add sound effects or even change the music's tempo. Audacity includes 28 filters, and more can be added. You can integrate VST (Cubase-compatible Virtual Studio Technology), Ladspa (a standard for Linux audio plug-ins) and Nyquist files as plug-ins. An editor for ID3 tags, functions for cross-fading, removal of noise and crackles round off the program. To save as mp3, you need to download and install the Lame DLL encoder (**http://lame.sourceforge.net**) and specify the path using File, Settings, File formats, Search Library. As well as the editing functions, you can record and save any signals from the soundcard's line-in channel (**http://audacity.sourceforge.net/?lang=ensourceforge.net/?lang=en**).

Ant Renamer 2.0.8: Name editor

Changing file names using Windows Explorer is tedious and time consuming due to the lack of automation. What might be acceptable for a few files becomes a nightmare when dealing with a large file archive. If, for example, you need to make mp3 file names consistent, add the date and place to image file names or change HTML file names to be all lower-case, then you need Ant Renamer.

Simply use the mouse to drag a selection of files into the program window and apply the relevant options. These include things like deleting and replacing characters and sequential numbering. Numbering allows you to create a sequence where you can specify both the starting number and the rate of increase. Using the Exchange characters method you can search for particular letters and numerals and replace them.You can also make changes to mp3 tags and change file names from using initial capital letters to all lower-case or all upper-case (**www.antp.be**).



PDF-Creator lets you output from any Windows application

Above: Filezilla is easy to use despite its comprehensive features

Left: Gaim messenger lets you use multiple IM networks simultaneously

PDF-Creator 0.81: pdf program

There are a lot of commercial or adware programs that will help you save your documents as pdf files, but only a few which are free and totally unsponsored.

Our recommendation is PDF-Creator, which installs as either a Windows network printer or a desktop printer driver. This means you can output from any Windows application as a pdf file. In the print dialogue you can specify the name for the document, its creation date and author. In the Format/PDF options you can choose between PDF 1.2 or 1.4 compatibility as well as specifying the preferred resolution. You can also adjust the pdf compression, which is on by default, for output quality and file size.

Alternatively you can save documents as png, jpeg, bmp or tiff graphics or as Postscript (ps) or Encapsulated Postscript (eps) files. PDF-Creator can integrate with the Windows Explorer context menu, allowing you to create pdfs with just two mouse clicks (**http://sector7g.wurzel6.de/pdfcreator/index_en.htm**).

GnuPG: Email encryptor

On its way to the recipient an email can easily be read by snoopers. You can achieve greater security by encrypting and signing messages that include sensitive content. This can be done using the GNU Privacy Guard (GnuPG) and the add-ons Enigmail (**http://enigmail.mozdev.org**) for Mozilla Thunderbird or the corresponding Outlook add-in. Encrypted messages are generally regarded, because of their use of public and private keys, as being secure.

Every GnuPG user has a key pair. Data encypted using the public key can only be decrypted with the private key. On the other side, digital signatures can only be generated with the private key and checked for authenticity with the corresponding public key. The public keys are available on key servers. If you receive an encypted message, you will not be able to see any plain text, just a jumble of numerals and letters. To make the original text visible, you will also require GnuPG and your private key. Even if you use a mail program other than Thunderbird or Outlook you don't have to do without GnuPGP support. You can download add-ons for Pegasus Mail (**http://community.wow.net/grt/qdgpg.html**), Eudora (**http://eudoragpg.sourceforge.net/ver2.0/en/**) and Outlook Express (**http://winpt.sourceforge.net/de/download.php**). And all for nothing (**www.gnupg.org**).

Gaim 1.4.0: Multiservice messenger

Almost every major online service now offers its own instant messaging (IM) service, but the different programs from AOL, MSN and Yahoo, as well as the popular ICQ Messenger, only work together in a very limited manner.

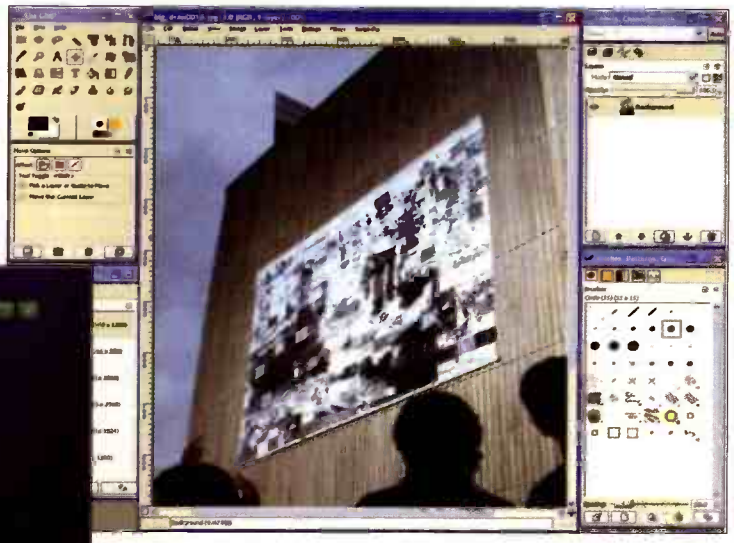
Instead of installing several programs, you can use Gaim, which is a multiprotocol IM client for Linux, BSD, Mac OSX, and Windows. It is compatible with Aim and ICQ (Oscar protocol), MSN Messenger, Yahoo, IRC, Jabber, Gadu-Gadu, SILC, Groupwise Messenger, and Zephyr networks. You can log in to multiple accounts on multiple IM networks simultaneously. This means that you can be chatting with friends on AOL Instant Messenger, talking to a friend on Yahoo Messenger, and sitting in an IRC channel all at the same time.

Gaim supports many features of the various networks, such as file transfer, away messages, typing notification, and MSN window closing notification, and it goes beyond that by providing many unique features. The most popular are Buddy Pounces, which notify you, send messages, play sounds or run a program when a specific buddy goes away. It can sign online, return from idle; and plug-ins give you text replacement, a buddy ticker, extended message notification, iconify when away, spell checking, tabbed conversations, and more (**http://gaim.sourceforge.net**).

Mozilla Firefox: Browser

With the Firefox browser the Mozilla Foundation has created one of the most successful open-source projects ever. In the period from November 2004 to February 2005 there were over 25 million downloads of this alternative to Internet Explorer from official mirror sites. If you add on other download sources, distribution on CD and DVD and so on, the figure could be double. Ease-of-use features, such as Tabbed Browsing and the open plug-in interface that is used, for example, to enable an ad blocker, Google search, mouse pointers, a download manager and many other add-ons. Firefox does not support visual basic scripts, ActiveX or Browser Helper Objects (BHOs).

Above: Firefox rocked Microsoft with 25 million downloads in four months



Above: The Gimp can be made to look like Photoshop for Mac users

Left: Media Portal brings all your media needs together

This makes Firefox less vulnerable to attack by malicious HTML code, although that doesn't mean it's totally immune (www.mozilla.org).

Filezilla 2.2.12c: FTP client package

Windows does not have a proper FTP client for transferring data to or from an FTP server. Filezilla is highly recommended; it's very easy to use despite a comprehensive list of features.

The multi-pane program window shows both the local drive and the remote server directory and lists the FTP commands in plain text. Among its main functions are the resumption of interrupted downloads or uploads, support for file transfer through a firewall and using an SSL encrypted file transfer. An editable Queue is used to manage the files selected for transfer. You can start uploads and downloads after selecting a server from the Site Manager. The developers also offer an FTP server. Among its functions are user and group management, a remote admin interface, a traffic limiter, IP restrictor and Kerberos authentication, as well as the option of starting the server as a service under Windows NT, 2000, XP and 2003 and to evaluate logfiles (http://filezilla.sourceforge.net).

Media Portal 0.1.1.1: Multimedia help

This program brings together a video, DVD and audio player with radio and TV functions. There's a wizard to guide you through the settings, including specifying the directories for media files setting up TV and radio cards.

Supported cards include those from Medion, Hauppauge, Pinnacle, Twinhan, Typhoon, ATI and Terratec. An electronic programme guide (EPG) displays the current TV programme. When recording movies to hard disk you can select the codec to use. Media Portal can also use RSS feeds fom the Internet. In the options, you can activate further plug-ins, such as an email client. The program requires Windows XP with Service Pack 1 or 2, DirectX 9.0c or higher, and Microsoft .Net Framework 1.1 (http://mediaportal.sourceforge.net).

Freemind 0.8: Mindmap designer

Use this software, which is written in Java, to make structured representations of your thoughts and ideas. In mindmapping the user collects, collates and adds notes to random content.

With Freemind you first specify the theme and then allocate the points and thoughts and gradually combine terms and notes. As a result you get new or interesting aspects, which can be joined together with lines. You can export the finished mindmaps as HTML documents for publication on the web. The program's own help files contain very useful pointers on how to use the software and on the structure of mindmaps (http://freemind.sourceforge.net).

The Gimp 2.2.4: Image editor

This software, which is available for Windows, Linux and Mac OS, can easily stand comparison with its commercial competitors. However, it's a little tricky to get used to its interface. Each element of The Gimp – the Image window, the Toolbar, Tool options and the Brush palette – floats on the desktop as a separate window. If you're an Apple or Linux user, help is at hand in the form of Gimpshop (http://plasticbugs.com/index.php?p=241), which makes The Gimp look more like Photoshop, but a Windows version of this hack isn't available yet. The Gimp supports layers and rules to help with object alignment. Power users will appreciate alpha channels, gradation curves, histograms and colourtone shifting. Filters, scripts and plug-ins can also be integrated (www.gimp.org).

Health Monitor 2.1: System checker

System administrators can use this program to monitor individual workstation PCs and servers on the network, and can be informed of problems by email or SMS. You can easily select the components and services to be checked: these include CPU usage, free hard disk capacity and available memory. Directories and files are monitored for changes and all activities are recorded in a log file. (http://healthmonitor.sourceforge.net).

Active participation

Even if you aren't a programmer, you can get involved in the open-source software development process. Most projects have their own discussion forums and mailing lists. If you have a good idea for a new feature or option, or find a bug, then you should let the project leaders know: your help will be appreciated.

THE BEST OPEN-SOURCE PROGRAMS AT A GLANCE

7-Zip 4.16 Beta	File compressor that integrates with Explorer and uses high compression	www.7-zip.org
A Note 4.2.1	Fix notes to the Windows desktop. Incorporates alarm function	http://a-note.sourceforge.net
Abakt 0.9	Save files in compressed form or copy them unaltered	www.xs4all.nl/~edienske
Abiword 2.27	Alternative to Windows Wordpad with numerous extra features	www.abisource.com
Aethera 1.21	Calendar, address book, to-do list with reminder function and an email client	www.thekompany.com/home
Ant Movie Catalog 3.5	Catalogue your DVD movie collection and add extra information	www.antp.be
Ant Renamer 2.0.8	Easy file renaming with various filters	www.antp.be
Audacity 1.2.3	Edit, optimise and add effects to audio files	http://audacity.sourceforge.net
Axcrypt 1.6.1	Encryption program that integrates with Windows Explorer	http://axcrypt.sourceforge.net
Blender 3D 2.36	Model, render and animate three-dimensional objects	www.blender3d.com
Borg Calendar 1.4.2	Multi-user-capable desktop calendar with to-do list and address book	http://borg-calendar.sourceforge.net
Cdex 1.51	Converts audio CDs to wav format or saves them as mp3 files	http://cdexos.sourceforge.net
Cinepaint 0.19	Professional image editor for high-resolution pictures	http://cinepaint.sourceforge.net
Clam Win 0.83	Virus scanner that also checks macros and file attachments	http://clamwin.sourceforge.net
Cool Mon 1.0.1003	Desktop window with lots of useful system information	www.coolmon.org
Cool Player 215	Slim player and ripper for ogg, mp3 and wav files	http://coolplayer.sourceforge.net
Dia 0.94	Create diagrams and flowcharts from predesigned symbols	www.gnome.org/projects/dia
Double Type 0.2.1	Design and save your own Truetype (TTF) fonts	http://doubletype.sourceforge.net
Egroupware 1.0.0.006	Multi-user PHP groupware with CMS, Mail, an address book and a calendar	www.egroupware.org
Eraser 5.7	Securely and permanently erase data	www.heidi.ie
Filezilla 2.2.12c	FTP client with twin-pane site manager and SSH connections	http://filezilla.sourceforge.net
Firefox 1.02	Web browser with pop-up blocker and parallel display of multiple websites	www.firefox-browser.de
Freemind 0.8	Create mindmaps with relationships and display them graphically	http://freemind.sourceforge.net
Gaim 1.4.0	Instant messenger with support for ICQ, Aim, MSN, Yahoo and Jabber	http://gaim.sourceforge.net
Ganttproject 1.11.1	Project manager for time planning and resource allocation	http://ganttproject.sourceforge.net
GnuPG Add-ons	Encryption software for emails with add-ons for mail clients	www.gnupg.org
Health Monitor 2.1	Monitors Window's state of readiness and sounds an alarm if there are problems	http://healthmonitor.sourceforge.net
Inkscape 0.41	Design vector graphics (SVG) for maps, technical diagrams and logos	www.inkscape.org
JDictionary 1.8	Database dictionary with over 1.4 million entries	www.jdictionary.info
Kee Pass 0.99b	Manages, generates and copies secure passwords to a database	http://keepass.sourceforge.net
Keynote 1.6.5	Combination of a word processor and a database, with good search functions	www.tranglos.com
Media Portal 0.1.1.1	Play video, DVD, audio and images as well as streaming radio and TV	http://mediaportal.sourceforge.net
MP3 Tag Tools 1.2.008	Editor for mp3 files' ID tags	http://massid3lib.sourceforge.net
MP3 Gain 1.2.5	Equalise mp3 sound levels without affecting the recording quality	http://mp3gain.sourceforge.net
NVU 1.0	Wysiwyg HTML editor with functions for creating professional web pages	www.mozilla.nightrat.net/nvu
Open Office 2.0 Beta	Word processor, spreadsheet, presentation program and database	www.openoffice.org
PDF-Creator 0.8.1	Installs itself as a printer driver to save documents as pdf files	http://sector7g.wurzel6.de/pdfcreator/index_en.htm
Poptray 3.10	Monitors email accounts in the background and alerts you to new mails	http://poptray.crause.co.za
PW-Gen 1.4.0	Generates secure passwords with key lengths 64 to 128 bits	http://sourceforge.net/projects/pwgen-win
RSS-Owl 1.1	RSS reader	www.rssowl.org
Screencopy 2.3	Tool for making screenshots of the active window or the whole desktop	http://smartision-sc.sourceforge.net
Syn Text Editor 2.1.0.46	Text editor that supports the command syntax of many programming languages	http://syn.sourceforge.net
Task SwitchXP Pro 1.1.2	Extend the functionality and appearance of the Windows task manager	http://taskswitchxp.sourceforge.net
The Gimp 2.2.4	Image editor with layer manager, retouching effects and filters	www.gimp.org
Thunderbird 1.02	Email client for Imap/Pop3 accounts, with spam filter and virtual folders	www.thunderbird-mail.de
True Crypt 3.1a	Encrypts files and partitions as well as USB sticks, Zip drives and floppies	http://truecrypt.sourceforge.net
True Downloader 0.82	Download manager for FTP and HTTP links with clipboard monitoring	http://francis.dupont.free.fr/truedownloader
TV-Browser 1.0.1	Daily updated TV listings for more than 80 channels	www.tvbrowser.org
Virtual Dub 1.5.10	Video editing and capturing for mpeg-1 and avi videos	www.virtualdub.org
Virtual Win 2.1	Manage up to nine virtual desktops; call them up with hotkeys	http://virtuawin.sourceforge.net
VLC Media Player 0.8.1	DVD, VCD and audio player, which supports mpeg and DivX streaming	www.videolan.org
Web HTTrack 3.33	Offline reader to save copies of Intenet pages on local hard disks	www.httrack.com
Winroll 2.0	Shrinks program windows with a single click on the title bar	www.palma.com.au/winroll
WX Musik 0.4.1	Jukebox with a database function for mp3, ogg, wma and wav files	http://musik.berlios.de
Xampp 1.42	Webserver suite with Apache, PHP, MySQL	www.apachefriends.org

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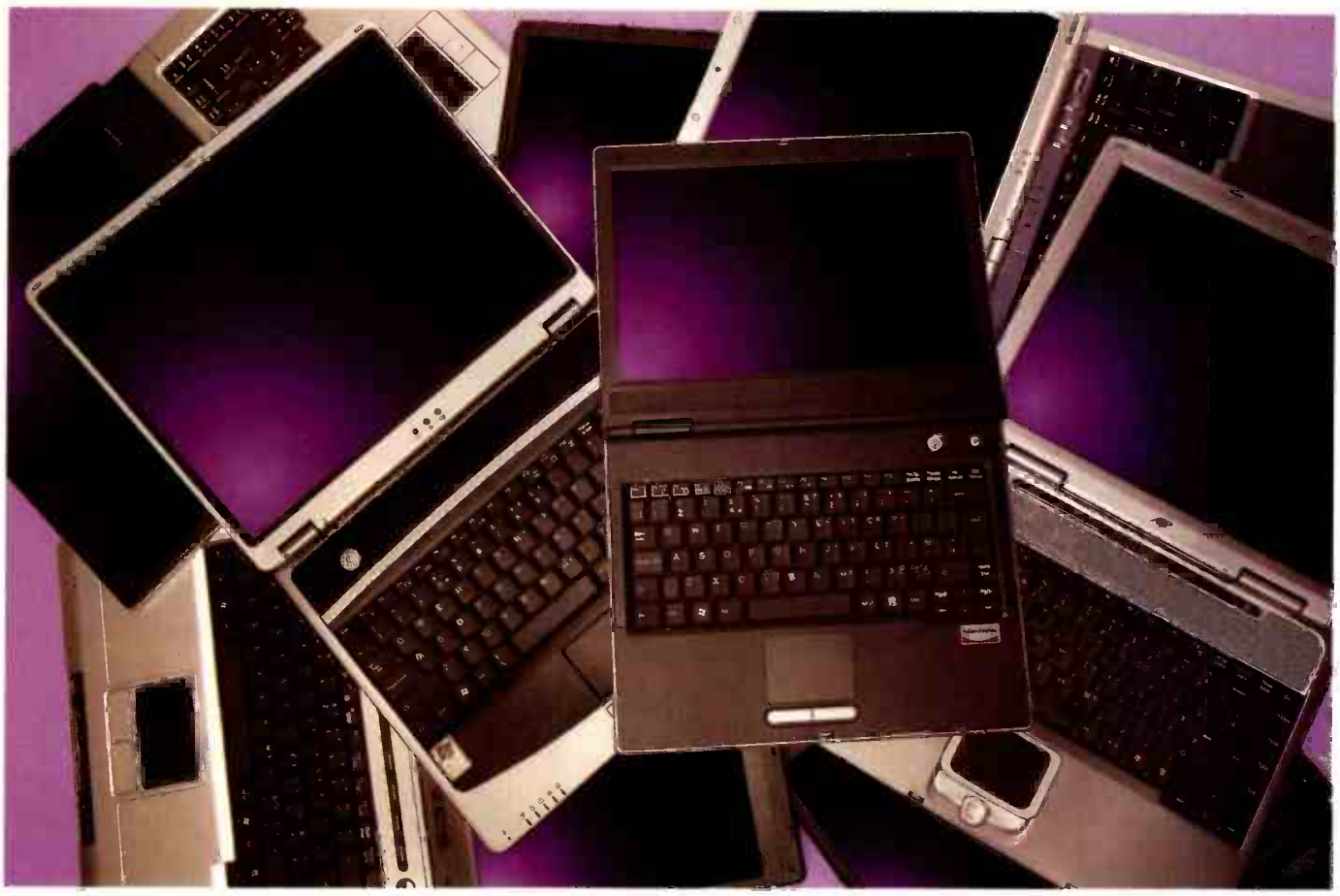

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Bargain laptops

WORDS: RORY REID **TESTING:** VNU LABS **PHOTOS:** BRUCE MACKIE

It's no easy feat to find a notebook for under £600, but whether you're a gamer, student or business user, one of these should answer your needs

It's probably safe to say that most of us own or have access to a desktop PC. But judging by the dramatically rising sales figures, the freedom and convenience of notebook PCs is tempting more and more people into a mobile lifestyle. The only problem is that finding a reasonably priced portable is often more difficult than finding a cheap desktop PC, and the configuration options are less flexible.

With this in mind, we challenged some of the UK's top notebook manufacturers to supply laptops costing less than £600 inc VAT. We're never pleased to see anyone cut corners, so we insisted that each one offered performance and features beyond what you'd expect of a machine in its price range.

A notebook wouldn't be much good if it couldn't connect to the outside world, so anything that didn't feature wireless network connectivity was thrown by the wayside. Likewise, we insisted on a decent number of input and output ports to ensure users didn't have any problems getting their files on and off the notebook.

One thing we didn't specify was what audience the submissions should be aimed at. This was to ensure we had something to offer everyone, including business users, gamers and students.

We put each one through its paces with rigorous benchmark tests to see how they coped with real-world applications, and to assess their features and value for money to see which is right for you.

Acer Aspire 3022

The Aspire 3022 is the multimedia darling of Acer's notebook range, and is distinctive thanks to its 15.4in widescreen display. This uses Acer's Crystalbrite technology, which is, it says, designed to produce brighter, sharper images by applying a polished coating to the glass. In tests, it is hard to fault, although Evesham's submission delivers equally impressive display results without the hype.

The Aspire 3022 is the first of our test subjects to use an AMD Sempron CPU. This is clocked at 1.6GHz, although its 2800+ model name suggests it offers performance in line with Intel CPUs clocked at 2.8GHz. While it isn't a patch on modern desktop CPUs, the Aspire 3022 has plenty of processing power, trouncing the competition in just about every area.

We were most impressed by the notebook's graphics. It is the only submission that has a discrete graphics adapter that doesn't borrow from the main system memory. The ATI Radeon X600 uses PCI Express technology and can still be found in some modern PCs. Unlike the others, it is capable of running modern games such as Doom 3 or Half-Life 2, albeit at moderate resolutions.

In addition to its impressive core specification, the Aspire 3022 doesn't cut many corners. Its 60GB hard drive was in line with the largest of the group, and it has a DVD rewriter drive. Digital camera enthusiasts will also be pleased with the 6-in-1 memory card reader.

With so many features, it's understandable that the Aspire 3022 is not the most portable notebook here. But despite its large screen, it is still far lighter than the chunky Mesh notebook.

The Aspire 3022 is cheaper than most of the notebooks in this group, but it beats them all hands down. Given its features, performance and the backing of Acer's notebook pedigree, it is thoroughly deserving of our Editor's Choice award.

DETAILS

RRP £580 (493.61 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Shop Acer 08001 613 060
www.shopacer.co.uk
PROS Great value; good all-round performance
CONS Too bulky for regular travel
VERDICT
The 3022 has a specification that belies its budget price, and wins our top award

FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

AJP 532

At £486, the AJP 532 is the cheapest notebook in the group test by some margin. It is the only device here to use a 1GHz Transmeta Efficeon TM-8600 CPU – the successor to the outdated Transmeta Crusoe.

Like the AMD processors seen throughout the rest of the group, the Efficeon is a dedicated mobile processor, designed to be used where battery life and heat emission are major concerns.

Unfortunately this has the drawback of making the Efficion somewhat pedestrian in comparison to its rivals using other CPUs. In our tests, it is about 50 per cent slower than the rest of the group.

It's not all bad news, though, as the 532 is perfectly capable of running everyday desktop applications, such as word processors, and will only struggle when working with documents that demand a huge store of memory. If you're likely to be opening large spreadsheets or databases, we suggest you upgrade the standard 256MB to at least 512MB.

Its XGI Volari SP5 SE graphics card (which borrows 32MB of main memory) also delivers a poor showing in the 3D Mark 2003 test, but it serves its purpose if all you want to do is play Solitaire and watch DVDs.

What the 532 lacks in performance, it makes up for in other areas. Its bundled 40GB hard drive provides adequate storage, and offers the fastest access times in the group. If you like to horde large quantities of multimedia files, you'll be pleased at the inclusion of an 8-speed DVD writer.

Overall, the 532 is a commendable notebook. Its specification isn't particularly impressive, but at this price it's hard to fault.

If you're on a tight budget, it could be ideal, particularly if you already have a main PC but still want something you can take on the road with little hassle.

DETAILS

RRP £486 (£413.61 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
AJP 020 8208 9744
www.ajp.co.uk
PROS Good value for money
CONS Poor performance
VERDICT
Surprisingly good for a notebook that costs less than £500, but demanding users should look elsewhere

FEATURES	★★☆☆☆
PERFORMANCE	★★☆☆☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★☆☆

Evesham Quest T28

Last month, Evesham impressed us with its Quest Roma (September, page 56) – a notebook that uses the AMD Turion 64 processor. Evesham has tried to emulate the same success in the budget market with the Quest T28.

As the name suggests, the Turion 64 (here in 1.6GHz guise) is a 64bit CPU that promises high performance. Most users won't see the benefit, however, unless they use it with Windows XP x64 Edition. In this company, its performance is only average, but it makes up for this with the best DVD playback battery life in the group at two hours, 50 minutes.

While half of the notebooks have just 256MB of memory, Evesham has supplied the T28 with 512MB of DDR400 Ram. You can therefore run more applications simultaneously, since the T28 is less likely to feel the strain of multitasking.

We were slightly concerned, however, that this notebook can only support a maximum of 1GB of Ram. Users thinking of upgrading to the 64bit version of Windows XP should note that the operating system runs best on 2GB of Ram.

Like every other model on test, the T28 has an integrated 802.11b/g wireless adapter, so you can surf the Internet, or connect to your home wirelessnetwork without the hassle of cables.

In delivering a notebook at this price, Evesham has cut some corners. The notebook lacks a discrete graphics card, relying instead on the integrated video chip that accompanies the Via S3G chipset. This is a fairly ineffective solution that trails behind the integrated graphics chips in notebooks using a Sis or Intel chipset. The T28 also has a fairly limited warranty compared with some of its rivals.

It has its faults – but the excellent battery life and impressive specification makes it worthy of our Highly Commended award.

DETAILS

RRP £599 (£509.78 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Evesham 08701 609 500
www.evesham.com
PROS 64bit CPU; battery life
CONS Lack of graphics card
VERDICT
A good specification and excellent battery life during DVD movie playback and everyday desktop tasks

FEATURES	★★★★☆
PERFORMANCE	★★★☆☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

HP Pavilion ZE2001EA

Compared to the rest of the group, the Pavilion ZE2001EA is a relatively old notebook. But as it will soon be superseded, HP has been able to substantially drop its price.

First impressions of this notebook are very positive. Its silver chassis is angular compared to the other notebooks here, but the overall design is quite contemporary. In contrast, the ZE2001EA looks very business-like when its screen is open, and is reminiscent of a notebook from the IBM Thinkpad range.

This is the largest notebook in the group by some margin. It is far less portable than the MV Mobeus 1.4, but the upshot is that HP has been able to supply a large screen, as well as the most comfortable keyboard in the group. Though its buttons are more tightly packed than on a standard desktop PC keyboard, they are slightly larger, so there's less chance of making a mistake when touch typing.

Disappointingly, HP has not taken full advantage of the Pavilion ZE2001EA's size. We would like to have seen quick-launch keys for starting an Internet browser and email client, but HP has only supplied shortcut keys for controlling the audio volume level.

The ineffective use of space can also be seen with the notebook's connectivity ports. It has a mini Firewire connector, but just two USB ports. This means there's potentially only room for a USB mouse and a USB memory key, so users with a large number of external peripherals should consider buying a multi-port USB hub, or look elsewhere.

The Pavilion ZE2001EA's core specification is rather average, but it will happily run most common desktop applications with ease. If you're a demanding user, you should definitely consider submissions like the Acer Aspire 3022, but this is still a capable notebook that should appeal to users for whom usability is a priority.

DETAILS

RRP £549 (£467.23 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
HP 08700 104 320
www.hp.co.uk
PROS Very good keyboard
CONS Small number of input/output ports
VERDICT
Not the fastest notebook in the group, but one of the best from a usability standpoint

FEATURES	★★★☆☆
PERFORMANCE	★★★☆☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★☆☆

Stop press: HP NX6125

According to HP, the NX6125 is aimed at cost-conscious professionals who require a highly portable notebook with strong connectivity options and a long battery life.

Our pre-production sample arrived too late to be tested with the rest of the notebooks in this group, but HP gave us the opportunity to get a hands-on impression before it is officially released. It's easy to see the NX6125 draws its inspiration from IBM's Thinkpad range of business notebooks, from the heavy resemblance in its keyboard, mouse and screen. This is no bad thing, as we were equally at home using this notebook or a desktop PC.

Impressively, the NX6125's chassis includes a number of shortcut keys for one-touch wireless network, volume and, most usefully for business users, a button that provides instant access to a presentation program such as Microsoft Powerpoint, and adjusts the screen and power to optimum settings.

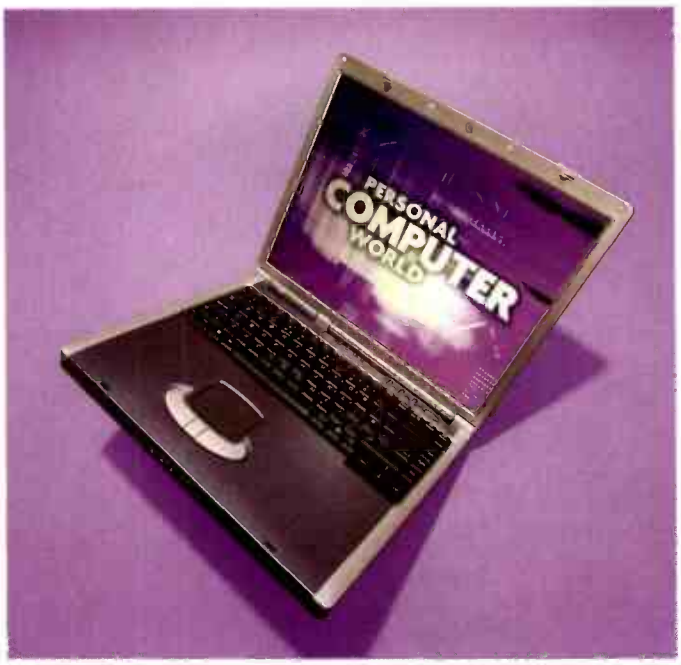
A number of AMD processor options are available, with the entry-level NX6125 using a 1.6GHz Turion 64 CPU and 512MB of DDR400 memory. If you're the type of business user who also likes to play games, the NX6125's integrated ATI Mobility X300 graphics chip should prove effective, as it has 128MB of dedicated memory that can run most DirectX9 releases.

Connectivity is also strong, with a front-facing memory card reader that accepts SD (Secure Digital), Memory Stick, MMC (Multimedia Card), SM (Smart Media) and XD cards. There are three USB2 ports, one Firewire and a PCI Express card slot. The NX6125 is also compatible with a range of HP's standard docking stations, which provide a good number of new and legacy ports. It works with HP's vertical desktop stand, which eliminates the need for a second monitor by holding the NX6125 in a vertical position at the same height as a standard screen.

Where the NX6125 excels is with its security features. It has a fingerprint reader that provides multi-user, Bios-level security (see our mini-roundup on biometrics on pages 52-53 for more), and automatic backup features that make a copy of your data on a separate partition of the notebook's 60GB hard drive.

HP claims the NX6125 has a splash-proof keyboard, so users needn't worry about minor spillages. It has been rigorously drop-tested, and can apparently resist falls from a height of 10in without sustaining damage to its hard disk or other sensitive components.

RRP £599 (£509.78 ex VAT)
PRODUCT INFORMATION HP 0870 010 4320 www.hp.co.uk



Mesh Pegasus 15in PCW

If you're after a notebook with plenty of extras, the Pegasus 15in is an attractive prospect. Like the submissions from MV and HP, it comes with a multimedia card reader, but is the only notebook in the group with an integrated webcam, which sits just above the screen.

The Pegasus 15in has a more substantial software bundle than its rivals. Mesh has included a copy of Microsoft Works 8, so you can start working on your word processing documents and spreadsheets from the moment you open the box. The package also includes a host of DVD authoring, editing, burning and playback software.

The notebook's 1,400 x 1,050 screen resolution is ideal for creating movies that have a widescreen aspect ratio, and you will be able to make multiple copies (plus file backups) via the internal eight-speed DVD rewriter.

Inside, Mesh has opted for the AMD Sempron 3000+ CPU. This budget processor is a more modern version of the Athlon XP CPU, which until a few years ago was commonly found in many low-end computers.

Though it isn't as new as the AMD Turion 64 CPU in the Evesham submission, it is actually faster when running most desktop applications. The tables may turn when running 64bit programs on a 64bit operating system, but in today's software market, the Pegasus 15in has a definite edge.

It is worth noting that, at 3.1kg, the Pegasus 15in is the heaviest in the group. Worse still, it does not have a replaceable battery so you can't take a spare with you on the road. If portability is a priority, you're better off looking elsewhere.

Despite these flaws, the Pegasus 15in is a good all-rounder. It isn't the best notebook here, but its substantial software and accessories package make it worthy of consideration.

DETAILS

RRP £599 (£509.78 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Mesh 08704 448 944
www.meshcomputers.com
PROS Accessories; software
CONS Quite heavy, no replacement battery
VERDICT
Doesn't have the most modern CPU, but is a solid performer with a good software bundle

FEATURES	★★★★☆
PERFORMANCE	★★★☆☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

MV Mobeus 1.4 Celeron

If portability is your primary concern, the Mobeus 1.4 Celeron should definitely be towards the top of your list. It is the smallest notebook here by some margin and, at 2.1kg, it is also the lightest. It could also be considered the most attractive from the outside – so it's sure to get a few admiring looks from fellow commuters.

When you open the laptop, it is a bit plainer, but the MV is one of few in this group that features a quick-launch button for one-touch access to applications. Its keyboard, though crammed into a relatively small space, is a decent size, and feels good to type on.

As its name suggests, the Mobeus 1.4 Celeron uses a 1.4GHz Celeron M CPU. This, in conjunction with 256MB of DDR400 Ram, provides performance slightly above what you'd expect from a 1GHz Pentium III with the same quantity of memory.

Where this notebook stands out from the crowd is with its excellent storage options. The Mobeus 1.4 has a large 60GB hard drive. However, it lacks a DVD writer so if you run out of space you're limited to backups of 700MB per disc.

Like the HP Pavilion, the Mobeus 1.4 only has two USB ports, but it has an integrated memory card reader – a feature digital camera users will definitely appreciate. An instant-on mode lets you play DVD movies, CDs, mp3s and view pictures, without starting Windows.

Though it is small, this notebook has a very good battery life. It lasted the longest when running everyday office tasks, and came a fairly close second when playing DVD movies.

Despite being a small laptop, the MV still has relatively good features and manages to impress in most areas. It is therefore very deserving of our Highly Commended award.

DETAILS

RRP £586 (£498.72 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION MV 08718 554 668 **www.go-mv.com**
PROS Compact size; plenty of features
CONS Average performance; no DVD writer
VERDICT
A highly portable, versatile and feature-packed notebook that is also very affordable

FEATURES	★★★★½
PERFORMANCE	★★★½☆
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★

Toshiba Satellite L10 114

At first glance, 'budget notebook' is the last term you'd associate with the Satellite L10 114. Its chassis feels very well constructed, and its stylish design makes many of its rivals seem ordinary by comparison.

We were impressed with its keyboard, which has large, well-spaced keys and is comfortable to use. It also has a very good 14in screen, which lacks a 16:9 widescreen aspect ratio, but is bright, clear and works well both indoors and outside.

The hardware is rather less exciting. The Satellite L10 114 uses a 1.5GHz Celeron M processor and 256MB of Ram. Though the CPU is the fastest Celeron M in the group, the Turion and Sempron-powered submissions outperform it by some margin.

It's not all bad news – its PCmark04 score of 2,430 placed the CPU towards the middle of the group, indicating it will happily churn through most applications at a reasonable pace. It also did fairly well in our Mobilemark battery tests, lasting two hours, 13 minutes when playing a DVD and three hours, 34 minutes while performing the office tasks.

The rest of its specification pales in comparison to some rivals. The notebook's 40GB hard drive doesn't give you a massive amount of storage, although it makes some amends by adding an integrated eight-speed DVD rewriter.

Toshiba has included a good quantity of software, including Microsoft Office Onenote 2003 (a note-taking application), the Microsoft Works 8 office suite, and various disc burning applications for creating CD and DVD backups.

On the whole, the Satellite L10 114 is a commendable notebook. It isn't as well-specified as some of its rivals, but it is well-constructed, provides adequate performance and will meet the needs of most business users.

DETAILS

RRP £599 (£509.78 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Toshiba 08704 448 944
www.toshiba.co.uk
PROS Build quality; battery life
CONS Average performance
VERDICT
Lacks the features of some others on test, but looks the part, has stamina and is ideal for business users

FEATURES	★★☆☆☆
PERFORMANCE	★★★☆☆
VALUE FOR MONEY	★★★★½
OVERALL	★★★☆☆

Mobilemark 2005 battery testing

If you've taken a look at the results section on page 89, you will notice a major difference in how we measure notebook battery life. Instead of the custom test *PCW* previously used (which puts a maximum and continuous strain on a notebook's processor), we now use Bapco's Mobilemark 2005.

Mobilemark 2005 was developed following extensive research into how people use notebooks in real-world scenarios, and has a number of unique tests to simulate this. The most basic of these is a Reader test, which simulates how long a battery lasts when the notebook is used to simply browse through a locally stored document.

An office productivity test is also included, which is based on a subset of Bapco's Sysmark 2004 SE benchmarks. This simulates the use of various applications including the 2002 versions of Microsoft Word, Excel, Outlook and Powerpoint, as well Internet Explorer, Netscape Communicator 6.01, Macromedia Flash 5, Adobe Photoshop 6.0.1, Intervideo WinDVD 6, McAfee Virusscan 5.13 and Winzip 8.

The quantity and type of test input varies depending on the application. For example, when simulating the use of Word 2002, Mobilemark 2005 starts the application and opens an eight-page document. Paragraph formatting and font configuration is set, and text is added. It then inserts an image, a table of contents and a table of figures. Twenty additional images of various sizes are inserted, as is a watermark and a video file. The resulting workload causes a drain on the battery, which Mobilemark 2005 measures over time.

Mobilemark 2005 also incorporates tests that reflect other potential uses for modern notebooks. It includes a module that measures the battery life of a notebook with a wireless network adapter switched on – a very useful test, since connecting to a wireless network in your local Starbucks requires an extra burst of battery power.

The final test module is for DVD playback. This measures how long a notebook battery lasts when playing a DVD movie from a disc.

During all the tests, Mobilemark 2005 considers user 'think times'. Since most users don't send their inputs to applications in fast, continuous burts, input is provided with pauses between some of the operations. This reflects how a user might review the results of a request before proceeding to the next operation. It also takes into consideration the fact that users often leave their computers idle for several minutes at a time, during meetings or screen breaks, so extra pause times are also included.

By using these tests, *PCW* believes notebook users will get a more realistic measure of notebook battery performance in a real-world environment. For more information on Mobilemark 2005, visit www.bapco.com.

Watford Provision 2001

The Provision 2001 has much in common with Asus' A6 range of notebooks. It uses the same chassis and is aimed at users who require strong multimedia capabilities.

Its most noticeable asset is a strip of buttons towards the front. Although these are visible when the lid is closed, they only work if it is open and the notebook has fully started Windows XP Home. The buttons come in very handy if you like quick access to your music playback controls.

We were also pleased to see a set of quick-launch buttons (a rarity on budget notebooks) that allow you to launch an email client and Internet browser. There is also a button to instantly enable or disable the mouse buttons and touchpad – a handy feature if you're prone to accidentally moving the mouse while typing. When fully active, the touchpad has a dedicated scroll strip that allows vertical scrolling through documents.

The Provision 2001 has an integrated 'high quality voice recorder' mounted at the top of the screen. This lets you take voice notes in a meeting, but it isn't as effective as an external microphone designed specifically for conference use.

To show off this notebook's portfolio of multimedia features, it has a large 15.4in widescreen monitor. Its display quality isn't as impressive as the excellent Acer Aspire 3022's but it is ideal for watching DVD movies.

Battery life for office-related tasks was two hours, 23 minutes. Unfortunately it only lasted one hour, 58 minutes minutes in our DVD playback test, so it isn't as good as the first-placed Evesham submission.

Given its size, weight and lacklustre battery life, this notebook is best suited to users who want a low-cost desktop replacement. There's nothing particularly wrong with it, but there are better options elsewhere in the group.

DETAILS

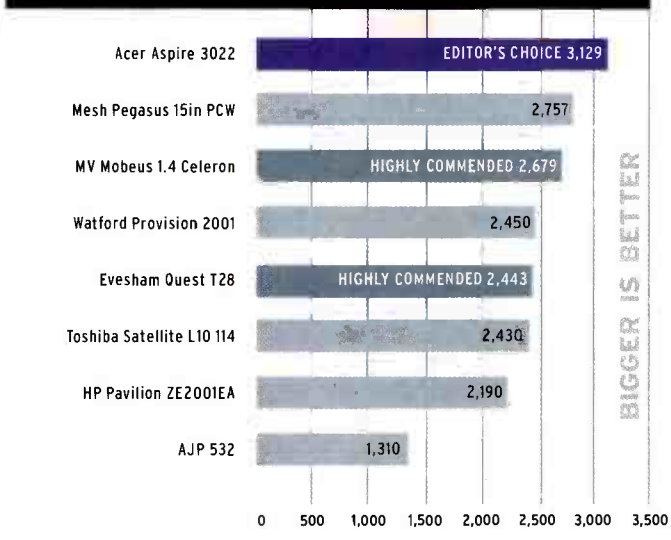
RRP £599 (£509.78 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Watford
08716 661 616
www.savastore.com
PROS Screen size
CONS Average battery life
VERDICT
A solid multimedia notebook, but it isn't well suited to users who are often on the move

FEATURES	★★★☆☆
PERFORMANCE	★★★☆☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★☆☆

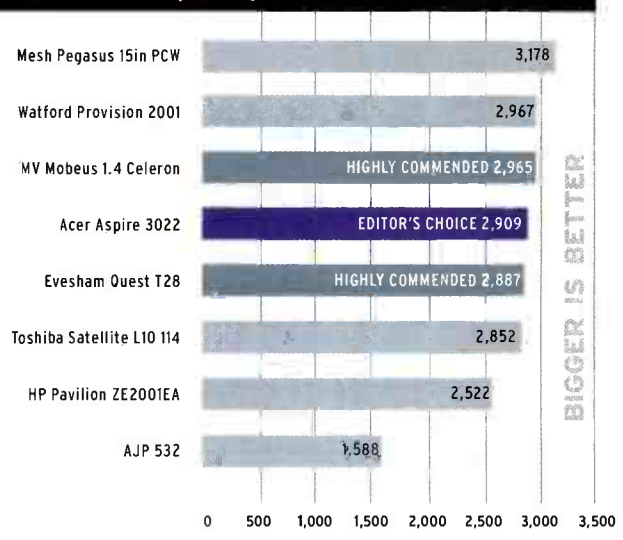
Lab results

vnu labs

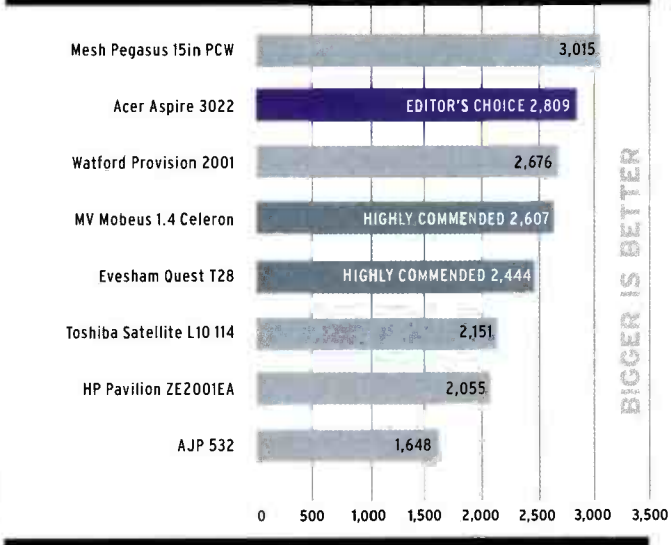
PCmark 2004 (overall)



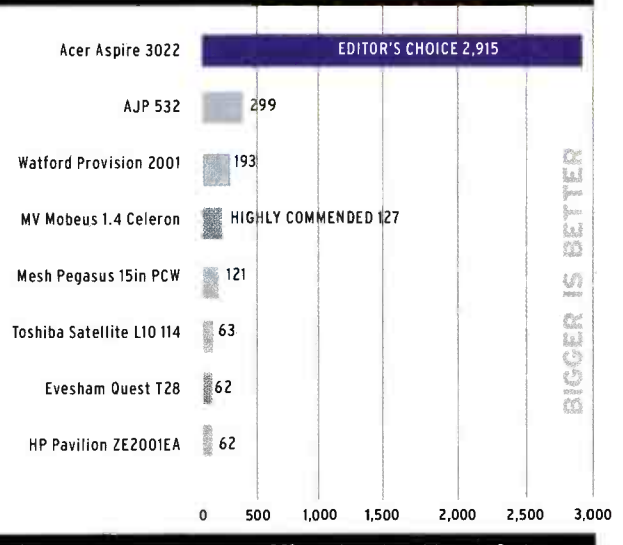
PCmark 2004 (CPU)



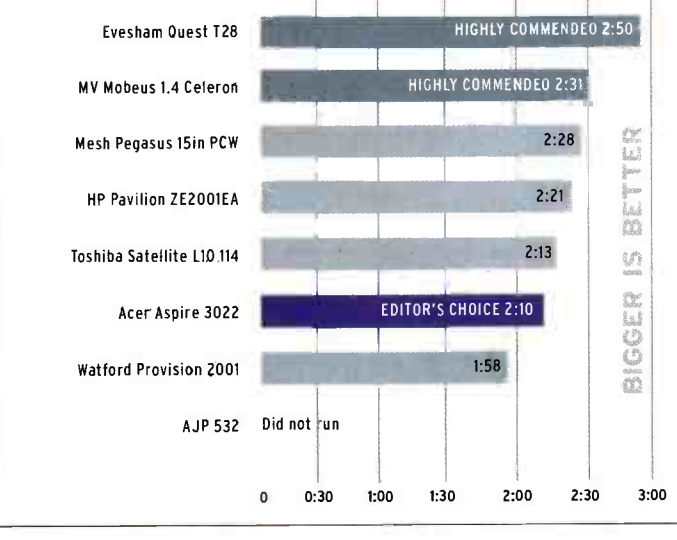
PCmark 2004 (Memory)



3Dmark03



Mobilemark 2005 – DVD playback (hr:min)



Mobilemark 2005 – office tasks (hr:min)

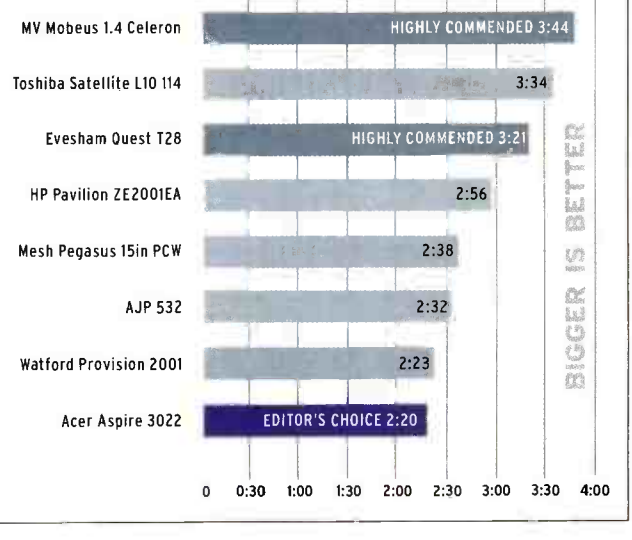


Table of features

MANUFACTURER	**ACER**	**AJP**	**EVESHAM**
MODEL NAME	**ASPIRE 3022**	**532**	**QUEST T28**
Price inc VAT (ex VAT)	£580 (£493.61)	£486 (£413.61)	£599 (£509.78)
Mainland UK delivery	Free	£45.82	£19.95
Sales telephone	08001 613 060	020 8208 9744	08701 609 500
URL	www.shopacer.co.uk	www.ajp.co.uk	www.evesham.com
HARDWARE SPECS			
Processor	AMD Mobile Sempron 2800+	1GHz Transmeta Efficeon TM-8600	1.6GHz AMD Turion 64 MT-28
Chipset	ATI Mobility Radeon Xpress 200	XGI Volari SP5 SE 1.08	Via S3G
Available memory/type	512MB DDR Ram (400MHz)	256MB DDR266	512MB DDR Ram (400MHz)
Max memory	1GB	1GB	1GB
Hard disk manufacturer and model	Hitachi IC25N060ATMR04-0	Fujitsu MHV2040AH	Western Digital WD600UE-00HCT0
Hard disk size	60GB	40GB	60GB
No of PCI Express card slots	0	0	0
No of PC Card slots	1	0	1
No of Firewire/serial/parallel/PS/2 ports	1/0/0/0	0/1/0/0	0/0/0/0
No of USB ports	4	4	4
MULTIMEDIA			
Optical drive	Slimtype DVDRW SOSW-833-S	Matshita UJDA760	Sony CD-RW CRX835E
Optical drive formats and speed (max)	DVD-R: 8x, DVD+R: 8x, DVD+R9: 2.4x, CD-R: 24x, CD-RW: 16x	DVD-R: 8x, DVD-RW: 4x, DVD+R: 8x, DVD+RW: 4x, DVD+R9: 2.4x, CD-R: 24x, CD-RW: 16x	CD-R: 24x, CD-RW: 24x, CD-R: 24x, DVD-Rom: 8x
Sound chip	Realtek AC97	Realtek AC97	Realtek AC97
Graphics chip	ATI Radeon X600	XGI Volari SP5 SE 1.08	Via S3G Unichrome Pro IGP
Screen size and maximum resolution	15.4in 1,280 x 800	14.1in 1,024 x 768	15in 1,024 x 768
OTHER INFORMATION			
Misc hardware/modem	6-in-1 memory card reader, V.90 modem	V.90 modem	V.90 modem
Network Technology	Gigabit Lan/802.11a/b/g	10/100 Lan/802.11b/g	10/100 Lan/802.11b/g
Weight (kg)	3.1kg	2.7kg	2.9kg
Dimensions (w x d x h) in mm	363 x 278 x 32.9	326 x 258 x 25	326 x 277 x 36.7
Battery type/capacity	4,000mAh	4,000mAh	6,000mAh
Operating system	Windows XP Home Edition	Windows XP Home Edition	Windows XP Home Edition
Bundled software	Norton Antivirus, NTI CD-Maker, Acer Arcade, Adobe Reader, Powerproducer	Free Virgin.net Internet access	Microsoft Works 8
Standard warranty (RTB = return to base, C&R = collect and return)	1 year international RTB	3 years RTB (1 year parts and labour, 2 years labour only)	1 year RTB
SCORES			
Features	★★★★★	★★☆☆☆	★★★★½
Performance	★★★★★	★★☆☆☆	★★★½☆
Value for money	★★★★★	★★★★½	★★★★½
Overall	★★★★★	★★★½☆	★★★★½

For the best notebook prices go to www.pcw.co.uk/bestprices

	HP	**MESH**	**MV**	**TOSHIBA**	**WATFORD**
	PAVILION ZE2001EA	**PEGASUS 15IN PCW**	**MOBEUS 1.4 CELERON**	**SATELLITE L10 114**	**PROVISION 2001**
	£549 (£467.23)	£599 (£509.78)	£586 (£498.72)	£599 (£509.78)	£599 (£509.78)
	–	£45.83	£39.90	£14.50	£17.62
	08700 104 320	08704 448 944	08718 554 668	08704 448 944	08716 661 616
	www.hp.co.uk	www.meshcomputers.com	www.go-mv.com	www.toshiba.co.uk	www.savastore.com
	Intel Celeron 1.3GHz	AMD Mobile Sempron 3000+	1.4GHz Intel Celeron M	1.5GHz Intel Celeron M	AMD Mobile Sempron 2800 1.6GHz
	Intel 855GM	Via KT600	Intel 855GM	Intel 855GM	Sis M760GX
	256MB DDR266	512MB DDR Ram (400MHz)	256MB DDR400	256MB DDR400	512MB DDR Ram (400MHz)
	2GB	2GB	1GB	1GB	1GB
	Toshiba MK4020GAS	Fujitsu MHT2060AT	Hitachi IC25N060ATMR04-0	Toshiba MK4025GAS	Samsung MP0402H
	40GB	60GB	60GB	40GB	40GB
	0	0	1	0	0
	1	1	1	1	1
	1/0/0/0	0/1/1/1	1/0/0/0	0/0/0/0	1/1/1/0
	2	3	3	3	4
	Sony CD-RW CRX830E	Multiformat 8x DVD-RW	Sony CD-RW CRX835E	Matshita UJ-830S	TSST Corp CDW/DVD TS-L462A
	CD-R: 24x, CD-RW: 24x, CD-R: 24x, DVD-Rom: 8x	CD-R: 24x, CD-RW: 24x,CD-R: 24x, DVD-RW: 8x	CD-R: 24x, CD-RW: 24x, CD-R: 24x, DVD-Rom: 8x	DVD-R: 8x, DVD-RW: 4x, DVD+RW: 4x, DVD+R9: 2.4x, CD-R: 24x, CD-RW: 16x	CD-R: 24x, CD-RW: 24x, CD-R: 24x, DVD-Rom: 16x
	Conexant AC-Link	Realtek AC97	AC97	Conexant AC-Link Audio	Realtek AC97
	Intel Extreme Graphics 2	Via S3G Unichrome Pro IGP	Intel Extreme Graphics 2	Intel Extreme Graphics 2	Sis M760GX
	15in 1,024 x 768	15.1in 1,400 x 1,050	12.1in 1,280 x 800	14in 1,024 x 768	15.4in 1,280 x 800
	V.90 modem	V.90 modem, carry case, 4-in-1 card reader, integrated webcam	V.90 modem, 4-in-1 card reader	V.90 modem	MMC card reader, V.90 modem
	10/100 Lan/802.11b/g	10/100 Lan/802.11b/g	10/100 Lan/802.11b/g	10/100 Lan/802.11b/g	10/100 Lan/802.11b/g
	2.95kg	3.1kg	2.1kg	2.7kg	3kg
	363 x 284 x 38	329 x 275 x 36.5	292 x 230 x 25	338 x 274 x 27	327 x 287 x 38
	4,000mAh	4,400mAh (cannot be changed)	4,000mAh	4,300mAh	4,800mAh
	Windows XP Home Edition	Windows XP Home Edition	Windows XP Home Edition	Windows XP Home Edition	Windows XP Home Edition
	HP Protect Tools, HP One-Touch Button Software, HP Mobile Print Driver, Synaptics Touchpad Drive, HP Help and Support, HP Wireless Assistant, Sonic Recordnow	Microsoft Works 8, Cyberlink PowerDVD 5 (2CH) (DVD playback), Power2Go 4 (Data burning), Powerproducer 3 (DVD authoring), Powerdirector 3 (Video editing), Mediashow SE (Slideshows), PowerDVD Copy (Powerbackup Copy) Powercinema 4 (4 Modules DVD, Video, Photo, Music), 60 day Microsoft Office trial	Microsoft Works 8, Office 2003 60 day trial, Panda Anitivirus, Roxio Creator 7 VCD	Microsoft Works 8, Microsoft Office Onenote 2003, Sonic Recordnow, WinDVD, Intervideo WinDVD Creator	Microsoft Works 8, Panda Antivirus Titanium 2004 with 1 year subscription, PowerDVD 5, Roxio DVD Suite 7
	1 year parts & labour	3 years RTB (mainland UK only), 1 year parts & labour, 2 years labour only	3 years RTB, 1 year parts and labour, 2 years labour only	1 year international, RTB	1 year RTB parts and labour, 2 years RTB labour only
	★★★½☆	★★★★½	★★★★½	★★½☆☆	★★★½☆
	★★★½☆	★★★½☆	★★★½☆	★★★½☆	★★★½☆
	★★★★½	★★★★½	★★★★★	★★★★½	★★★½☆
	★★★½☆	★★★★½	★★★★★	★★★½☆	★★★½☆

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.

Editor's choice

When we challenged each vendor to supply notebooks that cost under £600, we'd be lying if we said we expected high-spec submissions. It's rare that we like to be proved wrong, but the notebooks sent in for this test definitely exceeded our expectations.

Admittedly, we had to use the PCmark 2004 benchmark suite for testing, since many of the notebooks here will not run the more demanding Sysmark 2004 suite, as this requires at least 256MB of available memory. Despite this, they still provide adequate performance that will suit most users.

In fact, most of the entries in this group test offer features that wouldn't look out of place on a full-sized (albeit slightly older) desktop PC or, in some cases, notebooks costing much more.

We were also impressed that all the submissions had wireless network adaptor. With the rise in popularity of Wifi hotspots, it's reassuring that you can pick up any of the notebooks featured here and get online while away from your home or office.

One aspect that did disappoint was the graphics performance of these notebooks. Many of them use integrated solutions that eat up a sizeable chunk of system memory rather than a separate graphics card. With the exception of our Editor's Choice award winner, none of them is any good for playing the latest 3D games. Parents wanting to buy a notebook for their youngsters to do their homework on may consider this a blessing in disguise.

'Most offer features that wouldn't look out of place on a desktop PC'

Although most of our submissions are impressive, we do have our favourites, including the AJP 532. AJP threw down the gauntlet by submitting a notebook more than £100 cheaper than its nearest rival. Admittedly it was the slowest notebook here, but it should be ideal for users who want a second machine to take on the road.

The winners

Our first **Highly Commended** award winner is the **MV Mobeus 1.4 Celeron**. At just 2.1kg, it's the most portable notebook in this group. It's also the smallest, so if you want a low-cost ultraportable, you'll be hard pressed to find a better alternative.

Despite its diminutive size, the MV can still compete with its larger brethren. It is only marginally slower than the Mesh Pegasus 15in, which came second in our PCmark 2004 benchmark tests, and has the longest all-round battery life in the group.

We are also impressed with its multimedia capabilities. It is the only notebook here that can be used to watch DVD movies, view pictures and play audio without booting into Windows. If you want a versatile and highly portable notebook, the Mobeus 1.4 Celeron is difficult to ignore.

Our second **Highly Commended** award goes to the **Evesham Quest T28**. This notebook stands out thanks to the high quality of its TFT screen and excellent battery life during DVD playback. It isn't capable of a widescreen aspect ratio, but if you can live without this, the notebook is very impressive.

We are also pleased to see a 60GB hard drive backed by a DVD rewriter. In our experience, low-cost notebooks usually suffer from a lack of storage space and limited options for backing up your data, but the T28 has no such problems. On the whole, the T28 is a capable and well-equipped notebook. It is an ideal desktop replacement, but given its strong battery life it is also fine for travellers.

The winner of our **Editor's Choice** award is the **Acer Aspire 3022**. The specification was far more impressive than we expected and it is cheaper than most of its rivals. Its display is the best in the group, combining a widescreen aspect ratio with excellent contrast and brightness. Although users might expect such a display to be a huge drain on the battery, it lasts long enough to watch an average-length DVD movie.

More impressive was the Aspire 3022's performance. It makes the rest of the group look ordinary in our benchmark tests, and is the only submission that has a graphics adapter that can cope with 3D gaming. We've seen its PCI Express ATI Radeon X600 graphics card on fairly modern PCs, so to find it in a notebook that costs less than £600 is a pleasant surprise.

As ever, deciding which notebook is right for you depends very much on your needs. Whether you pick one of our excellent award winners, or one of their worthy rivals elsewhere in the group, we're sure you'll be pleased your money can stretch so far.

Acer Aspire 3022

Evesham Quest T28

MV Mobeus 1.4 Celeron

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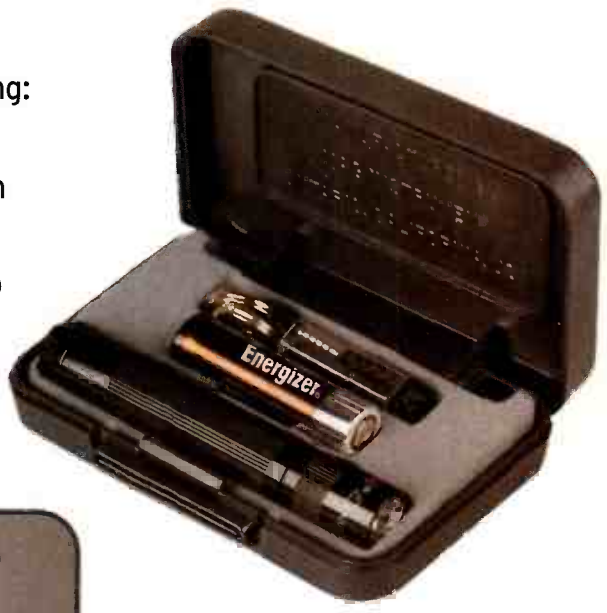

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Tri Huynh
Senior Engineer, Corporate IT
NVIDIA

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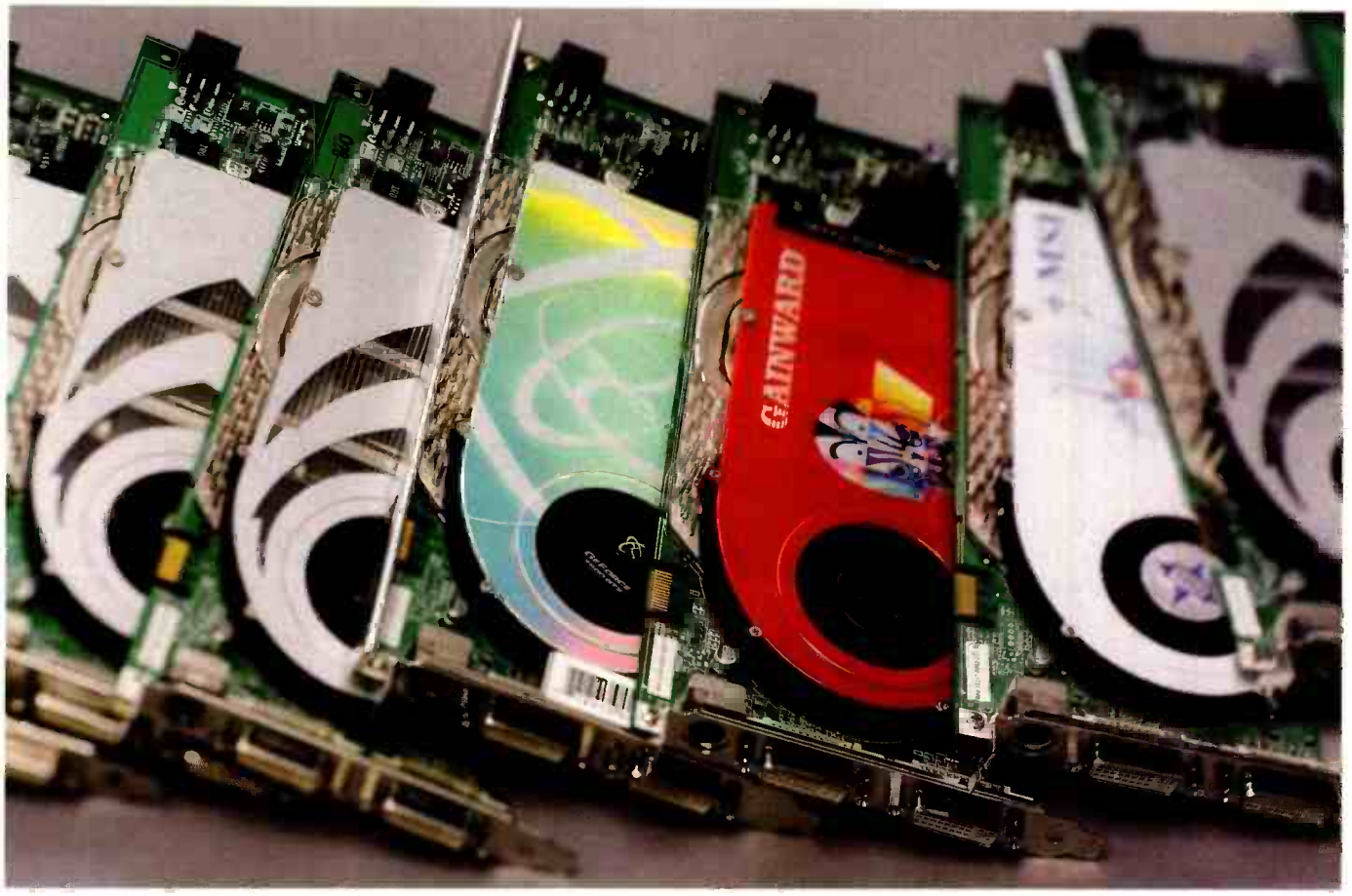

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Editor's Choice

Use the Geforce

WORDS: PAUL MONCKTON **TESTING:** VNU LABS **PHOTOS:** BRUCE MACKIE

With Nvidia currently ahead of ATI in the ever-changing graphics card market, we've rounded up seven 7800GTX cards to see how they perform

With the release of Nvidia's Geforce 7800GTX, we are called again to spectate at the perpetual game of leapfrog which is the high-end 3D graphics card market. Consisting of two players, it's a market where Nvidia and ATI continually battle for first place – each outperforming its rival with every new product release.

For the time being we have a new leader – Nvidia's 7800GTX taking a running jump over ATI's older and slower contender, the Radeon X850XT. It's a situation that's sure to change, but for now Nvidia has both the fastest single-card product and the only currently available dual-card solution with its SLI (Scalable Link Interface) technology.

Here are seven of the first 7800GTX-based products to hit the shelves. Most are based on Nvidia's reference design, but some are available with increased core and memory speeds. Whether this gives them any advantage is debatable, but what is clear is that the differences in price are greater than the variations in performance.

To help you make a choice, on page 97 we have also compared the 7800GTX against its predecessor, the 6800 Ultra in both single-card and dual SLI configurations, and ATI's current leader, the Radeon X850XT.

Taking a closer look at the features of the new boards we've examined how Nvidia has achieved these performance increases as well as other advantages in terms of power consumption and user convenience.

Aopen Aeolus 7800GTX

Based on a by-the book reference design, the Aeolus 7800GTX is as standard as you can get, bar the red graphic that will adorn the cooler on the retail versions.

Configured with slightly boosted core and memory speeds of 450MHz and 1,250MHz respectively, it turns in an impressive 3Dmark05 score, faster than any other with similar clock speeds.

You don't get much included in the box. One game – Second Sight – is provided but there are no DVD or multimedia applications. However, if you're prepared to spend this sort of money on a graphics card, you probably already have all the DVD software you need, and why let someone else choose your games for you?

At £364.19, the Aerolus 7800GTX costs less than any other card in this group and can't be faulted on its performance, making it the best no-nonsense choice by far.

DETAILS

RRP £364.19 (£309.95 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Planet Micro 0870 745 3555
www.planetmicro.co.uk
PROS Lowest-priced card in this round-up; good performance
CONS Small software bundle
VERDICT
Aopen has produced a good performer at a very competitive price

FEATURES	★★★☆☆
PERFORMANCE	★★★★☆
VALUE FOR MONEY	★★★★★
OVERALL	★★★★☆

Asus EN7800GTX

In a market where, so far, all manufacturers are basing their products on Nvidia's reference design, it can be difficult to differentiate your product from your competitors.

One method is to offer so-called 'Golden Sample' products with faster core and memory speeds, the other is to offer strong software bundle. Asus takes the latter approach, as the large box enclosing the Asus EN7800GTX is packed with goodies. There's a selection of three games, two multimedia applications and Asus' own DVD player software.

The goodies continue with Asus' exclusive driver enhancements, including Splendid Video Enhancing Technology, Game Face Messenger, Game Live Show and Asus Game Replay. These offer improved video quality in a range of applications and enhance gameplay with network-based multimedia add-ons. It's an attractive package, but not as cheap as some others here.

DETAILS

RRP £393.95 (£335.28 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION Perfex 0870 141 7161 www.overclock.co.uk
PROS Good software bundle; enhanced drivers; leather CD case
CONS Standard clock speeds; the slowest of the group
VERDICT
A good overall package but at a price comparable to faster, overclocked cards

FEATURES	★★★★☆
PERFORMANCE	★★★☆☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★☆☆

Gainward Ultra/350PCX

Possessing the fastest clock speeds of any Geforce 7800GTX we've seen so far, the Gainward Ultra/350PCX Golden Sample is a card for serious gamers.

Most of the cards we've reviewed here are likely to overclock manually quite considerably, but if you want to keep your warranty you'll have to let the manufacturer do it for you.

With a guaranteed core clock speed of 470MHz and a memory speed of 1,300MHz the Ultra/350PCX Golden Sample is already several steps ahead, so it's no surprise that it tops our 3Dmark05 results with a score of 8,291.

Gainward has taken the decision not to supply any games with this card, but multimedia applications (Cyberlink PowerDVD 5 and Muvee3) are provided along with Gainward's overclocking tool to help you push speeds even higher.

DETAILS

RRP £393.39 (£334.80 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Tekheads www.tekheads.co.uk
PROS Fast core and memory speeds; not as expensive as the XFX Geforce 7800GTX
CONS Expensive; no games
VERDICT
A fast product with purely application-based software bundle. Pricey but powerful

FEATURES	★★★☆☆
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

Galaxy Geforce 7800GTX

Galaxy's Geforce 7800GTX takes a similar approach to Aopen's Aeolus 7800GTX by bundling only a single game and no multimedia applications with the card. You get a copy of Codemasters' Second Sight game, which is worth about £12.99.

What's different about the Galaxy product is that it's clocked at the faster speed of 450MHz for the core and with a memory speed of 1,250MHz. This gives you a welcome boost of around 350 3Dmark05 points over stock speeds – although many of the cards reviewed here would be able to achieve this via manual overclocking.

There are minor cosmetic differences and only one, instead of the usual two DVI-VGA adapters is included, but that is virtually all there is to distinguish it from Aopen's card.

Even the price is nearly the same. OK so it'll cost you an extra fiver but we still think that's a bargain.

DETAILS

RRP £369.80 (£314.72 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Perfex 0870 141 7161
www.overclock.co.uk
PROS Fast core and memory speeds; low price
CONS Minimal software bundle
VERDICT
A fast card without gimmicks or a bundle of unwanted games, at a good price

FEATURES	★★☆☆☆
PERFORMANCE	★★★★☆
VALUE FOR MONEY	★★★★★
OVERALL	★★★★☆

Gigabyte GV-NX78X256V-B

The GV-NX78X256 V-B from Gigabyte is a standard-speed Geforce 7800GTX product bundled with two multimedia packages and a brace of current games.

Clocked at the reference 430MHz core and 1,200MHz memory speeds, the GV-NX78X256V-B's performance is equivalent to all of the other boards based on the standard reference specifications.

You get Cyberlink's PowerDVD 6 (one up on Gainward which provides version 5) along with the Power Director 3ME video-editing software. The games are Joint Operations and Xpand Rally – both released in 2004.

The GV-NX78X256V-B costs slightly more than Aopen's Aeolus 7800GTX and Galaxy's Geforce 7800GTX but could work out cheaper if you were already planning on buying any of the bundled software. However, it lacks the performance boost of its rivals' increased core and memory speeds.

DETAILS

RRP £373.53 (£317.90 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Perfex 0870 141 7161
www.overclock.co.uk
PROS Moderately priced; good software bundle
CONS Basic reference design and clock speeds
VERDICT
A reasonably priced product with a decent bundle of software

FEATURES	★★★★☆
PERFORMANCE	★★★☆☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆

MSI NX7800GTX

MSI's NX7800GTX is one of three cards here running at Nvidia's standard recommended core and memory speeds. A a result, its performance is relatively unexciting.

However, the company's commendable web support and software bundle certainly add value to the package.

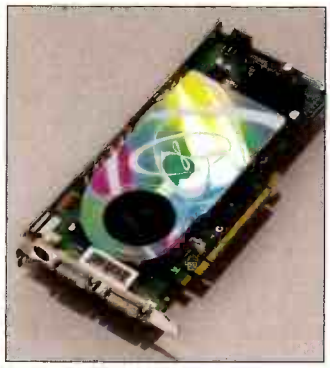
Included with the card is a copy of the highly acclaimed game The Chronicles of Riddick: Escape From Butcher Bay. Also provided is MSI's usual compendium of utilities and applications. These include MSI Live Update, which downloads the correct driver and Bios updates; Good Mem, which automatically frees up system memory; Lockbox, a program to secure your system when you're away from your PC; WMIinfo, a system diagnostic tool; and Norton Internet Security 2005.

At £383.10, It's a little expensive, but if you like the software package it could be the one for you.

DETAILS

RRP £383.10 (£326.04 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION Perfex 0870 141 7161 **www.overclock.co.uk**
PROS Good software package; online support
CONS Standard performance; expensive
VERDICT
A little pricey but offering a good balance of game and utility software

FEATURES	★★★★☆
PERFORMANCE	★★★☆☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★☆☆



XFX Geforce 7800GTX

With three top games and enhanced performance, the XFX Geforce 7800GTX is a strong contender, but at a price.

No DVD or multimedia software is included, but for your £416.80 you get Far Cry, Ultimate Racing Technology 2 and X2: The Threat.

You also get hardware that runs with a core speed of 450MHz, up from the standard 430MHz and memory running at 1,250MHz, an increase of 50MHz over the standard Nvidia recommendations. This gives a measurable speed hike of around 350 3Dmark05 points over standard 7800GTX cards.

However, the Galaxy and Aopen cards both achieved slightly higher scores for over £50 less than you'd pay for an XFX Geforce 7800GTX.

XFX does include more gaming software but if you shop around you can pick up all three titles for less than the premium XFX charges.

DETAILS

RRP £416.80 (£354.72 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Perfex 0870 141 7161
www.overclock.co.uk
PROS Overclocked; three full games included
CONS Expensive; no non-gaming software
VERDICT
A good performer but the price is simply too high

FEATURES	★★★★☆
PERFORMANCE	★★★★☆
VALUE FOR MONEY	★★☆☆☆
OVERALL	★★★☆☆

7800 at a glance

Here's a rundown of the main technical features of the 7800GTX (comparable figures for the 6800 Ultra are in brackets).

- **Number of PCI Express slots required: 1 (2)**
- **Number of transistors: 304m (220m)**
- **Number of vertex shader units: 8 (6)**
- **Number of pixel shader pipelines: 24 (16)**
- **Fill rate: 10,320 megapixels/sec (6,400)**
- **Standard core clock: 430MHz (425MHz)**
- **Standard memory clock 1,200MHz (1,100MHz)**
- **Subsurface scattering**
- **Shader model 3.0**
- **HDR (High Dynamic Range) lighting effects**
- **Transparency supersampling**
- **Claimed 10dB quieter than Geforce 6800U**
- **Power consumption: 100w (110w)**

Rumour mill

Nvidia's SLI currently restricts you to using two cards from the same manufacturer. If these cards are configured with different core and memory speeds, then both will run at the speed of the slower one when running in SLI mode.

In a future release of Nvidia's Forceware graphics driver, we've heard that the restriction on mixing cards from different manufacturers will be lifted. Rumour also has it that in releases after that, cards of different speeds and even GPUs can be mixed. Furthermore, both cards should be able to run at full speed.

If true, this is exciting for upgrading as it would enable you to simply add, say, a Geforce 7800GTX to your system without having to sell your existing Geforce 6800 Ultra. But there's no guarantee of truth.

And where is ATI's answer to SLI, Crossfire? At the time of writing (late July) it seems to have disappeared without trace, leaving Nvidia in a happy situation.

It's all in the pipelines

The 7800GTX is just more of the same, but better. With the Geforce 7800GTX Nvidia achieves a new level of performance, not by simply increasing processor and memory speeds, but by redesigning the card's hardware from the ground up. But there are no new graphical APIs (Application Programming Interfaces) or graphics effects present in the Geforce 7800GTX: the card is essentially a smaller, faster Geforce 6800 Ultra with more efficient power consumption.

The Geforce 7800GTX is also more compact: whereas the Geforce 6800 Ultra and ATI's Radeon X850 occupy two PCI Express slots, the 7800GTX now occupies only one. This is a reversal of the previous situation where we saw ATI's Radeon X800XT in one slot and the Geforce 6800 Ultra in two.

Apart from the obvious benefit of not wasting a slot, a single-slot solution is also more versatile and can be employed in a greater number of systems, such as small form-factor (SFF) cases.

The reduced power consumption (100w versus 110w for the 6800 Ultra) also helps the system produce less heat – this, combined with a new fan and cooler system, makes the Geforce 7800GTX substantially quieter than its predecessor. This is a benefit that's doubled when using a dual-card, SLI solution.

Both processor core and memory speeds have been increased in the 7800GTX, but only by relatively narrow margins. With a standard core speed of 430MHz it's only 5MHz higher than the 6800 Ultra. The GDDR3 memory speed of 600MHz, effectively doubled up to 1,200MHz, is 50MHz faster than the 6800 Ultra's 550MHz. In addition to boosts in clock speed, we see the number of vertex units increased from six to eight and the pixel pipelines up from 16 to 24. This results in a hugely complex processor, boasting 302 million transistors.

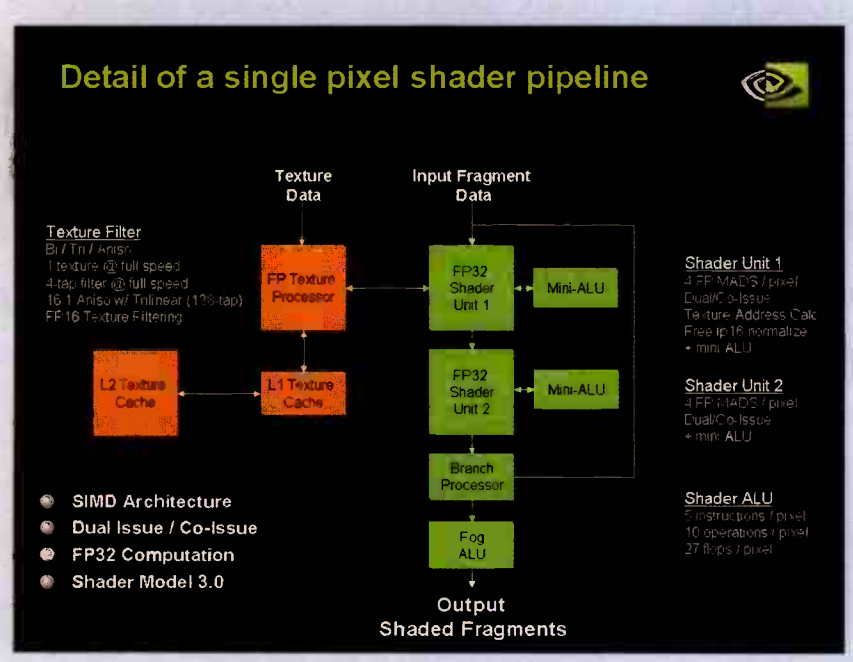
Despite these seemingly minor improvements, Nvidia claims the 7800GTX can deliver twice the raw processing power of the 6800. This is due to a complete redesign of the graphics processor, with reduced latency in the pipelines and more computational power per clock cycle or 'tick'. It takes 108 clock ticks for a piece of data to pass through the Geforce 6800 shader pipeline. With the 7800GTX, the same pipeline is cleared in only 79 ticks.

Nvidia's trump card is the Scalable Link Interface (SLI). By combining the power of two PCI Express cards, double the graphics power becomes available. Not all games support or benefit from SLI, but those that do can show huge increases in speed.

We compared the performance of Nvidia's 6800 Ultra and 7800GTX products in single and dual configurations, the results of which you'll find at The Test Bed (http://tinyurl.com/dd9n8). We've also included ATI's flagship Radeon X850XT PE for comparison.

3Dmark05 shows a large performance increase, but Far Cry slows down when played in SLI mode, as the limiting factor in this benchmark is the PC's CPU – the 'poor old' Athlon FX-57 simply can't supply data fast enough to the data-hungry graphics subsystem.

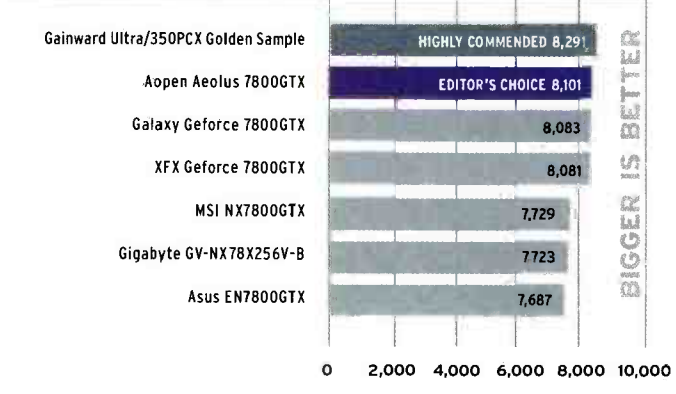
By incorporating commonly coded shaders into hardware. The Geforce 7800GTX is able to process much more data than the Geforce 6800 Ultra for the same number of clock ticks. The very powerful new MAD (Multiply and Add) instruction built into the Mini-ALU is very widely used in gaming titles and the 7800GTX shader unit can carry out four of them with each clock cycle.



Lab results

vnu labs

3Dmark05 (1,024 x 768 at 32bit)



Far Cry (fps) (1,024 x 768)

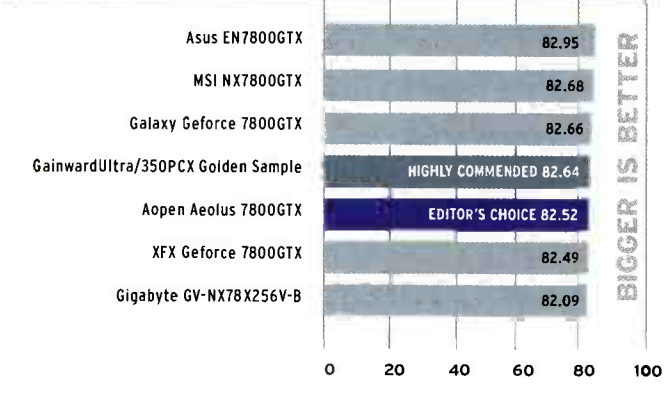


Table of features

MANUFACTURER	AOPEN	ASUS	GAINWARD	GALAXY	GIGABYTE	MSI	XFX
MODEL NAME	AEOLUS 7800GTX	EN7800GTX	ULTRA/350PCX GOLDEN SAMPLE	GEFORCE 7800GTX	GV-NX78X256V-B	NX7800GTX	GEFORCE 7800GTX
Price inc VAT (ex VAT)	£364.19 (£309.95)	£393.95 (£335.28)	£393.39 (£334.80)	£369.80 (£314.72)	£373.53 (£317.90)	£383.10 (£326.04)	£416.80 (354.72)
Telephone	0870 745 3555	0870 141 7161	N/A	0870 141 7161	0870 141 7161	0870 141 7161	0870 141 7161
URL	www.planetmicro.co.uk	www.overclock.co.uk	www.tekheads.co.uk	www.overclock.co.uk	www.overclock.co.uk	www.overclock.co.uk	www.overclock.co.uk
Graphics chip	Nvidia G70	Nvidia G70	Nvidia G70	Nvidia G70	Nvidia G70	Nvidia G70	Nvidia G70
Core clock speed (MHz)	450	430	470	450	430	430	450
Memory clock speed (MHz)	1,250	1,200	1,300	1,250	1,200	1,200	1,250
Memory type	GDDR3	GDDR3	GDDR3	GDDR3	GDDR3	GDDR3	GDDR3
Memory interface width	256bit	256bit	256bit	256bit	256bit	256bit	256bit
Cooling type	Active	Active	Active	Active	Active	Active	Active
Card width (slots)	2	2	2	2	2	2	2
Video in/video out	✔	✔	✔	✔	✔	✔	✔
DVI output	✔x2	✔x2	✔x2	✔x2	✔x2	✔x2	✔x2
DVI/VGA adaptor	2	2	2	1	2	2	2
DVD player (name)	None	Asus DVD	Cyberlink PowerDVD 5	None	Cyberlink PowerDVD 6	None	None
Overclocking utility	None	None	Gainward Expertool	None	None	None	None
Games	Second Sight	Joint Operations, Xpand Rally, Project Snowblind	None	Second Sight	Joint Operations, Xpand Rally	The Cronicles of Riddick: Escape from Butchers Bay	Far Cry, Ultimate Racing Technology 2, X2: The Threat
Other software	Driver CD	Cyberlink Media & Show SE 2, Power Director 3DE	Muvee3	None	Power Director 3ME	MSI Multimedia Beyond 3D	None
SCORES							
Features	★★★½☆	★★★★½	★★★½☆	★★½☆☆	★★★★½	★★★★½	★★★★½
Performance	★★★★½	★★★½☆	★★★★★	★★★★½	★★★½☆	★★★½☆	★★★★½
Value for money	★★★★★	★★★½☆	★★★½☆	★★★★★	★★★★½	★★★½☆	★★½☆☆
Overall	★★★★½	★★★½☆	★★★★½	★★★★½	★★★★½	★★★½☆	★★★½☆

Editor's Choice

Although the differences between the 7800GTX graphics cards in this group test are quite small, there are still enough to make your buying decision tricky.

All of the cards come with bundled software, some more than others. Do you want all the software offered? Do you like the games that are included or do you perhaps already have them? If the software bundle happened to coincide exactly with your needs, then at the right price, you could save yourself some money.

Most often than not, the choice is between all-out performance or the best value-for-money package.

Our winner in this round-up gives you the best of both worlds – almost. It's a close fight and, while the top performer is clear, prices are similar enough on the rest of the cards that shopping around may get you a better deal.

Aopen Aeolus 7800GTX

The winners

Two cards, by coming in at under £370, stand out from the rest as the least expensive way to purchase a Geforce 7800GTX. Both of them offer higher than the standard clock speeds. One, however, has the edge on both price and performance which is why our **Editor's Choice** award goes to the **Aopen Aeolus 7800GTX**, although it was a very close call between this and Galaxy's 7800GTX. Such is the level of competition here that the Galaxy loses out because of a slightly higher price tag and a marginal differential in performance. If you are looking for a great deal, the Aopen is, in our opinion, the best choice at the moment.

We recognise that there are always those of you who want the best performance at any price, though. And if you're prepared to pay a premium for it, the **Gainward Ultra/350PCX Golden Sample** gives you by far the finest performance and gets our **Highly Commended** award.

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Editor's Choice

Call for backup

WORDS: NIGEL WHITFIELD

Online services take the hassle out of backing up unwieldy amounts of data, and many add the versatility of sharing files with others

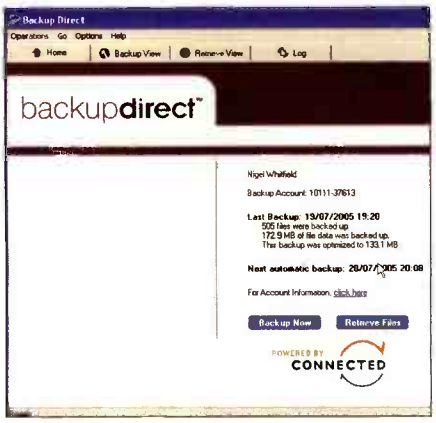
Backing up, like cleaning the windows, is something most of us don't do as often as we should. Making a complete copy of data is tedious, time consuming and typically involves hanging round to change tapes or discs, as although backup tapes and blank optical discs can hold much more data than in the past, hard drives and the amount of information on them have grown as well.

But with a broadband connection, there's another possibility – online backup. Why not use your Internet connection to copy important data to another location? You won't have to worry about the safety of discs or tapes in a fire, and you can just walk away and let the computer get on with the backup.

Whether you're a home user who wants to keep all your digital photos and music safe, or a business that wants to ensure accounts and order records are secure, it's an attractive option. With a range of services available, all you need to do is pick the combination of price and features that suits your needs.

In fact, if it's simply keeping copies of important files, online storage can help too – there's a wealth of sites that allow you to store your photos and other files online, rather than via a backup, sometimes even providing ways that you can send files to other people easily.

With a bit of lateral thinking, you might find you already have a solution you can use to keep some of your critical data safe, as we'll explain later.



Backup Direct

The Backup Direct service is aimed primarily at small businesses, and is a straightforward backup solution. Setup is simple, and installs a piece of software called Agent on your PC. As part of the installation process, you can select a simple daily backup window for schedules, and the software is clever enough to avoid using a modem or automatically back up if a certain time has elapsed since the last successful one.

The software will automatically choose files to back up when it starts, or you can use an Explorer-like interface to select them manually. However, we found this process a bit irksome since you can't select or deselect folders in the tree pane – instead you have to select the 'this entire folder' dummy entry in the file listing to its right.

Once that's done, though, the software is very simple to use, and when you want to restore a certain file you can easily browse through backups and even find the version that you had last Thursday, if you want.

For those who want extra security, you can also request that CDs of your backed-up data be posted to you, and there's an additional option that will allow system restore from a backup.

DETAILS

RRP £11.75 inc VAT per month for 500MB
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION Backup Direct 08701 417 437 www.backupdirect.net
PROS System restore option; straightforward software
CONS Slightly clunky interface for choosing files
VERDICT
Simple and straightforward to use; retains multiple file versions

FEATURES	★★☆☆☆
EASE OF USE	★★★★☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★☆☆

Backup My Stuff

One of the most noticeable things about Backup My Stuff is that it uses the same software as Backup Direct; the Agent software is provided by a third company and is used by several backup service providers. So, like its counterpart, there's the same niggle about the ease of using the Explorer-type interface to choose the files you want to back up.

On the plus side, the Advanced Backup Options window does make it easy to find the files that you want to select, with automatic options to choose just those that are data, have particular extensions, or copy everything on your hard disk including application and system files – though the latter will take a very long time to back up.

The chief difference between this service and Backup Direct is that the latter is aimed more at businesses, offering much higher capacities. Backup My Stuff stores only seven versions of your files, and offers only up to 10GB of storage as a standard option. Larger requirements than this can be individually discussed with the company. Annual pricing plans are also available, but you don't save anything going down this route. But, it is fairly competitively priced, and a good option if you don't want to copy lots of media files.

DETAILS

RRP £7.05 inc VAT per month for 500MB
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION Backup My Stuff 08456 447 522 www.backupmystuff.co.uk
PROS Low cost
CONS Limited capacity; slightly awkward interface
VERDICT
A good, low-cost solution for people with small requirements

FEATURES	★★☆☆☆
EASE OF USE	★★☆☆☆
VALUE FOR MONEY	★★★★½
OVERALL	★★★☆☆

.Mac

Apple's .Mac service is one of the most comprehensive of the offerings here. As you might expect from the name, it is primarily aimed at users of the OSX operating system, and in addition to online storage, it provides web hosting, email addresses and synchronisation services, including online access to a calendar and address book.

You can access all those services via a web browser, as well as through the many applications on OSX, though considering there are free calendar and email services available online, there's no compelling reason for PC users to subscribe for those.

While .Mac has one of the smallest basic online storage capacities – and it's shared between email and disk storage – it's also reasonably priced compared to the other UK-based services. Once again, though, the service is aimed more firmly at Mac uses, who can automatically synchronise their Idisk, so that they can access files offline – a feature that works well.

PC users can download the Idisk utility for XP, which allows the disk space to be mounted easily and added to your PC like an ordinary network drive, which works well, but Apple's Backup utility is once again Mac only.

DETAILS

RRP £69 inc VAT per year for 250MB
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION Apple .Mac www.apple.com/uk/mac
PROS Integrates well with Mac OSX
CONS Limited functionality for Windows users; no backup application
VERDICT
A well-featured bundle for light PC users, but better value if you have a Mac

FEATURES	★★★☆☆
EASE OF USE	★★★☆☆
VALUE FOR MONEY	★★★½☆
OVERALL	★★★☆☆

Netbax

Of all the packages that we tested, Netbax is probably the least intimidating to newcomers. It shares a similar interface to most of the other products, but with large icons, and a help pane that can be displayed in the program, it looks more modern than rivals.

Installation was simple and straightforward and – unlike the others – even gives a choice of running under a different system account. There are quick-pick tools to select file types like Microsoft Office documents, graphics and web pages, which is neater than a long list of file extensions, and you can include or exclude files and folders easily.

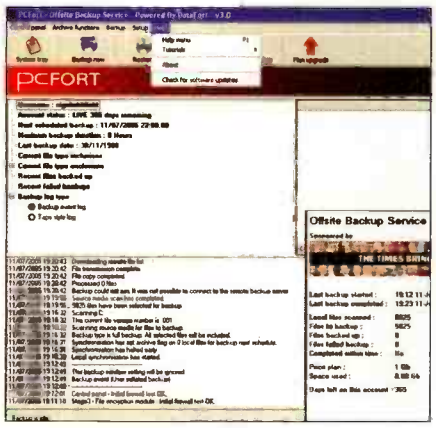
When it comes to restoring files, you can see a list of previous backups and choose which version of a file to retrieve, without an arbitrary limit – other than the amount of storage you're paying for.

Another area where the software scores is with its configurability – you can restrict the amount of CPU and disk usage, as well as prevent it from hogging your outbound net link – important in an office. There are also options for backing up servers, at an additional cost. We'd like to see options for more advanced scheduling, and different backup sets, but those niggles aside, Netbax is an impressive package.

DETAILS

RRP £11.75 inc VAT per month for 1GB
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Netbax 08714 333 090 **www.netbax.co.uk**
PROS Good interface; can restrict usage of system resources
CONS Not as cheap as some alternatives
VERDICT
A simple and modern-looking backup tool that's easy to use

FEATURES	★★★☆☆
EASE OF USE	★★★★☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★★☆



PC Fort

Like the other backup services, PC Fort has a dedicated application that runs on your PC. Installation is straightforward and the software reports whether or not it can connect through the firewall to the backup servers.

While many of the other tools use standard HTTP ports to transfer data, which means it will pass through firewalls without any special configuration, PC Fort requires port 22 (which is used for Secure Shell (SSH) transfers) to be open. Fortunately, the online help gives details of how to set things up if they don't work.

Selecting files to back up is easily done using an Explorer-type view, which allows the selection of whole folders in the left-hand pane, as well as individual items in the right. There's also a simple way of specifying file types, and basic scheduling facilities. You can retrieve multiple versions of your files, but you can only create one set of files to back up, and one schedule.

The service worked well, though it did make our PC feel a little unresponsive. Set against that, it's fairly attractively priced for the amount of data that you can store. For those with more complicated requirements, such as businesses, a managed backup service is available via the Datafort product (**www.datafort.co.uk**).

DETAILS

RRP £11.69 inc VAT per month for 5GB
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION
PC Fort **www.pcfort.co.uk**
PROS Attractively priced
CONS Made the test PC feel sluggish
VERDICT
Well priced and simple to use, with a reasonable capacity for home or small office users

FEATURES	★★☆☆☆
EASE OF USE	★★★☆☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★☆☆

Secured Backup

Secured Backup uses a piece of software called Rbackup. It got off to a bad start in our test by refusing to install on two separate PCs, and only working when we manually extracted files from the self-extracting executable.

Setup was fiddlier than the other options too – while the very technically minded might appreciate it, who really understands a choice of encryption methods? And a signup form that tells you to put something – even a space – in every field is just lazy.

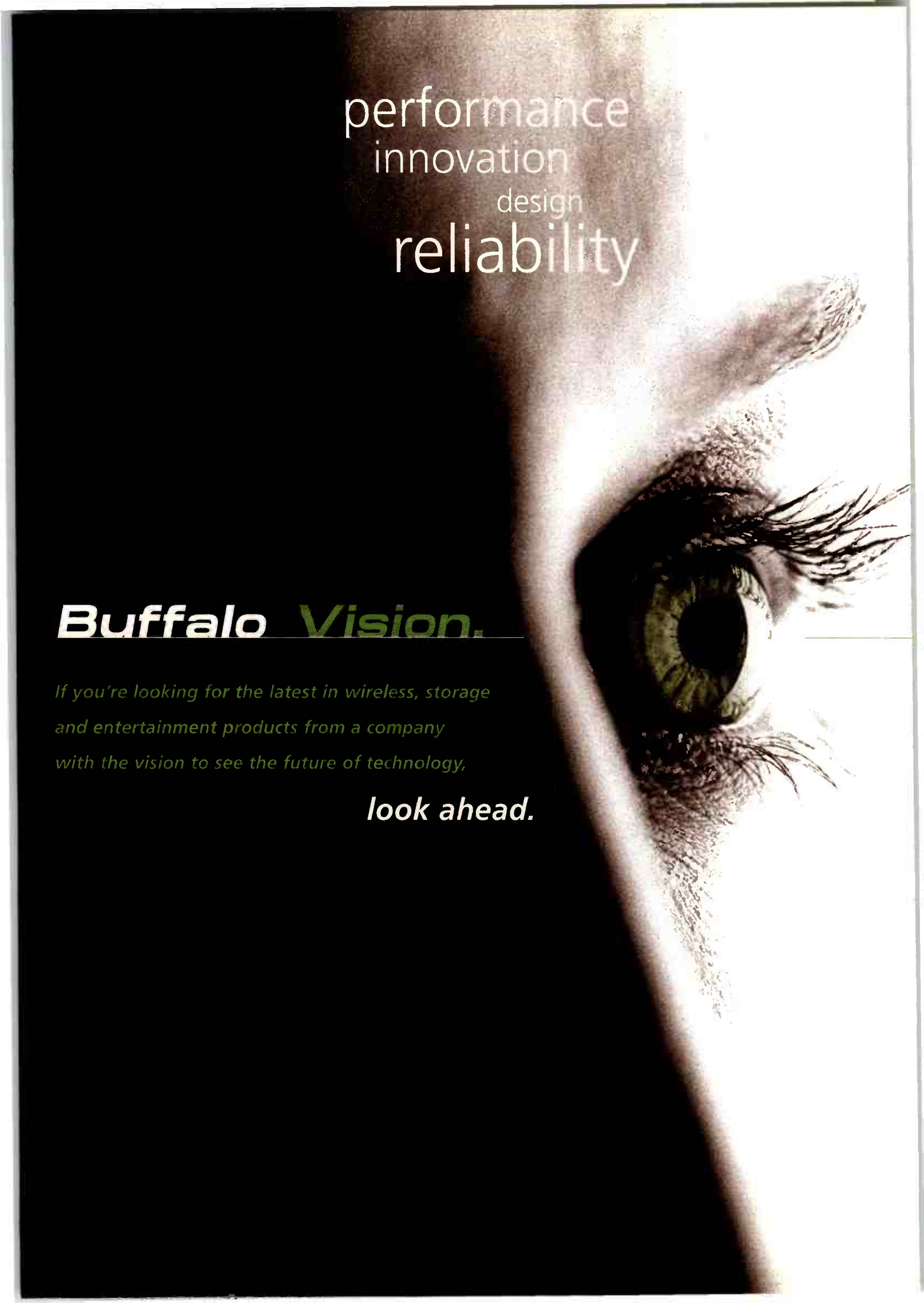
When you finally do get the software installed, you can create a backup of the encryption keys, to allow you to retrieve files on a fresh computer. The main interface is the familiar Explorer type, making it easy to include or exclude files, and an Estimator tool will attempt to work out how long backups will take. You can also create multiple backup sets should you need to.

We were less impressed by the website, which has very little in the way of support information, and the help section on the Rbackup site was also little use in getting up and running. Another fly in the ointment is the pricing – and we seriously doubt the claims of 75 per cent compression on the website.

DETAILS

RRP £11.75 inc VAT per month for 500MB
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Secured Backup 08702 406 014
www.securedbackup.co.uk
PROS Straightforward software
CONS Expensive; poor installer
VERDICT
Expensive and fiddly to install, with poor online support

FEATURES	★★☆☆☆
EASE OF USE	★★☆☆☆
VALUE FOR MONEY	★★☆☆☆
OVERALL	★★☆☆☆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reliability
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HD-H1.0TGL/R5

Storage

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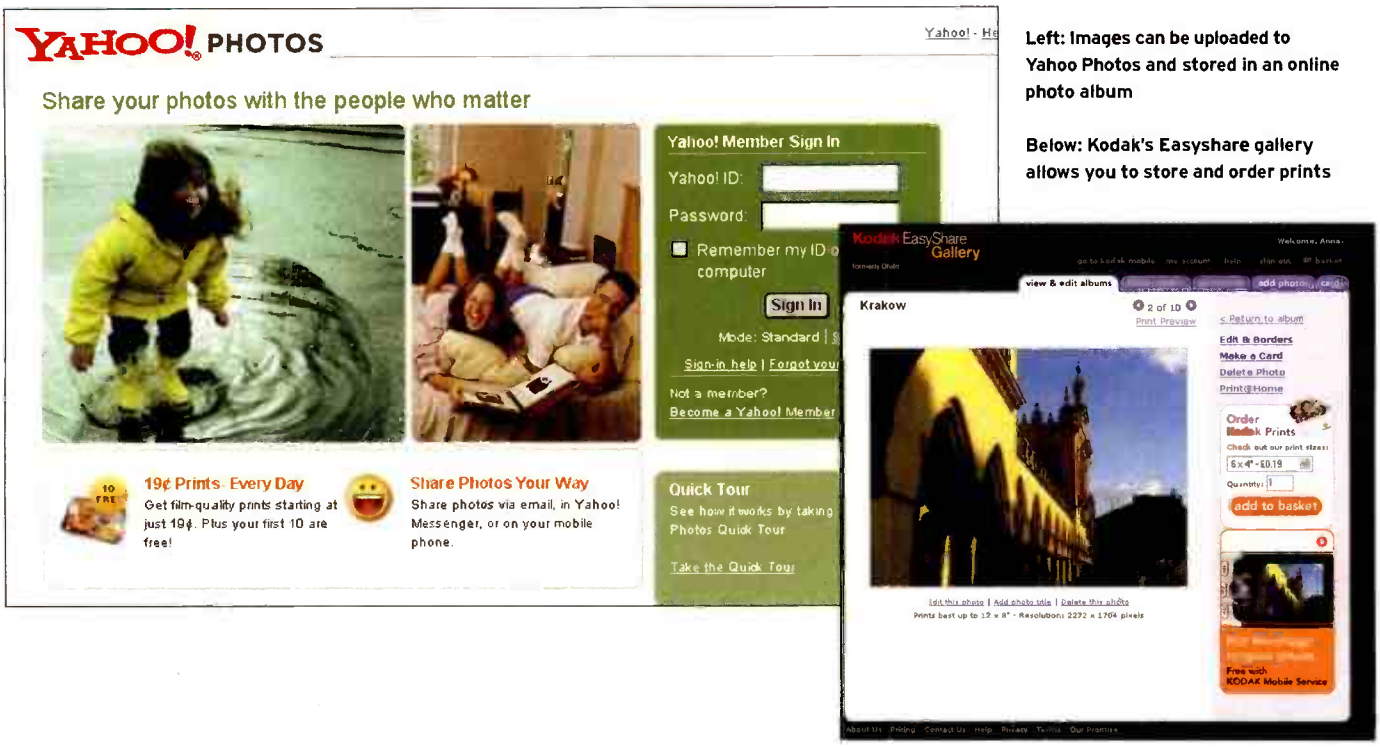


Left: Images can be uploaded to Yahoo Photos and stored in an online photo album

Below: Kodak's Easyshare gallery allows you to store and order prints

Alternative ways to keep data safe

Besides the online backup and storage solutions we've looked at, there's a wide range of alternative ways to keep copies of data safe and relatively secure – without having to pay a fortune.

If you simply want to keep a couple of important files safe – your Microsoft Money files, for example, or a database with information such as serial numbers for your valuables and insurance policy information – then a quick solution is to take advantage of the increased amount of storage now offered by many webmail accounts, and simply email your important files to a Hotmail or Gmail account periodically. Remember, though, that it's not a wise idea to rely on one of these services solely for backup; if you don't sign in to some webmail services for a certain amount of time, which can be as short as 30 days in some cases, your account may become inaccessible, which could leave you unable to retrieve important files.

If it is mostly photos you want to keep copies of, there's a wide range of solutions, including Yahoo Photos, and online group services, such as those from Yahoo and MSN. These typically have a much lower storage limit and, while you can upload photographs they're really designed to be viewed online – you can't download photos at the original resolution, though some group services allow you to upload files to share between members, which is an alternative way of storing information. Another option for keen photographers is to sign up with a service like Kodak's Easyshare (www.ofoto.co.uk), which allows you to upload high-quality images. You still can't download photos at their original resolution, but you will be able to order photographic prints or allow your friends to do so (see *PCW* September 05 for our round-up of online photosharing services).

Another factor to bear in mind is speed. While online backup sounds attractive, it's important to remember that it's limited by the speed of your Internet connection. Even the fastest ADSL lines can only send data at 256Kbits/sec, so that's the quickest files will be uploaded to a backup service. And although files are compressed before sending them, if you have lots of media files or zip files, those won't see any benefit. In short, backing up online will take a long time, especially if you have lots of data files. Without a more expensive SDSL or leased line net link, it's best to have an alternative arrangement.

For many users, that can take the form of a new DVD burner. With dual-layer drives now available for around £40, which are capable of storing 8.5GB on discs that now cost less than £2.50 each from suppliers such as SVP (www.svp.co.uk), it's much easier to create reasonably regular backups of your whole hard disk, or your applications, and then rely on an online service simply to back up your most important documents daily.

Privacy issues

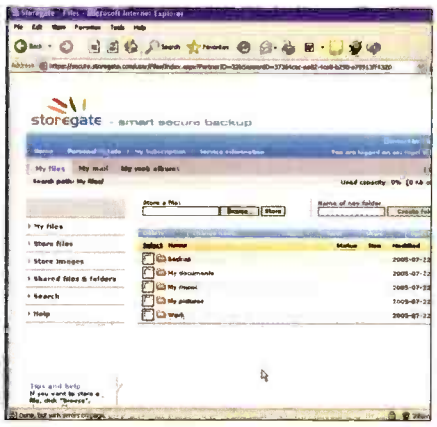
Businesses – in particular – need to be concerned about the privacy and security implications of online backup services. How safe will your data be? What happens if the company changes hands, and who might be able to access it?

Some of the services, as we mentioned in the reviews, provide the option to retrieve files that have been backed up to another account. In itself that's not a great security issue, but it does reinforce the fact that you will need to pick a secure password if you want to be certain that your backups will be protected. If you use a file storage or sharing service, you may find that your files aren't even encrypted.

The seriously security conscious will be better off not using a remote backup service. Although the best services compress and encrypt your data, it's still sent over the Internet, and if your system was compromised, it's not impossible that someone might gain access to your password too.

There's another issue – data protection. The companies that provide backup facilities guarantee the security of your data, but if you're registered with the information commissioner (formerly the data protection registrar), remember that you will need the consent of people you're holding information about before transferring data outside the European Economic Area (EEA), for example to backup servers in other countries.

Finally, if you opt for a free service as a way to keep a few files safe, such as an online groups or photo sharing site, check the terms and conditions carefully, as some photo sites assume they can reproduce images you've uploaded.



Storegate Private Plus

Storegate bills itself as an online backup service, but it does provide a little more – you can access stored files via a web browser, and even send and receive files via FTP. The service also includes shareable photo albums, and an email address to which you can forward important messages for safekeeping.

The other noteworthy aspect of this service – Private Plus – is that it has a very low monthly fee, and a fixed setup price based on the amount of storage you want, which we feel is a fairer reflection of real prices. If you prefer to rent storage rather than buy it, you can do that too.

All that looks pretty good, but the backup side of things is let down by a rather clunky program called Auto Store. It does the job, and includes scheduling options, but the interface really does need updating.

To select folders (not files) to backup, you pick them from a tree view on the left panel. You then browse a right-hand panel, which shows the folder view of your online space, click the folder where you want your PC folder to be stored and then click the Add to list button. Click Store and the files are uploaded; you'd be best off finding a backup program that supports FTP to use with Storegate.

DETAILS

RRP £3.99 inc VAT per month, plus one-off setup fee based on capacity - £29.99 for 2GB
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Storegate **www.storegate.co.uk**
PROS Novel pricing structure; FTP access
CONS Charged encryption; poor backup program
VERDICT
A useful service with a sensible approach to pricing, let down by the backup software

FEATURES	★★★☆☆
EASE OF USE	★★☆☆☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★★☆☆

Streamload

Streamload's chief aim in life is to make it easy to store and share the sort of large files that we end up collecting these days. With digital cameras producing ever higher resolutions, and the file size of home movies and large music collections, the slow upload speed of broadband can make it tedious to move data around.

Streamload allows you to store all your data, with all but the free accounts providing unlimited storage, and then easily access or to share it.

The catch is in the download limits – you can only download a certain amount of data per month. Though the limits are pretty generous, if you share a lot of photos or video clips with other people – which counts towards your allowance – you may use them up quicker than you thought.

Just about everything is done through the web browser, which has a fairly clear interface that allows you to send email links to files as if they're from your own address. And, since uploading files via a web browser is a pretty tedious task, there's also an Uploader application, which allows you to drag and drop files instead, but no specific backup tool, so you'd have to create an archive and send it manually.

DETAILS

RRP $4.95 (£2.84 approx) per month for unlimited stored with 1GB downloads
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Streamload **www.streamload.com**
PROS Easy sharing of media files
CONS No backup tool; download limits
VERDICT
A good solution for those who want to share their files

FEATURES	★★☆☆☆
EASE OF USE	★★★☆☆
VALUE FOR MONEY	★★★☆☆
OVERALL	★★☆☆☆

X Drive

Compared to the other services we looked at, X Drive is a hybrid – it offers online storage, which you can connect to your PC as a remote disk drive, as well as a backup application and tools for streaming music from your X Drive. It can create shareable folders, so that other people can access some of your information at reasonable speeds. You can also send people links to your data, rather than attempting to email large files. And, being US-based, the prices are fairly attractive to users in the UK.

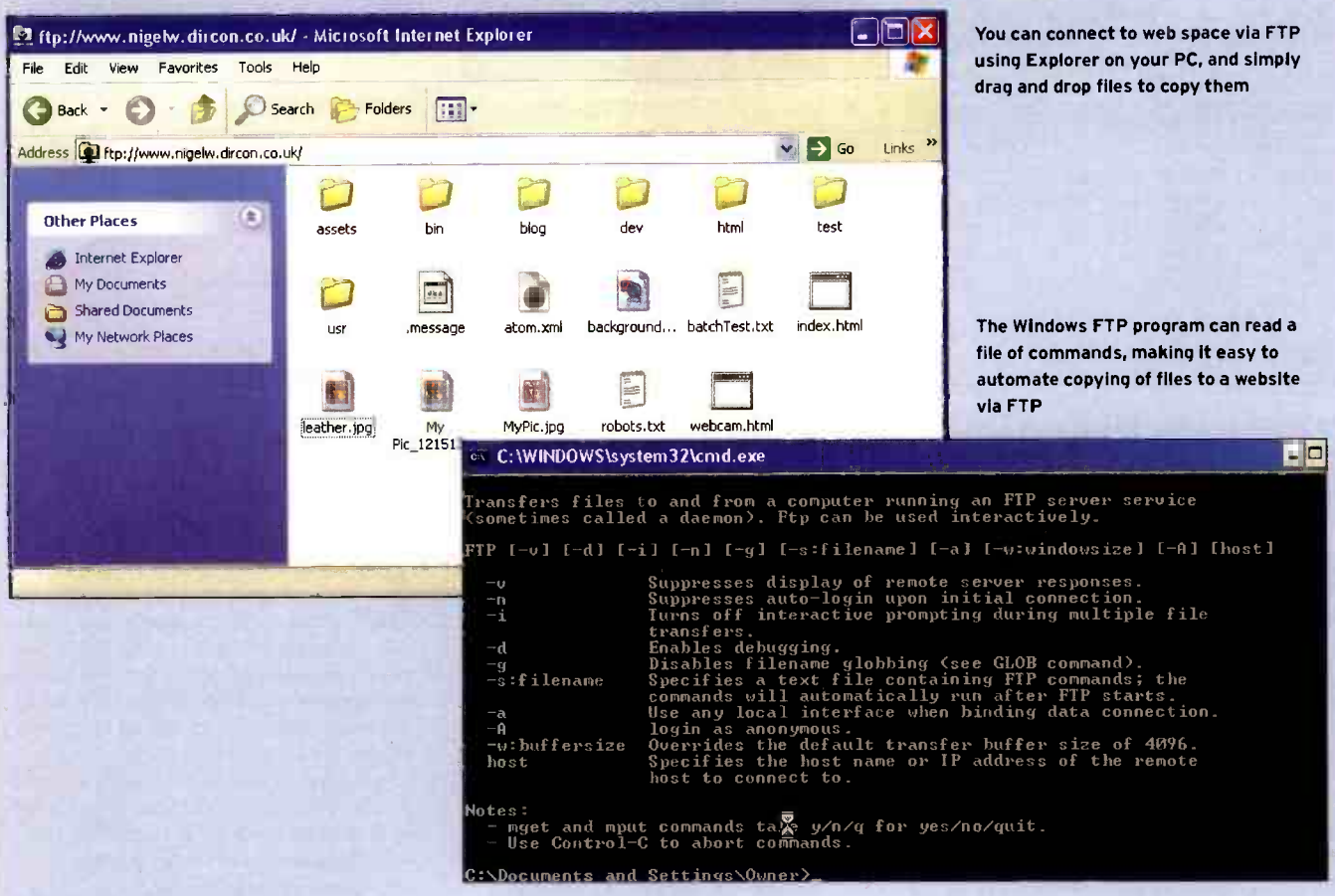
Setup is very straightforward – you don't need to install anything on your PC, since the whole service can be used from a browser, which makes it accessible to Mac users too. But if you download the X Drive Desktop software, you can have the service appear as an additional drive when your computer starts up, so copying files is just a matter of dragging and dropping.

The backup section of the application lets you quickly pick common file types, such as Word or My Pictures, or you can create multiple backup sets and choose which ones you'd like to back up – a very handy feature. Each of those can have its own schedule too, so you could back up music files once a month, and accounts files daily, for example.

DETAILS

RRP $99.50 (£57.25 approx) per year for 5GB
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION
X Drive **www.xdrive.com**
PROS Lots of features; simple to use
CONS Desktop backup application is Windows only
VERDICT
Flexible, simple to use and attractively priced

FEATURES	★★★★☆
EASE OF USE	★★★★☆
VALUE FOR MONEY	★★★★☆
OVERALL	★★★★☆



You can connect to web space via FTP using Explorer on your PC, and simply drag and drop files to copy them

The Windows FTP program can read a file of commands, making it easy to automate copying of files to a website via FTP

The FTP option

The services we've reviewed here are all, in one way or another, designed as dedicated backup or storage solutions. But there's another option, and it's one that you may already have, thanks to your Internet service provider.

With the exception of some very low-cost, 'access only' services, many Internet accounts come with free web space. You might think that's of little use unless you want to create a website, but in fact you can easily use the space to provide you with some online storage. How much will obviously depend on your ISP; there's unlikely to be enough to back up hundreds of media files, for example, but you should be able to copy important accounts or correspondence to the smallest amount of web space.

There are a couple of points to consider first, however. The most obvious is that web space is, by its nature, a public area, and potentially any files you leave there could be accessed easily by other people. That rules it out for commercially sensitive information or personal details of other people.

You can, of course, encrypt files, which will help, but for important information, make sure you use a robust encryption program such as Steganos or PGP, rather than simply password protecting a zip file. You should also save them in a folder that has an index file, so that people browsing your site don't simply see a list of the files you've copied over.

The second issue with FTP is how you upload files. Thankfully, that's much easier than it used to be. You don't need to struggle with a dedicated FTP program to transfer files. With Internet Explorer, for example, if you have a user name of pcwlabs, a password of LetMeIn and the instructions for your web space tell you to upload via FTP to www.pcwlabs.myisp.co.uk, you just need to type this into the address bar of the browser: ftp://pcwlabs:LetMeIn@www.pcwlabs.myisp.co.uk.

The browser window will look just like an ordinary collection of files on your PC, and you can copy files to and fro just by dragging and dropping them between the FTP window and other folders on your computer. If you can remember the name of a file (or you didn't put an index web page in the folder), you can retrieve it from anywhere with a web browser as well.

Another useful tip is that Windows has a built-in FTP program, which is scriptable, and so could be called from a batch file. To upload the file myarchive.zip to our web space, we could create a file called ftpcmds.txt, with these lines:

```
open www.pcwlabs.myisp.co.uk
pcwlabs
LetMeIn
binary
put myarchive.zip
bye
```

The 'binary' command ensures that the file is unchanged when it's transferred - Windows FTP will otherwise alter a file, though that doesn't happen when you use drag and drop.

To process the command file, you just need to type this command in Windows (or include it in a batch file):

```
ftp -s:ftpcmds.txt
```

Combined with a batch file, you could, for example, automatically archive and then copy to your web space your accounts files each time the PC starts up. Remember that you'll need to include full path names to command files if they're not in the same folder as a batch file.

Mac users can have an even easier time. Dantz Retrospect backup software for the Mac now supports FTP uploads as a backup destination, effectively allowing you to roll your own online backup service, as long as you have access to an FTP server.

ONLINE BACKUP AND STORAGE PRICING COMPARISON

SERVICE	BACKUP DIRECT	BACKUP MY STUFF	.MAC	NETBAX	PC FORT	SECURED BACKUP	STOREGATE PRIVATE PLUS	STREAMLOAD	X DRIVE
URL	www.backup direct.net	www.backup mystuff.co.uk	www.mac.com	www.netbax.co.uk	www.pcfort.co.uk	www.secured backup.co.uk	www.storegate.co.uk	www.streamload.com	www.xdrive.com
Backup software	✔	✔	Mac only	✔	✔	✔	✔	✗	✔
Days of backup retained	90	No limit	N/A	No limit	No limit	No limit	N/A	N/A	N/A
Versions of files retained	10	7	N/A	No limit	3	3	N/A	N/A	N/A
Scheduler	✔	✔	✔	✔	✔	✔	✗	✗	✔
Free service	15-day trial	15-day trial	60-day trial	14-day trial	✗	1-month trial	✔	✔	15-day trial
Free capacity	N/A	N/A	250MB	N/A	N/A	N/A	10MB	10GB, 100MB download	N/A
Basic capacity/ cost	500MB/ £11.75/month	500MB/ £7.05/month	250MB/ £69/year	1GB/ £11.75/month	5GB/ £11.69/month	500MB/ £11.75/month, £25 per additional GB	2GB/£3.99/month plus £29.99 setup	Unlimited, 1GB download/ $4.95 (£2.84 approx/month	5GB/ $99.50 (£57.25 approx)/year
Capacity up to 20GB/cost	20GB/ £58.75/month	10GB/ £29.38/month	1GB/ £103.99/year	10GB/ £35.25/month	20GB/ £46.77/month	4GB/ £41.13/month, £6.50 per additional GB	20GB/ £159.99 setup	Unlimited, 25GB download/ $19.95 (£11/47 appox/month	50GB/ $299.50 (£172.23 approx) /year
Download limits	N/A	N/A	3GB/month	N/A	N/A	N/A	N/A	100MB/month on free service	N/A
Features	★★☆☆☆	★★☆☆☆	★★★☆☆	★★★½☆	★★☆☆☆	★★☆☆☆	★★★☆☆	★★☆☆☆	★★★★☆
Ease of use	★★☆☆☆	★★☆☆☆	★★★☆☆	★★★★☆	★★★½☆	★☆☆☆☆	★★☆☆☆	★★☆☆☆	★★★★☆
Value for money	★★★☆☆	★★★★☆	★★★☆☆	★★★½☆	★★★★☆	★★☆☆☆	★★★☆☆	★★★☆☆	★★★★☆
Overall	★★★☆☆	★★★☆☆	★★★☆☆	★★★★☆	★★★½☆	★★☆☆☆	★★★☆☆	★★☆☆☆	★★★★☆

1. All prices are based on 12-month option. In some cases month by month options are available, at slightly higher cost. Includes VAT 2. Prices are for a service of up to 5GB, and for one of up to 20GB

Editor's choice

There's no doubt that backing up is a chore, but it can be made much easier by using one of the online services we've looked at. They all have their strengths and weaknesses and some use similar technology, but differ only in the servers they point at and the pricing structure they use. We'd like to see more people adopting similar pricing policies to Storegate's. With the price of hard drives dropping, charging as much as £25 per month per GB seems outrageous.

It's also worth remembering that for a typical home or small office, these solutions can really only ease the pain of a backup, not take it away, since they'll usually be run over an ASDL connection with a distinctly unimpressive upload rate. Unless you have a leased line or SDSL, many people will still need to do some form of backup to DVD for essential applications and system files.

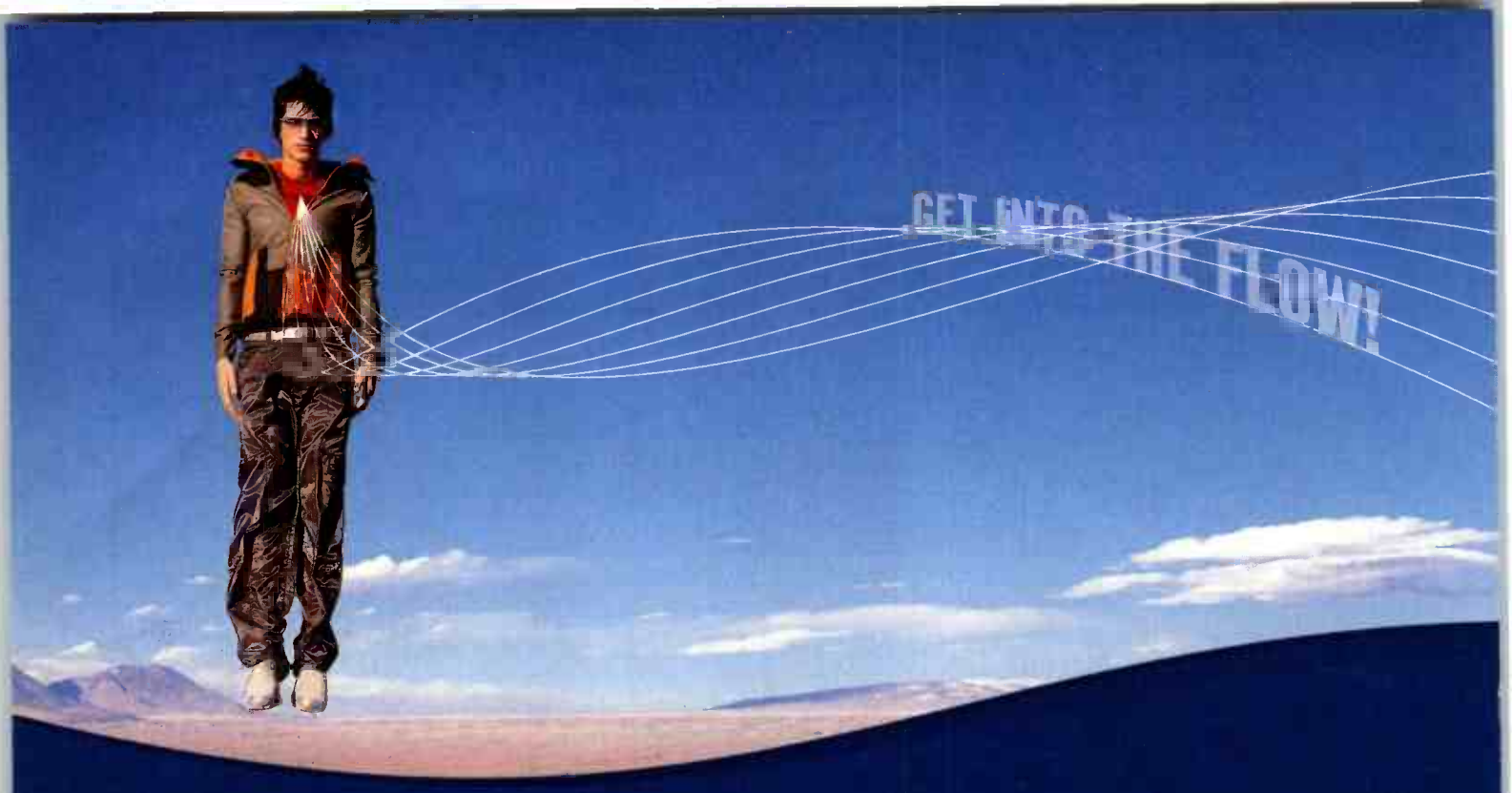
The right choice depends on what exactly you want to do with your information – simply keep it safe, or make it easier to share with other people, something that Streamload, Xdrive and .Mac all do quite well. Apple's .Mac service, with its Mac-only backup application is best suited to users of that system, and though it has a wide range of options, it is a little pricey to choose simply for the online storage included. If you have relatively modest requirements, and just want to keep a few files safe elsewhere, then Streamload's free account is worth considering.

X Drive

For straightforward backups, there were two simple-to-use and reasonably priced options – PC Fort and Netbax. Both of these will suit a small or home office that needs to back up important files and documents.

While PC Fort is attractively priced, we felt that the interface for Netbax was friendlier, and provided more help to the user. In particular, it adds useful features, such as limiting the amount of outbound bandwidth that's used up. Both products are worth investigating, but it's to **Netbax** that we give the **Highly Commended** award.

X Drive's combination of relatively low price, media sharing and file storage capabilities and a simple, but versatile backup system makes it an ideal choice. As the best all-round solution, it wins our **Editor's Choice** award.



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PC WORLD Business Tel 08701 664 664

MicroWarehouse Tel 08705 550 000

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Zyxel Zywall P1

Group test

115 Spam-filtering software
Stop unwanted emails filling up your inbox with one of these packages

ARM chips at code

Chip design company ARM is boosting the performance of Java applications in future mobile devices using its Jazelle Runtime Compiler Target (RCT). This set of hardware features, enable compilers to greatly reduce code size, and cut processor power consumption. Jazelle RCT supports both runtime and ahead-of-time compiler technologies and builds on the company's existing Jazelle technology.

Extreme WLan

Extreme claims its new WLan system offers simple, secure, scalable deployment of voice over WLan (VoWLan) infrastructure. The switches, Summit Wireless Mobility 100 and 1000 models, can manage 50 and 200 of its Altitude 350 access points. The WM100 and WM1000 switches cost £11,045 and £21,385 inc VAT respectively. Firmware upgrades to older Altitude 300 APs in September will allow them to use the new switches.

Foundry updates

Foundry Networks has updated its enterprise Layer 2/3 and Layer 4/7 switches and routers. It has introduced new Server Iron GT C-series application switches with and without Secure Sockets Layer (SSL0) support. The GT-C series supports web-application traffic management. Foundry has also launched a compact application switch, the Server Iron 350.

BT takes Ethernet to its heart

Telecoms giant launches three new services to fight competition

This summer BT is launching three new Ethernet services nationally, which it claims will put the technology at the heart of 21st Century Network (21CN) it is developing.

One service will offer low-cost, point-to-point private circuits at speeds between 250Mbits/sec and 1Gbits/sec. The second service, called BT EVLan, will provide a virtual private Lan service (VPLS) with metropolitan any-to-any Ethernet connections. VPLS is effectively a type of Layer 2 virtual private network (VPN).

The third new service is an enhancement of BT Enterprise Ethernet and is a low-bandwidth version of BT's Megastream product, offering similar characteristics to a traditional private circuit, but using an inexpensive Ethernet interface.

However, a BT spokeswoman said that pricing will only be announced when the new services are launched. 'BT's Ethernet portfolio needed a boost since competitors such as Thus, NTL and Telewest are fully behind Ethernet (even if it is not legacy carrier grade yet) in a much bigger way than BT at the moment,' she added.

Meanwhile, a report published by analysts Analysys, and commissioned by service provider Easynet, concluded that Multiprotocol Label Switching virtual private networks (MPLS VPNs) provide comparable security to similar services run over legacy VPNs using Frame Relay or Asynchronous Transfer Mode (ATM) links.

Summarising the report, Ariel Dajes, Analysys senior research analyst, wrote that MPLS-based VPNs could even offer better network security than legacy VPNs, since service providers could support IP Security (IPSec) over MPLS. Easynet said that no customers had asked for this capability yet, but predicted some public sector organisations may require it in future.

Dejes added that to help them assess risks, firms should ask their service providers how they protect their core network, data centres and switching centres.

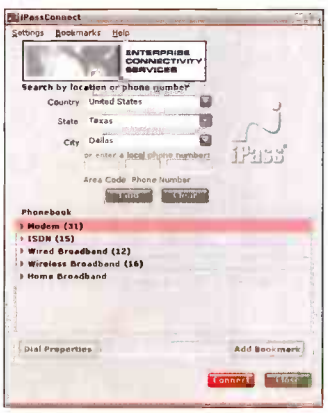
Dave Bailey

UPE means none shall Ipass

Connectivity services company Ipass has unveiled some tools to increase connection options for remote staff and lockdown laptops used to access company networks.

With Universal Policy Enforcement (UPE), staff can only access their company's virtual private network (VPN) via the Ipass Connect network client, which has mechanisms to enforce security policy, said Ipass. However, staff will be able to connect over a wide range of non-Ipass networks, such as public wireless hotspots or via their own broadband connections at home.

Piero DePaoli, Ipass product marketing manager, said the system was moving towards the vision of making all connections as secure as possible. With device fingerprinting technology acquired from Safe3w last year, the Ipass client ensures that staff can only connect from company laptops.



Ipass' new software protects private networks by locking down laptops

The same Device ID technology enables the new VPN lockdown feature because it uses the laptop's 'fingerprint' as part of the authentication process when staff are connecting.

'It can be set up so the user can only access the VPN through Ipass. Our client checks that the firewall and the anti-virus software are running, and that the system is patched up to date. The user won't be able to connect without going through all these stages,' said DePaoli.

Previously, this would have prevented mobile users from connecting if a network covered by Ipass Corporate Access was not available. However, version 3.35 of the Ipass client detects other wireless hotspots and helps users connect.

'Users and corporate customers like the idea of a single client that can get onto any network, whether 3G, Wifi or dial-up,' DePaoli said.

Daniel Robinson

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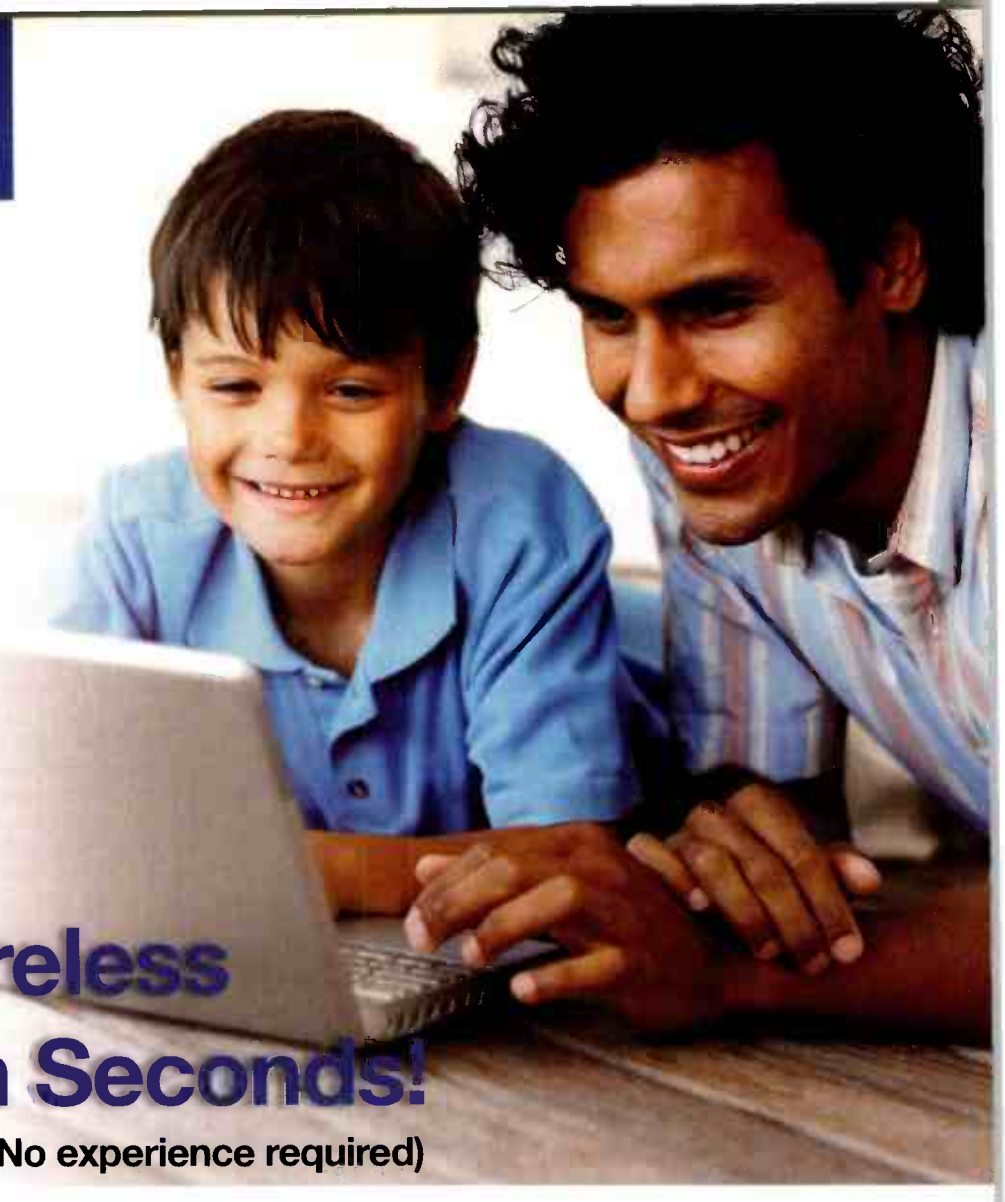

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CISCO SYSTEMS

POCKET PC

Symbol MC50

Rugged and durable handheld for use on the shop floor

Symbol's pocket PC will be useful for environments where a workhorse is needed rather than an organiser

Symbol's MC50 fills the gap between standard PDAs and fully ruggedised devices.

Essentially a pocket PC, the MC50 has features to support staff who are not desk-bound, but in environments such as the sales floor. This makes it pricier than standard handhelds, but it's well worth the cost for firms that need a workhorse instead of an organiser.

The device ships in three basic versions. One sports a 1D barcode scanner, the second houses a 2D scanner and monochrome image capture, while the third supports full-colour image capture. All three can be specified with either a five-way navigator control or a 37-key Qwerty-style keypad.

We looked at a keyboard-based model with 2D scanner and monochrome camera.

All versions feature a 520MHz Intel PXA 270 processor, 64MB of memory, and 802.11b wireless connectivity. The faster 802.11g Wifi standard is missing.

The TFT display is a 65K-colour model and has a resolution of 240 x 320. Each unit has a removable 1,560mA battery pack as standard, which offers a higher capacity than most other pocket PCs. The MC50's USB desktop cradle is able to charge both the device and a spare battery (an optional extra) at the same time. As an alternative, an RS232 connection is available.

Both a speaker and microphone are built into the chassis and the MC50 can be linked up to a VoIP (voice over IP) service for cheaper phone calls. A vibration and LED alert are included for incoming call warnings.

Symbol's well-designed keyboard makes it easier to use the device without recourse to the stylus – something that can drastically slow things down. A blue modifier key turns the top row of buttons into shortcut keys for the menu bar and applications, while a block of keys to the right of the keyboard become navigation (arrow) keys. The orange modifier key accesses secondary characters such as '@', and the same block of keys to the right serve as a numeric keypad while it is active. Although the MC50's keys are small, anyone used to text messaging on a mobile phone should have no problems. If you're inputting text for any length of time, though, things could start to get a little awkward.

The MC50 is more robustly constructed than most pocket PC devices we've come across before. A fitted strap makes it less likely that users will drop the unit, while a screw-down cover protects an SD (Secure Digital) memory card slot.

A sample application on the MC50 let us scan both 1D and 2D barcodes, and see the information they contained. Business applications could use the scanner to look up prices for retailing, or IT staff could barcode assets for quick lookup on their inventory records.

The barcode scanner can also be used to speed deployment of MC50 devices. Using Symbol's Mobility Services Platform (MSP), an administrator can print and distribute custom barcodes to staff, who scan them using the MC50's built-in Rapid Deployment Client. This configures the device and, based on a predefined list, informs it which applications to pull down from the network and install.

The MC50 also comes with a built-in client for Symbol's Airbeam Smart software. This is another part of the MSP and allows IT managers to update the device firmware and applications over the air. Again, this greatly aids deployment and maintenance.

A tool also allows the user to disable the MC50's radio to save battery power, but the likely roles for this handheld will typically need constant wireless Lan access.

The lack of 802.11g wireless connectivity is a little disappointing and the durable design of the MC50 also pushes up the price a fair amount, but it is a rugged digital assistant with a good range of features making it suitable for use in a variety of environments.

Daniel Robinson

DETAILS

PRICE £814.26 (£693 ex VAT)
CONTACT
Symbol 0118 945 7232
www.symbol.com
SPECIFICATIONS
Intel Xscale 520MHz processor • 64MB of Ram • 65K TFT (240 x 320) • 1.4in mono CCD (1megapixel) • 802.11b • USB1.1 • RS232 • Windows mobile 2003 SE • 75 x 136 x 29mm (w x h x d) • 192g
PROS Sturdy; barcode scanner; management features
CONS Expensive; 802.11b
VERDICT
A sturdy pocket PC that's designed to withstand shop floor and other harsh environments

FEATURES	★★★★★
PERFORMANCE	★★★★½
ENTERPRISE VALUE	★★★★½
OVERALL	★★★★½

VOIP ROUTER

Zyxel Prestige 2602HW

Connect to make calls over the web

The Prestige 2602HW is Zyxel's 802.11g wireless Voice over IP (VoIP) ADSL router aimed at small businesses.

It's a fully configurable router with strong security that is best used by those requiring a more complete offering. If your needs are simply to have several PCs wirelessly connected to the Internet, this is not the router for you. Instead, it's aimed at those who run a small business or often work from home, and need both a network and the ability to make regular phone calls over the Internet.

The networking element is not too difficult to set up and get going, although you'll need some previous experience in setting up a router, but the VoIP part is quite hard. The router comes with a decent manual, which helps, but despite all the screenshots, anyone without past VoIP knowledge will struggle. You will also need to know your VoIP provider's various SIP settings.

We initially had a lot of problems getting PCs online with this router. Rebooting the PC and the router itself solved the problem, but not permanently. Worse still, it would crash when making a VoIP call via an adapter box plugged into an Ethernet port – an alternative, but common means of phoning over the Internet. We spoke to Zyxel, but staff could not solve the problem, so we replaced the router and tried again.

Second time around things improved despite crashing – but not when making VoIP calls – and needed a router reboot to get going again. Most of the time though, it worked fine, had decent coverage and, although 54Mbits/sec is a theoretical speed, still achieved good performance.

Overall, the router worked fine once up and running, but seemed to have the occasional bad day.

Rob Jones

DETAILS

PRICE £186.83 (£159 ex VAT)
CONTACT Zyxel 01344 303 044
www.zyxel.com
SPECIFICATIONS
4 10/100 Ethernet ports • 2 RJ-11 ports • 802.11g • Wep encryption • DHCP • UPNP • G.711 and G.727 voice codecs • 248 x 37 x 168mm (w x h x d)
PROS VoIP functionality
CONS Crashed on occasions
VERDICT
Not a bad router, but it can suffer from intermittent problems

FEATURES	★★★★☆
PERFORMANCE	★★★☆☆
ENTERPRISE VALUE	★★★☆☆
OVERALL	★★★☆☆

PERSONAL FIREWALL

Zyxel Zywall P1

Security for remotely accessing a network

Working from home or away from your office is commonplace, but it can pose a real headache for IT managers looking to ensure network security. Zyxel's Zywall P1 is a personal firewall that aims to combat the security threats posed by employees who are remotely accessing their corporate networks.

The device is stylishly designed with a series of LED indicators, both wide and local area network ports and a mini USB socket for power. An external power supply unit is offered as an alternative, but the manual warns that using this with the USB cable still attached may render the device 'useless' – something Zyxel really should sort out.

Installation and setup via the web interface is simple and a range of settings are available. However, the main draw of the Zywall P1 is its ability to receive instructions remotely. This allows the firewall to be set up and maintained by an IT manager whether the employee is based in or out of the office.

As expected, it also features VPN (virtual private network) client support, while the network outbreak detection will highlight suspicious activity and help contain any attacks.

The Zywall P1 doesn't do itself any favours in only being capable of working with wired networks, especially at this price. But it's not possible to set up profiles: with a portable device it's likely you'll want to use it on a various networks, each with their own security policies.

Although its size makes the Zywall P1 a truly portable device, it's certainly not cheap. At £149 ex VAT per unit, costs will start to rocket if you're looking to secure anything more than a small network.

Will Stapley

DETAILS

PRICE £175.08 (£149 ex VAT)
CONTACT Zyxel 01344 303 044
www.zyxel.co.uk
SPECIFICATIONS
SPI firewall • IPSec VPN client • DOS prevention • Remote administration • 10/100 Lan and Wan ports • USB or PSU powered • 81.5 x 20 x 128.5mm (w x h x d) • 130g
PROS Small; remote management
CONS Expensive; no profile support
VERDICT
Great for IT managers looking to provide secure remote access, but expensive to implement

FEATURES	★★★☆☆
PERFORMANCE	★★★★☆
ENTERPRISE VALUE	★★☆☆☆
OVERALL	★★★☆☆

WORDS: EDUARDO SÁNCHEZ TESTING: VNU LABS

Spammer hammer

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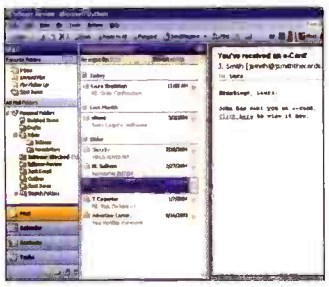
Stop spam from wreaking havoc on your inbox with one of these email filtering applications

The daily deluge of unwanted emails is taking its toll on many users who are faced with the never-ending task of clearing out their inboxes of this unwanted, unstoppable plague.

Spam is any unwanted email message, regardless of its contents. Apart from the inevitable virus, this type of unsolicited correspondence is generally an advertising or marketing mailout, or chain letter.

Junk mail goes far beyond its simple appearance and is a lucrative business for the companies that are professionally dedicated to this task. They offer their services to third parties as a way of making their products and services known to millions of potential clients. These companies make money by working on a percentage game: by sending a message to millions of potential email addresses they know that enough people will respond for them to make money. Even if your response is simply to ask them to stop spamming you, they may make money as your response is considered a hit, plus they have the added benefit of knowing your email address is live.

This group test looks at the effectiveness of anti-spam software that stops spam reaching your desktop without blocking legitimate mail. We tested a range of software, from spam catchers within larger security suites to programs that are available for download free, giving you a broad spectrum of options for controlling spam, depending on your level of needs.



Two separate email folders will sort the wheat from the chaff

Audiotrieve Inboxer

This well-designed application simplifies email filtering and is compatible with Outlook 2.0 (there is also a version for Outlook Express). Once installed, it creates two email folders: one for storing messages classified as spam and another for redirecting messages suspected of being spam.

Its functions are controlled using three icons on the client toolbar. Two of them (a thumbs up and a thumbs down) let you classify any message categorised incorrectly. Another button displays the options menu, with features such as detailed message analyses. It also lets you filter messages that have already been downloaded into any folder.

Inboxer lacked precision during testing, but with continued use the application will learn and improve. Initial tests lacked the use of blacklists, rules and format analysis, which can help to get better results.

DETAILS

PRICE $29.95 (£17 approx)
CONTACT Audiotrieve
www.inboxer.com
PROS Easy to use; creates separate email folders for spam and suspected spam emails
CONS Lacks a greater ability to detect unwanted messages; takes time to teach it to achieve best possible results
VERDICT
An ideal application for anyone using Outlook as their email client. However, users need to teach it in order to reach a certain level of effectiveness

FEATURES	★★★☆☆
ENTERPRISE VALUE	★★☆☆☆
EASE OF USE	★★☆☆☆
OVERALL	★★☆☆☆

This product's analysis tool can even scrutinise the wording of your email

Cloudmark 4.3 for Outlook

This is one of the more expensive programs tested and its strength lies in its compatibility with Outlook and Outlook Express, and in the way in which it optimises tasks. It creates a folder called spam in Outlook and Outlook Express, and uses Bayesian and other techniques to analyse messages that reach the email client.

It had a high success rate in our tests, especially as it looks at the real contents of the messages, and it detected items that other programs missed.

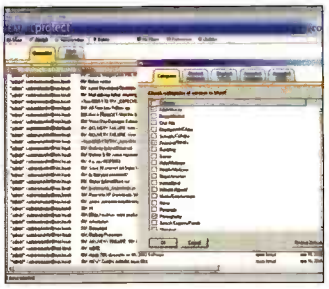
It works in the background while your messages download, letting you analyse any email folder you ask it to examine. With time and training it's likely to become one of the better anti-spam applications.

Finally, an interesting additional feature is that it shows you how much time, and therefore money, you are saving by using Cloudmark.

DETAILS

PRICE $39.95 (£23 approx)
CONTACT Cloudmark
www.cloudmark.com
PROS Compatibility with Outlook and Outlook Express; works in the background; scans folders on request and can produce automatic updates
CONS Lacks some of the options that other packages have, such as black and whitelists; a bit more expensive
VERDICT
An effective product for anyone wanting good compatibility with Outlook and Outlook Express

FEATURES	★★★★☆
ENTERPRISE VALUE	★★☆☆☆
EASE OF USE	★★★☆☆
OVERALL	★★★★☆



A basic email filtering package that can quarantine all your junk

Contentwatch Email Protect 1.8

Email Protect 1.8 has a simple interface with just basic features to stop invaders. It is compatible with Outlook and Outlook Express clients.

Once you have installed the program and restarted the machine, you'll see an envelope-shaped icon in the taskbar as it checks your email communications.

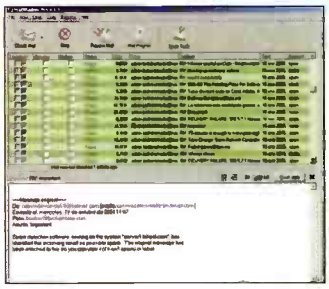
When a suspicious message is detected it is quarantined and an alert is sent to your client. But take care when choosing the filters because if all are selected most of your mail will be considered junk. Also, it lacks the option of omitting alert emails in the inbox and the only way around this is to create a rule to move and delete them.

Contentwatch offers a range of home and business software to help users fight unwanted emails, viruses and unauthorised browsing.

DETAILS

PRICE $29.99 (£17 approx)
CONTACT Contentwatch
www.contentwatch.com
PROS Can handle different email clients since it checks the Pop3 connections; precise spam detection
CONS Accepts all email messages, even notifications of messages classified as spam, so you need to create a rule to delete them
VERDICT
Manages server connections, regardless of the client used. Users can choose from 20 categories of messages to be blocked or authorised

FEATURES	★★★☆☆
ENTERPRISE VALUE	★★★☆☆
EASE OF USE	★★★★☆
OVERALL	★★★☆☆



This filtering system is only as effective as the person teaching it

Firetrust Mailwasher Pro

Mailwasher Pro 4.1.9's detection system is different from anything else we've seen, and is based on downloading headers and observing aspects such as the content of the subject line, the size, sender and the message's source servers. It combines this with spam blacklists to judge whether email is spam. However, to improve its effectiveness, you need to teach it and it will gradually get better. As a result, it hardly detected any unwanted items during our tests.

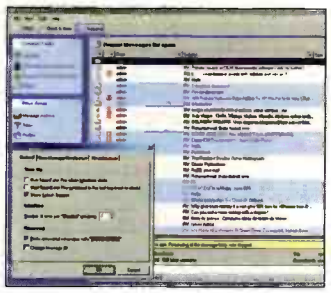
Once emails have been tested, you choose which are deleted from the server before downloading. A bounce message tells the spammer that your address doesn't exist.

A decent range of options let you create many types of rules and lists, add Domain Name Servers with spam classification, and so on. Overall, it's a good choice for experienced users.

DETAILS

PRICE $37 (£21 approx)
CONTACT Firetrust
www.firetrust.com
PROS Deletes and classifies messages without downloading from the server; works separately from the email client, so it is compatible with any application
CONS Doesn't analyse content; based on learning and blacklists and so initially lacks effectiveness
VERDICT
Good for anyone seeking to control and delete spam directly from the server without downloading messages

FEATURES	★★☆☆☆
ENTERPRISE VALUE	★★☆☆☆
EASE OF USE	★★☆☆☆
OVERALL	★★☆☆☆



A veritable security guard in an inbox, always on and making checks

High Mountain Spameater Pro

Spameater Pro is a decent, if unremarkable, product. It is efficient and quick to classify messages as spam, with a good level of success, and it has more options than some of the better-known products. The interface has an XP style, shortcuts to the most used functions and a good menu structure.

It's more than just an anti-spam filter; it's also a Pop3/SMTP client (although you can't activate SSL security), which checks your inbox for junk mail.

Required messages will stay on the server to be downloaded, while unwanted mail must be deleted or downloaded for processing. The utility is always on and conducts checks every few minutes.

It's quite a good product in terms of options and precision, but is somewhat complicated to use since it requires two applications to work separately.

DETAILS

PRICE $24.95 (£14 approx)
CONTACT High Mountain Software
www.hms.com
PROS Well designed; simple interface; high message processing speed and precise at detecting spam
CONS Not compatible with email clients, so you will need to manage two environments
VERDICT
Let down by having to use it at the same time as your email client. Its biggest advantages are a good level of effectiveness and that you can delete messages before downloading them

FEATURES	★★★★☆
ENTERPRISE VALUE	★★★★☆
EASE OF USE	★★★★☆
OVERALL	★★★★☆

Confirms authenticity by asking senders to take the kitty challenge

Mailfrontier Desktop 4.5

Mailfrontier Desktop has a well-designed interface and is simple to use – good for anyone wanting uncomplicated anti-spam software.

Once installed, it starts automatically with Windows and is compatible with Outlook, in which it creates and places folders and icons on the upper toolbar. One of the most noteworthy functions is the way it challenges suspected spam by sending messages to suspicious senders. Using a friendly picture of cats or dogs, senders are asked how many animals they see on screen. If they reply correctly, the program receives explicit confirmation that the message sent was destined for you. This is all done automatically.

In terms of effectiveness, it needs time to analyse and process each message, although this doesn't guarantee that its performance improves the longer it is used.

DETAILS

PRICE $29.95 (£17 approx)
CONTACT Mailfrontier
www.mailfrontier.com
PROS A clear, simple interface, excellent compatibility with Outlook; automatic validation of suspicious messages
CONS Takes too long classifying incoming messages compared with rival applications; success rate is simply not high enough
VERDICT
Good for users looking for compatibility with Outlook and wanting to use its sender validation technique

FEATURES	★★★☆☆
ENTERPRISE VALUE	★★☆☆☆
EASE OF USE	★☆☆☆☆
OVERALL	★★☆☆☆

Compatible with many email clients, Spamkiller lives up to its name

McAfee Internet Security 2005

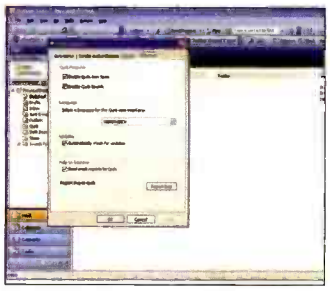
This security suite includes Spamkiller – which can be bought separately for £20 – and this is the tool we concentrated on. It is easy to install and start up, with a screen in the McAfee security centre telling you of the messages detected, highlighting those that have been blocked and those that have been allowed. This makes it easy to correct any wrong decisions made by the application. It also lets you export address books from Outlook, Outlook Express, MSN, Eudora and Incredimail to create a list of friends whose emails shouldn't be blocked.

It's compatible with a number of email clients, including Outlook, and is quite fast because it speeds up downloading so it can process messages once they are in your inbox. However, it does use considerable resources as it analyses messages.

DETAILS

PRICE £40 single-user licence
CONTACT McAfee
www.mcafee.com
PROS A fast, visual and simple interface that is updated automatically and good for eliminating most spam
CONS Resource-heavy when analysing lots of messages; although it learns over time, its success rate is lower than expected
VERDICT
Besides keeping spam away from your PC, it lets you protect yourself from any type of danger

FEATURES	★★★★☆
ENTERPRISE VALUE	★★★★★
EASE OF USE	★★★★☆
OVERALL	★★★★☆



Recognises specific addresses and so will quarantine unknown emails

Qurb 2.0

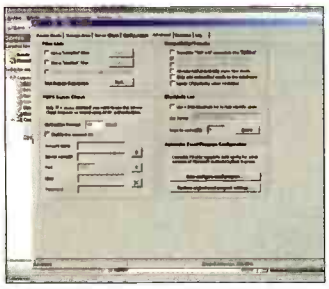
Qurb recognises specific addresses or domains and is compatible with Outlook and Outlook Express, with all emails being quarantined until you accept them. This is useful if most messages come from the same people because the program consults your address book to create a list of authorised senders and analyses which messages are stored on your PC. Once it has compared the address book and emails, any remaining messages are considered likely to be spam. A confirmation message is sent to first-time addresses and, if answered, Qurb moves the message to the inbox and adds the address to the list of authorised senders.

Among its strong points are its ease of use and simple setup. However, it examines addresses not the mail, and is only effective if you work with a specific group of people.

DETAILS

PRICE $29.95 (£17)
CONTACT Qurb
www.qurb.com
PROS Ease of use and simple installation process; compatibility with Outlook and analysis of emails
CONS Only checks that the sender or domain is authorised, not the content of the email, and therefore quarantines emails by default
VERDICT
A highly effective tool, as long as most of your messages originate from people you already know and are listed in your address book

FEATURES	★★☆☆☆
ENTERPRISE VALUE	★★☆☆☆
EASE OF USE	★★★☆☆
OVERALL	★★☆☆☆



A surprisingly useful freebie, with plenty of filtering capability

Robin Kier K9 Antispam 1.28

This free application came as a pleasant surprise because of its simple design and the quality of the Bayesian method used to detect spam. Once installed, it becomes a proxy and connects to your email server.

Setup is a little complicated, however. You configure your client with Pop3 support and it will look for this server on your machine (127.0.0.1) and connect via the TCP 9999 port (instead of the standard 110 port). Your username must include the target machine.

Its filtering capacity is powerful. It detected all our junk mail while allowing us to tell it which addresses, servers and senders not to download. Content classified as spam is downloaded to your client, although it gives you a spam alert at the end of the subject line. To permanently delete or move it automatically, you have to create a rule.

DETAILS

PRICE Free
CONTACT Robin Keir
www.keir.net
PROS Plenty of configuration options and high detection rate
CONS Email control system difficult for inexperienced users and those with only one account on their machine
VERDICT
An interesting application recommended for users looking for a freeware solution and who have enough experience to be able to set it up and configure its multiple options

FEATURES	★★☆☆☆
ENTERPRISE VALUE	★★★★☆
EASE OF USE	★★★☆☆
OVERALL	★★★☆☆

Proof that the best things in life are free – and can rival commercial apps

Sourceforge Spambayes 1.0.1

This application's design and features are similar in many ways to Cloudmark's. Spambayes is slightly slower when examining messages, but scored an impressive success rate by using Bayesian techniques based on a new algorithm.

Its trump card is that it's free while being good enough to sit in the same league as the commercial applications. It's easy to use and special mention should be made of its ability to practice and learn automatically from the messages that you have stored. Spambayes analyses both the sender's address and the contents of messages received, but that an application such as this is capable of training itself is a big achievement in itself.

One thing to watch, however, is that until it has had its first training session, it will treat all incoming mail as suspicious, moving it to a quarantine area until it has been classified.

DETAILS

PRICE Free
CONTACT Sourceforge
http://spambayes.sourceforge.net
PROS Advanced Bayesian classification technique, and automatic and ongoing training using the client's messages
CONS An initial learning period is required for it to work intelligently. Moves emails into quarantine until they've been classified
VERDICT
This is the best free product we've found for filtering spam. It's even better than many commercial products

FEATURES	★★★☆☆
ENTERPRISE VALUE	★★★★★
EASE OF USE	★★★★☆
OVERALL	★★★★☆

Now you can put an end to the onslaught of foreign-language spam

Norton Internet Security 2005

The primary difference between this and other suites is that the anti-spam module forms part of the security features, with options from other components, making it easier to manage.

We were surprised that a few features were not included in other products. The first is that it can filter messages according to their language, so you can classify any in an unwanted tongue as junk. The second is that as well as learning from your decisions, it takes outgoing messages into consideration, storing their addresses and memorising their structure.

Given the options and its ease of use, this suite has the best filtering system here. However, reliability only improves over time and through increasing the filter's sensitivity, which is set to medium by default. Its level of efficiency is good, although you pay a lot more to use this suite.

DETAILS

PRICE £54.99
CONTACT Symantec
www.symantec.com
PROS Easy to use; learns from outgoing messages and is efficient
CONS Options must be managed from the Norton security centre, not the email client; it's also a bit costlier than the others
VERDICT
Its ease of use and performance almost exceed McAfee's, but it's more expensive than other security suites while offering almost similar features

FEATURES	★★★★☆
ENTERPRISE VALUE	★★★☆☆
EASE OF USE	★★★★☆
OVERALL	★★★☆☆

Email servers

You can manage spam filtering from your own email server, which is ideal for companies that have their own machine dedicated to this as it helps to centralise the cleaning operation. Some of the best solutions for Windows environments are products such as McAfee's SpamKiller, GFI's Mail Essentials, Trend Micro's Scanmail and Symantec's Brightmail Antispam.

In the Linux world, some of the best solutions were Spam Assassin, dspam and Spamfilter. A host of applications are designed to work as Pop3/SMTP/Imap servers, which let you consult blacklists to ensure the sender is trustworthy; such as Workgroup Mail (www.workgroupmail.com), which can handle several DNSs with spammer blacklists.

Find out about suspicious IP addresses at www.dnsstuff.com, http://openrbl.org and www.senderbase.org.

Admins beware

Many spammers have trackers activated whose job is to find weak points in a network. Given that ISPs block their systems to any user they find spamming, spammers usually look for open relay servers (with open SMTP services for sending emails) or servers with some kind of security loophole. Thanks to these machines, they send thousands of messages in just a few days.

We came across a case in which, as a result of tests, a user running Windows 2003 with Exchange Server was left enabled by mistake. Within days, four spammers had found the machine and used it to send hundreds of thousands of messages. Apart from crippling the network, inundating the workload and saturating the queue with erroneous messages (more than 5GB), the server's IP was published on several anti-spam lists.

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- FW 400, USB2.0 & FW800 (all cables included)
- Compatible with Windows® backup utility
- 2 years manufacturer's warranty as standard

Available Models:
160GB, 250GB, 300GB, 400GB, 500GB,
1000GB, 1600GB, 2000GB

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- AC adapter-free, powered by USB or FireWire
- Ideal for notebook/laptop users as mobile storage
- Sleek, robust enclosure - design by F.A. Porsche
- Compatible with Windows® backup utility
- 2 years manufacturer's warranty as standard

Available Models:
USB2.0 - 40GB, 60GB, 80GB, 100GB
FireWire & USB2.0 - 40GB, 60GB, 80GB, 100GB

NEW!! LaCie Safe Mobile Hard Drives

- Biometric encryption - Fingerprint recognition
- Safely store and transport your private data
- Ultra-portable - only 8 x13.8 x2.5cm & 200g
- USB 2.0 interface - all cables included
- AC adapter-free, powered by USB
- Sleek, robust encloser - designed by F.A. Porsche
- 2 years manufacturer's warranty as standard

Available Models:
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- Photon 20 - 176 degrees viewing angle (IPS)
- 3 years advance replacement warranty

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Photon LCD/TFT 20.1"

LaCie 300 Series Monitors

- DVI and VGA connectors
- Highest specification Superfine TFT Panel
- 321 - maximum resolution 1600x1200
- 321 - response time 20ms
- 321 - dot pitch 0.27
- 321 - 176 degree viewing angle (S-IPS)
- 3 years advance replacement warranty

Available Models:
321 - 21"
319 - 19"

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- Automatic hardware calibration
- Creates and activates advanced ICC profiling
- Time saver colour test modukle
- Switchable colourimetic environments
- Designed to complement the LaCie 300 series
- USB interface - all cables and software included
- 2 years manufacturer's warranty as standard

Available Models:
Blue Eye Pro
Blue Eye 2

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E&OE July 05

Table of features

MANUFACTURER	**AUDIOTRIEVE**	**CLOUDMARK**	**CONTENTWATCH**	**FIRETRUST**	**HIGH MOUNTAIN SOFTWARE**	
PRODUCT	**INBOXER FOR OUTLOOK 2.0**	**CLOUDMARK 4.3 FOR MICROSOFT OUTLOOK**	**EMAIL PROTECT**	**MAILWASHER PRO 4.1.9**	**SPAMEATER PRO**	
Price	$29.95 (£17 approx)	$39.95 (£23 approx)	$29.99 (£17 approx)	$37 (£21 approx)	$24.95 (£14 approx)	
URL	www.inboxer.com	www.cloudmark.com	www.contentwatch.com	www.firetrust.com	www.hms.com	
ENVIRONMENT						
Works like a standalone email client	✗	✗	✗	✓	✓	
Email program support: Outlook/Outlook Express/Eudora/others	✓/✓/✗/✗	✓/✓/✗/✗	✓/✓/✓/✓	✗/✗/✗/✗	✓/✓/✓/✓	
Supported webmail services	Not specified	✗	Yahoo, MSN and Hotmail	Hotmail and AOL	Yahoo	
Supported Pop3/Imap services	✓/✓	✓/✗	✓/✗	✓/✓	✓/✗	
SSL support	✓	✓	✗	✓	✗	
FILTERS OF BLOCKING/PERMISSION						
Blocking by specific IP	✗	✗	✓	✗	✓	
Blocking by specific server	✓	✗	✓	✓	✓	
Support for public blacklists	✗	✗	✗	✓	✓	
Allows user to trust a specific servant	✓	✗	✓	✓	✓	
Allows user to trust a specific IP	✗	✗	✓	✗	✓	
Preloaded filter categories/number	✗/0	✗/0	✓/28	✗/0	✓/8	
RULES AND MESSAGES						
Allows customised rules	✗	✗	✓	✓	✓	
Account with predefined rules	✓	✗	✓	✓	✓	
Multiple rules support	✓	✗	✗	✓	✓	
Email bouncing capability	✗	✗	✗	✓	✓	
Automatic email deletion	✗	✓	✓	✓	✓	
OTHER CHARACTERISTICS						
Quarantine messages	✓	✓	✓	✗	✓	
Works with multiple DNS	✗	✗	✗	✓	✗	
Individual user profiles	✓	✗	✓	✗	✓	
Logging capability	✓	✓	✓	✓	✗	
Block viewing of images in messages	✓	✗	✓	✗	✗	
Programmable deletion of messages	✓	✗	✓	✓	✓	
Address book import	✗	✗	✓	✓	✓	
SCORES						
Features	★★★☆☆	★★★☆☆	★★★☆☆	★★☆☆☆	★★★☆☆	
Enterprise value	★★☆☆☆	★★★☆☆	★★★☆☆	★★☆☆☆	★★★☆☆	
Ease of use	★★☆☆☆	★★★☆☆	★★★★☆	★★☆☆☆	★★★☆☆	
Overall	★★☆☆☆	★★★☆☆	★★★☆☆	★★☆☆☆	★★★☆☆	

For the best anti-spam software prices go to www.pcw.co.uk/bestprices

	MAILFRONTIER	MCAFEE	QURB	ROBIN KEIR	SOURCEFORGE	SYMANTEC
	MAILFRONTIER DESKTOP 4.5	MCAFEE INTERNET SECURITY 2005	QURB 2.0	K9 ANTISPAM 1.28	SPAMBAYES 1.0.1	NORTON INTERNET SECURITY 2005
	$29.95 (£17 approx)	£40 single-user licence	$29.95 (£17 approx)	Free	Free	£54.99
	www.mailfrontier.com	www.mcafee.com	www.qurb.com	www.keir.net	http://spambayes.sourceforge.net	www.symantec.com
	✗	✗	✗	✓(Pop3)	✗	✗
	✓/✓/✗/✗	✓/✓/✓/✓	✓/✓/✗/✗	✓/✓/✓/✓	✓/✓/✗/✓	✓/✓/✗/✗
	Hotmail and MSN	Hotmail and MSN	✗	Not specified	✗	Yahoo
	✓/✓	✓/✓	✓/✗	✓/✗	✓/✓	✓/✓
	✓	✓	✓	✗	✓	✓
	✗	✗	✗	✓	✗	✗
	✓	✓	✗	✓	✗	✓
	✗	✓	✗	✓	✗	✗
	✓	✓	✓	✓	✗	✓
	✗	✗	✗	✓	✗	✗
	✗/0	✓/6	✗/0	✗/0	✗/0	✗/0
	✗	✓	✗	✓	✗	✓
	✓	✓	✗	✓	✗	✗
	✗	✓	✗	✓	✗	✓
	✗	✗	✗	✗	✗	✗
	✓	✗	✗	✓	✓	✗
	✓	✓	✓	✗	✓	✓
	✗	✗	✓	✗	✗	✗
	✓	✓	✗	✗	✓	✓
	✓	✓	✗	✓	✓	✓
	✓	✗	✗	✗	✗	✓
	✓	✗	✗	✓	✗	✗
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	★★★☆☆	★★★★☆	★★☆☆☆	★★☆☆☆	★★★☆☆	★★★★☆
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	★★☆☆☆	★★★★☆	★★☆☆☆	★★★☆☆	★★★★☆	★★★☆☆

Methods of detection

With many people receiving hundreds of emails every day, it's not easy for an application to automate the process of detecting and blocking spam without blocking legitimate messages as well. There are two ways of detecting and eliminating spam: using a software tool installed either on your email server (the best option), or on your PC. The latter includes methods that are built into your email server, which monitor Pop3/Imap connections and intercept all unwanted mail. Some will analyse subject lines without downloading them from the server and delete them immediately or leave them to be downloaded by the client.

The first detection method used by spam filters is to investigate the sender's address, the domain that sent it or the SMTP server from which the email was sent, and whether or not it is on a blacklist. To do this, many applications import addresses from your email client's address book, as well as analysing messages already stored, to check the identity of those who send you emails regularly.

Domains and servers that send spam are investigated by most client and server utilities. For domains, black and whitelists are also created and updated constantly. Over the Internet, there are machines designed specially for detecting and handling server lists from which junk mail is sent. Many anti-spam server modules consult these to check the IP addresses of the servers that send spam, which means a lot of spam should never reach its destination. However, it does have its down side as large providers and ISPs may be on lists because one or some of their thousands of users are involved, or have been involved, in this grim practice and so all of the messages sent via this server will be rejected.

Techniques and pitfalls

With this as a starting point, filters use different methods to work. Besides the lists already mentioned, they use rules to find specific words in the subject line or message to detect certain types of code or to find the composition of a message based on images, among other things. Another common technique is to send notification to suspicious senders or domains to request a confirmation, since most spam is automated. To do this, images are usually used and requests are made to validate characters or a number of elements (a reply that a machine cannot send automatically).

The most advanced type of filter is Bayesian (originating from Thomas Bayes 1702-1761), which is based on mathematical analysis. Included in many of the filters that we've tested, it learns from the messages that you receive and analyses their content before creating complex statistics, classifing items according to various factors, assigning them with a percentage to establish the likelihood of the message being junk mail, and organising them into categories. Hence, you can adjust the filter's sensitivity to strengthen or weaken its effectiveness, select the type of categories you want to receive and fine tune it over time.

Best method of prevention

To avoid spam, there's no better way than to follow good prevention procedures. The first golden rule is to be careful where you give out your personal or professional email address. So think before writing it on a web page form, questionnaire or subscription form. Where a website demands an address, we recommend you have a secondary email account (such as MSN, Hotmail, Yahoo), which you use for this purpose.

Rule number two: don't send messages requesting information from unknown places, company pages or organisations you don't trust. Often, these sites save your email address to create user lists which are later sold to third parties or used to their own advantage. In this type of situation, we also recommend that you use your secondary email address.

In short, the best type of prevention is not to give your email address to unscrupulous websites or companies that don't respect data protection.

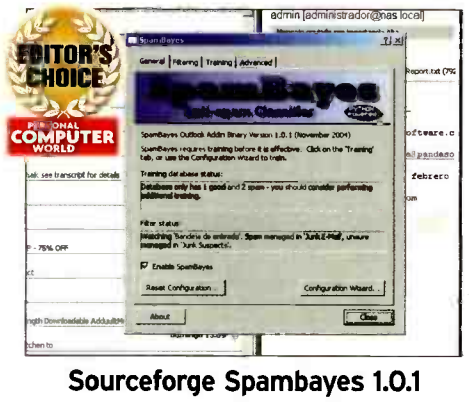
Editor's Choice

Our tests confirmed what we already knew – that no spam program is foolproof, or even comes close to being foolproof. All the products we tested managed to detect spam, but users will always need to monitor them for 'gate-crashers' and other classification errors.

Some catalogued all emails as junk by default (generally those that recorded a 100 per cent success rate), which stops unwanted items from entering your inbox, but it also restricts those emails you do want to receive from known senders.

Even so, three products stood out. In terms of commercial software, the **McAfee Internet Security 2005** and **Symantec Norton Internet Security 2005** security suites were clear winners; their filtering systems exceeded an 80 per cent success rate. Furthermore, they were easy to set up and configure, and both provided regular updates. Both get a **Highly Commended** award.

In the freeware section, **Sourceforge Spambayes 1.0.1** is definitely in a league of its own: during our tests it obtained a 100 per cent real success rate. It would have to be trained for several months in order to check that it isn't too strict on a daily basis and that it lets most of the 'good' messages through. However, the fact that it's free, offers a high level of efficiency and is compatible with Outlook makes it ideal for anyone looking for a zero-cost solution. As such, we think it deserves our **Editor's Choice** award. As with all Bayesian filters, it gets better with use, especially in terms of detecting wanted mail.



Sourceforge Spambayes 1.0.1

How we tested

The products in this group test have been reviewed in a controlled environment. We set up a Pop3/SMTP email server based on Windows 2000 and Mercury32 (free server is at www.pmail.com) in which we created an email account to which we sent 1,000 junk mail messages. We backed up the list, which was restored every time we tested a program.

For the client, we used a Pentium M, 1.5GHz laptop with 512MB of Ram and Windows XP with Outlook 2003 installed. This machine downloaded the entire queue of messages from a local network.

The results obtained varied greatly, as did the time that each application took to carry out the process. A 100 per cent success rate was only found in three cases, although this was because most of the mail was considered spam. Furthermore, these utilities had little learning time, or based most of their analyses on the generation of whitelists.

Their effectiveness was measured with recently installed tools and with all of the default values. This means that many will improve considerably with use, the experience gained by Bayesian filters, and by modifying some of the settings.

Hands on

EDITED BY KELVYN TAYLOR

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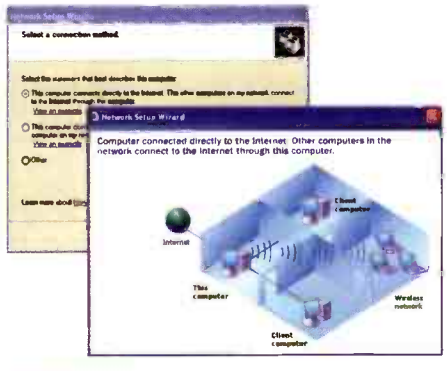

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Portioning up your broadband connection for use in the home or office brings many benefits

Podcasting is a bit of a buzzword these days, with Steve Jobs getting in on the act by adding podcast support to Apple's Itunes.

The term describes a method of delivering broadcast audio content via RSS syndication that allows you to automatically download the material onto a portable audio player. Niall Magennis delves deep into the technology in the Sound column, and shows you how to set up your very own podcasting service.

In the Hardware section, Gordon Laing has been busy with multimedia as well, but this time trying to find the ideal case for a media PC. With hundreds of models of PC case available, you'd think that finding a suitable one would be a doddle – which is what Gordon thought until he dug deeper. He eventually found a couple, though, and reviews them starting on page 128.

It's a moot point whether the heyday of TV home-makeover programs has passed, but they're still incredibly popular. We've never seen one that uses Excel for planning a room layout, though, which is exactly what Stephen Wells does in Spreadsheets, with quite impressive results. You might cringe if you're an architect, but for a quick and cheap solution it's a good example of the power of lateral thinking.

If databases are your thing, we've a bit of a double treat for you this month. In the Visual programming column Tim Anderson boldly ventures into the territory with a look at how the new SQL Server 2005's deep links with .Net programming languages and XML are going to affect Visual Basic developers. Mark Whitehorn's regular database column, meanwhile, looks at how you can use custom grouping to improve the display of your data. He's also reviewed a couple of new books on the subject of ADO.Net.

As Tim Nott reports in Windows, the System Restore is one those many things that's a great idea if it works properly. Unfortunately it doesn't always do this, so Tim's got some pointers to help you troubleshoot its foibles. In his Word programming article he's taming another annoying 'feature' – Word's Reviewing toolbar, which seems to have a mind of its own and pops up when you least expect it.

And finally, in Linux Barry Shilladay gets back to basics and shows you how to make the most of the powerful utilities and applications available from the Linux command line.

Advice from our experts

Our Hands on experts answer your questions and solve your problems

Spreadsheets

Q I have a spreadsheet with my fellow golf players' names in column A and their most recent scores in column B. Without re-sorting the players, I want to give their ranking in column C. The player with the lowest score will be in first place and the highest in last place. How can I do that on an Excel worksheet?

J Alastair Lack

A If your scores (73, 71, 68, 75) are in the range B2:B5 and these cells are named Score, then in cell C2 enter:

```
=RANK(B2,Score,1)
```

and drag this down to D5. As the function's name suggests it will give you the correct ranking (3, 2, 1, 4). If two players have the same score it will give them a tie and then jump to the next logical place just as they do in golf championships.

Q I have a column of dates on an Excel worksheet. From this, I want to produce a table telling me how many of these dates are Mondays, how many are Tuesdays, and so on. I suspect that I need an array formula, but I seem to have a mental block about those!

Dr Bruce Evans

A Name the range of dates, Dates. Custom Format them as ddd d/m/yy so you can check your answers (see screenshot 1). To count the number of Mondays, enter in a cell:

```
=COUNT(IF(WEEKDAY(Dates)✓
=2,1))
```

(Key: ✓ code string continues)

then press Ctrl & Shift & Enter. To count the number of Tuesdays, enter in a cell:

```
=COUNT(IF(WEEKDAY(Dates)✓
=3,1))
```

then press Ctrl & Shift & Enter. The second argument of the Weekday function is the Type. This determines the way the days are counted. Type 1 uses 1 for Sunday through 7 for Saturday; Type 2 uses 1 for Monday through 7 for Sunday; Type 3 uses 0 for Monday through 6 for Sunday.

There is nothing mysterious about an array formula. It usefully examines a range of cells instead of one. Once entered, Excel will automatically display curly brackets to acknowledge it's an array formula.

E2 fx {=COUNT(IF(WEEKDAY(Dates)=2,1))}

	A	B	C	D	E	F
1		Dates		How many?		
2		Thu 10/3/05		Mondays	4	
3		Mon 14/3/05		Tuesdays	2	
4		Wed 16/3/05		Wednesdays	3	
5		Sat 19/3/05		Thursdays	3	
6		Mon 21/3/05		Fridays	3	
7		Fri 25/3/05		Saturdays	3	
8		Mon 28/3/05		Sundays	2	
9		Thu 31/3/05				
10		Sun 3/4/05				
11		Wed 6/4/05				
12		Sat 9/4/05				
13		Tue 12/4/05				
14		Fri 15/4/05				
15		Mon 18/4/05				
16		Thu 21/4/05				
17		Sun 24/4/05				
18		Wed 27/4/05				
19		Sat 30/4/05				
20		Tue 3/5/05				
21		Fri 6/5/05				
22						

SCREENSHOT 1

Counting the number of certain days in a range of dates

Q If I enter my last year's council tax in cell A1 and this year's in A2, what Excel function should I enter in A3 to figure the percentage amount it has increased?

Dan Mazer

A You don't need a function. The simple formula:

```
=(A2/A1*100)-100
```

will do it.

Q Using Excel 2002, is it possible to round a time calculation to 15, 30, 45 or 0 minutes, if I get an answer of, say, 2.6 hrs? I would like to round it to the nearest 15 minutes which would be 2.5 hrs, and 2.7 hrs would be 2.75 hrs.

Paul Jackman

A To a spreadsheet, 2.7 hrs is not a time calculation – it's a quantity of hours. A recorded Excel time number is a count of days (and fractions of days down to hundredths of a second) since Jan 1 1900. So when you enter 2.7 in a cell, you should format it as a number. You can certainly round it up or down to 15-minute segments. They are quarters of an hour. So you use the MROUND function. If you enter 2.7 in cell B5, then in B6 enter:

```
=MROUND(B5,0.25)
```

Test this by changing the number of hours in B5 to other amounts.

Q I have a record on an Excel worksheet of our members' names, ages, gender and total contributions. How can I count, for instance, the number of men, over 29, who have made total contributions over, say, £29?

Jenny Clifton

A You could use Excel's database functions for this (see screenshot 2). Rather than learn those, you could also use the simple array formula:

```
=SUM(((Gender="M")*(Age>✓
29)*(Contribution>29)))
```

Use Ctrl & Shift & Enter to indicate an array formula. Excel will add curly brackets to acknowledge this. Create the Names Gender, Age, and Contribution for the data in the columns under those headings. Although the Sum function is used in this formula it will provide the count you need. It finds the number of conditions which are TRUE and not FALSE, multiplies them together, and gives you the result.

Hardware

Q Following the various articles in Hands on Hardware I'd like to build my own media PC running Windows XP Media Center Edition (MCE) 2005. I'd like to use it to record Sky programmes though and this has never been mentioned in the articles. I assumed because I have Sky Digital that I'd need a digital TV card, but I've been told I need an analogue one. Is this right?

Bill Bruen

A Since Sky doesn't produce PCI satellite tuner cards, you'll need to connect a Sky set-top box to your media PC and capture its video and audio signals – and since there's no digital video output on standard set-top boxes, you'll need to capture the analogue video signal.

Windows XP MCE 2005 can do this, but only with certain TV cards featuring both external analogue inputs and hardware mpeg2 encoding capabilities. Typically these features are only found on TV cards with analogue tuners, and those supported by MCE 2005 include the Hauppauge WinTV PVR 150MCE and 250MCE – see www.hauppauge.co.uk.

When setting up MCE, you can instruct it to record from the external video input connected to your Sky box. MCE can then download the TV

schedule for Sky's channels and an infra-red dongle can even switch the channels for you.

However, MCE won't be able to use the analogue tuner on your TV card if you're already using it to capture video from an external source. Also, despite MCE supporting twin tuners, you won't be able to fit a second analogue or digital tuner card either. The second tuner option only works if it's identical to the first, in order to avoid confusing the guide and channel listings.

So if you want to record two Sky channels at once, you'll need to connect a second Sky set-top box to another analogue tuner card and subscribe to Sky's multi-room option. Annoyingly, those with Sky+ boxes aren't in a better position, as the boxes only output video from one tuner at a time.

There'll also be an inevitable loss of quality from the composite or S-video connection between the box and the PC, not to mention the fact that the signal has to be decoded from digital then re-encoded. For all these reasons, MCE is best suited for recording directly from tuners on analogue or digital TV cards. If you want the highest quality from Sky recordings or dual-tuner support, then Sky+ remains by far the best solution.

Q I recently fitted what I believed was an 80GB hard disk, but 'My Computer' in Windows XP says it only has 7.82GB in the Fat32 format. How can I tell if there's any hidden space?

Andrew Bishop

A In order to read and write data on a hard disk it must be partitioned and formatted. It sounds like only a small portion of your disk has been prepared in this way. It could be that the rest of the space is either partitioned but unformatted, or perhaps not partitioned at all.

To view partition information under Windows XP, click Run on the Start menu, enter compmgmt.msc, then select the Disk Management option under Storage (see screenshot 2). This will show you what partitions are currently on your disk and whether they've been formatted. Any space not used on your disk will be shown as unformatted or unpartitioned; just right-click these areas and choose to partition then format them. Note the Fat32 file system can only support partitions up to 32GB under Windows XP. If you want a bigger partition, you'll need to use the NTFS file system.

Digital imaging & video

Q I have an aged parent (81) who has recently acquired a digital camera. The problem is, he doesn't have a computer. I would like to be able to download his memory card onto a DVD but enable the images to be viewed on a standard TV/DVD setup. Is there a program that would let me do this?

Ken Wood

A First, check to see if your father's DVD player supports playback of jpg images – many recent models do. If it does, you just need to copy the images into folders on a DVD using the writing software that was supplied with the drive.

If the DVD player isn't capable of displaying jpg files, then you need to create a DVD slideshow, which is an mpeg2 movie of the photos, using an application such as Roxio Easy Media Creator 7.5 or Ulead DVD Pictureshow.

These applications also allow you to archive the original images on the same DVD as the slideshow. If the program you use doesn't support this feature, make sure you keep backup copies on a separate CD or DVD.

Q Some time ago I saw a review for a photo-combining application. You declared several common points on the 2D views and the software then produced a 3D model of the scene. The software made a limited attempt to fill in areas on the unseen sides of buildings and the viewing position could be changed. In effect it was the reverse of the modern application for combining photos into a panorama.

Can anyone at *PCW* remember this software and is it still available?

Stephen King

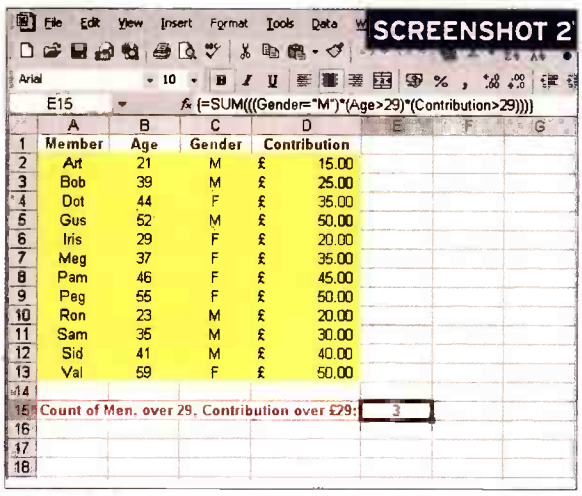
A The technique is called 'photogrammetric modelling' and several applications have been developed in the past few years, some of which (for example, Metacreations Canoma and Adobe Atmosphere) are no longer available. One that is still around is Realviz Image Modeler 2 (see screenshot 4). You can download a trial version from www.realviz.com.

Word processing

Q I've been sent some Word documents that have an underline between each paragraph. I don't seem able to delete these or remove them by Format, Font, Underline Style, and if I copy and paste the paragraphs (without the line) into another document, the line comes too. How can I get rid of these?

Mike Denning

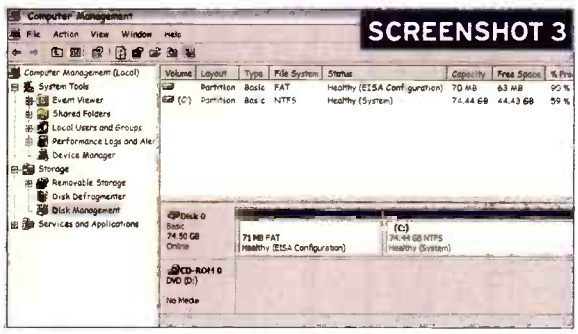
SCREENSHOT 2



	Member	Age	Gender	Contribution
2	Art	21	M	£ 15.00
3	Bob	39	M	£ 25.00
4	Dot	44	F	£ 35.00
5	Gus	52	M	£ 50.00
6	Iris	29	F	£ 20.00
7	Meg	37	F	£ 35.00
8	Pam	46	F	£ 45.00
9	Peg	55	F	£ 50.00
10	Ron	23	M	£ 20.00
11	Sam	35	M	£ 30.00
12	Sid	41	M	£ 40.00
13	Val	59	F	£ 50.00

Find the number of people who meet three criteria by using an array formula

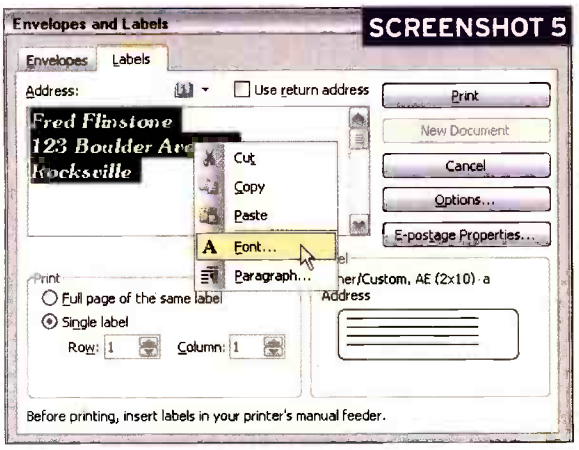
SCREENSHOT 3



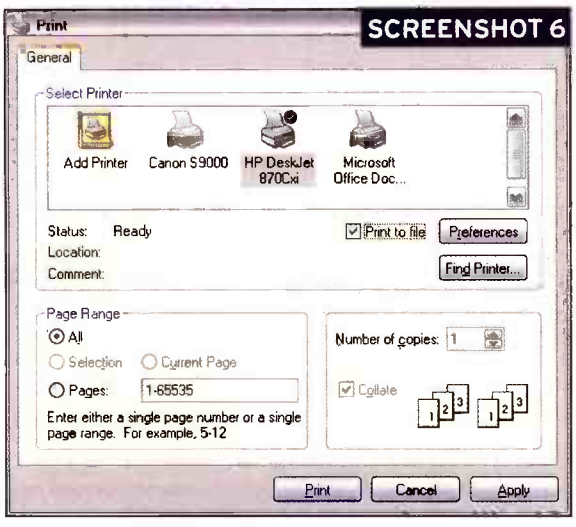
Use Windows computer management console to manage partitions

SCREENSHOT 4

Realviz: one of the few remaining photosymmetric modelling tools



If you're formatting one-off labels, use the context menu



Avoid sending print files as they can be tricky to open

A This sounds like a common Word gotcha: they are not underlines, but borders. Select the whole document (Ctrl & A) then Format, Borders and Shading, Borders, None. They should then all disappear – for good. The line is stored in the paragraph marker, so if you turn off 'Smart Paragraph Selection' in Tools, Options, Edit you'll be able to copy the text without the marker – and the line. Another copying alternative is to 'Paste Special', Unformatted Text or use the Word XP/2003 pop-up control to 'Match Destination Formatting'.

Q I find the single label printing option in Word 2000 very useful with its ability to select a particular row and column so I can go on using the same sheet of labels, printing one label at a time, but there appears to be no way of formatting the text. Doing a 'Full page of the same label' one can use the 'New Document' option and then apply formatting, but this option is not available when printing a single label. I have been reduced to using the 'Full page of the same label' option, and deleting all the labels I don't want. Am I missing something?

John Shore

A You are indeed missing something – but it had us stumped for a while. If you select the text in the 'Address' area, then right-click, the context menu has entries for 'Font' and 'Paragraph'. Those are what you need (see screenshot 5).

Q In Windows XP Explorer, when I click on a Word document icon it opens in Wordpad. I have contacted Microsoft, Sophos, and searched the Internet for a solution to this problem. I suspect it was caused by a virus, but cannot find the name of it. I have gone into Control Panel, Folder Options, File Types, and it says that DOC is a Microsoft Word Document. Down below it says 'Opens with: Wordpad'. I cannot change it back to 'Microsoft Word' because everything is greyed out.

Robert Mauk

A This sounds as if the account you are logged on to does not have administrator status – restricted users cannot change file associations. Log on with administrator status and you should find the 'Change' button in the File Types dialogue is no longer greyed out – click on this and you will be able to change the 'Opens with:' program from a list.

Q I'm using Ability Write as my word processor and, while I find it generally pretty good, I have a problem in that all the menus have disappeared. How can I get them back?

Gill Doughty

A This sounds as if you have Write running in full-screen mode. If you press Alt & V and then select 'Full Screen', things will return to normal. The same applies to Microsoft Word.

Windows

Q Someone has sent me a number of files with the '.prn' file type extension. Windows tells me these open with an 'Unknown Application'. So how can I open the files?

Mike Greene

A The short answer is 'with great difficulty'. What your correspondent has done is sent you the output of a 'Print to file' command, and the contents of this is dependent on his or her printer driver (see screenshot 6). If you know you have the same printer, then you may be able to copy the file to your own printer. Drag and drop may not work here, but you may be able to do this at a command prompt: if your printer is on LPT1, for example, type COPY MYFILE.PRN LPT1:

Another faint glimmer of hope is that the file has been created for the 'Generic/Text Only' printer, in which case you will be able to open the file in Notepad. A longer shot is that it has been created for a Postscript printer, in which case you may be able to read it with Ghostscript. By far the easiest course, however, is to get your correspondent to resend the files in the original document or image format.

Databases

Q I am moving an application from Access to SQL Server, but SQL Server doesn't seem to have any queries. The nearest things seem to be Views. Are these the same?

A More or less. SQL Server is a client-server database engine. The big advantage of using a server to hold the database is that the same server can hold not only the data, but also the common queries that are run against the data. Queries stored on the server are called Views. When a user runs a View it is executed on the server and only the answer is shipped across the network to the user's machine. This can make a really significant difference if, for

example, you want to find the top 10 out of 10 million customers.

On the other hand, if you do pull the entire table across the network and process it on your workstation, it is a query rather than a View. Since Access doesn't have a server, it doesn't use Views.

Networks

Q Most of our PC users are power users running Windows XP, and I would like to know if there is any way of implementing Windows Updates from the server without having to log in as an administrator on each PC.

John Howell

A Microsoft offers a free server-based update tool originally called SUS (Server Update Service) but recently re-named WSUS (Windows Server Update Services) and extended to cover Microsoft Office as well as core Windows updates (see screenshot 7). This tool lets you download updates to a central repository on your network and test them before deciding which ones you're going to distribute locally.

Client PCs can then be configured to get their updates automatically from the local server rather than the Microsoft Windows update site on the Internet.

Full details and the tool itself are on the Microsoft website at (**www.microsoft.com/windowsserversystem/updateservices**). Also, you might want to dig out the August issue of *PCW* where I covered installing and using the SUS/WSUS tools in the Network Hands on section.

Q I am looking at getting an Ethernet disk along the lines of the La Cie D2 or Asus Ethernet disk caddy, to allow my home PCs to have some shared disk space. I also have an ADSL connection with a fixed IP address and was wondering if it is possible to make a secure connection to the Ethernet disk over the Internet, maybe using VPN (virtual private network)?

I am also changing my current router to a wireless version and am considering the 3Com Wireless ADSL Modem Router (3CRWE754G72). Do you think it would be possible to configure a VPN connection using this equipment?

Richard Gent

A If you were to configure an encrypted VPN tunnel to a remote network, then anything you would normally do locally – such as access a shared disk – ought to be possible via that Internet tunnel.

You will, however, need to configure a VPN server to terminate the tunnels at the Lan end. One way of doing this is in software with suitable tools included in XP as well as the server implementations of Windows, both of which I've covered in recent Networks Hands on articles in *PCW*.

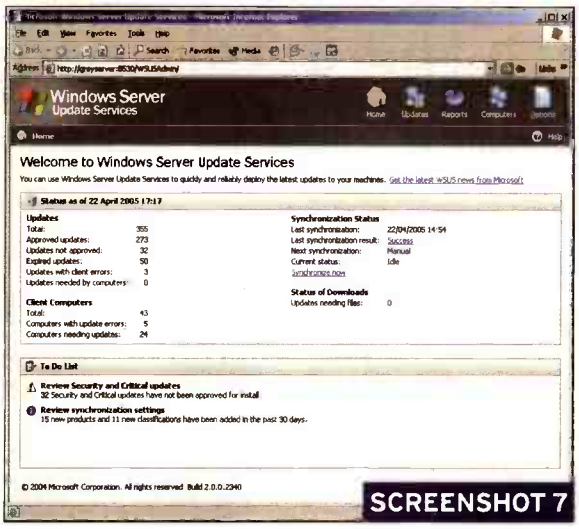
You would, however, need to leave the server PC turned on and connected to the Internet all the time, in which case it might be better to install a specialist VPN server appliance or look for a router with built-in VPN server capabilities. Unfortunately, although the 3Com router you mention will pass encrypted VPN traffic onto a Lan server, it doesn't provide tunnel termination itself, and neither do other wireless routers from 3Com, as far as I can see.

However, some routers from other vendors do, and you could look at the Vigor devices from Draytek (**www.draytek.co.uk**), many of which have this facility. Alternatively, if you want to stick with 3Com, you might want to consider its Officeconnect VPN Firewall (the 3CR870-95) at around £210 inc VAT, although you would need a separate router as well.

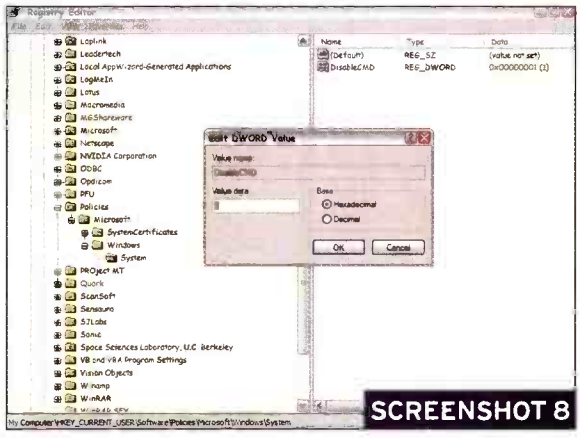
Q We are using Windows Server 2003 and have about 17 computers attached serving 20-odd users. I have installed Active Directory and have been experimenting with Group Policy recently. I have set up multiple shares and permissions. In the past few days I have been trying to tie up some loopholes. I have removed access to all floppy, CD and local drives using Group Policy (to encourage users to save to their folders on the server). I have also removed the 'run' command link from the Start menu. However, I cannot find anything to remove the command prompt icons in Group Policy. Obviously the command prompt is quite dangerous in the wrong hands.

Simon Morgan

A You can disable the command prompt and/or batch file processing via a Registry edit. Find or create the key HKEY_CURRENT_USER\Software\Policies\Microsoft\Windows\System and create a Dword value named DisableCMD (see screeenshot 8). Give this a value of 1 to disable the command prompt and batch files, or 2 to disable the command prompt but allow batch files. Using 0 enables both command prompt and batch files.



Windows Server Update Services lets you manage updates for operating systems and Office from a local server



Disable the command prompt with a Registry edit

CONTACTS

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Please do not send unsolicited file attachments.

Gordon Laing
has been a hardware enthusiast ever 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

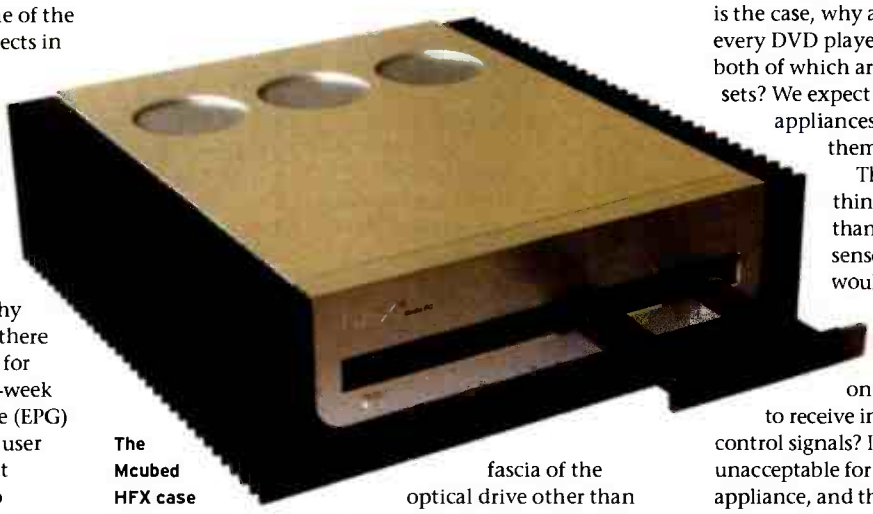
On the media centre case

Find out what makes the ideal housing for your home-built media centre PC

Building your own media PC has become one of the most popular subjects in the Hands on Hardware mailbox in recent months. The driving force has undoubtedly been the possibility of installing Microsoft's excellent Windows XP Media Center Edition 2005 front end on your own system.

While there are many worthy alternatives to Media Center, there are few that combine support for dual TV tuners and a free two-week electronic programming guide (EPG) with what's easily the slickest user interface around. The fact that Microsoft would prefer you to experience Media Center on pre-built PCs makes the DIY approach all the more tempting.

Over the past few issues, I've explained how to install the OEM copy of Media Center 2005 and looked into a few tweaks to get it running more smoothly. I've been compiling more tips for a future edition, but this month I want to tackle an issue that will face anyone building a media PC, regardless of the software it's running: namely, the case.



The Mcubed HFX case is dominated by two huge heatsinks running along each side, allowing fanless cooling of the components inside

Case checklist

In a media PC, the case is arguably the most important aspect of the whole DIY project – after all, this is the box that has to sit comfortably alongside existing AV equipment in your living room. Something that looks, or indeed whirrs, like a traditional PC simply isn't going to cut the mustard in this environment. It needs to look good, run quietly or even silently, and be operated like a conventional consumer appliance.

It doesn't sound like that tall an order, yet amazingly few, if any, case manufacturers have ever managed to fulfil all these requirements in the past. I admit I can be quite fussy about this kind of thing, but it often surprises me how far from the mark many so-called media PC cases can be.

As far as I'm concerned, there's a definite checklist for what makes a good media PC case. First, and most obviously, it has to look good and not be identifiable as a PC – this should include some way to hide the fascia of the optical drive other than its tray or slot. Second, it should allow the internal components to run very quietly or, preferably, in complete silence. Third, it should accommodate standard components and not force you to use expensive or esoteric parts.

So far so good, but to take a media PC case to the next level, all you need to do is simply take a leaf from existing consumer appliances.

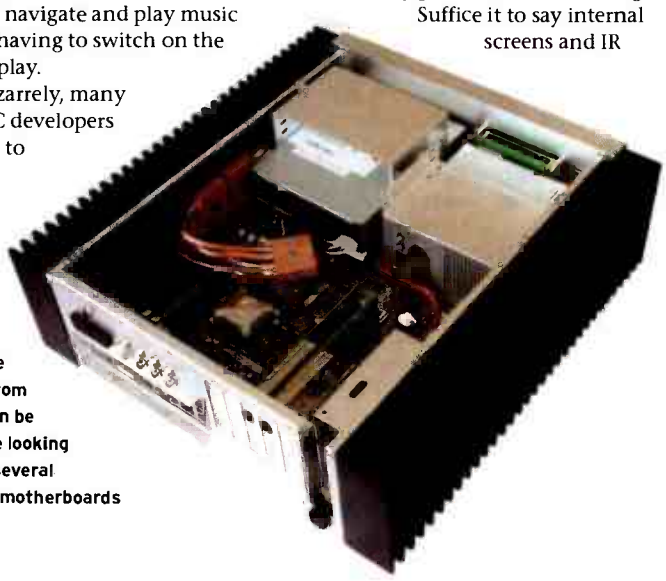
For example, I believe an integrated vacuum fluorescent display (VFD) or liquid-crystal display (LCD) is essential for a media PC to show information such as playing times, TV channel or artist details. I know all this can be displayed on the main TV or screen, but who wants intrusive graphics over the action when a quick glance at the case could reveal the remaining time of a recording? You could even use this screen to navigate and play music without having to switch on the main display.

Yet, bizarrely, many media PC developers continue to believe they're redundant. But if this is the case, why are they still fitted on every DVD player and set-top box, both of which are connected to TV sets? We expect them on consumer appliances, so we should have them on a media PC.

There are also few things more annoying than external infra-red sensors. Again, who would accept a DVD player that needed a small box plugged in the back and sat on the top in order to receive infra-red remote control signals? It would be totally unacceptable for a consumer appliance, and therefore equally so for a PC attempting to be one.

So the ideal media PC case should look great and accommodate an internal display and infra-red sensor, along with some means to allow standard internal components to run silently. A few brave pioneers out there have managed to fulfil much of the above, but many end up still looking just like PCs or just not quite working properly. And, annoyingly, the handful of commercial media PCs that are finally getting it right are using proprietary cases that aren't available (as yet) to the end user.

Then, like a breath of fresh air, not one but two great-looking media PC cases arrived in time for this month's Hardware column. One is relatively compact yet can accommodate most full-size components, while the other is the first affordable case I've seen to offer totally passive, fanless cooling. Suffice it to say internal screens and IR



The large heatsinks have necessitated an unusual arrangement inside the HFX case, where the power supply is fitted at the front and the kettle lead routed out the back. Note the heatpipes used to transfer heat from the CPU to the case. The pipes can be bent into place and, here, they are looking slightly the worse for wear after several adjustments for testing different motherboards

sensors can be fitted. Both cases were early models, so bear in mind that the prices quoted are approximate.

Mcubed HFX

The HFX from Mcubed is an AV-styled aluminium case that measures 450 x 430 x 145mm (w x d x h) and weighs a considerable 13kg (see picture left). The weight is thanks to large heatsinks running along each side like a hifi power amplifier. These can be used to passively cool many of the internal components, thereby eliminating the need for fans. The case costs £195 ex VAT.

With the case facing you, the heatsink on the right side can be dedicated entirely to cooling the main processor. To enjoy passive cooling of the processor, you'll need to buy the optional Borg CPU cooling kit, which costs £50 ex VAT and comes with mounting brackets for a variety of processor models and sockets, including toasty Pentium 4s and Athlon 64s.

A copper block is mounted on the CPU and four flexible heatpipes transport up to 120w to the case heatsink (see the photo left). Under heavy load, it kept a 2.13GHz Pentium M 770 at 47°C, compared to over 60°C using a standard heatsink and fan.

The heatsink on the left side can then be used to cool a passive power supply and a graphics card with the help of another optional heatpipe kit costing £20 ex VAT. The case is designed to be used with the optional Silverstone ST30NF 300w fanless power supply, which costs £85 ex VAT.

A VFD and IR sensor can be hidden behind a window on the left, while a matching Perspex strip on the right disguises the DVD drive tray. The case is designed to use an optional combined VFD and IR sensor from Imon costing £55 ex VAT, although you may be able to squeeze in an alternative if desired. Round the back there are eight RCA jacks and a Scart plug which you may be able to connect to some internal cards or motherboard headers.

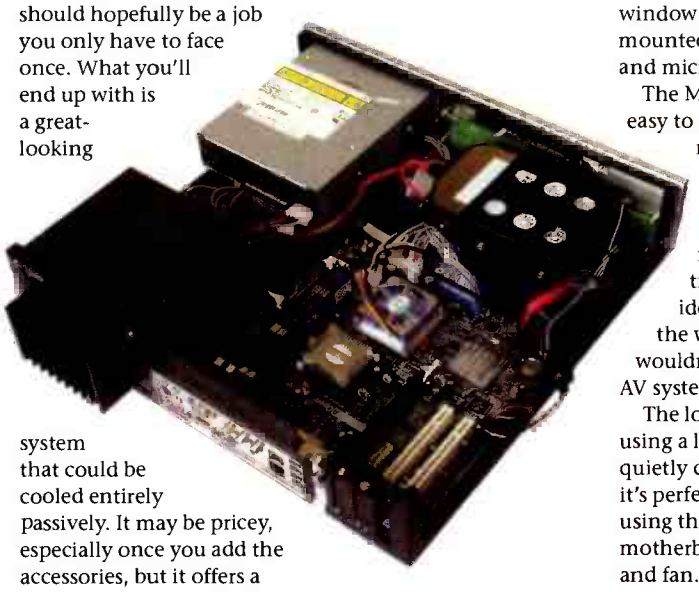
The case dimensions imply plenty of room on the inside, but the thick heatsinks have forced a slightly cramped and unusual arrangement of components. The power supply must be fitted at the front of the case and a mains lead fed out the back. There's room for a full-size ATX motherboard but, depending on the design, it could find itself mounted right next to the PSU with some ports hidden below the DVD drive cage.

The Ahanix MCE302 is a low-profile case that can hide a VFD and infra-red sensor behind a window, and disguises the optical drive tray with a clip-on panel

The mains plug to the PSU could also obstruct connectors in the corner of the motherboard.

The screws that hold the DVD drive and power supply cages in place are also quite hard to access, requiring a screwdriver with a thin 13cm shaft and a magnetic head. Finally, while Mcubed recommends feeding any cable spaghetti below the DVD cage, it can get pretty tight, especially if there's several spare power cables.

Ultimately, while the HFX case can be frustrating to assemble, this should hopefully be a job you only have to face once. What you'll end up with is a great-looking system that could be cooled entirely passively. It may be pricey, especially once you add the accessories, but it offers a unique proposition for the DIY media PC builder.



Despite being a low-profile case, there's plenty of room inside the Ahanix MCE302 for accessing and fitting full-size components

For more information, visit www.hifiatx.com. This case and its accessories are sold by Kustom PCs at www.kustompcs.co.uk.

Ahanix MCE302

The Ahanix MCE302 is an AV-styled case available in silver or black, measuring 432 x 410 x 105mm (w x d x h), weighing 5.44kg and costing £125 ex VAT. It's designed for micro-ATX motherboards and the relatively short height can only accommodate low-profile expansion cards. That said, there are plenty of decent micro-ATX motherboards available, and many TV cards are low-profile designs.

The problem with many low-profile cases, though, is their inability to handle other standard full-size components, instead forcing you to use notebook drives or shrunken power supplies with loud fans. In contrast, the Ahanix MCE302 can happily accommodate a 5.25in optical drive, two 3.5in hard disks and a standard ATX power supply. I fitted it with a fanless 503w Silentmaxx PSU costing £119 ex VAT.

The optical drive is positioned internally so only the tray is visible from the front and Ahanix supplies a bracket which clips on the front. This may not work with all drives, so check with the supplier; it worked fine with an NEC ND-3520A.

There's plenty of room behind a window on the front panel to mount both a VFD and an IR sensor. You can buy the case with a VFD that connects to an external parallel port for an additional £30 ex VAT, although you may prefer to use an alternative model that connects to an internal USB or serial port header. A panel below the window flips open to reveal front-mounted USB, Firewire, headphone and microphone jacks.

The MCE302 is well built and easy to assemble. Despite being relatively compact, there's plenty of room inside and easy access to most screws. The flip-open front panel and optical tray bracket may reveal its identity as a PC case but, on the whole, it looks good and wouldn't be out of place in an AV system.

The low height prevents you using a large heatsink and fan to quietly cool a hot processor, but it's perfect for Pentium M systems using the Aopen i915GMm-HFS motherboard with its tiny heatsink and fan. Couple this with a passive power supply and a quiet hard disk and you'll have a system that runs virtually silently. One final point about low-profile cards, though: while many come with optional shrunken blanking plates, an absence of standards means they may not fit perfectly in all low-profile cases. So be prepared for a little manual tweaking.

For more information, visit www.ahanix.com. This case and its accessories are sold by Quiet PC at www.quietpc.com.

CONTACTS

Gordon Laing welcomes your comments on the Hardware column. Email him at: hardware@pcw.co.uk. Please do not send unsolicited file attachments.

Gordon Laing
has been a hardware enthusiast ever 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

Chips with potential

Maximise your processor's power and understand its limitations

Virtually every processor can be overclocked by modest degrees, but to achieve significant improvements, you'll need specific models and conditions. Choose the right model and you might enjoy speed increases of over 25 per cent, but choose badly and you could unintentionally restrict yourself to overclocking by little more than 10 per cent.

Regular readers of the Overclocking column know that a processor is driven at a multiple of its bus speed and a figure known as the clock multiplier. Since the clock multiplier is normally locked on most processors, the only way to overclock them is to increase the front-side bus (FSB) speed.

So if you had a 1.6GHz processor, designed for a 100MHz bus with a fixed 16-times multiplier, increasing the bus to 110MHz would force the chip to run at 16 x 110MHz, or 1.76GHz. Whether it could do so stably is another matter.

Limiting factors

The greatest limiting factor when it comes to overclocking potential is the technology used to manufacture the processor. When a new processor is launched it uses a certain manufacturing technology. This same technology is then used for subsequent, faster models until a limit is approached. At this point, the manufacturer normally switches to a finer technology, allowing faster models to be produced.

For example, a certain technology may be used to produce a range of chips running from 1GHz to 2GHz; beyond 2GHz though, a new technology may be required. The processors with the greatest overclocking potential here would be the 1GHz models, as the same technology was used to make chips running up to twice as fast.

In contrast, a 1.8 or 2GHz model would already be close to the limit of that particular technology and may only allow an overclock of a few per cent. Of course this is all theoretical, but in practice you stand the best chance of decent overclocking using processors with the most headroom.

Another limiting factor is the fastest speed you can run the FSB and still have a reliable system. You may have a 1GHz chip manufactured with a technology which could produce a 2GHz version, but if your system bus can't be reliably increased by more than 10 per cent, you're only looking at overclocking the processor to 1.1GHz. The only way to find out the limits is to experiment. Overclocking will invalidate your guarantee and we can offer no support should anything go wrong.

The 1.6GHz Pentium M can match the 2.13GHz version with judicious overclocking

Test setup

To illustrate this theory I got hold of the slowest and fastest Pentium M chips available using the same 90nm manufacturing technology; at the time of writing, these were the 1.6GHz and 2.13GHz models. The 2.13GHz Model 770 is designed for a 133MHz bus only, whereas the 1.6GHz is available for either a 100MHz bus (model 725), or a 133MHz bus (model 730).

I sourced all three chips and tested them on Aopen's i915GMm-HFS motherboard using its integrated graphics, 1GB of Crucial DDR2 memory and a Seagate Barracuda 400GB drive running Windows XP Media Center Edition.

Results

Clocked normally at 2.13GHz, the model 770 scored 182 in Sysmark 2004. By increasing its bus speed from 133 to 150MHz, I overclocked it to 2.4GHz, scoring 200. This was as far as I could push this processor, which implies two limitations: the 90nm technology may be approaching its limit at 2.4GHz, and the motherboard may not be happy with bus speeds faster than 150MHz.

Next I switched to the 1.6GHz Model 730, designed for a 133MHz bus; this scored 143 in Sysmark. I then steadily increased the bus to overclock it, but again it became unstable beyond 150MHz. The best I could get was an overclock of 1.8GHz using a 150MHz bus, scoring 167.

While my own Model 730 just may not be conducive to overclocking, this result did imply that the limiting factor was probably the bus. In both instances, I couldn't get it to go faster than 150MHz, which for processors designed for a 133MHz bus will only result in a 12 per cent increase.

Feeling optimistic, I then fitted the 1.6GHz Model 725, designed for a 100MHz bus; this scored 144 in Sysmark. My first overclocking attempt involved switching a jumper on the Aopen motherboard to change the 100MHz bus to 133MHz. The system rebooted at 2.13GHz (16 x 133MHz) and ran Sysmark without a hitch, scoring 182. I then steadily increased the bus, but sadly couldn't get it to 150MHz. It did, however, work fine at 140MHz, clocking at 2.24GHz and scoring 190.

I was disappointed I couldn't drive the 1.6GHz Model 725 at 2.4GHz using a 150MHz bus, but an increase of 40 per cent is not to be sniffed at. Best of all, it was done with the standard heatsink and fan, no additional voltage and with a temperature increase of only 5°C under load.

I suspect 2.4GHz is close to the limit of the 90nm Pentium M technology, so trying the same 133MHz bus trick with other 100MHz bus processors may be pushing your luck. The 1.8GHz Model 745, for example, has an 18-times multiplier, which on a 133MHz bus would attempt an overclock of 2.934GHz. This may be too close to the limit.

This is why the 1.6GHz Model 725 is such a good choice for overclockers. If you can get it to work on a 133MHz bus, you'll match the performance of the 2.13GHz Model 770 at a third of the price. And it's all thanks to having a slower bus to start with: the key to the biggest potential overclocks.

CONTACTS

Gordon Laing welcomes your comments on the Overclocking column. Email him at: overclock@pcw.co.uk. Please do not send unsolicited file attachments.

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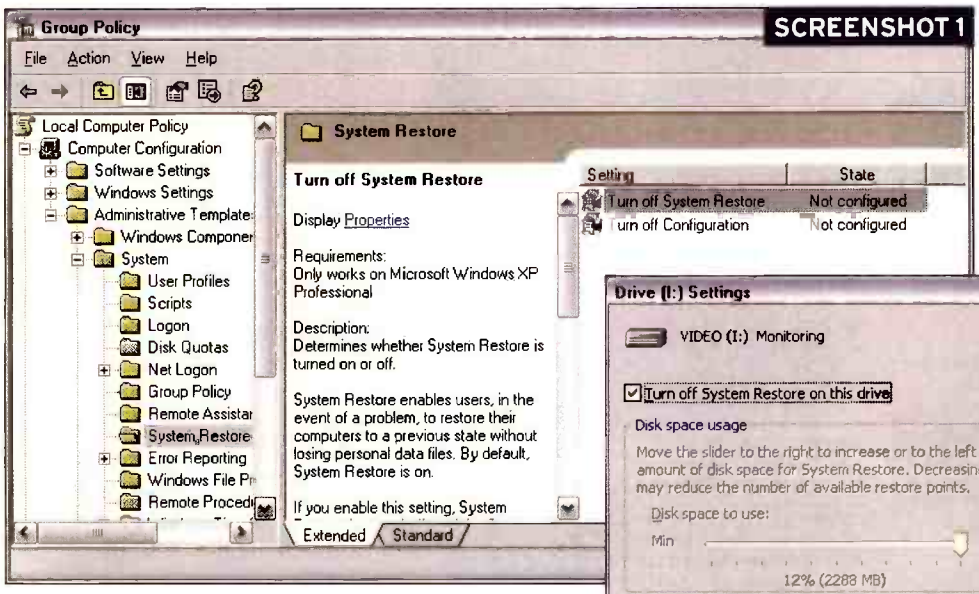
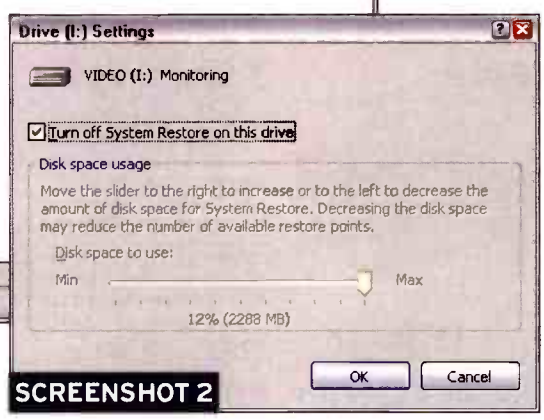
Tim Nott
Is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family

Restorative advice

Iron out System Restore problems, get a time zone utility and edit user profiles



SCREENSHOT 1



SCREENSHOT 2

The System Restore feature in Windows XP and ME is a great idea – when it works properly. Unfortunately it can behave in mysterious and distressing ways, as several readers discovered this month.

Dave Hill found, much to his surprise, that System Restore had been 'turned off by Group Policy'. Keith Morris had an even stranger experience. He created a restore point. The next day another was created automatically when he installed some software. Over the next two days, two more routine automatic restore points were created. And on the next day all the restore points had vanished. David Haynes found himself in a similar situation, and others have found that the System Restore tab has disappeared from Control Panel, System and that clicking on System Restore in the Start menu does nothing.

Only users with administrator rights can use System Restore or change its settings. XP Pro users can access the Group Policy editor by Start, Run, gpedit.msc. Go down through Administrative Templates, System, System Restore and there will be settings to turn off System Restore and its configuration. Don't get caught by the double-negative – enabling the setting disables the corresponding function. The default value is 'Not configured', in which case System Restore works normally(see screenshot 1). XP Home users will have to ferret in the Registry. Start, Run, regedit, then go to HKEY_LOCAL_MACHINE \Software \Policies \Microsoft \WindowsNT \System Restore. Since you can't make a restore point, you may want to export the key as a .reg file, as a backup. There should be DWORD values for DisableSR and DisableConfig which should both be set to zero – if either is missing, create it (right-click in the right pane, New, DWORD Value). Repeat the procedure at HKEY_LOCAL_MACHINE \Software \Microsoft \Windows NT \CurrentVersion \SystemRestore.

Above: XP Pro users can turn off System Restore in the Group Policy editor

Right: There's little point in System Restore monitoring a non-system partition

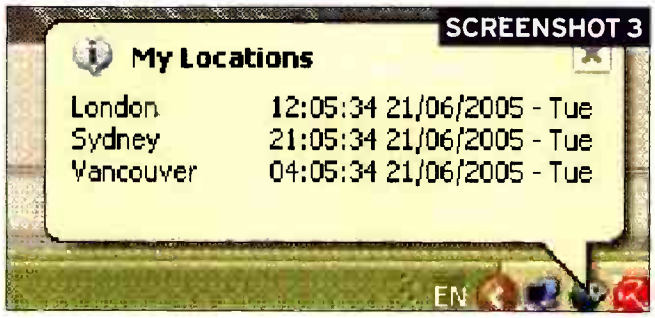
System Restore needs disk space. If you are running low, two things may happen. First, System Restore may delete some restore points in an attempt to free up space: this is done on a first-in-first-out (Fifo) basis. Second, it may stop monitoring changes. Once it has sufficient space, it should start up again and create a new System Checkpoint automatically. Usually this happens on a per-drive or per-partition basis – if space on D:\ is getting tight, C:\ should continue normally, although a very full drive may cause System Restore to grind to a halt system-wide.

Even on a disk with plenty of free space, System Restore can be cramped. If you open the System Restore tab in Control Panel, System, you will see that the space allocated on each partition can be varied. By default, this is 12 per cent (subject to a 400MB minimum).

You can decrease this by highlighting a drive and clicking the Settings button – you'll just get fewer available restore points. Turning off System Restore on the drive hosting Windows will turn it off globally, but other drives can have it turned on or off individually. There are good reasons you might want to do this. For example, System Restore does not monitor the contents of 'My Documents', nor does it restore files with common data types, such as .doc or .jpg. Obviously, if you have been working hard on documents, images or any other data and you do a restore, you don't want the files restored to a previous state. So there is little point in having System Restore monitor drives on which you just have data – although you should, of course, back these up regularly. And if you have assigned a separate partition for the swapfile, there is little point in monitoring this (see screenshot 2).

Another reason restore points disappear is that they might be pushed off the Fifo wagon by the automatic checkpoints created by Windows. These are made daily, as well as when you install Windows Updates, new programs using the Windows Installer or Installshield, and 'unsigned' drivers. Disk Cleanup will also remove all but the latest restore point if you enable this in the 'More Options' tab. Finally, System Restore points can just die of old age. By default, XP

The Time Zone pop-up shows what time it is in various places around the world



SCREENSHOT 3

deletes restore points when they become older than 90 days. Next month we'll dig a deeper into the issues, including the saga of the disappearing calendar of restore points.

Did I wake you up?

A thank you to Vivian Dunn for bringing to our attention the Microsoft Time Zone utility. This neat gizmo sits in the system tray and pops up the current time and day in various parts of the world (see screenshot 3). The places shown are configurable, so you can add your own, from a list or by typing in a place and selecting a time zone (see screenshot 4). It keeps track of all the varied daylight-saving time shifts that tend to complicate phoning far-flung friends. It's free from www.microsoft.com/downloads.

Time Zone can be customised to show the places you want to see

Administrator issues

Further thanks to Malc Parr, who pointed out an error in July's column. In Windows XP home you can't log in as supreme administrator by pressing Ctrl & Alt & Del at the welcome screen. You need to restart in Safe Mode and the supreme administrator will be offered on the Welcome screen. The default password for this account is blank, so you may want to change this. You can do this in XP Home and Pro by being logged on to any account with administrator status, then opening a command prompt and typing 'control useraccounts2' without the quotes ('control userpasswords2' also seems to work). This will open the User Accounts dialogue, which reaches somewhat wider and deeper than Control Panel, Users. You can change the password of any account, including that of the supreme administrator (see screenshot 5).

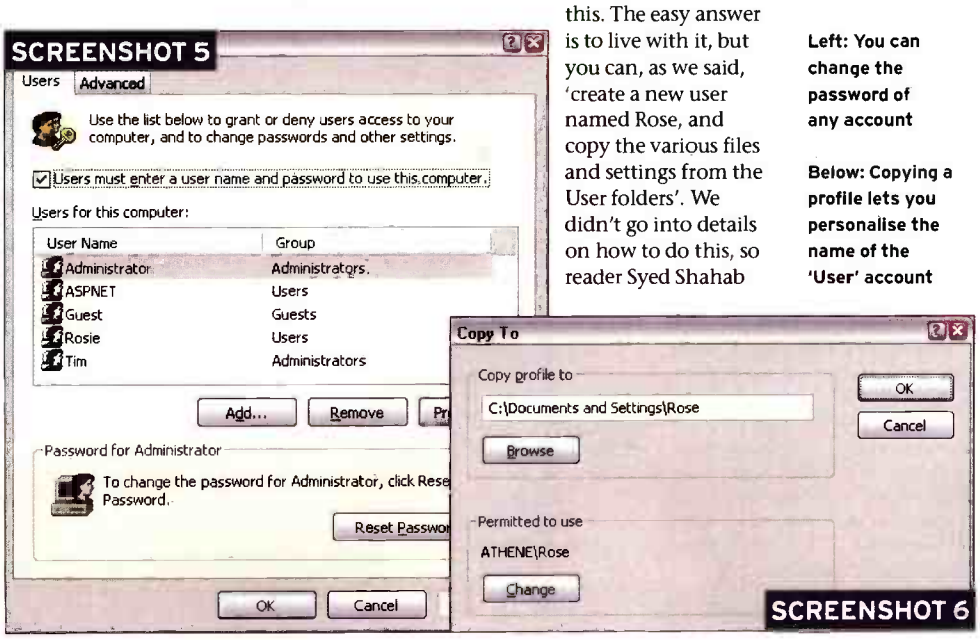
Rob Church chides me for referring to the 'super-administrator' account, which is a plain member of the Administrators group, although it cannot be deleted. My excuse is that I was using the term to distinguish it from any other named account with administrator status. He also notes that I failed to stress this account should only be used for administrating, not for day-to-day work, an omission that was made good in August's column.

This brings us neatly to a related problem, again mentioned in July's column, on renaming the 'User' account that comes as standard on many pre-installed XP PCs to something more personal. Although you can change the user name to, for instance, 'Rose', the name of the folder containing Rose's documents and settings remains 'User'. As we stated at the time, you should not try to rename this. The easy answer is to live with it, but you can, as we said, 'create a new user named Rose, and copy the various files and settings from the User folders'. We didn't go into details on how to do this, so reader Syed Shahab Jafri has stepped into the breach. He writes 'I am a regular reader of *PCW* – we get it a bit late here in India but it's still the best magazine around', which is a very good start. Then it just gets better, with an account of how to transfer all User's documents and settings to a new user. First, log in as User, who should have administrator status. If not you'll have to log in as the (sorry Rob) super-administrator.

Now go to Control Panel, User Accounts and create a new user with the desired name – we'll stick with Rose – and Computer Administrator status. Log off from XP, then log back on again as Rose. This will create the relevant folders for Rose under Documents and Settings. Log off Rose, then log back on as the super administrator as detailed above (you can also log on as another user with administrator status that is neither User nor Rose). Go to Control Panel, System, turn to the Advanced tab and click on Settings in the User Profiles panel. Select User from the list of profiles and click 'Copy to...'. In the ensuing dialogue, first click the Change button in the 'Permitted to use' panel. The 'Select User or Group' dialogue will open. Type Rose where it says 'Enter the object name', then click the 'Check Name' button.

What you typed should appear prefixed with the computer name and a backslash. Click OK to get back to the 'Copy To' dialogue, then click the Browse button and navigate to Documents and Settings\Rose. Click OK to select the target, then OK in the Copy To dialogue (see screenshot 6). You'll get a warning that the current contents of Rose will be deleted, which you should confirm. Log off, log on again as Rose and you should find that all the documents and settings have been copied from User's profile. Once you are sure this is the case, User – and her files – can be deleted from Control Panel, User Accounts.

There are a few caveats. First, make a backup copy of User and all its sub-folders. You should also make a System Restore point (and hope it works). Finally, we have only been able to get this to work in XP Pro. XP Home produces an error message at the 'Copy to' stage – 'Failed to set security on the Destination Profile. Error – Access is denied'. If anybody can shed light on this, we'd be grateful.



Left: You can change the password of any account

Below: Copying a profile lets you personalise the name of the 'User' account

CONTACTS

Tim Nott welcomes your comments on the Windows column. Email him at: win@pcw.co.uk. Please do not send unsolicited file attachments.

Barry Shilliday
has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time prefers to travel the world – and snap it with his camera

Make sure you're in command

Text-based commands are very powerful. Here's a walkthrough of some essential ones

```
barry@gentoo:~
barry@gentoo ~ $ free
             total       used       free     shared    buffers     cached
Mem:       1035072     869984     165088          0     159668     458376
-/+ buffers/cache:     251940     783132
Swap:      1983988          0    1983988
barry@gentoo ~ $ ps
  PID TTY          TIME CMD
 8812 pts/3    00:00:00 bash
 8826 pts/3    00:00:00 ps
barry@gentoo ~ $ df
Filesystem           1K-blocks      Used Available Use% Mounted on
/dev/hda3             19542436  13619168   5923268  70% /
udev                    517536      2668    514868   1% /dev
none                    517536         0    517536   0% /dev/shm
/dev/hda11            46683368  41409220   5274148  89% /hda11
/hda11/portage        46683368  41409220   5274148  89% /usr/portage
barry@gentoo ~ $
```

SCREENSHOT 1

Many newcomers to Linux expect to be bogged down by complicated text-based commands to do the simplest of tasks. At one time, this was perhaps true, but the desktop options now available rival those from Microsoft and Apple. However, Unix has been around for a long time, and command-line interfaces existed long before graphical equivalents. This history means Linux and other modern Unix systems come with powerful utilities and applications available at the command line.

A group of basic commands exists on all Unix platforms, such as file manipulation programs. In Linux these are provided by GNU, the project to create free open-source equivalents for the old proprietary Unix systems. The coreutils package, as the name suggests, contains the most fundamental commands, and packages such as diffutils and util-linux contain many of the other commonly found utilities. Their widespread use means these commands are essential and will be installed on any Linux distribution, so there's no need to download or install any of them.

Understanding the shell

Any program that runs on Linux needs an environment and an interface to run, either graphical or text-based . For interacting with Linux in a text-based way, the shell provides the interface. The shell at its most basic level allows you to run a command and see the results; it's the text equivalent of the graphical framework that lets windows appear on a display. At this basic level it's comparable to the MS-Dos interface; the comparison must stop there, though, as the Unix shell is immensely more complex and powerful.

Under Linux, FreeBSD and OSX, the standard shell is 'bash'. The original Unix shell was simply 'sh' and was known as the Bourne Shell. Bash builds on this venerable shell, and was named the 'Bourne Again Shell'. Bash is part of the GNU project and is the shell we're going to look at here.

The traditional xterm program provides a shell to run commands

The shell provides the interface for us to run commands, but where does the shell exist? Normally you would run a shell within a terminal window (like xterm or Konsole) or via the virtual consoles (the simple text-based screens available outside the graphical interface). There's no need to run a shell manually – upon starting an application such as Konsole or logging into a virtual console, the shell is launched automatically. See screenshot 1 for an example of the classic xterm program; this basic terminal program starts a shell, where a few commands are run.

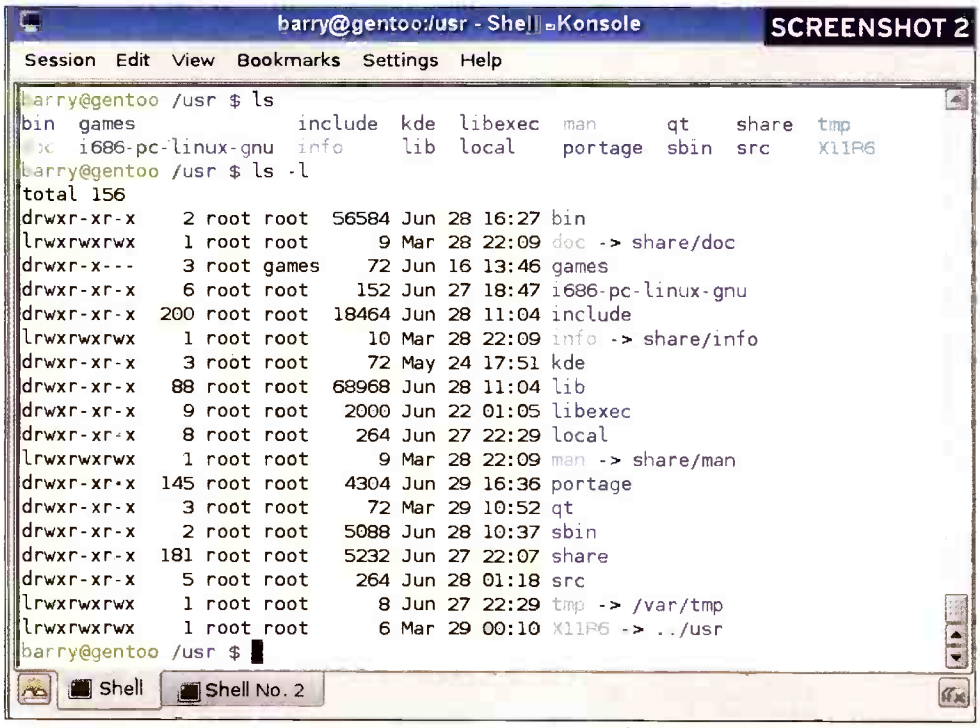
The familiar shell-prompt from bash is a dollar sign ($) if you're logged in as a standard user, or a hash sign (#) if you're logged in as the superuser root. Some systems will modify the prompt to include other information, such as your username or the current directory. There's more on that later. For now, start up Konsole (for KDE) or gnome-terminal (for Gnome), and we'll begin with a few examples.

Essential commands

Some commands in Unix have existed, in one shape or another, since it was first developed decades ago. While there's nothing stopping Linux from running without these commands, you'll always find them present. The most ubiquitous commands are the file utilities ls, cp, rm and mv.

Run 'ls' at the bash prompt. This is about as simple as it gets: you see a list of the files in the current directory, sorted alphabetically. What's happened here is that the shell has interpreted what we've entered (in this case a simple one-word command), searched for the program

The ls command gives you a list of files in the current directory



SCREENSHOT 2

in question, executed it and displayed the results. This process is more or less the same for any programs you run at the prompt (see screenshot 2).

The ls command offers a number of advanced features. To display the files in a long format, including the security permissions and file sizes, use the '-l' option. It is standard practice in Unix to introduce options with a minus sign. Other useful options include: -t to sort by file date instead of alphabetically; -S to sort by file size; and -r to reverse the sort order. For example:

```
$ ls -lS
$ ls -lrt
```

Both commands produce a long list of files; the first sorts in order of file size (-S) while the second sorts in reverse-order of time (the oldest files first). It's possible to list each option separately (-l -S), but most commands allow you to combine the options like this. As before, the shell processes the command: the ls program is given the options we entered and acts on them accordingly.

The cp command enables you to copy a file. Put the source (from) file first and the destination (to) file second. So to copy pic.jpg to img.jpg, simply run:

```
$ cp pic.jpg img.jpg
```

Renaming and moving a file is performed with one command: mv. The action is logically quite similar: the only difference between moving a file and renaming it is whether the file remains in the same directory. Put the source file first and the destination second; this order is the norm for Unix. In the following example we rename a file, then move another to the /tmp directory and change its name at the same time:

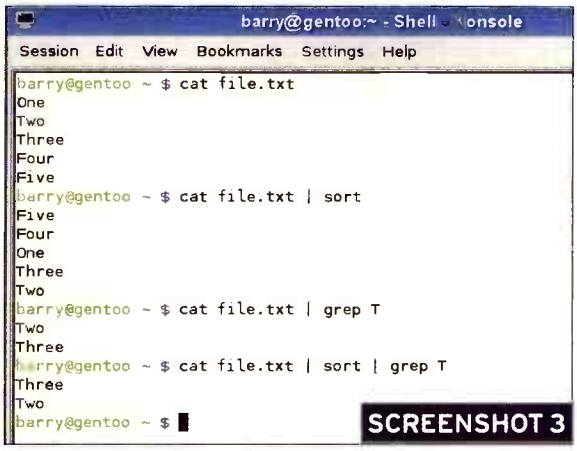
```
$ mv pic.jpg pic2.jpg
$ mv img.jpg /tmp/new.jpg
```

As you can see, the syntax is the same for either action. To move a file to a new directory just provide the directory name without a file name.

Finally, to remove a file, use the rm command. List the files you want to delete and they will be removed in that order, so for example:

```
$ rm /tmp/new.jpg pic2.jpg
```

Two files are removed, one from the current directory (since no directory was given), the other from the /tmp directory. Here the first sign of the shell's power is evident. We didn't have to run two separate rm commands to delete the files. So how does the rm command know how many files to delete? The shell, as before, executes the rm command and provides it with all the additional arguments we gave. The rm command can easily count those arguments and delete each in turn.



SCREENSHOT 3

The cat command and pipes can help match text without

Pattern matching

Bash offers sophisticated pattern matching (sometimes called wildcards) to enable you to match multiple files with one word. The most common wildcard is '*', which means 'match anything'. So *.jpg will match pic.jpg and img.jpg, and a* will match any file beginning with 'a'.

```
$ rm *.gif *.jpg
```

This command will delete all files in the current directory with gif or jpg extensions. This functionality is provided by the shell and not the command; the shell matches the files and sends them to the rm command as if you had typed them yourself. This means that commands don't need to implement any kind of file matching themselves.

Another wildcard is the question mark (?). This matches any single character. Several can be used together to match a certain number of characters: a?.jpg would match a1.jpg but not a12.jpg; a??.jpg would match a12.jpg but not a1.jpg. It's possible to combine the two, for example:

```
$ ls a*1.?pg
```

In this slightly obtuse example, the filenames a1.jpg, aust1.Jpg and az1.zpg would match. Such matches may not be useful every day, but in directories with lots of similarly named files these kind of matches can be a life-saver.

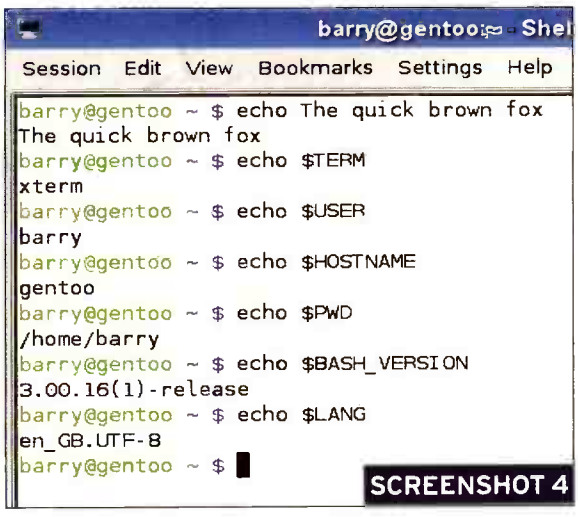
Another useful option is the less commonly used brackets; these allow you to match multiple patterns or ranges. For example, to match the letters a, c, or f use [acf], while to match the letters a to z use [a-z]; and to match from a to d or one to nine use [a-d1-9].

The following three lines of code demonstrate the use of brackets:

```
$ ls [acf]*.jpg
$ ls [a-c]*.jpg
$ ls *[0-9].???
```

In the first line, any file ending in .jpg and beginning with a, c or f is matched. The second line differs in that any file beginning with the letters 'a' to 'c' will be matched. The third line matches any file ending in a Windows-style extension (three characters after a dot), which is immediately preceded by a number: 1.gif and snd34.wav would match.

The echo command is the easiest way to display environment variables



SCREENSHOT 4

Connecting pipes

A Unix pipeline lets information flow from one place to another. With a pipe you can connect two or more commands, redirecting the input and output from one to the other (see screenshot 2. The 'more' command (part of util-linux) is primarily to show text one page at a time. You can view a text file with a simple command:

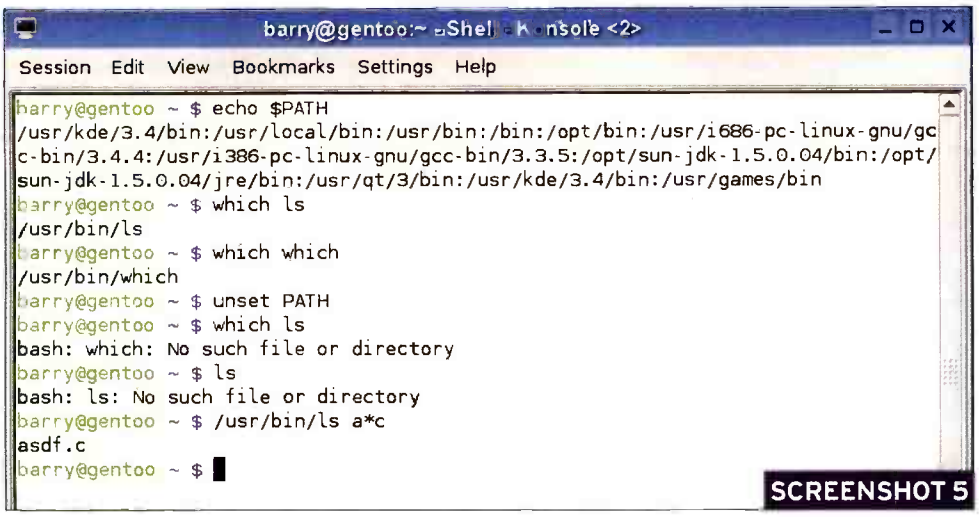
```
$ more /tmp/file.txt
```

What happens here is that the more command reads the /tmp/file.txt file (its input) and displays the contents, one page at a time, back to the terminal (its output). This makes it ideal for use with a pipeline. Instead of supplying a file for more to read, it can receive that information from a pipe instead. Take the following command:

```
$ ls -l | more
```

The shell does something slightly clever now. The ls command is run, as usual, but the more command is also run. The pipe is created between the two commands, hence the pipe character '|' appearing in that place. This syntax means that the output from the ls command (a long list of files) is sent to the pipe, and that the more command, instead of reading from a normal file, reads from the pipe instead. The result is that a list of files is presented page by page.

Pipes are built into the shell (and into the operating system) so the commands in question don't need to know anything about them. As far as



SCREENSHOT 5

the ls program is concerned, it's sending out the file listing as usual, and similarly the more command behaves as if it's reading a standard file. Pipes can be used more than once, for example:

```
$ cat file.txt | sort ↙
| less
```

(Key: ↙ code string continues)

The 'cat' command simply reads a file and outputs its contents. In this case it sends the contents to the sort command, which in its simplest form, as above, sorts alphabetically, and the result is then fed to 'less', which is a more advanced version of 'more' (less is more, get it?). You can see on screenshot 3 that a simple text file containing a few words is first read and output by cat. Next the same is done with the sort command. On such a short file there's no need for less here, so we've left that out. Finally, the 'grep' command is used. Grep is another ubiquitous Unix command; it allows very complex pattern matching, although in this case we're keeping it rather simple and just matching the letter 'T'.

Pipes provide the shell user a great deal of power. Since many Unix commands are built to fulfil one specific purpose, pipes are often used to combine several of these programs together to do something more complicated. By using the cat, sort and grep commands this way in the last example, we've done something that would otherwise be impossible without writing a new bloated command for that particular purpose.

Environment variables

In Unix, every process running on the system has a set of environment variables. These typically include things such as the current username, the process ID and the current working directory. As the shell is just another process, it has a set of them too. Environment variable names are traditionally in upper case, although there is nothing that requires them to be. You can view variables by prefixing their name with a dollar sign and using the 'echo' command. Echo does what its name suggests – it just returns what you enter, but since the shell substitutes environment variables with their contents, it will return their values instead. For example:

Path determines which directories to search to find commands

```
$ echo hello
$ echo $TERM
```

The first command returns 'hello' as expected. In the second, the shell knows we're using an environment variable because of the dollar sign, so it looks up the value of TERM and sends that to the echo command instead (see screenshot 4). A few more variables are returned here. TERM is set to xterm, as the terminal program Konqueror emulates the xterm standard; USER returns the username you're running the shell as; PWD returns the present working directory (the directory you are currently 'in'); LANG returns the language setting; and the version string returns the current version of the shell.

To set an environment variable, use the equals symbol without spaces, and to delete an environment variable, use 'unset':

```
$ MYVAR=hello
$ echo $MYVAR
hello
$ unset MYVAR
```

No dollar sign is used when setting a variable, since the dollar is only used when you want the shell to substitute the value of that variable. When programming with the shell it's common to use environment variables, but on a day-to-day basis it's rare. Sometimes programs will behave differently if an environment variable is set – the 'less' program is one such example.

One important common usage is the PATH variable. This tells the shell which directories to search when you run a command. Without a path you would have to run a command explicitly from its location on the filesystem. When running a command, the shell searches through each directory in the path until it finds a match – otherwise it returns a 'command not found' error (see screenshot 5). Here the path is displayed; each directory is separated with a colon (:). Next, the 'which' command tells us where the ls command is located; since this returns the first instance of a command called 'ls' on the path, it effectively tells us 'which' ls command is run.
The PATH variable is then unset, meaning no commands can be found automatically. We can still run ls from its location (in /usr/bin). Environment variables only affect the current shell or programs launched from that shell, so simply open up a new terminal window to restore the path.

Since variables are substituted by the shell, we can set variables by using existing others. You could copy the path variable or extend it as follows:

```
$ MYPATH=$PATH
$ PATH=$PATH:/opt/bin
```

In the first shell operation a variable is created and set to the current path. In the second, the PATH variable has ':/opt/bin' added to its current value and the result replaces the original. This is similar to the 'a=a+1' style of programming you might have come across before.

A variable you may want to play with is PS1. This determines how the shell prompt will appear. Bash provides a few special codes: \u for your username, \w for the current directory and a few others (see the bash manual page for a list). A typical prompt might be set by something like this:

```
$ PS1="\u \w $ "
barry ~ $
```

As there are spaces inside the setting, it must be placed in quotes. The prompt is changed to the username and working directory. Many distributions include a PS1 setting in the system-wide and user shell startup scripts. These are typically found at /etc/bashrc and ~/.bashrc. Next month we'll explain some simple shell scripting and how to use them to perform useful jobs.

CONTACTS

Barry Shilliday welcomes your comments on the Linux/Unix column. Email him at: linux@pcw.co.uk. Please do not send unsolicited file attachments.

Alan Stevens
has been implementing and supporting networks for over 25 years, working for IT vendors, systems integrators and customers. He now mostly researches and writes about networking matters

Share your bandwidth

If your kids are hogging the PC, splitting your broadband connection may be the answer

Judging by my inbox of late there's a whole generation of new computer users wanting to share a broadband connection and not knowing how best to go about it. In many cases it's for home use, often to let the kids play games without hogging the family PC, while for others it's to share web and email access on a small-business network. Either way, the options are much the same, and this month's column explains what's available and the pros, cons and cost of each approach.

The budget option

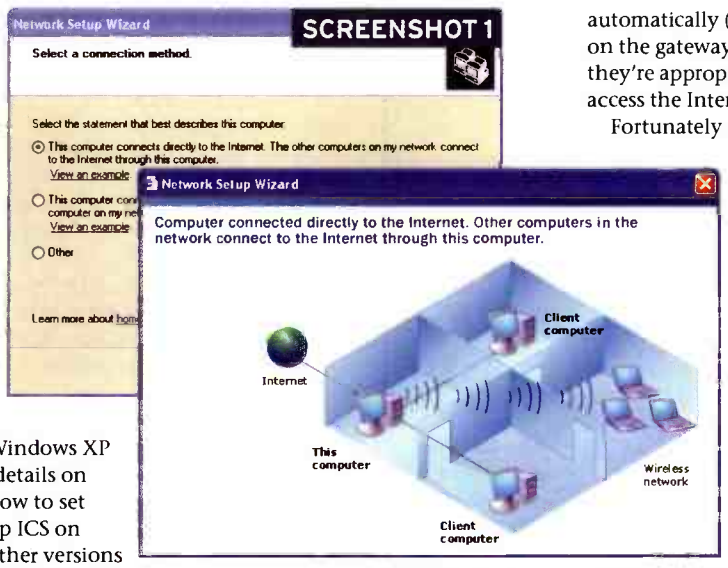
I'll start with software because if you're on a budget this is by far the cheapest way of sharing a broadband service. That's because most ADSL and cable providers include the basic hardware required (a broadband modem) with their standard consumer products – often for free. Also the software needed to share it, ICS (Internet Connection Sharing), is included as part of Windows, again, at no extra cost.

Bundled with every version of Windows since the days of Windows 98 and dial-up modems, ICS effectively turns a PC with a modem attached into an Internet gateway. Add in basic network hardware and other computers can then connect to the Internet via this machine, although that does mean leaving the gateway PC turned on all the time to allow access.

Bear in mind, too, the cost of the Lan adapters required in each PC, if they're not built in already. You'll need Lan adapters no matter what approach you take, although if just two systems are involved – a notebook and a desktop, for example – then one of the advantages of ICS is that it lets you get away with a crossover Ethernet cable to connect the PCs together. Otherwise a network switch will be needed to link everything together, and yet more hardware if you want wireless.

Configuring ICS

ICS can be used with either ADSL or cable broadband and for the purposes of this overview I'll assume that you've already got the broadband connection working on the PC with the modem attached. I'll also assume you're using Windows XP (details on how to set up ICS on other versions of Windows can be found on the Microsoft Knowledgebase website at http://support.microsoft.com). You'll need the necessary network adapters installed, both on the gateway and the other PCs you want to connect to it.



The easiest way of configuring an ICS gateway under Windows XP is through the Network Setup Wizard

That done, you just need to run the Network Setup Wizard from the Control Panel on the gateway system, which you'll find under Network and Internet Connections in the default Category view. It's pretty straightforward, just click Next until you get to 'Select a connection method', then choose the option that starts 'This computer connects directly to the Internet', as shown in screenshot 1.

You'll then be led through the process of identifying the broadband connection you want to share and the Lan connection that will be used to share it. The desktop firewall, included in XP, will also be turned on by default to protect network users, plus the wizard will configure the gateway to be a DHCP server – to automatically assign IP addresses to any client PCs you then attach. Along the way it will ask if you want to share files and printers, which you may well want to do, but it isn't of any relevance here.

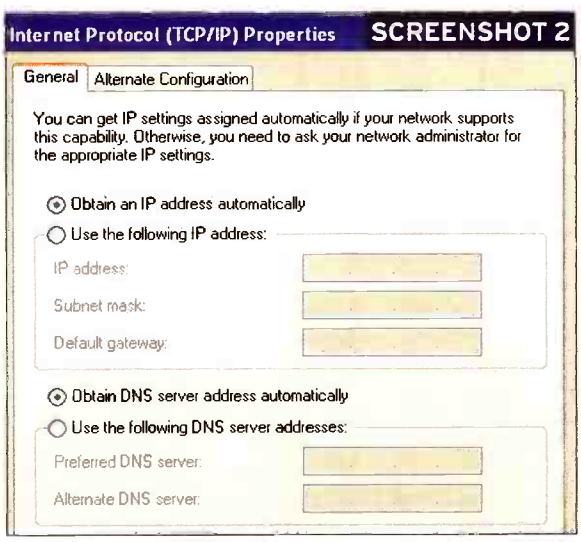
There's not much else to do as you only have to set up ICS on the gateway PC. The others just need to be able to communicate with the gateway using a TCP/IP network connection. They do, though, need to be configured to obtain an IP address automatically (ie via the DHCP server on the gateway system) to make sure they're appropriately configured to access the Internet via that PC.

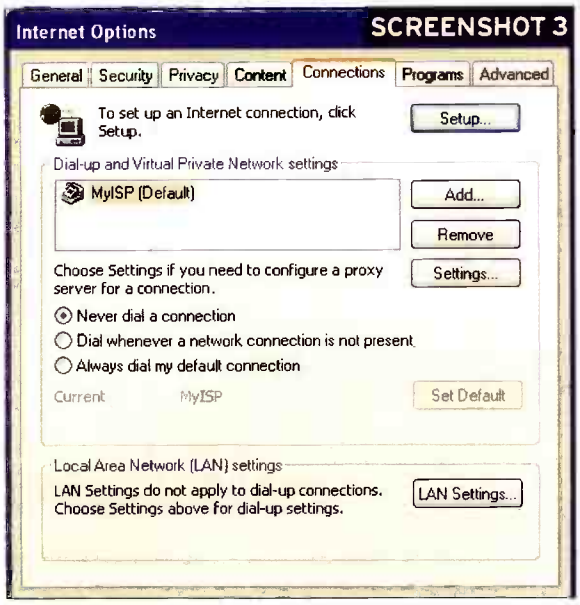
Fortunately that's how XP sets up any Lan connection you have by default. If the setting has been changed for any reason it's easy enough to reset by editing the Properties of the connection concerned, as shown in screenshot 2.

Where earlier versions of Windows are involved a reboot may also be needed but, that aside, you should be able to start sharing the broadband modem and its Internet connection straight away. However, if you do have problems surfing the web check the browser settings, especially where clients previously had their own dial-up modems.

You can do this from the Tools menu in Internet Explorer, by clicking Internet options followed by the Connections tab, as in screenshot 3. From here, make sure the option marked 'Never dial a connection' is selected. This will force the PC to use the Lan connection and hence the ICS gateway for Internet browsing. The exception here is where you happen to be using a notebook with a built-in modem and want to connect to the Internet when

Client PCs don't need any special software to use ICS, just a Lan adapter configured to use DHCP to get its network address





travelling. In this case you should select 'Dial whenever a network connection is not present' instead.

For a few dollars more

ICS is does go wrong from time to time and, as I've already pointed out, you have to leave the gateway PC on all the time for it to work. You also still need to network everything together in the first place, and for a little extra outlay it's possible to get not just a network switch, but a broadband router and switch combined – about which more later.

In the meantime there are plenty of good reasons for looking at a router rather than ICS. As well as eliminating the need for a dedicated gateway PC, it will typically have a much better firewall built in and, in many cases, a wireless interface and other useful options, such as content filters and in some cases a VPN (virtual private network) server. It will also be able to handle many more clients and be less prone to problems, plus if it does go wrong, you just switch it off and back on again.

What to look for

Broadband routers cost anything from £40 to well over £100, depending on the model involved. However, it's not always best to go for the cheapest and some care is needed as there are lots of different makes and configurations.

To start with not all routers come with a broadband modem built in, which is fine as long as it can work with the modem you already have. Sadly, where an external modem is needed, most routers require one with an Ethernet rather than a USB interface and most ADSL customers, at least, will have a USB device.

Make sure that your browser is configured to use the Lan to connect to the Internet – not a dial-up modem

Cable customers are lucky in that they tend to be sent modems with both USB and Ethernet connectors or Ethernet-only modems, which makes life a lot easier. But if all you have is an ISP-supplied ADSL modem with a USB port you either have to look for a router with a suitable USB port (which are about as common as hen's teeth) or ditch what you've got and buy another modem with an Ethernet connector.

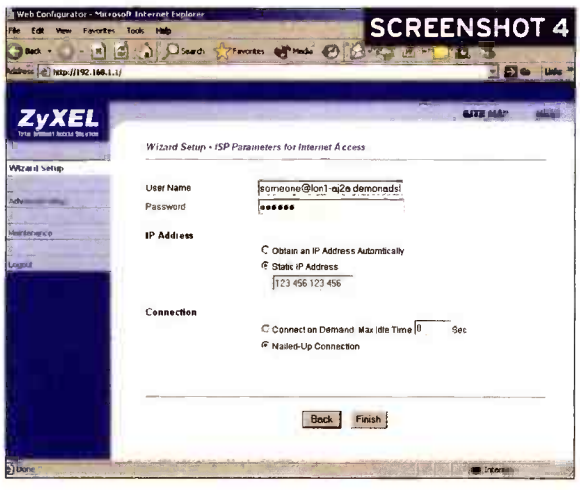
Choice is a bit limited here but you could try a D-Link DSL-300T (for around £35 inc VAT) which has a single Ethernet port or the DG632 from Netgear (about £45 inc VAT) which has both USB and Ethernet connectors and can also be used as a combined modem and router, doing away with the need for another separate box.

The Thomson Speedtouch 530 (£57 inc VAT) can also be deployed either as a modem or in a router configuration, and if you're upgrading your existing modem it's arguably better to go all out for a router with a modem built in. (Not if you're on cable, where an external Ethernet modem is always required, but definitely if you're looking to share an ADSL connection). It may cost extra but it does away with the need for two devices, each with its own AC adapter and setup requirements, and the end result will be easier to configure and maintain.

Speaking of which, browser-based setup is the order of the day here. Simply plug the router into the ADSL socket and a PC into an Ethernet port on the router, then follow the instructions to browse to the setup screen. A wizard will, typically, detect the type of ADSL service you have; if not, it's usually a matter of either taking the defaults or selecting a known service.

Most users will have their IP address assigned dynamically, although a fixed address can be specified, and the only other requirement is a login name and password as assigned by the service provider when you signed up for ADSL to begin with (see screenshot 4).

Broadband routers can be configured with a browser and require very little setup other than a username and password, as on this Zyxel product



It's worth noting that just as with ICS, most broadband routers come with a DHCP server configured by default, so there's little client setup needed. Indeed, it should be just the same as with the Windows gateway.

Network connectivity

As I mentioned earlier, one of the benefits of a hardware router is that it can take care of the Lan side of the equation as well as the Internet connectivity. Here again, though, you need to know what to look for, as some routers only have one Ethernet port. This means buying a router and a separate switch to share the broadband connection with more than one PC. Others, however, have integrated network switches with four to five ports, which is a far more cost-effective solution that, again, reduces the number of devices required.

Many routers also have a wireless interface built in and other optional extras such as support for Voice over IP (VoIP). Examples are the popular Vigor products from Draytek, which offer a range of advanced features for the more demanding home or small-business user, but are still affordable.

The Vigor 2600VG (£179 inc VAT), for example, has an onboard four-port 10/100Mbits/sec Ethernet switch and a 54Mbits/sec 802.11g wireless access point, plus an integrated VoIP facility that allows two analogue phones to be attached and make calls over the broadband connection.

It also has a firewall and a VPN server for remote access with a dedicated processor to handle the encryption. It's even got a USB port, although this is to let you attach and share a printer, as an ADSL modem is also built in.

There are many other makes and models and special bundles that include both a router and the network adapters needed to connect to it. But whatever you choose, ask plenty of questions to make sure it will do what you want. Especially when it comes to more specialised options like VPN access, which I'll be looking at in more detail next month.

CONTACTS

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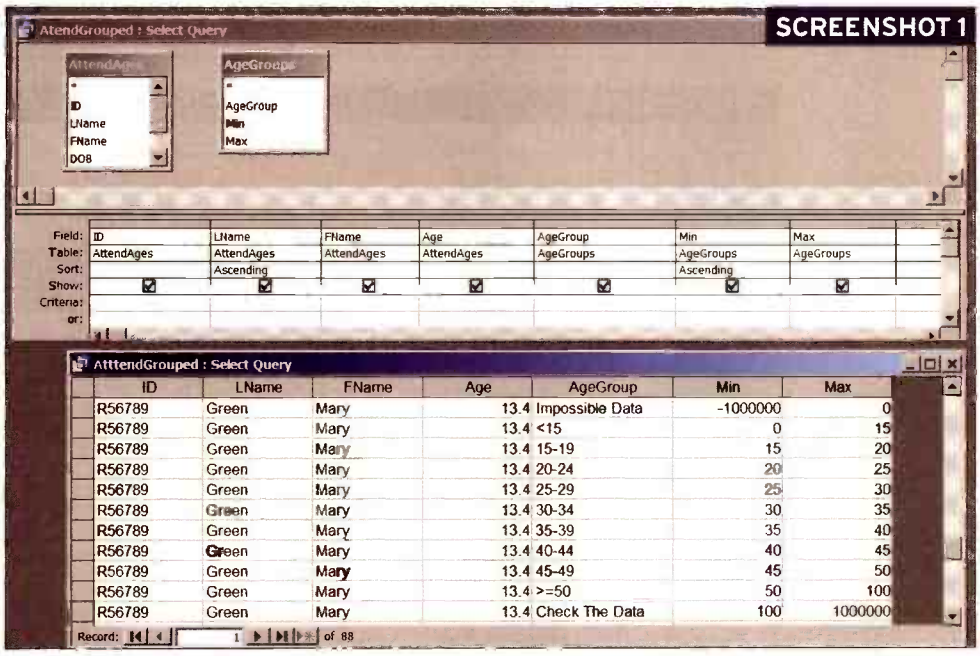
An easy way to display your data

How to use custom grouping to improve the way your information is shown



The Cartesian join and part of the answer table

I had an interesting query about custom grouping from reader Patrick Pearson. He works for the NHS and collects data as shown in table 1 below. He wants to be able to run a query that shows both the patient's age when they were seen, as well as the age group into which the patient falls, as shown in table 2.

The age groups he currently uses are <15, 15-19, 20-24, etc up to >=50. He would prefer to use a look-up table to hold these; which is a very smart request because it enables him to easily change the groups at a later date.

He has already cracked the Age field and uses the formula:

```
Age:([AttendDate]-
[DOB])/365.25
```

(Key: ↙ code string continues)

but can't crack the grouping. OK, the first part we need is the lookup table. This is easy and looks like table 3 on the next page.

As well as the intermediate rows which aren't shown, I would always add a couple of checking rows, such as those shown in table 4.

These will flag up those who attended before they were born and very elderly patients. Clearly Patrick knows his data far better than I do. He may know that 100-year-old patients are common; no problem, he just sets the check value at the point where he wants to be warned that the data is looking suspicious.

Now we create a query that calculates the age of the patients on the day they attended.

```
SELECT Attend.ID, Attend.
LName, Attend.FName,
Attend.DOB, Attend.
AttendDate, ([AttendDate]
-[DOB])/365.25 AS Age
FROM Attend;
```

And save it as AttendAges. For Access users, this query is also saved as an Access query in the sample database DBCOCT05.MDB which, if you've bought the DVD edition of *PCW*, can be found on the cover disc and it's also at www.penguinsoft.co.uk.

Next we create an unusual query that has two tables without a join (a so-called Cartesian join). Cartesian joins have the potential to produce huge answer tables because they multiply the two tables together. For example, if one table had five rows and the second had 10, the answer table would have 50 rows. That doesn't sound too bad, but if the two tables had, say, 10,000 and 100,000 rows, the answer table would be a whopping 1,000,000,000 rows. In our case we know that it is unlikely to be too bad because our lookup table only has 11 rows.

Our Cartesian join is between AttendAges (the query above that we just created) and the lookup table called AgeGroups. The SQL reads as:

```
SELECT AttendAges.ID,
AttendAges.LName, Attend
Ages.FName, AttendAges.
Age, AgeGroups.AgeGroup,
AgeGroups.Min,
AgeGroups.Max
FROM AttendAges, AgeGroups
ORDER BY AttendAges.
LName, AgeGroups.Min;
```

And is shown in Access, together with part of the answer table, in screenshot 1. There are 11 rows in the lookup table so, for every row in the AttendAges table, we get 11 rows in the answer table.

As you can see in the screenshot, Mary Green is 13.4 years old. (I have set the format properties of the Age field to be numeric with one decimal, just to make it easier to read.)

TABLE 1

ID	LName	FName	Gender	DOB	AttendDate
J12345	Brown	John	M	10/12/67	15/10/04
R56789	Green	Mary	F	7/3/90	17/8/03
Q23456	Penguinsson	Penguin	M	1/1/60	1/1/00

TABLE 2

ID	LName	FName	Gender	DOB	AttendDate	Age	AgeGroup
J12345	Brown	John	M	10/12/67	15/10/04	36.8	35-39
R56789	Green	Mary	F	7/3/90	17/8/03	13.4	<15
Q23456	Penguinsson	Penguin	M	1/1/60	1/1/00	40	40-44

We have 11 rows for her; one for each of the age groups. The trick we need to perform is to narrow these 11 down to the single row that is correct for her, namely the one with the AgeGroup value of <15.

For this we will use the Min and Max values. If you look at Mary Green's age (13.4) you'll notice that, in the particular row that we want (where AgeGroup is <15), the Min value (0) is smaller than her Age.

It is also the case that the Max value (15) is greater than her Age. There is no other row where both of these are true. So we can add these two constraints to the query (see screenshot 2).

This works fine for most of the cases; however Penguin Penguinsson doesn't appear in the answer table. He happens to be exactly 40; so Min isn't smaller than his Age, it is exactly the same as it. So we can amend the formula for Min to be:

```
<=[Age]
```

And lo, he appears (see screenshot 3).

The SQL is:

```
SELECT AttendAges.ID,
AttendAges.LName, Attend
Ages.FName, AttendAges.
Age, AgeGroups.AgeGroup,
AgeGroups.Min,
AgeGroups.Max
FROM AttendAges, AgeGroups
WHERE (((AgeGroups.
Min)<=[Age]) AND
((AgeGroups.Max)>[Age]))
ORDER BY AttendAges.
LName, AgeGroups.Min;
```

As an added bonus (which Patrick didn't ask for but may find useful) we can now create a further query that counts the number of attendances where the patient fell into each age group.

This is a Group By query and is in the Access MDB as CountOfDifferentAgeGroups (see table 5).

```
SELECT AttendGrouped.
AgeGroup, Count(Attend
Grouped.ID) AS CountOfID
FROM AttendGrouped
GROUP BY
AttendGrouped.AgeGroup;
```

TABLE 3: AGEGROUPS

AgeGroup	Min	Max
<15	0	15
15-19	15	20
20-24	20	25
Etc.	...	...
>=50	50	100

TABLE 4: AGEGROUPS

AgeGroup	Min	Max
Impossible Data	-1000000	0
Check The Data	100	1000000

Matters arising...

Patrick's question (and the answer) raises a couple of other points. You may have noticed that he is calculating age as ([AttendDate]-[DOB])/365.25 and your fingers may be poised over an email about to point out that this is not always accurate. True. Dates are tricky and calculating ages with perfect accuracy is relatively complex (although it can be done and the subject as been covered in earlier columns).

However there is a trade-off here. One important question is 'How accurate does the answer need to be?' If it is paramount then, of course, we use the accurate calculation. However, in those cases where totally accuracy isn't that important, I would argue that using a much simpler formula which is almost as accurate may be better. Why? Because the code is so much more readable by the other programmers who may follow you and will have to maintain the code. As I say, it all depends on the situation but, as long as you do it intelligently, you should never be ashamed to trade some level of accuracy for maintainability.

Another point is how you set up the lookup table. I have, in effect, duplicated some of the numbers. In other words, for the Min and Max values, I have used pairs such as 20 & 25, 25 & 30 etc. I could have used 20 & 24, 25 & 30 etc.

TABLE 5: COUNTOFDIFFERENTAGEGROUPS

AgeGroup	CountOfID
<15	1
30-34	1
35-39	3
40-44	1
Check The Data	1
Impossible Data	1

How would that have affected the code – would it have made it easier to write the queries, or more difficult?

Another interesting question is – have I finally got the logic correct or are there some cases which will be incorrectly classified? I'd love to be able to tell you that I can always write this sort of logic perfectly, first time, every time. But I can't. I write what I hope is the correct logic and then I test it with all sort of strange cases (such as Penguin Penguinsson who was exactly 40 when he attended). So, again, my advice is, never be ashamed to test your logic with many test cases, just in case. It is left as an exercise for the reader to test this one thoroughly.

Two solutions

Tony Leach was in contact with a problem involving a field created with a NOW statement and which contains dates and times. He wanted to extract just the date part for export to a comma separated value (csv) file. Having experimented with input masks, formatting and DateValue, none could be persuaded to shave the time element from the date element.

My table of test data is called TimeIsTricky and contains an AutoNumber ID field and a Date/Time field called DateNow for which the Default Value on the General tab is set to Now(). Now() is a handy function that pulls in the current date and time from your computer's system date/time settings. The table also has a Foo text field that is simply there so that new records

Adding the constraints

SCREENSHOT 2

AgeGroup	Min	Max
AgeGroups	AgeGroups	AgeGroups
	Ascending	
☑	☑	☑
	<[Age]	>[Age]

AttendGrouped : Select Query — SCREENSHOT 3

ID	LName	FName	Age	AgeGroup	Min	Max
D43433	Baa	Foo	-1.0	Impossible Data	-1000000	0
J12346	Brown	John	36.9	35-39	35	40
J12345	Brown	John	36.8	35-39	35	40
F34567	Cranz	Rosanne	35.0	30-34	30	35
F34566	Cranz	Rosanne	35.0	35-39	35	40
D54545	Foo	Baa	150.0	Check The Data	100	1000000
R56789	Green	Mary	13.4	<15	0	15
Q23456	Penguinsson	Penguin	40.0	40-44	40	45

Record: 8 of 8

The query working: Penguin is 40

can be added for testing purposes, the two other fields being populated automatically by AutoNumber and the Now() function.

I then built a query called ShowTime based on this table, the SQL is:

```
SELECT TimeIsTricky.Id, ↙
Day([DateNow]) & '/' & ↙
Month([DateNow]) & '/' & ↙
Year([DateNow]) AS Mark
FROM TimeIsTricky;
```

The answer table will comprise an ID field and a field called Mark which looks like a date field, but is a text field. (To test this you can temporarily make ShowTime a Make-Table query, run it and check out the table in Design view, then change ShowTime back to a Select query). The SQL is extracting the Day, Month and Year elements from the DateNow field in the TimeIsTricky table, concatenating them and putting in the / character so that you end up with something like 04/06/2005.

If you now export that query as a csv file, the Mark field will be in text date format without the time.

I passed this answer on to Tony, who was delighted and then later replied having found another solution: both his and mine are implemented in the DBCOCT05.MDB file.

Tony's SQL statement reads as:

```
SELECT TimeIsTricky.Id, ↙
Format([DateNow],↙
"dd/mm/yy") AS Tony
FROM TimeIsTricky;
```

This produces an answer table with a field called Tony in which the Format function imposes a format (in this case dd/mm/yy) onto the value found in the DateNow field (see screenshot 4).

With either solution you have control over the way the dates are displayed, so in the ShowTime query in the sample database there are four fields, Mark and Tony as described above, and Mark2 and Tony2 which produce dates in mm/dd/yy format. The SQL for the complete query is:

```
SELECT TimeIsTricky.Id, ↙
Day([DateNow]) & '/' & ↙
Month([DateNow]) & '/' & ↙
Year([DateNow]) AS Mark, ↙
Format([DateNow],↙
"dd/mm/yy") AS Tony, ↙
Format([DateNow],↙
"mm/dd/yy") AS Tony2, ↙
Month([DateNow]) & '/' & ↙
Day([DateNow]) & '/' & ↙
Year([DateNow]) AS Mark2
FROM TimeIsTricky;
```

A curiosity

The Help system says of the Format function that 'mmm' can be used to display full month names. In fact, altering mm to mmm in Tony's code renders answers like 04/Jun/05 and 26/Aug/05.

Adding a fourth m gives 04/June/05 and 26/August/05. Strangely, adding a fifth m produces 04/June6/05 and 26/August8/05, adding a sixth gives 04/June06/05 and 26/August08/05, while adding a seventh gives 04/JuneJun/05 and 26/AugustAug/05. Weird or what?

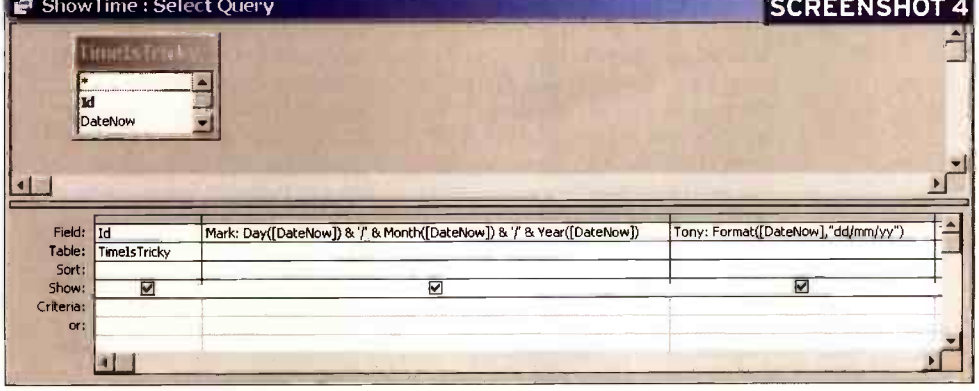
And finally

As promised last month, here are brief comments on two books on ADO.

ADO.Net in a Nutshell
Hamilton & MacDonald (O'Reilly)
ISBN 0596003617, £31.95
This is primarily a reference book for experienced developers who need to understand ADO.Net. No prior knowledge of ADO.Net is assumed, but you are expected to be familiar with basic .Net and database development. Knowledge of SQL will help you get the best from the book. Part 1 is an ADO.Net tutorial with code examples. Part 2 details core classes, one per chapter, each with description, comments and troubleshooting pointers, and details of properties, methods and events. Part 3 is an API Quick Reference.

ADO.Net Cookbook
Hamilton (O'Reilly)
ISBN 0596004397, £31.95
The Cookbook problem-solution-discussion format is employed to help solve specific problems for users with all levels of experience. Topic areas include retrieving and managing data, searching and analysing data, maintaining database integrity and working with XML. Code samples in C# and VB.Net are available from the publisher's website and the appendix contains a brief tutorial on converting code from C# to VB.Net.

ShowTime : Select Query — SCREENSHOT 4



The Access query builder showing two solutions to the problem

CONTACTS

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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

Banish the Reviewing toolbar

Disable unwelcome functions and remove potentially embarrassing 'hidden' data

Have you ever been puzzled by the unbidden appearance of Word's Reviewing toolbar, even if you never, ever use it? This most often happens when opening a document sent to you as an email attachment. You may also be bothered by messages asking if you want to Merge Changes. Reader Vivian Dunn has solved the mystery.

The culprit is Microsoft Outlook, which defaults to tampering with a document's properties, adding the sender's email address, name, message subject and ad hoc review capabilities. Some would call this useful – others a diabolical liberty. Fortunately this function can be turned off, though it's a deep dig. Go to Outlook's Tools, Options dialogue and turn to the Preferences tab, then click Email Options, and in the next dialogue click Advanced Email Options: you'll see the dialogue shown in the screenshot (right). The last option – 'Add properties to attachments to enable Reply with Changes' – is the one to disable.

This will, at least, stop you sending out attachments that open the recipient's Reviewing toolbar, but it won't help for incoming mail. This can, however, be banished with a simple macro. In Tools, Macro, Macros, create a new macro named 'Noreview' and add the code below. Note that the VBA editor will have already created the first and last lines.

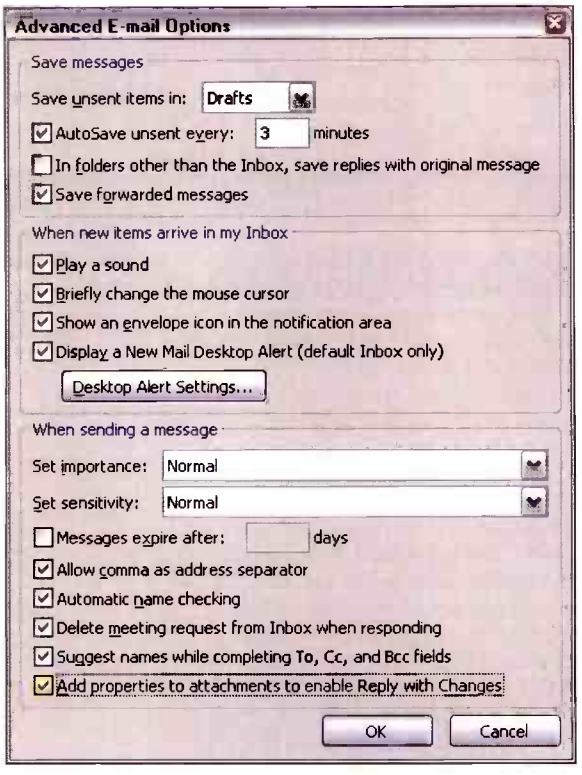
```
Sub Noreview()
CommandBars("Reviewing")↙
.Enabled = False
End Sub
```

(Key: ↙ code string continues)

This disables the toolbar completely – you won't be able to open it from the View menu, and nor will any documents. If you want to automate this, then name the macro 'Autoexec' (or add the code to an existing Autoexec macro) and save it in Normal.dot. If you want the toolbar back, create another macro named 'Yesreview', identical to the first but substituting 'True' for 'False'.

You may find a similar problem with the Web toolbar when you go anywhere near a hyperlink in a document. The cure is to use a similar macro containing the line:

```
CommandBars("Web").↙
Enabled = False
```



Prevent outgoing documents from summoning the Review toolbar

Again, you can put this in an Autoexec macro, and re-enable the toolbar with a 'True' value.

Hidden treasure

If you are using Word XP or 2003 and want to track changes using the Reviewing toolbar, be aware that revised text may still be present – but hidden – in the document after you Merge changes. Other data from previous authors, comments, custom properties and more may also be hiding. If you open a Word file in a hex editor – or even Notepad – you will be surprised at what's there. If this is likely to cause embarrassment or security issues in documents you email, then the Microsoft Hidden Data Removal tool is what you need. It's free from **www.microsoft.com/downloads**: use the search tool on the page to find 'hidden data'. We must confess that we couldn't get it to work from within Word, despite tweaking the macro security settings. It did, however do a good clean-up in command-line mode and in Excel, so investigations continue.

A clash of symbols

Further to Roger Castle-Smith's problem on getting Word's Autocorrect to substitute a degree symbol for the letters 'deg' without leaving a space between the number and the symbol (*PCW* July), David Kelsey has come up with a much simpler solution. Go to Insert, Symbol and choose your symbol. Then press the Autocorrect button in the Symbol dialogue. Type the text you want replaced, eg, deg, then click the Add button and close the Autocorrect and Symbol dialogues. You should now find that '25deg' (without a space) will be corrected to '25°'. This only seems to apply to numbers – typing 'Microsofttm' for example, will not work. To get a trademark symbol you need to enclose 'tm' in brackets if you don't want a space.

Four-up

Readers Sarah Birkin and David Buley independently came up with a more elegant way to split an A4 page into four sub-pages than our method of using labels in August's column. You'll need Word 2000 or later. First, go to Page Setup and create a custom paper size of 10.5 x 14.85cm (A6), with margins to suit. Next, create your multi-page document, using page breaks to move to the next pane. Finally, in the Print dialogue, set the 'Pages per sheet' in the Zoom panel to four, with no scaling. Which just goes to show that we too can miss the obvious.

Perfect price

Good news for Wordperfect fans – Corel has released two new packages for home and small-business users. The small-business edition has Quattro Pro, Presentations, Norton Internet Security, Wordperfect and more, all for £175 including VAT. The home edition includes Wordperfect and Quattro Pro, Office Ready Personal Finance and Encyclopaedia Britannica Ready Reference 2005. This costs £69.32 including VAT, bringing it much nearer in price to Star Office and Ability Office than Microsoft 'megabucks' Office. For more information visit **www.corel.com**.

CONTACTS

Tim Nott welcomes your comments on the Word processing column. Email him at: wp@pcw.co.uk. Please do not send unsolicited file attachments.

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. A US citizen, he now resides on the Essex coast

Best laid plans

Why waste time learning a dedicated interior design program when Excel can do the job?

The problem with interior design software is not its purchase cost. Such packages are often inexpensive. It's the time it takes to learn how they work. If you just want to produce one floor plan, and you are comfortable formatting a spreadsheet, Excel can do the job perfectly well (see screenshot 1).

The first thing is to measure up the room and note the position of the fixtures. On the worksheet, create a grid. If your default row height is 12.75 with a column width of 1.71, this will divide the workspace into squares similar to those on graph paper. Then decide on a scale. Each square could represent 10cm. To indicate the walls select Format, Cells, Patterns and choose, I suggest, an ochre colour with a black cross-hatch pattern. Leave gaps for windows and doors.

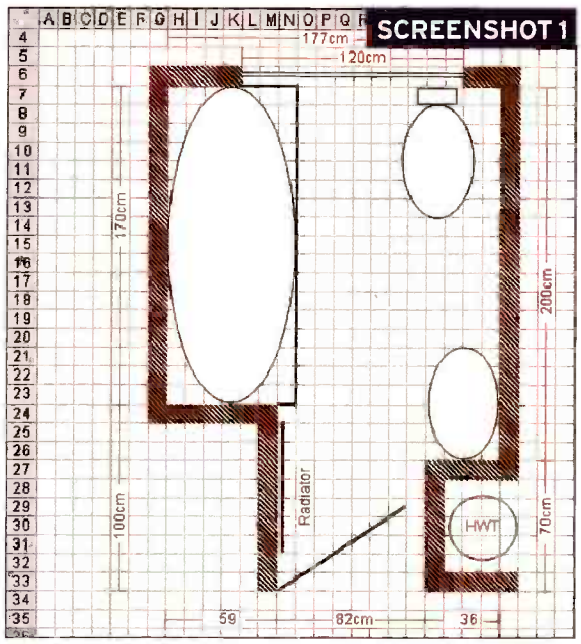
Display the Drawing toolbar. Select the Line tool. Hold down the Shift key and draw a horizontal line to indicate the glass of the window. If it's double-glazed, right-click on the line and select Format Autoshape, Line, Style, 3pt double-line.

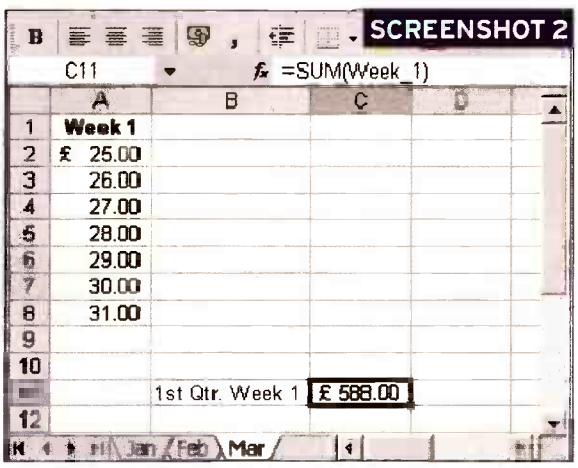
Draw a 2pt black line for the door at about 45°. Other linear fixtures like a radiator can be reproduced the same way. Any line which coincides with the edge of a square – the outside edge of the bath in this example – can be created using Format, Cells, Border.

The bath shape, basin, and toilet are drawn with the Oval tool on the Drawing toolbar. Draw it first roughly then you can change its shape, placement and angle on the worksheet. Click beside a shape to fix it in position. The cistern behind the toilet here was drawn with the Drawing Rectangle tool.

To insert dimensions, indicate the ends of the lines using cell borders. Draw the lines with the Line tool. To run a description centred over several cells, highlight them and choose Format, Cells, Alignment, Text control, Merge cells. To run text vertically, choose Format Cells Alignment, Orientation, Text and drag the indicator around the half clock face.

Insert any captions and titles and you're done. The job takes less time than this description suggests, and alternative plans for remodelling a bathroom can be created just as easily.





Top: A bathroom floor plan created in Excel

Bottom: creating a 3D formula gives you results for Jan, Feb and Mar

Labels in formulas

Excel users frequently create Range Names to represent a range of cells without realising they could often just use column labels instead of Names. Just choose Options on the Tools menu, under the Calculation tab, choose Accept labels in formulas. Save the file.

If you have a column of figures headed Jan you could total them using, =SUM(Jan). If you have three columns, headed Jan, Feb and Mar, you could total them all using =SUM(Jan,Feb,Mar).

You could also use a stacked label. If you enter Jan in F1 and Results in F2, and have numerical values entered in F3:F12, you could total them in F13 using =SUM(Jan Results). The function arguments are interactive, so if you change F1 to Feb then F13 will change to =SUM(Feb Results). In an example like this, you would get the same result using =SUM(Feb). That's because Excel would accept Jan or Feb as column labels and ignore the text in F2 when totalling the values.

Excel will also accept a combination of row and column labels. If the total for January is in B9, the column label is Jan and the adjacent row label is Month then you can refer to the contents of B9 elsewhere using, =Month Jan. No comma, no quotes.

To create a 3D formula, drilling down through a workbook, Excel offers an even easier way than using column labels. Say you have three worksheets and the tabs are titled Jan, Feb, Mar. Each sheet has results for days of the week in cells A2:A8. Cell A1 on each sheet holds the column heading Week 1. On the Insert menu, point to Name, and click Define. In the Names in workbook box, type Week_1. In the Refers to box, type = (equals sign). Click the Jan tab. Hold down Shift and click the Mar tab. Highlight cells A2:A8. The Refers to box will then read, =Jan:Mar!$A$2:$A$8. Click Add. Then in any cell you like you can enter, =SUM(Week_1) to display the total of Week 1 for all three months (see screenshot 2).

Rather than use labels you may wish to use a keyboard shortcut to turn labels into Names.

If you have a column-heading label in cell D1 and data in the range D2:D30, highlight the full range D1:D30 and press Ctrl & Shift & F3. A dialogue box will say 'Create Names in Top Row'. Click OK. To confirm the Name is made, highlight the data range D2:D30 and the label will appear in the Name box on the left of the Formula Bar.

To list the available Names on your worksheet, click an empty cell, press F3 and click the Paste List button in the Paste Name dialogue box.

CONTACTS

Stephen Wells welcomes your comments on the Spreadsheets column. Email him at: spreadsheets@pcw.co.uk. Please do not send unsolicited file attachments.

Niall Magennis
has been dabbling in Midi and digital audio since the days of the Atari ST. He writes on a freelance basis for a number of music magazines and lives in London in a flat overrun with music equipment

Broadcast your own show

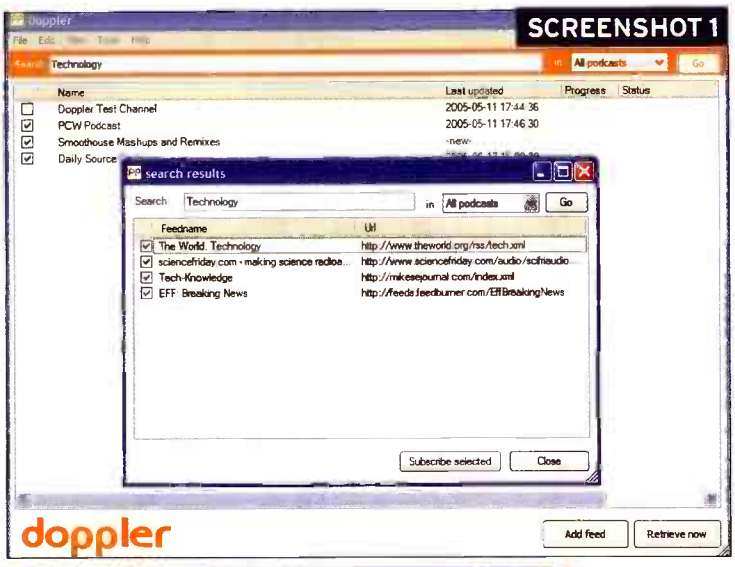
Fancy having a go at your very own radio programme? It's easy with a podcast

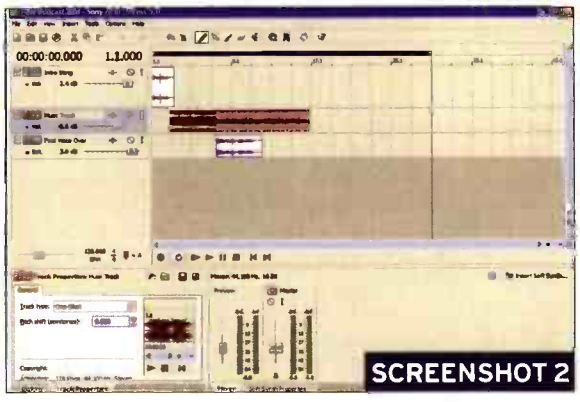
Every once in a while the web throws up a new trend that creates so much excitement you're slightly disappointed when you discover it hasn't turned out to be news of the Second Coming. The latest buzzword on the tip of everyone's tongue is podcasting. The name, conjuring up the style of the Ipod and the hip world of broadcasting, makes the concept sound very cool. However, podcasting could very well have just been called web radio, because that's pretty much what it is. Those who podcast create a radio show using audio-editing software and then send it out to people who want to listen to it on their computer or mp3 player. That might make it seem boring, but some people are producing really interesting radio shows on everything from the new technology to the latest in the world of knitting. Some of the top podcasts are attracting audiences numbered in the thousands. That's not to be sniffed at when you're talking about a technology that's only a year or two old.

Behind the scenes

The clever bit about podcasting is not so much the way podcasts are created, but the way they are distributed. With traditional web radio you click on, say, a Shoutcast link (**www.shoutcast.com**) and the audio starts streaming to your computer. However, podcasts are not designed to be streamed from a website. Instead the shows are pushed out to people who have subscribed to the podcast feed. A technology called RSS is used to distribute the audio files. RSS has been used in the past for pushing out tickertape-style text feeds from news sites, but the ability to encapsulate audio and other files in the feed was added to the technology in 2001. In 2003, Dave Winer, one of the driving forces behind RSS technology, and Adam Curry, an ex-MTV video jockey and Internet entrepreneur, started using it for creating radio show-type feeds, and the idea of podcasting was born.

For the listener, of course, the podcasting experience is quite painless. All you have to do is download a piece of free podcasting software, such as Doppler (**www.doplerradio.net**)





Top: Listeners can receive podcasts via easy-to-use software, such as Doppler

Bottom: Acid Xpress is available as a free download

(see screenshot 1) or Ipodder (**www.ipodder.net**) and do a search for the show you want to sign up to, or enter the web address of the RSS feed directly. The podcasting software will automatically grab any new episodes of the show that are posted. If you have your podcasting software set up with the synch software for your mp3 player, such as Itunes, the shows will automatically be transferred to your player the next time you connect it to your PC. It's relatively simple and straightforward. It's also set to become even easier and probably more mainstream, with the recent addition of podcasting support to version 4.9 of Apple's Itunes.

Roll your own podcast

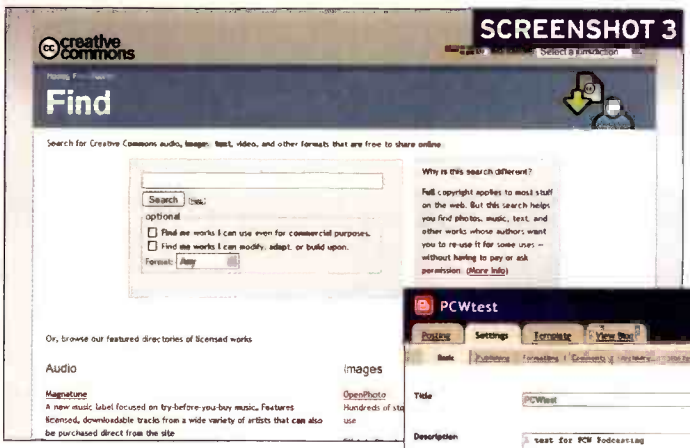
Of course, if you want to create your own podcast it can be a bit more difficult to know where to start. That's why we're going to give you a complete rundown of how to put your show together, upload it to your web space and create the RSS feed to distribute it to subscribers. We're going to break it down into easy steps so you don't have to be an audio expert or even know anything about web development, to get a show up and running. All you need is some audio-editing software, some webspace for storing mp3 files online and a few hours.

If you fancy having a go at being one half of Smashie and Nicey you'll first need some software to allow you to put together your show. There are tons of audio editors around that allow you to record audio, but to create a professional-sounding podcast you'll need an audio package that's multi-track capable. This means the software can mix together multiple different streams of audio into a single stream. So, for example, it can mix a recording of your voice over some backing music. However, to put together a podcast easily you really need to be able to slide different tracks around on a timeline.

The best option is a program called Acid from Sony. This is a loop sequencer designed for putting together music tracks, but it works well for podcasts. Luckily there's a cut-down, free version you can download called Acid Xpress (**http://tinyurl.com/dcoh2**) (see screenshot 2).

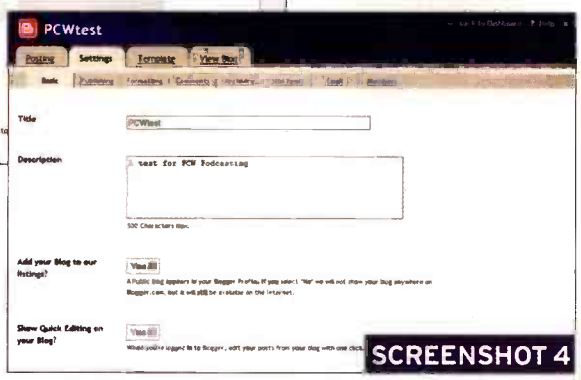
When you've downloaded and installed the software, start it up and enter the registration details. Once this is complete, Acid will load in the default demo song. Close down this demo tune and start a fresh project by selecting File, New. Give your project a name, something like podcast Show 1 will do and click OK.

You'll now be presented with the Acid Xpress main arrangement window. It takes the form of a timeline with the individual audio tracks stacked on top of each other. You can record or load audio files into the tracks and they will spread out across the timeline. You'll then be able to move the tracks on the timeline to dictate where they should appear.



Left: You can find music that's free to use via the Creative Commons website

Below: Blogger allows you to create a blog that you can later turn into an RSS feed



Adding voice to the mix

Before you can record your voice you need to plug a microphone into your PC. Most audio connectors on modern PCs are colour coded with the microphone socket marked in red. Next open up your computer's soundcard mixer applet – you can usually find it in the Entertainment section of the Accessories folder in the Start menu – and make sure the microphone input isn't muted and the input volume slider is set at around three-quarters level. Return to Acid Xpress and click on the Record button to bring up the pre-record window.

Make sure the Monitor box is ticked and check the recording volume by speaking into the mic. If necessary, use your soundcard's mixer applet to adjust the microphone input volume. Once you've got the volume set correctly, click on the Record button and record an intro for your podcast.

Content is king

Now that you've got an intro recorded you'll want to add some music. If you are distributing your show on the net you can't use copyright tracks from CDs. You can find royalty-free music at the Creativecommons website. Go to **www.creativecommons.org/find** and do a search (see screenshot 3). Once you've got a tune you want to use return to Acid Xpress. Right-click below Track One and select Open from the menu that pops up. Use the file browser to select the mp3 file you've just downloaded and load it in. Once it's loaded you can use the pencil tool to 'paint' the audio onto the track. You can then click and drag the audio file around on the time line to position it correctly. Turn off the 'snap to bar' feature by hitting the F8 key to accurately position the audio.

By adding more voiceovers and extra mp3 tracks you can build a complete show. Unfortunately Acid Xpress doesn't include any effects, but you can always upgrade to the paid-for version and start adding echo, reverb and other effects to your recordings to create stings and jingles.

Once you've finished putting your show together you need to convert it into an mp3 file. Acid Xpress features a built-in mp3 encoder you can use a limited number of times to convert your show into mp3. To use it, click on the File menu and select Render As. Now choose mp3 in the Type box and '128kbps, CD Quality Audio' as the bit rate in the Template box. Enter a name and click Save.

World broadcasting

With the podcast completed and converted into mp3 format you need to upload it to your webspace, using an application like FlashFXP to FTP. Remember to jot down the full address to the file for later.

We're going to set up a blog that we'll then convert into an RSS feed. This means that to push a new show out to your subscribers all you'll have to do is create a new entry in this blog.

Log on to **www.blogger.com** and create a new account (see screenshot 4). Select any of the templates and click on the Start Posting link. The editing page will appear and you'll see a row of tabs across the top. Click on the tab for Settings and when the sub-tabs appear beneath select the one marked Formatting. At the bottom of the Formatting page you'll see a dropdown box marked 'Show Link Field'. Change this box to the Yes setting and click on the Save settings button. Click on the posting tab again. Give the posting a title and in the 'Link' box enter the full address of where your podcast mp3 file is stored on your webspace. Fill in a description and then click on the Publish Post button. To check the link to your mp3 file is working click on the View Blog tab and then on the mp3 link.

Using Feedburner you can turn a blog into an RSS feed – ideal for distributing podcasts

RSS publishing

Once the link is correctly set up nip over to **www.feedburner.com**. Feedburner allows you to convert the blog into an RSS feed that you can use to automatically distribute the podcast (see screenshot 5). In the box on the front page of Feedburner enter the address **http://x.blogpost.com** where x is the name of your blog and click on the Go button.

On the Feedburner service page scroll down and tick the box marked Smartcast. On the bottom of the page you'll see the Feedburner URL for your podcast. Note this address. On the next page you'll be asked to create a username and password for a Feedburner account. Fill in the details and then click on the Activate My Feed button.

Your podcast is now active. You can test the feed by entering the Feedburner URL for your podcast into a podcast application such as Doppler. Once you're sure the link is working you can publicise the show on your website, blog or one of the podcasting directories on the Internet. When you want to publish a new show all you have to do is upload it to your website and create a new entry with the link in your special podcast blog. The new show will be automatically sent out to your subscribers. Just remember that distributing the show from your website can take up a lot of bandwidth, so if it becomes popular you might have to look for a specialist podcast hosting company.

CONTACTS

Hands on Sound will return in December issue. Niall Magennis welcomes your comments on the Sound column. Email him at: sound@pcw.co.uk. Please do not send unsolicited file attachments.

Ken McMahon
is a freelance journalist and graphic designer. His involvement with digital graphics began with a Commodore 64. He graduated to Macs and now works mostly with PCs. Draw your own conclusions

A shot in the dark

Even when there's limited natural lighting available, you can still take great videos

This being the October issue of *PCW*, you'll doubtless be reading it some time in late August. Already the days are getting shorter and the hours during which imaging, still or moving, is possible are limited. So what better time to look at the problems of shooting video in low light and at night-time?

Low-light and night shooting present similar problems for videographers as they do for photographers. At the risk of stating the obvious, there's not enough light. The photographer's answer to this is relatively straightforward – shooting with a wide open aperture and as long an exposure as is necessary to capture an image. Sensors capable of ISO ratings of 3,200 and even 6,400 are pushing the boundaries of low-light digital photography, and this trend will doubtless continue.

For video the problem is slightly more complicated, not least by the requirement to shoot at 25 frames per second (fps). Virtually every DV camcorder has a low-light mode – the equivalent of increasing the ISO rating on a still camera. This amplifies the signal from the sensor to produce a brighter image, with the kind of consequences you might expect – a considerable amount of noise accompanied by colour distortion. You can attempt to minimise this in an editing application, but it's never going to look brilliant.

You can often get better results using the camcorder's manual exposure settings. Start by opening the aperture to its widest setting – and bear in mind that high zoom settings will reduce the maximum aperture. If that isn't enough you'll need to set a slower shutter speed. The default shutter speed setting on camcorders is usually 1/50th of a second, but there's scope for increasing this substantially.

There are, of course, reasons for the default 1/50th of a second setting. First, it's fast enough to capture most movement, the odd bit of motion blur isn't that noticeable at 25fps and in fact the use of faster shutter speeds that freeze every last bit of motion tends to introduce an uncomfortable jerkiness to video footage.

Above: Manually reducing the shutter speed can be a better option than using automatic low-light modules – but use a tripod

Right: Boosting the gain allows you to shoot in very low light, but introduces noise and colour distortion

The second reason is that at exposures slower than 1/50th of a second, it's not possible to maintain 25fps interlaced Pal video. Usually, the first thing to go is interlacing, so the vertical resolution is halved from 576 lines to 288. And at much slower shutter speeds, the frame rate will also drop – at 1/10th of a second, you're shooting half-vertical resolution video at 10fps. Clearly, you're going to need a tripod, and any subject movement is going to be blurred and erratic (see screenshot 1).

Setting exposure controls manually may enable you to get marginally better results than using the automatic low-light mode, and on many models you can also set the gain manually, which, if nothing else, will at least give you an idea of how much you're having to boost the signal and therefore how much image degradation to expect (see screenshot 2).

Another thing worth keeping an eye on in low-light situations is the white balance and focusing, both of which have a tendency to perform badly in less than optimum lighting. The solution, once again, is to use manual controls if your camcorder has them. Use a white card, or some other neutral surface – such as a wall or t-shirt – to take a manual white balance reading.

While these techniques will help you get the best results in low-light conditions, you need to resort to different tactics when there's little or no light. In total darkness there's no substitute for shooting in infra-red mode (see screenshot 3). Not all camcorders support this, but if you plan on doing a lot of night shooting – nocturnal wildlife, for example – you should look for a camcorder with this feature. Sony's DCR-HC40E is a good example. In 'Super Night Shot' mode a small infra-red lamp

Buying a camcorder for low-light shooting

There's no easy way of comparing the low-light performance of DV camcorders. Manufacturers are fond of quoting minimum illumination requirements in lux – the International System unit of illumination – but these figures are at best confusing, at worst meaningless.

For one thing, cameras with an infra-red shooting mode invariably have a zero lux rating. For another, the lux rating merely tells you how much light there needs to be for the camcorder to form an image – not what that image will look like, so comparing the lux ratings of models you're considering buying won't tell you much unless you can see the footage that is produced in these conditions.

A camcorder's low-light performance is mostly determined by the amount of light passing through the lens, so compare the maximum aperture values of potential models. Larger CCDs are generally more sensitive and have better signal-to-noise ratios. Consumer mini-DV camcorders generally have 1/6in or 1/3in CCDs, whereas professional models use 1/3in sensors.

Cameras such as the Sony DCR-HC40E have an infra-red mode for shooting in total darkness

mounted on the front of the camera illuminates the subject (you can't see it, as infra-red is invisible to humans and most animals). The camera's infra-red filter, normally positioned in front of the sensor to prevent it from registering infra-red, is moved to one side and your camcorder can see in the dark.

Infra-red footage is black and white and the range of the lamp is fairly limited, so your subject needs to be within about two metres and directly in front of the camera. If there's any ambient light at all, the HC40E manages to pick up some colour in the image, but generally it doesn't get much better looking than surveillance CCTV.

In certain situations you may have to shoot in the dark, but a frequently used movie trick is to shoot 'day-for-night'. This involves shooting in broad daylight and post-processing to make the footage look like the dead of night. With film, this is achieved by placing a blue filter over the lens and under-exposing by a couple of stops. DV offers even more scope for this technique, both in the camcorder and at the editing stage.

The first thing to understand about shooting day-for-night is that lighting conditions can make all the difference. Paradoxically, the best conditions for simulating night shots are bright sunshine and a cloudless blue sky. Low sun is good for creating moonlit shadows, so try for early morning, late evening and any time in the winter.

An effective in-camera day-for-night technique involves setting the camcorder white balance to its tungsten or indoor position. Artificial lighting is warmer than daylight, so this has the effect of introducing a blue cast that simulates moonlight very well (see screenshot 4).

There's plenty you can do to footage shot like this in your editing application that will further enhance the effect. Essentially, this boils down to reducing the exposure and saturation, adjusting the blue cast and increasing the contrast. You can also use colour balance controls to introduce a cast into footage that has been shot with the white balance correctly set for daylight. If that's the case, you may ask, why bother changing the white balance in the first place? Well, one of the advantages of adjusting the white balance in-camera is that in-shot light sources, such as car headlights, torches and illuminated windows, appear white, which enhances the illusion that everything else is illuminated by moonlight.

Skies are one of the biggest headaches in day-for-night. Even using the tungsten white balance trick and under-exposing or adjusting levels in editing, daytime skies don't make convincing night-time ones. Again, at the risk of being obvious, they're just too bright. The best solution is to try and omit the sky altogether, or at least obscure as much of it as you can behind buildings, trees, or whatever else is available. If you can't avoid an open sky shot, a polarising filter will help to make it darker or, failing that, a graduated neutral density filter will produce a similar effect.

You can darken a sky very effectively using your video-editing application's keying tools to select it and replace the colour. Blue screen, lumakey and chromakey filters produce good results with blue skies (see screenshot 5). To find out how to replace the sky or other background detail using Adobe Premiere Elements 1, see *PCW* May 2005, page 174.

Top: Create realistic night skies using chromakey, lumakey, or colour key filters in your video editor

Left: Shoot outdoors with the white balance set to indoors to achieve a moonlit effect

Day-for-night plug-ins

There are several plug-ins available for Premiere After Effects and other editors, which are capable of producing good-quality day-for-night effects without too much effort.

Digital Film Tools 55mm suite is a plug-in for After Effects, Premiere, Avid editing systems and Apple Final Cut Pro as well as Photoshop . See the website (www.digitalfilmtools.com/55mm) for a full list of supported applications. As well as the day-for-night effect, the suite includes colour correction and balancing filters, cross-processing, bleach bypass and Faux film.

Like 55mm, Digieffects Delirium costs $695 (£396) (www.digieffects.com). As well as day-for-night, it has almost 50 other effects, including fireworks, lens flares, rainfall, smoke, specular lighting and fog factory. It's an After Effects plug-in available for Windows and Mac OSX.

In addition to a suite of filters for creating film looks and effects, Red Giant software's Magic Bullet Editors includes a day-for-night filter and costs a more affordable $279 (£159). Supported software includes Premiere Pro, Vegas, Avid (Media Composer and Xpress) and Final Cut Pro.

CONTACTS

Ken McMahon welcomes your comments on the Digital imaging & video column. Email him at: digitalimaging@pcw.co.uk. Please do not send unsolicited file attachments.

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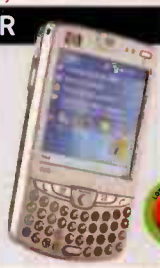

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3M39PW	TravelMate 8101WLMi P-M 730	1078.99	918.29
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3K4BPW	iBook G4 1.33GHz 256MB 60GB	1024.99	874.03
3k4WPW	iBook 1.2GHz 256MB 30GB 12.1"	693.25	590.00
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3RD2PW	Amilo Pro V2010 Celeron M 340	446.49	379.99
3RJMPW	V2010 Celeron M370 WLAN XPPRO	539.33	463.82
3RJNPW	V2010 Celeron M370 WLAN XPPRO	1395.00	502.97
3RJQPW	V2020 PM725 40GB WLAN XPHOME	680.33	563.40
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3NJPPW	zd8181EA P4 640 1024/80 XPH	1172.99	998.29
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3P6XPW	P28se LVC350 Cel-M 350 1.3Ghz	540.49	459.99
3NG1PW	P28se LVC 350 Celeron M 1.5GHz	518.99	441.69
3NG0PW	P28se MVC 730 Pentium M 730	719.10	612.00
3MWQPW	P28 HVM 730 1.6GHz 512MB 40GB	763.74	649.99
3P6YPW	X20 Home Special Cel-M 730 1.6	798.99	679.99
3NG7PW	X50 LWC 740 Pentium M 1.73Ghz	1320.00	1123.40
3MRHPW	X25 HVM 750 Pentium M 1.86GHz	1451.13	1235.00
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3FN7PW	A217M Centrino P-M 725	1349.99	1148.93
3KJ1PW	A397XP Centrino 760	1697.87	1445.00
3NKMPW	A417M Centrino P-M 750	1173.82	999.00
3NKKPW	A417S Centrino P-M 760	1699.99	1446.80
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3KJ7PW	S3HP Centrino 730 512MB	1350.07	1149.00
3NKYPW	S4HP/B Centrino P-M 740	1454.99	1238.29
3Q3ZPW	S4M Centrino 730 512/60G	1236.99	1052.76
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3KJ5PW	T2XP/L Centrino 753	1551.00	1320.00
3KJ4PW	T2XP/S Centrino 753	1551.00	1320.00
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35YJPW	Rechargeable Battery A Series	159.54	136.23
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3L73PW	Sat Pro L10 Cel-M 370 1.5GHz	546.36	464.99
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3R96PW	Tecra A5 P-M 730 1.6/XP PRO	850.99	724.25
3RHDPW	Tecra A2 P-M 735 1.7Ghz XPP	857.74	729.99
3MWYPW	Tecra A4 P-M 730 1.6GHz 512MB	978.78	833.00
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3J1BPW	Tecra A2 P-M 745 1.8Ghz 512MB	904.74	769.99
3F91PW	Tecra M2 P-M 725 1.6GHz Centri	1135.99	966.80
3MX3PW	Portege M300 P-M 753 1.2GHz	1135.99	966.80
3K29PW	Portege R100 P-M 733 1.1GHz	1173.83	999.00
3PQVPW	Tecra A3 P-M750 1.68 XPP 15"	1192.99	1015.31
	HP NX6110 NOTEBOOKS		
3LQ3PW	nx6110 Cel-M 360 256/40 XPH	458.24	389.99
3LQ4PW	nx6110 Cel-M 360 256/40 XPP	479.99	408.5
3LQ5PW	nx6110 P-M 730 512/40 XPP	622.74	529.99
3LQ6PW	nx6110 P-M 740 512/60 XPP	681.49	579.99
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3MLPPW	nc6120 P-M 730 512/40 XPP	768.99	654.46
3L0PPW	nc6120 P-M 740 512/60 XPP	813.99	692.76
3PJFPW	nc6120 P-M 750 512/40 XPP	1729.59	1471.99
3MLSPW	nc6120 P-M 750 512/80 XPP	875.99	745.52
	HP NC8230 NOTEBOOKS		
3RXSPW	nc8230 PM 750 512/60 XPP	1124.99	957.44
3PJBPW	nc8230 P-M 740 512/40 XPP	1373.56	1168.99
3RRYPW	nc8230 P-M 750 512/60 XPP	1509.99	1285.1
	IBM		
3R11PW	Thinkpad R50e Cel M 330 1.4GHz XPP	493.49	419.99
3PXGPW	Thinkpad R50e P-M 725 1.6GHz XPP	619.21	526.99
3NFHPW	Thinkpad R51 P-M 725 1.6GHz XPP	728.49	619.99
3R14PW	Thinkpad R50e P-M 735 1.7GHz XPP	763.74	649.99
3Q7XPW	Thinkpad R51 512MB 60GB 15"	889.99	757.44
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3M2NPW	Veriton 3700G P4 2.66Ghz 256MB	458.99	390.63
3M2TPW	Veriton 3600GT P4 2.8GHz 256MB	458.99	390.63
3P8YPW	Foxconn Athlon 64 3000 T140	500.00	425.53
3M2JPW	Veriton 7700G P4 2.93Ghz 512MB	583.99	497.01
3PJ8PW	T630 Intel P4 540 + 17" monitor	650.00	553.19
	APPLE		
3L8MPW	Mac mini G4 1.25GHz 40GB Combo	338.99	288.51
3L8NPW	Mac mini G4 1.42GHz 80GB Combo	398.99	339.57
	FUJITSU-SIEMENS		
3L5RPW	Scenic X102 P4 2.93GHz 256MB	387.74	329.99
3L5NPW	Scenic X102 Cel D330 2.66Ghz	281.99	239.99
3L5QPW	Scenic X102 Cel D330 2.66GHz	333.69	283.99
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3PSBPW	ThinkCentre Intel Cel D 2.6 256mb 40gb CD	270.66	230.35
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3RN2PW	a1109 Cel-D 335 256/80 XPH	350.00	297.87
3NHXPW	a1020 AMD Ath3200+ 512/160 XPH	415.99	354.03
3RN1PW	M7140 P4 516 512/160 XPH	631.00	537.02
3RN0PW	w5161 P4 630 1GB/160GB XPH	859.99	731.91
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3P5CPW	dx2000 P4 2.8Ghz 256/40 XPP	422.99	359.99
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	HP DC5100 SMALL FORM FACTOR		
3ND0PW	dc5100 P4 520 256/40 SFF XPP	467.99	398.29
3ND1PW	dc5100 P4 520 512/80 SFF XPP	527.99	449.35
3P5GPW	dc5100 P4 530 512/80 SFF XPP	571.99	486.8
	HP DC5100 MICRO TOWER		
3NCQPW	dc5100 P4 520 256/40 MT XPP	422.99	359.99
3NCSPW	dc5100 P4 520 512/80 DVD MT XPP	478.99	407.65
3NCYPW	dc5100 P4 530 512/80 MT XPP	528.99	450.2
	HP DC7100 SMALL FORM FACTOR		
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39D2PW	dc7100 P4 520 512mb/80 XPP	522.88	445
39D3PW	dc7100 P4 530 512mb/80 XPP	605.00	514.89
	HP DC7100 CONVERTIBLE MINI TOWER		
39C7PW	dc7100 P4 530 512mb/80 XPP	560.48	477
39CQPW	dc7100 P4 530 512mb/80 XPP	628.99	535.31
	HP DC7100 ULTRA SLIM DESKTOP		
3GZTPW	dc7100 USDT P4 520 512/40 XPP	543.99	462.97
3PD4PW	dc7100 USDT P4 530 512/80 XPP	721.99	614.46
	HP DC7100 CONVERTIBLE MINI TOWER		
3BSGPW	HP Compaq dc7100 CMT P4-520	586.99	499.57
3BSCPW	HP Compaq dc7100 CMT P4-530	711.99	605.95
3BLYPW	HP Compaq dc7100 CMT P4-550	932.99	794.03
	HP THIN CLIENT		
3RXMPW	T5520 VIA 800MHz 128MB 64MB	212.44	180.80
3P5JPW	T5510 TM5700 800Mhz 128MB	213.84	181.99
3P5KPW	T5710 TM5700 800MHz 256MB	301.96	256.99
3Q3BPW	TM5700 1.2GHZ 256MB 256MB	412.99	351.48
	SONY VAIO		
3GD8PW	RA204 P4 560 1G/400GB DVD+/-DL	1173.82	999.00
3PY4PW	V3M P4 3.2GHz HT 512MB 250GB 17"	1424.99	1212.76
3MR8PW	V3S P4 3.4HT 512MB 250GB DVD+/-DL 20"	1642.65	1398.00
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- DVD+ - R/+ - RW
- Lightscribe Technology
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•Intel Pentium 4 3.2E GHz with HT Technology •512MB RAM •250GB HDD •Dual Layer DVD+/- RW Drive •20" TFT

only **£1643.82** (£1399.00 ex VAT)

PAVILION A1109 UK PHOTOSMART PC

quicklinx 3RN2PW

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- Intel Celeron D 335 Processor
- 256MB DDR / 80GB HDD
- DVD+ -/+ - RW
- Windows XP Home

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ViewSonic
See the difference

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The ViewSonic VE710 LCD display not only brings images to life with vivid colour and outstanding realism. Its stylish design is also sure to catch your eye. Delivering ViewSonic's renowned image quality, it enhances your viewing comfort with high brightness and progressive styling.

- 1280 x 1024 Resolution
- 450:1 Contrast Ratio
- 8ms Response Time
- Three-year limited warranty

AMAZING VALUE - NEW LOW PRICE

•1280 x 1024 resolution •450:1 contrast ratio •Anti-glare surface
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With this in mind, not only is it an excellent monitor for all business applications but it shows added advantages in graphics, video and DVD movie play. Furthermore, it is equipped with a digital DVI-D input in addition to the standard VGA connector.

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iiyama

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A solid feature set, a 3 year on-site UK warranty and superb value for money. A 12msec response time and 500:1 contrast ratio ensures that video and gaming are just two of the applications that will suit it.

- 1280 x 1024 resolution
- 500:1 contrast ratio
- 12ms response time

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SONY
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•Incredible image quality and precision •12ms response time
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CTX

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LG

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3J5LPW	F415 15" TFT Display Black	115.98	98.71
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3JWZPW	F419 19" TFT Display Black DVI	187.98	159.98
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3Q6VPW	FP737S-D Silver/Black 17" TFT	147.71	125.71
3JBJPW	FP 767-12 17" TFT Display	155.06	131.97
3JBNPW	FP 937S 19" TFT Display Silver	205.39	174.80
3KTQPW	FP71E+ 17" TFT Display 8ms	184.99	157.44
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3JX1PW	Prolite E380S-S 15" TFT Display	136.30	116.00
3Q7NPW	17" TFT ProLite E431S Black	184.48	157.00
3R66PW	17" TFT Prolite E431S Silver	208.66	177.58
3R71PW	Prolite H431S-B 17" TFT Black	229.82	195.59
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3Q7RPW	19" TFT E481S-S ProLite Silver	289.99	246.80
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31F1PW	Prolite E511 20.1" TFT Monitor black	548.73	467.00
31JPPW	Prolite H540S 21.3" TFT Black	817.80	696.00
356PPW	Prolite H540S 21.3" TFT Ivory	875.99	745.52
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36GYPW	L1715S 17" TFT Display Silver	147.40	125.45
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2TK1PW	1720B 17" TFT Monitor Blk/Slv	175.25	149.15
2X0YPW	L1710M 17" TFT Monitor Speaker	193.29	164.50
3R7FPW	L1915S 19" TFT 12ms	212.42	180.78
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3JKWPW	200P4SS 20" LCD Display	644.99	548.93
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3MSZPW	SDM-HS75B 17" black	186.82	159.00
3MT0PW	SDM-HS75S 17" Silver	210.32	179.00
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3QYQPW	SDM-S75DS 17" TFT DVI-D Silver	226.12	192.45
3QYYPW	SDM-X75KS 17" TFT DVI-D Silver	242.42	206.32
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3G78PW	SDM-HS74P 17" X-black TFT	269.07	229.00
3MT3PW	SDM-HS75PS 17" Silver	279.99	238.29
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3JD6PW	iPAQ hx2410	337.99	287.65
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3JD7PW	iPAQ hx2750	411.25	350.00
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2R7FPW	Charger Adaptor (Barrel)	15.99	13.61
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2R7QPW	Slim keyboard h5000/3900 serie	47.99	40.84
3FVWPW	Cradle Kit	47.99	40.84
3HWKPW	USB Desktop Cradle	52.99	45.10
2R7GPW	h5000 series slim battery	60.99	51.91
3K4QPW	Bluetooth Stereo Headphones	60.99	51.91
3KB5PW	h6300 series standard battery	62.99	53.61
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3KBFPW	hx4700 extended battery	122.99	104.67
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3PPFPW	LifeDrive - Mobile Manager	305.99	260.42
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3F3TPW	USB Docking Cradle	17.40	14.81
3F3NPW	International AC Charger	20.57	17.51
3H9QPW	Tungsten T5 Hard Carry Case	21.37	18.19
373QPW	64MB Expansion Card	23.58	20.07
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3HB2PW	Wireless Keyboard	41.66	35.46
3543PW	256mb Expansion Card	44.13	37.56
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3H9RPW	512MB Expansion Card	69.32	59.00
3FXXPW	WiFi Card	77.10	65.62
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3MY6PW	GO 500	469.98	399 99
3MY7PW	GO 700	549.99	468.08
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3KXWPW	Road Angel - Blackspot and Camera Alert	399.99	340.42
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•4.0GB hard drive •Onboard voice recorder, MP3 player
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HANDS-FREE CALLING

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- Just plug in, switch on & GO
- Simple touch-screen operation
- Clear, accurate turn-by-turn voice instructions
- Compact, portable design; easy to take from car to car
- Crystal-clear 3D graphics
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- Hands-free calling via Bluetooth™ connection with mobile phone

•Integrated GPS antenna •Postcode navigation (UK & Ireland)
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It combines two essential networking functions in one innovative product – an ADSL Modem with a 4-Port Router.

BELKIN

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DG834GT WITH FREE WG511T

802.11G

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Achieve speeds up to 108 Mbps! The Netgear DG834GT offers a modem, router, switch, 802.11g 108Mbps access point, and SPI True Firewall. Used with the PC Card it provides total mobility to access your home wireless router, office network, or public hotspots.

NETGEAR

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This 802.11g wireless network PCI card works as an ideal standalone to give you instant networking capabilities. It features breakthrough 802.11g technology that makes wireless file transfers and downloads faster than ever before.

BELKIN

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802.11g 54Mbps PCI CARD

quicklinx 3119PW

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- PCI card connects desktop PC to Wireless LAN
- Ad-Hoc and infrastructure communication
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UNBEATABLE PRICE

quicklinx 33SWPW

- LAN PC 802.11g 54Mbps
- IEEE-802.11g & IEEE-802.11b Standards
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- Supports 32bit Cardbus Interface
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802.11g 54Mbps USB STICK

LOWEST PRICE

quicklinx 39JVPW

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- Supports 64/128/256-bit WEP, WPA (TKIP, IEEE 802.1x) and AES functions for high level of security
- Supports peer-to-peer communication among any wireless users, no Access Point required

dabsvalue

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The Microsoft Digital Media Pro Keyboard makes it even more fun to work with your digital media. Zoom in and out of photos, documents and web pages with the zoom slider, and launch your favourite files and programs at the touch of a button.

Microsoft

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Burning CDs, downloading clips, playing music & DVDs ...today's PCs are bursting with possibilities. The LX-500 offers the perfect way to orchestrate the pieces for an even cooler media experience. And with Logitech's expert Power Management System, battery life won't be a problem.

Logitech

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395KPW	Wireless ADSL Modem Router & USB Adapt.	62.99	53.61
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3774PW	802.11g Wireless Print Server	50.53	43.00
36VSPW	125g Wireless PCI Adapter	33.63	28.62
3L8WPW	ADSL2+ Modem with High-Speed	75.00	63.83
31VYPW	802.11g Wireless Client Bridge	49.33	41.98
	BUFFALO		
3JK2PW	54Mbps Airstation Wireless Bridge	49.91	42.48
3NFBPW	54Mbps Cable/DSL Router	33.55	28.55
3GW2PW	125Mbps Wireless Notebook Adapter	33.39	28.42
	DLINK		
2THNPW	Wireless PCMCIA CardBus 11Mbps	20.10	17.11
24JJPW	4-Port Broadband Router	25.74	21.91
31NRPW	DWL-G650+ W/less PCMCIA Card	28.05	23.87
36YNPW	54mbps Wireless Access Point	45.92	39.08
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2Z9MPW	Wireless ADSL Modem 4 Port 802.11g	74.47	63.38
2D13PW	Wireless-G PCI Card	35.46	30.18
2D12PW	Wireless-G Access Point	48.59	41.35
2CM7PW	Wireless-G Broadband Router	49.60	42.21
	NETGEAR		
2NYGPW	54Mbps Wireless PCI Card	37.18	31.64
2DMGPW	WG511 802.11g Wireless PC Card	34.08	29.00
3KF6PW	WG111T 108Mbps USB 2.0 Wireless Adapter	40.77	34.70
2DMHPW	WG602 802.11g Wireless Access Point	45.92	39.08
2VCDPW	54Mbps Wireless ADSL Modem	69.33	59.00
3L1LPW	Wireless Modem Router & WG111T	92.83	79.00
	US ROBOTICS		
2WDHPW	100Mbps Wireless Turbo PC Card	33.02	28.10
2SLTPW	100Mbps Wireless Turbo PCI Adapter	31.18	26.54
22YYPW	56K External Faxmodem USB	48.29	41.10

KEYBOARDS

quicklinx	LOGITECH	£ inc VAT	£ ex VAT
248QPW	Deluxe Access Keyboard	11.84	10.08
39N4PW	Media Keyboard	15.28	13.00
3FXVPW	Cordless Desktop Express	27.00	22.98
39Z4PW	Cordless Desktop LX 500	28.28	24.07
3KMRPW	Cordless Desktop LX 300	31.67	26.95
3FHRPW	Cordless Desktop LX 501	43.48	37.00
248LPW	Cordless Desktop Comfort	46.66	39.71
3H7VPW	Cordless Desktop LX 700	53.80	45.79
3J1JPW	diNovo Cordless Desktop for Notebooks	67.19	57.18
3JQDPW	diNovo Media Desktop 2.0	115.76	98.52
	MICROSOFT		
22N8PW	Internet Keyboard White	11.22	9.55
3K8SPW	Internet Keyboard Black	11.67	9.93
39JFPW	Digital Media Pro Keyboard	20.36	17.33
2PKVPW	Natural MultiMedia Keyboard	27.32	23.25
2PKGPW	Basic Wireless Optical Desktop	37.73	32.11
37XVPW	Wireless Optical Desktop 3.0	47.88	40.75
2PKFPW	Wireless Optical Desktop Pro	48.05	40.89
2PKDPW	Wireless Optical Desktop Elite	55.23	47.00
3FKHPW	Wireless Optical Desktop + Fingerprint Read	57.60	49.02
3FKJPW	Optical Desktop Elite for Bluetooth	92.03	78.32
	BELKIN		
2V5KPW	Classic Keyboard	10.28	8.75
2V5JPW	Classic Keyboard, Black; USB Only	13.37	11.38
2V70PW	Mediaboard Pro W/2 USB	27.57	23.46

MICE

quicklinx	LOGITECH	£ inc VAT	£ ex VAT
3FXJPW	Click Optical	14.69	12.50
2Q4CPW	MX310 Optical Mouse	21.15	18.00
3FXNPW	Cordless Click Optical	23.78	20.24
39NCPW	Cordless Click+ Optical	27.75	23.62
33M6PW	MX510 Performance Optical	29.38	25.00
3FPQPW	MX1000 Laser Cordless Mouse	43.48	37.00
2T84PW	MX900 Optical Mouse Bluetooth	65.14	55.44
3QWFPW	Harmony 655 Remote Control	60.57	51.55
3QWCPW	Harmony 688 Remote Control	87.42	74.40
3QWBPW	Harmony 680 Remote Control	91.30	77.70
3QW9PW	Harmony 885 Remote Control	135.24	115.10
	MICROSOFT		
3F2RPW	Standard Wireless Optical Mouse White	16.47	14.02
3F2SPW	Standard Wireless Optical Mouse Black	16.65	14.17
396VPW	Wireless Optical Mouse Mood Ring	22.09	18.80
396TPW	Wireless Optical Mouse Groovy	22.34	19.01
37XSPW	Optical Mouse by S+ARCK Blue	24.09	20.50
37XTPW	Optical Mouse by S+ARCK Orange	24.09	20.50
2PK6PW	Wireless IntelliMouse Explorer Metallic Grey	25.33	21.56
2QNDPW	Wireless IntelliMouse Explorer Platinum	25.36	21.58
3FKFPW	Wireless IntelliMouse Explorer Bluetooth	49.93	42.49
	BELKIN		
2DH1PW	3 Button Mouse PS2 in Black	4.11	3.50
3LRPPW	Optical Mouse USB and PS/2 w/Scroll	6.82	5.80
2V6QPW	3 Button with/Scroll Mouse	7.34	6.25

INKJET PRINTERS

quicklinx	CANON	£ inc VAT	£ ex VAT
3F16PW	PIXMA iP1500	39.95	34.00
3F17PW	PIXMA iP2000	52.87	45.00
3F18PW	PIXMA iP3000	64.42	55.00
3F1BPW	PIXMA iP4000	89.99	76.59
3GW4PW	PIXMA iP5000	124.55	106.00
3GW6PW	PIXMA iP6000	129.25	110.00
3GW5PW	PIXMA iP4000R	141.00	120.00
3GW7PW	PIXMA iP8500	257.32	219.00
	EPSON		
376ZPW	Stylus C46UX	35.25	30.00
3770PW	Stylus C66	49.76	42.35
393PPW	Stylus C86 Photo Edition	68.15	58.00
2TDXPW	Stylus Photo R300	84.60	72.00
300KPW	Stylus Photo R800	205.62	175.00
	HP		
37MXPW	Photosmart 7450	71.01	60.43
36KWPW	Photosmart 7760	85.99	73.18
3GGFPW	Photosmart 8150 Printer	130.12	110.74
37MVPW	Photosmart 375	167.83	142.83

LASER PRINTERS

quicklinx	BROTHER	£ inc VAT	£ ex VAT
3MHMPW	HL-2040	79.70	67.83
308TPW	HL-5130	142.98	121.69
	EPSON		
2SRVPW	EPL-6200	192.78	164.07
2SRZPW	EPL-6200L	111.62	95.00
	KYOCERA		
3MKCPW	FS-720	133.90	113.96
3MKDPW	FS-820	153.26	130.44
	OKI		
3605PW	B4100	81.07	69.00
360DPW	B4250	151.57	129.00
	KONICA MINOLTA		
2WX8PW	Pagepro 1300W	89.95	76.56
	SAMSUNG		
3GV5PW	ML-1520 Mono Laser	81.07	69.00
30H0PW	ML-2550 Mono Laser	338.98	288.50
3JCBPW	CLP-550 Colour Laser Printer	333.99	284.25

SCANNERS

quicklinx	CANON	£ inc VAT	£ ex VAT
2483PW	Lide 20	39.99	34.04
38HXPW	Lide 35	52.87	45.00
3H45PW	CanoScan 4200F	85.19	72.51
36THPW	CanoScan 5200F	116.32	99.00
3H44PW	CanoScan 8400F	140.76	119.80
3H9WPW	CanoScan 9950F	301.98	257.01
	EPSON		
38NGPW	Perfection 2480 Photo	74.13	63.09
3958PW	Perfection 2580	84.60	72.00
2Q9GPW	Perfection 3170 Photo	136.08	115.82
3K75PW	Perfection 4180 Photo	164.31	139.84
3KZPPW	Perfection 4990 Photo	316.99	269.78
	HP		
2HY3PW	ScanJet 2400 1200dpi	41.77	35.55
3813PW	ScanJet 3770	55.85	47.53
360CPW	ScanJet 4070	95.05	80.89
2PTFPW	ScanJet 4600	99.96	85.07
2PTGPW	ScanJet 4670	122.66	104.39
3JXDPW	ScanJet 4670vp	123.08	104.75
2R84PW	ScanJet 5530C	184.43	156.96
340LPW	ScanJet 5590	269.99	229.78
2MG6PW	ScanJet 8200	382.99	325.95
VYPPW	ScanJet 7450C 2400dpi 48-bit	425.98	362.54
2MGCPW	ScanJet 8250	637.99	542.97
2MGGPW	ScanJet 8290	1269.99	1080.84

MULTIFUNCTIONS

quicklinx	CANON	£ inc VAT	£ ex VAT
3H9TPW	PIXMA MP110	75.00	63.83
3H9VPW	PIXMA MP130	105.53	89.82
3H9SPW	PIXMA MP750	184.47	157.00
3HBQPW	PIXMA MP780	199.99	170.21
	EPSON		
3DWXPW	Stylus CX3600	69.32	59.00
3DWYPW	Stylus Photo RX-420	83.82	71.00
37XJPW	Stylus CX6600	125.72	107.00
3L64PW	Stylus Photo RX-620	168.02	143.00
	HP		
35FKPW	PSC 1215	61.97	52.74
35FMPW	PSC 1315	89.49	76.16
340QPW	OfficeJet 4215	111.61	94.99
2R7YPW	PSC 1350	116.99	99.57
340RPW	OfficeJet 4255	126.22	107.42
2ZVZPW	Officejet 5510	135.57	115.38
39BSPW	PSC 2355	136.88	116.49
2C6MPW	OfficeJet 6110	150.87	128.40
2R80PW	PSC 2410	180.74	153.82
2DB8PW	OfficeJet 7110	225.68	192.07
3G13PW	Photosmart 2610	244.52	208.10
3GG5PW	Photosmart 2710	273.49	232.76
3HH2PW	OfficeJet 7310	310.19	263.99
3HGWPW	OfficeJet 7410	402.59	342.63

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The stylish, space-saving PIXMA iP4000 delivers superior lab-quality photos and a host of other capabilities. Benefit from outstanding photo quality with ContrastPLUS, bringing extra depth to photos.

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- Never miss a moment – take this stylish, compact and easy-to-use printer with you to parties, on holiday or anywhere else you'll want to share photos with friends.

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Get professional quality photos at breathtaking speeds with the world's fastest photo printer. Enjoy efficient printing with 6 individual HP Vivera ink tanks linking into a unique HP ink recirculation system for maximum pages per cartridge. The HP Photosmart 8250 Photo Printer is designed for home users wanting to produce professional-quality photos at lightningfast speeds, with the efficiency provided by an ink recirculation system that maximises use of the 6 separate cartridges.

- Save ink and money with six separate, easy-to-install HP Vivera Ink Cartridges – only replace inks that have run out.

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Professional quality photo printer with integrated 1.4" colour LCD. The Epson Stylus Photo R320 gives you the power to print real, high quality photos at home, at any time. Quick, easy and convenient to use, thanks to a 1.4" colour LCD and memory card support – it can bring your memories to life in minutes.

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This sheet fed, multifunction product includes colour printer, fax, copier, scanner & PC Faxing. It delivers fast inkjet printing with speeds up to 20ppm mono and 15ppm colour and photo-quality printing resolutions up to 6000 x 1200 dpi for exceptional colour output. No PC required for faxing and copying.

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Key to the cutting edge miniaturization of the Digital IXUS 50 is the ultra-high refractive index aspherical (UA) 3x optical zoom lens, which delivers outstanding optical performance and corner-to-corner clarity in an exceptionally compact form. It combines with the 5.0 Megapixel sensor to deliver superb images suited for photo quality prints to A3 size.

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DIGITAL CAMERAS

quicklinx	CANON	£ inc VAT	£ ex VAT
3F4WPW	Powershot A400 - Silver	91.65	78.00
3LHPPW	Powershot A510	116.32	99.00
3LSSPW	Powershot A520	154.99	131.91
3F4SPW	Powershot A95	184.47	157.00
3GKLPW	Ixus i5	193.86	164.99
3GKHPW	Ixus 40	194.97	165.94
3MK3PW	Ixus 50	226.76	192.99
31M6PW	Powershot S1 IS	229.12	195.00
36LQPW	Powershot S60	258.99	220.42
3MJPPW	Ixus 70	267.90	228.00
3F4VPW	Powershot S70	299.62	255.00
3NYGPW	Powershot S2 IS	343.76	292.57
3F4TPW	Powershot G6	364.25	310.00
31M5PW	Powershot Pro 1	463.83	394.75
3MHXPW	EOS 350D Digital SLR Body Only	616.87	515.00
3MHYPW	EOS 350D Digital SLR Lens Kit	629.80	536.00
	HP		
2PTJPW	Photosmart 945	197.29	167.91
32XSPW	Photosmart R707	172.30	146.64
3574PW	Photosmart R707 with Dock	205.38	174.79
37W6PW	Photosmart M307	91.74	78.08
37WXPW	Photosmart R507 with Dock	177.66	151.20
37WYPW	Photosmart R507	146.78	124.92
3F8HPW	HP Photosmart M407	132.31	112.60
3F9FPW	HP Photosmart M407#U with Dock	169.71	144.43
3HVZPW	Photosmart 375/R507 Camera	366.99	312.33
	OLYMPUS		
3GY6PW	C-370	92.82	79.00
3NW8PW	AZ-2	107.68	91.65
3Q54PW	C-180	112.38	95.65
3MLBPW	C-480Z	133.36	113.50
34R9PW	C-725UZ	153.13	130.33
3H2TPW	Mju Mini - Silver	176.53	150.24
34R8PW	C-765UZ	192.70	164.00
3ML7PW	Mju Mini S - Black	207.28	176.41
3ML6PW	C-55Z	212.79	181.10
3KHFPW	Mju 500	215.02	183.00
3GY3PW	C-70	291.40	248.00
3Q81PW	Mju 800	291.98	248.50
34CHPW	C-8080WZ	354.99	302.12
3LL2PW	C7070	377.59	321.36
3KNNPW	E-300 Digital SLR Camera Kit	539.32	459.00
3N1SPW	E-300 Digital SLR TWIN LENS	645.07	549.00
	PENTAX		
3N1TPW	Optio 50	116.32	99.00
3NK3PW	Optio S5N	186.82	159.00
3NK4PW	Optio WP	189.17	161.00
3FJDPW	Optio X	233.82	199.00
3FJCPW	Optio 750Z	384.22	327.00
	SONY		
3N2NPW	DSC-S40 Cyber-shot 4.1MP	123.99	105.53
3N2PPW	DSC-S80 Cyber-shot 4.1MP	159.99	136.17
3NLLPW	DSC-PS90 Cyber-shot 4.1 MP	179.90	153.11
3MF0PW	DSC-W55 Cyber-shot 5.1 MP	222.16	189.08
3L5JPW	DSC-P200S Cyber-shot 7.2MP	237.83	202.41
3MF1PW	DSC-W15 Cyber-shot 5.1 MP	222.07	189.00
3MF2PW	DSC-W7S Cyber-shot 7.2 MP	257.32	219.00
3MF3PW	DSC-W17 Cyber-shot 7.2 MP	279.99	238.29
3FPMPW	DSC-T3 Cyber-shot 5.1MP	264.37	225.00
3L8FPW	DSC-T33 Cyber-shot 5.1 MP	237.35	202.00
3FPNPW	DSC-V3 Cyber-shot 7.2MP	302.96	257.84
2QL2PW	DSC-F828 Cyber-shot	599.99	510.63

DIGITAL CAMCORDERS

quicklinx	CANON	£ inc VAT	£ ex VAT
3LHQPW	MV800	240.36	204.57
3LHRPW	MV830i	281.98	239.99
3LHSPW	MV850i	315.99	268.93
3MP4PW	MV880X	362.18	308.24
3LHTPW	MVX300	367.88	313.09
3LHVPW	MVX330i	404.67	344.40
3LHWPW	MVX350i	464.11	394.99
3N7JPW	MVX40	519.80	442.39
3NN5PW	MVX20i	567.51	482.99
3F7KPW	MVX25i	586.44	499.10
3F7LPW	MVX30i	633.32	539.00
3F7MPW	MVX35i	656.82	559.00
3N7KPW	MVX45i	670.51	570.65
	SONY		
3L6SPW	DCR-TRV270E Handycam Digital 8	225.99	192.34
3L6VPW	DCR-TRV285E Handycam Digital 8	256.99	218.72
3L6XPW	DCR-HC19E Handycam Mini DV	269.99	229.78
3L6WPW	DCR-TRV480E Handycam Digital 8	310.00	263.83
3L6ZPW	DCR-HC22E Handycam Mini DV	319.99	272.34
3L70PW	DCR-HC32E Handycam Mini DV	389.99	331.91
3L7GPW	DCR-HC39E Handycam Mini DV	448.74	381.91
3L7RPW	DCR-HC42E Handycam Mini DV	439.99	374.46
3L7TPW	DCR-PC53E Handycam Mini DV	439.99	374.46
3L7WPW	DCR-PC55E Handycam Mini DV	479.99	408.51
3L7SPW	DCR-HC90E Handycam Mini DV	579.99	493.61
2VCFPW	DCR-IP1 Handycam MicroMV	703.82	599.00
3L7XPW	DCR-PC1000E Handycam Mini DV	747.30	636.00
32V5PW	DCR-VX2100E MiniDV Handycam	2078.57	1769.00
3KKVPW	HDR-FX1E High Definition	2337.07	1989.00

VIDEO CARDS

quicklinx	ASUS	£ inc VAT	£ ex VAT
30LWPW	Radeon 7000 64MB AGP VO	17.63	15.00
37CFPW	Radeon 9550 128MB AGP DVI-I VO	39.60	33.70
39TVPW	Radeon X800XT 256MB PCI-E DVI-I VIVO	381.08	324.32
3LCNPW	GeForce 6800 256MB PCI-E DVI VO	136.96	116.56
39TQPW	GeForce 6800 128MB AGP DVI-I VO	200.96	171.03
3LCPPW	GeForce 6800GT 256MB PCI-E	248.41	211.41
	CONNECT 3D		
3KJSPW	Radeon 9250SE 128MB AGP DVI VO	23.99	20.42
2LJMPW	Radeon 9600 128MB AGP DVI-I VO	47.79	40.67
2VDRPW	Radeon 9600XT 128MB AGP DVI-I VO	74.01	62.99
3165PW	Radeon 9600XT 256MB AGP DVI-I VO	97.98	83.39
2RXWPW	Radeon 9800 Pro A-in-W 128MB AGP DVI-I	187.98	159.98
3KJXPW	Radeon X700Pro 128MB PCI-E DVI-I VO	92.06	78.35
359BPW	Radeon X800 Pro 256MB AGP GDDR3 DVI-I	199.97	170.19
36SNPW	Radeon X800XT Platinum 256MB AGP DVI-I	300.99	256.16
3LVTPW	Radeon X850XT 256MB PCI-E DVI-I VIVO	287.99	245.10
3MXLPW	Radeon X850XT PE 256MB AGP DVI-I VIVO	321.99	274.03
	GIGABYTE		
3MG1PW	GeForce 6200TC 32MB TurboCache PCI-EI	39.95	34.00
3K56PW	GeForce 6600GT 128MB AGP DVI-I VIVO	143.34	121.99
37Z3PW	GeForce 6800 128MB AGP DVI-I VO	180.95	154.00
37T9PW	GeForce 6800GT 256MB AGP 2xDVI-I VO	249.69	212.50
3MFVPW	GeForce 6800GT 256MB PCI-E DVI-I	258.49	219.99
3R2ZPW	GeForce 7800 GTX 256MB PCI-E 2xDVI-I	370.00	314.89
37T6PW	GeForce PCX5750 128MB PCI-E DVI-I VO	53.17	45.25
37T5PW	GeForce PCX5900 128MB PCI-E DVI-I VO	90.10	76.68
37TKPW	Radeon X600Pro 128MB PCI-E DVI-I VO	47.48	40.41
3MFRPW	Radeon X700 128MB PCI-E DVI-I	90.58	77.09
3MFQPW	Radeon X800 128MB PCI-E DVI-I	123.75	105.32
3MFPPW	Radeon X800 256MB PCI-E DVI-I	158.86	135.20
37THPW	Radeon X800Pro 256MB AGP DVI-I VO	224.06	190.69
3P2RPW	Radeon X800XL 256MB AGP DVI-I VIVO	200.42	170.57
3MFNPW	Radeon X800XL 256MB PCI-E DVI-I VIVO	213.84	181.99
	SAPPHIRE		
3L36PW	Radeon 7000 64MB AGP DVI-I	16.90	14.38
3H2SPW	Radeon 9250 128MB AGP DVI-I VIVO	33.68	28.66
3HQ7PW	Radeon 9250 256MB AGP DVI-I VO	33.09	28.16
36JCPW	Radeon 9550 128MB AGP DVI-I VO	40.68	34.62
36JDPW	Radeon 9550 256MB AGP DVI-I VO	40.70	34.64
2WJ2PW	Radeon 9600XT 128MB AGP DVI-I VO	31.73	27.00
2WJ3PW	Radeon 9600XT 256MB AGP DVI-I VO	71.92	61.21
3HQ8PW	Radeon X700 Pro 256MB PCI-E DVI-I VIVO	109.63	93.30
3L3DPW	Radeon X700Pro Fireblade 128MB PCI-EI	94.01	80.01
3M6MPW	Radeon X800 256MB PCI-E DVI-I	144.10	122.64
3MX8PW	Radeon X800XL 256MB DVI-I VO	219.00	186.38
3MQ9PW	Radeon X800XT 256MB AGP VIVO	285.51	242.99
3M7VPW	Radeon X850Pro 256MB PCI-E DVI-I VIVO	250.00	212.77
3MP3PW	Radeon X850XT 256MB PCI-E DVI-I VO	290.00	246.81
3MXCPW	Radeon X850XT Platinum 256MB AGP DVI-I	330.00	280.85
	DABSVALUE		
3L36PW	Radeon 7000 64MB AGP DVI-I	16.90	14.38
3H2SPW	Radeon 9250 128MB AGP DVI-I VIVO	33.68	28.66
3M6KPW	Radeon 9250 128MB PCI DVI-I VO	28.74	24.46
36JDPW	Radeon 9550 256MB AGP DVI-I VO	40.70	34.64
3L37PW	Radeon 9800SE Advantage 128MB AGP DVI-I VO	70.09	59.65
3L38PW	Radeon X300SE 128MB PCI-E DVI-I VO	37.00	31.49
3L3CPW	Radeon X700Pro Toxic 128MB PCI-E DVI-I VIVO	96.67	82.27
3668PW	Radeon X800 Pro 256MB AGP DVI-I VO	232.72	198.06
3LQBPW	Radeon X800 XL 256MB PCI-E DVI-I VO	198.97	169.34

CASES

quicklinx	ANTEC	£ inc VAT	£ ex VAT
2QJCPW	Sonata UK 380W PSU ATX	77.49	65.95
2RVMPW	4U22ATX550EPS-UK Rackmount	164.03	139.60
2QJFPW	Minuet UK 220W PSU ATX	45.57	38.78
2QJHPW	SLK1600 UK 300W PSU ATX	37.54	31.95
2QJJPW	SLK2600AMB UK 300W PSU ATX	40.95	34.85
2QJKPW	SLK3700AMB UK 350W PSU ATX	56.19	47.82
2WG7PW	SLK3700BQE-UK 350W PSU ATX Black Quiet	58.10	49.45
2WG8PW	Super LANBoy EU - No PSU	58.15	49.49
31Q2PW	ATX Anodized Alu SuperMid TowerCase - P160	69.99	59.57
2RVDPW	PlusView 1000AMG EU	46.57	39.63
3NW2PW	SLK3000B Black Super Mid Tower	29.90	25.45
2QJPPW	SX835II UK 350W PSU ATX	52.04	44.29
3HJ0PW	SLK1650BUK 350W PSU	50.36	42.86
	COOLERMASTER		
39HWPW	Stacker BTX ATX Case - Silver Trim	97.27	82.78
3GWJPW	Stacker BTX ATX Case with window - Blue	95.39	81.18
39HZPW	WaveMaster ATX Blue - Limited Edn - No PSU	116.27	98.95
3J7DPW	Cavalier 1 Case Silver No PSU	61.99	52.76
3J7FPW	Cavalier 1 Case Black No PSU	61.99	52.76
39HXPW	Cavalier 3 Case Black No PSU	68.68	58.45
3J7GPW	Cavalier 4 300W ATX Aluminium Black	65.52	55.76
3J7HPW	Cavalier 4 300W ATX Aluminium Silver	65.52	55.76

SOUND CARDS

quicklinx	CREATIVE	£ inc VAT	£ ex VAT
3F43PW	SoundBlaster Live 7.1 24Bit	22.99	19.57
3M94PW	SoundBlaster Live 24Bit External USB	38.11	32.43
2S2RPW	Audigy 2 ZS PCI	62.00	52.77
3KDFPW	SoundBlaster Audigy 2 ZS Notebook PCMCIA	74.26	63.20
3GJ4PW	Audigy 2 ZS Platinum	118.68	101.00
3LRYPW	SoundBlaster Audigy 4 Pro	146.39	124.59

GEFORCE 6800GT 256MB DVI VO

STUNNING PERFORMANCE

dabsvalue

quicklinx 3BH3PW

- Powered by GeForce 6800 GT GPU;
- Superscalar 16-pipe GPU Architecture; 0.13-micron Process Technology;
- High-Speed GDDR3 Memory Interface;
- 256-Bit Memory Interface with Advanced Memory Control;
- 0.13-micron process technology

only **£208.53** (£177.47 ex VAT)

WINTV NOVA-T USB 2

WATCH TV ON YOUR PC

Hauppauge!

quicklinx 3LNGPW

Watch Free-to-View digital TV (terrestrial) on your PC or laptop, in a window or full screen.

- Digital TV offers sharper pictures & clearer sound
- Record digital TV programmes to disk in an MPEG-2 format. Play back on your PC screen, or record to CD/DVD!

only **£75.00** (£63.83 ex VAT)

GEFORCE 6200TC 64MB TURBOCACHE

LATEST TECHNOLOGY

GIGABYTE TECHNOLOGY

quicklinx 3PRHPW

Features a revolutionary design that delivers best-in-class performance on today's hottest games and applications. The only GPU in its class to support Microsoft DirectX 9.0 Shader Model 3.0, the GeForce 6200 powers the latest effects without compromising performance.

only **£43.35** (£36.90 ex VAT)

PCTV 200E

PINNACLE SYSTEMS

quicklinx 3NNQPW

Ideal for travellers, PCTV 200e from Pinnacle turns your laptop into a digital TV (DVB-T), advanced personal video recorder (PVR) and all-in-one entertainment centre.

WATCH TV ON YOU LAPTOP

only **£76.12** (£64.79 ex VAT)

RADEON 9250 VIDEO CARD

SAPPHIRE

quicklinx 3HQ7PW

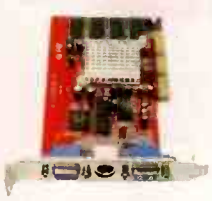
Empowering your creative element is what Sapphire does best and the SAPPHIRE RADEON 9250 continues this commitment with an advanced relationship between hardware and software! Fueled by the industry's leading technology in the ATI RADEON™ 9250 core, the SAPPHIRE RADEON 9250 comes fully loaded with its four pixel shader pipeline, SMARTSHADER™ technology, full hardware support for Microsoft® DirectX® 8.1 and DX9 compliance.

- Supports the AGP 8X and AGP 4x standard or PCI Bus, providing a high-speed link between the graphics board and the rest of the PC.

•ATI RADEON™ 9250 VPU operating at 240 MHz
•256MB of 400MHz DDR memory •Four pixel shader pipeline

only **£34.49** (£29.36 ex VAT)

RADEON X850XT 256MB PCI-E DVI-I VO



connect3D

quicklinx 3LWRPW

The Radeon X850 series advances High-Definition Gaming with blockbuster features, including Smartshader HD. ATI's highly advanced pixel shader engine. With up to 16 parallel pixel pipelines and up to 43 billion shader operations per second, the X850 series delivers the power serious gamers need.

only **£281.87** (£239.89 ex VAT)

RADEON 9800 PRO 128MB AGP DVI-I VO

connect3D

quicklinx 3GGZPW

Merging advanced stability with revolutionary features, RADEON 9800 Series is the only Visual Processing family in its 2nd generation, delivering an impressive, cinematic experience for the most demanding next-generation games.

UNBEATABLE VALUE

only **£95.17** (£81.00 ex VAT)

SOUNDBLASTER AUDIGY 4 PRO

LATEST PRODUCT

CREATIVE

quicklinx 3LRYPW

An amazing fusion of Entertainment and Music Creation. Featuring ultra-high quality DACs and an External I/O Hub which provides 6 Stereo Inputs/6 Stereo Outputs, Sound Blaster Audigy 4 Pro enables amazingly clean recording of six channels at 24-bit/96kHz with low latency ASIO 2.0 support.

only **£147.83** (£125.82 ex VAT)

SONATA UK 380W PSU ATX

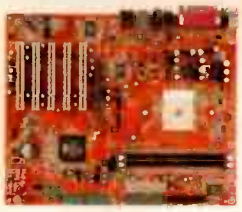
Antec The Power of You

quicklinx 2QJCPW

Independent laboratory testing proves that Sonata is three times quieter than a comparable high-performance mid-tower case. How quiet? Just 20.4 dBA. Which means Sonata is literally quieter than a whisper.

only **£73.59** (£62.63 ex VAT)

NF8 SOCKET 754 NFORCE3 AGP ATX

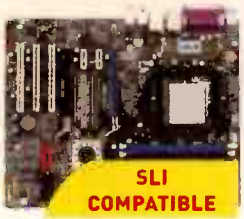


quicklinx 3KGLPW

ABIT NF8 series powered by nForce3 250Gb chipset based on AMD Athlon 64/Sempron processors platform. The nForce3 250Gb integrated NVIDIA Gigabit Ethernet and NVIDIA Firewall. Its one single chip means less power consumption and less need for heat dissipation or special cooling hardware.

only **£56.00** (£47.66 ex VAT)

S939 nFORCE 4 MOTHERBOARD



quicklinx 3KGWPW

Representing motherboard engineering at its best, the performance of A8N-SLI Deluxe is not for the faint of heart. The NVIDIA® SLI ™ (Scalable Link Interface) technology enables two PCI-Express cards on this motherboard to provide extreme performance over the edge.

only **£102.10** (£86.90 ex VAT)

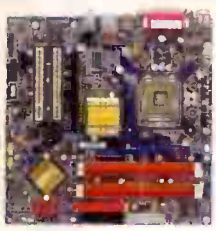
S939 nFORCE 4 ULTRA MOTHERBOARD

quicklinx 3P28PW

Supporting AMD Athlon64/ 64 FX processors, the K8N-S939 represents the most cost effective solution for AMD platform. Accompanied with the innovative designs of AMD64 technology, the advanced NVIDIA nForce4 processor contributes to functionality and stability of this platform.

only **£88.40** (£75.24 ex VAT)

S775 INTEL 915G MOTHERBOARD



quicklinx 3K40PW

Designed with a pack of features and dedicated to satisfying the needs of cost-effective platforms, the GA-8I915D MFD lets you experience next-generation processing with the latest LGA 775 Intel®P4 Processor with Hyper-Threading Technology! Supports DDR2 533/400 to satisfy the needs of a wide range of systems.

only **£73.47** (£62.53 ex VAT)

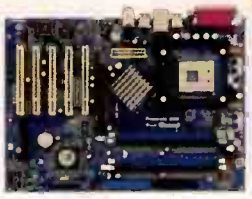
S939 nFORCE 4 MOTHERBOARD

quicklinx 3KR7PW

The MSI K8N Diamond not only supports Nvidia's outstanding SLI technology for extreme 3D performance, but is also the first one to integrate the most advanced controllers for outstanding connectivity, storage and high-definition audio.

only **£125.94** (£107.19 ex VAT)

SOCKET 478 MOTHERBOARD



quicklinx 3HRTPW

The P4V88 supports FSB800MHz processor, Prescott Ready and H-T Technology, as well as DDR400 and Dual Channel Technology. Features ASRock safe overclocking. SerialATA 1.5Gb/s, RAID 0,1, JBOD, SATA HDD Hotplug, AGP8x, 5.1Ch Audio, 10/100 Ethernet LAN, ASRock I/O & 6 ready to use USB2 ports.

only **£28.14** (£23.95 ex VAT)

ATHLON 64 3200+ PROCESSOR 2.2GHz

LOWER PRICE

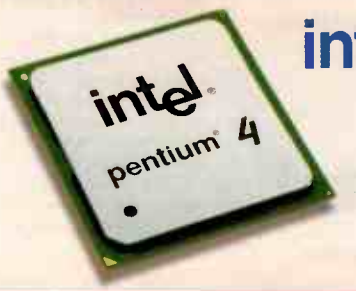
quicklinx 36T2PW

You live at the forefront of technology & you won't settle for less from your favourite software. That's why AMD is proud to bring you the AMD Athlon 64™ processor, with AMD 64-bit technology for dramatically higher performance & built-in support for 64-bit applications - only AMD64 -bit technology can run today's 32-bit & complete with 64-bit Windows™ at the same time. Maximize system efficiency & stay ahead of the curve with the technically superior PC processor, packed with advances such as HyperTransport technology & an integrated DDR memory controller. Whether for business, school or play, with the AMD Athlon 64™ processor, you can address your current and future computing needs.

•AMD Athlon 64 3200+ 2.5GHz •Socket 754 •HyperTransport technology •Integrated memory controller

only **£122.50** (£104.26 ex VAT)

PENTIUM 4 PROCESSOR 3.2GHZ



quicklinx 3146PW

Based on Intel NetBurst microarchitecture, the Pentium 4 processor delivers significant performance gains for use in personal computing, business solutions and all your processing needs.

The Intel Pentium 4 processor for business desktop PCs delivers the enhanced productivity, performance and stability demanded by today's business workers and IT managers. Whether it's Web services, security or Microsoft Windows XP: high-performance Pentium 4 processors can enrich the business solutions and applications you're deploying today or tomorrow.

•3.2 GHz •800MHz Bus Speed •Socket 478 •Streaming SIMD extensions 2 •Hyper-Threading Technology

only **£154.82** (£131.76 ex VAT)

MOTHERBOARDS

quicklinx	ABIT	£ inc VAT	£ ex VAT
384DPW	VIA P4M266A So478 MATX Audio/Video/LAN	29.07	24.74
384CPW	SiS 651 So478 MATX AGP4x Audio/Video/LAN	31.73	27.00
3849PW	Intel 848P Socket 478 ATX Audio/LAN	39.17	33.34
384BPW	Intel 865G Socket478 MATX Audio/Video/LAN	57.45	48.89
3KGJPW	IG80 Socket 775 Intel 915G PCI-E ATX	60.00	51.06
3KGLPW	NF8 Socket 754 nForce3 AGP ATX	53.00	45.11
36M3PW	Intel 915P Socket 775 ATX Audio/LAN/RAID	86.52	73.63
39QJPW	Intel 915P So775 PCI-E ATX A/LAN/RAID	96.98	82.54
	ASUS		
35B1PW	VIA P4M266A S478 AGP 4x DDR mATX A LAN	27.98	23.81
37ZYPW	Intel 865GV Socket478 ATX Audio/Video/LAN	41.58	35.39
3GNQPW	Socket 754 nForce 3 ATX Audio LAN RAID	44.00	37.45
39PZPW	Intel 865PE Socket775 ATX Audio/LAN	58.69	49.95
38KVPW	Intel915G So775 PCIE MATX A/V/LAN/RAID	64.74	55.10
37ZZPW	nForce3 Socket 754 ATX Audio/LAN/RAID	51.71	44.01
35B4PW	S754 VIA K8T800 AGP DDR ATX A LAN RAID	58.49	49.78
37ZXPW	Intel 915P So775 PCI-E ATX A/LAN/RAID	70.04	59.61
37CCPW	VIA K8T800PR So939 ATX WiFi A/LAN/RAID	74.37	63.29
39PYPW	Intel 915P So775 PCI-E ATX A/LAN/RAID	91.65	78.00
37ZWPW	Intel 915P So775 PCI-E ATX A/LAN/RAID	88.99	75.74
37ZVPW	Intel 915G So775 PCIE ATX A/V/LAN/RAID	102.97	87.63
3KGXPW	nForce 4 SLI Socket 939 PCI-E ATX	88.07	74.95
37ZTPW	Intel 915P So775 PCI-E ATX A/LAN/RAID	101.11	86.05
3KGWPW	nForce 4 SLI Socket 939 PCI-E ATX	101.32	86.23
37ZSPW	Intel 915P So775 PCI-E ATX A/LAN/RAID	103.86	88.39
	GIGABYTE		
3K42PW	GA-7VM400AM-RZ SoA VIA KM400A MATX	32.83	27.94
3KZQPW	GA-8S648FX-755 So775 SiS 648FX AGP	40.19	34.20
3KR2PW	GA-7N400SL SoA nForce 2 Ultra AGP 8x ATX	39.80	33.87
37G6PW	nForce 250 Socket 754 ATX Audio/LAN/RAID	42.68	36.32
37GJPW	VIA K8M800M So754 MATX Audio/LAN/RAID	38.56	32.82
3KR3PW	GA-K8NS-939 So939 nForce 3 Ultra AGP	50.24	42.76
3K41PW	GA-81865GMF-775 So775 Intel 865G MATX	55.74	47.44
37GFPW	nForce3 Socket754 ATX Audio/LAN/RAID	62.00	52.77
2QPKPW	S754 VIA K8T800 MATX A L R	51.11	43.50
3KSZPW	GA-K8NF-9 So939 nForce 4-4X PCI-E ATX	68.00	57.87
2QPRPW	S754 VIA K8T800 ATX A L R	94.78	80.66
37GGPW	nForce 3 Socket 754 ATX Audio/LAN/RAID	94.85	80.72
3KT0PW	GA-K8NXP-9 So939 nForce 4 Ultra PCI-E	109.08	92.83
3HRZPW	GA-K8NS Ultra 939 So939 nForce 3 250Ultra	74.87	63.72
3KLYPW	GA-K8NXP-SLI So939 nForce 4 Ultra PCI-E	103.98	88.49
3KR1PW	GA-8AENXP-D S775 Intel 925XE PCI-E	148.47	126.36
	MSI		
384FPW	VIA KM266 SocketA MATX AGP4x A/V/LAN	28.44	24.20
3JM8PW	K7N2 Delta2-LSR SoA nForce 2 Ultra ATX	33.88	28.83
3JM2PW	PT880 Neo-FSR Socket 478 VIA PT880 ATX	41.08	34.96
3GVXPW	Socket A nForce2 Ultra ATX AGP Audio RAID	42.65	36.30
3JM6PW	K8M Neo-V Socket 754 VIA K8M800 ATX	46.49	39.57
3KR5PW	915GM-FR S775 Intel 915G PCI-E MATX	64.13	54.58
39QQPW	nForce3 U Socket939 ATX Audio/LAN/RAID	81.11	69.03
3LX5PW	K8N Neo3-FSR Socket 754 nForce 4 ATX	57.54	48.97
3H9GPW	915G Neo2 Platinum S775 Intel 915G ATX G	87.28	74.28
3KR7PW	K8N Diamond S939 nForce 4 SLI PCI-E ATX	124.40	105.87
39QGPW	Intel 925X S775 PCI-E ATX Audio/LAN/RAID	130.43	111.00

PROCESSORS

quicklinx	AMD	£ inc VAT	£ ex VAT
3KBSPW	Sempron 2300+ SoA 1.583GHz 256Kb Inc Fan	41.31	35.16
396FPW	Sempron 2400+ Box 1.67GHz SoA 256Kb	48.18	41.00
396DPW	Sempron 2500+ Box 1.75GHz SocketA 256Kb	46.52	39.59
396CPW	Sempron 2600+ Box 1.83GHz SoA 256Kb	54.54	46.42
396BPW	Sempron 2800+ Box 2.0GHz SoA 256KB	61.75	52.55
3KVHPW	Sempron 2800+ Box 2.0GHz SoA	57.82	49.21
3M6GPW	Sempron 3000+ S754 256KB Box	64.46	54.86
3968PW	Sempron 3100+ Box 1.8GHz S754	73.39	62.46
34VVPW	Opteron 148 2.2GHz 1MB S940 Box	207.92	176.95
3FKCPW	Opteron 150 2.4GHz S940 1MB Box	287.29	244.50
3FKDPW	Opteron 250 2.4GHz S940 1MB Box	484.99	412.76
3L17PW	Athlon 64 3200+ 2.0GHz So939 512Kb no Fan	123.43	105.05
3J31PW	Athlon 64 3000+ Socket 939 512Kb Inc Fan	96.40	82.04
3J33PW	Athlon 64 3200+ Socket 939 512Kb Inc Fan	123.38	105.00
3J34PW	Athlon 64 3500+ Socket 939 512Kb Inc Fan	178.18	151.64
3J38PW	Athlon 64 4000+ Socket 939 1MB Inc Fan	318.40	270.98
3J39PW	Athlon 64 FX-55 Socket 939 1MB Inc Fan	544.99	463.82
	INTEL		
3GVBPW	Celeron D 320 256Kb S478 533	46.73	39.77
36LKPW	Celeron D 330 256Kb S478 533FSB Box	55.00	46.81
36SVPW	Celeron D 335 256Kb S478 533FSB Box	60.98	51.90
3KDDPW	Celeron 345J S775 256Kb	82.26	70.01
3HX0PW	Pentium 4 520J So775 1MB 800FSB Inc Fan	115.21	98.05
3HX1PW	Pentium 4 530J So775 1MB 800FSB Inc Fan	115.08	97.94
3HX2PW	Pentium 4 540J So775 1MB 800FSB Inc Fan	141.81	120.69
3HX3PW	Pentium 4 550J So775 1MB 800FSB Inc Fan	178.82	152.19
3HX4PW	Pentium 4 560J So775 1MB 800FSB Inc Fan	262.99	223.82
3HX5PW	Pentium 4 570J So775 1MB 800FSB Inc Fan	398.99	339.57
3HX6PW	Pentium 4 3.40GHz EE So775 2MB 800FSB	677.99	577.01
3KHMPW	Pentium 4 EE 3.46GHz So775 2MB cache	696.50	592.77
3HXNPW	Xeon 3.2GHz So604 1MB 800FSB Passive H/S	243.77	207.46
3HXPPW	Xeon 3.4GHz So604 1MB 800FSB Inc 1U H/S	292.99	249.35
3HXSPW	Xeon 3.6GHz So604 1MB 800FSB Inc 1U H/S	515.21	438.48

OPTICAL DRIVES

quicklinx		£ inc VAT	£ ex VAT
	ASUS		
36NWPW	CD-ROM 52x IDE	11.84	10.08
36NYPW	DVD-ROM 16x IDE	14.73	12.54
36NRPW	CD-RW 52r 52w 32rw IDE Black	16.91	14.39
351RPW	CD-RW 52r 52w 32rw Ext USB2	31.73	27.00
3MHBPW	DVD+-R/RW 16x IDE Drive Only	32.83	27.94
3MH9PW	DVD+-R/RW 16x IDE	38.43	32.71
	BENQ		
39NFPW	CD-ROM 56x Retail Kit	11.84	10.08
3H17PW	CD-RW 52r 52w 52rw IDE Beige RP	14.53	12.37
3JT8PW	DVD+RW 16x Dual Layer IDE Beige	37.42	31.85
	FREECOM		
3P8VPW	Classic CDRW 52x24x52x	56.13	47.77
3FMTPW	DVD+-R/RW 16x Double Layer IDE	37.44	31.86
3FMXPW	DVD+-R/RW 16x Double Layer IDE Black	43.45	36.98
3FMYPW	Classic DVD+-R/RW 16x Double Layer USB2	64.95	55.28
3FN0PW	FX-50 DVD+-R/RW 16x D/Layer USB2 & FW	99.02	84.27
3KF8PW	FS-50 DVD+-R/RW 8x USB2	145.44	123.78
	IOMEGA		
3471PW	Combo USB2 16xDVD 52r 52w 24rw	54.88	46.71
3JHJPW	DVD+-R/RW 16x Dual Layer USB2 Beige	61.78	52.58
	LITEON		
3407PW	52x Internal IDE Retail	11.93	10.15
39VMPW	CD-RW Int IDE 52r 52w 32rw RP	14.32	12.19
3KC0PW	DVD16x 52x52x32x IDE Beige RP	24.44	20.80
3M25PW	DVD+-R/RW 16x16x IDE Beige	32.72	27.85
3M27PW	DVD+-R/RW 16x16x Dual Layer IDE	41.07	34.95
3M28PW	DVD+-R/RW 16x16x IDE Dual Layer Black	32.63	27.77
3M2CPW	DVD+-R/RW 16x Dual Layer USB2 Black	51.32	43.68
	LG		
352DPW	CD-RW 52r 52w 32rw IDE OEM	14.52	12.36
35YRPW	16xDVD 52r 52w 32rw Int IDE RP	20.84	17.74
3L90PW	DVD+-R/RW 16x Dual Layer OEM	29.95	25.49
3LYGPW	DVD+-R/RW 16x Dual Layer IDE RP	37.81	32.18
3LYHPW	DVD+-R/RW 16x DL Black OEM	30.30	25.79
	NEC		
3KNCPW	DVD+-R/RW 16x Dual Layer Beige OEM	32.05	27.28
3KSSPW	DVD+-R/RW 16x Dual Layer IDE Black OEM	31.70	26.98
3M8DPW	DVD+-R/RW 16x Dual Layer Silver OEM	34.96	29.75
3LV7PW	DVD+-R/RW 16x Dual Layer Beige	44.34	37.74
	PLEXTOR		
2LSRPW	CD-RW 52r 52w 32rw Int IDE RP	54.24	46.16
2WKFPW	CD-RW 52r 52w 24rw Int IDE RP	24.50	20.85
2VP0PW	16xDVD 48xCD Int IDE Retail	22.98	19.56
37JQPW	DVD+/-R/RW 12x SATA	65.71	55.92
3GZQPW	DVD+-R/RW 16x16x IDE Beige Drive Only	73.00	62.13
3GZPPW	DVD+-R/RW 16x16x IDE Beige + Black Bezel	77.69	66.12
3L25PW	DVD+-R/RW 16x16x USB2/Firewire External	126.68	107.81
	PIONEER		
3LMFPW	DVD+-R/RW 16x IDE Dual Layer IDE	32.85	27.96
3LSBPW	DVD+-R/RW 16x IDE Dual Layer Black	33.18	28.24
	SAMSUNG		
3MTQPW	CD-RW 52r52w32rw Black OEM	13.57	11.55
3H33PW	DVD16x CD48x IDE Beige Retail	15.99	13.61
3L32PW	DVD+-R/RW 16x16x Black OEM	31.71	26.99
3L31PW	DVD+-R/RW 16x16x Beige OEM	29.87	25.42
3K5FPW	DVD+-R/RW OL 16x USB2 RP Black	74.71	63.58
	SONY		
3P8RPW	CD-RW 52x32x52 Silver OEM	14.25	12.13
2T3DPW	CD-RW 52x32x52x Internal IDE OEM	16.10	13.70
2W4RPW	CD-RW 52x32x52x Internal OEM Black	15.26	12.99
33K7PW	CD-RW/DVD 52x32x52x16 OEM	20.10	17.11
33K8PW	CD-RW/DVD 52x32x52x16x OEM Black	21.13	17.98
33S3PW	CD-RW/DVD 52x32x52x16x OEM Silver	24.76	21.07
3Q1VPW	DWQ28A DVD+/-RW Dual Layer OEM Beige	34.08	29.00
3Q1WPW	DWQ28AB DVD+/-RW Dual Layer OEM Black	34.08	29.00
3Q1XPW	DWQ28AS DVD+/-RW Dual Layer OEM Silver	34.08	29.00
3NY8PW	DRU-800A 16x DVD+/-RW Dual Layer Internal	48.49	41.27

MEDIA

quicklinx		£ inc VAT	£ ex VAT
	PHILIPS		
3997PW	4.7GB DVD+RW 4x 5pk	4.11	3.50
398QPW	DVD+R 8x 10 Pack	8.71	7.41
398SPW	CD-R 52x 100 Pack	12.62	10.74
398RPW	DVD+R 8x 50 Pack	14.95	12.72
	SONY		
380HPW	DVD+R 4.7GB 25 Spindle Pack	7.99	6.80
380GPW	DVD-R 4.7GB 25 Spindle Pack	10.00	8.51
2CM8PW	DVD-RW Jewel Case 5 Pack	5.16	4.39
1Y6JPW	DVD+RW Jewel Case 5 Pack	4.38	3.73
	VERBATIM		
3JFPPW	DVD-R 4.7GB General 4x 5 Pack	2.07	1.76
3GV2PW	DVD+R 12x Jewel Case 5Pack	6.11	5.20
31GHPW	DVD+R 4.7GB 8x 10 Pack	16.20	13.79
34BVPW	DVD+RW 4.7GB 4x - 10 Pack	8.47	7.21
3GTZPW	DVD+R 4.7GB 8x 25pack Spindle	10.00	8.51
3GV0PW	DVD-R 4.7GB 8x 25pack Spindle	10.00	8.51
3JY2PW	DVD+R 16x 4.7GB 25pack Spindle	10.29	8.76
376GPW	DVD+R Dual Layer 8.5GB 2.4x 5pack	25.50	21.70

DVD+-R/RW DUAL LAYER USB

quicklinx 3FMYPW

Multitalented external drive supports all disk types allowing you to burn DVDs/CDs with complete confidence; Supports DVD+R Double Layer recording; Store up to 8, 5 GB on a Double Layer DVD; Latest generation DVD+/-RW drive that now write to; DVD+R, DVD+RW, DVD-RW and DVD-R recordable discs.

FREECOM TECHNOLOGIES

only **£70.42** (£59.94 ex VAT)

DVD+-R/RW DUAL LAYER USB

16X

quicklinx 3G6YPW

With new double layer DVD recording technology, the LaCie DVD±RW drive can be used to store nearly twice as much data as before. With up to 8.5GB of space on a single-sided, double layer DVD disc, save up to 16 hours of VHS video, 4 hours of personal, high-quality DVD video or up to 8.5GB of important information.

LACIE

only **£63.73** (£54.24 ex VAT)

DRU-800A DUAL LAYER DVD+RW INTERNAL ATAPI/EIDE

NEW

16X

SONY

quicklinx 3NY8PW

The Sony DRX-800A Dual Layer DVD+RW Internal Drive has a huge 8.5GB capacity - doubling your recording time or recording quality. The sleek compact design with shorter depth makes for easier installation and air flow improvement, and it even comes with a replaceable black front panel to suite a wider varariety of PCs.

- Compatible with most DVD Players
- External Drive (USB 2.0 and iLINK)
- AHEAD nero software suite included for writing, authoring, video/audio editing, backup... and more!
- External drive also available - see quicklinx 3R63

•16x+R/8x+RW/16x-R/6x-RW/4x DL+R and-R
•Includes replacable front panal (black)

from **£48.49** (£41.27 ex VAT)

DVD+-R/RW DUAL LAYER IDE BLACK

quicklinx 3M28PW

ATAPI/E-IDE Half-Height internal DVD+R / DVD+RW / DVD-R / DVD-RW / DVD+R9/ DVD-ROM / CD-R/ CD-RW / CD-ROM combination drive. The SOHW-1673S-05C supports Double Layer DVD+R9 recording function and features SMART-BURN, adjusting writing strategy and running OPC to provide the best quality.

LITEON

only **£32.71** (£27.84 ex VAT)

DVD+-R/RW DUAL LAYER IDE

16X

quicklinx 3L90PW

Introducing GSA-4163BA, the latest LG Super Multi Triple format drive. With an incredible 16X max DVD burn speed, and 5X DVD-RAM, you'll never have to worry about compatibility because this drive is compatible with all DVD formats.

LG

only **£31.84** (£27.10 ex VAT)

DVD+-R/RW 16X DUAL LAYER USB2

quicklinx 3JHJPW

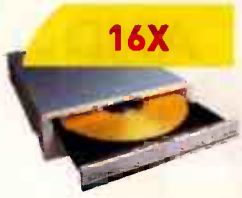
The 160GB drive is both The Iomega Super DVD Writer 16X Dual Format USB 2.0 external drive is the only drive you need to save and share your videos, photos, music and data. Now, transferring home videos, photos, music and other files from the computer to the living room DVD player becomes virtually effortless.

iomega

only **£64.89** (£55.23 ex VAT)

DVD+-R/RW DUAL LAYER IDE

16X



quicklinx 3GZPPW

The PX-716A writes at 16X for DVD+R, 16X for DVD-R and 4X for DVD+R DL (Double Layer). The drive rewrites 8X DVD+RW and 4X DVD-RW. The PX-716A reads CD-ROMs at 48X and DVD-ROMs at 16X. Includes: PX-716A, E-IDE (ATAPI) cable, Plextor CD/DVD Utility Software, an extra black front bezel and more!

PLEXTOR

only **£77.69** (£66.12 ex VAT)

DVD+-R/RW DUAL LAYER IDE

16X

quicklinx 3P68PW

The ND3540 16x dual layer DVD writer will write and re-writes all your data on a range of media at exceptional speed. Capable of writing DVD-R and DVD+R at a speed of 16x, you can burn one hour of DVD in 4 minutes! What is more, the dual layer compatibility will allow you to store up to 8.5 GB of data on one disc.

NEC

only **£43.08** (£36.67 ex VAT)

DVD+-R/RW DUAL LAYER IDE - BLACK

LOWER PRICE

quicklinx 3LSBPW

The industry's first DVD writer to support 16x write speeds on both DVD-R/+R along with the option to write at 4x speed on Double Layer media. The DVR-109 extends Pioneer's track record of establishing key performance benchmarks when introducing new DVD writers.

Pioneer

only **£34.36** (£29.25 ex VAT)

CLASSIC 400GB USB2

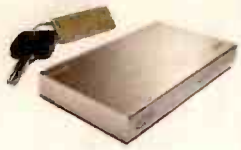
quicklinx 3PKXPW

Freecom now offers the perfect upgade for your PC: the Classic Hard Drive, a no-nonsense external hard drive. No need to open your PC: just plug the Classic Hard Drive in the USB port (USB 2.0 or 1.1) and you instantly have a substantial increase in storage space. The future is simple!

FREECOM TECHNOLOGIES

only £231.24 (£196.80 ex VAT)

40GB USB2 MOBILE DRIVE



quicklinx 2SCYPW

Made with durability in mind, these mobile drives were designed to let you work on your projects wherever you happen to be. At only 7.6 x 12.9 x 1.7cm, this bus-powered hard drive is small enough to fit in your shirt pocket and ideal for laptops, personal backup or carrying around your MP3's or photos.

LACIE

only £62.63 (£53.30 ex VAT)

250GB P3 HARD DRIVE

quicklinx 31PLPW

Designed by the world-famous Porsche Design Agency, the LaCie Hard Drives exhibit world-class style and elite performance. With room to store up to 250GB, you can back up your entire system or add extra storage space when your internal hard drive is full.

LACIE

only £102.96 (£87.63 ex VAT)

CLASSIC MOBILE HD 2.5" 60GB USB2

quicklinx 3P9PPW

- Fast, low noise external mobile USB-2 hard drive
- Powered via USB port
- The easiest way to add and manage extra storage capacity to your notebook or computer
- Hot swappable, no need to turn off your computer
- High quality, sleek design, only 128x72x12mm, easy to take with you.

FREECOM TECHNOLOGIES

only £75.02 (£63.85 ex VAT)

DIAMONDMAX PLUS10 160GB

quicklinx 3Q6QPW

The 7200 RPM DiamondMax Plus 10 hard drive is your solution for performance PCs with data-intensive applications such as network attached storage, home networking devices, audio, video and other multimedia applications.

Maxtor

only £53.53 (£45.56 ex VAT)

BARRACUDA 7200.7 160GB

quicklinx 2FZYPW

The Barracuda 7200.7 features high capacities, the best FDB motors for quiet operation, 350 Gs of non-operating shock to protect against handling damage, and the comprehensive 3D Defense System to help preserve your valuable data.

Seagate

only £51.68 (£43.99 ex VAT)

DESKTOP 250GB USB2 7200RPM

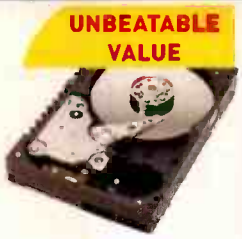
quicklinx 38KTPW

The Iomega HDD 250GB desktop hard drive is a high-capacity data protection and storage solution that also doubles as a disaster recovery solution. At 7200 RPM, this external hard drive is fast and functional; plus you can run applications directly from it enabling you to take the whole application with you.

iomega

only £122.27 (£104.06 ex VAT)

CAVIAR 160GB UDMA133



quicklinx 2J7ZPW

With features and capacities that are ideal for next-generation computers and low-end enterprise storage, users benefit from a data transfer rate performance roadmap that begins with 150 MB/s and extends to 600 MB/s, as well as improved cabling that enables greater system design flexibility.

Western Digital

only £51.75 (£44.05 ex VAT)

CRUCIAL MEMORY SELECTOR TOOL

The Crucial memory you buy from dabs.com is the very same high quality product used by the world's largest PC manufacturers in their systems and comes complete with a limited lifetime warranty. When chosen with the help of the Crucial Memory Selector tool, you're guaranteed 100% compatibility with your system and complete satisfaction with your purchase!

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EXTERNAL HDD

quicklinx	FREECOM	£ inc VAT	£ ex VAT
3M07PW	Classic SL 120GB LAN/USB2	106.02	90.23
3M08PW	Classic SL 160GB Lan/USB2	118.15	100.55
3M09PW	Classic SL 250GB Lan/USB2	141.51	120.43
3M0BPW	Classic SL 400GB Lan/USB2	263.99	224.67
389JPW	FHD-3 160GB USB2 External HDD	99.23	84.45
389LPW	FHD-3 160GB USB2/Firewire	112.37	95.63
389QPW	FHD-3 250GB USB2 External HDD	127.43	108.45
389MPW	FHD-3 250GB USB2/Firewire	139.74	118.93
3JWNPW	FHD-2 PRO 30GB USB2 Special Edition	80.58	68.58
3HDYPW	FHD-2 Pro 100GB USB2	133.25	113.40
389NPW	FHD-3 400GB USB2/Firewire	254.61	216.69
3P9MPW	Classic 2.5" 30GB USB2	47.63	40.54
3P9NPW	Classic 2.5" 40GB USB2	56.34	47.95
3P9PPW	Classic 2.5" 60GB USB2	72.20	61.45
3P9QPW	Classic 2.5" 80GB USB2	82.19	69.95
	IOMEGA		
30PBPW	Host powered 40GB USB2	55.73	47.43
30PCPW	Desktop 80GB USB2	76.50	65.11
3364PW	60GB USB2 Portable Hard Drive	72.15	61.40
37D2PW	Desktop 120GB USB2 7200rpm	87.22	74.23
38KTPW	Desktop 250GB USB2 7200rpm	129.86	110.52
3P62PW	REV 35/90GB Ultra 2 SCSI	220.22	187.42
	LACIE		
2SDJPW	P3 80GB Ext USB2 HDD & Cbl	56.98	48.49
2SDLPW	P3 80GB Ext Firewire HDD & Cbl	67.09	57.10
2SDKPW	P3 160GB Ext USB2 HDD & Cbl	74.55	63.45
2SDMPW	P3 160GB Ext Firewire HDD & Cbl	84.49	71.91
31PLPW	P3 250GB Ext USB2 HDD & Cbl	101.51	86.39
2SDNPW	P3 250GB Ext Firewire HDD	115.08	97.94
3JG1PW	200GB Extreme FW 400/800 USB2	121.75	103.62
2ZDMPW	d2 500GB Ext FW 400/800/USB2	254.99	217.01
31PJPW	d2 500GB Extreme Ext FW 400/800	239.79	204.08
31PKPW	d2 1000GB FW 400/800/USB2 HDD	508.99	433.18
3KHSPW	d2 400GB SATA 7200rpm 8MB	262.26	223.20
2GKWPW	500GB Ethernet Disk 10/100 NAS	600.55	511.11
3LC7PW	1000GB Ethernet Disk 10/100 NAS Server	987.76	840.65
	MAXTOR		
3K8HPW	One Touch 80GB USB2 7200rpm	69.27	58.95
3K8JPW	One Touch 160GB USB2 7200rpm	91.87	78.19
3446PW	One Touch 160GB 7200rpm USB2/Firewire	109.26	92.99
3K8KPW	One Touch II 200GB USB2/Firewire 7200rpm	123.79	105.35
3H1KPW	One Touch II 250GB USB2/Firewire 7200rpm	146.97	125.08
3H1LPW	One Touch II 300GB USB2/Firewire 7200rpm	166.99	142.12
3K8KPW	One Touch II 200GB USB2/Firewire 7200rpm	123.79	105.35
2VDLPW	One Touch 250GB Firewire 7200rpm - MAC	125.24	106.59
2VDGPW	One Touch 120GB USB2 7200rpm	82.24	69.99
	SONY		
2Z6KPW	GigaVault 80GB Hard Drive USB	236.99	201.69
2Z6LPW	GigaVault 80GB i-Link	242.99	206.80

IDE HDD

quicklinx	HITACHI/IBM DESKSTAR	£ inc VAT	£ ex VAT
2PH9PW	7K250 80GB SATA150 8MB 7200rpm	37.42	31.85
2PHDPW	7K250 120GB UDMA100 2MB 7200rpm	54.83	46.66
2PHFPW	7K250 120GB UDMA100 8MB 7200rpm	55.15	46.94
2PHLPW	7K250 120GB SATA150 8MB 7200rpm	57.33	48.79
2PHMPW	7K250 160GB UDMA100 2MB 7200rpm	50.47	42.95
2PHNPW	7K250 160GB UDMA100 8MB 7200rpm	54.98	46.79
2PHPPW	7K250 160GB SATA150 8MB 7200rpm	56.28	47.90
2PHQPW	7K250 250GB UDMA100 8MB 7200rpm	79.18	67.39
2PHRPW	7K250 250GB SATA150 8MB 7200rpm	83.51	71.07
	SAMSUNG SPINPOINT P80		
2QD2PW	80GB UDMA133 2MB 7200rpm	36.95	31.45
2ZDNPW	80GB SATA150 8MB 7200rpm	39.89	33.95
2S0TPW	120GB UDMA133 2MB 7200rpm	47.05	40.04
2ZDPPW	120GB UDMA133 8MB 7200rpm	50.98	43.39
2ZDQPW	120GB SATA150 8MB 7200rpm	52.78	44.92
2S6SPW	160GB UDMA133 2MB 7200rpm	53.99	45.95
2ZDRPW	160GB UDMA133 8MB 7200rpm	55.00	46.81
2ZDTPW	160GB SATA150 8MB 7200rpm	64.27	54.70
	SEAGATE BARRACUDA 7200		
2GZ4PW	5400.1 40GB UDMA100	32.52	27.68
2FZQPW	7200.7 80GB UDMA100	36.01	30.65
2FZVPW	7200.7 Plus 120GB UDMA100	50.51	42.99
3K5VPW	7200.8 250GB UDMA100 7200rpm 8MB	80.25	68.30
3K5ZPW	7200.8 300GB UDMA100 7200rpm 8MB	104.58	89.00
3K60PW	7200.8 400GB UDMA100 7200rpm 8MB	171.96	146.35
3K5RPW	7200.7 NCQ 80GB SATA150 7200rpm 8MB	40.24	34.25
3K5SPW	7200.7 NCQ 120GB SATA150 7200rpm 8MB	54.43	46.32
3K5TPW	7200.7 NCQ 160GB SATA150 7200rpm 8MB	60.40	51.40
3K61PW	7200.8 NCQ 250GB SATA150 7200rpm 8MB	88.60	75.40
3K62PW	7200.8 NCQ 300GB SATA150 7200rpm 8MB	110.74	94.25
3K63PW	7200.8 NCQ 400GB SATA150 7200rpm 8MB	179.46	152.73
	WESTERN DIGITAL		
18HFPW	Caviar 120GB UDMA100 8MB 7200rpm	49.76	42.35
2N5BPW	Caviar 120GB SATA150 8MB 7200rpm	50.45	42.94
12NMPW	Caviar 160GB UDMA100 2MB 7200rpm	50.75	43.19
2J7ZPW	Caviar 160GB UDMA100 8MB 7200rpm	52.70	44.85
25T3PW	Caviar 200GB UDMA100 2MB 7200rpm	60.98	51.90
25T5PW	Caviar 200GB UDMA100 8MB 7200rpm	61.84	52.63
2N7DPW	Caviar 250GB SATA150 8MB 7200rpm	82.29	70.03
2SLSPW	Raptor 74GB SATA150 8MB 10000rpm	120.97	102.95

DIGITAL AUDIO PLAYERS

quicklinx		£ inc VAT	£ ex VAT
	APPLE		
3L72PW	iPod shuffle 512MB	68.00	57.88
3L74PW	iPod shuffle 1GB	86.99	74.04
3ML0PW	iPod Mini 4GB - Silver	134.99	114.89
3MKZPW	iPod Mini 4GB - Blue	134.99	114.89
3MKYPW	iPod Mini 4GB - Pink	134.99	114.89
3ML1PW	iPod Mini 4GB - Green	134.99	114.89
3ML3PW	iPod Mini 6GB - Silver	159.99	136.17
3ML2PW	iPod Mini 6GB - Blue	159.99	136.17
3ML4PW	iPod Mini 6GB - Pink	159.99	136.17
3ML5PW	iPod Mini 6GB - Green	159.99	136.17
3P47PW	iPod Photo - 60GB	279.99	238.29
	CREATIVE		
3RLBPW	Zen Nano Plus 256MB - White	49.99	42.55
3RLGPW	Zen Nano Plus 256MB - Black	49.99	42.55
3RLCPW	Zen Nano Plus 512MB - White	64.98	55.31
3RLHPW	Zen Nano Plus 512MB - Black	64.98	55.31
3RLDPW	Zen Nano Plus 1GB - White	81.99	69.78
3RLJPW	Zen Nano Plus 1GB - Black	81.99	69.78
3RKSPW	Zen Micro SE - Silver	129.99	110.63
3RKTPW	Zen Micro SE - Black	129.99	110.63
3RKVPW	Zen Micro SE - Dark Blue	129.99	110.63
	SONY		
3MKPPW	NWE105S 512MB MP3 Walkman Silver	74.49	63.40
3MM4PW	NWE107S 1GB MP3 Walkman Silver	93.49	79.57
3MMMPW	NWE507S 1GB MP3 Walkman FM Silver	148.99	126.80
3MMBPW	NWE405B 512MB MP3 Walkman FM Black	88.12	75.00
3MMFPW	NWE407B 1GB MP3 Walkman FM Black	116.32	99.00
3MMHPW	NWE407R 1GB MP3 Walkman FM	116.32	99.00

DIGITAL MEDIA PLAYERS

quicklinx		£ inc VAT	£ ex VAT
	ARCHOS		
3QVFPW	AV700 40GB	420.96	358.27
3QVCPW	AV700 100GB	569.99	485.10
	CREATIVE		
3F1YPW	Zen Portable Media Centre	299.98	255.31
	MUSTEK		
3HVHPW	PVR-A1 Media Centre	79.99	68.08
3KMSPW	PVR-H140 Portable Media Centre	199.99	170.21
	SMARTDISK		
3P4PPW	FlashTrax XT 40GB	265.00	225.54
3P4QPW	FlashTrax XT 80GB	379.99	323.40

DAB RADIO

quicklinx		£ inc VAT	£ ex VAT
	SONY		
389XPW	DAB Digital Radio	116.48	99.14
	INTEMPO DIGITAL		
3RXNPW	PG-01 DAB Radio in Beech	69.99	59.57
3RXQPW	KT-01 DAB Radio in Pink	59.99	51.06
3RXRPW	KTB-01 DAB Radio in Gray	59.99	51.06
	SHARP		
3PT5PW	FVDB1EW DAB Radio in White	59.99	51.06

DVD PLAYERS & RECORDERS

quicklinx		£ inc VAT	£ ex VAT
	LITE-ON		
3HL5PW	LVW-5006 DVD Recorder	137.99	117.44
3KBJPW	LVW-5045 DVD Recorder 160GB	279.99	238.29
	SONY		
34CFPW	6 Head NICAM Smartlink VCR	84.77	72.15
34CGPW	6 Head NICAM VCR Jog/Shuttle	108.76	92.57
3R1QPW	SLVD980 DVD/VCR COMBI	138.43	117.82
3J95PW	DVPNS955VS QS DVD Player SACD DivX DTS	209.99	178.72

FREEVIEW

quicklinx		£ inc VAT	£ ex VAT
	HAUPPAUGE		
24M4PW	Dec 2000t	99.99	85.10
	MUSTEK		
3P7MPW	DVB-T102 Freeview Receiver	39.99	34.04
3P7NPW	DVB-T202 Freeview Receiver	82.84	70.51
	SONY		
2S8GPW	Freeview Digital TV Receiver	81.99	69.78

HEADPHONES

quicklinx		£ inc VAT	£ ex VAT
	APPLE		
30KSPW	iPod In Ear Headphones	21.98	18.71
2Z73PW	iPod Remote & Earphone Kit	25.19	21.44
	SHURE		
3FQQPW	E2c Earphones	57.34	48.80
3FQSPW	E3c Earphones	115.06	97.93
3FQRPW	E5c Earphones	288.99	245.95
	SONY		
11VCPW	MDR-E829V Fontopia Headphones	13.99	11.91
2GBZPW	MDR-ED21LP Fontopia Plus	14.00	11.92
2GC0PW	MDR-ED31LP Fontopia Plus	17.00	14.47
2LHWPW	Open Air Cordless Headphones	27.31	23.25
2GBYPW	MDR-EX71SLB Fontopia Headphone	31.70	26.98

SPEAKERS

quicklinx		£ inc VAT	£ ex VAT
	CREATIVE		
3P4MPW	I-Trigue 3200	45.15	38.43
3HJKPW	TravelSound i300	45.19	38.46
3M91PW	Travelsound 500 - Notebook	45.82	39.00
	JBL		
3P8WPW	On Tour Speakers	59.99	51.06
3L71PW	Creature II - Black	64.46	54.86
3189PW	Creature II - White	64.46	54.86

IPOD COLOUR - 20GB

HOLDS UP TO 15,000 SONGS

quicklinx 3RJKPW

Now that iPod and iPod photo are one and the same, every white iPod boasts a full-colour display.

Listen longer with up to 15 hours of battery life
Shuffle songs in the main menu
Play MP3, AAC and Apple Lossless
Jog without fear — 25 minutes of skip protection
Sync and charge via USB 2.0 (included) or optional FireWire
Use as a portable hard drive — take your files with you
Play colour games on the go
Keep appointments using the Alarm Clock/Sleep Timer
Stay organised with colour contacts, calendars and to-do lists

•Sharp, vivid 5.08cm Colour LCD screen
•Use iPod Colour with Mac OS X or Windows 2000/XP

only **£207.99** (£177.02 ex VAT)

NW-E405B 512MB MP3 WALKMAN

UP TO 50 HOURS BATTERY LIFE

quicklinx 3MMBPW

What can you do with up to 50 hours of battery life and 512MB of built-in memory? How about mow the lawn... on an 18-hole golf course or chill out in your bedroom... all weekend. Sony gives you more time with superior battery life. The super bright LCD Display provides easy viewing of song data, so you've got more control of your tunes. And, you can pack your player with up to 22CDs worth of songs. Features MP3 playback and Skip-Proof Design.

Also available in blue - see Quicklinx 3MMCPW.

•Direct MP3 Playback •Store up to 22 CDs
•Get 2 hours playback for just a 3 minute charge

only **£93.49** (£79.57 ex VAT)

ZEN MICRO - BLACK

quicklinx 3RKTPW

The Zen Micro will store up to 2,500 songs in WMA or 1,250 in MP3 on its 5GB hard disk, and its easy-to-remove rechargeable battery delivers up to 12 hours of high-quality digital audio. It's micro-sized and fits naturally into the hand, placing the touch-sensitive control pad in the perfect position for navigation with just one finger.

only **£129.99** (£110.63 ex VAT)

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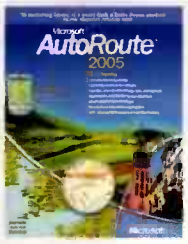

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39TWPW	Adobe Premiere Elements	69.70	59.32
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335HPW	Roxio VideoWave Movie Creator 7	55.46	47.20
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	WEBSITE PUBLISHING		
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Tim Anderson
is both 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

Get with the program

How SQL Server 2005 changes database programming for Visual Basic developers

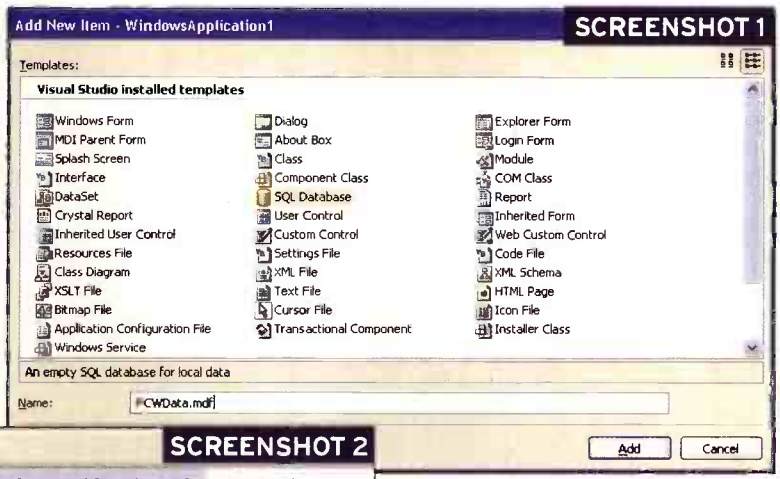
Most applications need a database, and for many Windows developers that means Microsoft Access, or its underlying database engine which is called Jet. Database experts scorn Jet for its poor network performance, and over the past few years even Microsoft has been trying to wean its users away from Jet and towards various forms of SQL Server, its grown-up database engine. There are other choices, as well. For web applications, MySQL is the most popular choice, although mostly on Unix-like systems rather than Windows, while for single-user desktop applications, a better choice is often SQLite, a small but capable open-source database engine.

But Jet still refuses to die. Developers like it for several reasons. Microsoft Access is everywhere, and few alternatives can match its slick user interface, which makes database tables look reassuringly like Excel. Performance is good enough, and copying data between machines or over the Internet is simply a matter of grabbing the relevant mdb file. In contrast, copying data in SQL Server requires you to get your head around concepts such as attaching and detaching databases, or the complex Data Transformation Services. Another issue is that SQL Server runs as a separate Windows service, which has to be installed and running on the target machine, whereas all Jet requires is some runtime files that are probably already installed.

The Windows database scene is now changing again, with the final release of Visual Studio 2005 and SQL Server 2005. After a protracted beta period, these products will be launched in November. This is the first major release of SQL Server for five years, and it is particularly interesting for Visual Basic developers or others using the .Net platform. The range of editions includes SQL Server Express, which is targeted directly at all those stubborn programmers still using Jet. SQL Server Express is described by Microsoft as 'always free to obtain and use'. It replaces MSDE (Microsoft Database Engine), which is also a version of SQL Server but marred by a lack of tools and a mysterious 'workload governor' that limits performance. You can bundle SQL Express into your application and deploy it without paying a royalty. This is a generous offer, since Express is a full version of SQL Server. The key limitations are that databases may not exceed 4GB, only one CPU will be used, and there is no 64bit edition, although it will run as a 32bit application on 64bit Windows. It far exceeds Jet as a database engine. There is still a case for something like SQLite if you want small and simple, but for anything more than that, SQL Server is the obvious choice.

Microsoft has also addressed the deployment issues that kept developers hooked on Access. To see how this works, start up Visual Basic 2005 and require database support in your application, you can right-click the application in the solution explorer, choose Add item and select SQL Database. The wizard will create an empty database file and copy it to your application folder, just as if it were an mdb (see screenshot 1). For deployment, you can simply copy all the files, including the database file, and run it on a different machine. Provided SQL Express is installed, it will work. Behind the scenes, the application will attach and detach the database when you open and close a connection. This way of doing things is not a requirement and might not produce the best performance, but it simplifies matters when all you want is a database to support your application.

SCREENSHOT 1



SCREENSHOT 2

title	
JavaScript for the World Wide Web	Dori Smith
JavaScript for the World Wide Web	Tom Negrino
Programming ASP.NET	Dan Hurwitz
Programming ASP.NET	Jesse Liberty
The C# Programming Language	Anders Hejlsberg
The C# Programming Language	Peter Golde
The C# Programming Language	Scott Wiltamuth

Above: Using the Add New Item wizard, you can easily add an SQL Server Express database to a project

Left: The result of a query for books with their authors is multiple rows for every book with more than one author

Programming tips

The reason SQL Server 2005 belongs in a programming column is that this version is deeply integrated with both .Net programming languages and XML. Getting the best from these features will take some learning, but they open up significant new possibilities for simplifying and optimising your code. In essence, you can now run VB or C# code within the database engine rather than in your application.

First, a cautionary note. Database engines are not designed to be stuffed full of application code. Incorrect use of the feature could cause problems. However, judicious use of stored procedures and user-defined functions can dramatically improve performance. It is particularly worthwhile when it reduces either the amount of data that has to be shifted across the

SCREENSHOT 3

title	Authors
JavaScript for the World Wide Web	Dori Smith, Tom Negrino
Programming ASP.NET	Dan Hurwitz, Jesse Liberty
The C# Programming Language	Anders Hejlsberg, Peter Golde, Scott Wiltamuth

The final query selects books with their authors in a user-friendly list

network, or the number of separate calls made to the database. Even on a single machine, some of the same logic applies, since SQL Server runs in a separate process and inter-process communication is expensive.

Here is an example based on a book database, illustrating a classic database problem. Books may have more than one author, so you might have a Books table, an Authors table, and a BookAuthor table to link them. Now imagine that you query the data for titles with their authors. Every book with more than one author will appear more than once in the list (see screenshot 2).

There are two problems with this. First, it is confusing for users who expect to see each book listed only once. Second, redundant data has been returned, slowing performance.

This problem can be solved with a user-defined function that returns a list of authors. You can do this in Visual Basic 2005. Here are the steps based on the second beta version, and using the April Preview of SQL Server 2005; the details may change in the final release. Start a new VB project of type SQL Server. Right-click the project in the solution explorer, and choose Add – User defined function. Call it GetAuthors.vb. Change the code to accept an integer representing the BookID and return a string. Then write VB code to query the database for a list of authors and return it as a comma-separated list.

There are a few practical points to note. In the code, you need to get a reference to the current database connection, like this:

```
Dim conn As SqlConnection
 = New SqlConnection
("Context Connection = 
True")
```

(Key: ↵ code string continues)

You still have to open the connection and close it when done. You also have to mark the user-defined function to allow data access. Visual Studio will generate an SqlFunction attribute above the function declaration, but by default its DataAccess property is None. Change it like this:

```
<Microsoft.SqlServer.
Server.SqlFunction(Data
Access:=DataAccessKind.
Read)>
```

Finally, by default, SQL Server disables CLR (Common Language Runtime) execution. You can enable it by executing:

```
sp_configure 'clr 
enabled', 1
```

and then:

```
reconfigure
```

It is likely that some of these steps may be simplified in the final release, so check your documentation.

Put the function to work

Once you have written your VB code, you can build the SQL Server project. Next, choose Deploy from the Build menu. This registers the compiled assembly with SQL Server. Now you can include the function in an SQL query, like this:

```
SELECT title, 
GetAuthors(id) 
As Authors FROM books 
ORDER BY title
```

The result is the list that you probably wanted (see screenshot 3), showing each book in a single row with all its authors. You can put this query in the test SQL script that Visual Studio creates, although you may have to prefix the function with dbo to get it recognised. To get convenient debugging, first make the SQL Server project the startup project, if it is not already. Next, right-click the test script and set it as the default debug script. Then you can press F5 to debug the code in the same way as for any VB project.

Since your VB function is, in effect, an SQL extension, you can call GetAuthors anywhere that you can use SQL, such as in a stored procedure written in the old Transact SQL (T-SQL) familiar to SQL Server developers.

There is a lot more you can do with CLR integration in SQL Server, such as writing .Net stored procedures and triggers and using user-defined types defined as .Net classes. However, by default, code in SQL Server is sandboxed. There are three levels of permission: Safe, External access and Unsafe. If the code has the Safe permission, it cannot write files or access the network. In most cases, that is the best option. The point is that SQL Server is easier to extend than before, even for VB developers who prefer to avoid the intricacies of T-SQL.

Inside SQL Server Express

We asked Euan Garden, an SQL Server Group Product Manager at Microsoft, about the replacement for MSDE (Microsoft Database Engine).

Q: How does SQL Server Express address the lack of tools in MSDE?

A: We've built a new dedicated tool for it, Express Manager. The primary goals are simplicity and ease of use. It does not provide full functionality, which means the application is fairly small. You also get the new SQL Command command-line tool, and a configuration management tool.

Q: Will there be a cost for deployment?

A: No, it's a free product. We've committed to it being free. There's a redistributable version without any of the tools and another with the tools included. One of the interesting things about MSDE was that a lot of customers didn't want any tools included, because when they install an application that uses it as an embedded database you don't want SQL management tools showing up on the Start menu.

Q: Why is Microsoft giving this away?

A: We created MSDE because we needed a free embedded version of SQL Server. There's a whole range of applications that don't need anything more. We've seen widespread adoption as a lightweight desktop database. The benefit to Microsoft is that all the users are potential future SQL Server customers.

Euan Garden: Goals are simplicity and ease of use

Q: Is SQL Express deliberately throttled to reduce performance, in the same way as MSDE?

A: People were avoiding MSDE because they were scared by the workload governor. The reality is most people were never hitting it, but because it existed it caused angst. So we took the workload governor out of SQL Server Express. The database limit has also been upped, from 2GB to 4GB. The tight integration with Visual Studio and the Express editions is also something new. We want to make it very easy to develop with it.

Q: What are the implications for Access?

A: Access is an application development tool for forms-based applications more than anything else. Access as a tool will still continue. SQL Server Express has no graphical query builder or schema designer. We've kept Express Manager very simple.

CONTACTS

Tim Anderson welcomes your comments on the Visual programming column. Email him at: visual@pcw.co.uk. Please do not send unsolicited file attachments.

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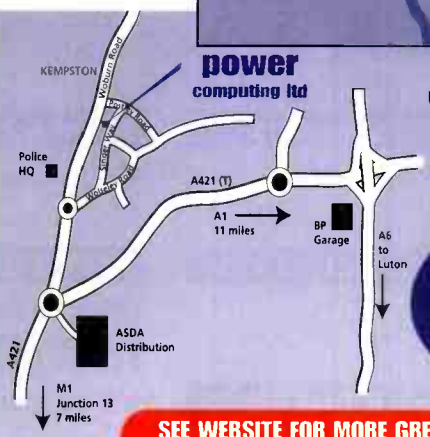

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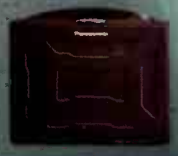

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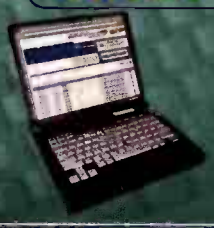

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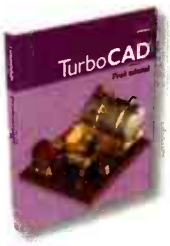

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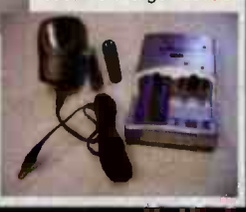

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Grand Theft Auto: San Andreas has come under fire for its alleged inclusion of explicit sex scenes. The revelations came to light when a group of hackers released the Hot Coffee mod, which allows players to control the game's main character while he has sex.

To use the mod, players must take one of the lead characters' girlfriends on a date. Should the pair hit it off, you'll be invited back to her place for coffee. Instead of a censored external view of the house and suggestive moaning from inside, the Hot Coffee mod lets you to play an x-rated mini-game.

Rockstar Games, the creator of the GTA series, quickly distanced itself from the mod, saying the scenes depicted in the mini-game 'cannot be created without intentional and significant technical modifications and reverse engineering of the game's source code'.

However, similar scenes have been found in the Playstation 2 version of the game, without the need for a mod. Instead players use the 'Action Replay' cheat device, which can unlock existing hidden content.

US Senator Hillary Clinton, a stern critic of violent media content, said that in the US, GTA: San Andreas should have been given an Adult Only classification by the Entertainment Software Rating Board . As we went to press, the ESRB agreed with this, forcing a reclassification of the game.

Battlefield 2

War, what is it good for? Well, it makes for a great shoot-'em-up

According to James Brown, war is good for absolutely nothing. However there are hordes of gamers who'd beg to differ, as the ancient pastime of killing people who disagree with your views is an ideal premise for a 3D first-person shooter.

One of the best examples of the genre is Battlefield 2 – the follow-up to Battlefield 1942 and Battlefield Vietnam. Whereas its predecessors allowed up to 64 players to scrap it out against Nazi or Vietcong forces, this new release places you against (or in the shoes of) more modern enemies, along with their respective weapons and vehicles.

Although the foes and locations have changed, the premise is still exactly the same; join an army and try to capture all your enemy's control points. Each army is allocated a number of 'tickets', which reduce incrementally every time a soldier is killed and rejoins the game. The winning team is the one that captures all the opposition's control points or reduces their tickets to zero.

One of our main complaints about the previous Battlefield games was the amount of confusion caused when a large number of players entered the game. Battlefield 2 addresses this by grouping five or six players into squads led by a single commander.

Commanders have a realtime bird's-eye view of the battlefield and can scan the map for enemy forces, deploy spy drones, and issue orders to squad leaders. This can be done via the new Voice-over-IP system that lets you speak directly to your troops using a microphone headset.

To reduce confusion, players can only talk to soldiers in their own squad, with orders sent down the chain of command and requests sent upwards. We found this feature very satisfying, adding to the feeling of being immersed in the action.

Battlefield 2 isn't without faults. It is common for one team to have a far larger number of fighters than its opponent. Fortunately a small, organised squad can still defeat a larger force of disorganised troops. Also there is no option to fight against 'bots' (computer-controlled characteristics) in a multiplayer game.

These complaints aside, Battlefield 2 is an excellent multiplayer shoot-'em-up that even rivals Call of Duty.

Rory Reid

DETAILS

PRICE £34.99 inc VAT
CONTACT Electronic Arts
europe.ea.com
SYSTEM REQUIREMENTS
Windows XP (32bit) • 512MB of Ram • 256MB Radeon X700, Geforce 6600 or higher graphics card • 2.4GHz CPU DirectX 8.1 compatible soundcard • 2GB of hard disk space
VERDICT
Varied and immensely fun, BF2 is possibly the best multiplayer shoot-'em-up we've ever played.
OVERALL ★★★★★

Squad leaders can talk to their troops using a microphone headset

WIN!

Competitions

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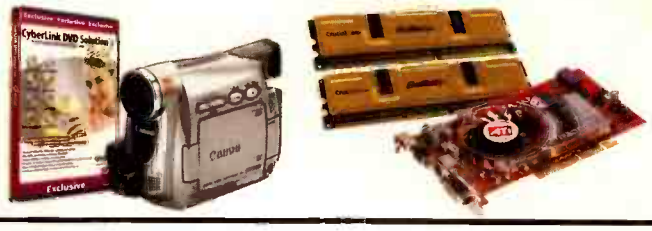

Earth 2160

Ambitious realtime space combat

Earth 2160 is the sequel to the hugely ambitious Earth 2150. The game tells the story of a long-running feud between three factions; the European Dynasty, the Union of Civilized States, and the Lunar Corporation. Their fighting destroyed the Earth and forced them to flee to new worlds, but rather than see the error of their ways, they soon fell back to their feuding.

One of the best aspects of Earth 2160 is its three-dimensional game engine, which allows you to play from a bird's-eye view, or to zoom right in and play it from a first-person perspective. Doing the latter isn't always advisable but it allows for some very entertaining viewing angles.

Like its predecessor, Earth 2160 involves a lot of asset management. You can design vehicles and structures on a modular basis, so everything you create can have a unique look and function. It is possible, for example, to create an army of Mech Warrior-style troops for different tasks, albeit with only slight variations.

However, you'll need to spend a good deal of time researching new technologies before you get to use them, and the user interface for doing so can become quite complex. Fortunately you can employ the services of 'virtual agents' who can help you in one area while you concentrate on others.

Like any science-fiction realtime strategy (RTS) game, Earth 2160 can feel very unrealistic, particularly in comparison to titles based on real wars. In our opinion, the sound of a laser just doesn't compare to the noise made by an automatic machine gun.

If you're after an all-encompassing RTS that lets you get your hands dirty in nearly every department, Earth 2160 is a great choice. It's not so easy to get into, but if you invest the effort it's very rewarding.

Rory Reid

DETAILS

PRICE £34.99 inc VAT
CONTACT Deep Silver
www.deepsilver.de
SYSTEM REQUIREMENTS
Windows XP • 512MB of Ram • 256MB Radeon X700, Geforce 6600 or higher graphics card • 2.4GHz CPU • DirectX 8.1-compatible soundcard • 2GB of hard disk space
VERDICT
Not very accessible, but one of the best options for ardent RTS fan
OVERALL ★★★★★

Cricket 2005

EA delivers googlies, yorkers and more

With Cricket 2005, EA promises a 'no-holds-barred cricket explosion'. Considering even most die-hard cricket fans admit the game is a tad slow, it's a bold claim.

On the graphics side, EA has certainly got it right. The players look good and move in a lifelike manner. If you're a cricket fan, you'll instantly recognise the big and not-so-big names. The crowd is perhaps a little more animated than the sunburnt, intoxicated sorts you usually find during an Ashes series, but on the whole EA has done a sterling job with the visuals.

Richie Benaud was the obvious choice as the Cricket 2005 commentator, and he's backed up by the Aussie great, Jim Maxwell. In time though, you'll tire of their oft repeated one-liners.

Game options are varied and include club cricket, one day internationals and five-day test series. Should you prefer a faster paced game, Twenty20 tournaments can be played out. In true EA style, it's also possible to conjure up your own cricketing legends and adjust their appearances right down to the colour of their eyes.

Of course, without decent gameplay and smooth graphics, quirky features count for nothing. It took us a while to get to grips with the batting system and we'd recommend using a joypad as opposed to the keyboard. At first our wickets fell at an alarming rate, but it didn't take long to master the basic shots.

Sadly, the bowling side of things isn't nearly as much fun as batting, and we were left feeling that the whole process was far too automated. On the plus side, it does keep the number of wides down to a reasonable level.

All in all, Cricket 2005 is a decent addition to the series, but we'd like to see an improved bowling system in the next release.

Will Stapley

DETAILS

PRICE £29.99 inc VAT
CONTACT
EA **www.ea.com.uk**
SYSTEM REQUIREMENTS
700MHz processor • 128MB of Ram • 1.2GB hard disk • Windows 98SE/2000/ME/XP
VERDICT
Good fun when you're in bat, but bowling can become a tad tedious
OVERALL ★★★★★

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Microbee

How a do-it-yourself magazine kit became a much-loved Australian home computer

Over the years, Retro has told the story behind vintage home computers of the 1970s and 1980s, and how small companies would take on large corporates for a share of this exploding market. While many popular models from the UK and US were distributed to global markets, several countries produced their own machines.

One such country was Australia, whose most famous home computer started life as a do-it-yourself kit, but soon found itself in schools across the land, and homes as far away as Scandinavia. This is the story behind the Microbee.

In early 1978, Stephen Dennis tried to build his own video card using instructions serialised in *Electronics Today International* (*ETI*) magazine. After completing the project, Dennis found it didn't work properly, so he rang the magazine which put him in contact with the author, David Griffiths.

Griffiths' video card project used the S100 bus, an early industry standard pioneered by MITS Altair. You started with a shell consisting of a case, power supply and motherboard, before slotting in various cards – two of the most important housing the processor and video circuitry.

Griffiths' video card could display 64 x 16 characters. Applied Technology took the card on and sold 2,000 kits based on it, naming the card DG640 after Griffiths.

Applied Technology was formed in 1975 by electrical engineer Owen Hill. It sold electronics components by mail order, while Hill wrote various project articles for *ETI* and *Electronics Australia* magazines.

Through *ETI*, Dennis met Griffiths and his flatmate John Oxley. They discussed S100 projects and Griffiths proposed designing a microprocessor card using a Z80 chip. Once again, *ETI* published the project, while Applied Technology sold the kit. More than 1,000 DG680 kit boards were sold, for which Griffiths also wrote a small operating system called DGOS.

The projects had been a great success, but pre-built computers from the likes of Apple and Tandy Radio Shack were becoming popular. Hill saw the days of kits were numbered, so in January 1981, Applied Technology started work on its first complete computer, codenamed 'Granny Smith', after the Australian apple variety.

The computer was redesigned from the ground up by a team including Mathew Starr, Craig Barratt, Garner Annett and Raymond Han. Starr was recruited as the main hardware designer, fitting in the work after school and during weekends, as he was still in high school.

Applied Technology wanted to sell the first models as kits, but as the project neared completion in November 1981, Hill decided to submit a competitive tender to produce computers for schools in New South Wales. But what should they call the new machine?

Hill had discovered that students didn't like technical-sounding names for computers. Starr suggested 'Bee' because the software could then be called 'honey'. Hill added 'Micro' and their computer had a name.

The New South Wales education department visited Applied Technology's factory and inspected the 32 working Microbee prototypes. The result of the tender was announced in April/May 1982, the contracts going to both Apple and Microbee. Hill only found out when the CEO of Apple Australia rang to offer his congratulations.

The first 1,000 Microbees were sold as kits, with a AU$100 option to have Applied Technology service them. In practice, many customers simply bought the kit and paid AU$100 to have it built. Fully assembled Microbees soon followed and by August 1982 almost 1,000 were produced every month.

The first Microbee contract was for New South Wales schools, followed by districts across the country. At one point, more than 3,000 Australian schools were using Microbees.

Over the next five years, the company grew rapidly, floating in 1985 and developing new models including the Telecomputer and Gamma.

As the 1980s drew to a close, the momentum of IBM's PC proved unstoppable. Microbee Systems imported and badged some Taiwanese IBM clones, but the company ran out of cash and later went into receivership.

The Microbee is fondly remembered in its homeland, selling more than 70,000 units across Australia and further afield to Scandanavia, Hong Kong and Russia. At its peak in 1984, the Microbee enjoyed an impressive 11 per cent of the total Australian PC market.

Gordon Laing

Thanks to Owen Hill, David Griffiths and Stephen Dennis

Cyberlink CDS Gold and 2 Canon cameras

To coincide with the release of its CDS Gold software, Cyberlink is giving 12 *PCW* readers the chance to win a copy of the application. CDS Gold (Cyberlink DVD Solution Gold) is described as the 'essential burning suite' for all your audio, video, disc and data-related needs, and includes six main applications.

First, PowerDVD 5 Express lets you play all your favourite DVD movies. Photonow enables you to touch up your digital images. Power2go is a top-notch CD/DVD authoring tool and Mediashow lets you create slideshows.

And that's not all. CDS Gold also includes Musicmatch, where you can listen to and rip your favourite tunes, and Powerbackup ensures that the memories you've captured aren't lost. Cyberlink CDS Gold can be bought exclusively from Game (www.game.co.uk).

As well as a copy of the software, two winners will get a camcorder or camera. The first-prize winner will receive a Canon MV800 digital camcorder. This is the perfect compact camera for shooting quality, hassle-free home movies. It has a 20x zoom, image stabilisation, and a 16:9 widescreen recording mode.

The second-prize winner will receive a Canon Powershot A520, featuring a 4megapixel CCD, 1.8in LCD monitor and simple elegant design. *PCW* gave the A520 a Recommended award in the July issue, concluding that if you want a simple-to-use camera that takes good photos with plenty of features you're unlikely to find a better model.

For your chance to win a Canon camera or a copy of Cyberlink CDS Gold, answer the question below and follow the instructions on how to enter.

What do the letters CDS stand for?

a) Cyberlink Data Solution
b) Cyberlink Delta Solution
c) Cyberlink DVD Solution

Rules of entry

These competitions are open to readers of *PCW*, except for employees (and their families) of VNU Business Publications, Cyberlink and Crucial. *PCW* is the sole judge of the competition 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 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 competition sponsor(s) for this purpose. No purchase of the magazine is necessary to enter the competition. VNU will use all reasonable efforts to ensure that the prizes are as described on this page. However, VNU cannot accept any liability in respect of any prize, and any queries regarding a prize should be taken up directly with the sponsor of that prize.

We may use the contact details supplied to communicate with you regarding *PCW*. Please indicate if you are also happy for us to contact you via email or mobile about other products or services available from *PCW* and the VNU Business Publications Group, and if you are happy for us to pass your details on to other carefully selected companies to contact you about their products or services.

Crucial memory, drives and ATI graphics cards

Memory specialist Crucial is giving 22 lucky readers the chance to win components and removable storage.

The first-prize winner will get a Ballistix memory kit, consisting of 2GB of DDR400 memory. The Ballistix line is specifically built for performance enthusiasts who want to push performance without worrying about data loss or corruption, mysterious intermittent errors and display problems, or the dreaded blue screen of death.

One second-prize winner will receive an ATI Radeon X800 Pro graphics card worth over £200. The X800 Pro has high clock speeds and data rates, and remarkable image acceleration. It provides up to twice the performance of the acclaimed Radeon 9800 Pro, and maximises image quality in demanding games at high resolutions.

There are 20 runner-up prizes: 10 512MB Gizmo drives and 10 512MB flash cards worth nearly £30. The Gizmo is a high-speed USB flash drive that measures just 68 x 22mm, so multiple drives can fit into neighbouring USB ports. Each Gizmo comes with a lanyard, and is plug and play-compatible with Windows ME, 2000 and XP, as well as with Mac OS 8.6 and above. As not all digital cameras take the same kind of flash memory cards, Crucial will allow the 10 memory card winners to choose a suitable one from its full range.

For more information on Crucial's range of products, visit **www.crucial.com/uk**, or for your chance to win one of these excellent prizes, answer the question below and follow the instructions on how to enter.

How much memory is up for grabs in the Ballistix kit?

a) 512MB
b) 1GB
c) 2GB

How to enter

For your chance to win the prizes from Cyberlink (page 170), call **0906 616 6317** and for the Crucial prizes (page 171) call **0906 616 6315** and follow the instructions.

Calls cost 60p per minute from a BT landline (mobile and other network rates may vary) and last approximately 90 seconds. Competition closes midnight on 16 September 2005.

You can also enter online at **www.pcw.co.uk/Competition**.

August winners

The two winners of the Jal Phoebe PCs are N Kimpton from Cumbria and Stephen Whitelaw from Glasgow. M Henderson of London is the winner of the Shuttle XPS PC.

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BELKIN WIRELESS MIMO NETWORKING

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Bring your network up to speed with the new Belkin wireless Pre-N Mimo router. This exclusive special offer for readers of *PCW* will rid your network of poor coverage, signal degradation and slow transfer speeds. Mimo stands for Multiple Input, Multiple Output which means greater range, increased data transmission speeds and increased signal strength over larger distances. Tested by top IT journalists, Belkin's wireless Pre-N router has won many awards and accolades since the UK launch in September 2004. In *PCW*'s review we said: 'It's easy to set up and provides a wireless network that's not only extremely fast, but has great coverage as well: (*PCW* March 2005, p13S).

Router features include:

- 8x greater coverage than standard 802.11g
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For only £.99.99, you will get both the Pre-N Router and either a desktop network card or notebook network card for free. If you want the complete set, you can also buy the additional wireless desktop network card for £64.99 or the wireless notebook network card £59.99.

Please quote the following order codes: Z211 - Belkin Pre-N Router with wireless desktop network card; Z212 - Belkin Pre-N Router with wireless notebook network card; Z213 - Wireless desktop network card; Z214 - Wireless notebook network card

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LP Recorder 5

Using the cover disc

The *PCW* cover disc uses a web-browser-style interface. To get full functionality, you'll need to use Microsoft Internet Explorer (version 5.5 or later). Unfortunately, Netscape doesn't properly support this software. However, we have also provided links to the featured programs so that you can still copy them to your hard disk or install them manually (the standard download dialogue box will appear). Programs can be found in the \software\ folder on the disc.

Starting the disc

The CD-Rom (or DVD) should auto-start. If it doesn't, double-click the CD-Rom/DVD icon in My Computer, or open the terms.htm file on the root of the disc.

Problems?

Please note that we cannot give support on individual programs contained on this disc.
If you have problems running the disc or any of its content, please note these guidelines:
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Upminster, Essex RM14 3HL
quoting reference **'*PCW* Vol 28 No 10'.**
PROBLEMS INSTALLING/RUNNING THE SOFTWARE > Check the support page on the disc, or check the manufacturer's site.
GENERAL DIFFICULTIES > Call 08700 885 995 (9.30am to 5pm Mon, Tues, Thurs & Fri; open until 8pm on Wed and 10am to 2pm Sat). Or go to www.vnusupport.co.uk.
Or email us at pcw@vnusupport.co.uk.

SOFTWARE LISTING

CD

Full versions
Conceptdraw V Personal
Roxio MyDVD Slideshow VCD Edition
Cyberlink Powerbackup 1
LP Recorder 5

Trial versions
AVG plus Firewall
LP Recorder 7
WS_FTP Professional 2006

Open-source programs from the magazine including
7-Zip 4.23
A Note 4.21
Abakt 0.9.1
Abiword 2.28
Aethera 1.21
Ant Movie Catalog 3.5.0.2
Ant Renamer 2.08.3
Axcrypt 1.61
Blender 2.37a
CDex 1.51
Gaim 1.4
Health Monitor 2.1
TV Browser 1
VLC Media Player 0.8.2
WX Musik 0.4.1.0
XAMPP 1.4.14

Freeware
Horodruin 2.0.179.0
Mayk 1.6
Password Coral 4
Startright 1.2.8
Subpad

Resources including
Audacity 1.23
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Brian Lara International Cricket 2005; EA Cricket 2005; Panzers 2; Prison Tycoon; Team Manager 2005

Conceptdraw V PE

FULL VERSION

Flowcharts, business diagrams, maps and form design libraries mean Conceptdraw covers all your business charting needs

Need to know

System requirements
128MB Ram, Windows 98/ME/NT4 SP6/2000/XP, 150MB drive space

Information
www.conceptdraw.com

Registration
Obtain your serial number from www.conceptdraw.com/registration/cd5personal.php

Limitations
None

Effective graphics are a vital part of any business document, so there is a wide range of programs that will help you design them. You could pick just one to suit your needs: flowcharting, floor plans, form design, desktop publishing, organisation charts and so on. But it's probably simpler to install Conceptdraw V Personal Edition, which can handle all these types of graphics and a whole lot more.

The creation process starts with the Conceptdraw Template Gallery, which appears as soon as you launch the program. It presents you with a long list of graphics categories to choose from, such as building plans, flowcharts, maps and technical drawings.

Each graphics category then has a number of additional examples, some of which you wouldn't necessarily expect. Basic Diagrams has 2D and 3D blocks options, for instance, which let you draw large, chunky, colourful flowcharts.

There's also a Solid Geometry option, which provides a library of shapes (everything from a cube or cone to an irregular polyhedron and four different types of pyramid), which will help you produce more complex geometric images.

There's a similar depth to many of the other chart categories. For example, Flowcharts includes libraries of all the basic shapes you would expect, but there are also options to produce Data Flow and Cross Functional diagrams as well as Cause and Effect (fishbone) charts.

Choose one of these and the program performs as you would expect. A tabbed library of flowchart shapes opens on the left-hand side, and you drag and drop the ones you need onto the page. Resize them, add captions, direct connector lines and you're nearly done.

Conceptdraw doesn't just provide symbols for the flowchart. Click the Title Blocks tab, for instance, and you'll find 42 different title formats for the top of your chart. Find one you like, drag and drop it onto the page and fill in the details – much better than the more basic text tool you'll find in similar packages.

The extras don't stop there. You can also add a fancy border or frame to your chart by dragging and dropping, and there are 38 colourful backgrounds to choose from.

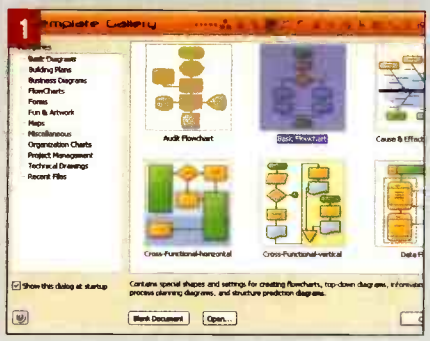
Perhaps the most interesting part of Conceptdraw is its ability to produce marketing images, such as comparison charts, where the features of your product are compared with those from the competition. You would probably normally build something like this in a word processor, but Conceptdraw can produce an attractive pre-built chart in a few mouse clicks, which you can further customise in just a few more – it couldn't be easier.

When you're finished, you'll want to share your work with others, and there are plenty of options here, too. In a couple of mouse clicks you can send the chart by email, save it as an image (jpeg, bmp and png are among the 14 supported formats), or even produce a finished pdf, making Conceptdraw a one-stop solution for all your charting and simple desktop-publishing needs.

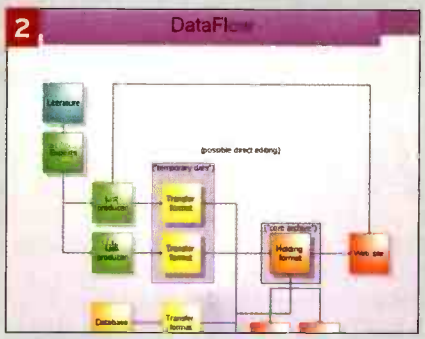
Key features

- Hundreds of pre-drawn symbols, organised into 70 separate libraries
- 11 chart template categories
- Directly import graphics, Powerpoint slides and XML for Visio files
- Add hyperlinks to URLs or local files
- Support for anti-aliasing ensures the highest presentation-quality graphics
- Save your finished chart in one of 14 graphics formats or as a pdf

If you need quality business diagrams in a hurry, here's the secret



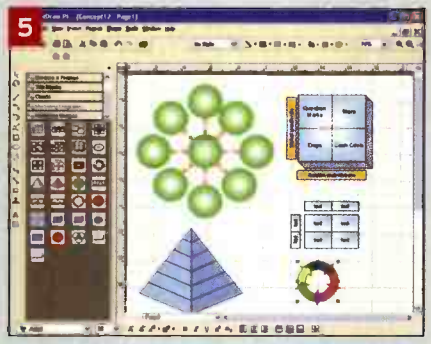
1 Conceptdraw can produce many different types of chart, as you'll see from the Template Gallery displayed when the program is first launched. A common application might be flowcharting, for instance: click Flowcharts then select Basic Flowchart and click OK to create one.



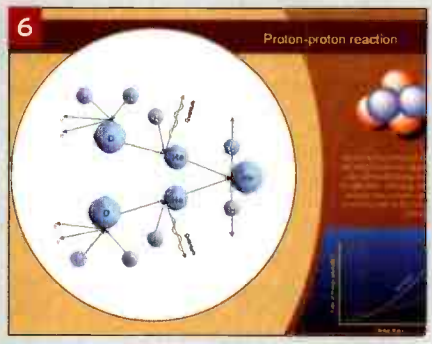
2 Choose any required symbols from the library and drag and drop them onto the page. Double-click on a symbol to add text, right-click and select Properties to change colours and so on, then add connectors to join everything up. Add title blocks and background to improve the page's appearance.

3 Conceptdraw comes with many different libraries, which makes it very versatile. If you're planning a major home redesign project, for instance, the Building Plan templates include options to set up everything from wall shape and dimensions to internal office and room layouts.

4 Some symbols are more than just static shapes. Click Project Management > Calendar, for example, then drag and drop the Large Month symbol onto your page, and you're prompted to customise it with your choice of month, year and other attributes. It's easy to build up and print a custom calendar to suit your needs.



5 Other options can be a little hidden, so be sure to explore the program properly. The Marketing Diagrams alone contain enough pre-built symbols to justify installing Conceptdraw: there's a Boston or Ansoff matrix, step chart, Venn diagram, 3D pyramid chart, process chart and many more.



6 You're not restricted to the templates provided by Conceptdraw – you can combine the symbols however you like. Browse the samples provided for some interesting and unusual ideas, including everything from molecular diagrams to a mock-up of a user interface on the Mac.

Upgrade offer >> Standard or Professional

New features

- More templates, wizards and libraries
- Extended import/export options
- Scripting capabilities

The Standard version of Conceptdraw V adds more wizards, chart templates and libraries of shapes. It lets you create multi-page documents and can export them in HTML, Powerpoint and other formats.

The Professional version offers extended import/export options, including Autocad DXF and Macromedia Flash, as well as adding its own Conceptdraw Basic scripting language.

Normally priced at $149 (£85.62) (Standard) or $349 (£200.50) (Professional), you can upgrade for only $79 (£43) or $99 (£54) respectively. Visit **www.conceptdraw.com/en/purchase/cd5/upgrade.php** to place your order.

Roxio MyDVD Slideshow

This VCD edition lets you show off your photos

Need to know

System requirements
128MB Ram, Windows 98SE or later, Windows Media Player 7.1 or later, Internet Explorer 5.x or later, 10GB free hard drive space, CD or DVD writer

Information
www.roxio.co.uk

Registration
Go to www.roxio.co.uk/keys and follow the instructions

Limitations
No mpeg2 support, VCD only

After taking loads of great photos on holiday or at a family event, you'll want to show them to others. That's not easy, of course: there are too many to email in a single file, and some family or friends may not have a PC. Fortunately Roxio has the solution.

Install MyDVD Slideshow and it will let you collect all your favourite images (all the main graphics formats are supported, including jpeg and bmp) on a single disc. DVDs aren't supported on this version, but writing to CD means you get almost 650MB to play with – more than enough for most purposes.

After dragging and dropping your images into the order you want, you might like to add a soundtrack. This could be a simple mp3 file or a wav narration where you tell the story of each image.

It's even possible to split the project into mini slideshows, which might be preferable if you have lots of photos to share. For a family wedding, for example, you might have sections such as Preparations, Getting to the Church, The Service, Reception and so on.

MyDVD Slideshow keeps your sections organised by letting you build a DVD-like chapter menu where each button points to a separate slideshow.

Once you're done, click Burn to write the slideshow to CD. Mail it off to family or friends and they'll be able to play it on most standalone DVD players or just about any PC with a software DVD player.

Create a stylish, professional slideshow

1 Launch MyDVD Slideshow, then click 'Create or Modify a Video CD Project' and select Add Slideshow. Locate the images you want and drag them into the bottom of the filmstrip box, or click Get Pictures and select them directly. Drag and drop them into your chosen order.

2 Click OK to return to the main disc menu, which now has a single button for the one slideshow you've created (right-click on this and select Edit for changes). Repeat the process to add more slideshows on different topics and click on the menu text to add your own captions.

3 Our two-line title slightly overlaps the first two buttons, which looks a little messy. Click Tools > Edit Styles to change this, and reduce the title text size by a few points to fix the problem. Choose another menu style if you like, then click OK and Burn to write your slideshow to CD.

Upgrade offer >> Roxio products

SAVE 10% OFF RRP

Features
- CD and DVD authoring
- Disc copying
- Audio capturing
- CD or DVD label design
- Photo organising
- Graphics and video editing

Roxio Easy Media Creator includes MyDVD Slideshow and a huge range of other utilities: CD and DVD authoring, disc copying, audio capturing and CD or DVD label design, photo organising, graphics and video editing, a DVD player, system backup and more.

Save 10 per cent on this suite (that's £62.99 instead of £69.99) and other Roxio products either by following the links at www.roxio.co.uk/adban/cd-upgrade/upgrade_en.jhtml, or using the discount magazine code, 'Magazines', when requested in the Roxio store.

Cyberlink Powerbackup 1

Take the hassle out of backups

Need to know

System requirements
Windows ME/2000/XP, 10MB drive space

Information
www.gocyberlink.com

Registration
Visit www.gocyberlink.com/english/bundle/index.jsp?nEventID=1331 before the end of October 2005

Limitations
No scheduler, differential or incremental backups. OEM Edition.

When was the last time you backed up your most valuable files? For most people, it has been longer than they would like to admit, partly because the process is too much of a hassle.

It doesn't have to be that way. Cyberlink Powerbackup offers a straightforward interface and all the features you need to run backups with the minimum of effort.

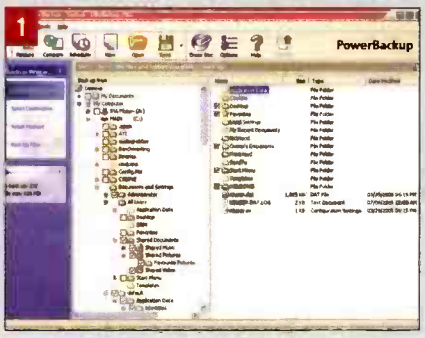
The process starts by selecting the source files to back up, which uses a familiar Explorer-style interface. If you want to save the contents of 'My Documents', for example, just check the box next to that folder. Powerbackup then counts the number of files it contains and lets you know their total size.

You can also tailor what's included in a backup by building up a list of Exclusions – file types that won't be saved. If you're only interested in saving documents, for instance, then you might want to add exclusions for executable files (*.dll, *.exe and so on) – click Options > Exclude > Add to build your own list.

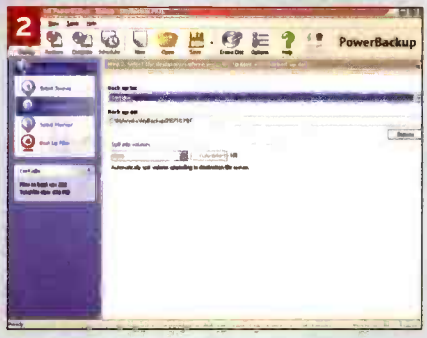
After choosing your files, click Select Destination to define where they'll be saved. This could be your own hard drive, a network drive, or even CD or DVD (no other CD- or DVD-authoring software is required).

Leave the backup method set to 'Full' (the Differential and Incremental options aren't available in this version). Finish by clicking Back Up Files > Backup Now. Your files will be saved, and you've just bought yourself a little insurance against any potential PC problems.

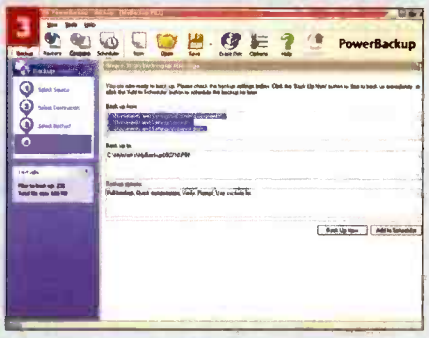
Backing up your most important files made easy



1 Powerbackup is a wizard-driven program where your whole backup is carried out in four simple steps. For the first, Select Source, choose the files you'd like to be saved. Check the box next to any folder or file you want to include and clear the box if you'd like to exclude something.



2 In step 2, Select Destination, and tell Cyberlink where your backup file will be saved. This could be on your hard drive, but this won't protect you against drive failure. It's safer to choose an external drive instead (most CD- and DVD-writers are supported).



3 Full Backup is the only option this version makes available in the third step, but you can customise other settings via the Options button. Move to the final 'Back Up Files' step when you're happy, click Back Up Now, and your selected files will be saved to disc.

Upgrade offer >> Powerbackup retail version

New features

- Scheduler for unattended backups
- Differential and incremental options to improved backup speed

The retail version of Powerbackup includes all the standard backup features you see here, but adds a scheduler for unattended backups, along with differential and incremental options that can improve your backup speed and let you back up only the elements changed on your system since your last backup.

The download version is available for $39.95 (around £24), and you can read more about the program or order it directly from the Cyberlink store at www.gocyberlink.com/multi/cyberstore/product_order.jsp?ProdId=29.

LP Recorder 5

FULL VERSION

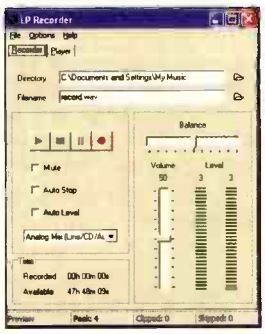
Need to know

System requirements
Windows 98/ME/2000/XP, 300MB free disk space (for 30 minutes wav storage)

Information
www.cbsoftware.com

Registration
Not required

Limitations
None



LP Recorder contains only the analogue to digital recording settings you need

LPs, tapes and other analogue recordings aren't exactly the most convenient audio format by modern standards, but that's easy to fix. Install LP Recorder and you'll be able to record your LPs in digital wav format on your hard drive, ready to convert to mp3, copy to CD, or anything else you'd like to do with them – as long as it doesn't infringe copyright.

The first step involves connecting the tape or line output from your stereo or sound source to the line input of your soundcard. Your soundcard should be able to record CD format wav files (16bit, stereo, 44.1Khz quality) for the best results; that's rarely a problem for modern desktops, but ageing laptops with integrated sound may not fit the bill.

Once you're set up, launch LP Recorder, provide a file name and click on Record. Set your audio source playing and the program will record it to disc for you. No need to worry about audio levels if you don't want to, as they can be set automatically to avoid distortion. Skip and clip prevention and detection ensures high-quality results, and LP Recorder can even automatically stop recording once it detects that your playback has finished.

Upgrade offer >> LP Recorder 7

The latest LP Recorder has an Auto Start option to begin recordings when the stylus is lowered on an LP or a tape player is started. The player function may now play back your recording from any starting point using the track bar slider. There's an enhanced Help file and a new interface.

Version 7 retails at around £22, but order before 10 November and you'll only pay about £17. Place your order at www.cfbsoftware.com/special37.htm.

Cyberlink Powerdirector 2.55

ON OUR COVER DVD

FULL VERSION

Need to know

System requirements
Windows 98SE and above, 200MB disk space

Information
www.gocyberlink.com

Registration
Get your CD key from www.gocyberlink.com/english/bundle/index.jsp?nEventID=1329

Limitations
No mpeg2 support, VCD only

Fades, wipes, slides and folds are among the 60 transition effects you can apply between individual scenes

No matter how skilled you are on a camcorder, the initial results will be less than impressive. There are times you start filming too soon or bits where you can't hear the audio track, and sometimes bits of seemingly pointless footage. What you need is a good video editor to convert these raw clips into a polished masterpiece, and Cyberlink Powerdirector Pro VE 2.55 is an ideal candidate.

The feature list starts with scene detection, for instance. Import your video, drag and drop it onto the Preview screen, then click Edit > Scene Detection > Detect. Powerdirector plays your clip and splits it into individual scenes.

Back in the main window, you can drag and drop those scenes onto the storyboard in whatever order you like. Then it's time to start tweaking. You can trim unwanted footage from clips, say, change their speed or add titles. There are special effects such as Mosaic, TV Wall or Ripple, fancy transitions to apply between the clips, audio effects and more.

When you've finished, you're ready to export the completed movie. You can save your video as an mpeg1 file, but burning a Video CD is more flexible; with the result viewable on both other PCs and standalone DVD players.

Upgrade offer >> Powerdirector 4

If you want to save your videos in full DVD format, then Powerdirector 4 can help. It adds more video, transition and title effects, many new intelligent editing features, a Picture-in-Picture function, support for lots more input and output video formats, and that's just the start.

The download version is available for $89.95 (about £51). Order it from www.gocyberlink.com/multi/cyberstore/product_order.jsp?ProdId=4.

PERSONAL COMPUTER WORLD

Next Month

on sale 22 September 2005

Find out if using the right paper gives you better prints

The best dual-core PCs on offer are put through their paces

Don't miss November's *PCW*...

Inkjet photo paper

Modern inkjet printers are capable of printing stunning photos but, according to the vendors, only if you use the right type of paper. In the first of our two-part look at inkjet photo printing, we put several well-known brands to the test.

Dual-core PCs

It won't be long before all PCs have dual-core processors, but at the moment you still have a choice. This round-up of some of the best systems will give you a better idea of what's on offer

Anti-spyware programs

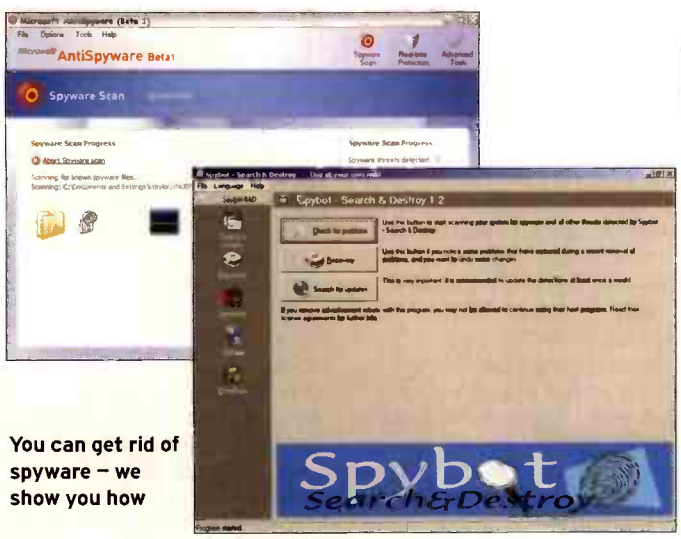
Spyware has become a major threat to your online security and privacy, but what's the best way of getting rid of it? Our group test investigates the top free and commercial anti-spyware programs.

Power-over-Ethernet switches

Power over Ethernet (PoE) is a standard that allows you to supply DC electrical power to devices such as IP phones or network cameras via standard Ethernet cabling. We test some of the latest 24-port switches that let businesses take advantage of this technology.

For regular updates of what's in November's issue, go to

www.pcw.co.uk/magazine/nextissue



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PERSONAL COMPUTER WORLD

OCTOBER 1985

Back in our October 1985 issue, Geoff Simmons was dreaming of a future where AI (artificial intelligence) was commonplace. Indeed, some people argued that computers could be regarded as emerging life-forms. Energy intake occurs through electricity, thought is possible through the processor and there is even reproduction – although the idea that computers could design other computers was a little tenuous. After much deliberation, Geoff decided that, when a life is seen essentially as a systems phenomenon, computer-based systems would qualify as being alive.

Elsewhere, Amstrad released its brand new PCW8256.

As much as we'd like to take credit for the name, the PCW stood for Personal Computer Word Processor. Running off the CP/M operating system it came with 256KB of Ram, a monitor and a printer – a bargain at £399.

Finally, our Chip Chat section highlighted a strange entry in a microcomputer dictionary. It explained that 'I'm leaving' signifies someone is announcing their departure. Alternatively, if spoken by a tree, it means 'Spring is near'. Humour was very different back in 1985.

OCTOBER 1990

In this issue, we finally managed to secure an interview with Sir Clive Sinclair. Among other things, he revealed plans to build a super-bike, designed to revolutionise city commuting. Unfortunately, the wafer-like bike never made it past the drawing board and onto the road.

Our bench test saw the two main players of this era battle it out with their latest offerings in the PC market. IBM and Amstrad made the front page with their new low-cost PS/1 and PC3000 machines.

PCW's Simon Rockman was far from impressed with IBM, concluding that the PS/1 range, aimed at the home market in the US and the small business in the UK, was a cheap attempt to broach either market, due to its fast-fading processor and limited expansion possibilities. He added that no-one who knew anything about computers would buy a PS/1.

Amstrad PC3000: this 20MHz computer for the corporate market was considered a safe bet

Amstrad's attempt to tackle the corporate market, the PC3000, performed slightly better under the inspection of Guy Kewney, who concluded that the 20MHz machine was reliable and a safe bet for users.

Graphics cards were also on test this month, although none of today's players was featured. Paradise came the top due to its superb blitting (a graphics rendering test) and reliability, while NEC's Multisync Graphics card came a close second.

OCTOBER 1995

Computing on the move gave us our cover story 10 years ago, when we put 15 notebooks equipped with a docking station to the test. With 20 per cent of business users favouring the dockable notebook at that time, *PCW* decided to test which notebook best combined portability and desktop usability.

A number of established names took part in the group test, with Toshiba stealing the limelight with the Editor's Choice award for its Satellite Pro 400CDT. The only notebook to include a Pentium processor and CD-Rom drive as standard, the Toshiba, was priced at £4,400, putting into perspective the sub-£600 models tested in our current issue (see page 92).

Elsewhere in the issue, *PCW* was trying to find the best way to access the Internet, with Wendy Grossman providing a guide to the best and worst ISPs. It hardly needs saying that most of those ISPs are long gone, in fact, long-term ISP reliability was such a controversial issue that Wendy refrained from giving an Editor's Choice award and instead just provided pros and cons under each review.

Finally, with the launch of Windows 95 two months earlier, Simon Rockman took a look at three of the first applications available for this 'revolutionary' new platform: Visio 4, Microsoft Works for Windows 95 and Xara Studio. Simon's final comment to those considering an upgrade that 'there will come a time when you won't have an option – all software will be made this way' was rather ironic considering the Microsoft anti-monopoly suit in the US at the time.

OCTOBER 2000

By the time of our October 2000 issue, the whole business model for flat-rate unmetered dial-up Internet access was starting to come apart at the seams. Like the NHS had discovered many years before, a free service can generate infinite demand and as our News section reported, ISPs were realising that if you offer 24-hours-a-day access, that's exactly what many users will use. Nothing's changed, of course, and we're now going through the same process with uncapped broadband.

One of our group tests featured 14 graphics cards. Competition was starting to hot up with new upstart Nvidia's introduction of the successor to the innovative Geforce 256 chip, the Geforce 2 GTS. ATI's Radeon came up trumps, though, beating the other (mostly Nvidia) cards to get one of the Editor's Choice awards. Hercules' 3D Prophet II 64MB claimed the other one.

Our other group test was 'stylish' slimline home PCs, although looking at them now they don't seem particularly slim nor stylish. Only the Panrix V-Box looked more like a VCR than a PC, but even this was spoiled by an ugly beige CRT monitor. At least the winner, the Hi-Grade Ultinet, came with a 15in TFT display.

With the death in July 2005 of James Doohan (*Star Trek*'s Scotty), perhaps it's appropriate for us to mention our Futures article on the possibility of quantum teleportation, which we headlined with one of the most famous phrases that never appeared in the TV series: 'Beam me up, Scotty.'

The *PCW* team

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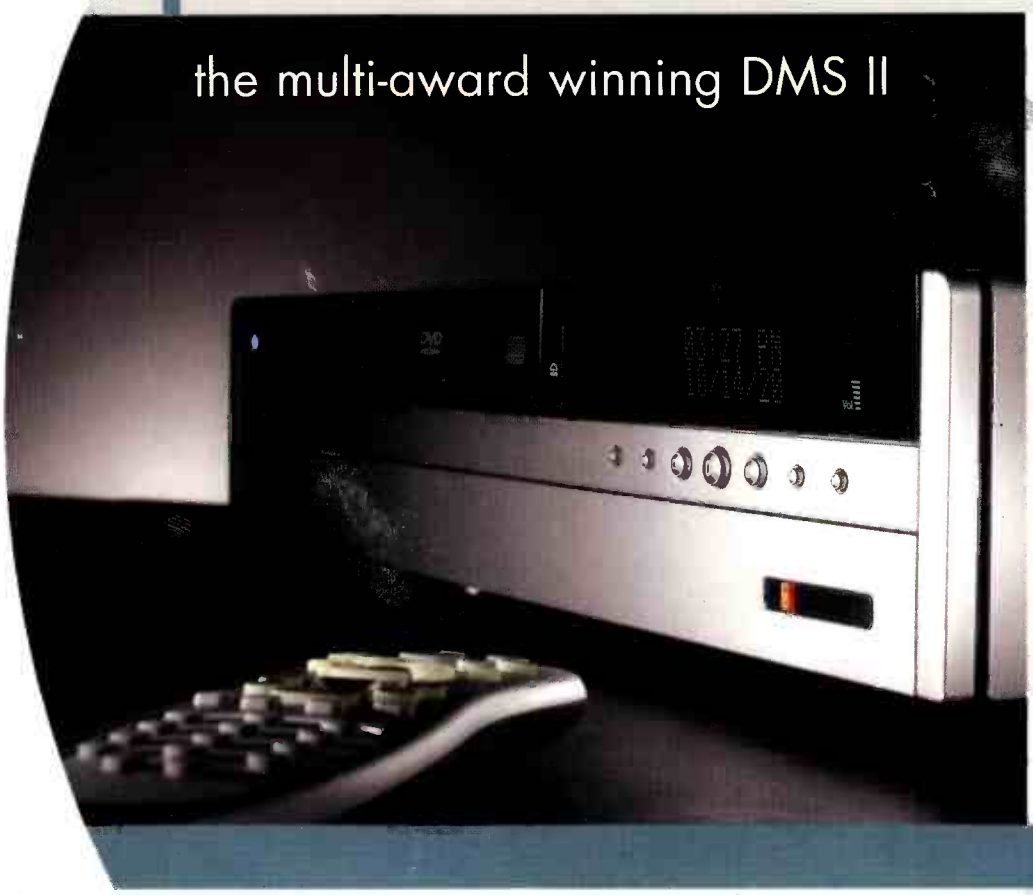

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