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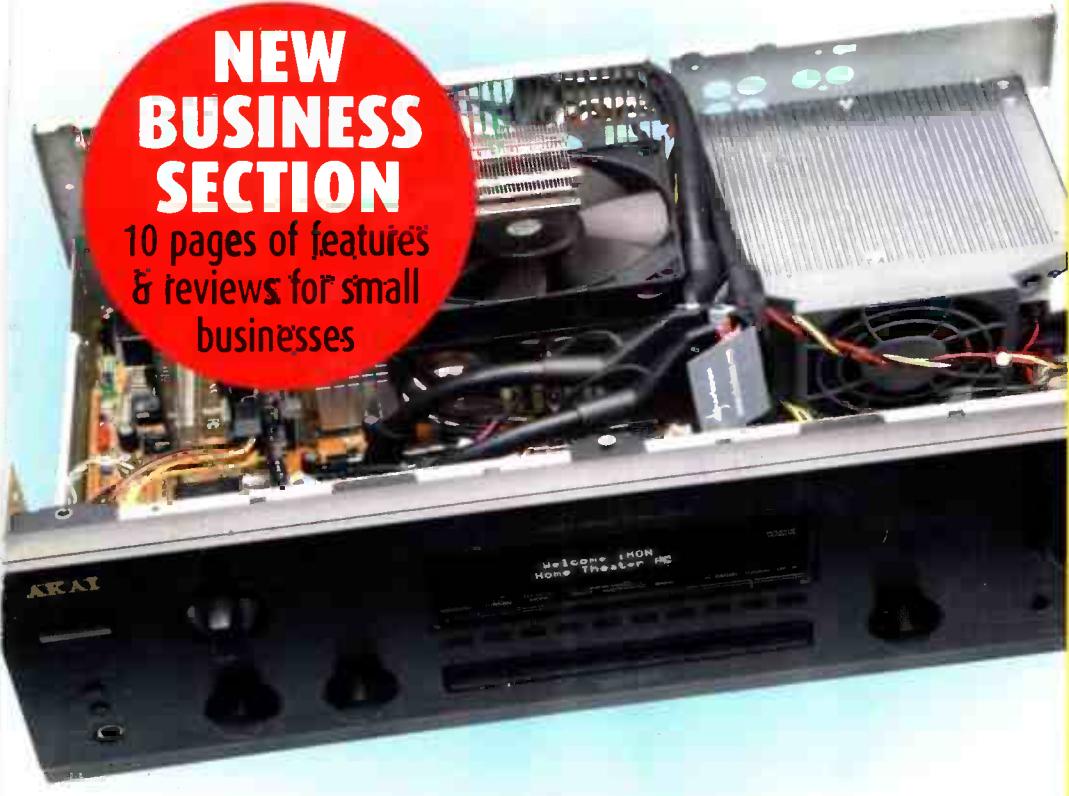
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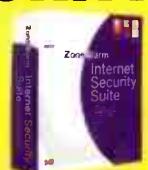
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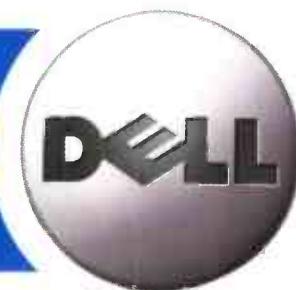
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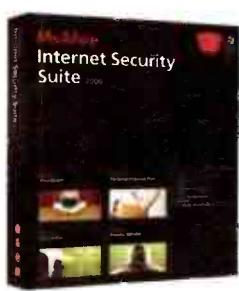
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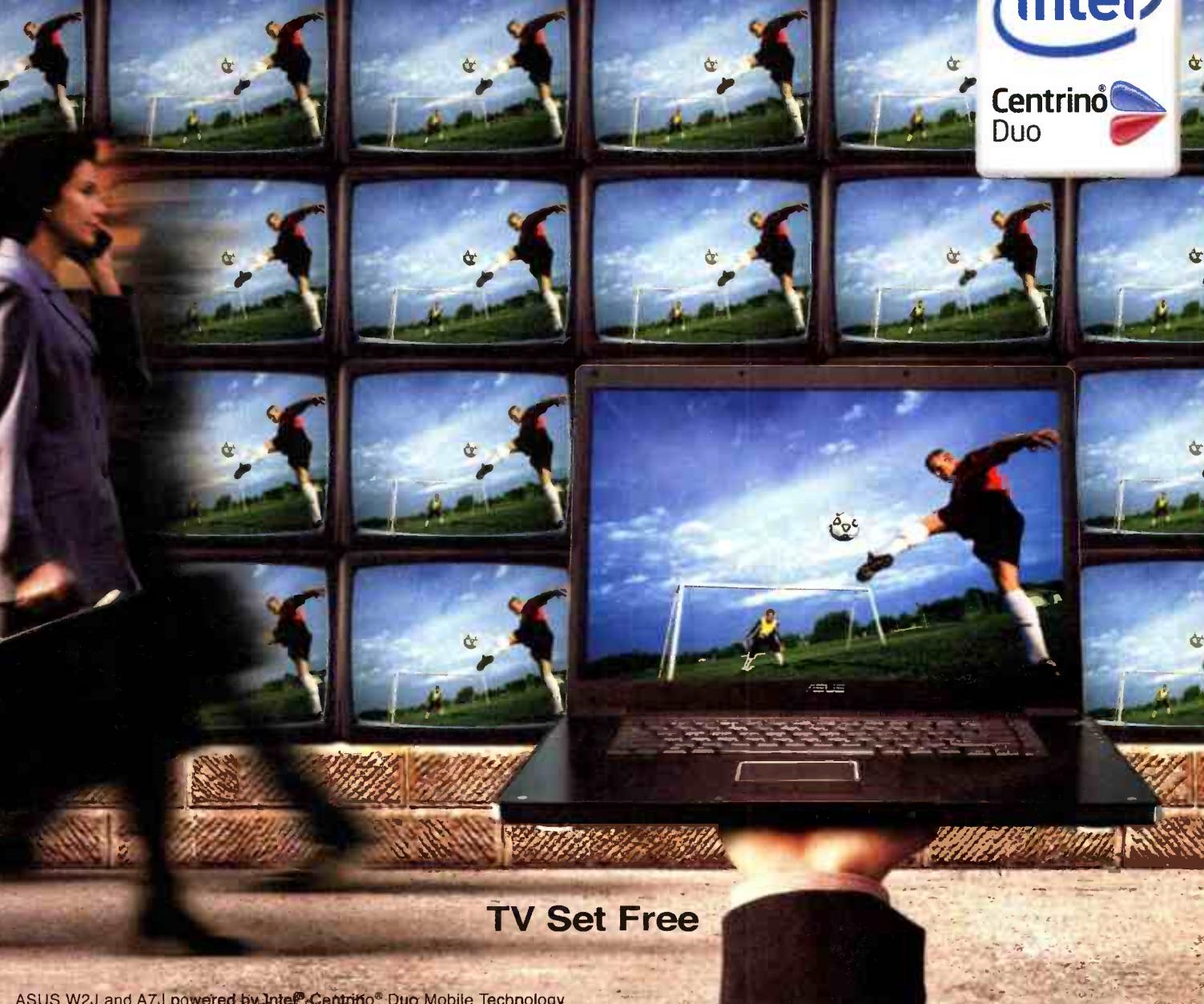
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Editorial

Webtop to push Desktop aside and bring back thin-client PCs

Web 2.0 technology heralds a new way of working and the return of an old idea, says Dylan Armbrust

It's hard to believe it wasn't that long ago that the concept of the thin-client PC was everywhere. I recall, particularly in the mid-1990s, the likes of IBM touting transferable desktops and low-spec desktop clients plugged into a company network that would allow you to access your desktop and data anywhere in the world. It was a good idea but it never took hold and, as the cost of desktop PCs dropped and their power increased, allowing you to be more productive locally, the thin client seemed an expensive option. Add to this the cost of company networks back then, before the Internet and cheap broadband, and you can see the viability was fairly low.

Today, however, constraints like this are no longer an issue. Computers are cheaper than ever, as is broadband, and portable desktop workspaces are much easier to implement. Now one of the most costly items for businesses are the software packages that have to be loaded onto each desktop PC. And whether you run a small business or large enterprise, licence fees can add up. It would be fair to say that basic programs, such as Microsoft Office, dominate. Then there are creative image-editing packages, security utilities, and so on. When you add all these together, along with the cost of support, it can cost far more than your average new, super-powered PC.

But, as ever in the technology industry, this looks set to change. We are now seeing the emergence and, more importantly the viability, of web-based applications that can do what desktop applications can, all through a browser interface. No software needs to be loaded and configured on your PC. This is what people in the industry are calling Web 2.0 (see our feature on page 56 and more online at www.pcw.co.uk/2155029). Instead of a Desktop, you'll have a Webtop, where you simply log on, boot up your PC, start your browser, access your web-based applications and start working. Your data won't even have to be stored locally on your hard drive. In real terms, this means that you could access your files anywhere in the world, whether it's in an Internet café in Cairo or a workstation in Woking.

This, of course, brings me back to the issue of thin clients. What was once a dead idea is now more viable than ever, and with more bells and whistles than ever imagined. Today's thin clients wouldn't be the low spec 'dumb' terminals of over a decade ago. They would be proper PCs with proper graphics cards and processors. And why not, because PCs are cheap. The difference is that they won't have much software on them.

What we will see is subscription-based application services, cheaper than the average cost of your Microsoft Office suite naturally, that you simply log in to. With the widespread availability of fast and reliable Internet access and stable networking environments, you could have an office with almost no software applications stored locally.

The implications of this are pretty big. Staff could work from home more, providing more flexible and family-friendly working practices, or if they travelled a lot they would not have to worry about carrying crucial or sensitive files on laptops. Of course, this is all speculation and you won't see software companies such as Microsoft take this potential trend lying down. Some industry analysts have said that Microsoft's upcoming Office 2007 will be the last sold and distributed on optical media. After this, the oracles say, you'll subscribe to a Microsoft service and do your word processing, spreadsheets and so on online. Whatever happens, what was once an old and dead idea is making a comeback, and it looks set to change the way we all use and view PCs and software. **PCW**

'You could access your files from an Internet café in Cairo or a workstation in Woking'

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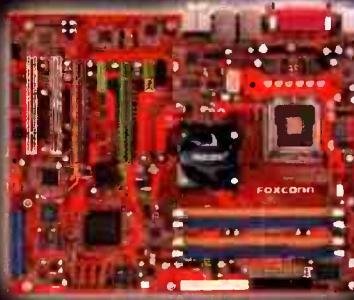
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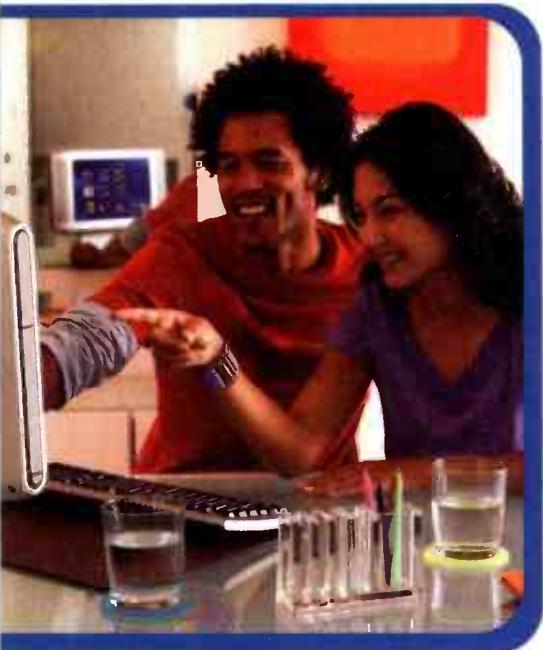
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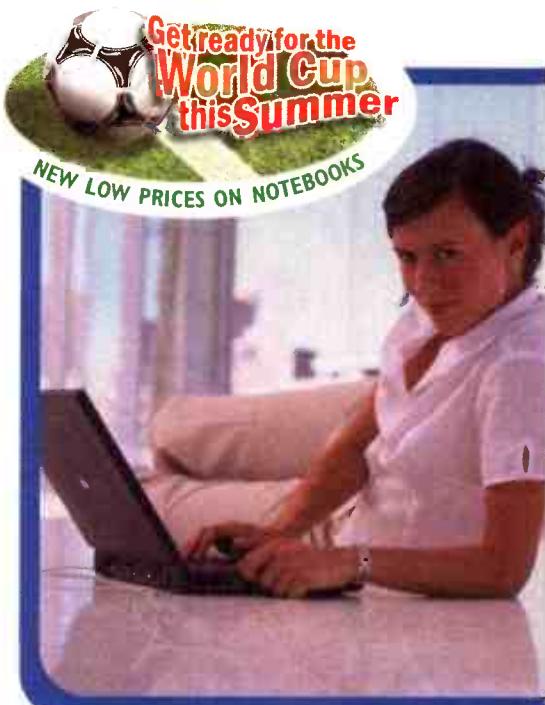
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'Free' broadband rocks industry

An offer of 'free' broadband from Carphone Warehouse rocked the industry last month, though it was scorned by rival operators if not by users – the company claimed it was generating an inquiry every five seconds.

The interest was not surprising given the offer's blanket coverage in the TV and radio news, despite the fact that 'free' turned out to mean £21 a month and a £30 connection fee. The Advertising Standards Authority is investigating ads for the offer, called Talk Talk, after receiving more than 50 complaints.

Nevertheless the deal, which does not cover business use, does look tempting. You get access at up to 8Mbps, capped at 40GB a month and free unlimited calls to 28 countries including all the EC, the US, Canada and Australasia.

Carphone Warehouse says it will be available for 70 per cent of the population from 4 July, when BT is due to have a fully automated system in place for allowing third-party broadband vendors to use its 'local loops' – the lines from exchanges to homes.

Chief executive Charles Dunstone freely admits that the deal is a loss leader, on which he expects to lose at first to gain customers. The company's website (www.carphonewarehouse.com)

boasts that it is offering 'free broadband forever', which is a brave claim in a world where bandwidth has to be paid for somewhere down the line.

The 40GB cap sounds generous in the light of today's usage, but the whole point of pushing up access speeds is to make bandwidth-hungry applications such as video on demand and video telephony more viable.

The BBC has just announced a plan called Creative Futures to enable people to access content of their choice at their convenience rather than passively submitting to a programme schedule. Other media groups are sure to follow its lead. So the demand for bandwidth is bound to increase.

And other operators are not sitting still. T-Mobile was reported to have a very interesting plan to offer unlimited data access over an upgraded 3G link for £8.50 a month, doing away with fixed links altogether.

The company says its 3G links would be upgraded to 1.8Mbps later this year using High-Speed Downlink Packet Access (HSDPA), which could be boosted to 14Mbps by 2008.

Bulldog Communications, which has its own national infrastructure, launched what it says is the first

ADSL2+ service, offering 'up to' 16Mbps/sec. Chief commercial officer Andrew Morley said some customers would get 20Mbps/sec but he did not want to hype up expectations because, as is usual for ADSL, much depended on the distance from the exchange and the quality of the line.

Prices start at £9.75 a month with a 1GB cap; uncapped services are £24.50 a month with a £5 discount for the first two months and a free modem. Morley points out that users get a 1Mbps/sec upload speed, two to four times faster than rivals, which is good for sending pictures and making video calls.

Morley said there was no sign of a drift of customers taking up what he described as the Carphone 'free lunch, which is neither a lunch, nor is it free'.

He added: 'Speed is an absolute priority for this market... a 2Mbps service compared to 16Mbps is like black-and-white to colour TV.'

There was speculation in the wake of the Carphone Warehouse announcement that some service providers may be forced to merge and that others would offer rival deals. NTL was rumoured to be preparing a 'quad play' bundle of dial-up phone, mobile, Internet access and TV.

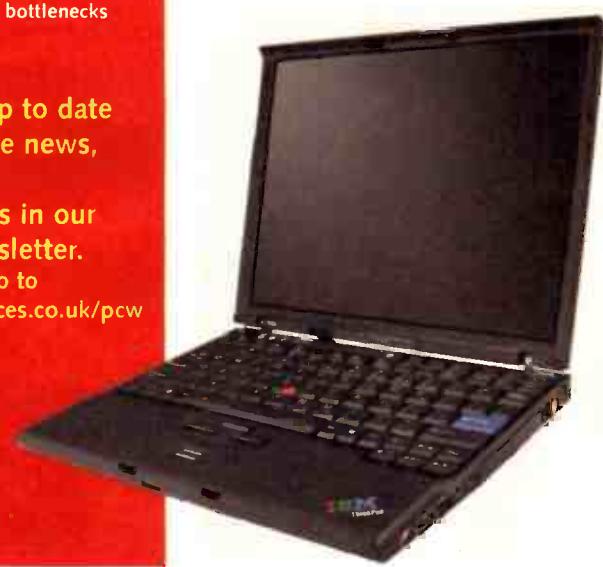
Battery lasts a working day

A notebook with a battery that lasts a full working day has been the aim of system designers for some years. Now, the Thinkpad X60 from Lenovo (formerly IBM) just about does it, if you allow for a lunch break, although only when you fork out for a special battery. It uses a 1.83GHz Core Duo processor and weighs 1.6kg.

It scored way ahead of any other notebook on our Mobilemark 2005 battery tests, lasting nearly six and a half hours on productivity tasks, seven and a half playing a DVD, and 10 and a half in ebook mode.

There is a full review and a link to the results on our website at www.pcw.co.uk/2155329.

Intel says its next-generation chips will offer three times the performance per watt, promising even longer battery life (see story opposite).



First ultra-mobiles released

Ultra-mobile computers, the first true portables with desktop-class power and links, are about to hit the shelves, with analysts predicting annual sales of up to 11 million within five years.

There's a review of the Samsung Q1 on page 72, with a more in-depth version on our website at www.pcw.co.uk/2155011 and I hope to have field tested one for our Test Bed blog by the time you read this. The Q1 is priced at a shade under £800, which puts it into direct competition with notebooks.

Simpler models using Via's low-drain C7-M ULV processors could be cheap enough to compete against PDAs and (if they include telephony) smartphones.

But this is an entirely new class of computer, very much in its early days and will not necessarily sell in enormous numbers initially –



Samsung's Q1 is the first ultra-mobile to hit the market

though I believe it will evolve into the mainstream platform of the future. Like the first desktop PCs it should be seen not only for what it is, which is exciting enough, but for what it will become over the next couple of decades.

The first models use relatively inefficient single-core mobile processors, but Intel is promising a threefold increase in power efficiency with its next generation

of chips. Increased power will allow better graphics and co-ordinated use of speech and handwriting recognition, allowing each to reinforce and correct the other.

Better screens and power supplies will be needed but the new Lenovo notebook (see page 14) shows that battery life is improving.

Emerging fast wireless links such as Ultrawideband (UWB) will allow the machine to offload processing to the network and access data and streamed music and video.

Analysts In-stat predicted last month that these links will be essential if the ultra-mobile is to go beyond the status of a niche product. Principal analyst Jim McGregor predicted sales of between 100,000 and 210,000 units next year.

● Is simplicity the key to ebook success? See page 23.

In brief



20in monitor

Videoseven has launched a 20in LCD monitor, the S20PD, with an 8ms reaction time and a maximum resolution of 1,400 x 1,050. It costs £269.99.

→ www.videoseven.com

Hands-free Skype

A USB speakerphone enabling hands-free two-way web calls is the first fruit of a new alliance between Skype and Polycom, which specialises in business-class video and audio links. The price is \$169 (£96 approx) and it will be available next month.

→ www.polycom.com

Wifi access deal

The Cloud is offering Wifi access at any of its 7,000 hotspots for £11.99 a month, in a deal that was seen as a challenge to mobile operators as it could make it easier to switch to web calls in cities.

→ www.thecloud.net

Tech Boutique

Are you tired of reading about boys' toys? Or are you wondering about a present to buy for your wife or girlfriend? If so, then check out our new blog at www.techboutique.co.uk, which is dedicated to gadgets for today's IT girls.

Tech Boutique

No more feeling lost | Main

Apple speaker for the less discerning

This er... desirable little item is the Foldable Speaker, aimed at owners of phones, mp3 players, laptops and old-school portable CD players (see their it's meant to look like an Apple when folded).

We've also thought iPod owners had a little more style and taste in their technology making decisions, so can't quite believe this would attract many of them. And we'd like to believe owners of other audio devices would be equally discerning.

But, if you have alternative tastes and need a set of travel speakers, you can buy them for \$16.



HD kicks off for the Cup

Manufacturers are rushing out high-definition (HD) products in the hope of a sales bonanza from June's World Cup. This 47in model is from Toshiba's WLT66 range and includes two HDMI interfaces allowing it to take digital content from other sources, including PCs. It supports full 1,920 x 1,080 widescreen resolution HDCP digital-rights protection. But HD recorders look as if they will be too late for the Cup – see page 18.

Intel rushes out new processors as AMD gains

Intel is preparing a major shake-up to save \$1b and reverse a trend in which it has lost market share to AMD.

It has brought forward launch of its next generation of processors which are said to have three times the performance per watt of current products, and analysts are predicting it could drop its high-end Itanium processor. New desktop chips, codenamed Crusoe will ship in July and their server stablemates, 'Woodcrest' and mobile versions 'Merom' will follow in August.

Intel also announced a new platform called vPro, using the new Crusoe processors and aimed at reducing management costs.

Intel chief executive Paul Otellini announced the restructuring to 'adjust to the business realities of today [and] tomorrow' only days after IBM said it would no longer use the Itanium.

That decision was linked to the fact that IBM has begun to use 64bit Opteron processors, which helped increase AMD's share of the server market from

16.4 to 21.1 per cent in the first three months of this year.

Opterons use a 64bit version of the classic x86 PC instruction set and are compatible with existing PC software. But so are Intel's Xeon server chips; for two years up to 2006, chips from AMD have been perceived as technically superior to those from its bigger rival.

Intel says its troubles also stem from a slowdown in PC sales. The last quarter's profits dropped 38 per cent compared with last year. Revenue was down five per cent.

Universal dock

A docking station from Kensington Computer Products that can be used by any USB2-equipped XP notebook will be one of the first products to use a Nivo chip, removing the need for a monitor cable and other links.

The chip from Newham Research has Virtual Graphics Card (VGC) software that sends display information via USB2 to a hardware rendering engine (HRE), which translates it back to pixel data.

→ <http://uk.kensington.com>
→ www.newhamresearch.com

Legal eagle

The Content Inspection (CI) appliance from security vendor Code Green Networks stops staff sending unauthorised content. It vets instant messages, web traffic and peer-to-peer shares. 'First-generation web filtering and email security [technology] has been successful at monitoring structured data, but outbound scanning has to work on another level,' said European director of sales engineering, Mike Smart.

→ www.codegreennetworks.com

Tablet bundle

Nokia and Linksys are offering a £295 bundle to provide untethered Internet access in homes. It includes Nokia's 770 Internet Tablet and a high-speed wireless router from Linksys. The 230g, 14.1 x 7.9 x 1.9cm tablet runs Linux and has a web browser, email client, news reader and media player.



Mobile web

Mobile devices will be the dominant web browsing platform over the next few years, says a report from market researchers Ipsos. Four in 10 users in Japan use a phone to browse, as do many in France and the UK, says the report, *The Face of the web*.

Long-reach Wifi under fire

Vendors that try to stretch the range of wireless products have come under fire from a UK consultant for making airwave congestion worse.

It is common in cities to find several Wifi cells overlapping, and the longer the device range, the more there are likely to overlap. Yet vendors often boast extended range, the wireless equivalent of shouting, as if it is an unalloyed good thing.

Bill Ray, of consultancy Arcchart, said long-range links are available from technologies such as WiMax, GSM and 3G, and there is a need for short-range wireless to minimise interference between neighbours.

Yet even the IEEE standards body is extending the reach of Wifi with the next-generation 802.11n spec, which is designed for local links. Ray writes in a company newsletter: 'The latest standards to emerge from the IEEE could easily see the effective range [of Wifi] doubling, with disastrous consequences.'

'The problem is that while a Californian's house might stretch the 45m limit of an access point, much of the world is less spacious: a typical Victorian terrace in London is only 5.5m wide, allowing the signal from the access point to be shared by around 10 other properties.'

Neither is the problem restricted to Wifi. The original 10m range of Bluetooth is extended to 100m in the latest Class 1 products. And Ultrawideband (UWB), designed for high-data-rate links between devices within a room, is going the same way. Ray wrote: 'Wiquest recently announced UWB operating at a range of 30m – enough to cover five houses in our Victorian terrace!'

He added: 'UWB operates on a wide range of frequencies and so has the potential to interfere with just about anything... but even before we see the standards settling down companies are demonstrating how they can extend the range.'

Ray warned: 'Unless the industry recognises short-range wireless should be just that... [it] risks harming the usability of unregulated spectrum and very long spools of Cat5 [cable] might again become the cutting edge in connectivity.'

Range issue muddied as '11n' kit ships

Netgear and Linksys have announced products based on the draft 802.11n spec (see main story). Linksys said its product would reach four times further than 11g, and Netgear's Rangemax is self-explanatory.

The products, which include routers, access points and PC Cards, will transmit data at speeds up to a theoretical 300Mbps/sec and are compatible with existing 11b/g Wifi equipment.

Pictured is Netgear's new WNR834B wireless router. Like all 11n products, it uses Multiple In Multiple Out (Mimo) technology, which complicates the range issue in that it can form beams, increasing the range in one direction.

The 11n standard has no provision for transmit power control (TPC), which would reduce the chance of contention between networks by limiting

Netgear's product uses Mimo technology



the signal strength to the minimum required for the link.

TPC was bolted on to the 802.11a Wifi spec at Europe's insistence. Masato Kato, Buffalo's Japanese engineering manager and observer at the IEEE 11n deliberations, told us at CeBIT this year that he believed it should be extended to all Wifi links.

He said this would not involve changing existing specs: it could be done as a separate spec covering all signal types. Analysts are warning companies to beware of buying pre-N gear that may not be compatible with the final spec.

Mark Main, senior analyst with research firm Ovum, points out that 11n will not be ratified until next year, by which time the spec could change. 'Make sure the products can be firmware upgraded to conform with the finalised spec,' he said. Netgear chief executive Patrick Lo said changes are unlikely.

Small firms get VoIP switchboard for £50 a year

A new web-based service offers small firms the functions of an advanced telephone switchboard, integrated with customer-relations management (CRM) software for £49.99 per number per year.

New clients pay £298 ex VAT for the first year, but this includes two Voice over IP (VoIP) phones.

Start-up Band Telecom says the service is equivalent to systems that can cost thousands to set up.

The Linux-based telephony server runs open-source SugarCRM software that automatically lodges messages with customer files.

The telephony services use standard SIP protocols, with

features such as interactive voice response, call queuing, direct-dial numbers, conferencing and fax-to-email. In addition, you get SIP tricks such as the ability to answer calls anywhere in the world as if you were in the office.

There's more detail on this story at www.pcw.co.uk/2154555.

Mobile broadband on cards

Mobile Wimax broadband services are on the cards for major UK cities following a deal between Intel and service provider Pipex, one of only two companies to own the necessary spectrum.

They will roll out a Wimax service in London and Manchester next year, but this will be for fixed installations. It will be extended to eight other UK population centres in 2008. Mobile Wimax, using a recently drafted 802.16e spec, would have a far wider market.

Pipex has transferred ownership of its 3.6GHz spectrum to Pipex Wireless, a company formed jointly with Intel, which put in \$25m. This will deploy the Wimax services.

Business development director Graham Currier could not say when these would go mobile because at the moment the frequencies are licensed only for fixed use. 'It is up to [the regulatory body] Ofcom to say how it liberalises spectrum but



it has published policies that suggest it would like to... [The fixed] licence is enough for the time being as the technology is not there for mobile yet.'

He played down suggestions that mobile Wimax could threaten 3G, saying if you could start from scratch with Wimax where there were no existing services you could build a better system than 3G. 'But where services are already in place it is a question of finding complementary needs and targeting them.'

So how is fixed Wimax going to compete in cities already replete

Mobile Wimax card from Airspan in use on a notebook

with fixed broadband links? Currier said Wimax enabled the company to offer a new mix of services because it could offer things such as high upload speeds, that were harder to replicate on fixed lines.

'It is flexibility, the fact that you can run multiple services off a single infrastructure using Wimax standards, that is a change from previous years.'

The trend is to have broadband everywhere, Currier said. Intel's strategy was that within five years, the kind of device that now has WiFi will also have Wimax, which would open up new business models.

Airspan, which has been involved in Wimax trials with Pipex, reckons individual mobile users could get 9Mbps/sec downstream and 2Mbps/sec up. But cities would need wide, expensive deployment of base stations to get those speeds.

Scramble for .eu domains

UK firms have been scrambling to ensure their brands are registered with a .eu suffix to prevent someone else grabbing the name.

The .eu registry, Eurid, received 390,000 applications within 100 minutes of the suffix being made available.

EU commissioner Viviane Reding said: 'Europe and its citizens can now project their own web identity, protected by EU rules... making .eu a powerful domain name on equal footing with .com.'

Phil Turnbull of web-hosting firm Hostway commented: 'Firms [with trademarks or prior rights] have had about four months to get their applications in so they only have themselves to blame if they haven't [done so].'

He believed the .eu domain has the potential to be as 'significant and authoritative' as .com.

→ www.eurid.eu

£10 Bluetooth

Dynamode has launched a USB2 Bluetooth dongle for £10. It uses Bluetooth v2 with a range of 20m and a throughput 1Mbit/sec.

→ www.dynamode.co.uk



Google tests smarter search

Google is testing an enhanced search feature that presents longer excerpts from sites as well as links to related content and a 'search this site' option. The company said it could not say if and when the feature would be generally available.

The Google spokesperson said she couldn't disclose if the technology was related to Orion technology, developed by 26-year-old Australian PhD student Ori Allon, which has been bought by Google.

'Silent call' firms face £50,000 fine

Regulator Ofcom is threatening to level fines of up to £50,000 on companies behind the growing problem of silent calls, when you answer the phone and there appears to be no-one on the line.

The calls are made by automatic systems used for telesales or market research. They ring numbers from a list until they get a reply, when the call is switched to a call-centre operator – if one is available. If not, the line hangs. Scanning systems building lists of numbers do not

even bother to get an operator: they simply register the phone as 'live'.

Complaints to BT about silent calls are currently running at about 80,000 a month and a phone owner receives an average 5.7 a month. An Ofcom statement says the organisation will take 'swift and decisive' action to ensure companies comply with new requirements.

These require that no more than three per cent of live calls can be silent, and that if no operator is available within two seconds then

a brief message must be played containing the name of the organisation. Unanswered calls must be allowed to ring for 15 seconds before being cut off, and there must be no repeat call within three days.

A Calling Line Identification (CLI) number must be made available to which return calls should be charged at no more than the national rate.

Call-system specialist Netcall claims its Queuebuster product always ensures an operator is available before making a call.

Nokia gives video a new twist

Video capture in phones is not new, but Nokia claims to have taken it to a new level with its N93 model, due to ship in July.

It is said to capture mpeg4 VGA video at 30 frames per second, and acts as a 3.2megapixel stills camera with a 3x Carl Zeiss optical zoom lens. As the picture shows, the main display twists to act as a shooting screen.

The machine will be sold with Adobe Premiere Elements 2.0 for around £380 unsubsidised.



In brief

**Boombbox beamer**

Projectors and big screens are likely to be big sellers around World Cup time. Toshiba says 32in LCD TV screens, costing around £1,000, are now one of its most popular sizes.

Two models in its new projector range, the E10 and E20, have a wide-angle lens that can throw up a 100in image from 52in away from a screen. Both models have a 30w Dolby 5.1 sound system built into them in the form of five 16mm satellite speakers and a 2in subwoofer.

They use a 480p DLP chip with an 85 x 480 resolution and a 2,500:1 contrast ratio. The E10 will cost £1,099 and the E20, which includes a DivX-supporting DVD player, costs £1,299.

→ www.toshiba.com

2GB U3 drive

Kingston is offering 1GB and 2GB USB DataTraveler sticks, at £25 and £55 respectively. They support U3 technology that lets you run compliant applications from the stick on any PC.

You can also read U3-based magazines published by the Zinio system and the drives come with the Pass2Go password manager.

→ www.kingston.com

Maxtor mini

Maxtor is shipping its 2.5in Onetouch III Mini Edition USB hard drive in 60GB (£99) and 100GB (£149) versions, with software for backup, encryption, synchronisation and rollback.

→ www.maxtor.com

Net stores

Iomega has announced 1TB and 500GB versions of its Storcenter network storage product at \$900 (£509 approx) and \$500 (£283 approx). You can read a review of the 300GB version at www.pcw.co.uk/2154822.

HD burners offside for Cup

Rival high-definition storage players look like they're ruling themselves offside for a sales bonanza before the World Cup, which kicks off on 9 June.

Sport is considered to be one of the best subjects for showing off the advantages of high-definition (HD) video. Panasonic and Samsung plan to launch Blu-ray PC drives capable of recording HD on 10 June and 25 June respectively. Both makes of drive also support major DVD and CD read/write formats.

In the rival camp, Toshiba and Fujitsu will be launching rival

notebooks equipped with HD-DVD players in May and June but these cannot burn discs. LG Electronics has said it will offer a drive supporting both formats this autumn.

But Panasonic's Kazuhiro Tsuga says there is no chance of a compromise between the two camps. 'We are not talking and we will not talk. The market will decide the winner,' he told Reuters.

He claimed that Toshiba's HD-DVD player, which is already selling in Japan, must be making a loss at \$499 (£280 approx).

Toshiba is to launch the HD-XA1 player in Europe this autumn

following an 18 April launch in the US. It screens standard DVDs as well as HD and will even scale them up to a resolution of 1,080i or 720p. It supports L-PCM 5.1-channel audio and three next-generation surround-sound formats, Dolby Digital Plus, Dolby True HD and DTS-HD.

Toshiba marketing manager Vic Harasimov said: 'We firmly believe we will be the only players to succeed in this market.'

Panasonic says its LF-MB121JD Blu-ray PC drive will come with software to facilitate video and audio editing, and backing up and archiving data.



Big rise in disk space predicted

The data density on hard disks (and therefore their capacity) will double every two years over the next decade or so, according to Hitachi Global Storage Technology. The estimate mirrors Moore's Law, which predicts a similar rate of increase in the transistor density of processors.

The company also says no technology is likely to supersede magnetic recording for the foreseeable future. 'We have heard a number of times that holographic storage is about to break through. It is always a case of "it will happen in a couple of years". It hasn't happened yet,' said Larry Swezey, Hitachi GST's director of product strategy and marketing.

He points out that areal density has increased by a factor of 50 million over that of the first drive, in IBM's Ramac mainframe, which was launched on 13 September 1956 and offered 5MB spread over 50 2ft platters. Hitachi claims to be the first to offer a 0.5TB 3.5in drive. Its new 7,200rpm Deskstar T7K500 and Cinemaster 7K500, containing three platters storing 160GB apiece, are optimised for data and multimedia use; low-capacity versions are also available. Hitachi GST has opened a new factory in China to meet the demand for storage. Its new 500GB drives are part of a refresh of its 3.5in product line.

Data loss dogs USB keys

Spin doctors have issued this picture in case you need reminding that a chewed-up USB stick can mean lost data. It marks the release of a report showing that one in three people have suffered this way.

The survey, carried out by Ontrack Data Recovery, did find someone whose dog mistook a USB for a chew toy. It lists a number of measures you can take to avoid calling on Ontrack's services. Most are pretty obvious, like keep your device in a safe place and carry with care. More

controversially, it argues that USB sticks are too vulnerable to be used for backup. And it says we should always stick the cover on when not using the stick.

More to the point, it might have urged vendors to insist on products with attached covers. They do exist (one design has the stick swivel out of its cover like a penknife blade) but they are hard to find on the shelves, a situation that might change if market researchers asked something really useful, like how many people have lost USB covers.

Apple code lets Macs boot Windows

Users of Apple's Intel-based Macs now have the choice of booting Windows with the release of beta code called Boot Camp (see page 103 for a review).

Apple is widely believed to think the move will encourage Windows users to switch to Macs because they will still be able to run their familiar applications.

Most will need to buy a copy of Windows XP to do so legitimately, because copies of the operating system bundled with PCs are invariably sold under a manufacturer's licence that ties them to one machine.

A final version of Boot Camp will be included in the next release of the Mac OSX, codenamed Leopard.

The module creates a new partition on the host hard disk to hold the Windows code and Apple sensibly warns people to back up their system before trying it.

There were reports that the beta code had wiped out the Mac OS partition on some users' hard disks, locking them into the Windows operating system, an

irony that caused much amusement in some circles.

The Onmac.net project has published instructions on how to triple-boot Mac OSX, XP and Linux using Boot Camp. But the procedure is tricky as you have to 'chain load' Linux from an XP installation.

Multi-boot systems will require separate virus protection for each operating system. And users should not assume that the Mac OS is secure: security researcher Tom Ferris last month listed seven unpatched security holes in the operating system. One, in the Safari browser, would allow an attacker to execute code on a system, he said.

Security experts fear the Apple code could become a more frequent target of attacks as it becomes more popular.

17in Macbook Pro

Apple has quietly released a 17in Macbook Pro notebook boasting five times the speed of its 17in Powerbook G4. The 17in screen has an impressive 1,680 x 1,050 display capable of displaying high-definition (HD) video.

Apple says the display is 36 per cent brighter than previous Powerbooks. Powered by a 2.16GHz Intel Core Duo processor, the 1in-thick model weighs a hefty 3.1kg and has a claimed battery life of five and a half hours.

Features include graphics powered by the ATI Mobility Radeon X1200, with 256MB of dedicated video memory and a 120GB hard drive. Prices start at £2,000.



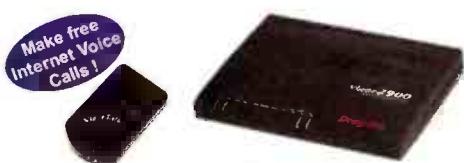
Vigor3100 SDSL



Vigor2800 Series



Vigor3300V



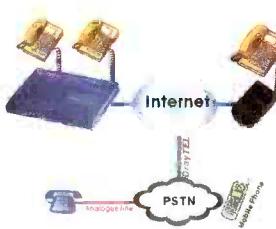
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DrayTek routers and firewalls provide a vast array of essential and advanced features, designed around users' needs. The new Vigor2800 series provides compatibility with the latest ADSL2+ lines, as well as enhanced security, content filtering, VPN, 108Mb/s wireless and Voice-over-IP. Also available is the Vigor2900 series for cable modem users and the new Vigor3100 router/firewall for SDSL.

The new Vigor3300V is a high performance firewall, VPN concentrator and VoIP (Voice-over-IP) device. Stateful Firewall, load balancing, content filtering, up to 200 VPN tunnels and up to 8 VoIP ports. (Due March).



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XP minus media player flops

One of the more bizarre results of the 2004 EC anti-trust case against Microsoft was that the company was ordered to protect the buying public by offering them less for their money.

It was, of course, done with the best of intentions. Microsoft was judged to be abusing its near-monopoly by bundling Media Player software with Windows XP, squeezing out rivals in exactly the same way it killed Netscape's Navigator browser by giving away Internet Explorer.

The company was ordered to offer a version of XP minus the media player. Yet only 2,000 PCs have been sold using this

version, demonstrating, if nothing else, that few people will turn down a freebie.

The figure was revealed at the European Court of First Instance where Microsoft appealed against the ruling, a £350m fine, and an order that it should reveal protocols that would allow rival server software to interoperate fully with its own.

Microsoft counsel Ian Forrester described this latter requirement as 'the biggest assault on intellectual property rights in European competition history'.

He might have added that it carries some of the heaviest fines. Microsoft could have to pay a penalty £1.4m for every day it is

found not to have complied with the order.

Commission lawyers argued that it is standard practice in the industry to share protocols to allow software from different developers to work together. They cited an instance in 1998 when Microsoft refused to supply Sun Microsystems with the required information.

The four-day hearing was bad tempered at times, but lacked the relentless washing of dirty linen that has characterised earlier Microsoft anti-trust hearings. A ruling is not expected until later this year or early 2007, although the Commission may rule earlier than that on whether Microsoft must pay the daily fines.

In brief

Cool chip cooling

Future processors will have a cooling system like that of a car, with coolant circulated to the hottest parts by a system of sealed pipes, according to researchers at Purdue University, Indiana.

They have demonstrated the system on a 1cm sq chip etched with microchannels



through which water is driven by a Mems (micro-electro-mechanical system) pump.

The researchers (including Brian Iverson, pictured above with a disc containing three of the micro-cooled chips) said chips a decade from now could have 100 times as many transistors as today's, and that new approaches need to be taken to prevent overheating.

→ <http://news.uns.purdue.edu/>

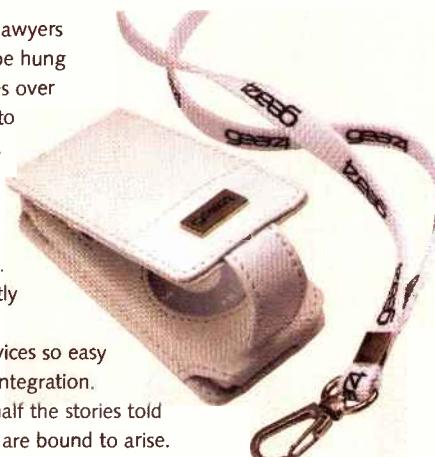
IE picks up tabs

The beta 2 version of Internet Explorer 7, available for download at www.microsoft.com/ie, supports the tabbed browsing that has become a popular feature of products. It addresses various security issues and features include a thumbnail view of sites you have visited. Read our review at <http://www.pcw.co.uk/2154916>.

10mp camera

Casio has launched an Exilim compact camera with 10.1million pixels. The EX-Z1000 has a 2.8in LCD screen, a 3x optical zoom and a movie mode with audio. The 8MB of built-in flash memory can hold just one image at the highest resolution, though an SD memory card slot is available.

→ www.casio.co.uk



Apple may lock in its users but third-party vendors have not been slow to cash in with iPod accessories. This case is sold at www.gear4.com

France turns up heat on Apple's iPod

Nothing could be more galling to Bill Gates' famously adept lawyers than to see Apple getting away with what Microsoft would be hung out to dry for. Microsoft has fought long-running legal battles over what critics saw as attempts to use Windows to lock users into buying products such as music or services from the company.

One reason EC competition commissioners were so concerned with XP's Media Player was that it could lure users into buying music and films from Microsoft. Yet the iPod more or less locks people into buying tracks from Apple. And the excellent iLife suite bundled with the Mac OS is tightly coupled to Apple's .Mac online services.

This integration is partly what makes the suite and its services so easy to use. Microsoft would not be allowed the same degree of integration.

Microsoft has only itself to blame for this, if you believe half the stories told about its past practices, and it is so big that monopoly issues are bound to arise.

But Apple is hardly a struggling dwarf. Microsoft lawyers at last month's EC appeal hearing cited the success of the iPod as evidence that XP's Media Player had nothing like a monopoly position.

If the implication was that both products should be given a free rein, French politicians disagree. They passed a Bill last month prohibiting any digital-rights measures that blocked 'legitimate use' of content, and that includes restricting music tracks to one brand of player. Apple said it would lead to 'state-sponsored piracy'.

Open Office removes Excel passwords

Some password protection of Excel files can be bypassed by opening them in Calc, the spreadsheet in the rival Open Office suite.

The password on an entire document still works, but Calc removes any protection applied to cells and worksheets, so hidden information can be read, edited

and saved. Password protection on elements of a Word document is similarly removed by importing the file into Open Office's Writer app.

Darren Strange, Office product manager at Microsoft, played down the importance, but admitted it could present 'a bit of a problem'. He accused the open-source

community of 'not respecting' the security measures. He said Office 2007, due to launch next year, will offer a higher level of security.

John McCreesh of OpenOffice.org said Calc's removal of password protection was a feature not a bug, and that users were warned about it. Tim Smith

Pirate Windows to be exposed

Microsoft is using its automatic Windows update service to check for pirate versions of the operating system. Dodgy copies will be refused all upgrades except critical security patches.

A pop-up box gives users the option to opt out of validation but any who do will be refused full updates. Validation under Microsoft's Windows Genuine Advantage (WGA) scheme is already necessary in order to get downloads of programs such as Internet Explorer.

Users who fail the WGA test are advised to contact their supplier if they bought the software in good faith pre-loaded on a PC, something that accounts for nearly one in 10 pirated copies, Microsoft says.

Users will also be told how to get authorised software. A similar scheme is being extended to Microsoft Office installations.

Online backup gathers pace

Three companies have launched online backup services, which have become more viable with the spread of broadband.

A system from Log Me In, formerly known as 3am Labs, uses the same infrastructure as its remote-access service to allow you to back up data on spare storage on family machines or a company network.

Chief executive Michael Simon reckons that typically 70 per cent of PC hard drive space is unused but using it for backup over the Internet or a local network can be tricky.

The Log Me In system is designed to make it as easy possible. 'You can back up [the Windows] My Documents [folder] in three or four clicks of the mouse,' Simon said.

The backed-up files are encrypted so that only authorised users can access them.



Store your stuff on the web with Diino's online servers

restricted to 5GB of storage, and three 'buddies'; a £10 version offers unlimited storage across any number of buddies.

Earlier this year Bytek Systems launched a service called Diino, offering online storage on its servers. It is free for up to 20MB, and prices range from £29.99 a year for 1GB, to £399.99 a year for 100GB.

It uses 2,048bit encryption and is not browser based; but its software client can be loaded on a U3-enabled USB stick, which will allow you to access your files from any PC.

→ www.logmeinbackup.com
 → www.databarracks.com
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Camera to capture your life

Researchers have developed a wearable camera that ensures you will never miss a good photo opportunity – because it can take pictures all the time.

Taken to the limit, the system could capture your entire life, especially if you give credence to a speaker at an Intel forum a couple of years back, who predicted that storage densities will get so high you will be able to store video of everything you have ever seen.

The prototype system at HP's Bristol Labs consists simply of a sensor module taped to a pair of sunglasses and connected to a belt pack containing a battery, processor and 40GB of storage.

It takes 1.5megapixel stills at a rate of 15 every two seconds and simultaneously captures a 0.3megapixel video at 30 frames per second.

The belt unit can store only about three hours of images so it is not switched on all the time. When the user presses a button on the belt pack the device saves the last 20 seconds of pictures, which are held in a rolling buffer, and all



This camera could record every moment of your life

those taken during the next five minutes.

Phil Cheadle, who heads the 'casual capture' project, cheerfully admits that much of what is taken is complete rubbish, particularly as the picture tends to jerk about as we move our heads. In fact image capture is the easy

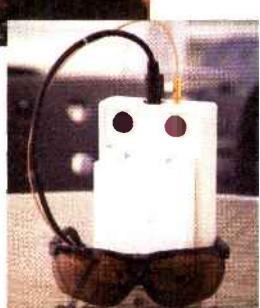
part of always-on videoing. Cheadle said: 'The problem is to find the bits in it that are interesting. The more you have, the more difficult it is.'

Cheadle and his team have developed software that can to an extent pick out the interesting bits – images taken during rapid head movements, for instance, can be rejected.

The work is targeted at people for whom even point-and-shoot

cameras are too much hassle. 'If you take a couple of two-year-olds out you can't take your eyes off them for two seconds. You don't have time to take a photograph and even if you do it is incredibly difficult to take one at exactly the right moment.'

But the work has more serious possibilities. Cheadle has had inquiries about the feasibility of police officers using a similar system to capture information that could be used in evidence. CA



Soft keyboard aids India's poor

Researchers in India have developed a gesture-based keypad that can be used with minimal training to input many of the country's languages. The problem is typified by Hindi, which is spoken by 400 million people and requires 36 consonants and 12 modifiers that can combine in 1,500 different ways.

A growing amount of official business is being done via computers in local languages, putting non-typists at a distinct disadvantage. The researchers at HP Labs India have mapped onto a small Acecad digitiser pad – a soft keyboard on which consonants can be combined with a number of gestures to generate Unicodes for the language's Devanagari script.

Shekhar Bargaonkar, director of the Bangalore lab's affordable-access department, reckons that someone literate in Hindi can use the system within 15 minutes and that the system can in principle can be used with any phonetic script.

The project is one of several at the labs aimed at extending government help to needy people and speeding up sluggish Indian bureaucracy.

A project called Coffei provides a framework for the creation, deployment and administration of electronic forms, using open standards such as InkML. Lab director Ajay Gupta demonstrated how a farmer could use a cybercafé to download and print a form needed to gain a bank loan.

The form provides a certified list of crops the farmer is growing and the information is provided both in text and as an encrypted barcode. The bank can read both to ensure the information has not been tampered with, and the system prevents officials 'going slow' on requests for a form until they are slipped a few rupees.

Another system developed at the labs uses spare bandwidth in satellite TV systems to deliver educational material in local languages that can be printed out and used in class. The same system can be used to deliver public-service information to areas that otherwise might not get it.

Is simplicity the key to ebook success?

An ebook design at HP's Bristol Labs raises the question of whether general-purpose ultra-mobiles like the Origami (see page 15) will make endangered species of narrow-function handheld devices like the iPod.

The design comes from a team led by Anthony Sowden, who predicts that the ebook will be a standalone device. Sowden argues that ebook readers will want simplicity and ease of use. 'They don't want anything that will interfere with their reading,' he said.

He also says that ultra-mobiles will need touchscreens that do not render text as clearly as a good TFT and that standalones will be cheaper.

We can assume that screens will get better, though they could take decades to come close to paper. The plasticky feel of current screens is a snag and Sowden said they could be prone to scratching.



HP's ebook shows the pages turn like a 'real' book

The HP design weighs about the same as the lightest of the ultra-mobiles showed at CeBIT this year but it is thinner; pages are navigated by zoom buttons and four scroll pads on each side. The screen is optimised for easy reading and pages turn as quickly and as easily as a 'real' book.

They also look far less scrappy than most web pages, and it makes you wonder if the ebook may encourage a fashion for more

traditional design. This is more likely to happen if the market fixes onto a screen size to which designers can work.

The HP device has all the benefits of simplicity and would doubtless find a market at the right price. But its minimal use of interactive features could irritate some computer users.

I am reminded of Palm, which had success with its Pilot handhelds which did a few useful things very well. But it came unstuck as hardware got more powerful and rivals packed in features. The Kiss (keep it simple, stupid) principle may work in politics, but in computing it could underestimate the intelligence and needs of users.

But Sowden and I agree at least that, though the ebook has advantages, the traditional book is not about to die. Clive Akass

In brief

Virus threat

Security vendor Kaspersky Labs has discovered a proof-of-concept virus that can infect Linux and Windows systems. It works only when an infected file is downloaded and would not threaten most Linux installations, which tend to be servers or embedded applications.

But the code, written in assembler by an apparently experienced programmer, could lead to the creation of more cross-platform viruses.

A security flaw has also been found in Linux kernel version 2.6.x that could allow malicious users to cause a denial-of-service attack, according to security firm Secunia. A patch is available which users are advised to download.

→ www.kaspersky.com

Fedora move

Red Hat has abandoned plans to create an independent foundation to control Fedora Linux, which is essentially a preview version of the company's enterprise Linux distribution. Red Hat decided a Fedora Foundation could accomplish nothing that the company could not do, Fedora project leader Max Spevack explained.

Oracle distro?

Database giant Oracle is thinking of developing its own Linux distribution and has considered purchasing Novell, which itself bought Suse Linux in 2004.

Chief executive Larry Ellison said told the *Financial Times* last month: 'We're missing an operating system. You could argue that it makes a lot of sense for us to look at distributing and supporting Linux.'

He argued that the move would help Oracle to integrate and test its database with other software.

China boom

China's Linux market will generate more than \$51m annually by 2010, up from just \$11.8m last year, predicts IDC.

Microsoft to support Linux

Microsoft caused a surprise at the Linuxworld convention last month by announcing a free download of software that will allow Windows machines to run the Linux operating system.

Virtual Server 2005 R2, which creates several servers out of one, previously cost \$199 (£113) and an estimated 5,000 users had already bought it.

Linux users will be entitled to Windows support for any problems running within a virtual machine (VM) created by the software.

The Microsoft move was seen as a response to VMware, which made its entry-level product free some weeks before Linuxworld.



Microsoft, the Great Satan of the Linux world, has opened a new site to prove it really does want to embrace the open-source community – or least ensure the two environments can interoperate. The site is called Port25 (<http://port25.technet.com>), after the Windows communications port used to carry email

The strategy of both now seems to be to get companies hooked on the basic facilities so that they are willing to pay for refinements.

Virtualisation is used in enterprises to make maximum use of available machines, provide resilience, and facilitate the use of a mix of operating systems. But it

is expected to go mainstream. Dell chief technology officer, Kevin Kettler, said it has much potential on the desktop, where users will be able to optimise VMs for different purposes such as gaming or security. A VM infected by a virus can simply be killed. From *VNUnet reports*

New interface may boost desktop Suse

The high cost of migrating from Windows to Linux remains a major barrier to uptake of the open-source operating system – although a new version from Novell could make it more common at the desktop, according to analysts Gartner.

The warning followed a Novell demonstration of Suse Linux Enterprise Desktop (SLED) 10, which is due to ship this autumn.

Gartner research director Michael A Silver said SLED 10 has many new features likely to appeal to enterprises, including integrated desktop search, support for popular

virtual private network clients and the inclusion of OpenOffice.org version 2.0.2 with Visual Basic for Applications macro conversion.

Improved support for USB and Bluetooth devices is also a major step forward. But the most visible change is a new interface similar to the Mac OS and Windows Vista. 'Compared with the new one, previous Linux user interfaces felt grafted on,' Silver said. Improvements include better window animation, transparent frames and 3D graphics to ease navigation between multiple desktops.

Silver said SLED 10 is 'a positive step in the evolution of desktop Linux', and could be suitable for people with limited need for Windows compatibility. But he warned that it is still 'unlikely to be suitable for all users'.

Companies should also factor in Novell's annual fee for security fixes. 'Expect Novell's version of OpenOffice.org to be suitable for more users. But it is too early to determine its level of compatibility and fidelity with enterprise Excel applications and complex Word documents,' said Silver.

Robert Jaques

Developers plan purge on Open Office bottlenecks

Developers are working on ways to speed up the open-source Open Office suite following complaints of bottlenecks, including slow startups, particularly when running under Linux.

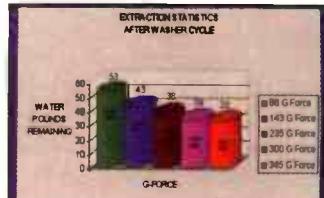
The governing OpenOffice.org group plans to pre-load some code into memory to get the suite running more quickly.

Michael Meeks, an Open Office developer with Novell, told a Linuxworld seminar that the version release cycle had been

shortened from 18 to three months to get performance improvements and bug fixes out quicker.

Meeks said improving the performance of Calc, the suite's answer to Microsoft's Excel, was also a priority. He cited the case of a company that ported a large spreadsheet to Open Office: in Excel it had taken 30 seconds to recalculate; in Calc it took three hours. Developers got that down to about one hour, but Meeks said there is still much work to be done.

Open Office plans to enhance macro imports, critical for companies migrating to its suite. It is working on a 64bit version, too. Tom Sanders



The Impress presentation module within Open Office

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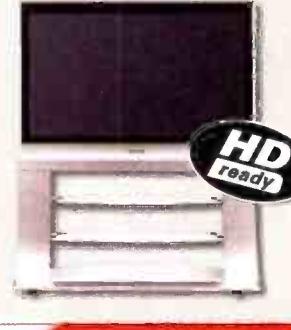
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LETTERS

LETTER OF THE MONTH

What about sat-nav security?

Your recent review of in-car sat nav units covered the main technical issues well, with one exception: you made no mention of security. Having had a sat nav stolen from my car, I've become aware that such thefts are big business. As I understand it, sat-nav theft is the number one reason for car break-ins; the manufacturers need to take this seriously.

Some manufacturers offer the helpful advice that the unit shouldn't be left on display on the dashboard. The principle of this is fine, but to be effective the complete unit and its windscreens cradle needs to be removed – the cradles themselves are easily recognisable. In practice, given the need to route wires safely and so on, many users will simply hope for the best.

There is more that the manufacturers can do to help, by adding some simple software-based security features to make theft ineffective. Pin codes should be simple to add, rendering a stolen unit useless. Owner information could be stored

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Send your email to letters@pcw.co.uk



internally, with some kind of password access to prevent it being overwritten. My TomTom unit now has my home postcode displayed on the start-up screen: this will make an embarrassing surprise for anyone who buys it down their local pub.

The mobile phone industry has recognised the need to address this issue. The sat-nav suppliers can easily do the same – and I for one will regard security features as a key product differentiator.

Laurence Barker

Kelvyn Taylor replies: You're right that sat-nav theft is a massive problem. The International Security Register (ISR) sells a DIY sat-nav pack for £11.75 that etches a code onto the casing of the device that's visible under UV light. Owner details are registered with ISR and anyone can call ISR to verify ownership – it's the same system used to register cars by marking the windows. An order form can be downloaded from www.retainagroup.com/fr_shop_win_prods.htm#sat.

FIGHT THE FLAB

So Vista is nearly here, Office 2007 is not far off and, thanks to cheap Ram and dual-core CPUs, we now have more processing power at our fingertips than ever before. However, despite the graphical polish of Microsoft's latest offerings, I do get frustrated at how inefficient and bloated its software always seems to be.

I'm not an anorak who only runs Linux from a floppy disk, but I do wonder how the open-source movement seems able to develop similar functionality and performance at a fraction of the size (and cost). I often wonder whether it is the consumer driving



the demand for more and more features and hence more power, or if it is the hardware and software manufacturers developing solutions that

make the consumer feel they need to upgrade so frequently. I was blown away recently when visiting www.scene.org, a website devoted to 'scene demos' – there is a category specifically for 64KB demos, which are simply amazing when one considers that most people consider a 128MB USB key to be too small these days.

I'm not saying we should reverse the trends or languish in the past, but I do feel the majority

of people only take their guidance from Microsoft or the big hardware vendors and don't realise that, with a bit more creativity, amazing software can be developed that doesn't need gigabytes of Ram and massive CPUs.

Michael Webster

THE FALLING COST OF TECHNOLOGY

I always enjoy the 'looking back' articles in the magazine and marvel at how low today's hardware prices seem compared with, say, 10 years ago. Today I was having a clearout of old paperwork and came across two invoices from 1997 for PC components from Simply Computers (Misco now) and

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

realised just how far I was prepared to go to keep near to the cutting edge of PC technology.

The prices I paid in November 1997 were staggering: A Yamaha CD writer (six-speed read, four-speed write) was £315 ex VAT and two 32MB EDO Ram Simms cost me £176 ex VAT. Misco's price for the same memory today is £11.49 ex VAT and a 52-speed CD rewriter drive is £11.99 ex VAT.

It seems inconceivable that nine years on I can buy a complete PC for less than those components. And the same order included five CD-Rs at £3 ex VAT each. Carry on at this rate and in 10 years' time, PC component resellers will be paying us to take the items off their hands!

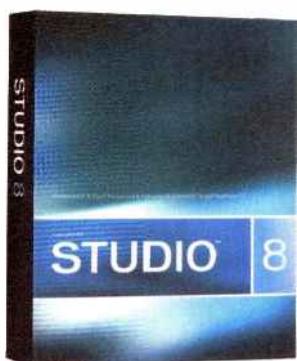
Alan Farrell

ADobe RIP-OFF

I work as an IT technician in the education sector in a local primary school. I was asked recently about running a lunchtime computer club for the gifted and talented children in Key Stage 2 classes.

I decided this was a good idea and that I would teach them to use Macromedia Dreamweaver so they could produce material for our website and intranet.

Macromedia sold this for primary schools at £299 for Studio 8 with 15 student and two teacher licences – a bargain. I placed an order for this through



Adobe's prices are too high for most primary schools

a reseller, who contacted me to tell me this

was not available as a result of the Adobe takeover of Macromedia, even though it is advertised, and that Adobe had school licences available as site licences. Looking at the new pricing I found this was going to cost us a minimum of £1,699 – over five times as much.

This is the price for secondary schools, colleges and universities – fine if you have a large budget to play with. Most primary schools can't afford this kind of expenditure and don't need 500 licences as they are lucky if they have 100 PCs and probably would only use Dreamweaver with the more able pupils in small groups anyway.

How can Adobe justify this massive price increase? I suspect this will backfire on the company as most primary schools will look at alternatives, which may lead to a decline in the use of certain pieces of software as the next generation of programmers and designers will be used to using products they learn at school from an early age.

Microsoft had to learn this lesson in schools, restructuring its licence prices for education as it came under threat from open-source software, as schools

simply couldn't afford the extortionate cost of corporate-like pricing and began moving away from Microsoft products.

Perhaps some of these other companies should take a leaf out of Microsoft's book for once.

Sean Hindle

Kelvyn Taylor replies: You have our sympathies – we've also tried to make sense of the impenetrable pricing plans for educational purchases of Adobe and Macromedia products (now all lumped under the Adobe Open Options licensing system, www.adobe.com/aboutadobe/openoptions/main.html) and failed miserably. We've been promised a clarification from Adobe's PR company, but at the time of going to press we still hadn't received this. Keep an eye on the copy of your letter that we've posted on our Interactive blog at <http://tinyurl.com/kbpwz> – we'll post the response there as soon as it arrives.

and I am also worried that it will stress my PC into an early grave. I have been looking to see whether a network-attached storage (Nas) drive could do the job and allow my PC to be turned off most of the time. Can these products offer what I need? If so, can you recommend one?

Dan Renton

Kelvyn Taylor replies: This is a conundrum faced by many people who want to stream media. One lateral-thinking solution is to use an old or cheap laptop as your server – it's a lot quieter and has a built-in battery backup. However, there are some Nas devices around that are designed as media servers. One that springs to mind is Buffalo's Terastation Home Server (<http://tinyurl.com/htbj6>).

Some audio streamers require your PC to be turned on

WIN Next month's prize for the letter of the month is a Pinnacle Soundbridge



This sleek network music player is a true plug-and-play solution for enjoying all your digital music throughout the house via your existing WiFi router. It lets you control your music library from across the room using the remote control and plays a large selection of Internet radio stations, even when your computer isn't on. It requires no software installations, and supports audio formats including wma, aac and mp3, as well as a multitude of music services such as iTunes and WMP10. For more information on the Pinnacle Soundbridge, go to www.pinnaclesys.com.

CLARIFICATIONS & AMPLIFICATIONS

● In the June group test of USB TV tuners, we mistakenly named the Terratec product as the Cinergy T USB XS, when it should have been the Cinergy Hybrid T USB XS. The Hybrid model has an RRP of £89, although at the time of writing it is available

through PCW Best Prices (www.pcw.co.uk/bestprices) from around £65. We still rate it as the best of the review group, and it retains its Editor's choice award.

● Fujitsu Siemens has apologised for providing us with the wrong price for the Scaleo E Media Center PC in

our June group test. The Scaleo E as reviewed costs £856.98, not £799 as printed, and is available from www.dabs.com using the Quicklinx code 3Y70WS. In our view it still represents excellent value for money, and keeps its Recommended award.

THE ADVISER

COVER YOURSELF

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

HOW TO COMPLAIN

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

BLOT ON THE LANDSCAPE

I purchased a Sony Vaio laptop Model PCG-6E1M in May last year from John Lewis. I rang Sony when an inkblot-shaped blemish appeared on the screen. The support agent stated that he thought it was a hardware problem and told me to return it to Sony. I received an email from Sony in March saying that the warranty had been invalidated because the LCD was broken. The quoted cost for repair was nearly £570 and amazingly the cost for return without repair was over £107. I was not informed of this before it was collected.

I have not damaged this computer or its screen. I carry it in a padded case and use it for writing reports. No-one else has access to it. I am a psychologist and use it for writing confidential reports. I received my notebook back at the end of March but Sony did not charge for the return as I had waited so long.

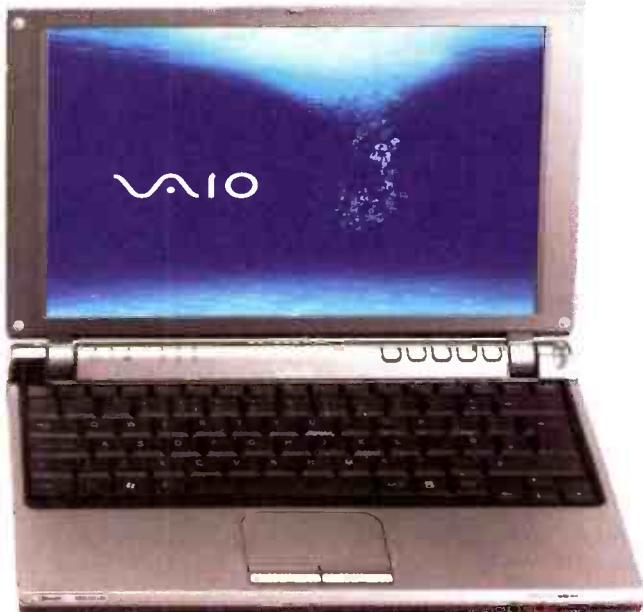
John Lewis told me that as Sony said I had damaged the computer, I have no further recourse except through my home insurance as any damage to the LCD screen is not covered under the guarantee. I cannot see any damage but presumably there must be. I have not shut the lid with an object inside, dropped it, or dropped something on it.

Brenda Chapman

When we contacted Sony, the company sent us its engineer's report on Mrs Chapman's notebook. The company insisted that pressure in some form had been applied to the screen,

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



Sony decided that damage to a laptop was caused by the consumer

saying that such damage can be caused by the device being dropped, having heavy objects placed on the LCD screen or by attempting to close the lid of the PC when an object such as a pen lid or coin is inside.

Sony told us that it keeps photographs of similarly damaged notebooks, which are compared with devices sent in for repair under warranty, when other hardware defects such as burnt-out transistors or a failing graphics card have been ruled out. Sony said it realised Mrs Chapman 'was not aware' of such an incident, and she told us no-one else had used the notebook. Yet with Sony's verdict being that the fault was caused by accidental damage, John Lewis, which would have been liable for the cost of repairs as it sold the notebook, is within its rights to say that the warranty terms have been broken.

The options when a company decides damage has been caused by a consumer are few; to challenge the decision, it would be necessary to get evidence that another flaw – one inherent in the design, such as components

that failed before they should reasonably have been expected to – had caused the damage. That invariably means getting an expert opinion, such as a PC technician. This can be presented to the company, although few change their minds after their own engineers have filed a report.

The only resort then is to consider a small claims court procedure. The court would weigh the evidence of your expert against that of the company's. Needless to say, this involves cost and time and there is no guarantee of a victory.

As for the delivery charges, companies are not obliged to pay for carriage to inspect or return goods if the damage is caused by the consumer. They should tell customers the potential charges, and if returning items for repair we advise you to ask what these might be. However, in this case, Sony said it had asked for £78 to cover carriage both ways, but that it had ultimately waived the fee because of delays returning the notebook to Mrs Chapman.

Mrs Chapman told us she had decided to accept Sony's argument

that the fault was caused by accidental damage, although she had no idea how it had occurred.

INNOCENT VICTIM

A fraud was committed on my credit card to purchase a £1,000 computer from PC World that was delivered to my parents-in-law's house (the registered address for my credit card). The card was immediately cancelled and the fraud was reported to the police and PC World.

In January my mother-in-law returned the computer to PC World after several failed attempts to set up collection by their courier company, and the PC was signed for by the duty manager. I have incurred charges on the credit card because of the illegal withdrawal yet still there is no sign of the refund.

Melvyn Mildiner

PC World managed to resolve this situation within a day of us contacting them. The company apologised to Mr Mildiner, and said that while the circumstances regarding the fraud had contributed to the delay, some 'human error' on its part had led to an unacceptable delay. It agreed to process the refund immediately, and offered Mr Mildiner an extra sum to compensate for the charges to his credit card account.

All fraudulent transactions on credit cards must be reported to the police. Most card issuers will provide a refund to compensate victims of crime. To get a refund, proof must be provided. That means getting an incident report number from your local police, so that the bank knows the crime is being investigated.

CONTACT THE ADVISER

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

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

Mea culpa

In the last issue, we reported on the case of Andrew Evans and retail website Limeleaf. The information we provided was inaccurate, and we're happy to put the matter straight right away.

Mr Evans ordered goods from the website, which were signed for by a neighbour. The neighbour told Mr Evans the package had been left on his doorstep, but it disappeared.

Limeleaf said it was not responsible because the courier had obtained a signature from the neighbour. The key point here, as we should have said in the last issue, was that Mr Evans' contract of sale was with Limeleaf, and that as the goods had not been delivered to him it was liable. Apologies from the Adviser team for the error. Limeleaf had already agreed to refund Mr Evans as a goodwill gesture.

The payment was required, though. Limeleaf could have made a claim against the courier, which itself could have claimed against the neighbour. Amtrak's

insistence it had fulfilled its responsibilities by obtaining the neighbour's signature for the delivery is dubious. It was contracted to deliver the item to a specific address, and any terms in its contract with Limeleaf relating to leaving goods elsewhere if the addressee is not available, are not Mr Evans' problem.

With more goods being ordered online, these situations are a growing concern. Martin Allcorn contacted us about a similar problem with a delivery from Dabs.com. He told us Dabs had told him to resolve the dispute with his neighbour. The company was unavailable for comment as PCW went to press but we will return to this in the next issue.

Meanwhile, Mr Evans called us to say that he had yet to receive the refund from Limeleaf. We have contacted the company to enquire, although it may be that Limeleaf, in common with many providers, issues payments once a month. We hope that's the case.



KNOW YOUR RIGHTS

● In England and Wales, the retailer must prove that faults found within six months of purchase are not inherent.

● Consumers should not suffer financial loss in order to repair a faulty item, so postage and courier fees should be claimed back if the fault is inherent.

● Companies are not obliged to repair goods damaged by accident or misuse.

● The contract of sale is between the buyer and the company that accepted your money. It can be quicker to deal direct with manufacturers, but do not let resellers bully you into this.

● Goods ordered online, by post or phone can be returned within a reasonable time under the Distance Selling Regulations. This is widely accepted as being seven days.

● Companies cannot charge for services they fail to deliver, regardless of any contract you have signed – the contract goes both ways.

● Benefits provided under extended warranties are an addition to your statutory rights, so buying one does not invalidate your consumer rights under legislation.

● Online auction sellers are only obliged to ensure goods are described accurately. However, individuals selling more than one of an item, and those listed as power sellers, may be classed as businesses rather than individuals.

● For more detailed information on consumer law in England and Wales, visit www.oft.gov.uk/consumer. In Scotland, visit www.scotscourt.gov.uk.

Gordon Laing



gordonl@pcw.co.uk

Internet cafés ain't what they used to be

Working on the move is tough and Gordon Laing thought he'd found the answer, until VoIP interrupted his peace and quiet

I've always loved the idea of mobility – untethering yourself from the desktop and heading out with the possibility of working anywhere you fancy. Forget about unfolding a laptop in the safety of a hotel room though. I'm talking about keeping it real and snatching crafty half hours here and there on trains and planes, or perhaps at a coffee shop while you wait for friends or colleagues – that's the mobile dream.

Annoyingly, whenever I attempt this kind of liberation, it never works out. However honourable my intentions, I rarely if ever get any real work done when I'm out of the office. But the adverts make it look so easy. Am I really the only one who fails in the pursuit of this mobile nirvana?

Take coffee shops with their increasingly common wireless hotspots. They sound ideal for polishing a presentation, but it's only when you

'Many modern Internet cafés have become louder than a pub on a Friday night'

start trying to concentrate that you realise just how loud and distracting these places can get. Plus, maybe it's just me, but at half the wireless hotspots I visit, I spend most of my time and battery life just trying to get connected.

How about a train then? Find a peaceful carriage and prepare for some quality time with your laptop. Only watch out, because if you sit on the sunny side, you'll strain to see anything on your screen. And those tables seem designed to make using a laptop as uncomfortable as possible.

So onto a plane, with the promise of several uninterrupted hours of work. But foiled again by the constant distractions: there are only a few brief windows of opportunity between announcements and delivery of drinks and food. When you do get a longer gap, the person in front of you reclines their seat, which folds your laptop shut.

Maybe I've just been unlucky, but this stream of failures has resulted in me rarely if ever carrying a laptop on a trip – for work purposes anyway. I think the people you see using their laptops for watching DVDs have the right idea.

But sometimes work needs to be done when you're away from the office, and I head for the

nearest Internet café. Before committed laptop users reel in horror, think about the benefits. In a decent Internet café you'll get to use a mains-powered system which will almost certainly be quicker than a battery-operated laptop. You'll also enjoy a decent-sized screen, full-size keyboard and mouse, and of course a fast connection without any need for configuration. Perhaps best of all, you'll also be able to travel light without lugging your own machine around, or worrying about having it (and company secrets) nicked.

Yep, I reckon Internet cafés offer a number of truly compelling benefits for the modern worker away from the office, and appropriately enough, I'm writing this very column from one.

Trouble is, my plan of doing proper work in such environments has yet to catch on with my fellow café visitors. Most are still students or backpackers looking for a convenient way to stay in touch with friends and family. Nothing wrong with that, except that in the past year or so, the means by which they do so has changed dramatically.

Not so long ago, anything other than a Hotmail inbox was considered an unusual sight on the screens of an Internet café. Then as instant messaging became increasingly popular, you'd see a few people conversing in real time.

Today it's all changed. The rise of Voice over IP (VoIP) services such as Skype have seen many travellers abandon keyboards for a microphone and headset. And why not?

Trouble is, many modern Internet cafés have become louder than a pub on a Friday night. It's like being in a room packed with inconsiderate mobile phone users, except with both ears normally encased by headphones, their conversations are shouted louder than ever. I know – I've already walked out of two cafés in frustration today.

VoIP may be a killer application for travellers in Internet cafés, but sadly it's rendered many of them unusable for anyone wanting to do any work. To be fair, the cafés never pretended to be peaceful havens for mobile workers, but it now seems the only place you can work away from the office really is in your hotel room. It's a reluctant defeat for anyone pursuing the mobile dream, but in the absence of a better solution, it's the only practical way of getting the job done. **PCW**

Barry Fox



barryf@pcw.co.uk

Wide-open networks the biggest threat

If people don't protect their network, their files could be at risk, says Barry Fox, and this is an identity fraudster's dream

Hotels now charge an arm and leg for Wifi access or a broadband Ethernet connection. Being mean, I don't want to pay. And often I don't have to.

There has been a fair amount of publicity over the way home Wifi networks leak free broadband access and file sharing into the street. Laptop leaks are a newer problem.

If you are staying in a hotel, try scanning for Wifi networks. Often a dozen or more will pop up. The same thing happens in airport lounges, and at train stations. Some of the networks show up as 'security-enabled', sometimes with names like 'This is Frank's PC, now sod off'. They are using Wep or WPA encryption and need a shared key before an outsider can connect.

Many others show up as open, advertising themselves as 'insecure', and often with the

Webroot, Sophos, Sunbelt and Panda have all published surveys which highlight the problem. The Panda study is the most thorough (www.pandasoftware.com/wifi). Panda people drove round cities in nine countries sniffing for unsecured Wifi. Around six out of 10 networks had no security. Four out of five in Spain were open wide. It is only a question of time, says Panda, before people are driving round deliberately infecting networks with viruses and worms.

Hiding the SSID, so that no-one can see it, obviously makes intrusion a lot more difficult. But many people will understandably be scared of making their home network invisible, for fear of never finding it themselves.

Says Andy McKewan, Panda's security consultant: 'Internet Connection Sharing is a cheap and easy way to get a home network working. When the laptop is away from home and connected to a Wifi service it advertises itself as an access point. If there is a good firewall running on the laptop it will warn when someone is trying to connect. But Windows won't. Anyone with computer knowledge will be able to access files that can be shared on the home network.'

Even if there is a firewall, when it keeps on giving warnings the owner is tempted to click Yes just to stop the pop-ups. So the intruder gets in.

You can also forget all the fancy talk about the comparative strengths of Wep, WPA and WPA2. They are all equal if people don't switch them on.

As the Wifi industry has done such a rotten job of warning and helping consumers on this, the next step should logically be an official awareness campaign. Unfortunately there's a Government-created credibility gap to overcome.

In the run-up to the year 2000 the UK Government spent over £20m on scaring the public witless with warnings about the millennium bug. The campaign team ignored ways to check the real level of threat, for instance with free software to check a PC's Bios against a look-up list of known problem versions. This kept the campaigners' jobs secure but meant the public were misled.

As a result the bug became a joke. Wifi is a more serious and real threat. It's the answer to an identity thief's prayer. But who will now believe anyone in Government who tries to say so? **PCW**

'People will be scared of making their network invisible for fear of never finding it'

Service Set Identifier (SSID) name still set at the factory default, like 'Belkin' or 'Netgear'.

Some of these insecure networks reject any attempt at unauthorised connection, even though they have no security. They are most likely cellphones with built-in Wifi or leaks from laptops connected by an Ethernet plug. Others let an unauthorised PC connect for a short while before shutting it off. These are most likely laptops with a software firewall that throws up a warning when an outsider tries to get in.

But plenty of the insecure networks are open. On a trip to Tokyo, I spent a week in a hotel saving \$20 a day by leaching free Internet access. I didn't try to explore anyone else's files, but I probably could have done. This is happening because it's so tough to get a home network working.

Making Wifi work is tricky too. Setting up firewalls and sharing takes more skill and patience. Most people are so thrilled when their home network works that the last thing they want to do is add security and risk shutting it down. So home networks leak free access and when the owner takes a laptop out of the house and connects to a hotspot it leaks from there.

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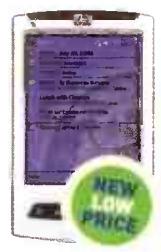


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Guy Kewney



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The importance of being a blogger

Anyone can publish information on the Internet, but Guy Kewney thinks much value will be lost as a result

What's the difference between *PCW* and *Big Brother*? It's a trick question and the answer is: 'Not much. Both are attempts at entertainment.'

Those of us who work in what we call 'news' are, at the end of the day, competing for attention. We're dancing up on the table, shouting 'Look at me!' But, instead of showing vague movements under a blanket where two people appear to be asleep, we're showing things which we label 'important!' So, if traditional publishing is to survive the 'blogalanche', it has to find some way of seeming more important than what individual bloggers have to offer.

Take boxing. Around the time I was writing this, British boxer Chris Eubank was selling the video of a particular fight over the Internet. Specifically, he had set up a website aimed at

And then, people who work for the industrial enterprises started publishing in their own right, and for an awful lot of people, this was far better than journalism. The question that hasn't been answered yet is 'how long can this be true?' The answer is not what people are assuming it is.

Bloggers who are experts in their field, and able to tell you more about Origami than Clive Akass can, are often people who work for the companies involved. Already, we're seeing such people getting mown down by their employers. You can lose your job just for talking to a journalist; but if you start trying to be a journalist, your career will not necessarily flourish.

People who were seen challenging Microsoft on its stance in China, wearing their 'I work in Redmond' badges, are moderating their voices and explaining that 'it's more complicated than that and I can't say any more.' Some of these bloggers are turning into publishers and journalists. Instead of venting their own personal experience and opinion, you'll see people doing blogs like Engadget contacting suppliers, asking them questions and writing down what they say. That's journalism. By no coincidence, Peter Rojas (Editor of Engadget) is a professional journalist.

What has changed is simple: journalism is no longer the only way of 'getting your message out' to the reader. Microsoft can do Channel Nine videocasts on the web and you can watch and learn – which is much better than the old days, when all you could do was send off for a brochure. But how helpful is this really? In the long term, it's just a better brochure. It's what Microsoft wants to tell you, not what you may judge as important.

The good news is that the PC and the Internet have given us a new media-garden, with a new perspective on what may be important. Immediacy, for example, is one gift of Google News. Variety, too; you don't have to buy a copy of each publication in the market to find out what all the expert observers think.

But there is bad news: for a short while, a lot of these expert observers are going to be out of work. The clearing of the forest may mean new trees in the future; but in the interim, much value will be lost. And that's definitely important. **PCW**

'Simple journalism is no longer the only way of "getting your message out" to readers'

mobile phone users where, for £10, you can download and watch another boxer receiving brain injuries which left him in a wheelchair. Important? According to Eubank and his publicists, yes. 'Arguably one of the five most important fights ever,' they told me and anyway, Eubank himself cries his eyes out when he sees it.

I'm not into boxing and find the idea of a brain-damage accident as an important sporting event weird, but that's just me: millions of people think it is important and, until now, couldn't watch the fight because ITV (which owned copyright) put an embargo on it on the grounds of good taste. So unless you recorded it live back in 1991, you couldn't see it, important or not.

For readers of *PCW*, the word 'important' means things like 'what does Clive Akass think about the new Origami platform?' and they are prepared to pay each month to find out.

Traditional wisdom was that this process was called journalism and that it was almost the only way of getting to see behind the curtain of secrecy most industrial enterprises create. They like to hide what they do behind a veil and you find out no more than what their outlets allow you to.



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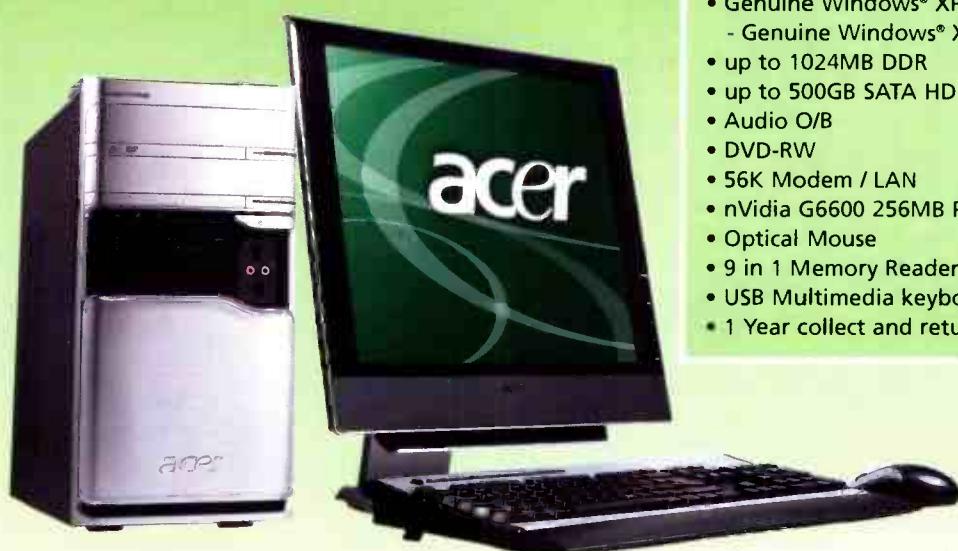
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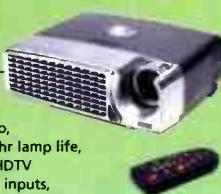
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With over £40b worth of transactions completed worldwide on eBay in 2005 alone, it's clear that there is money to be made and bargains to be found. In the same year, eBay.co.uk passed the 10 million user mark. But the sheer volume of goods and traders using the service make it increasingly difficult to bring buyers and sellers together.

It doesn't have to be that way. There are means that can help sellers make their items stand out from the crowd and assist buyers to locate their quarry. Over the next few pages, we will present a guide for private buyers and sellers that will go beyond the basic steps of getting started and help you to make the most of your entrepreneurial spirit. Much of what we will discuss is common sense and down to having a shrewd eye, but we'll also talk about new tools, provided by both eBay and third-party developers, that can smooth the path to a good deal.

The information will be presented in two parts; first for sellers and then some expert tips on buying, but we recommend you read the article in full, as a knowledge of how transactions are structured from both points of view can be useful. As with all successful ventures, criminals have been quick to catch on to the opportunities presented, so safety and security will also be covered, along with a summary of your rights and responsibilities under consumer protection law.

SETTING UP SHOP

Although often called an auction house, eBay is in fact a trading platform. That means the company takes no responsibility for transactions carried out using its technology. You may feel this is not entirely fair, but it's what you agree to when registering with the site, as indicated by acceptance of eBay's terms and conditions, which can be read in full at <http://pages.ebay.co.uk/help/policies/user-agreement.html>. The agreement states that eBay will not accept liability for financial

losses incurred through fraudulent transactions, although some protection is offered if you sell through eBay's own payment management service, PayPal. The PayPal terms are explained in full at <http://tinyurl.com/6qmou>.

To begin selling you will need to register for a seller's account. Sellers are required to register a debit or credit card in order to pay the fees required to list items on the site. Registration is free and you will be asked to

Paypal offers protection against fraud

PayPal

[Sign Up](#) | [Log In](#) | [Help](#)

Welcome | Send Money | Request Money | Merchant Tools | Auction Tools

► Protection

We Help Protect Your Account—and Your Purchases

PayPal's industry-leading fraud prevention measures and our one-of-a-kind method of keeping your financial information private from sellers make us one of the safest ways to pay online. Plus, we offer the following to protect your purchases:

- Extensive protection against fraudulent transactions from your account
- £500.00 GBP buyer protection coverage on qualified eBay purchases.
- Dispute resolution on PayPal purchases

More Information

- How Sellers Qualify for PayPal Buyer Protection
- Fraud Prevention Tips
- PayPal Security Centre

Extensive protection against fraudulent transactions from your account

► Increase Your Safety.

provide a postal address and telephone number. Here you'll also find the option to create a business account, and it's worth considering the difference straight away.

There are two types of seller on eBay: private and commercial. The key difference is that commercial sellers are bound by the Sale of Goods Act in full while private sellers are obliged only to ensure that the goods they sell are accurately described in listings. The item must also be permitted according to eBay's terms; some items are prohibited outright such as fireworks, while others, including weapons, are considered questionable. Items that could affect someone else's copyright, meanwhile, are listed as Potentially Infringing. If in doubt about an item, check <http://pages.ebay.co.uk/help/policies/items-ov.html> before listing it.

Differentiating between the two types of seller has been a cause of dispute when buyers feel disappointed by a purchase and try to get redress. In general, anyone who regularly sells more than one copy of an item or whose volume of transactions is consistently high, is considered commercial. eBay's own definition suggests you are commercial if buying or making items with the intent to sell them for a profit on the site. There are tax implications for people in this position, and business sellers can provide eBay with their VAT registration number and receive net invoices for their eBay fees.

The tax authorities are starting to view the enormous amount of money changing hands through eBay with envious eyes, so if you are intending to supplement your income rather than sell the occasional unwanted item, take some advice from an accountant or the Inland Revenue first and download eBay's guide to businesses at www.pcw.co.uk/2154962.

Photo tips

Most people PCW has spoken to won't even look at a listing if there's no photo attached. To make a success of eBay, there's just no excuse for not using a photo to help sell an item. That said, a bad photo can also put people off, so take time and care to prepare shots.

Good lighting is the key, and daylight is always the best source so if possible, get the item out in the garden and set it against a contrasting backdrop made of a sheet, piece of card or even a towel. Just make sure the backdrop is plain, as noticeable textures and patterns are distracting.

Consider paying an extra 12p to add extra images to a listing so you can show details, including flaws – buyers will appreciate your candour.

Right: If your username now seems inappropriate, change it

Your good name

Whether selling for fun or for more serious profit, you need a good trading name. Choosing the right name is important, because it is the first piece of information listed in the 'Meet the seller' panel that appears whenever a potential buyer clicks on one of your items.

A comical or saucy nickname might seem funny to you, but may set an inappropriate tone for buyers. You may wish to choose a word or phrase that tells buyers something about your areas of interest, and therefore items you might be trading in or something that tells people where you are in the UK.

If you chose a username before reading this that now seems inappropriate, it is possible to change it. eBay provides a guide at <http://tinyurl.com/fgwpa> but the ID can be changed only once in a 30-day period and we advise you think very carefully about your trading name and choose one that will stick.

Once the ID has been changed, an icon will appear next to the new name, in new and existing transactions, to alert other users. The feedback attached to the old ID will remain and if any seller asks (as we would advise them to) why the ID was changed before making a bid, just tell them the truth.

Your good name also means your reputation. If you're a relative newcomer we advise trying a few test runs. Buy or sell a few low-priced items before moving on to a more valuable sale. This will give you some hands-on experience of a transaction and start to build a picture of you as an eBay user. If you plan to trade on a regular basis, set up an 'About me' page (see the links box on page 48).

eBay is a faceless market so completing this section gives you a chance to tell prospective buyers more about yourself and the items you tend to sell. This is especially handy for those who are dealing in collectables.

Changing Your User ID

Your User ID is the unique nickname you choose for signing in when you first register at eBay. You can change your User ID (once in a 30-day period) by going to the [Change User ID](#) page.

When you change your User ID

- The change will appear immediately, even in listings you're participating in.

eBay will automatically attach your member and other important account information to your

user next to your User ID for 30 days.

else at eBay for 30 days.

in a 30-day period. This is to prevent confusion for D is a valuable asset, like your member profile. Other your User ID, so it's a good idea to choose one you'll

Left: Some items may not be sold through eBay, so check the terms for questionable items

The easy sell

Now you're ready to sell in earnest, but don't rush in and just plonk your item on the site. Preparation and research yield better results. You may find it helpful to click the Sell link to open the listing designer to follow some of our tips.

One of the first options when setting up a listing is the type of auction. Two choices are offered: 'Sell at an online auction' or 'Sell at a fixed price'. Online auctions make up the majority of eBay transactions, with visitors to the site bidding against each other until the auction ends, usually over five or seven days.

If you choose an auction, eBay will offer you the choice to set a reserve price as well as a starting price – if the bidding doesn't hit the minimum price you set, the auction is cancelled and you still pay the insertion fee. Fees start at 15p and rise to £3 depending on the starting or reserve price that has been set. A second fee applies to auctions where the item is sold. See <http://pages.ebay.co.uk/help/sell/fees.html> for eBay's fees in full.

Fixed-price auctions offer visitors the chance to snaffle the item straight away, although normal bidding beneath the fixed price can continue if the starting price of the item is lower than its fixed price. It's often used by people who take advantage of eBay to run small, low-overhead businesses and such auctions have a bright 'Buy it now' logo next to them. But in the true spirit of a free market, eBay has now introduced a good old-fashioned haggling tool. Bidders on fixed-price auctions can use the 'Best offer' button to submit a lower bid that the seller is free to accept or reject – more on that later.

To qualify for the fixed-price format, you will need a feedback rating of 10 or more to list single items, or 30 or more to list multiple items. Giving eBay a direct debit for fee collection when registering also qualifies you for the format.

The final auction type you may offer is a Dutch auction, where multiple and identical items are listed in the same lot. Instead of

Alternatives to Ebay

Bargains abound online, and several competitors are queuing to pick up the small but increasing number of people who are a bit bored on Ebay or have had a poor experience there.

Ebid (<http://uk.ebid.net>) is probably the best known, and challenges Ebay on the basis of fees, with sellers able to place listings free and pay two per cent on the value of a sold item or pay for a subscription and keep all revenue.

CQ out (www.cqout.co.co.uk) operates on a similar basis and both display tables of comparative fees for successful auctions, none of which PCW can verify.

Hunt for it (www.huntforit.co.uk) is the latest pretender to Ebay's throne and offers bidding by phone from any mobile network.

selling at a fixed price, visitors bid on the quantity of items they want and the price they're prepared to pay. A full guide to Dutch auctions can be found at <http://pages.ebay.co.uk/help/buy/buyer-multiple.html>.

Snoop for profit

Always check the competition; look at how other similar items are being traded on the site. Click the Buy link at the top of the home page to start a search by keyword.

As an example, consider the sale of a vase. When PCW typed 'vase' into the search field and hit Enter, Ebay displayed 46 separate categories of goods, including pottery, porcelain, collectables, stoneware, antiquities and dolls' house miniatures. Most buyers use this method to track down what they're after, so choosing the right category is key. Spend some time browsing through the categories that seem to best match your item and make a note of the category titles. It is possible to choose two categories, but the fee charged to list the item on the site then doubles. (For full information about fees, see our links box on page 48).

Look at listings for items in categories and note what other sellers have chosen to highlight. It's important to check as many as you have time for, as you'll most likely encounter listings from hobbyists, specialist collectors and online shops that will have plenty of experience of selling items similar to yours. The key things to look out for are

The screenshot shows the Bumblebee Auctions website. At the top, there's a search bar with 'Search Any Words' and 'Search' buttons. Below the search bar, there are links for 'New', 'Current', 'Closing Today', 'Last Chance', 'Closed', 'Featured', and 'Premiere'. The main content area has a sidebar with categories: Antiques (0), Carpets & Rugs (0), Clocks & Watches (11), Coins & Medals (0), Electrical Equipment (7), Garden Stat & Arch' (0), Luggage (2), Miscellaneous (44), and Music Related (7). To the right of the sidebar, there's a list of categories: Books & Manuscripts (0), Ceramics & Glass (4), Clothes & Textiles (36), Computer Equipment (13), Furniture (0), Jewellery (16), Militaria (0), Mobile Phones (0), and Photographic (7).

Burglary items that can't be returned to their owners are available on Bumblebee

For some more unusual lots, try Bumblebee, the auction site that disposes of property recovered by police under the anti-burglary operation of the same name (www.bumblebeeauctions.co.uk). A full list of UK auction sites can be found at <http://www.auctionlotwatch.co.uk/auctions.html>.

the main title that appears for each item in the search page once a buyer has selected a category, the price and the description.

Like the façade of a shop or a newspaper headline, the title is your first hard sell; a good title will propel an item up the listings in a search and draw a potential buyer's eye to it in the list. In PCW's search for a vase, we found 'pretty little vase', 'brown vase' and the slightly more helpful 'Ltd edition Chokin plate from 1983 & small Chokin vase'. The latter indicates at a single stroke three pieces of information that distinguish it from the crowd and highlight it to a potential collector.

Given the vast array of items sold on Ebay, we can't give concrete guidance on what to include in the main title, but consider adding brand names, model numbers, year of build, names by which an item is popularly known (as opposed to its rightful name), size, weight and pattern. You have 31 characters to work with – use them well. For more impact, consider paying an extra 35p to add a 55-word subtitle.

Buyers also have the option to search for items by category and description, so that the text used to describe the item in detail is referenced. A random search through Ebay listings will establish that not everyone is a gifted writer; there's no need to be and in fact many people make the mistake of trying too hard. We say keep it simple.

Write the description in a word processor before even starting the listing process on Ebay. Say what it is, describe its appearance, be clear about any flaws or blemishes (as you are required to under the Sale of Goods Act). But go further and state, depending on what's appropriate for the item, what the item could be used for, how a buyer might benefit from owning this specific item. Don't reach for the thesaurus or spend hours composing purple prose. Be straight and to the point. Always use the spelling and grammar tools and, wherever possible, ask someone else to read the description to ensure it makes sense. Badly composed listings full of errors give the appearance of an amateur and fail to inspire confidence.

Many items benefit from a second opinion, and online reviews give you a way to link from a listing to an independent

Ebay reviews of CDs and DVDs are useful to buyers and sellers

The screenshot shows the eBay 'Reviews & Guides' section. At the top, there are tabs for 'Reviews' and 'Guides'. The 'Reviews' section features a large image of a movie ticket and text: 'See comments and ratings for movies, CDs, and other specific products - all written by eBay's members. [Learn more](#)'. Below this, there's a question: 'Do you have experience with a product that you would like to share with others? Find an item and [write a review](#)'. The 'Guides' section features a large image of a notepad and text: 'Research products and learn about all kinds of topics. Get the information you need — including shopping advice from eBay. [Learn more](#)'. Below this, there's a question: 'Are you an expert, collector, or just a member with some helpful information to share? [Write a guide](#) and share your knowledge.' At the bottom, there are sections for 'eBay Guides' (with a 'See all...' link) and 'Computers & Networking Buying Guide' (by eBay, with a link to the guide). There are also sections for 'CDs' and 'DVDs', showing top-selling products like 'Harry Potter And The Goblet Of Fire' and 'Various Artists - The First Two Beatles'.

opinion. This method is useful when selling electrical items, old games, music and video.

Just include the URL in the description, stating where the link goes and when the review was written. For CDs and DVDs, Ebay offers users the opportunity to write their own reviews at <http://reviews.ebay.co.uk>, so if you're selling such an item, look there for a suitable link to include in your description.

What price profit?

One of the trickiest parts about setting up an auction is deciding where to start the bidding. Set the price too low, and you risk cutting your profit. Set it too high and potential bidders may be put off. The same applies to the use of reserve prices, with the added frustration that buyers know there is an invisible ceiling through which they must break.

Obviously we can't tell you how much to charge for an item – all we can do is stress research and a bit of market savvy. As we'll find in the section on buying, sniping tools have taken most of the guesswork out of the bidding process.

Again, turn to the competition. Check similar listings on the site and compare your item with them. Also turn to retail outlets for certain goods – what's it worth new? Then check Ebay listings and build a picture of how age, condition and rarity are reflected in starting prices, current bids and auctions that have recently ended (see http://pages.ebay.co.uk/help/buy/view_listings.html for details on how to search by these criteria).

Remember above all that while many people come to Ebay for a bargain, they also are often seeking items that are difficult to find elsewhere. If your item falls in that category, check specialist dealer websites or magazines to get a clearer idea of value. If you have a strong idea of the value of an expensive item, don't be afraid to set it.

Below: Turbo Lister provides an HTML editkit for easy formatting of listings

slightly high and watch the auction fail. You lose the insertion fee but with those levelling out at £3, it might be worth a punt to learn about your prospective market.

Looks count

When searching through listings, take account of presentation. Ebay permits traders to add HTML coding so text can be enlarged, centred, coloured and so forth. The site also provides the Listing Designer that applies a themed style to a listing, with graphics added to borders.

But why do it the hard way? Ebay provides a free tool called Turbo Lister that includes templates and an HTML editing kit that means you don't have to fiddle about with code. Get Turbo Lister at http://pages.ebay.co.uk/turbo_lister.

We recommend you use the Turbo Lister web setup utility that searches your hard disk for components of the tool that you have already used, such as the image uploading utility and then downloads the remaining files.

Once the download is complete, the installation wizard will prompt you to enter your Ebay username and password, and will access your account details from the main site over an encrypted link.

All that Turbo Lister does is to streamline the array of options available to sellers in successive steps, but it does a good job of it. The beauty is that it draws your

attention to useful options that can be missed in the morass of information, dropdown menus and hyperlinks that have been added to the standard Ebay selling areas as the site has added more features. Listings can be created while offline and then uploaded (a boon for dial-up users), which enables you to take your time and be a bit more objective about the description and presentation.

You can set templates for postage and insurance terms, edit listings in bulk if a detail changes, and easily navigate current and previous transactions. Occasional users will benefit from the simple interface while those who want to make a business of selling through Ebay can organise their business using folders to group inventory and set defaults for their Ebay store.

An in-depth tour of its features is available in a pdf at www.pcw.co.uk/2154942. The options activated using Turbo Lister attract the usual Ebay fees.

Pictures can sell an item on their own – or they can be a deal breaker. The main picture on a listing is free, so add one, but don't use pictures from other websites because you don't own the copyright. See our tips on taking an effective photograph in the box on page 44.

Adding extra images costs 12p apiece and there are few items that fail to benefit from being clearly displayed from a few angles. But there's no need to pay the extra fees if

Left: Turbo Lister streamlines the options from the standard Ebay listing tool and makes it easier to see what's going on

Below: Use links to external reviews to give potential buyers independent views on your item

you have some webspace. Include a link to a website, or photo sharing service such as Photobox or Picasa, to the fields provided under Add Pictures and Gallery – also available in Turbo Lister.

A pleasure doing business

Once an auction is live, potential bidders often have questions of their own, which are emailed to you via a web form link on the listing. Good sellers let buyers know when to expect a response, so if you only check your mail during the week, state this in your description. Regular users should include this information as part of a template using Turbo Lister, or in the 'About me' page.

Closing an auction is simple, but PCW's postbag has revealed a flaw that leaves sellers in a vulnerable position. It concerns postage and insurance and it's simple to avoid if you prepare the listing properly. The sad fact is that packages go missing in the post with alarming regularity. Sellers with no proof of delivery find themselves without a leg to stand on when the buyer complains to Ebay or Paypal and can have their profile suspended or Paypal account debited.

Proof of posting is not sufficient, and given the amount of complaints we've fielded on this matter our advice is to make insured signed-for delivery a condition of sale. If a winning bidder says they won't pay for a signature-recorded delivery service, they have breached the terms and you can cancel the auction, but be sure to inform Ebay.

There are other times when auctions can be closed early, but the rules are strict and apply in situations where typos result in incorrect starting prices or where items are no longer available: a full list of conditions is available at <http://pages.ebay.co.uk/help/sell/questions/endlist-now.html>.

Our final tip for sellers regarding the end of a sale is to pack your items carefully. All goods become fragile if badly packed, and dealing with the fallout of a damaged item is avoidable. If you sell a high volume of goods, consider a mail fulfilment service; search for local companies at www.ukauctionhelp.co.uk.

If you can't find what you're looking for, use 'Want it now' to let potential sellers know

The screenshot shows the 'Want It Now' website interface. The top navigation bar includes 'Want It Now', 'Buyers', 'Sellers', and 'It's Free'. The 'Buyers' section features a 'Post To Want It Now' button and a 'Tip: You can view all your posts in My eBay'. The 'Sellers' section includes a 'Search Want It Now' input field and a dropdown menu for 'All Categories'. Below these are sections for 'Browse Want It Now' with categories like Antiques & Art, Baby, Books, Comics & Magazines, Business, Office & Industrial, Clothes, Shoes & Accessories, Coins, Collectables, Computing, Consumer Electronics, Crafts, DVDs & Film & TV, Everything Else, Health & Beauty, Home & Garden, Jewellery & Watches, Mobile & Home Phones, Music, Musical Instruments, PC & Video Gaming, and Photography. The 'Sellers' section also includes a link to 'Address: http://wantitnow.listings.ebay.co.uk/_WQQSeCategory214675'.

Dispute resolution

A significant number of disputes arise because of poor communication, which can be characterised as much by aggression as by a lack of contact. Give the other party a couple of days to respond to your complaint and set it out in calm terms that state the facts of the case. Don't dive straight into leaving negative feedback, and head instead for Ebay's guidelines on solving disputes at <http://tinyurl.com/kljgm>.

The screenshot shows the 'Solve Problems with Online Dispute Resolution (ODR)' section of the eBay Square Trade website. It features a 'File a Case' button with the text 'FREE to file' and 'Takes only 5 minutes!', and a 'Withdraw Feedback' button. Other links include 'Login to ...> My Cases', 'How to ...> Withdraw Feedback', and 'Help for New Users'.

If no satisfactory response is forthcoming, first open an automatic dispute form at <http://tinyurl.com/56rn6>. You will need to complete these formal stages before Ebay will accept a claim under its standard buyer protection programme. If the dispute remains, consider using an alternative dispute resolution scheme – Ebay is affiliated to one called Square Trade, which offers free online discussion.

Dispute resolution will not help if you are the victim of a crook and, as we stated at the beginning of this article, Ebay will not be held responsible. The best advice is to contact your local police, but don't be surprised if they offer little hope if the other party is not within the UK.

Mediation is available through the Ebay-approved Square Trade service, but you may have to pay

BUYING ON EBAY

The rise of bidding (or 'sniping') tools, has automated what for some used to be the fun part of using the site. Be that as it may, this part of the feature is about how to land a bargain so a discussion of snipers is inevitable.

As we found in the selling section, using the ordinary search window on Ebay is a lottery. As with all search technology, the more criteria you provide, the more exact matches the search will return. So first off, be as specific as possible.

Why say 'notebook computer' when you mean 'notebook PC 80GB hard disk 1.8GHz'? Experiment with combinations of terms and note the variations that sellers are using when you find suitable items.

Some guides advise that you navigate through categories in a logical order. Go ahead, if you have the patience. However, like all search engines, Ebay's is sensitive to specific characters. Adding or subtracting a final 's' from your search term to signify plural or singular will yield different results.

To search through titles and the text descriptions for key words, click the Buy link at the top of the home page and then place a tick in the box labelled 'Search title and description'.

This will find lots more matching items if they are available; too many to manage in some cases, so add search commands to further filter your results.

Regular users of Google will be familiar with the concept and a full list and Ebay's description of search commands is available at <http://tinyurl.com/jr7qj>.

A few final points on searching: beware of using redundant words such as 'the' in a search unless the item's name specifically contains that term, as Ebay does not exclude such terms. It will actively seek out every reference, which will leave you with an unmanageable list of results.

Searching can be a passive experience, as Ebay provides a 'wish list' function for those seeking really hard-to-find items such as collectables. Specialist sellers can browse the list (Want it now) at (<http://pages.ebay.co.uk/wantitnow/index.html>) by category.

Snipers

Bidding or sniping tools are a logical extension of Ebay's own proxy bidding tool, which automatically bids on your behalf up to your preset upper limit for the item. While Ebay's proxy bidding facility increases your bid, the moment another bidder enters the fray, snipers enter your lowest bid until the final moments. The idea is to keep bidding action to a minimum, thereby keeping the final price low.

There are two types of sniper: PC-based clients requiring the PC and Internet connection to be active as the auction approaches its end; and web-based tools that go ahead without your involvement. Some, such as Onbidder (see www.pcw.co.uk/2148675 for a review) offer the ability to bid on a number of similar items simultaneously and then stop bidding when one is won.

Snipers can't guarantee a win; if your upper limit is surpassed the game is up, but they can be effective. Some require a subscription, others a one-off fee to use. The many free bidding tools available online bring with them adware, spyware and the risk of identity theft – we recommend you avoid them.

Or nearest offer

Not all items sell via auction, particularly where a reserve price has been set. The 'Best offer' facility enables sellers to give buyers the ability to haggle and it's increasingly used by Ebay merchants with ageing or end-of-line stock.

On the search results page, click the 'Buy it now' tab at the top to show only Buy it now listings. Since not all Buy it now items have a Best Offer option, you will need to view each item and see if the option is offered by sellers. Attempting to offer a price for an item that doesn't display the Best offer icon is a breach of Ebay's terms and could lead to a suspended or cancelled profile. Best offer bids are valid for 48 hours and you must complete the transaction if the seller agrees.

Read Ebay's guide at
<http://pages.ebay.co.uk/help/buy/best-offer.html>.

Try a bit of old-fashioned haggling if a seller displays a Best offer icon

Ebay shops provide a useful way to track down hard-to-find items

Auctions aren't everything on Ebay, and it's often worth having a look at Ebay's shops. Go to <http://stores.ebay.co.uk> and look for items using the search window or directory on the left of the page. Click a trader's name and their entire Ebay inventory is displayed, some in auction format but most are usually offered with Buy it now and Best offer facilities.

Ebay's brass attracts the muck of the criminal world, so use the means at your disposal to check out sellers. On the right-hand side of each listing is a section containing links to that seller's history, including details of positive, negative and neutral feedback. Note that negative feedback is not a sure sign that a seller is disreputable. Check out the seller's response to neutral or negative feedback and view such comments in the wider context of their feedback.

Never pay using cash or money transfer services, and note if you buy from sellers outside the UK, you have little redress available if something goes wrong other than leaving negative feedback. Also avoid any user who tries to persuade you to trade outside of the usual processes.

If goods fail to appear or are different than advertised, and you have paid using Paypal, two forms of compensation are available. Sellers that have achieved a specified trading reputation with Paypal are granted Paypal Buyer Protection status, indicated by an icon featuring a blue tick on a white shield. This offers buyers the safety net of £500 against qualified sellers if claims are made within 45 days. Most other listings qualify for Ebay's standard protection of £120, minus a £15 fee, for claims made against sellers within 90 days (see box on page 47).

Account security is also important, and we recommend using the Ebay Toolbar. It's a free download that sits in a browser window and displays a red alert icon if the browser visits a non-verified Ebay or Paypal site. It also has a System Tray icon for quick access to alerts and your My Ebay page.

Ebay has become an online behemoth, but it can be tamed with the right tools. Don't be discouraged at the size of the market as a buyer or seller, for with the right tools and approach you can nail that sale or purchase. **PCW**



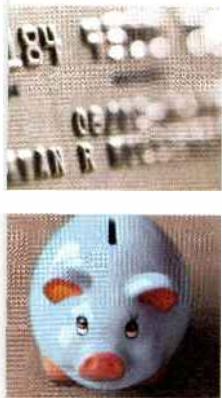
Useful information

Ebay links

- Ebay Safety Centre
<http://pages.ebay.co.uk/safetycentre/index.html>
- Ebay Help Centre
<http://pages.ebay.co.uk/help/index.html>
- Dispute resolution – the easy way
<http://tinyurl.com/56rn6>
- Ebay serious dispute resolution
<http://tinyurl.com/mz96b>
- How to change user ID
<http://tinyurl.com/fgwp4>
- Guide to Ebay fees
<http://pages.ebay.co.uk/help/sell/fees.html>
- HTML examples for Ebay listings
<http://tinyurl.com/45f3e>
- Setting up an 'About me' profile
<http://pages.ebay.co.uk/help/account/about-me.html>
- Using images effectively
<http://tinyurl.com/s2l69>
- Download Turbo Lister
http://pages.ebay.co.uk/turbo_lister
- Download Ebay Toolbar
http://pages.ebay.co.uk/ebay_toolbar
- Selling Manager overview
http://pages.ebay.co.uk/selling_manager
- Restricted items
<http://tinyurl.com/lpm6>
- Paypal protection for buyers
<http://tinyurl.com/oe9a9>
- Paypal protection for sellers
<http://tinyurl.com/6qmou>
- Ebay-recommended Escrow agents
<http://pages.ebay.co.uk/help/buy/intl-risk.html>

Miscellaneous advice and guides

- Auction Help
www.ukauctionhelp.co.uk
- Auction Software Review
www.auctionsoftwarereview.com
- Practical selling advice
www.samizdat.com/ebay.html



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Weekend project: Build a hifi-style PC

You'll find it easy and quick to build a PC that fits in with your hifi setup, adding a touch of class to your living room. Oliver Jendro explains what you need and offers tips on how to save money on components, to transform an old amplifier or CD player into a stylish PC

Here's a real challenge: build a PC stylish enough for your living room that effortlessly records videos, plays music and yet doesn't run into difficulties when running the latest 3D games. It should all look as classy as possible, have the ability to be operated with a remote control and match your hifi components.

It doesn't, at first, sound possible – at least it's not a project you'd think could be done cheaply. However, it can be done and we'll show you how, by building a home-made unit which anyone can copy in a couple of days with a bit of effort and some simple tools.

The motherboard

Because there's not much space in the amplifier housing, a small motherboard using the micro-ATX format is a good idea. We've chosen the Asus A8N-VM CSM Nforce 430-based Athlon board. It's well featured and has good passive cooling features. £58, www.komplett.co.uk

Sound & TV

The onboard sound chip will do for basic sound, but a good soundcard will raise your PC to the same level as a reasonable hifi. Worth considering is the new Soundblaster card, the Creative X-Fi Extreme Music. It offers good output quality, comprehensive spatial effects and good connectivity for surround systems. £75.54, www.scan.co.uk

If you want to build in TV reception, the best bet is the ATI All-in-Wonder graphics card. There are versions with various chips – from basic models to top-of-the-range 3D cards. The advantage of ATI's All-in-Wonder is that everything is on a single circuit board – TV receiver and graphics accelerator, so that it only requires one PCI Express slot, an important factor if space is tight.

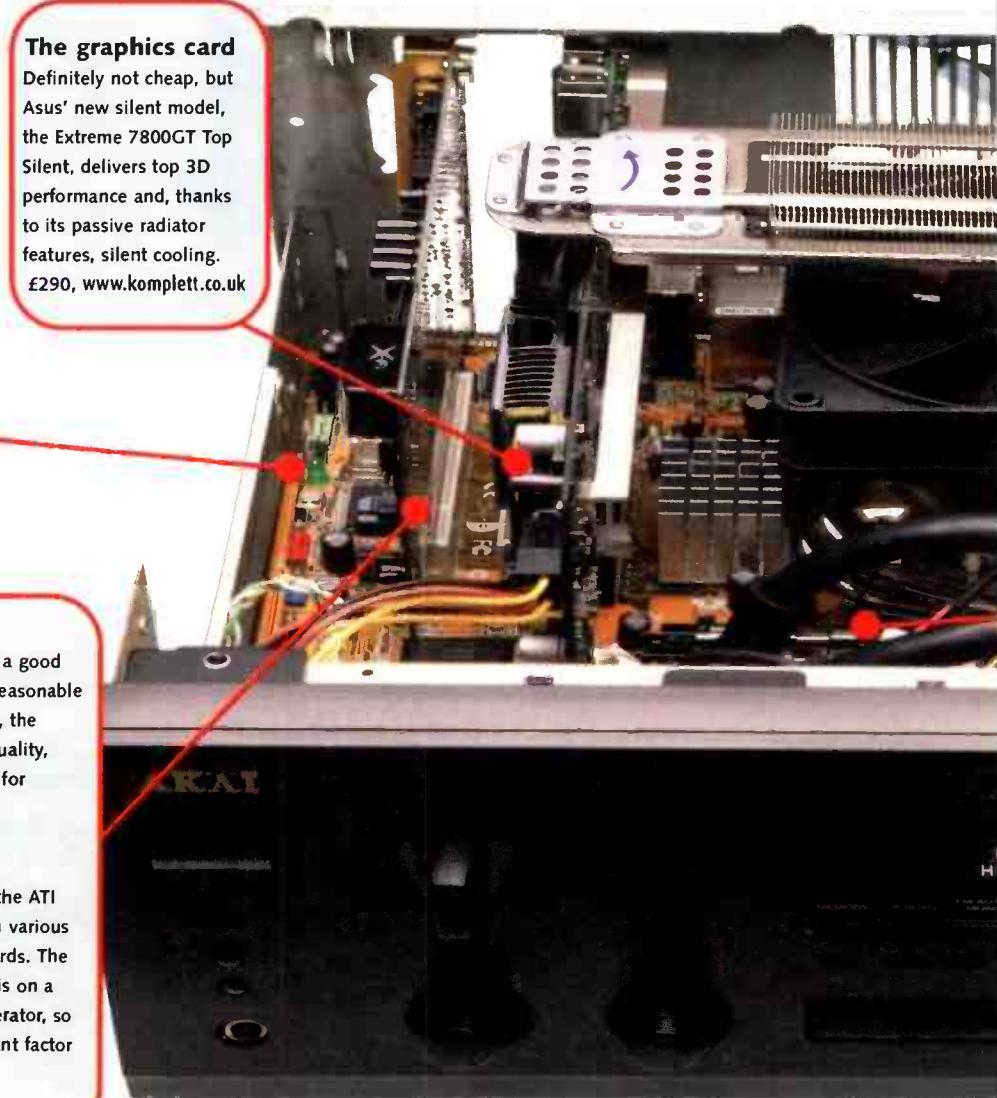
From £134 (AIW X800GT), www.scan.co.uk

We'll be making use of off-the-shelf components and some of the stuff which often ends up cluttering up your attic or junk cupboard: outdated hifi components, such as amplifiers, receivers, cassette and CD players. These latter items can make an elegant shell

for your classy computer. Of course, if you prefer you can buy a brand new hifi-style case. Manufacturers such as Silverstone have had aluminium-finish PC cases in their product range for years, but they are not exactly cheap – a decent model will set you

The graphics card

Definitely not cheap, but Asus' new silent model, the Extreme 7800GT Top Silent, delivers top 3D performance and, thanks to its passive radiator features, silent cooling. £290, www.komplett.co.uk



back at least £70. If you really want one that looks like a bit of hifi kit, such as the Dign HTPC Media Case HV 7 (<http://www.specialtech.co.uk/spshop/customer/home.php?cat=162>), then you'll have to fork out close to £200.

These cases are designed for computer use and do have all the necessary fittings, holes and certifications, but they are not as well made as high-end stereo components. Older amplifiers and receivers made in the 1970s and 1980s stand out with their solid frontplates, better workmanship and – importantly – aluminium cooling elements for optional passive cooling. They also have that much sought-after retro look.

Cheap hifi cases from Ebay

If you don't have any old hifi gear handy, then you can easily buy some from an auction on Ebay, where non-working kit can be found very cheaply. But here's a tip: don't bother with the well-known big name brands. Even if the output stage is burnt out,

Tools you'll need

Screwdriver to fasten the components
Dremel craft tool or equivalent for cutting and smoothing the edges of the casing
Soldering iron to release cable connections
Solder to solder the display and switch wiring
Electric drill for drilling the screw holes

amplifiers from the likes of Marantz, Revox, Onkyo, Sony or Denon often cost more than £100. It's much cheaper to go for one of the brands hifi purists turn their noses up at, like Akai, Fisher, Sherwood or Sanyo. You shouldn't have to pay more than £20 including shipping for one of these. For more advice on buying from Ebay, see our cover feature on page 43.

When buying, make sure that the casing is at least 15cm high. It's a good idea to use search terms like 'receiver', as these devices

are normally a bit taller than conventional amplifiers. Words such as 'large' usually yield good results for self-build enthusiasts as sellers often use that term to describe older, more robust kit.

The condition of the casing is also important. Check the photos of the item being auctioned and check that its condition is described as good. It's a good idea to ask follow-up questions as items being sold often have cosmetic damage which cannot be seen on the photos.

Heat build-up

Putting high-performance components into a small hifi casing has its problems. There's a good reason for putting gaming PCs into full tower cases – the bigger the casing, the easier it is to cool the components. CPUs and graphics cards together can push out almost as much heat as an electric cooker hob plate. To protect the main processor from emergency shutdown as a result of excessive heat, elaborate cooling systems

The CPU cooler

Massively powerful, but quiet. The Ichbinleise Cooler 1216 R uses a 120mm EMB-Papst fan to deliver whisper-quiet cooling. Even running demanding 3D games the fan's noise level is kept below 34dBA.
 €89.90 (about £62), www.ichbinleise.de/index.php?language=en

The power unit

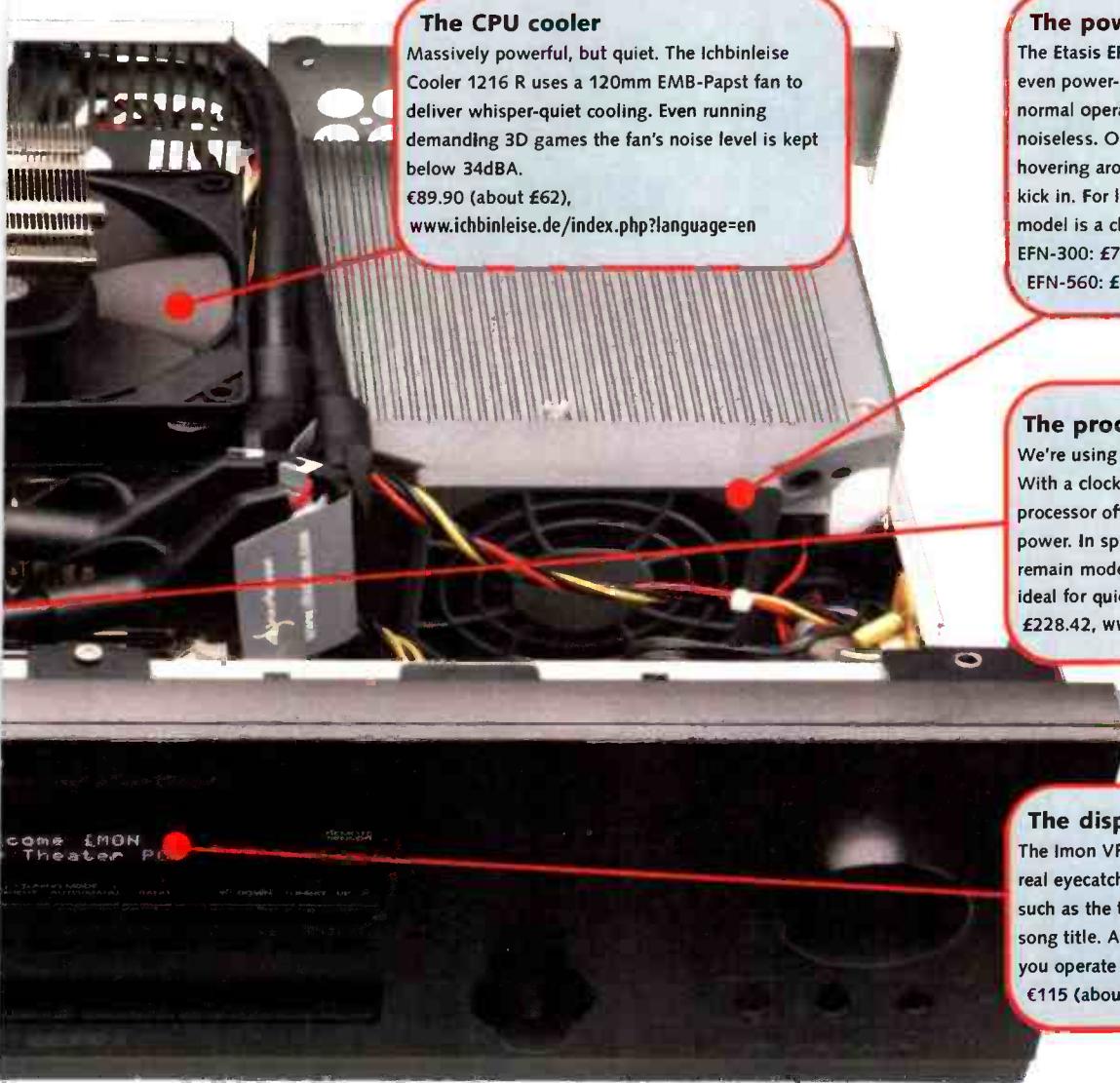
The Etais EFN-560 power supply unit keeps even power-hungry components well fed and in normal operation is, thanks to the heatpipe, noiseless. Only when the core temperature is hovering around 70°C does the 560w unit's fan kick in. For lesser power demands, the EFN-300 model is a cheaper alternative.
 EFN-300: £74.01, www.scan.co.uk
 EFN-560: £90, www.ebay.co.uk

The processor

We're using an AMD Athlon 64 4000+ CPU. With a clock speed of 2.4GHz this single-core processor offers more than enough processing power. In spite of this its power requirements remain moderate, below 85w, and it's therefore ideal for quiet high-end systems.
 £228.42, www.scan.co.uk

The display

The Imon VFD display kit for home theatre is a real eyecatcher. It shows current information such as the temperature, fan speed or the MP3 song title. An IR interface and remote control let you operate the PC from your sofa.
 £115 (about £80) www.ichbinleise.de



Alternative CPUs

If you can find a motherboard such as the upcoming Gigabyte GA-8I945GTMF-Y-RH micro-ATX model, then the new Intel dual-core mobile processor is potentially a fast alternative to the AMD Athlon 64 4000+ for our living-room PC.

The price for the Core Duo T2600 2.16GHz is almost £500, while the 2GHz T2500 is around £330, although a suitable motherboard will cost you more than £100. Less powerful processors such as the Pentium M do not offer enough performance for our needs and in addition, suitable motherboards are too expensive at around £100.

are needed. These have to remove the heat as quickly and quietly as possible.

In practice this means large fans which rotate slowly and blow a lot of air over solid cooling ribs. The radiators have now become so big that they can weigh over half a kilo – although both Intel's and AMD's

specifications for CPU coolers lay down 450g as a maximum. The Zalman CNPS7700Cu copper CPU cooler, popular with silent PC fans, weighs 950g.

There are lighter alternatives, such as the one we used in our system, the Thermalright XP-120 which tips the scales at 350g, thanks to a clever mixture of a copper socket and aluminium radiators. Despite its light weight the XP-120's cooling power is at the same level as the 1kg CPU coolers in towers. The light weight and a height of just 95mm including the fan make this an ideal unit for hi-fi and desktop cases.

Another advantage of the XP-120 is that it is very easy to fit as its construction means it does not get in the way of any protruding motherboard components. The heat is fed straight from the CPU via five heatpipes to the large aluminium vanes. A 120mm diameter silent fan is placed on top. A better fan can be fitted separately later; for example the Noisblocker SX1, which costs about £12.

We decided to use a preconfigured fan system, the Ichibinleise Cooler 1216 R. In normal operation inside a hifi casing the fan reaches a noise level of just 29dBA.

'We used the fastest passively cooled graphics card on the market'

Passive or active cooling?

Cooling systems with no fans at all can only be recommended in certain situations, as the graphics card, processor and motherboard can all get very hot. Tests in our labs show that in a system with passive cooling only and no fan, temperatures of nearly 180°C can arise on the motherboard. For this reason, the motherboard should always be supplied with cool air.

A good CPU fan is usually enough if the motherboard itself is fitted with passive cooling elements. For living-room PCs motherboards with integrated fans are not really suitable, because their high speed (about 2,500rpm) makes the mini-fans too noisy.

Hot 3D

Until now, standard 3D graphics cards such as those in the Nvidia or ATI

How to build your hifi-style PC

STEP 1



1 Cleared out: Remove all the internal workings from the amplifier case and fix the motherboard mountings in place. A thin piece of foam sheet is used to prevent short circuits under the board.

2 First in: The micro-ATX motherboard is fitted tight to the right edge to leave room for the power supply unit.

3 CPU and fan: Because of the space required, the CPU and fan assembly should be fitted first.

STEP 2



STEP 3



reference designs have been unsuitable for use in a quiet environment as they are usually only made with noisy, undersized, cheap fans.

To get the best possible 3D performance in our quiet living-room PC, we used the passively cooled Asus EN7800GT, which is at present the fastest passively cooled graphics card on the market.

The card uses Nvidia's 7800GT chip which is factory-tuned and uses a 420MHz core with a memory speed of 620MHz (400/500MHz are normal). This means that the Asus is already overclocked when sold – with a full three-year warranty. Normally, if you overclock a card it immediately invalidates the warranty.

A movable cooling radiator element is linked to the socket with a heatpipe. The hinged cooling construction is designed to be adjusted so that it sits above the CPU fan, which then sucks the air from the graphics card heatpipe: this can have a temperature of up to 70°C.

The CPU fan has to work hard so that the aluminium cooling element can dissipate enough heat, or when the temperature

'Using practical skill and the right tools, it's easy to build a living-room PC'

reaches 105°C the graphics card will throttle back and become noticeably slower.

Casing fans ensure cooling

A switch-controlled extra fan in the right place will allow the card to be cooled even more if need be. This lets it run at full power – its performance level is 10 per cent above that of a conventional 7800GT which means that passive cooling and top performance can go together. If the machine is not being used for gaming, the fan can simply be turned off. The large CPU fan provides enough cool air when the computer's in normal use.

However, the EN7800GT Top Silent used in our living-room PC is taller than a standard amplifier case (15cm). This means that you won't be able to avoid having to make a suitably sized opening in the top of the casing, so that everything fits inside. If you don't want to do this, use a standard

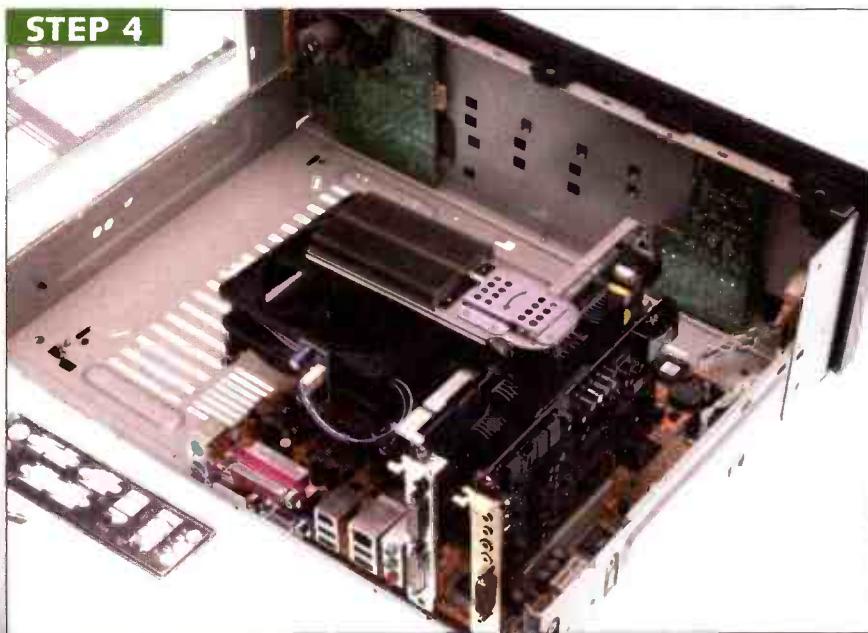
graphics card instead and swap the active graphics card cooler for one of the special models from Arctic Cooling (www.arctic-cooling.com). The Silencer VGA cooler range is available for most popular ATI and Nvidia models and installation is straightforward. This quiet cooling system costs around £19 and has a maximum noise level of 36dBA.

If you don't want to do any modification work, take a look at the Asus or HIS graphics cards. Some of these cards come with the powerful, but quiet, Arctic Cooling fan. But a word of caution: graphics cards with this fan require a lot of space and usually block the PCI slot next to the PCI Express slot.

If you don't need top 3D speed, then you can do without an external graphics card altogether: the onboard Nvidia graphics chip, which is passively cooled, is adequate for video playback and DVD encoding.

The whole point of our living-room PC is that just about anyone can build one without much outlay over and above a normal PC. For the actual work, you only need some simple tools – a soldering iron, a screwdriver and a miniature electric rotary tool (Dremel or similar). The amount of work involved is

STEP 4



4 Cards: Insert the graphics and soundcards and position the graphic card's heatpipe (if you're using the Asus silent model) over the CPU fan. You might need to cut a hole in the top of the case to accept this cooler.

STEP 5



STEP 6



5 Rear panel: The rear panel with suitable holes cut out for the I/O and expansion backplates is screwed into place.

6 Power: The fanless power supply unit is the last component to be fitted inside the case.

7 Drive cables: In this variation, the cables for the hard disk and DVD drive are routed through the backplate to attach to an external enclosure.

STEP 7



BUILD A LIVING-ROOM PC

reasonable; it shouldn't take you more than a weekend, as long as you have all the parts to hand.

And the added beauty of this project is that you can make whatever modifications to our basic plan that you fancy – the only limit is your ingenuity.

How to build your living room PC

Using a little practical skill and the right tools, it's easy to build your own living-room PC. With a soldering iron and some basic knowledge of electronics, you can even rewire the switches on the amplifier/receiver's front panel – for example to control the fan and Windows function keys.

If you just want to build a simple living room PC, then a normal CD player case should be fine. There's enough space inside for an ATX board, disk drives and a micro-ATX power supply.

The first step is to remove the innards from the amplifier. Most older amplifiers, whatever the brand, are well constructed and screwed together. Apart from the circuit boards that control the switches and rotary controls, everything can be removed with a screwdriver. Removing the circuit boards is a little more fiddly as the assorted cables and the knobs have to be desoldered. The whole front panel should be kept, as the only part that will be discarded is the original display, which will be replaced with a programmable one so that it can show information such as the case and CPU temperatures or audio and video track titles.

The next step is to fix the new components into place, but if

possible before starting just place everything loosely in the housing to check that it all fits. A standard amplifier case will comfortably hold a micro-ATX motherboard, a power supply, graphics card and a hard disk. After measuring the space requirements, you'll have to cut the back panel so that the motherboard connectors can be faced outwards. This can be easily done in an hour or so using a Dremel (www.dremel-europe.com) or similar tool.

The next step is to mount the motherboard. You'll need to drill holes in the baseplate so that you can screw the motherboard to the amplifier casing. The baseplate won't be flat so you'll need some packing, for example pieces of small PVC tubing or, better still, the small brass mounting pillars from an old PC.

Outboard drives

As soon as the motherboard, CPU fan and power supply unit are in the case, it's the

The CD player

The hard disk and DVD burner are mounted in an old hifi CD player casing which matches the amplifier. The hard disk is placed in a silencer box to quieten it, and the DVD burner is installed as a replacement for the hifi's CD drive. Connecting cables run out via the back panel to the main unit.

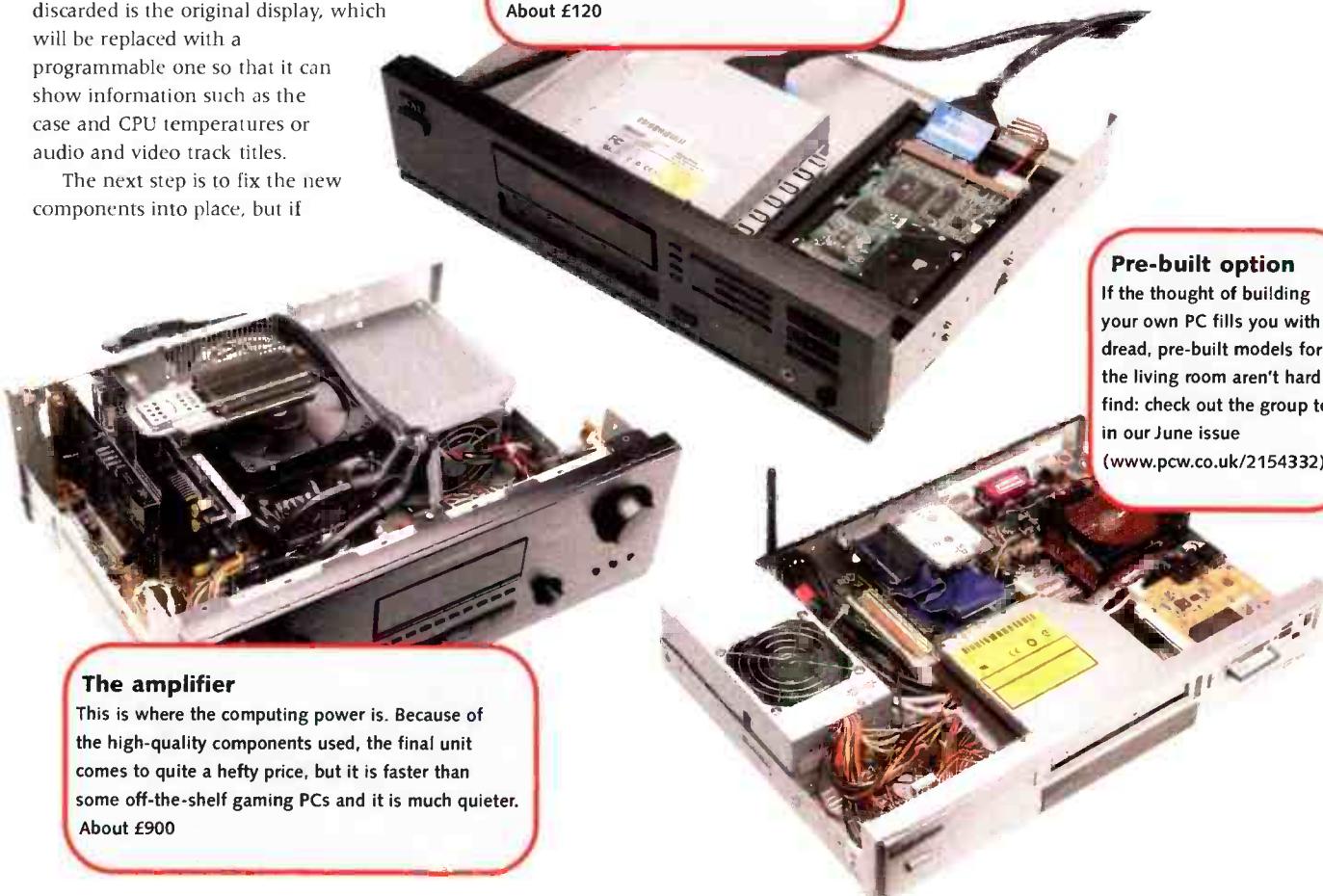
About £120

turn of the hard disk and the DVD drive. There are two ways to go about this. The simplest variant is to fit a small notebook hard disk inside the amplifier case. There should be enough space between the motherboard and the front of the case.

The DVD drive can be fitted externally – for example using a USB2 model. Instead of front USB ports you can use an external card reader with an integrated three-port USB hub.

We decided to go for a more elegant variant and put all the drives inside a separate CD player case (pictured below). The hifi CD player is replaced by a DVD burner; the front cover from the CD player's drawer is fixed to the DVD drive's front using model-making polystyrene adhesive.

The hard disk is a 250GB Samsung Spinpoint V120CE (www.komplett.co.uk, £68) which is pleasantly quiet. For additional noise insulation we placed the hard disk in a sound-reducing case, the Silentmaxx Aluminium HD-Silencer (www.quietpc.com, £37.61). The power supply and IDE connection cables were routed via the rear of the amplifier casing – standard cables should be just about long enough depending on where you want to place the CD player, although if needed you can buy extra-long (1m) flat IDE cables from Maplin (£5.99, www.maplin.co.uk), or 90cm round ones from Aria PC (£2.35, www.aria.co.uk). PCW



The amplifier

This is where the computing power is. Because of the high-quality components used, the final unit comes to quite a hefty price, but it is faster than some off-the-shelf gaming PCs and it is much quieter.

About £900

Pre-built option

If the thought of building your own PC fills you with dread, pre-built models for the living room aren't hard to find: check out the group test in our June issue (www.pcw.co.uk/2154332).



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Microsoft
**Windows
Server System**

Welcome to the webtop

Imagine being able to access everyday applications and data any time, anywhere via the Internet. Dave Howell explains how revolutionary Web 2.0 technologies are gathering pace and why Microsoft could be fighting a battle to stay on top in the software market



Wouldn't it be great if you never had to install another piece of software? Or how about being able to avoid upgrading your favourite applications every time a new version is released? What if you could access all the software you want to use with nothing more than an Internet connection and your trusty web browser? Well, you can – almost – with a new breed of applications that are discarding the Windows desktop in favour of an Internet-based platform that can be delivered to any user, anywhere, anytime.

Life online

The web is changing. New technologies that are often dubbed Web 2.0 are being developed rapidly. Users are embracing blindingly quick Internet connections that are becoming ubiquitous, and asking why they can't use the applications they rely on every day as easily as their favourite websites. Desktop application developers and

the new start-up companies that are embracing the 'webtop' will soon go head-to-head, to win the hearts and wallets of users who are becoming increasingly frustrated with desktop-bound applications.

Old-guard developers such as Microsoft and Adobe will have to look at their business models and modify them, so the webtop becomes more central to their products' functionality and relevance to users. However, there is a shark circling these leviathans. The great white Google with its massive user base and inherent evolution on the Internet could steal more than just market share. What would your computing world look like if there was a Google operating system (OS), for instance?

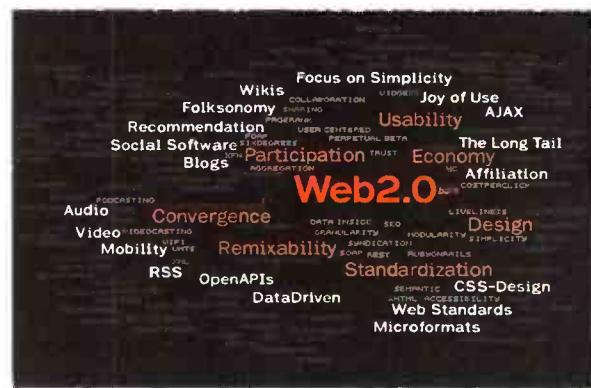
This memo map clearly illustrates how the Web 2.0 paradigm has evolved from a diverse range of elements

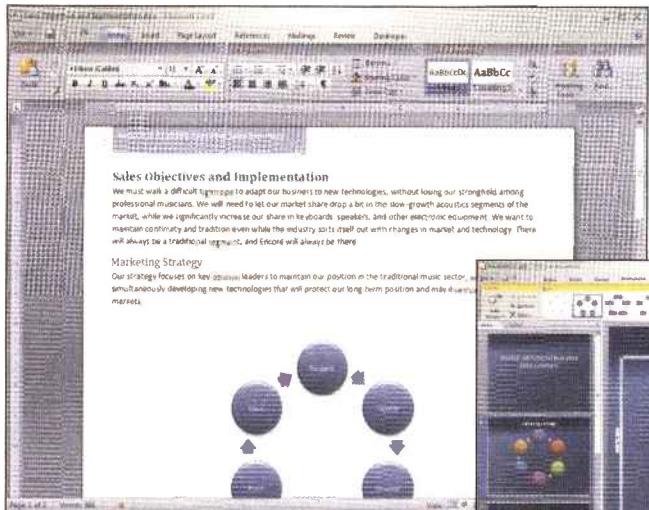
Google has had its chequebook out recently and snapped up Writely, the online word processor. This purchase fits well with the company's online business model. And with advances such as Gmail, who needs Outlook? Add a few more applications to its shopping list and the idea of a web-based OS doesn't seem too far fetched.

Now broadband access is almost ubiquitous, the desire to make even more use of this massive data pipe attached to people's homes is encouraging developers to come up with more than just new desktop applications. The massive take-up of the Firefox browser, the demand for more computing power on the move, plus the need to access and use heavyweight applications such as word processors from any location, has ignited a new paradigm that has no time for the foibles of a desktop-bound operating system.

Wide open web

So what are these new applications, and what can they do for you that your trusty group of desktop applications can't? Think about your last computing session. Chances are you used your word processor, maybe did some accounts, made a few notes about the things you need to do this weekend, sent some emails and checked your calendar for any appointments you have to keep. All these tasks required you to start a variety of





applications that rely on the operating system you're running.

Life on the webtop is somewhat different. New web-based applications are challenging the foundation of desktop applications. Flickr (www.flickr.com) takes photo storage and blogging to new levels. Box (www.box.net) enables you to store your digital files online and reach them any time you like.

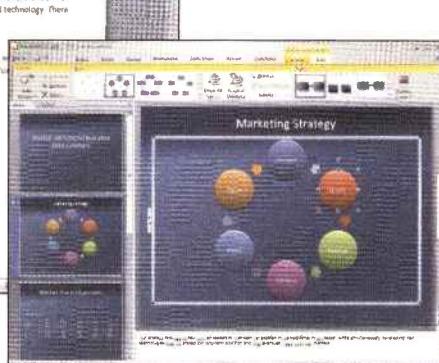
Writely (www.writely.com) is, in effect, a full-featured word processor you access via your browser, and is now part of Google's empire. Think Windows Wordpad that you access via an ordinary Internet browser and you'll understand what Writely is offering. You could also try Ajaxwrite (www.ajaxwrite.com) or Zohowriter (www.zohowriter.com).

Backpackit (www.backpackit.com), Basecamp (www.basecamphq.com), Writeboard (www.writeboard.com) and Ta-da List (www.tadalist.com) all come from one innovative company that is placing a number of desktop utilities online.

Kiko (www.kiko.com) is an online calendar application. If you use Hotmail, for instance, and want an Outlook-like calendar, Kiko offers just this feature. Protopage (www.protopage.com) gives you a web page that can contain a wide range of information including news feeds and links. And if you have a memory like a sieve, Rememberthemilk (www.rememberthemilk.com) is an online things-to-do application.

If you always get stuck taking notes at meetings, look at Jotspot (www.jotlive.com). And if you need to build a quick website and want to update this often, you don't need Dreamweaver or Frontpage with Edit My Site Online (www.editmysiteonline.com).

Apart from being web based, all these applications have one thing in common: they can all be updated instantly. This is a radical shift away from the traditionally long software development lifecycle. Tim O'Reilly, founder and CEO of O'Reilly Media, who is



widely credited with starting the debate about Web 2.0, stated: 'The open-source dictum, "release early and release often", has morphed into an even more radical position, "the perpetual beta", in which the product is developed in the open, with new features slipstreamed in on a monthly, weekly, or even daily basis. It's no accident that services such as Gmail, Google Maps, Flickr, del.icio.us and the like may be expected to bear a "Beta" logo for years at a time.'

Gates will have to pull off a brilliant manoeuvre to stay anything like on top'

Cal Henderson, the lead developer at Flickr, stated that it releases new builds up to every half an hour. The traditional application development cycle is being turned on its head.

It's still early days for all the Web 2.0 technologies and the companies that are developing them. But according to Clem Chambers, CEO of Internet businesses ADVFN (www.adfn.com), Microsoft had better keep an eye over its shoulder: 'Almost unbelievably, the nerd fantasy of "death to Microsoft", dreams of Apple ascendancy and the web as the platform all seem to be coming to pass. Both Google and Apple are just a version away from becoming a credible replacement for Office and Windows.'

Chambers described the threat to Microsoft. 'Office in particular looks like a dinosaur poised on the brink of a meteor strike of generic, free net-based spreadsheets and word processors. To consider Microsoft a monopoly any longer is to miss the fact that its hegemony is dead.'

Office 2007 will have a radical new interface, but can it compete with web-based applications that are being developed to take advantage of the web as an application platform?

'While Google is destined to quickly replace Microsoft as the new Bogeyman, Gates will have to pull off a most brilliant manoeuvre to stay anything like on top.'

Yet Chambers concluded: 'Real-world inertia is still well entrenched and, while the "Internet messiahs" may see this future bright and clear, it may take until Web 3.0 for the reality.'

Microsoft myopia

As applications migrate to the web, companies such as Microsoft must change. Otherwise, just as evolution breeds out those who don't adapt to the prevailing environment, the only thing it has to look forward to is a steady decline and then extinction. This certainly won't happen overnight, but if there is one thing the rapid development of the web has clearly shown, things happen very quickly online.

When Gates failed to see the significance of the web, with the might of Microsoft behind him he was able to regain ground and stake a claim on the new online market. Can he do it again? Not many would bet against him. You can see what Microsoft is thinking about for its move to more web-based applications at <http://ideas.live.com>.

But with the next version of Microsoft's operating system delayed and the changes afoot with its arch rival, Apple, where Microsoft moves next is open to debate. Its recent announcements of new applications that encroach into markets in which it has had no previous interest may suggest a desperation to hold onto its desktop-bound users. With a rash of new beta releases, Microsoft has staked a claim in these established markets. Expression Acrylic Graphic Designer competes with Adobe's Photoshop; Expression Quartz Web Designer competes with Dreamweaver 8; and Expression Sparkle Interactive Designer competes with Macromedia's Flash. Whether these applications can unseat the established



Internet Explorer is back from the dead. The latest version should embrace the changes that have taken place on the web since its last update. But can it compete? ▶

applications is yet to be seen. But if Adobe moved Photoshop, Dreamweaver and Flash to the webtop, this would leave Microsoft with little choice but to react to the changing market, where previously it had shaped it.

Microsoft, it seems, is facing a dilemma. Take its Max (www.microsoft.com/max) program. Designed as a platform for sharing photos, it competes with the Web 2.0 application Flickr, but the Microsoft application demands that users install Max on their computers, whereas Flickr can be accessed by anyone with an Internet connection. As users demand flexibility, can Microsoft continue to lock them in to desktop applications?

Office 2007 will soon be with us, sporting a new look and supposed improved usability.

'Some industry watchers are predicting that Google could develop its own OS'

As one of Microsoft's cash cows it's certain to rake in millions in update fees, but how long can applications like this continue in the face of web-based versions such as Writely?

O'Reilly concluded: 'While Microsoft has demonstrated enormous ability to learn from and ultimately beat its competition, there's no question that this time, the competition will require Microsoft (and by extension, every other existing software company) to become a deeply different kind of company.'

Native Web 2.0 companies enjoy a natural advantage, as they don't have old patterns (and corresponding business models and revenue sources) to shed.'

Google domination

Whatever Microsoft does to fend off the attack on its desktop dominance, one company that looks set to govern the web-centric world is Google. The company doesn't have the baggage of the Seattle giant, and is trading in a very different market. No matter what Microsoft does with new operating systems, or radical interfaces to its established applications such as Word, it may be too little too late.

What would happen if Google released its own version of Microsoft's Office suite? Word is a mature product, but with the resources available to Google, it might not take long for it to make Writely just as good. When the time comes to upgrade to the next version of Office, a web-based alternative such as a much-improved Writely might prove more attractive to users.

Some industry watchers are even predicting that Google could go one stage further and develop its own operating system. The consequences of this event would mean a seismic shift in the way applications are developed. Google is already building a suite of applications that includes Writely, Desktop Search, Gmail and Sidebar. If it bought companies such as Kiko, Backpackit and Box.net, it would have a suite of programs that would be tough to ignore. And if it offered these for free, integrated with Gmail and Sidebar, it would then have a framework for a new webtop office applications suite, which would be just about irresistible.

The desktop, on the other hand, has always been a complex environment to deal with. Windows XP may be the most stable OS yet developed by Microsoft, but bolt on a few dodgy pieces of shareware and that stability can quickly go right out of the window. With a web-based OS, the user would be oblivious to such concerns. The technical prowess of Google would see to it that the server you're using is always up and stable. This would banish software conflicts forever. This is, of course, just speculation, but if Google did offer an OS plus applications you could access anywhere, any time with any browser, it seems unlikely users would turn their backs and continue to install desktop applications.

Desktop for sale

So, if you wanted to move all your desktop applications to the webtop, could you do it today? The short answer is not yet. It's still early days, but these new web-based applications will develop at an astonishing

Webtop applications

Flickr

www.flickr.com

This site, perhaps more than any other, illustrates how the web and the people who use it are changing. It illustrates how content can be shared and manipulated by its users via a shifting database of images and links.



Writely

www.writely.com

If you want to see a webtop application in action right now, Writely is it. It is the first web-based application to clearly indicate the direction in which the web is evolving. It's early days yet, but expect to see all your favourite apps moving to the web soon.



Protopage

www.protopage.com

More than simply a news aggregator, Protopage gives you the ability to sample information and leave yourself notes and links to interesting information on the net. Systems like this could replace the homepages BT/Yahoo and MSN offer to their users, as they are more versatile and put the user in control.



Backpackit

www.backpackit.com

This is just one of the innovative applications from 37 Signals (www.37signals.com). Get organised with this app that New York Times technology columnist David Pogue called 'A cool organisational tool'.



Kiko

www.kiko.com

Another desktop application that has been successfully moved from the desktop to the webtop. If you use Outlook and rely on its calendar features, Kiko puts these functions online. You can then access your calendar from any browser and take advantage of its online versatility as it's not tied to your desktop.





Vista is delayed, but when it arrives it could be the last desktop operating system as we know them today

speed. The web-based applications we have now may not be as sophisticated as their desktop cousins but don't forget, unlike desktop applications that need lengthy development cycles, an application on the web can be updated daily with nothing for you to do except use the new features.

Writely may not be anywhere near Microsoft's Word yet, but keep an eye on it. One of the reasons Word is getting a radical makeover is that users were asking for features which were already present in the current version, yet they couldn't find them as the program had become too complex. Online applications such as Writely may be all you really need.

Clearly power users will stay with their tried and trusted applications. It will take nothing short of a nuclear blast to shift some users from Excel, for instance. The fact that it's a cornerstone of many businesses should ensure its long-term future, but nothing is forever. At some point an Excel killer will appear, and you can bet your shiny new dual-core PC that it will be entirely web based. Gmail has shown how a webtop application can free you from your PC's desktop. If it had more of the capabilities of Outlook 2003, would you continue to buy upgrades to Outlook?

Another development, hand-in-hand with web-based applications, is how the data each application generates is stored. After all, crunching a spreadsheet in a cybercafé somewhere is great, but not if the data you need is back on your home or office PC. The solution is to move the data your applications generate to the web, and this is precisely what is happening.

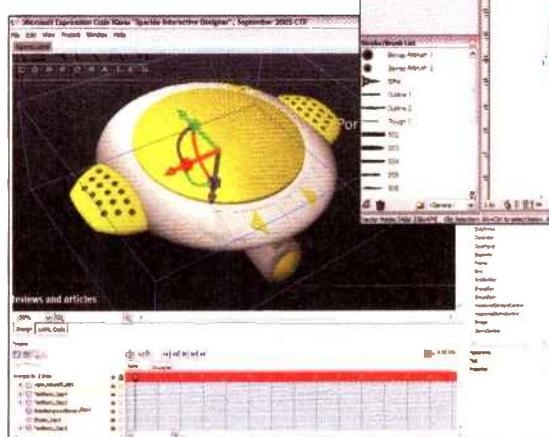
Companies such as Box.net are illustrating how you can store all your data online. Businesses have used online backup for years to secure data, but increasingly everyone will want their own slice of cyberspace to store their data. Couple this with usable online applications and you begin to see how Web 2.0 and the webtop could free you from the current desktop paradigm. Users of Google's Gmail service are already using their server

space allocation to store more than just emails. Costs are high if you want to store more than a couple of gigabytes, but prices will fall. Eventually the hundreds of gigabytes you have on your local hard drive will be online, ready and waiting for you to access the data with whatever web-based application you need.

Today the applications you use, the computer you bought and the operating system it runs have a symbiotic relationship. In the world of the webtop, this bond is broken. The move away from

'Apple could find that the move to the webtop has a great knock-on effect'

a desktop-bound operating system could finally give companies such as Apple a chance of cracking the mass market. If you could have a Mac on your desk running its universally heralded operating system, you could have the best of both worlds. You'd have a great-looking PC, running a great OS, but you'd use the OS to run your favourite web browser as all your apps would be online. Apple could find that the move to the webtop has a great knock-on effect.



The range of applications Microsoft has just released moves the company into new markets. This could bolster its desktop apps business, but it's likely that it won't gain significant market share over the established players

Web-based applications are inevitable, but how far they penetrate into the bunker of the desktop has yet to be seen. Andrew Betts, co-founder and director of software development company Assanka, offered his conclusions about what the future of Web 2.0 could be: 'Sites that provide outdated

features and poor interfaces often have to rely on the quality and comprehensiveness of their databases to get people to use their service.

This is changing, as more and more information providers are seeing the benefits of opening their databases and casting their data as far and wide as possible. As more sites provide other features that add to and enrich the data, everyone is better off. It's exciting stuff, but we're not quite there yet. Perhaps this is only an intermediate release, a Web 1.5.'

The membrane that separates desktop applications and the webtop is becoming more porous by the day. We can now create our own news feeds, website links and blogs so we take only what interests us from the sea of information that is online. Web 2.0 means more control over this content. But it also means that as consumers we can become creators. Podcasting, music mixing, blogging, portal websites and mobile access all become one, using the tools Web 2.0 is offering. If documents, emails, presentations, calendars, photos and all the other digital content we produce was online, you could not only get at it more easily, but you could also share it with others. Placing the applications we all need to create and control this data is the next logical step. But it's a step that will mean a tectonic shift in how we use the web. PCW

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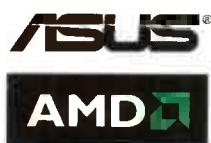
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Technology behind backgammon

The die is cast as artificial intelligence takes online backgammon to a new level, explains Paul Wardley

Backgammon is the oldest known board game, with a history spanning thousands of years. It is ever-popular in the Middle East and Asia, but in the rest of the world it swings in and out of fashion. In the last century it enjoyed something of a revival in the 1920s, when the doubling cube was introduced to increase the skill element and enhance the game's gambling potential, but the decade it had the most worldwide impact was the 1970s. Big-money tournaments were set up, a world championship was established, backgammon clubs sprouted up everywhere (there were even backgammon restaurants) and a whole publishing industry was founded to satisfy the demand for books and magazines about the game.

Although interest waned in the 1980s, it is on the rise again and there's talk of backgammon following in the footsteps of poker as the next big gambling craze. Celebrity players include Nicole Kidman and Tobey Maguire, and many of the top poker stars are fans of the game, including Gus Hansen, the Poker World Tour champion.

Such is the popularity of the online game that on the leading backgammon servers, where you can play for fun or real money, there are now monthly tournaments with guaranteed prizes of \$100,000. And the enthusiasm is international, so if you log onto Play65 or Gammonempire at any time of the day or night, you'll find up to 10,000 people playing simultaneously on thousands of tables. Somewhere in the world it's always backgammon time.

Chips with everything

Much of the renewed interest in the game stems from its connection with computing technology: not only because backgammon is being packaged as a hot new form of online gaming or because a PC is a tireless and always-available opponent, but because backgammon has become one of the success stories of research into artificial intelligence (AI). Self-taught backgammon-playing

Big money tournaments aren't cheap to enter (\$250 in this case) but you can sneak under the wire by winning low-cost satellite tournaments

computer programs are so good that they have overturned many of the assumptions previously held about how the game should be played and which are the best

moves, especially in the opening phases of the game. Any player who trains by regularly playing against a backgammon program, using moves suggested by the program itself, can learn to play at levels that were previously attained by only a few top players.

Unlike the top chess-playing computers and computer programs, which tend to use brute-force tree searching and rely on massive amounts of computing power in a hybrid hardware/software platform, any PC can run a world-class backgammon program.

Hydra, which is the world's most powerful chess-playing computer and has never been beaten, is a cluster computer based on 32 x 3.06GHz Xeon processors, each paired with its own FPGA (Field Programmable Gate Array) device and capable of evaluating 200 million moves per second.

It is able to look 18 moves ahead, which is six more than IBM's Big Blue. In contrast, the top backgammon programs, which are based on neural net techniques, will run happily on a bog-standard Pentium under Windows 95.

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Learning by doing

Backgammon-playing programs are entirely self taught using the technique of reinforcement learning, which is one of the most promising avenues of research into artificial intelligence. In essence, it's no different from the way we train dogs, dishing out a reward when the animal does what we want it to and withholding the reward when it doesn't.

In AI, the trainee or agent, is a neural network, and it is the aim of the agent to maximise the total amount of reward it receives. An agent won't respond at all to a biscuit or a pat on the head, so the reward is a numerical one based on the agent's most recent action. What the agent must try to do is maximise the cumulative reward it receives for succeeding in its goal and not get hung up on the immediate reward for making one good decision.

The goal in any game is, of course, to win and it's easy to score the outcome by awarding +1 points for a win, -1 points for losing and 0 points for a draw or



uncompleted game. An agent needs to understand the environment in which it operates and must know when it has achieved its goal, but in the case of backgammon this is incredibly simple.

A backgammon board is basically a one-dimensional race track split into 24 segments, with opponents racing in opposite directions and all checkers moving identically. A draw is impossible and the goal has been achieved when the agent gets all its checkers round the track before its opponent.

Timing is the key

The mode of reinforcement learning that has been so successful in teaching computers to play backgammon is called temporal



difference (TD) learning, which is based on the differences between temporally successive predictions. Each move by each notional player in the game (the computer plays both sides) is regarded as a time step, and there is a heuristic reward signal sent to the agent after each step and at the end of each game. The agent learns to predict the best move by adjusting the prediction at each time step to make it more closely match the prediction at the next time step. It is the

At Play65.com, every player's rating is public knowledge, so you can choose the level of opponent you prefer

difference between successive predictions which is the only measure of error, and the program is never explicitly instructed as to what is the best move.

Gerald Tesauro, an IBM researcher, is responsible for pioneering TD techniques with backgammon. His program, TD-Gammon, was developed after abandoning experiments with a supervised learning program called Neurogammon, in which the good and bad moves were hard-coded. Neurogammon never reached an expert level of play, whereas TD-Gammon went on improving for 1,500,000 games and became a world-class player. Readers with long memories may recall that a version of TD-Gammon was included in the 1996 Family Funpak for OS2/Warp.

The next commercially available neural net program came in 1998, in the form of Fredrik Dahl's Jellyfish, and this was soon followed by Olivier Egger's Snowie. The current version of Snowie is regarded as the state of the art in terms of its playing skills and analysis tools, and it is priced accordingly.

However, there is a free alternative in the form of GNU Backgammon. This was the brainchild of Gary Wong, who by 1999 had drawn on the work of Tesauro and others to produce a neural net backgammon player called Costello. He donated his code to the GNU Project, and GNU Backgammon (as it became known) is still under development. It plays an extremely strong game and has not stopped learning.

Backgammon on the web

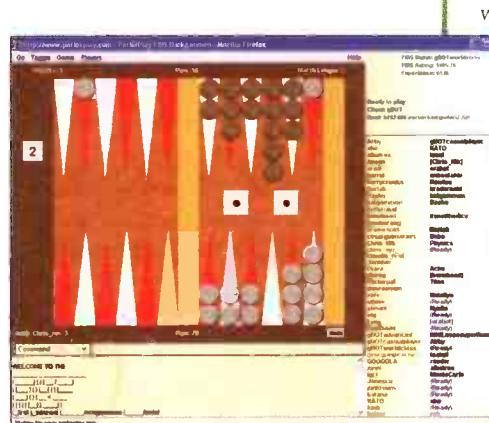
The best site for playing backgammon for pleasure and not profit is www.fibs.com. There you'll find free client software for Windows, Mac and other platforms. Alternatively, you can access FIBS from any web browser by going to www.parlorplay.com.

On the following sites you can play for fun or money: www.play65.com, www.gammonempire.com (operated by the same company), www.truemoneygames.com, and www.gamesgrid.com/backgammon.

For the rules of the game, tips, FAQs and much more there are two excellent one-stop shops for backgammon info. One is Backgammon Galore at www.bkgm.com and the other is Backgammon Pages at www.gammoned.com.

For a clear beginner's guide to probability as it applies to backgammon dice throws, visit www.edcollins.com/backgammon/diceprob.htm, while for a list of the recommended opening moves after you've thrown the dice see www.bkgm.com/openings.html.

The best free backgammon software is at www.gnubg.org, where you can download



When you register with Parlorplay, you can join FIBS at the same time

GNU Backgammon. There's also a free version of the commercial program Jellyfish at <http://effect.webbie.net>, but it can only be used to play games, not to analyse them. If money is no object, buy the Pro version of Snowie 4 on CD for \$380 (£215), or the Student version at \$100, which has all of the key features for beginners. Check out the facts at www.bgsnowie.com.

A version of it plays on the First Internet Backgammon Server (FIBS), where it ranks in the top 20 of over 6,000 players.

Knowing where you stand

All three programs provide a way of doing what no human player is easily able to do, which is to compute the equity of games and matches while they are in progress.

Human players can estimate their positions within a game by counting the points remaining for each player and applying their experience and gut instinct, whereas a neural net program can compute the equity of a game to several decimal places. The simplest type of equity is game equity (sometimes called settlement equity), which is a value that represents what a game would be worth to you if you and your opponent decided to stop playing and settle with each other according to the current state of play. If your equity is reported as 0.62 and the stake is £1, your opponent should pay you 62p to end the game.

Backgammon websites use neural net programs to compute the equity of games (and settle them) when connection or hardware problems make it impossible to play the games out.

When playing against a neural net backgammon program in tutorial mode, you are warned if you are about to make, or have made, a bad move. You are presented with a table of all the possible moves for the current dice throw, with a computation of what the game equity would be after each move. Often the differences are mere thousandths of a point, but sometimes (as when you've completely failed to see an obvious play), the difference in equity can be the difference between a losing position and a winning one. In a sense, the equity table is a visual representation of how the program evaluates the temporal differences between moves.

According to Snowie, black's current move is only ninth best and leads to minus equity, whereas the top move puts black in the lead



Use your PC to improve your game

Playing against a stronger opponent in any game or sport always boosts your own performance and you can learn a lot just by taking note of how a neural net backgammon program plays its moves. But this is just the start, because if you switch one of these programs into tutor mode it will tell you if you're going to play a 'bad' move.

GNU Backgammon, for example, flags an ill-advised move and then lets you choose between playing the move anyway, rethinking your position or receiving a hint in the form of a list of all the possible moves and their relative impact on game equity.

Games you play against the computer are automatically logged and can be replayed at any time

The less often you see this in GNU Backgammon, the more your game is improving

to see where you went wrong, as can games played on many of the Internet servers. There are several formats for storing games and all of them can be imported by both GNU Backgammon and Snowie Pro.

If you've ever said: 'I wonder what would have happened if I hadn't made that move half-way through,' while playing a game with a neural net backgammon program, then you can find out. Simply ask it to roll out a saved game to its conclusion, from any position, as many times as you want.



For anyone with an interest in puzzles and mental arithmetic, the mathematics of backgammon form part of the attraction. All good backgammon players know the chances of throwing any specific combination of numbers with two dice, along with a host of other probabilities involving the chances of being hit by pieces at various distances, and of being able to re-enter the board against a set number of occupied points.

Probability also governs when you should double your opponent, and whether you should accept the offer of a double yourself.

The basic rule of thumb is that you should accept a double if you have at least a 25 per cent chance of winning, but it is notoriously difficult to compute your current position with this degree of accuracy.

However, when playing against a computer opponent in tutorial mode, it can tell you your precise chances of winning at any point in a game, all of which helps an aspiring player

to recognise potential winning positions in subsequent games against human opponents.

It's only a game...

Backgammon involves luck (the dice) and skill (moving and doubling), and it is generally thought to be fairer than poker because there are no hidden elements such as hole cards: both players' pieces are visible to both players at all times. Although a skilled player will beat an amateur three times out of four, an amateur can still win if the dice roll with them. This is unlike chess and other games of pure skill where a class player will always wipe the floor with an amateur opponent – and it's for this reason that backgammon players of all abilities tend to mix. This results in games that are more interesting to play because they feature a wider range of playing styles.

If backgammon really is set to follow in the steps of poker, now's the time to start honing your skills before everybody else jumps on the bandwagon. It needn't cost you a penny if you practise on one of the many free servers, and you'll never be short of playing partners because there are human and robot opponents online at all hours of the day, willing to play with you at any level. Best of luck! **PCW**

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Blu-ray and HD-DVD are competing storage formats aimed at high-definition video content. But, as Manual Masiero discovers, the new copy protection system will keep a tight control of your viewing options

Under pressure from the Hollywood studios and the movie industry, there is now a zero-tolerance approach to copying high-definition (HD) cinema films. For Blu-ray and HD-DVD – the successors to the successful DVD format – the film industry is playing it safe and

implementing the Advanced Access Content System (AACS), a new form of digital rights management (DRM). AACS, initiated jointly by Intel, Microsoft, Panasonic, Sony, Toshiba, Walt Disney and Warner, chains video content firmly to Blu-ray and HD-DVD discs. How often and by what means copies can be

made is no longer up to you: it's for the manufacturer to decide. AACS also allows new, previously unfeasible licensing models. Conceivably, we could see discs that can only be played a certain number of times or which contain a whole season of a TV series with each individual episode requiring a paid-for unlock code.

Playback permission

The copy protection covers not only the media; it also extends to the hardware and software used for playback. By making use of DRM, the AACS License Administration

Estimated to cost around £500 (£345 approx), the Sony Playstation 3 will play Blu-ray discs

(AACSLA www.aacs.com), can decide which applications, displays and players are allowed to show the HD video material. Each piece of equipment is allocated a unique Device Key by the AACS. This is stored in the playback

device's internal memory and is used to decrypt the media.

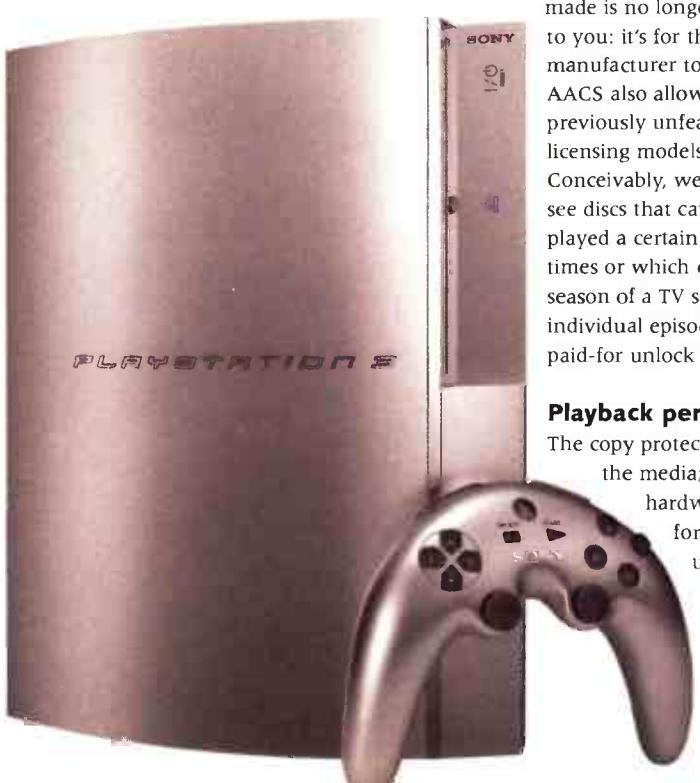
In contrast to the fairly weak CSS copy protection used for DVDs, which was cracked soon after its introduction, AACS is supposed to be harder to open.

The reason for this is the Advanced Encryption

Standard (AES) encryption, which is widely regarded as being more secure. It uses 128bit keys and makes brute-force attacks difficult due to the amount of time it would take to copy. Copy protection is also made so it can be renewed at any time.

Renewable copy protection

If an individual device – such as a TV, projector or player – is discovered to have been hacked, then the AACS organisation can block it without having to amend the copy protection. A list of cracked players or displays is located on every HD-DVD or Blu-Ray disc in the Media Key Block section. This list can be updated with each disc that is pressed. So if you put an HD





Blu-ray PC drives should be available in the UK this summer

disc into a player, the blocked list is transferred from the disc to the player's firmware. If the player's or display's Device Key is on the blacklist, then the device will be locked and the player or display will only show the video material at low quality or not at all.

You will not even be able to play older discs: the player will spot that the blacklist on the disc is out of date and use the newer version stored in its firmware. Manufacturers are obliged to store the latest Media Key Block on their discs.

As a user, you cannot do anything about it if your player or display is blocked, even if your equipment has been blacklisted by mistake. Equipment classed as cracked can be reset and given a new Device Key with a firmware upgrade – but only with the agreement of the AACSLA.

No more 1:1 copying

Apart from device verification using the hardware key, the AACS specification states that all HD content must be encrypted. This means if you want to burn HD videos yourself, then you will need, not only a suitable recorder, but also a burning program which is capable of creating AACS-compliant (that is, DRM-protected) video files.

For example, Nero (www.nero.com) has recently updated its burning suite, Nero 7, to include Blu-ray support, even though the AACS specification isn't finalised yet.

AACS effectively prevents 1:1 copies. Every Blu-ray or HD-DVD disc contains a key used to decrypt the video content. Even blank discs have an individual serial number which is stored in a read-only area and can't be modified. If a pre-recorded HD movie is copied to a Blu-ray or HD-DVD blank disc, then the key and the content won't match and the recording will fail.

This is not the only restriction on HD content. If you want to watch HD videos you will need a matching display as well as an HD-DVD or Blu-ray player and you can only use products with DVI or HDMI connectors.

These are used by the High-Bandwidth Digital Content Protection (HDCP) system which is the standard encryption method for

'In the end, it's the consumer who will decide the fate of the formats'

HDTV. This is supposed to prevent analogue audio and video data being intercepted (and hence copied) between the player and the display. Equipment suitable for HD playback with an HDCP-compatible video input is branded with the 'HD ready' logo. The transmitter (player) and receiver (display) use a key to talk to each other and establish an HDCP-encrypted link.

No graphics cards supporting HDCP encryption via HDMI or DVI are available yet, but ATI and Nvidia are working on suitable models – most of their latest graphics chips support HDCP, but extra chips are required on the card to implement this feature.

Expensive, and not much choice

If you want to make use of HD content, be prepared for some disappointments. With AACs you'll find that what you're allowed to do with your legally obtained Blu-ray or HD-DVD movie could potentially be specified in minute detail with no room for flexibility, which could annoy a lot of people.

In addition, the HDCP copy-protection system makes it necessary to obtain a graphics card or a TV set which supports the standard, but offers no other benefits. However, no copy protection system is unbreakable: at the moment the industry thinks that AACs is the way forward but we will have to wait and see what happens when, inevitably, the first cracked firmware versions emerge into circulation.

There are some encouraging signs, however. Worried that incompatibility issues with older equipment will dent sales, some of the Hollywood studios are saying that they don't intend to implement all the AACs capabilities on their commercial HD movies.

Sony Pictures Home Entertainment, for example, has said publicly that it won't implement the 'Image Constraint Token' that degrades the quality of analogue signals, therefore allowing those without HD-ready displays to watch the content at full HD quality.

They haven't forgotten that in the end it's the consumer who will decide the fate of the new formats. **PCW**

Copy protection in Windows Vista

Windows Vista allows you to play HD videos but uses its own digital rights management (DRM) system to prevent unauthorised copying.

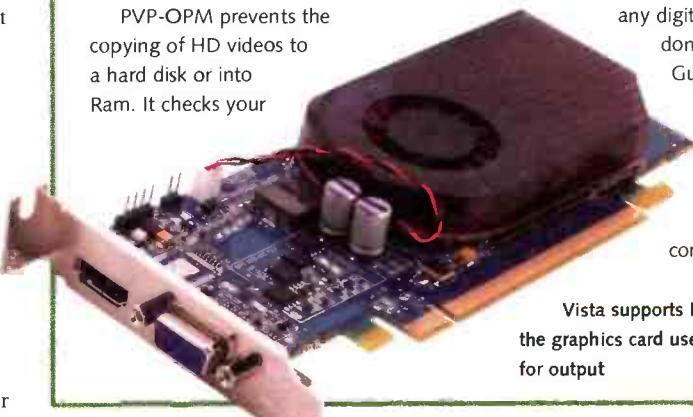
In Windows Vista, Microsoft has noticeably enhanced the DRM system that was already present in Windows XP. The most important parts of this are two copy-protection mechanisms: PVP-OPM (Protected Video Path – Output Protection Management) for video and Puma (Protected User Mode Audio) for audio.

PVP-OPM prevents the copying of HD videos to a hard disk or into Ram. It checks your

hardware and examines your drivers to see if they've been hacked. The movie will only be played back if no driver modifications are detected. Windows Vista also checks the PC's VGA and DVI outputs, putting a block on making one-to-one copies of high-resolution films.

The DRM system for audio files works in a similar way to PVP-OPM: Puma prevents manipulation of the software and hardware components responsible for audio reproduction. Vista can switch off

any digital audio outputs that don't support encryption. Guidelines embedded in the music files can specify whether or not you can copy the files or play them over unencrypted connections.



Vista supports HD video – but only if the graphics card uses HDCP encryption for output

you can
Canon



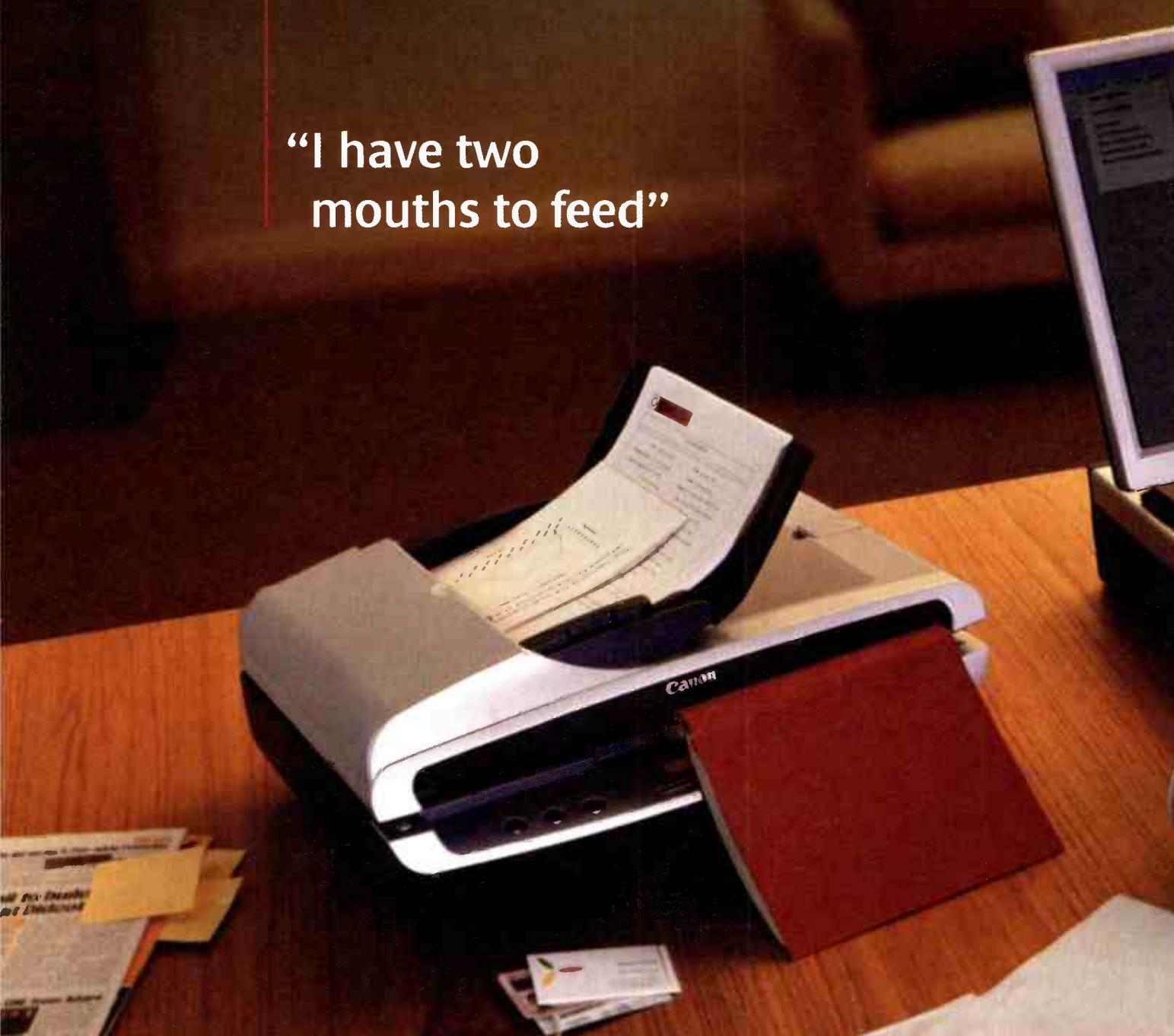
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WHAT'S NEW THIS MONTH

Opting for a small form factor PC usually means sacrificing raw power – at least it used to. Shuttle surprised us all this month with the brand new XPC P 2500G. Despite the ultra-small chassis, Shuttle has found room for Intel's FX-60 processor (currently the fastest available) and a Radeon X1900 XT graphics card from ATI. The end result is a small yet extremely powerful PC. Check out the full review on page 70.

We've also got a first from Philips this month – the Showline MCP9350i. It's Philips' debut in the Media Center arena and, although analogue tuners are preferred over digital models, it's a good-looking and well-designed PC for the living room. You can read more on page 71.

Finally, if you're in the market for a powerful yet cheap notebook, be sure to check out our group test of dual-core notebooks costing from just £649 on page 113.

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OUR SCORING

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

OUR AWARDS

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

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

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



REVIEWS



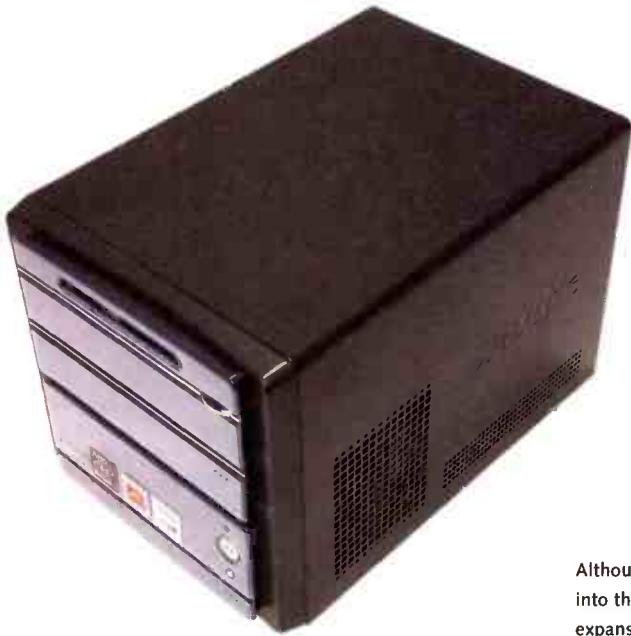
'Shuttle's latest release, the XPC P 2500G, is the fastest small form factor PC we've ever seen'

Read the review on page 70

SMALL FORM FACTOR PC

Shuttle XPC P 2500G

A supercharged PC crammed into a ridiculously small chassis



Although Shuttle has crammed loads into the tiny chassis, there are some expansion options

Suttle is no stranger to good-looking PCs and the latest is the XPC P 2500G, the fastest small form factor (SFF) PC we've ever seen.

The traditional black chassis is combined with light blue panels at the front, concealing Shuttle's own CR40 dual-layer DVD writer, a 3.5in drive bay and a selection of audio, USB and Firewire ports. A multiformat card reader is situated just above the DVD drive.

As far as the processor goes, you don't get much faster than the Athlon64 FX-60 from AMD. We first saw this CPU in action when we reviewed the Mesh Xtreme FX60 (see www.pcw.co.uk/2148285), and more recently in the supercharged Chillblast Atlantis Fusion (www.pcw.co.uk/2153163) where the clock speed was bumped up to 2.9GHz.

Shuttle has left the FX-60 at its standard 2.6GHz, which is wise since the small XPC SN25P case needs all the help it can get to keep things cool.

However, Shuttle has clearly spent a fair amount of time designing the XPC to enhance airflow with separate cooling zones for the processor, graphics card and hard drive sections of the case. Underneath the case there are extra vents to aid cooling of the motherboard.

Using the Shuttle Smart Fan application, you can adjust the fan speed manually or leave it up to the PC to adjust the speed when necessary.

Given the relatively small amount of space inside, we were surprised that Shuttle found room for one of ATI's Radeon X1900 XT cards (see www.pcw.co.uk/2149098). This model comes from Connect3D and, although it's not the fastest (the X1900 XTX is ATI's current king of the hill – see www.pcw.co.uk/2149098) it's still a pacy little number.

The XPC P 2500G flew through our performance tests, clocking up a score of 273 in Sysmark 2004 SE. The only PC to beat this is the Chillblast Atlantis Fusion (see www.pcw.co.uk/2153163), with its overclocked processor pushing Sysmark to a mindboggling 320.

The single X1900 XT-powered 3Dmark05 to 9,541, which is a good score by anyone's standards and indicates it won't have any problems with the latest games. It can't match some of the dual-graphics card PCs we've seen, but cramming two graphics cards into this diminutive case just isn't an option.

A single 250GB hard drive sits inside the case and, should you want to increase your storage capacity, two further 3.5in drives can be placed neatly above the PSU and optical drive at the top of the case using the supplied plastic brackets.

As is always the case with Shuttle, you pay a fair amount for the name. This system comes in at a staggering £2,300, and that doesn't include a monitor, keyboard or mouse. However, this price isn't as outlandish as you might first think. For a start, just the processor and graphics card have a combined street price of around £1,000 – an FX-60 will set you back over £700, while the X1900 XT retails for around £300.

Despite the high-quality components, this small form factor PC still costs more than we expected. But if you want a supercharged PC in a small and stylish case, there are few alternatives at present and Shuttle has done an excellent job with the XPC P 2500G.

If you want to hear about Shuttle's latest XPC, head over to www.pcw.co.uk/podcasts, where you can listen to our podcast.

Will Stapley

Performance

Sysmark 2004 SE: 273



3Dmark05* 9,541



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

Details

Price £2,300

Best price www.pcw.co.uk/bestprices

Contact Shuttle www.shuttle.com

Specifications AMD Athlon64 FX-60 • 2GB DDR400 Ram • ATI X1900 XT 512MB • Samsung SP2504C 250GB hard drive • Shuttle CR40 • Multiformat card reader • 350w SilentX PSU

Verdict

Pros Extremely fast; small and stylish case

Cons Very expensive; limited expansion options

Features



Performance



Value for money



Overall The fastest SFF PC currently available, but the price will deter many potential buyers



MEDIA CENTER PC

Philips Showline MCP9350i

Another CE heavyweight throws its hat into the Media Center ring



Microsoft must be rubbing its hands with glee as Philips launches its Showline MCP9350i Media Center. Although companies such as Evesham, Elonex and Hi-Grade are all committed to producing innovative Media Center PCs, Microsoft's home theatre operating system is never going to appeal to the mass market until traditional home electronics manufacturers start to produce models.

This Media Center has been designed from a non-PC perspective. The black and silver chassis looks impressive and will sit alongside your other lounge entertainment equipment. The remote control shares the Media Center's good looks and, thanks to its rather large size, sits comfortably in the palm of your hand. It can also control other Philips AV equipment.

An LED screen on the front provides information about the status of the Showline, while a flap hides the multiformat card reader and a selection of USB, Firewire and audio sockets.

The fans go into overdrive as soon as you turn on the Showline, but things soon calm down and it runs at an almost inaudible level. You're unlikely to notice it's on, even when it's recording with the TV switched off.

Philips has included a dual TV tuner. While this means you can record two channels at the same time, they're both analogue so you can't watch Freeview channels. We're told a digital version is on the way, but at present there's no firm release date from Philips, which is a little surprising since digital tuners are hardly new technology.

Should you want to hook up your Sky or Freeview set-top box, infra-red blasters are included. These allow the Showline to control channel changes and schedule recordings. Three set-top boxes can be attached.

Further highlighting Philips' high-end display credentials, the Showline comes with Digital Natural Motion. This Philips technology aims to eliminate the juddering effect that can plague scrolling scenes in films. It also results in a sharper, clearer image.

On the PC side of things, the Showline runs off an Intel Pentium 4 630 (3GHz) processor. A total of 512MB of Ram is supplied. While this is fine for Media Center, the relatively low amount of memory means the Showline will start to struggle should you use it as a normal PC with various programs running concurrently.

A single drive provides 250GB of storage space. Should you want to export your films, music or photos, there's a dual-layer DVD writer included.

Round the back of the Showline lie a plethora of input and output sockets. DVI and VGA are both available, along with Scart and S-video alternatives. The only notable omission is component video.

Audio output is handled by two stereo analogue and both optical and coaxial digital, while two further analogue inputs are also provided.

Philips has included all the cables you could possibly need, including a DVI, DVI-HDMI (for HD content), Scart, digital coax and S-video. There's also plenty of documentation to help you out.

Along with Microsoft Media Center 2005, you get Likemusic (a DJ-style application), Norton Internet Security Suite and various Cyberlink DVD titles.

With the Showline MCP9350i, Philips has created a high-performing and well-featured Media Center PC. Our only real complaint is the use of analogue tuners. If you're not fussed about digital TV, or simply plan to hook it up to a digital set-top box, you certainly get a lot for your money.

Will Stapley

Details

Price £999

Best price www.pcw.co.uk/bestprices

Contact Philips www.philips.com

Specifications Intel Pentium 4 630 (3GHz) • 512MB Ram • 250GB hard drive • DVD writer • 802.11b/g •

Ethernet • 4 USB2, 3 Firewire •

Multiformat card reader • Wireless portable keyboard • Scart, S-video, DVI and VGA outputs

Verdict

Pros Good design; plenty of input/output options; quiet

Cons Analogue tuners; only 512MB of Ram

Features

★★★★★

Performance

★★★★★

Value for money

★★★★★

Overall The lack of digital tuners is a real disappointment and prevents what is otherwise a quality Media Center scoring higher

★★★★★

ULTRA-MOBILE PC

Samsung Q1

Small, portable and easy to use, the first ultra-mobile PC heralds a new era



The Q1 from Samsung is the first in a new breed of what Microsoft calls ultra-mobile PCs (UMPCs). Our review sample arrived only a short while before going to press – we've highlighted the main points here, but you can read a more in-depth review and take a closer look at the Q1 online at www.pcw.co.uk/2155011.

Physically, the Q1 looks like an oversized portable media player, but under the chassis it's a fully fledged PC. The processor is a Celeron running at 900MHz with 512MB of Ram – not exactly the most powerful pairing, but the Q1 was never designed to be a

replacement for a desktop PC. In the absence of a built-in keyboard, the 7in touchscreen display can be used to write text using the stylus (the Q1 comes with Windows XP Tablet Edition).

Alternatively, you can use the Dialkeys application to enter text. This places two arcs on either side of the screen with a Qwerty key layout. You then use your thumbs to enter text – just like sending a text message. It takes a bit of getting used, but it's good for short text entry.

In terms of ergonomics, the Q1 sits comfortably in the hand. A joystick can be operated by your right thumb and mimics the arrow key functions on a keyboard. Various other shortcut buttons are placed around the chassis.

Battery life sits at a maximum of three and a half hours, although it only lasted around two and a half hours when we were testing it – this involved a mixture of watching video, browsing the web, writing documents.

There's plenty to like about the Q1 and we're looking forward to seeing other UMPC designs, but it is difficult to determine whether it's aimed at business or home users.

Only time will tell whether or not it will suffer the same fate as tablet PCs.

Will Stapley

Details

Price £799
Best price www.pcw.co.uk/bestprices
Contact Samsung
www.samsung.co.uk
Specifications Intel Celeron M ULV 900MHz • 512MB PC3200 Ram • Intel 915GMS chipset • 7in TFT (800 x 480) • Intel 915GMA 900 integrated graphics • 40GB 1.8in hard drive • 802.11b/g • 2 USB2, 1 mini Firewire • Three-cell lithium-ion battery (up to three hours) • 227.5 x 25.7 x 138mm (w x d x h) • 779g

Verdict

Pros Small; good design; many uses
Cons Battery life; small hard drive; processing power

Features
Performance
Value for money

Overall A new era in mobile computing, but we're struggling to work out who it's aimed at

AMD NOTEBOOK

Averatec 4155

An attractive design and a good display, but it lacks raw power



Averatec's 4155 notebook has clearly been influenced by Apple's design. The £799 price suggests it's not going to generate a benchmark meltdown, but hats off to Averatec for creating a stylish, portable laptop.

Inside the 2kg chassis is an AMD Turion 64 Mobile MT-30 processor that runs at 1.6GHz and has 1MB of L2 cache. Partnered by 512MB of PC2700 DDR333 Ram, it produced an overall Sysmark 2004 SE score of 119 and a result of 1,141 in PCmark05. This makes it quicker than the Averatec 1050 (see

www.pcw.co.uk/2149135), which costs £200 more, but certainly not powerful enough to compete with some of the dual-core laptops we've seen recently.

The integrated Mirage Sis760GX graphics chipset didn't have the clout to run 3Dmark05, but then this notebook isn't designed for games.

An 80GB hard disk is suitable for those intending to use the Averatec 4155 as a portable computer for word processing, browsing and the like, but start loading video on it and you'll soon run out of space.

Perhaps the most outstanding feature of this 31mm-tall slimline notebook is its pin-sharp 13.3in WXGA (widescreen) display. The Averabrite-coated screen makes Windows and DVDs look bright and rich in contrast. It's a bit flimsy to the touch and appears much brighter when connected to the mains, but for the price it's a good compromise.

An Active USB port allows external devices to draw power and recharge from the socket even when the 4155 is switched off. There are two more USB ports, Firewire, S-video, VGA, 4-in-1 memory card reader, PC card, modem and headphone/mic sockets on the front.

At £799 this is a basic notebook that's portable and looks good. However, a dual-core laptop that will perform better doesn't cost much more.

Luke Peters

Performance

PCmark 2005 1,141

Details

Price £799
Best price www.pcw.co.uk/bestprices
Contact Averatec
www.averatec.co.uk
Specifications AMD Turion 64 Mobile MT-30 (1.6GHz) • 512MB Ram • 80GB hard disk • 13.3in screen • Mirage Sis760GX integrated graphics • DVD writer • 3 USB2 • 1 Firewire • Multiformat card reader • 316 x 224 x 31mm (w x d x h) • 2kg

Verdict

Pros Bright display; reasonably lightweight; attractive design
Cons Average performance; graphics

Features
Performance
Value for money

Overall Performance is nothing to shout about, but this looks good and is reasonably priced

DIGITAL SLR

Olympus E-330

More than just an upgrade, this camera offers some unique features



The E-330 is the first DSLR to have a live preview mode

Modern mid-range or prosumer digital cameras have a lot going for them. They deliver far greater quality than a compact, use bigger CCDs and have larger, higher-quality lenses.

They also come with LCD panels that you can use as viewfinders, often tilting to allow shooting at waist level or overhead. This is something you just can't do with an SLR unless, that is, you've got an Olympus E-330.

This feature alone makes the E-330 one of the most versatile digital cameras you can buy. If you've attempted to take shots with an SLR of objects on the ground or over the head of someone standing in front of you, you'll know that the requirement to have your eye looking directly into the back of the camera can be very restrictive. You're climbing and ducking to get your subject in view or shooting blind and hoping for the best.

Physically, the E-330 is very similar to the E-300. Its low, squat body is impressively compact for an SLR and is due to the Porro mirror arrangement. Unlike standard pentaprism mechanisms, as found in most digital SLRs, this Porro mirror first sends the incoming light sideways through the camera body before emerging at the viewfinder, which is slightly off-centre with respect to the lens.

Olympus has designed not one, but two different methods of providing a live preview. The first, called Full Time Live Preview, uses a second image sensor incorporated into the optical system that feeds the viewfinder. This allows the main camera mirror to remain in place in front of the primary image-capturing sensor. In this mode, auto focus is functional, but the field of view is slightly smaller than what you get from the final photograph.

The second mode, Macro Live Preview, operates with the mirror locked up and uses the main sensor to drive the digital viewfinder. In this mode you can preview 100 per cent of your final image, but you're restricted to manual focus. A quick 10x zoom option makes it possible to focus accurately using the LCD screen.

Despite the slightly lower, 7.5megapixel resolution of the E-330, it offers many improvements over the E-300. Using a system inherited from the E-500, the E-330 gives you quick access to a large number of camera settings, such as ISO, white balance and metering options. This is achieved by making the camera status display interactive. Clicking the OK button allows you to change any of the displayed settings using the cursor keys – much more convenient than navigating a menu system.

Thanks to the live preview mode, the E-330 can now overlay these controls on the viewfinder image so you never need to take your eyes off the action.

The LCD panel folds out and tilts up and down. It has increased in size from 1.8in to 2.5in and has a 215,250 pixel display. Continuous shooting speed sits at an impressive 3fps (frames per second) for a maximum of 15 jpeg shots.

Our review model came with a 14-45mm lens (28-90mm equivalent), and costs around £900, which is really quite expensive compared to the competition, including Olympus' own E-500. Photo quality is impressive, but it doesn't really offer anything extra compared with previous Olympus models. However, at the moment there's no other option if you want to combine a removable-lens SLR with a live LCD viewfinder.

Paul Monckton

Details

Price £900 (14-45mm lens kit)
Best price www.pcw.co.uk/bestprices

Contact Olympus

www.olympus.co.uk

Specifications 7.5megapixels (3,136 x 2,352) • 4/3in sensor • two live preview modes • 1/4,000 second shutter speed • 3fps continuous shooting • ISO 100-400 • White balance • 2-12 second timer mode • Li-ion battery • 140 x 87 x 72mm (w x d x h) • 616g

Verdict

Pros Two live preview modes; ease of use; powerful features

Cons No major advances in image quality; price

★★★★★

Features

★★★★★

Performance

★★★★★

Value for money

★★★★★

Overall Innovative, but also expensive. If you can manage without the live preview, there are good digital SLR and prosumer alternatives

★★★★★

CAMCORDER

Canon MV960

A good value-for-money camcorder that shoots natively in widescreen



The most impressive feature of the MV960, the flagship model in Canon's new range of DV camcorders, is that it's a true widescreen camera. The CCD has a widescreen (16:9) aspect ratio, meaning it records in that aspect ratio as standard, without having to chop off parts of the picture or resort to other trickery. This makes it far more useful for the growing number of people with widescreen

televisions and computer monitors – although for anyone with a standard aspect ratio screen the MV960 can also switch to 4:3 mode.

Being the top of the range, it comes with DV-in (in the form of a mini-Firewire port) as well as DV-out, which means it's possible to record footage back to the camera once it's been edited. Since this is performed digitally, there's no loss in quality. There's also a whopping 25x optical zoom and, if you should run out of tape, both images and footage can be saved to an SD card, which is inserted into a slot at the side.

Another good feature of the MV960 is that it's easy to use. Starting to shoot is simply a case of popping in the tape, switching it on and pressing the Record button. One design flaw is that this is a little close to the power switch and we managed to switch the whole thing off while attempting to record. However, it's not a major problem once you're used to the switches.

Video quality is good, although it's not as impressive as some competitors with larger CCDs. That manifests itself in a slight coating of noise on the image, which is only a problem in low light conditions. Those qualms aside, however, anyone who wants to shoot in widescreen will be hard-pressed to find a better, cheaper camera.

Anthony Dhanendran



Details

Price £350
Best price www.pcw.co.uk/bestprices
Contact Canon www.canon.co.uk
Specifications 800,000 pixel CCD (1/6in) • 2.7in LCD screen • 25x optical zoom (43.6-1,090mm – 35mm equivalent) • Recording media: Mini DV tape, SD card • Pal • Image stabiliser • Night mode LED • DV-in/out • USB (SD card transfer only) • 49 x 115 x 92mm (w x d x h) • 445g

Verdict

Pros True widescreen video; easy to use; 25x optical zoom
Cons Not good in low light; some minor design issues

Features
Performance
Value for money

Overall The Canon MV960 has some minor faults, but it's a decent widescreen camera at a very good price



GPS

Novogo V30

A GPS complete with voice controls, but it's little more than a gimmick



The V30 GPS from Novogo looks similar to its popular A30 alternative, but features more buttons, including a four-way navigation control, swappable fascias and voice control.

The package we tested included UK mapping, a car mount, car and mains chargers and a soft case to protect the unit in your bag or glove box.

The Navigon software on the system is the same as the A30 (www.pcw.co.uk/2153852) and has a brightly coloured skin, with colourful icons. The spoken directions are loud and clear, which helps for motorway driving.

The main difference between the A30 and this model is the extra keys and the voice commands. The

extra keys, frankly, aren't that useful. Large Escape and Enter buttons are found in addition to the navigation control, but they didn't always do what we expected, so you still end up having to tap on the screen, which is frustrating. We also felt that the screen coating was far too reflective, making it harder to see at times – a removable screen protector could fix this, but shouldn't really be necessary in our view. As it stands, you'll need to site the unit carefully to avoid glare.

Voice command is one of the main features touted for this model. However, it's just a simple tool to add a voice tag to destinations you've saved; you can then press the menu button, tap Voice Command and say the destination. That's the theory, but in practice it was very unreliable. We found it a lot easier to just go into the favourites list then pick from the destinations on screen. In other words, it's another classic example of a gimmick rather than a useful feature.

If you really want to persevere with voice commands, or you like the quick-release car cradle, this model's worth a look. It's slightly louder than the A30, and retails for only £30 more, but we still prefer the A series with the simpler selection of buttons. It's also just less fiddly to get to grips with than the A30.

Nigel Whitfield

Details

Price £279
Best price www.pcw.co.uk/bestprices
Contact Novogo www.novogo.com
Specifications 3.5in touchscreen TFT • Navteq mapping • UK street-level maps • SD/MMC card slot • External antennae socket • Built-in speaker, microphone and audio jack • Mini USB port • Car mount • Li-ion battery • AC/in-car power adapter

Verdict

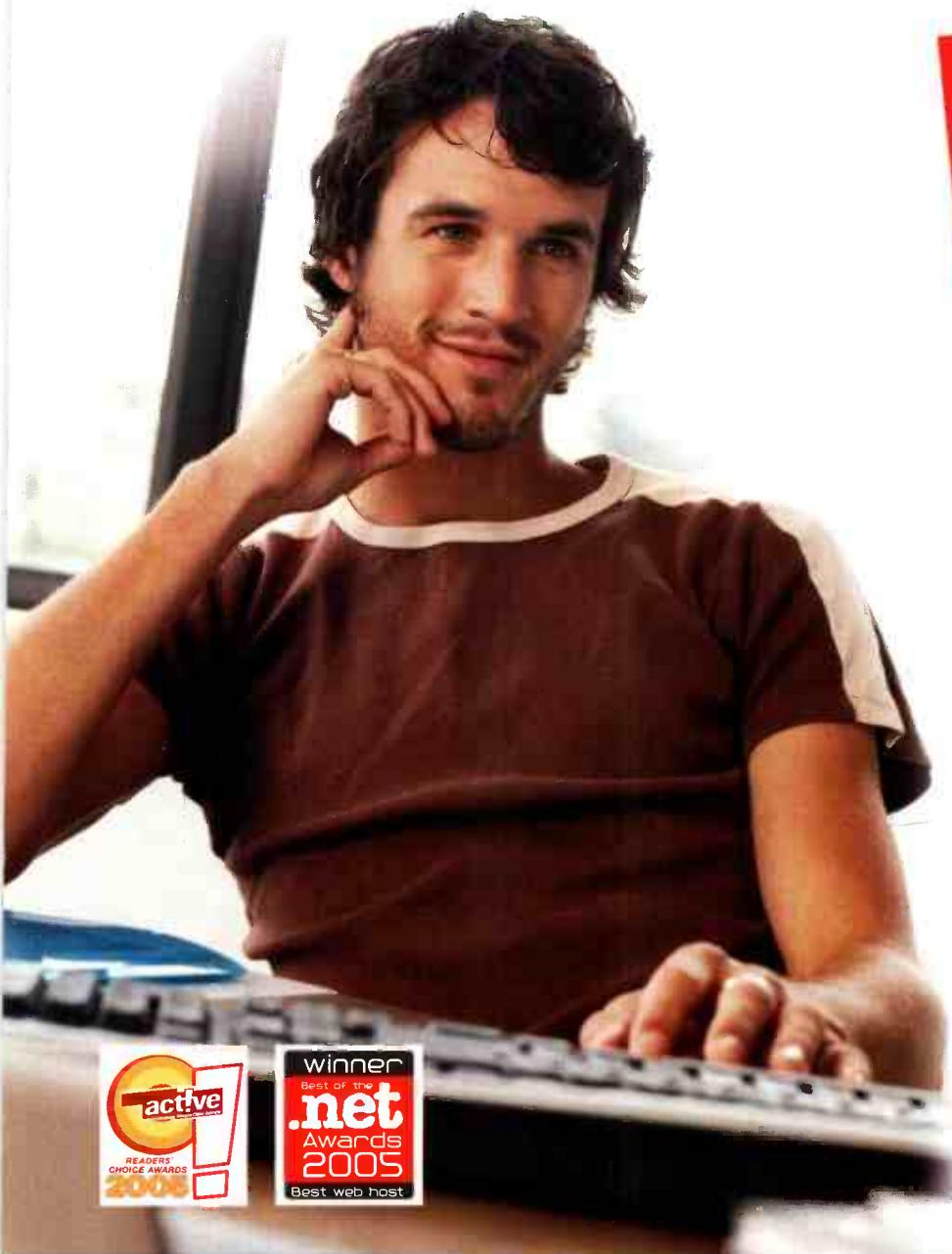
Pros Good speaker; straightforward software
Cons Buttons can be confusing; over-reflective screen

Features
Performance
Value for money

Overall The core of this system is a GPS that performs well, like Novogo's A30, but the voice control isn't good enough to be more than a gimmick



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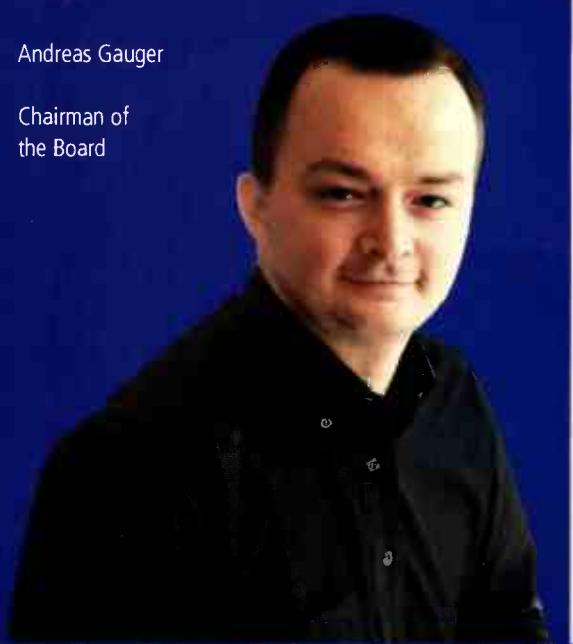
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Chairman of
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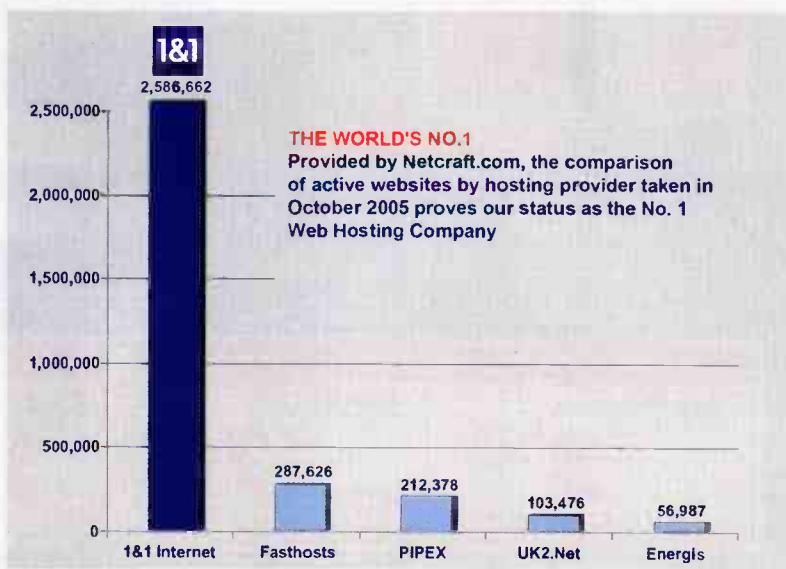
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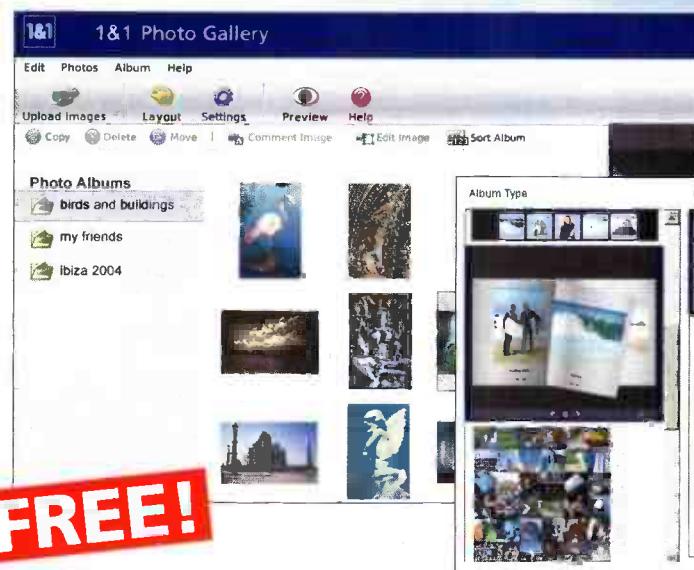
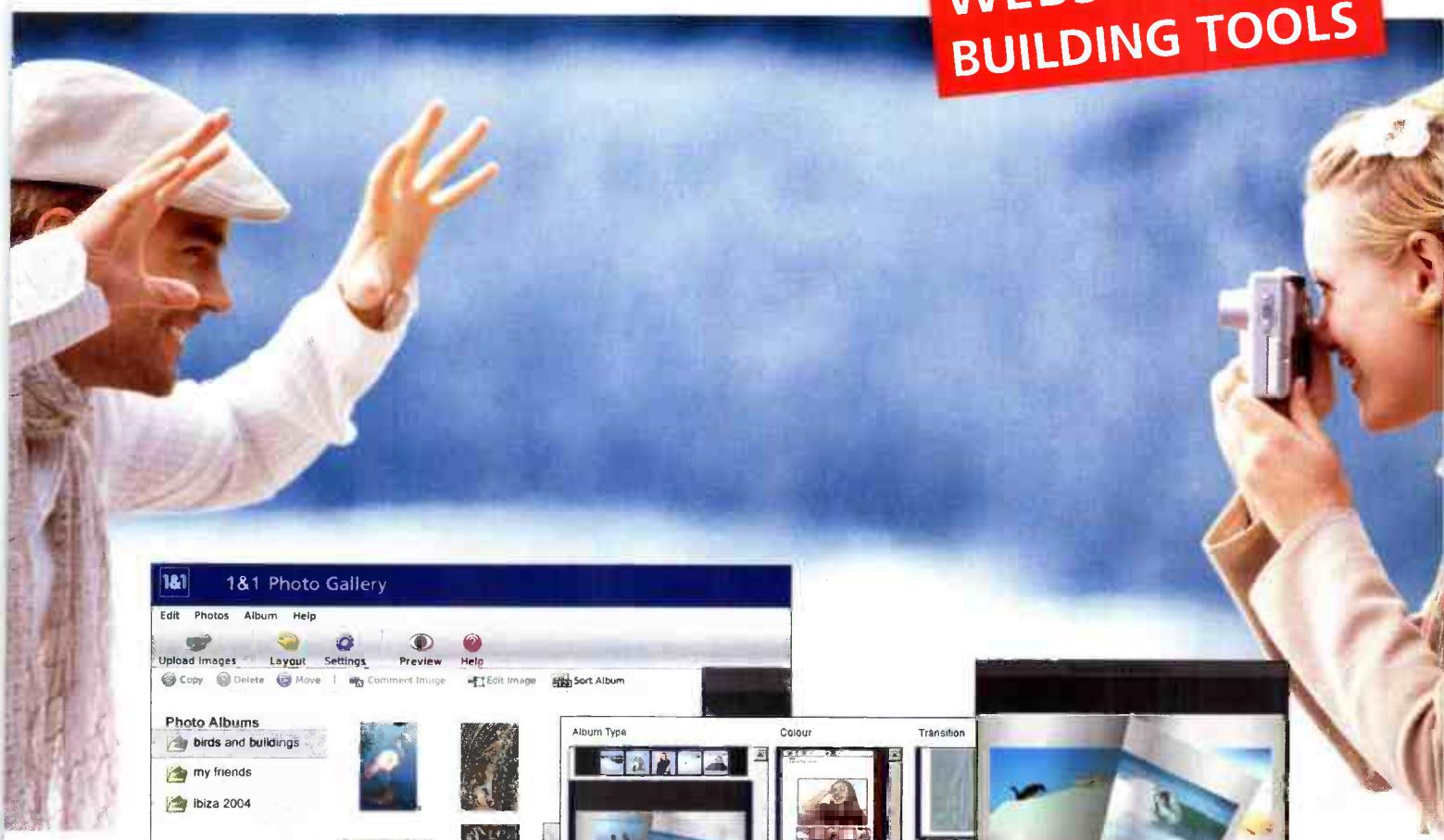


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10th February 2006

Temperature: 7° Weather: cloudy with fog patches

Wind: 5mph Wind Direction: NW

Chance of Precipitation: 80% UV Index: 1

British Airways CEO Willie Walsh
LONDON (AP) - British Airways is to get all sorts from the press in the next two years under a restructuring programme that aims to slash costs across the group. The restructuring will see a loss of 567 managers. The number of senior managers will be reduced by 10 percent, while 10 percent of the 1,000 managers in the number of middle managers in 1991 become 1,381.

Lawson set for Credit debut
CARMARSHIRE (AP) - New Zealand rugby legend Jonah Lomu is set to make his debut for Cardiff Blues against Italian side Cagliari in the Heineken European Cup on December 17.

Lawyer agency set to open
MELBOURNE (AP) - Michael Owen has admitted that his recent injury problems will not prevent him from playing a full part in Newcastle's Premiership campaign and England's build-up to next summer's World Cup.

Dawson on track for World Cup comeback
LONDON (AP) - Stewart Downing, rated the best naturally gifted midfielder available to England, is back on track to make Steven Gerrard and Goran Eriksson's World Cup squad after told he could be back in action for Middlesbrough in January.

Rala hoping for World Cup spot for Harry
LIVERPOOL, England (AP) - Liverpool manager Rafael Benitez has told Spain's national team coach, Luis Aragon, to start playing well to ensure his place in Australia's World Cup team.

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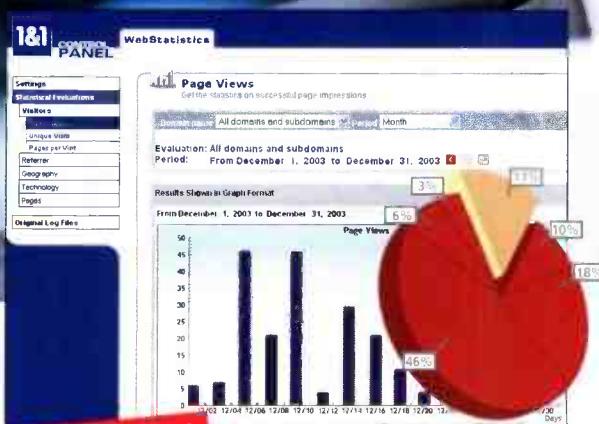
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Build your own website & showcase your pictures

1&1 WebsiteBuilder and Photo Gallery tools are included free with all Shared Hosting packages. These award-winning tools are intuitive and very easy to use – no programming knowledge is necessary. Publish your website in just 20 minutes.

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PACKAGE FEATURES		
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■ Monthly Traffic included	10 GB	10 GB
■ 1&1 Control Panel	✓	✓
■ Unlimited amount of websites	✓	✓
■ 1&1 WebspaceExplorer/Webfiles	✓	✓
MARKETING TOOLS		
■ 1&1 WebStatistics	✓	✓
■ 1&1 WebElements	✓	✓
■ 1&1 Newsletter Tool	✓	✓
WEBSITE BUILDING TOOLS		
NEW ■ 1&1 Dynamic Content	✓	✓
■ 1&1 WebsiteBuilder	12 pgs	12 pgs
■ 1&1 Photo Gallery	✓	✓
■ 1&1 DynamicSiteCreator	12 pgs	12 pgs
■ 1&1 PDF2Web Converter	✓	✓
■ Personal Merchandise Shop	✓	✓
■ 1&1 Multimedia Archive	✓	✓
■ Full Version Software worth £400	✓	✓
■ FrontPage Extensions supported	✓	✓
■ Ready-to-run CGI library	✓	✓
■ ASP Scripting supported	—	✓
■ PHP3, 4 & 5, Perl & Free CGI's	✓	—
■ SSI (Server Side Includes)	✓	—
DOMAIN NAMES		
■ Included .co.uk domains	1	1
■ Sub-domains	50	50
■ Complete DNS Management	✓	✓
E-MAIL		
■ IMAP/POP3 e-mail accounts	300	300
■ Auto-responders/e-mail aliases	✓	✓
■ 1&1 Webmail	✓	✓
■ Virus Scanning for Accounts	5 Acc.	5 Acc.
■ Spam Filtering	✓	✓
SECURITY FEATURES		
■ Protected by up-to-date Firewall	✓	✓
■ Daily backups	✓	✓
■ Password protection	✓	✓
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■ FTP access accounts	10	10
■ Monthly Traffic included	20 GB	20 GB
■ 1&1 Control Panel	✓	✓
■ Unlimited amount of websites	✓	✓
■ 1&1 WebspaceExplorer/Webfiles	✓	✓

MARKETING TOOLS

■ In2Site Live Dialogue	✓	✓
■ Chat Channels	5	5
■ 1&1 WebStatistics	✓	✓
■ 1&1 WebElements	✓	✓
■ 1&1 Newsletter Tool	✓	✓
■ 1&1 WebDatabase	✓	✓
■ Customisable Forums	✓	✓

WEBSITE BUILDING TOOLS

NEW ■ 1&1 Dynamic Content	✓	✓
■ 1&1 WebsiteBuilder	25 pgs	25 pgs
■ 1&1 Photo Gallery	✓	✓
■ 1&1 DynamicSiteCreator	18 pgs	18 pgs
■ 1&1 PDF2Web Converter	✓	✓

■ Personal Merchandise Shop	✓	✓
■ 1&1 Multimedia Archive	✓	✓
■ Full Version Software worth £400	✓	✓
■ FrontPage Extensions supported	✓	✓
■ Ready-to-run CGI library	✓	✓

NEW ■ Database	2 MySQL	MS Access
■ SSI (Server Side Includes)	✓	✓

DOMAIN NAMES

■ Included .co.uk domains	3	3
■ Sub-domains	300	300
■ Complete DNS Management	✓	✓

E-MAIL

■ IMAP/POP3 e-mail accounts	700	700
■ Auto-responders/e-mail aliases	✓	✓
■ 1&1 Webmail	✓	✓
■ Virus scanning for accounts	10 Acc.	10 Acc.
■ Spam Filtering	✓	✓

SECURITY FEATURES

■ Protected by up-to-date Firewall	✓	✓
■ Daily backups	✓	✓
■ Password protection	✓	✓
■ Shared SSL or optional dedicated SSL Certificate	✓	✓

EXPRESS SUPPORT

■ 24/7 Express Support (inc. e-mail)	✓	✓
■ Step-by-step online guides	✓	✓
■ Online account management	✓	✓

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■ FTP access accounts	75	75
■ Monthly Traffic included	50 GB	50 GB
■ 1&1 Control Panel	✓	✓
■ 1&1 WebspaceExplorer/Webfiles	✓	✓

MARKETING TOOLS

■ In2Site Live Dialogue	✓	✓
■ Chat Channels	10	10
■ 1&1 WebStatistics	✓	✓
■ 1&1 WebElements	✓	✓
■ 1&1 Newsletter Tool	✓	✓
■ 1&1 WebDatabase	✓	✓
■ Customisable Forums	✓	✓

WEBSITE BUILDING TOOLS

NEW 1&1 Dynamic Content	✓	✓
■ 1&1 WebsiteBuilder	25 pgs	25 pgs
■ 1&1 Photo Gallery	✓	✓
■ 1&1 DynamicSiteCreator	25 pgs	25 pgs
■ Personal Merchandise Shop	✓	✓
■ 1&1 Multimedia Archive	✓	✓
■ Full Version Software worth £400	✓	✓
■ FrontPage Extensions supported	✓	✓
■ Ready-to-run CGI library	✓	✓
■ ASP Scripting supported	—	✓
■ ASP.NET, .NET Framework	—	✓
■ PHP3, 4 & 5, Perl & Free CGI's	✓	—

NEW Database (8x MySQL, MS Access/2x MS SQL)

■ SQL Import	—	✓
■ SSI (Server Side Includes)	✓	✓
■ Cron Jobs	✓	—

DOMAIN NAMES

■ Included .co.uk domains	5	5
■ Sub-domains	1,500	1,500
■ Complete DNS Management	✓	✓

E-MAIL

■ IMAP/POP3 e-mail accounts	1,500	1,500
■ Auto-responders/e-mail aliases	✓	✓
■ 1&1 Webmail	✓	✓
■ Virus scanning for accounts	20 Acc.	20 Acc.
■ Spam Filtering	✓	✓

SECURITY FEATURES

■ Protected by up-to-date Firewall	✓	✓
■ Daily backups	✓	✓
■ Password protection	✓	✓
■ Shared SSL or optional dedicated SSL Certificate	✓	✓
■ SSH Access	✓	—

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■ FTP access accounts	100	100
■ Monthly Traffic included	80 GB	80 GB
■ 1&1 Control Panel	✓	✓
■ Server Priority	✓	✓
■ 1&1 WebspaceExplorer/Webfiles	✓	✓

MARKETING TOOLS

■ In2Site Live Dialogue	✓	✓
■ Chat Channels	25	25
■ 1&1 WebStatistics	✓	✓
■ 1&1 WebElements	✓	✓
■ 1&1 Newsletter Tool	✓	✓
■ 1&1 WebDatabase	✓	✓
■ Customisable Forums	✓	✓

WEBSITE BUILDING TOOLS

NEW 1&1 Dynamic Content	✓	✓
■ 1&1 WebsiteBuilder	30 pgs	30 pgs
■ 1&1 Photo Gallery	✓	✓
■ 1&1 DynamicSiteCreator	25 pgs	25 pgs
■ Personal Merchandise Shop	✓	✓
■ Full Version Software worth £400	✓	✓
■ FrontPage Extensions supported	✓	✓
■ Ready-to-run CGI library	✓	✓
■ ASP Scripting supported	—	✓
■ ASP.NET, .NET Framework	—	✓
■ PHP3, 4 & 5, Perl & Free CGI's	✓	—

NEW Database (15x MySQL, MS Access/3x MS SQL)

■ SQL Import	—	✓
■ SSI (Server Side Includes)	✓	✓
■ Cron Jobs	✓	—
■ Advanced Developer Tools	✓	—

DOMAIN NAMES

■ Included .co.uk domains	10	10
■ Sub-domains	3,000	3,000
■ Complete DNS Management	✓	✓

E-MAIL

■ IMAP/POP3 e-mail accounts	3,000	3,000
■ Auto-responders/e-mail aliases	✓	✓
■ 1&1 Webmail	✓	✓
■ Virus scanning for accounts	100 Acc.	100 Acc.
■ Spam Filtering	✓	✓

SECURITY FEATURES

■ Protected by up-to-date Firewall	✓	✓
■ Daily backups	✓	✓
■ Password protection	✓	✓
■ Dedicated SSL Certificate	✓	✓
■ SSH Access	✓	—

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■ Step-by-step online guides	✓	✓
■ Online account management	✓	✓

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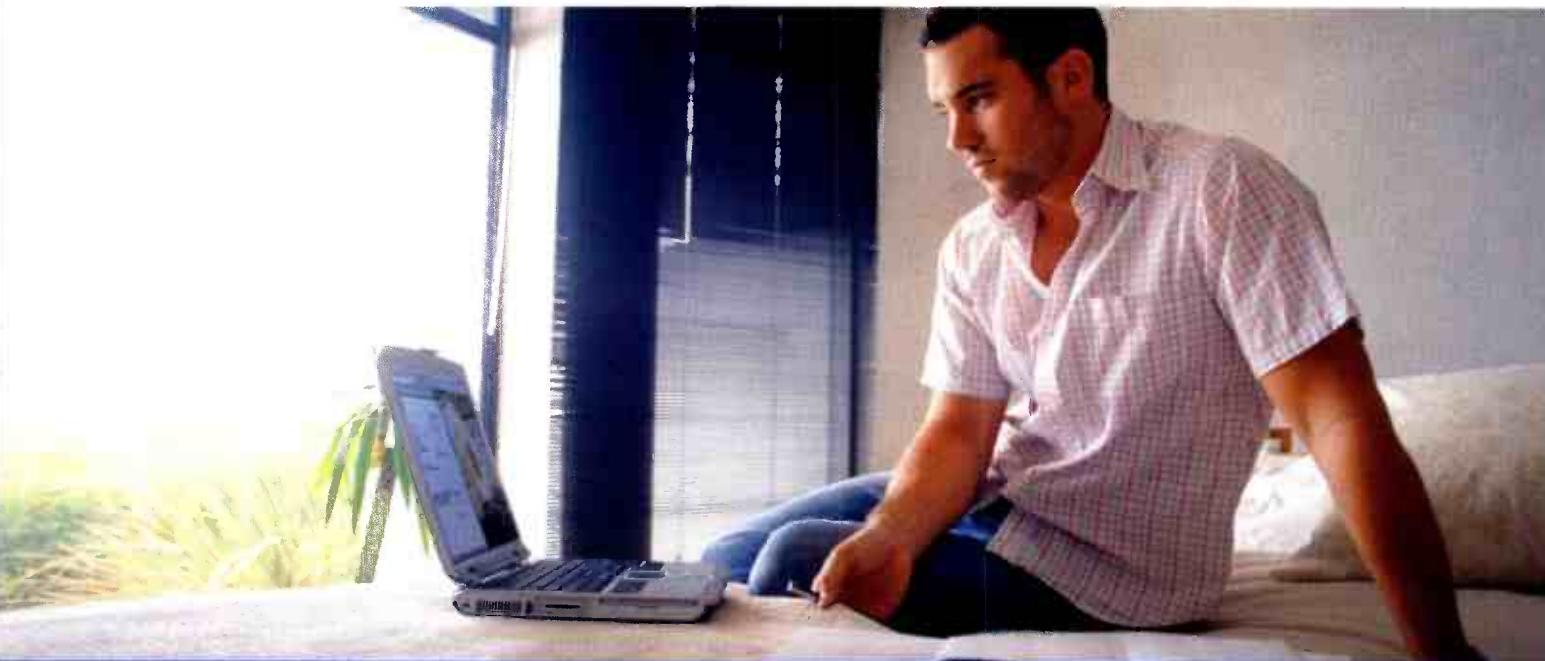
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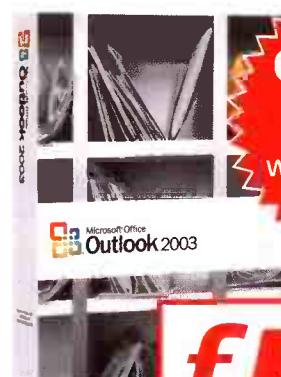
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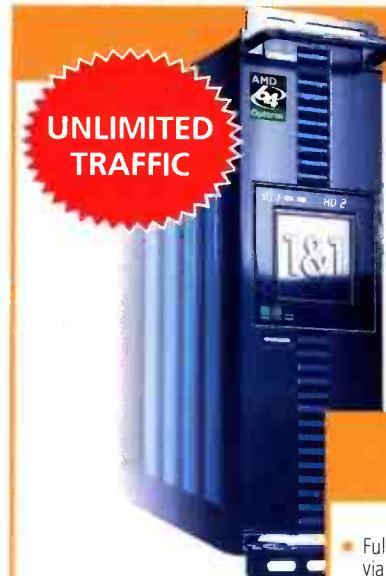
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- 2,048 MB DDR-RAM
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- Free Server backup space* - 60 GB

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DIGITAL AUDIO PLAYER

Sandisk Sansa m250

A good-value player, but it doesn't look as attractive as others



With the trio of Apple, Sony and Creative commanding such an enormous share of the digital audio player market, it's amazing that smaller manufacturers still continue to churn out their own take on the genre. If these lesser-known devices are to have any chance of winning the battle, they need to offer something slightly different.

While the Sandisk Sansa m250 offers good value, we're not convinced it's good enough to lure people away from an iPod Nano or Creative Muvo v200.

It's a 2GB player (a 1GB model is also available) that will play mp3, wma and Audible music files. It also has Microsoft's Plays For Sure logo, so it will have no problem with music downloaded from Napster or any other site using DRM (digital rights management) encrypted wma files. You also get a built-in microphone for voice recording and one AAA battery lasts around 11 hours.

Once the accompanying USB lead is attached, transferring music is done within Windows Media Player or by dragging and dropping files into the player's directory. It's very small (7.5cm long, 3.5cm wide) and lighter than an iPod Nano.

Music quality is good too and the menu system is intuitive and sorts by artist, song or album based on ID3 tags, but it's nowhere near as slick as most of its competitors.

Downsides include the small screen and the slow scroll speed. It also lacks an automatic pause feature if the headphones are unplugged and the tuner feature is disabled here in Europe. The supplied headphones are atrocious in terms of sound quality and the plastic casing feels very breakable.

In all, it's a nifty little player that offers good value for money, but it lacks certain features and is just not as aesthetically appealing as other players. *Luke Peters*

Details

Price 2GB: £98, 1GB: £65

Best price www.pcw.co.uk/bestprices

Contact Sandisk www.sandisk.com

Specifications 2GB/1GB • LCD screen • Stereo headphones • 1 AAA battery (included) • USB2 • Mp3, wma, DRM-wma, Audible • Plays For Sure compatible • 80g

Verdict

Pros Small and light; supports DRM wma files; good value

Cons Small screen; unattractive design; no radio

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall If you can overlook the dubious design, it's actually a good-value player

★★★ ★

MULTIFUNCTION DEVICE

Epson Stylus Photo RX640

Excellent-quality photo prints, but text output could be better



This multifunction device (MFD) replaces the Epson Stylus Photo RX520. Like its predecessor, it's a standard-feed model that takes paper in at the back and spits it out through a tray at the bottom of the front of the unit. The landscape scanner sits above the print unit and you lift the scanning unit up to replace the ink cartridges.

Thanks to their space-saving nature, MFDs are becoming ever more popular and, as a result, manufacturers are churning out more and more units.

The idea behind the Stylus Photo range is to combine standard printing and scanning with photo-quality capabilities. Since it's designed for home users, there's no fax facility.

The front of the printer is home to a 2.5in LCD screen, which is clear and easy to read. At first, the menu system and various buttons are a little confusing, but it doesn't take too long to get to grips with it.

As with the RX520, the memory card reader is mounted on the front of the scanner unit, which isn't the easiest place to access. It reads an impressive array of cards, though.

Both scans and photo-quality prints are extremely good – the latter is almost indistinguishable from similarly priced full-on inkjet photo printers. However, the quality of text prints isn't quite so impressive. Draft quality is poor but readable, and while normal quality shows an improvement, it still looks blurry due to ink bleed.

At over £200 it's by no means the cheapest of MFDs, but there's not much the Stylus Photo RX640 from Epson can't do. That said, it's aimed very much at the home market and anyone wanting both a home-office workhorse and a photo printer will have to look elsewhere. Brother's MFC-820CW is worth considering.

Anthony Dhanendran

Details

Price £230

Best price www.pcw.co.uk/bestprices

Contact Epson www.epson.co.uk

Specifications 6-colour inkjet printer • 21ppm claimed speed for text • Up to A4 paper size • Borderless printing • 2.5in LCD screen • Memory card reader • USB/Pictbridge direct printing • Bluetooth adapter available • Flatbed CCD colour scanner • 450 x 414 x 210mm (w x d x h)

Verdict

Pros Excellent-quality photo printing; memory card support

Cons Unimpressive text quality; menu could be more intuitive

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall For those who want to print photos and need a scanner it's a good deal, but it's not suitable as an office printer

★★★ ★

WIRELESS MULTIFUNCTION DEVICE

Canon Pixma MP800R

A capable printer, scanner and copier with built-in wireless networking



It's always frustrating when things don't work, and our expectation of trauma tends to increase proportionately with the complexity of the product. This is why the Pixma MP800R from Canon is such an unexpected delight to use; everything it does, and it does a lot, just works.

Installation and setup is very easy. It's a joy to see trouble-free automated configuration of such a complex device. Animated diagrams show you exactly what cables need to be plugged in and connection to your wireless network is made as simple as possible. During the installation, supplementary information is

provided on dealing with issues such as personal firewalls and wired 10/100 Ethernet. Infra-red and optional Bluetooth connections are also available.

The MP800R's many media handling capabilities include dual paper trays, automatic double-sided printing and CD/DVD printing.

Nearly all printing and scanning options are available over the network, including access to the built-in card reader. This makes the MP800R ideal for sharing with multiple PCs located around the house.

Operation from the front panel is simple. The 3.5in LCD presents clear menus with plenty of large icons and helpful information. You can print directly from digital cameras, memory cards or even 35mm film and slides, the latter two using the supplied adapters.

Photo print quality is excellent thanks to the five ink cartridges and 1picolitre drop size. A 6 x 4 print takes just over 30 seconds to arrive. Text output is similarly impressive and legible right down to two-point.

There are plenty of image enhancement options and you can scan documents directly to a networked PC as images or using the pdf creation function.

Considering the wealth of features, it's a wonder Canon has made the Pixma MP800R MFD so easy to use.

Paul Monckton

MULTIFUNCTION DEVICE

Lexmark X8350

Photo-quality printing is disappointing, but there are some useful features for small offices



With a print speed of up to 25 pages per minute (ppm) in black and 19ppm in colour, the X8350 MFD (multifunction device) offers plenty of speed for a small office.

The built-in automatic document feeder (ADF) takes up to 50 sheets and saves time by allowing you to start a copy or fax job and walk away while it completes.

The inclusion of photo-quality printing, four memory card slots and Pictbridge support for direct connection to digital cameras makes it extremely

versatile, while the 2.4in colour LCD panel allows editing and printing of photos without a PC.

As you'd expect from an installation requiring a whopping 800MB of disk space, the software goes way beyond a simple set of drivers. Lexmark's Productivity Suite provides an integrated interface, incorporating simple tools for carrying out all the main functions from your PC, as well as applications for managing documents and photos.

Unfortunately, you can't choose where to store the various components – something that could cause problems if your C drive is running low on space.

To enable six-colour printing and obtain the best photo-quality results, you must swap the black cartridge for a photo colour one, leaving the remaining colour cartridge in place. This is a little annoying, but cartridge installation is easy and information on the LCD panel makes resorting to the manual unnecessary.

We were a little disappointed with the photo print quality. It's much better than Lexmark's P450 photo printer, but can't match that of products such as Canon's MP800R (see above).

However, the X8350 costs a great deal less than Canon's device and offers fax and ADF capabilities with networking as an optional extra.

Paul Monckton



Details

Price £329
Best price www.pcw.co.uk/bestprices
Contact Canon www.canon.co.uk
Specifications 1pl droplet size • 2,400 x 4,800dpi scanning • USB • 802.11b/g • Ethernet and Bluetooth connectivity • 3.5in colour LCD • Dual paper trays • Duplex printing • CD/DVD printing • Multiformat card reader • Borderless photo printing

Verdict

Pros Superb usability; good print quality; fast print speed; excellent features

Cons No fax support
Features
Performance
Value for money

Overall A well-made, high-quality product that makes it easy to share photo printing, scanning and copying functions around the home or office

Details

Price £199.99
Best price www.pcw.co.uk/bestprices
Contact Lexmark www.lexmark.co.uk
Specifications Inkjet printing • 25ppm mono • 19ppm colour • 4,800 x 1,200dpi print resolution • 48bit 1,200 x 2,400dpi scanning • 50-page ADF • Borderless photo printing • Pictbridge • Multiformat card reader • 33.6K fax modem • USB2 • 448 x 379 x 254mm (w x d x h) • 7.8kg

Verdict

Pros Good range of features; ADF
Cons Photo quality; poor viewing angle on LCD; price

Features
Performance
Value for money

Overall Photo quality isn't the best, but this is a versatile MFD with some useful office features



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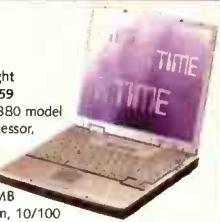
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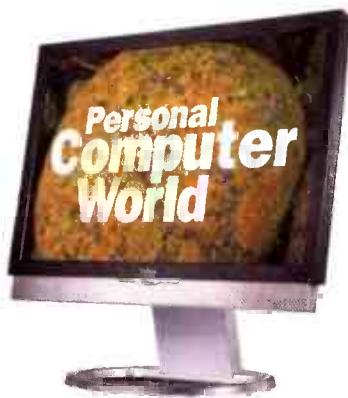
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20IN TFT

Belinea 10 20 30W

Quality, flat-screen monitor that comes at a good price



In January we reviewed Belinea's 10 20 35W (see www.pcw.co.uk/2149480) as part of a group test of widescreen monitors. At £367 it was significantly cheaper than any of its competitors and now you can have almost the same experience for £48 less.

The latest addition to the family, the 10 20 30W has an almost identical specification. It features the same 20.1in 8ms MVA panel two-tone black/silver housing and basic stand (find out more about TFT technology at www.pcw.co.uk/2149165). The resolution

also stays at 1,680 x 1,050. There is, however, one major difference – the omission of a DVI input.

A clip-on rear panel conceals all cables and connectors. Audio and power inputs sit alongside the single analogue VGA connector and, curiously, it's also here that there is a four-port USB hub. It's so well hidden from view that once you close the panel you could very easily forget it was ever there. Good for neatness, but not so great for accessibility.

Five silver control buttons, including an auto setup switch, sit tightly up against the lower edge of the bezel. The largest button is an illuminated power switch that glows with a soft blue – this light can't be turned off.

The buttons are a little tricky to press, but this is more of an annoyance than a genuine difficulty. Inside the menu, selectable colour temperatures include an sRGB mode for easy basic colour matching.

Today there are 20in widescreen monitors that cost less than the 10 20 30W, but often have inferior specifications and TN-based panels that offer narrower viewing angles with visible colour-shifts.

The 10 20 30W offers superior image quality at a good price, especially in photo-editing applications where smooth, accurate colour is required. *Paul Monckton*



Details

Price £319.99
Best price www.pcw.co.uk/bestprices
Contact Belinea www.belinea.co.uk
Specifications 1,680 x 1,050 • MVA panel • 8ms response time • 4-port USB hub • Analogue VGA input • Built-in 1w speakers • ISO 13406-2 Class 2 panel TCO 99 • Contrast ratio: 800:1 • Brightness: 300 cd/m² • 474 x 218 x 433mm (w x d x h) • 6.4kg

Verdict

Pros MVA panel; 8ms response time; good specifications; price

Cons No DVI input; tilt-only stand; location of USB ports

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

Overall A high-quality MVA panel with great specifications at a £48 saving over the premium version, but it lacks a DVI port



2.1 SPEAKERS

Creative I-Trigue L3800

Speakers with extra functionality for Creative's Zen audio players



If you've no need for a 5.1 surround-sound system such as Logitech's Z-5450 (www.pcw.co.uk/2150926) the I-Trigue L3800 from Creative might be more up your street.

It's a 2.1 system (that's two satellite speakers and a subwoofer) with an attractive, futuristic design and a brushed-aluminium finish. Each satellite speaker is rated at 9w and makes use of titanium micro drivers, while the subwoofer pumps out 30w of bass.

A wired control unit attaches to the back of the subwoofer. This unit houses headphone and line-in

sockets while also displaying the volume level via an LED indicator.

Creative also includes a small and particularly thin remote control, which provides access to simple functions such as volume, bass and power.

Should you own one of Creative's Zen audio players (such as the Zen Micro, see www.pcw.co.uk/2045026) the remote will also be able to perform track navigation and activate the FM radio, which is a neat feature. However, it isn't compatible with other players such as Apple's iPod.

In terms of raw power these speakers aren't going to set the world alight. The satellite speakers can only muster up 9w each, while the subwoofer is rated at 30w. We tested them out with a variety of material and at low to medium levels they worked well. However, when we set the volume at top whack, clarity disappeared a little.

Other bundled accessories include a 2m audio cable for hooking the speakers up to your PC or digital audio player and an RCA stereo cable.

At £100 the I-Trigue L3800 is expensive and we suspect only those with Creative Zen audio players will be willing to part with their cash. Those who don't have Zen players should look elsewhere. *Will Stapley*

Details

Price £99.99
Best price www.pcw.co.uk/bestprices
Contact Creative <http://europe.creative.com>
Specifications Satellite speakers: 9w RMS per channel • Subwoofer: 30w RMS • Frequency response: 30Hz ~ 20KHz • Wired control panel • IR remote control

Verdict

Pros Attractive design; controls Zen audio players; good sound quality
Cons Expensive; audio loses clarity at high levels

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

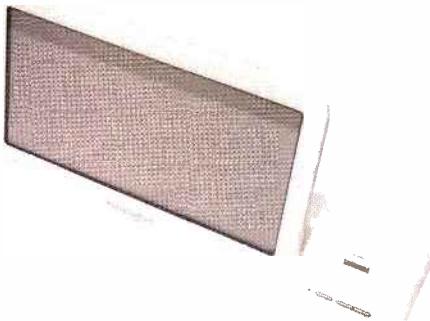
Overall A quality set of 2.1 speakers, but only those with compatible Zen audio players will be able to make use of the extended remote control functions



IPOD SPEAKERS

Kensington SX2000

Pump up the volume with this slimline speaker system



If you've ever had the delight of visiting an Apple Store – in our opinion, the epitome of hands-on technology shopping – you'll no doubt have envied the range of iPod speaker systems. Fancy and expensive designs from Bose, Altec Lansing and Apple itself leave you wishing your boss had given you that Christmas bonus after all. However, Kensington's SX2000 is a neat-looking iPod speaker system that costs less than £80.

It uses NXT flat-panel speaker technology, which makes for a very slim design – just 10cm deep. But it

manages to exert a reasonable volume from the elongated pane, if a little zealous on the treble.

Although there's a sweet spot (about 5m back, directly in the centre), the volume can be turned up loud enough to fill a kitchen, bedroom or living room quite comfortably. However, at neighbour-annoying levels, the soundstage begins to crack and it's not long before the separation between bass and treble is hard to decipher.

Speaking of low rumblings, the bass is impressive but only because of the flat design; it's nowhere near as crisp and punchy as the Bose Sound dock or Apple iPod HiFi. Pushing it up against a flat surface yielded better results, though.

The SX2000 supports all iPods that have a dock connector and comes with interchangeable inserts to cradle the iPod Nano and video iPod. There's a line-in socket on the back for connecting other audio sources.

It will charge any iPod when docked but the unit only operates on mains power. There's no remote control either, so volume has to be manually altered using buttons on the front and music has to be navigated using the iPod's controls.

At £80 it's a cheaper option than many other systems but the low price is reflected in the distinctly average sound quality.

Luke Peters

Details

Price £80

Best price www.pcw.co.uk/bestprices

Contact Kensington

<http://uk.kensington.com>

Specifications Compatible with all iPods with dock connector • NXT Surface sound technology • Charges iPod while playing • Line-in socket • AC adapter • 410 x 100 x 180mm (w x d x h)

Verdict

Pros Slim design; line-in port for connecting other devices; docking adapters for various iPods

Cons Doesn't cope well at high volume levels; no remote control



Features



Performance



Value for money



Overall If you're looking for style over substance, this is a good bet. Audiophiles should look elsewhere



HEADPHONES

Sony MDR-NC50

Minimise ambient sounds with these noise-cancelling headphones



Sony is touting its latest set of MDR-NC50 noise-cancelling headphones at those who listen to music outdoors or on flights.

If you're new to noise-cancelling headphones, it's important to understand they won't block out all external sounds. Instead, they monitor ambient noise, such as the drone of an air-conditioning unit or an airplane's engine, and attempt to eliminate it.

In our tests, Sony's headphones performed well. It's an odd sensation at first, but it doesn't take long to get used to it. Indeed, they work so well, we used them even without listening to music on a train journey. Announcements were still audible, but the ambient noise was effectively dealt with. The MDR-NC50 headphones combine reasonable bass with clear undistorted treble, even at high volumes.

If the AAA battery residing in the right earpiece runs out, the headphones will still function well with noise cancelling switched off, however they sound far better with the feature turned on. A mute button sits on the outside of the left earpiece and will turn off both the audio feed and noise cancellation when pressed.

Sony claims the MDR-NC50 has an 'ear-conscious design'. The padded earpieces cover the entire ear and the headband can be adjusted to suit. The only drawback is their size, meaning you're unlikely to carry them with you on a commute. A carry case is included, but even with the earpieces folding inwards they're bulky – the 290g weight doesn't help either.

But if you're a frequent flyer or want to cut out ambient noise in the office, the MDR-NC50 is a decent set of noise-cancelling headphones. *Will Stapley*

Details

Price £110

Best price www.pcw.co.uk/bestprices

Contact Sony www.sony.co.uk

Specifications Foldable earpieces • Mute button • AAA battery • 1.5m gold-plated audio cable included • Airplane adapter • 30 hours maximum battery life • 290g

Verdict

Pros Effective noise cancellation; comfortable design

Cons Bulky; expensive



Features



Performance



Value for money



Overall A quality set of noise-cancelling headphones, but the bulky design won't suit commuters



PHOTO PRINTER

Hi-Touch S400

A compact, stylish and durable 6 x 4 photo printer



With an unconventional appearance, the Hi-Touch S400 is a standalone 6 x 4in photo printer. It uses a detachable wired controller with a built-in colour LCD to enable printing with or without a PC. However, it's not a case of form without function. The design gives you easy front access to the print ribbon while retaining a small footprint. Meanwhile, the 10-button hand controller lets you access all the functions quickly and comfortably.

The S400 uses dye sublimation to print at a resolution of 403dpi. Unlike inkjet printers where each

dot can only be one of the supplied ink colours, dye sublimation allows continuous tone printing, which means any of the 16.7 million colours are available for each dot on the page, resulting in the equivalent photo resolution of a high-end inkjet. Each print is coated with a protective layer making prints resistant to fingerprints, water and UV rays.

Many of the S400's functions are aimed at using it as a standalone device. If you have pictures stored on a memory card or Pictbridge-compatible camera, the hand controller can be used to perform print jobs away from the PC. If you are hooked up to a PC, the supplied Photodésirée Deluxe software helps you format your photos quickly for printing in a variety of ways.

Unfortunately, the printer's controls, and therefore direct printing from memory cards, are disabled while the printer is connected to your PC via USB. We also found usability to be hampered due to the short length of the coiled lead and the fact that it emerges from the bottom rather than the top of the hand controller.

At a print speed of 70 seconds and an average of 50p per print there are faster and cheaper options available, including others from Hi-Touch, but the S400 produces exceptionally good prints that are a tough challenge for any photo inkjet to beat. *Paul Monckton*



Details

Price £170
Best price www.pcw.co.uk/bestprices
Contact Hi-Touch www.hi-ti.co.uk
Specifications Dye sublimation printing • 403 x 403dpi • 6 x 4in prints • Print speed 70 seconds • Compact Flash, SD, MMC, Smart Media, Memory Stick, Memory Stick Pro card slots • USB interface • Pictbridge • 2.5kg

Verdict

Pros High-quality prints; UV and water resistant photos; easy operation
Cons Short controller cable; card slots can't be read from PC
Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall The compact and stylish Hi-Touch S400 produces excellent, UV-resistant prints that won't smear



VOIP SERVICE

Tesco Internet Phone

The supermarket chain's quest for world domination continues with its take on an Internet phone



Tesco's new VoIP offering differs from most in that it includes everything you need to start making Internet telephone calls on your PC.

Most similar devices come with the software and the phone, but don't include any credit to make calls straight away, while some offer software and hardware as well as inclusive calls, but no handset.

Although you need a PC (it won't work with Macs or Linux-driven PCs), the Tesco Internet Phone comes with the VoIP software and a voucher for £5 worth of

calls. You can also choose a local dialling code for wherever you are in the country. However, we found many area codes were missing – the closest match for a London code was 0203 instead of 0207 or 0208.

The setup process is simple, although it does require a further download of software. It uses a proprietary VoIP carrier so although calls to other Tesco users are free, calls to other VoIP users are not.

Calls to standard landlines start at 2p per minute, so while it may not be great news for people who call mostly local numbers, it can be a reasonable deal for anyone calling overseas regularly.

Call quality is good, but we've heard better on rival VoIP services. The software can be controlled using either the on-screen keypad or the keypad on the handset. It didn't interfere with the PC's normal sound operation, so we were able to listen to music at the same time as making a call using the handset.

Tesco's phone offers a complete VoIP package for a reasonable price, but as with all USB VoIP phones you'll need your PC turned on 24/7 if you want to use it like a standard phone. If you want a VoIP phone for your router (which can make and receive calls without having your PC switched on) see our review of Dratel's Vigortalk at www.pcw.co.uk/2150402. *Anthony Dhanendran*

Details

Price £19.99
Best price www.pcw.co.uk/bestprices
Contact Tesco www.tescointernetphone.com
Specifications USB2 connection • £5 free calls • Broadband connection required (not included)

Verdict

Pros Good call quality; easy setup process; cheap international rates
Cons Proprietary VoIP service; not all area codes available
Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall It's not a perfect service, but the Tesco Internet Phone benefits from an easy installation and low price



NOTEBOOK STAND

Hela Lap Up 2340

A useful device for those who regularly use their notebook in place of a standard desktop



Notebooks have now overtaken desktops in terms of sales, but there is a big disadvantage to using a notebook all the time, namely ergonomics. The Lap Up 2340 notebook stand helps combat this problem by lifting the notebook so the screen is at a comfortable height. With the notebook sitting on the stand you'll need to use a separate keyboard and mouse, but if you're using your notebook for any length of time this is a preferable setup.

Once on the stand, the notebook screen is at a much better height than normal and closer to that of a standard monitor. The two-part design is easy to fit together and, since the fitting is threaded, the height of the screen can be adjusted. The threading is very fine so the height adjustment is precise, however it takes time to get it from the lowest point to the highest.

Another advantage of this screw fitting is that the notebook can be rotated easily, which would be useful in presentations. Although the stand swivels well, it isn't easily moved if accidentally nudged.

The notebook is kept in place by a couple of bolts fixed onto the bottom of the notebook base. These can be moved horizontally should they be blocking any front-access ports, but they could really do with some padding; in time the bare metal could damage your notebook.

Holes in the stand ensure that the flow of air to and from fans isn't obstructed, while slots at the top help organise cables.

Overall, the Lap Up 2340 is a useful device for anyone who uses their notebook regularly in one location instead of a desktop PC. However, it's not the kind of peripheral that you'd want to carry around with you.

Tim Smith

Details

Price £49

Best price www.pcw.co.uk/bestprices

Contact Hela www.helashop.com

Specifications 2.4 kg • 315 x 130 x 205-255mm (w x d x h)

Verdict

Pros Stable stand; promotes ergonomic working

Cons Notebook retainers don't have padding

Features



Performance



Value for money



Overall A worthwhile

investment for regular notebook users, but won't suit those who are constantly on the move



SCANNER

Plustek Opticard 820

A portable business card reader that doubles as a photo scanner



With most business cards roughly similar in size to many photographs, Plustek has combined the two ideas into one and produced a scanner that can cope with both.

The Opticard 820 is a sheet-feed scanner and comes with software for performing OCR (optical character recognition) on scanned business cards as well as editing photos. The device is easy to use and the supplied software is not too tricky to set up.

The quality of photo scans is good, with decent colour response and sharp images. However, when photos didn't quite fit right to the edges of the scanner, they had an unfortunate tendency to slip out of place, which resulted in a wonky image. However, it's possible

to pick up a quality A4 flatbed scanner for as little as £35 that will provide as good a photo scan, if not better.

In its favour, the Opticard 820 is a lot smaller than a flatbed. It's also easier to use when scanning a batch of photos – inserting each photo through the scanner is far better than having to open and close the lid for each photo on a standard flatbed. The Opticard 820 is also faster than a flatbed scanner because it doesn't have to do an initial scan of a full A4 page area.

When it comes to business cards, the Opticard 820 excels. The software is easy to use – you just place a card in the slot and press a button. Around 80 per cent of the cards we tested worked fine, although the device did get confused, thinking our contacts were from the US. A few non-standard-shaped business cards gave it major problems, as did those with hard-to-read backgrounds, but generally the OCR function worked well.

After using the scanner for some time, we found it hard to envisage what kind of person would use both functions equally. But despite the limited market, the Opticard 820 is an excellent business card scanner and the photo side of things is a bonus. But if you'll mainly be using it to scan photos there are cheaper, if bulkier, options available.

Anthony Dhanendran

Details

Price £79.99

Best price www.pcw.co.uk/bestprices

Contact Plustek

<http://www.plustek.com>

Specifications 600dpi optical

resolution • Single-pass scanner • 48bit colour • 4.1in maximum scanning width • USB2 • 174 x 60 x 38mm (w x d x h) • 194g

Verdict

Pros Fast batch photo scanning; good business card OCR

Cons Those using it mainly for photos should opt for a flatbed

Features



Performance



Value for money



Overall Not a bad photo scanner, but it's business users who'll get the most out of the Plustek Opticard 820





Gainward Bliss 6800GS GLH

Price £176.19 Contact www.overclockers.co.uk Overall ★★★★★

Already well known for producing overclocked graphics cards with its Golden Sample series, Gainward is upping the ante with a new range of cards under the Bliss banner. By opting for high-quality components and paying attention to overall build quality, Gainward has ensured this card will be reliable and will have decent overclocking potential.

The 6800GS has a core running at 425MHz. Gainward has upped this to 485MHz on the 6800GS GLH, but it's the memory that makes this card special. The 6800GS GLH uses 512MB of 1.4ns memory chips clocked at 1.3GHz instead of the 2ns memory running at 1GHz of the standard version, allowing for further overclocking. Full review is at www.pcw.co.uk/2153635. *Simon Crisp*

Overall A cheap card with plenty of overclocking opportunities

Gainward Bliss 7800GT GLH

Price £244.89 Contact www.tekheads.co.uk Overall ★★★★★

Looking almost identical to the Gainward 6800GS GLH, the second card to be tested is Gainward's Bliss GLH (that stands for Goes Like Hell) range is based on Nvidia's Geforce 7800GT.

Just like the 6800GS GLH, the core and memory clock speeds are far from standard. Gainward has doubled the amount of memory on the card to 512MB and overclocked it to 650MHz (1.3GHz effective), which is some 150MHz faster than the reference design.

However, the Samsung GDDR3 memory chips are rated up to 1.4GHz, so you may be able to tweak a little more out of them if you're that way inclined. Read the full review at www.pcw.co.uk/2153962. *Simon Crisp*

Overall A little expensive, but has further overclocking potential



Linksys WTR54GS Travel Router

Price £60 Contact www.linksys.com Overall ★★★★★

With dimensions of just 70 x 30 x 104mm (w x d x h) and housing a built-in power supply, the WTR54GS Travel Router is extremely portable. Two ports sit on the side of the router, one for an Ethernet cable to your PC should you prefer wired over wireless, and another for hooking up a broadband Ethernet modem. If you've used a Linksys router before, the web-based interface won't cause you any problems, but it's not the most intuitive of menus. The WTR54GS also includes Broadcom's Speedbooster technology to enhance performance with compatible wireless devices. We also found the router got very hot, so we recommend giving it plenty of breathing space when in use. Read the full review at www.pcw.co.uk/2154106. *Will Stapley*

Overall Good for users who want to set up networks when travelling

Aopen G325

Price £64.63 Contact www.aopen.com Overall ★★★★★

Aopen's latest SFF (small form factor) case is a step up in size from its popular XC Cube range. It measures 280 x 405 x 260mm (w x d x h), which allows the use of micro ATX motherboards compared to the proprietary motherboards in the XC Cube range.

The large compartment attached to the back panel holds the power supply and is a novel way of getting rid of one source of heat in a PC. Slightly worryingly, the PSU fan is the only source of cooling for the G325. Aopen says you should use a PSU with a 12cm fan and we recommend you buy the best-quality supply you can afford. When it comes to looks you'll either love it or hate it. *Simon Crisp*

Overall Cooling might be an issue and the design won't suit everyone





Aopen i975a-YDG

Price £211 Contact www.scan.com Overall ★★★★☆

Not many motherboard manufacturers have dipped their toes into the mobile CPU desktop board market, but one company that has kept faith since the early notebook chipset equipped boards is Aopen. Its latest i975Xa-YDG is a good contender for both the best and most expensive mobile ATX motherboard. While the price is sky high, so is the feature list. Core Duo/Solo support, Intel 975X (Intel's latest high-end chipset), 667MHz FSB and two x16 PCI Express graphic slots, which support ATI's Crossfire technology.

It also has Sata II and Raid (not through the ICH7 Intel chipset, but through an ITE chip), integrated 7.1 audio and Gigabit Lan. Furthermore, it's ready to be tinkered with and is highly overclockable. *Simon Crisp*

Overall The best desktop support for Intel's Core Duo so far

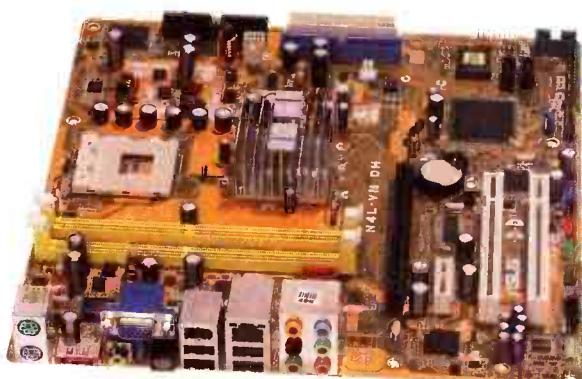
Asus N4L-VM DH

Price £119 Contact <http://uk.asus.com> Overall ★★★★☆

Asus' mobile motherboard arrived on the labs bench just after Aopen's Core Duo board (see above). It's nowhere near as costly as Aopen's board, but it doesn't have as rich a feature set either.

Built on a micro ATX PCB, using Intel's 945GM chipset, the N4L-VM DH offers a powerful base for anyone wanting to build their own home theatre PC in a small case. The feature set is quite basic, but there's plenty to build around including one x16 PCI Express graphics slot (thanks to the integrated graphics, this is free for a TV Card), one x1 PCI Express and two PCI slots. On the backplate is an external Sata connector and two digital audio ports – one coaxial, the other optical. *Simon Crisp*

Overall A well-priced board supporting the Intel's latest mobile CPUs



Pioneer DVR-111

Price £30 Contact www.pioneer.co.uk Overall ★★★★☆

The DVR-111 DVD writer has arrived a couple of months after the DVR-110 and little appears to have changed. Speeds remain the same, but the chassis looks slightly different and Pioneer has brought in its Disc-Resonance Stabiliser. The latter controls the airflow caused by the disc spinning, therefore reducing the chances of warping – especially at high-speeds.

Although we had no trouble when testing the DVR-110, there was talk of it having problems in terms of burn quality when using the fast 16-speed mode. Again, our tests with the DVR-111 threw up no issues, but if you own a DVR-110 and have been experiencing burn-quality issues the DVR-111 may solve them. *Will Stapley*

Overall A good value-for-money drive that covers all the bases



Gecube Radeon X1800GTO 256MB

Price £131.33 Contact www.lowestonweb.com Overall ★★★★☆

ATI launched the X1800GTO in response to Nvidia's latest mid-range card, the 7600GT. Based on a cut-down version of the X1800XT's R520 core it features just 12 pixel pipelines instead of the 16 found on both the XT and XL. Vertex shaders remain the same at eight. Gecube's X1800GTO doesn't vary much from the reference design – the core and memory clocks are both 500MHz (1GHz effective for the 256MB of memory).

The card comes bundled with everything you should need including a DVI-to-VGA adapter, S-video and composite extension cables. You also get a Component video dongle. With a low price tag, it's a card that would suit most users including casual gamers. *Simon Crisp*

Overall A well-priced version of ATI's latest graphics card



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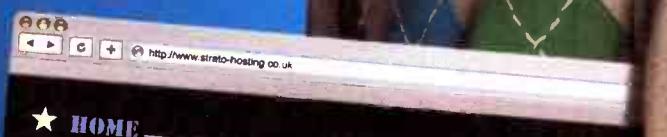
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DVD AUTHORING

Adobe Encore DVD 2.0

Slideshow creation features have improved, but this package is still difficult to use



Above: The flowchart screen gives an overview of your project

Left: The main interface consists of dockable frames and panels

It's clear when you launch version 2.0 of Adobe's DVD authoring program Encore DVD that the software company has been working hard to give the application a more approachable interface.

Gone are the old floating palettes and rolling blinds of previous incarnations. In their place are dockable frames and panels. These take a bit of getting used to but are, by and large, an improvement. Similar facelifts have, apparently, been applied to some of Encore DVD's fellow Production Studio applications. Although, since we are reviewing Encore DVD as a standalone program, this isn't something we'll go into detail about in this review.

What we will say is that those who have other Adobe applications on their PCs will certainly get more out of Encore DVD.

The most obvious thing to point out is that Encore DVD works with menus, text and buttons that are all natively PSD format files. A simple click and the menu or background currently being worked on can be opened up in Photoshop and edited in detail.

For the money, we found that Encore DVD worked fine with the previous version of Photoshop (CS) that we had installed on our test system.

The one aspect of Encore DVD we weren't able to try out was the much vaunted Adobe Bridge file management app. It comes on the Encore DVD disc but, for some reason, didn't find its way onto our test machine during setup and gave us an error message on launch after we installed it manually.

A phone call to Adobe revealed that this particular feature is only available to those who have more than one of the current version (2.0) Adobe video and imaging applications installed.

Other more accessible enhancements to Encore DVD include improved photo slideshows, a flowchart-style visualisation of projects and support for DTS sound, none of which are particularly groundbreaking.

In fact, in many ways it seems as if Encore DVD is only just managing to keep up with the crowd. It's great that users can now add transitions, motion effects and music to their DVD slideshows, for instance, but this is something that much simpler DVD authoring products have been offering for years – and at a fraction of the price.

Similarly, the flowchart method of representing projects is a very useful improvement, but it's a feature that can already be found incorporated into many of Encore DVD's competitors.

Something else that many other DVD authoring software developers are currently boasting about is their support for high-definition video formats, but you won't even find a whiff of this in Encore DVD. Granted, it's early days for HD yet and many of the promises made by other companies are slightly hollow given that true recordable HD (in the shape of Blu-ray and HD-DVD drives) has yet to materialise. Nevertheless, it's a surprise to find that Adobe is simply ignoring the whole HD issue altogether.

As it is, this feels more like Adobe playing catch-up with Apple, rather than leading the field. Encore DVD is a powerful authoring tool but sometimes it feels like little more than a slightly complicated way of building DVDs, particularly when used on its own.

It's only when it's combined with other Adobe video and graphics applications – specifically Premiere and Photoshop – that everything starts to make a bit more sense.

Jonathan Parkyn

Details

Price £287

Best price www.pcw.co.uk/bestprices

Contact Adobe www.adobe.co.uk

System requirements Pentium 4 1.4GHz • 512MB Ram • 1GB hard disk space (5GB for installation of extra content) • DVD writer • Windows XP SP

Verdict

Pros Improved slideshow creation; support for DTS audio; flowchart preview

Cons No high-definition support; complicated to use; expensive

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

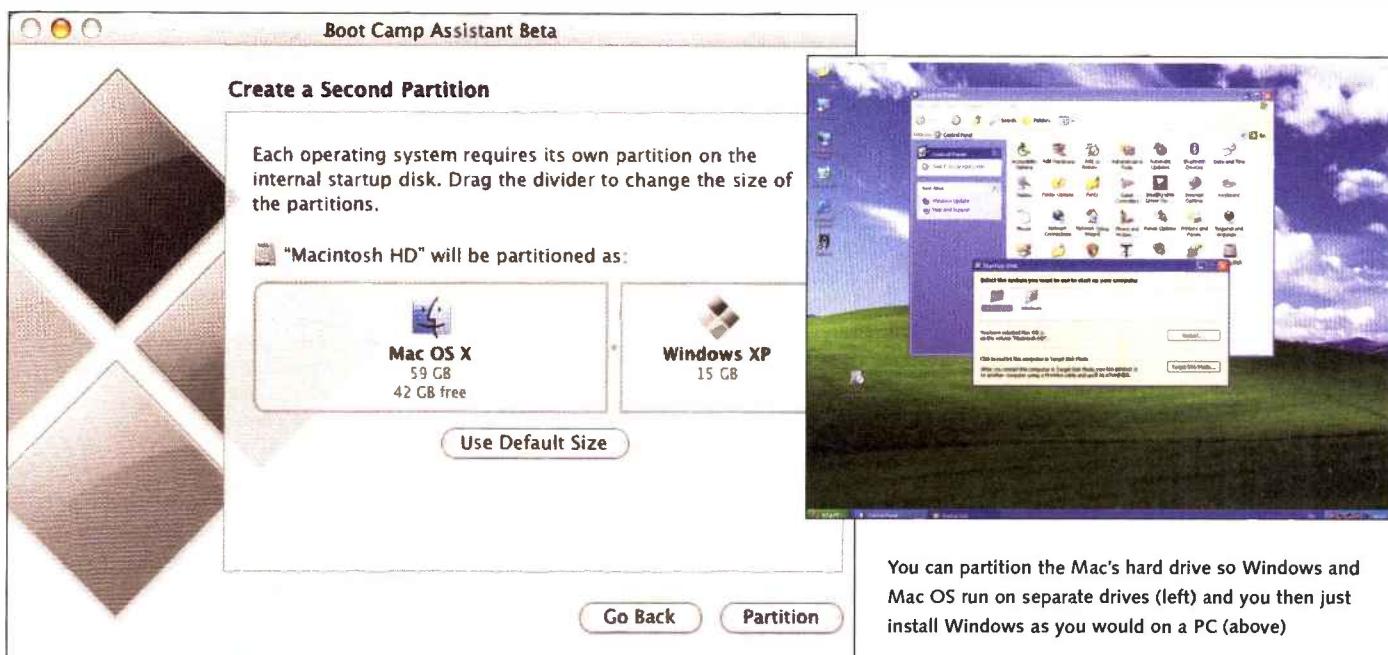
Overall Encore DVD 2.0 fills in some of the previous version's big gaps, but offers little in the way of real innovation, particularly as a standalone product without Photoshop and Premiere Pro

★★★★★

MAC BOOT MANAGER

Apple Boot Camp

We knew Windows would run on an Intel Mac – we didn't think it would be this easy



You can partition the Mac's hard drive so Windows and Mac OS run on separate drives (left) and you then just install Windows as you would on a PC (above)

The moment Apple announced it was going to switch over to using Intel chips in its Mac computers, people started to wonder if they would finally be able to install Windows on a Mac.

Apple didn't seem terribly keen on the idea, so when the first Intel-based Macs arrived in January it was left to the hacker community to see what they could do. They cracked it by the middle of March, but the process they came up with was so long and complicated that it hardly seemed worth the effort.

Then, just a few days later, Apple announced it was working on a bit of software called Boot Camp that could do it all for you.

The program is still in the beta stage, but it allows you to install Windows XP onto an Intel-based Mac, and to create a dual-boot system that can start up using either Windows or the traditional Mac OS.

We used Boot Camp to install Windows XP onto an Intel Core Duo Mac Mini and were amazed to see that we had Windows up and running within about 45 minutes – about the same time that it would take to install onto an ordinary PC.

However, there's one big hitch that we have to warn you about straight away. The Windows installation disc you use has to install Windows XP and Service Pack 2 all in one go. You can't install an older version of XP first and then install SP2 separately.

Furthermore, Boot Camp won't work with older versions of Windows such as 98 or ME.

But as long as you've got a Windows XP/SP2 disc, the process really is very simple.

The first step is to download and install a firmware update for the Mac from Apple's website and then launch the Boot Camp application.

Boot Camp will create a disc containing Windows drivers for the Mac's graphics, audio and networking features. It then allows you to partition the Mac's hard disk so that you can have Windows and the Mac OS on separate partitions.

Once this is done, you just insert your Windows XP disc and install Windows as you would do normally. The entire process was surprisingly smooth and problem-free – finally you don't need to be a hard-core hacker to get Windows running on a Mac.

Boot Camp is still beta software, so it does have a few rough edges. Some Mac models have built-in webcams, and these won't currently work with Windows.

However, running ordinary Windows applications such as Microsoft Office and Internet Explorer was no problem. We even got a few 3D games running as well, such as Dungeon Siege 2 (though the cheap and cheerful Mac Mini isn't a particularly good games machine).

Of course, this is a big gamble for Apple. It's clearly hoping that Boot Camp will lure PC users into using a Mac for the first time, safe in the knowledge that they can still run Windows if they need to.

It also prevents current Mac fans from buying a PC purely because they want to run software that's only compatible with Windows.

Only time will tell if that gamble pays off. In the meantime, there are plenty of people for whom the ability to run both Windows and the Mac OS on the same machine is an absolute godsend.

Best of all, it's a free download and available now from www.apple.com/macosx/bootcamp.

We'll be testing Boot Camp further and will be reporting further findings on the Testbed at www.pcw.co.uk/labs.

Details

Price Free

Best price www.pcw.co.uk/bestprices

Contact Apple www.apple.com/uk

System requirements Apple Mac with Intel processor • OS X v.10.4.6

• Windows XP/SP2 installation disc

• 10GB hard disk space • Blank CD for drivers

Verdict

Pros Simple to install; runs Windows applications on a Mac

Cons Beta software so currently no technical support; requires SP2 Windows disc

Features

Ease of use

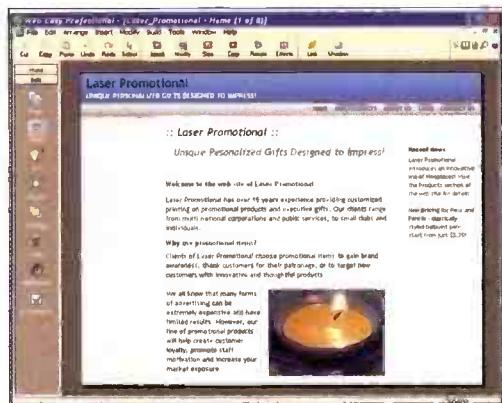
Value for money

Overall Still in beta stage, but it's a minor miracle to get Windows running on a Mac with such little hassle and no obvious performance penalty

WEB DESIGN

Web Easy 6 Professional

An easy-to-use web editor for a wide range of sites



Web Easy 6 Professional is designed to create sites quickly but without sacrificing advanced tools such as ecommerce. It supports a wide range of web formats including CSS for consistent formatting and dynamic HTML, which offers all sorts of effects including moving text.

Getting started is easy thanks to the well-written tutorials and large selection of templates covering both business and personal websites. The tutorials cover the basics as well as more advanced topics.

In the design view, object properties (text, shapes, multimedia) are placed down the left-hand side of the screen, while the bottom is devoted to a browser for clipart and objects. It's easy to drag anything from pictures to hit counters direct onto your page. All the scripts can be edited, which lets more experienced users tailor the design further.

One of the best ways to encourage visitors to your site is to create RSS feeds. Web Easy 6 includes full support for RSS and will automatically generate feeds from your main website.

There's loads of media, such as clipart, on the CD and more online. The ecommerce wizard supports a variety of payment services such as the ever popular Paypal. However, it was disappointing to find these wizards don't provide any way of categorising products and services, so it ends up becoming a long list.

It should be remembered that Javascript does not always make for the most accessible websites and you should think carefully about how it is used. Some of this content will be blocked by Internet Explorer so it should be used with care.

On the whole, Web Easy 6 Professional is a solid web design package, with the relatively low price hinting at its target audience.

Tim Smith

SLIDESHOW CREATOR

Magix Photos on CD & DVD 5.0

Create impressive slideshows and videos without spending a fortune



Photos on CD & DVD 5.0 is Magix's latest budget slideshow creator. The range of special effects include animated 'fun motifs', pictures can be rotated and resized effectively and DVD menus are greatly improved.

Other changes are more radical. You can upload your slideshow as a video (with transitions, effects, commentary and background music) to your free space on a Magix website. However, you're only given 25MB, so you won't be storing a great deal online.

Paying extra for the Deluxe version (£39.99) gives you more advanced features such as Bluetooth and infra-red export as well as higher resolution output via Windows Media High Definition technology.

The way Photos on CD & DVD 5.0 works has changed little over recent versions. You import music, audio, video and pictures into the storyboard. You can then convert them into slides, which can be compiled into what Magix calls a Photoshow. An overview mode helps you position objects more precisely.

Photos on CD & DVD 5.0 provides effects and blends to enhance slides. For more detailed editing, you can launch the inbuilt photo editor, Photo Clinic 5.0.

Although the photo editing provided isn't on a par with dedicated editors such as Paint Shop Pro, it's still effective for simple tasks.

Finally, you can convert the storyboard into a timeline. This can then be used to rearrange your slides and add both subtitles and audio material.

After you've selected and customised your slides, you can test your Photoshow as if you were viewing it on a CD or DVD player.

At under £20 you're not going to get advanced tools, but Photos on CD & DVD 5.0 does exactly what it sets out to.

Stephen Copestake

Details

Price £50

Best price www.pcw.co.uk/bestprices

Contact Avanquest

www.avanquest.co.uk

System requirements Pentium 500MHz • 256MB Ram • 170MB disk space

Verdict

Pros Wide range of usable templates; editable scripts; supports RSS

Cons Limited ecommerce options; no way of categorising products and services

Features

Ease of use

Value for money

Overall Considering the price, this is a good web design package that includes some advanced tools

Details

Price £19.99

(£39.99 for the Deluxe version)

Best price www.pcw.co.uk/bestprices

Contact Magix www.magix.com

System requirements Pentium III 500MHz or higher • 128MB of Ram • 500MB hard disk space • Microsoft Windows 2000/XP

Verdict

Pros Very reasonably priced; lots of features

Cons Steep learning curve; interface lacks clarity

Features

Ease of use

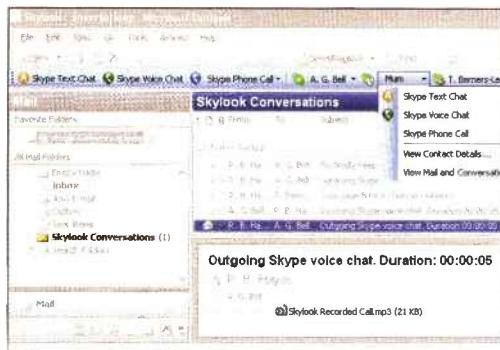
Value for money

Overall Does what it says on the box but new users will struggle at first

VOICE OVER IP

Skylook 1.5

Integrate Microsoft Outlook with Skype's Internet phone service



Skylook is aimed at heavy users of Skype and Microsoft Outlook and allows you to make calls or hold instant messaging chats directly from your email account and record all conversations.

It also includes an answer phone, an option offered by Skype but only on a paid subscription basis.

Download and setup is straightforward, with a wizard guiding you through the process.

A Skype bar is added to your Outlook account, combining any contacts you have in both packages. You can add any Skype-only contacts into Outlook, using the information supplied on setup.

The free Skylook Basic adds the ability to phone, email and text Outlook contacts via Skype, while an Academic version adds call recording features. But it's the Business and Home versions that will interest most people. Advanced dialling features for very heavy phone users is the only extra in the Business edition.

When you open Outlook you'll see options in the Skype bar along the top, including a selection of contact names and icons for starting and ending calls, accessing the answer phone and stopping recordings.

It can be set to automatically record either just your voice or both sides of the conversation, depending on your preference and, once a call is finished, gives you the option to email it as an mp3 file to the other party.

However, Skylook does not give you the option to change the email address should you want to send it to a different account, nor will it let you enter an address if the email field was blank.

Our initial attempts to record conversations were mixed. When it worked, playback quality was clear. But conversations did not always record and there was no obvious way to kick it into action. However, a simple reboot remedied this. While it's obvious how to make or receive any type of call, some aspects, such as the answer machine, need to be easier to use. Rob Jones

Details

Price Basic: Free, Academic: £15.20, Home: £21.29, Business: £30.43

Best price www.pcw.co.uk/bestprices

Contact Skylook

<http://www.skylook.biz>

System requirements Skype • Microsoft Outlook • Internet connection

Verdict

Pros Easy setup; records conversations; good-quality playback; answer machine; cheap

Cons Some aspects a little unintuitive; only works with Outlook

Features

Ease of use

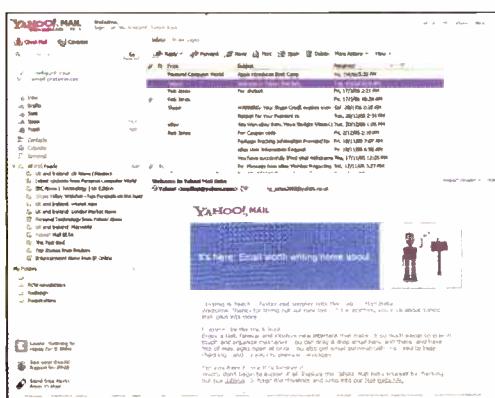
Value for money

Overall A good application for heavy users of Outlook and Skype at a good price, but it has the feel of freeware rather than a polished commercial application

INTERNET MAIL

Yahoo Mail Beta

Yahoo's Internet mail service gets a much needed update



Yahoo Mail has been around for years, but with a few tweaks such as improved security measures and increased storage, it has had little in the way of a major upgrade.

The application was beginning to look and feel very tired as an email tool, but Yahoo has finally put that to rest. Following the trend of releasing beta versions to the public, this upgrade is called Mail Beta. You don't have to upgrade, but we suggest you do.

This version has breathed new life into Yahoo Mail. Suddenly it is a far easier, more intuitive application to use. New to Yahoo Mail – somewhat belatedly – is a preview pane.

The icons running along the top have been refreshed, and email folders, the calendar, contacts and notepad icons have been moved into the left-hand pane, making it quicker and easier to manage your email.

Plus, the company has integrated the RSS feeds set up as part of your My Yahoo account, so you now get news stories in your email as well. It all has the look and feel of Microsoft Outlook, although it obviously can't match Outlook for functionality.

You still get 1GB of free storage, but gone are the Mark and Move tabs – email can now be dragged and dropped between folders. All emails are now kept as a continuous stream that you can scroll down, rather than on different pages.

There's little in this update that sets it apart from existing email tools, but if you are a current user of Yahoo Mail, or don't have an Internet email account, it is definitely worth moving to this version, especially since it won't cost you a penny.

We look forward to the response from Hotmail and Gmail. Rob Jones



Details

Price Free

Best price www.pcw.co.uk/bestprices

Contact Yahoo www.yahoo.co.uk

System requirements Internet connection

Verdict

Pros Simple layout; drag and drop email

Cons Nothing to give it an edge over the competition

Features

Ease of use

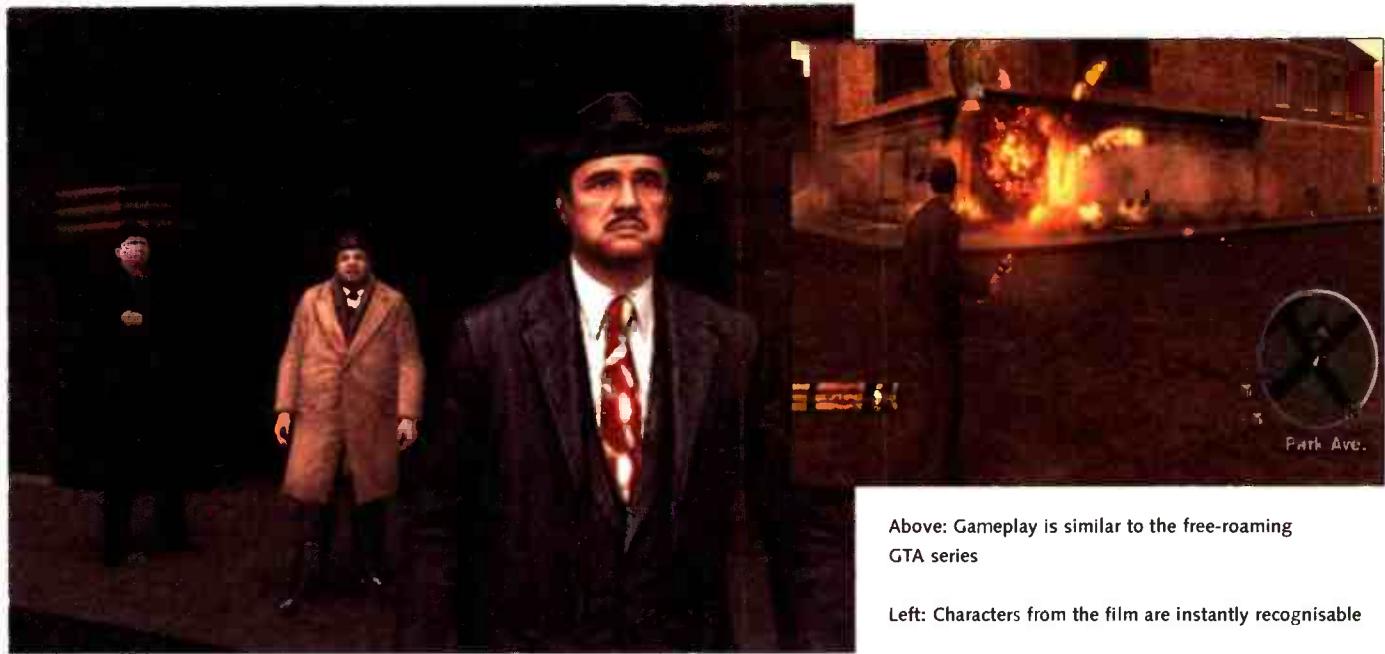
Value for money

Overall A long overdue update to an ageing email tool, but one that is well thought out and makes the software far more user friendly

3D ACTION

The Godfather

A cinema classic is transformed into a great game



Above: Gameplay is similar to the free-roaming GTA series

Left: Characters from the film are instantly recognisable

Unlike some big movie licences – *Star Wars* or *Lord of the Rings* for instance – *The Godfather* doesn't instantly leap out as being a particularly suitable candidate for video game conversion. But while characters and events may have been borrowed from Francis Ford Coppola's classic, the gameplay in EA's *The Godfather* is straight out of another blockbuster franchise, namely the *Grand Theft Auto* series.

GTA Vice City proved that it was possible to design a mobster-themed, free-roaming action adventure and make it a huge hit. Since then, however, gamers have been force-fed a steady stream of extremely weak *GTA* clones, which is why crowbarring the *Grand Theft Auto* formula into *The Godfather* smells initially like a recipe for disaster.

It's clear, however, that EA has spent a lot of time – not to mention money – trying to get it right, even to the extent of persuading Marlon Brando, to reprise his role as the mafia boss from the movie. Anyone who has seen the game's TV ad campaign will attest to how eerily effective the late Mr Brando's involvement is, although it's perhaps ironic that this turned out to be the great actor's final performance.

Story-wise, you find yourself filling the spats of an up-and-coming hood in the Corleone family. Taken under the wing of the big boss himself and eager to avenge the murder of your father, your character is put into the care of Luca Brasi who sets you on a path that will eventually lead you to take over the gang and ultimately become the don of New York City. It's not a particularly original premise, but it cleverly allows your character's story to run in parallel with events from the movie.

What this translates to in terms of gameplay is a series of story-based missions in which you carry out orders from your bosses and start to assert your grip on the city. The missions involve a mixture of vehicle and on-foot action which will be familiar to anyone who has played *Grand Theft Auto* – an assassination here, a driving job there, for example. On top of this, you get to build your own empire by extorting protection money from businesses in your neighbourhood while enjoying a similarly varied set of side missions and mini games as those offered in the *GTA* titles.

Graphically, *The Godfather* has a much higher level of detail than other games of its type. 1940s New York is captured pretty faithfully, while character models in particular are visually very effective. Actors Robert Duvall and James Caan have also been recreated in pixel format for the characters of Tom Hagen and Sonny Corleone respectively. In fact, many of the characters you meet are instantly recognisable from the films with the notable exception of Michael Corleone, as Al Pacino allegedly refused to be involved in the game. Nino Rota's *Godfather* theme music fleshes out the soundtrack, adding another layer of authenticity.

The game is not perfect. The vehicles feel clunky, for example, while the missions vary wildly in their difficulty levels and can occasionally be a bit repetitive. That said, the game is huge and there is masses of fun to be had, whether you're a fan of the *Godfather* movies themselves or *GTA*-style gaming. Naturally, there will be those who consider *The Godfather* game a sacrilegious stain on the memory of their favourite movie. Nonetheless, EA has produced an extremely playable action game while remaining surprisingly faithful to the *Godfather* legacy.

Jonathan Parkyn

Details

Price £29.99

Best price www.pcw.co.uk/bestprices

Contact www.godfathergame.com

System requirements 1.4GHz

processor • 256MB of Ram •

Windows 2000/XP • 5GB free hard

disk space • 64MB video card •

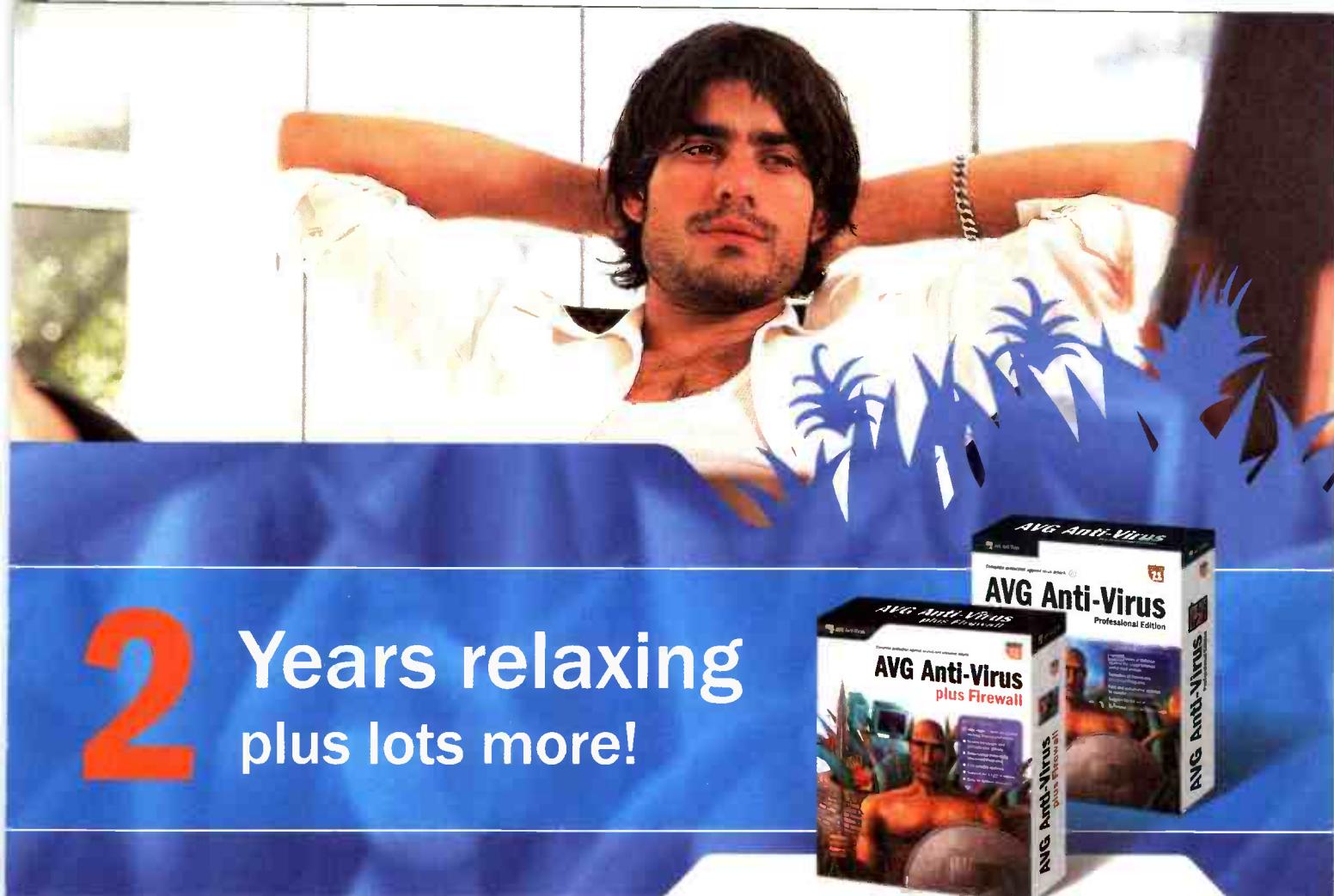
Two-speed DVD-Rom drive

Verdict

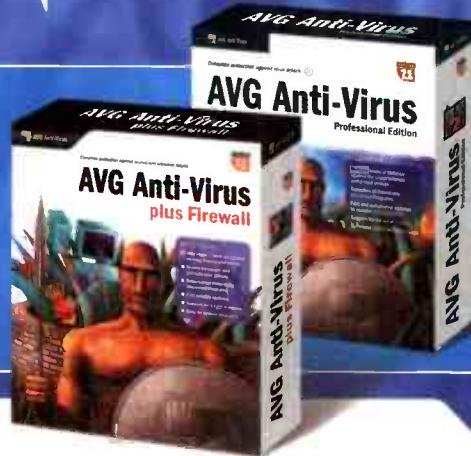
Overall It could have been a total flop, but EA has made the conversion from classic movie to video game work well.

What's next? *Gone with the Wind: The Game*, maybe?

★★★★★



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SIMULATION

The Sims 2: Open for Business

Make your sims work for you with this expansion pack for the ever-popular series



If you're a fan of The Sims then you probably won't be reading this. You're probably playing the addictive little game right now, sacrificing all notion of an actual existence (social life, work, reading quality magazines etc) in favour of a virtual one.

If, by chance, you've managed to take your eyes off the screen for a second, then you'll be pleased to hear that yet another in a long line of Sims expansion packs has been released to help keep you in simulated hog heaven. This time the idea is to get your sim

involved in a number of business ventures, almost all of which appear to be based in the retail industry.

Naturally, you need a copy of the original Sims 2 installed on your system for the pack to work, but assuming you're already a dab hand at the game, the expansion won't pose much problem in terms of learning new controls.

Open for Business allows you to start either a small home-based cottage industry or purchase a vacant lot and build your very own commercial outlet. It puts you in charge of hiring and firing staff, checking stock and using your business acumen to increase sales. To anyone possessed of the entrepreneurial spirit we can only say this: put your talent to work in the real world and you might earn real cash.

In fairness, Open for Business is full of the same kind of self-deprecating humour that made the original games so great and maintains its whole sandpit-come-goldfish bowl appeal. Aside from that, there's very little to add. Sims addicts will almost certainly buy it regardless of what we say, and those who have little or no interest in The Sims will be left pondering the irony of why anyone would want to shell out £20 to go to work in their spare time.

Jonathan Parkyn

Details

Price £19.99
Best price www.pcw.co.uk/bestprices
Contact EA Games www.ea.com
System requirements The Sims 2 (full game) for Windows • 1GHz processor • 256MB Ram • 1.5GB free hard disk space • Windows 98/2000/ME/XP

Verdict

Overall Open for Business will appeal to Sims fans wanting more. For the rest of us, the joke is beginning to wear a little thin



REALTIME STRATEGY

The Lord of the Rings: Battle for Middle-Earth II

More strategic swords and sorcery for Tolkien fans



The original Battle for Middle-Earth was a highly enjoyable but in some ways limited strategy game that focused squarely on the epic combat from the three film adaptations. Battle for Middle-Earth II goes a lot further, providing locations, races and conflicts from the books that never made it to the big screen. It's possible to play as Elves, Dwarves and Goblins as well as the various forces of good and evil from Gondor, Rohan, Isengard and Mordor.

Single and multiplayer action is available with a variety of gameplay options ranging from drop-in skirmishes to full-blown campaigns and a War of the Rings mode that sees you battling for conquest of the entire Middle-Earth map quadrant by quadrant – either against the computer's AI or against a real, live online opponent.

Many of the features that made the original Battle for Middle-Earth a success have been retained for this release. That includes the heavy influence of the movie trilogy's art design, as well as the brand new hero character system that allows you to call upon familiar faces to help your hordes in times of need. The latter now allows you to build your very own custom hero, complete with role-playing game-style level-ups and experience points.

If you have a broadband Internet connection you can play the game online. Multiplayer tournaments can be fought, as well as two-player skirmishes.

Those with an aversion to all things hobbit and/or strategy gaming are unlikely to be swayed by the prospect of this sequel. Tolkien fans who have been gagging to grapple with goblins or dice with dwarves, however, will be pleased at the increased scope of Battle for Middle-Earth II.

Jonathan Parkyn

Details

Price £34.99
Best price www.pcw.co.uk/bestprices
Contact EA Games www.ea.com
System requirements 1.6GHz processor • 256MB Ram • 5.5GB hard disk space • DVD-Rom drive • Windows XP

Verdict

Overall Effectively it's more of the same, but Battle for Middle-Earth II is definitely an improvement on the original



How we test

Performance testing is an important part of PCW's reviewing process and to obtain our authoritative results we use the UK's best PC testing resource – VNU Labs. Here we explain why you can trust our results and give you a tour of our most frequently used benchmark programs.

One of the main reasons people upgrade their PCs is because their old model seems 'too slow'. But how do you tell whether the one you're going to replace it with is any faster? At PCW we take PC testing very seriously and we have the UK's best PC testing labs – VNU Labs – on tap to help us give you reliable, authoritative performance figures, to help you with your purchasing decisions.

It's true that speed isn't everything, but it's an important part of the buying equation, especially when there are so many components out there. As many of our PC group tests are based on price bands, checking the performance is even more important – if the core system is underperforming, you need to know before you part with your hard-earned cash.

In VNU's UK Labs, which is part of the European VNU Labs network, our staff have over 20 years of combined testing experience. We know all the perils and pitfalls of practical benchmarking and we contribute to the development of industry-standard benchmarks through our full membership of Bapco (www.bapco.com), the non-profit benchmark consortium. We are also a media member of the Futuremark Benchmark Development Program (www.futuremark.com). Listed below are the main benchmarks we use for testing PC systems and components.

- Bapco Sysmark 2004 SE – an application-based benchmark that tests real-world system performance.
- Futuremark 3Dmark03 – a 3D graphics benchmark designed to test the performance of DirectX 8 graphics cards.
- Futuremark 3Dmark05 – the latest version of 3Dmark that tests DirectX 9 3D graphics performance.
- Ubisoft Far Cry – we use the Fort level timedemo to see how graphics cards perform in a real DirectX 9 game.
- Futuremark PCmark05 – a synthetic benchmark used to test the performance of a PC's major subsystems.
- Bapco Mobilemark 2005 – used to assess the battery life of notebooks using real-world applications and usage scenarios.
- Test beds – we use standardised AMD and Intel-based test rigs to test components and peripherals.

There's more information about our testing procedures and benchmarks on our Labs site at www.reportlabs.com/testbed/bguides/benchmarks.php.

Performance



- ➊ A score of 200 indicates that the system is twice as fast as the reference PC
- ➋ The reference PC (2GHz P4 512MB of Ram) scores 100



- ➌ A Geforce 7800 GTX would score in the region of 7,490



- ➍ A score of 60fps (frames per second) or higher is most desirable
- ➎ A result of 30fps or above means the machine can produce playable frame rates at the tested resolution



3Dmark03 is used to test DirectX 7/8 graphics cards



PCmark05 measures memory, processor, graphics and hard drive performance



3Dmark05 pushes modern graphics cards to their limits



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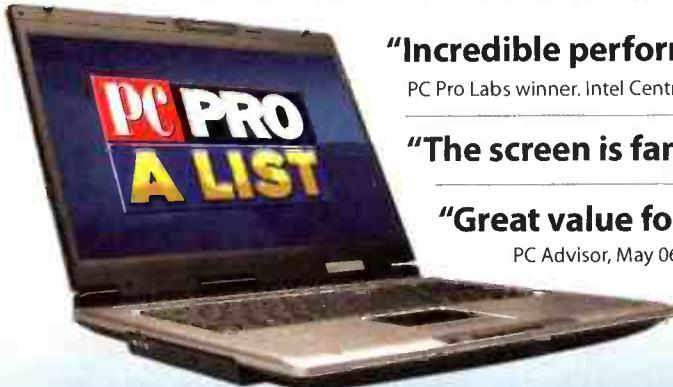
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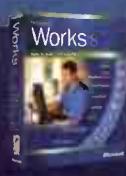
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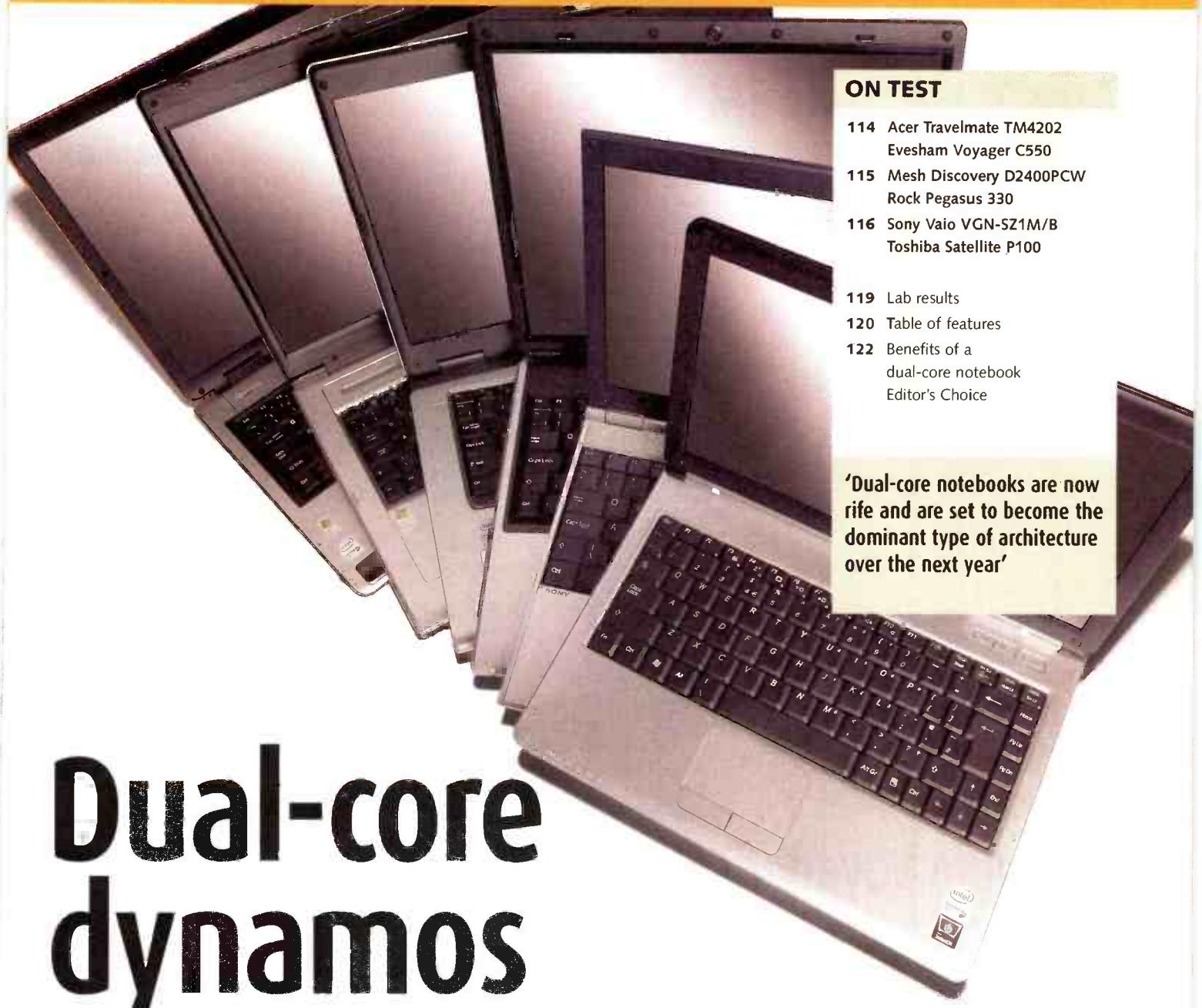


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ON TEST

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dual-core notebook
Editor's Choice

'Dual-core notebooks are now rife and are set to become the dominant type of architecture over the next year'

Dual-core dynamos

Dual-core technology is set to take the notebook world by storm, and as prices fall you might be surprised what you can get for your money. Luke Peters puts six entry-level models through their paces

Unless you've had your head buried in binary, dual-core notebooks are now rife and are set to become the dominant type of architecture over the next year. Like any new technology, dual-core notebooks currently impose a price premium. However, there are entry-level models available starting from less than £700. Obviously these are aimed at the home user but as the technology becomes more common, prices will fall very quickly. So what can you expect from today's budget offerings?

We asked six manufacturers to send us their lowest-priced dual-core model. While we left the AMD/Intel decision open, every notebook arrived using Intel's new Core Duo architecture, which shows either how popular these new processors are, or how successful Intel's marketing push has been.

As always, we've put every notebook through a series of exact and demanding

benchmarks to see how they cope with the kind of assault that today's software applications exert. We're also looking for the best mix of features against price and performance, so the lowest-priced model won't automatically win.

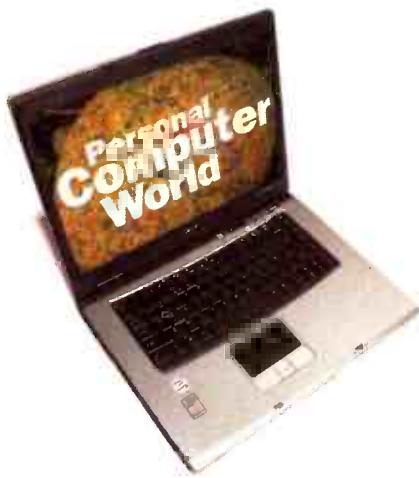
We've explored the benefits of using a dual-core notebook on page 122, which shows that it's not just 'power users' who can benefit from two cores, especially with the glut of multimedia applications demanding our attention.

On page 119 you'll find our performance charts, which highlight how each notebook matched up against the competition. And of course, use the table on page 120 to cross-reference each model's specifications and features. You'll also find the results available to browse online at <http://labs.pcw.co.uk>.

So let's get down to business and, to coin a very bad pun, let the dualing begin. ▶

Acer Travelmate TM4202

Price £649 Contact www.acer.co.uk



The Travelmate TM4202 sits in the familiar Acer chassis; has a curved keyboard, rounded edges and a generally pleasant feel about it. The 1.66GHz Intel Core Duo T2300 processor – a popular choice – is supported by 512MB of DDR Ram, which can be upgraded to 4GB.

While not setting our Labs alight with fast benchmark scores, considering it's the cheapest laptop here it did very well; scoring 192 in Sysmark, which

earned it third place on the podium. Although its PCmark result of 2,647 was the lowest here, it will still outperform single-core notebooks running at the same clock speed.

Primarily designed as a business notebook, the TM4202 comes with the Intel 945GM integrated graphics chipset. It can't cope with 3D games and wouldn't even run our 3Dmark or Far Cry frame rate tests, even though up to 224MB of system memory can be allocated to the graphics.

The 15.4in WXGA screen operates at a native resolution of 1,280 x 800 and is clear and bright. It's not as crisp as the Sony or Toshiba screens, but good enough to watch DVDs and use Windows comfortably.

The smallish 60GB hard disk is about right for a notebook of this price, and the multiformat DVD writer is also par for the course.

At 2.7kg, the TM4202 is reasonably light, but its two hours, 45 minutes battery life won't even get you from London to Liverpool.

Apart from some basic media software, Norton Antivirus and Acer's bespoke 'Empowering Technology' applications, there's not much else to write home about. An S/PDIF socket resides on the front with other audio sockets and a WiFi radio switch, but along with the usual ports and connections, that's about it.

In all, it's a basic dual-core notebook that won't win awards for speed but does a solid and admirable job.



Verdict

Pros Cheap; solidly built; good screen

Cons Small hard disk; poor graphics; battery life could be better

Features



Performance



Value for money



Overall Fantastic value for money and surprisingly fast in some areas; a basic but solid offering



Evesham Voyager C550

Price £1,149 Contact www.evesham.com



Evesham's Voyager C550 may be one of the most expensive notebooks here, but those extra pounds have gone a long way to boosting its speed and specifications. At a clock speed of 2GHz, the Intel Core Duo T2500 is the joint fastest processor here and, with 1GB of DDR2-677 Ram, allowed the Voyager C550 to rip through our benchmark tests.

Its final figures were 3,971 in PCmark and an overall rating of 198 in Sysmark 2004 SE, which

were by far the speediest results we encountered in this group.

Graphics are also top notch, thanks to the 256MB ATI Mobility Radeon X1600 graphics chip pushing polygons faster than anything else here. A 3Dmark05 result of 3,371 and a zippy 62.92 frames per second (fps) in Far Cry means this notebook will hold its own at gaming parties and with other graphics-intensive applications.

The 15.4in WXGA X-Bright screen displays a native resolution of 1,280 x 800 and is incredibly composed – the lack of horrible tearing or distortion when knocked is testament to how far notebook displays have improved over the past few years.

The 80GB hard disk is one of the biggest here and the DVD writer supports all disc formats bar DVD-Ram.

The Windows MCE (Media Center Edition) operating system and a few other pieces of software are included. There's a mini control panel on the front for media navigation. No TV tuner is built in, so to make full use of MCE you'll have to factor this into the overall cost. A DVI port and 5.1 soundcard are welcome attributes, as is the high-quality voice recorder built into the lid.

However, at two hours, 15 minutes before needing a recharge and weighing 3.2kg (almost as heavy as the 17in Toshiba), it's by no means the most portable notebook on test.



Verdict

Pros Great system performance; graphics; screen; Windows Media Center

Cons Heavy; poor battery life

Features



Performance



Value for money

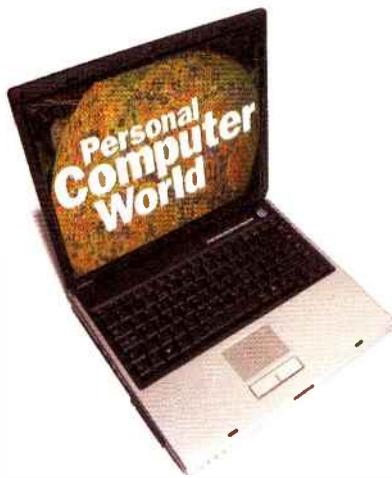


Overall At the higher end of the budget price bracket, but the extra money is put to very good use



Mesh Discovery D2400PCW

Price £899 Contact www.meshcomputers.com



In the company of five widescreen notebooks, the Mesh Discovery D2400PCW, which has a 4:3 aspect ratio 15.1in SXGA+ display, looks rather large, even when compared to the 17in Toshiba. However, at 2.65kg it's still portable.

Inside the slim chassis lies one of the more powerful processors featured here – Intel's Core Duo T2400, which runs at a clock speed of 1.83GHz. Add 1GB of DDR2-533 memory to the mix and you have a

notebook that will cope convincingly with the latest software applications. This was confirmed by its speedy Sysmark 2004 SE rating of 196 and a PCmark05 score of 3,111 – both of which were at the higher end of the charts.

Unfortunately, the same cannot be said of its 3D graphics. The integrated Intel 945GM graphics chipset just isn't gutsy enough to cope with the demands of resource-hungry 3D games and wouldn't even run our 3Dmark05 benchmark. It did obtain a Far Cry frame rate score, though, albeit a weedy 6.23fps.

The 15.1in screen runs at a native resolution of 1,400 x 1,050 but doesn't present the sort of clarity and definition produced by the Sony, Toshiba and Evesham models.

As with every other notebook here, the Discovery has a multiformat DVD writer. It also boasts an 80GB hard disk.

The chassis feels quite plasticky, but seems rugged enough for everyday use. Battery life is good, and the Discovery will play a DVD for over two and a half hours before needing a recharge.

Like many Mesh computers, this D2400PCW comes with an impressive range of software and a one-year collect-and-return warranty. It's also the only notebook here with a built-in webcam in the lid.

Verdict

Pros Fast system performance; reasonable battery life; good software bundle

Cons Heavy; poor graphics; average screen



Features



Performance



Value for money



Overall As usual, Mesh manages to squeeze in some powerful components and software while keeping the price down



Rock Pegasus 330

Price £880 Contact www.rockdirect.com



Unlike some of the business-oriented notebooks here, Rock bills its Pegasus 330 as a 'mobile-entertainment centre'. However, other than a bundled TV tuner, we're not sure what makes it that different from the other models here.

To keep costs down, Rock has used an Intel Core Duo T2300 (1.66GHz), which is at the budget end of the dual-core line, and has fitted 512MB of DDR2 Ram into its small, yet chunky frame. A Sysmark 2004 SE

score of 172 is comparable to the similarly specified Sony and a result of 2,873 in PCmark05 makes it one of the slower performing notebooks on test, but quicker than most single-core notebooks running at this frequency.

The Rock has an 80GB hard disk, which is 20GB more than two of the other notebooks on test here. This will be valuable when using the TV tuner, a USB DVB-T model, to record TV. If things do fill up, there's a multiformat DVD writer to store data offline.

The 13.3in WXGA screen is coated with Rock's X-Glass technology that makes Windows look sharp and movies clear and crisp, although it's not as insensitive to knocks as Evesham's display.

Contrary to Rock's description of the Pegasus 300 as a mobile entertainment centre, the Intel 945GM integrated graphics only just managed to run 3Dmark05, scraping a score of 451, with 6.36fps in Far Cry – nowhere near the power needed to run the latest games.

It weighs only 2.15kg and lasted for two hours, 43 minutes playing a DVD, enough for a feature film. It also has a 'silent mode' which did quieten things down. An 'instant on' function can be used to access digital videos, music and TV without having to load Windows.

I/O connectivity is pretty sparse – three USB ports, mini-Firewire, VGA, S-video, network, modem, memory card reader and PC card – but there is integrated WiFi and a few pieces of bundled software.

Verdict

Pros USB digital TV tuner; 80GB hard disk; lightweight and portable

Cons Poor overall performance; only two USB ports



Features



Performance



Value for money



Overall There are quicker and cheaper notebooks here, but if you need smaller and lighter the Pegasus could be the one to go for



Sony Vaio VGN-SZ1M

Price £1,199 Contact <http://vaio.sony-europe.com>



We're almost bored of saying it, but if you want a stylish notebook, Sony Vaios usually fit the bill. The sub-2kg VGN-SZ1M has a brushed-aluminium chassis and black carbon fibre-look lid among its classy attributes. Its edges and corners are smooth enough to make some of the clunkier models here look positively primeval.

Inside the casing is one of the slower dual-core processors here; an Intel Core Duo T2300 (1.66GHz).

However, this and 512MB of DDR2-533 Ram (upgradeable to 2GB) still notched up 3,248 in PCmark05, which puts it bang in the middle of its peers. Sysmark 2004 SE was less impressive at 170, which was the lowest rating of the group.

The 80GB hard disk is what we should expect for its size, but not the price, and the multiformat DVD writer is on hand to archive data.

The appearance of an Nvidia Geforce Go 7400 graphics chip was welcome, but with only 64MB of dedicated memory it didn't cope too well with the visual effects you'll find in today's 3D games. A score of 1,805 in 3Dmark05 and 39.11fps in Far Cry mean games will be playable on the rather small 13.3in display but won't zip along as on the Evesham.

Windows looks fantastic on the 1,280 x 800 WXGA X-Black screen. Battery life was even more impressive, scoring three hours and 21 minutes in our Mobilemark 2005 productivity tests.

Other plus points include a power-saving switch to flick between 'stamina' and 'speed' settings, a springy yet sturdy keyboard and integrated 802.11a/b/g wireless networking. The inclusion of only two USB ports may deter those after desktop replacement, but for style on the move it's a great choice, as long as Sony delivers on its promise to beef up its customer-support operation (see <http://tinyurl.com/r5vul>).

Verdict

Pros Fantastic lightweight design; reasonable performance; loads of software

Cons Expensive for what you get

Features

Performance

Value for money

Overall As expected, Sony's budget dual-core notebook is the most expensive here but it's by far the best designed and offers great style and portability



Toshiba Satellite P100

Price £1,056.33 Contact <http://uk.computers.toshiba-europe.com>



Toshiba's dual-core entrant is the only model here with a 17in WXGA+ screen. However, while similarly sized notebooks of yesteryear would weigh more than the weekly shopping, the Satellite P100 comes in at 3.4kg, which is just about on the limits of portability in our books.

On paper, its Intel Core Duo T2300 (1.66GHz) processor and 512MB of DDR2-533 Ram (expandable to 4GB) should be just as fast as the Sony. However, it

managed to score 3,540 in PCmark05 and an overall rating of 185 in Sysmark 2004 SE, which isn't as quick as the Evesham, but is better than most of the models here.

For such a large notebook we expected a hard disk bigger than 60GB; but for this price, something had to give. There is a multiformat DVD writer to back up data.

Another good inclusion for the price is the 128MB Nvidia Geforce Go 7600 PCI Express graphics, which managed just 1,884 in 3Dmark05 but an impressive 50.12fps in Far Cry. At its native resolution of 1,440 x 900, Windows, movies and software applications all look great on the Trubrite display.

As expected for a notebook of this size, battery life suffered. Cutting out an hour and 20 minutes into a DVD movie means it won't be away from the mains for very long before needing more juice.

The software bundle isn't a patch on Sony's, but it does have integrated Bluetooth and a fantastic set of Harman Kardon speakers, which are built into the front edge and emit a space-age blue glow.

There are six shortcut keys under the display for quick access to multimedia controls, one of which is an instant-on button for accessing media without booting Windows. A DVI port, S-video and four USB ports are dotted around the case and there's room for a dedicated numeric keypad. The trackpad could have been bigger, but it's still an impressive multimedia system.

Verdict

Pros 17in WXGA+ display; good performance

Cons Poor battery life; small trackpad

Features

Performance

Value for money

Overall A great effort by Toshiba. We weren't expecting a 17in notebook and the Satellite Pro proved its worth in every area bar battery life



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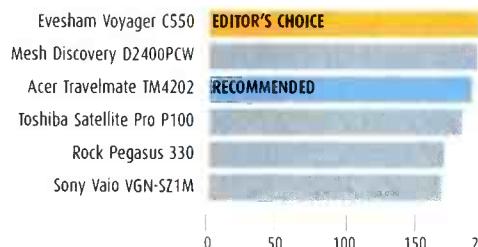
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Lab results

As expected, these notebooks produced a wide range of results, and the greatest variation was seen in graphics performance

Sysmark 2004 SE (overall)



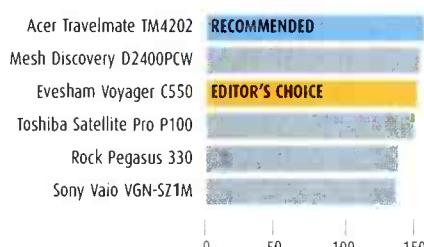
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Sysmark 2004 SE Internet content creation



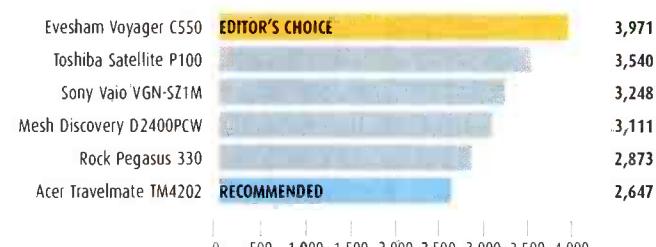
Bigger is better

Sysmark 2004 SE office productivity



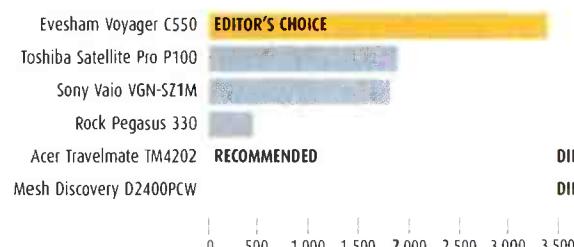
Bigger is better

PCmark05 (overall)



Bigger is better

3Dmark05 (1,024 x 768 in 32bit colour)



Bigger is better

Far Cry (1,024 x 768 in 32bit colour)



Bigger is better

Cinebench 1 CPU



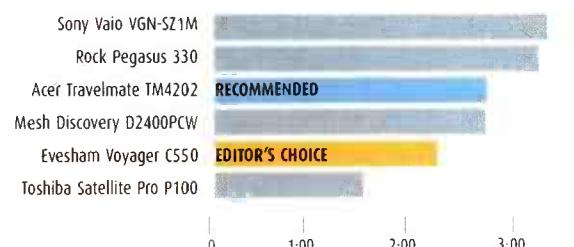
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Cinebench 2 CPUs



Bigger is better

Mobilemark 2005 productivity (hours:minutes)



Bigger is better

Mobilemark 2005 DVD playback (hours:minutes)



Bigger is better

Please see page 109 for an explanation of how we tested the notebooks

Dual-core laptops



MANUFACTURER		ACER	EVESHAM
Model name	Travelmate TM4202	Voyager C550	
Price inc VAT	£649	£1,149	
Sales telephone	0800 161 3060	0870 160 9500	
URL	www.acer.co.uk	www.evesham.com	
HARDWARE			
Processor	Intel T2300 (1.66GHz)	Intel T2500 (2GHz)	
Chipset	Intel i945GM Express/ICH7-M	Intel i945GM Express/ICH7-M	
Available memory/type	512MB/PC2-4300 DDR2	1GB/PC2-4300 DDR2	
Occupied/spare memory slots	1/1	2/0	
Hard disk manufacturer and model	Seagate ST960812A	Western Digital WD800UE	
Hard disk size	60GB	80GB	
No of PCI Express card slots	0	0	
No of PC Card slots	1	1	
No of Firewire/serial/parallel/PS/2 ports	0/0/0/0	1/0/0/0	
No of USB ports	4	4	
MULTIMEDIA			
Optical drive	LG GSA-4082N	Sony DW-Q58A	
Optical drive formats and speed (max)	8x DVD, 8x DVD-/+R, 4x DVD -/+RW	8x DVD, 8x DVD-/+R, 8x DVD+RW, 4x DVD-RW, 4x DVD-/+R DL	
Soundchip	Realtek	Realtek	
Graphics type/memory	Integrated Intel GMA950/64MB shared system memory	ATI Mobility Radeon X1600/512MB	
Screen size and (maximum resolution)	15.4in WXGA/1,280 x 800	15.4in WXGA/1,280 x 800	
OTHER INFORMATION			
Misc hardware/modem	10/100 Lan, 56K modem	Gigabit Lan, 56K modem, 4-in-1 card reader	
Wireless technology	802.11a/b/g	802.11a/b/g	
Weight including/excluding AC adapter (kg)	3.1/2.7	3.5/3.2	
Dimensions (w x d x h) mm	358 x 269 x 29.8/33.8	354 x 284 x 35.2	
Operating system	Windows XP Professional	Windows Media Center Edition	
Bundled software	Acer Empowering Technology bundle, Acer Launch Manager, Cyberlink PowerDVD, NTI CD Maker, Norton Antivirus		
Standard warranty (RTB = return to base, C&R = collect and return)	1yr International Travellers Warranty		
SCORES	★★★★★		
Features	★★★★★		
Performance	★★★★★		
Value for money	★★★★★		
OVERALL	★★★★★		



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<http://vaio.sony-europe.com>

TOSHIBA

Satellite Pro P100
£1,056.33
0870 444 8944
<http://uk.computers.toshiba-europe.com>

Intel T2400 (1.83GHz)
Intel i945GM Express/ICH7-M
1GB/PC2-4300 DDR2
2/0
Fujitsu MHV2080BH
80GB
0
0
1/0/0/0
3

Intel T2300 (1.66GHz)
Intel i945GM Express/ICH7-M
512MB/PC2-4300 DDR2
1/1
Fujitsu MHV2080BH
80GB
0
1
1/0/0/0
3

Intel T2300 (1.66GHz)
Intel i945GM Express/ICH7-M
512MB/PC2-3200 DDR2
2/1
Seagate ST98823AS
80GB
0
1
1/0/0/0
2

Intel T2300 (1.66GHz)
Intel i945GM Express/ICH7-M
512MB/PC2-4300 DDR2
2/1
Fujitsu MHV2060BH
60GB
1
1
1/0/0/0
4

Sony DW-Q58A
8x DVD, 8x DVD-/+R, 8x DVD+RW,
4x DVD-RW, 4x DVD-/+R DL
Realtek
Integrated Intel GMA900/64MB
shared system memory
15.1in/1,400 x 1,050

Sony DW-Q58A
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4x DVD-RW, 4x DVD-/+R DL
Realtek
Integrated Intel GMA950/224MB
shared system memory
13.3in WXGA/1,280 x 768

Matshita UJ-842D
8x DVD, 4x DVD-/+R, 2.4x DVD-RW,
2x DVD+RW, 2.4x DVD+R DL
Sigmatel
Nvidia Geforce Go 7400/128MB
13.3in/1,280 x 800

LG GMA-4082N
8x DVD, 8x DVD-/+R, 4x DVD-/+RW,
2.4x DVD+R DL, 2x DVD-R DL
Conexant
Nvidia Geforce Go 7600/128MB
17in WXGA+/1,440 x 900

Gigabit Lan, 56K modem, 3-in-1 card
reader, 1.3megapixel camera
802.11a/b/g
2.95/2.65
333 x 276 x 33
Windows XP Home

Gigabit Lan, 56K modem,
3-in-1 card reader
802.11a/b/g
2.4/2.15
316 x 224 x 31.9
Windows XP Home

10/100 Ethernet, 56K modem,
Magicgate card reader
802.11a/b/g
2.3/1.85
315 x 234.3 x 21.8
Windows XP Professional

Gigabit Lan, 56K modem,
3-in-1 card reader
802.11a/b/g/Bluetooth
3.8/3.4
394 x 275 x 35.9
Windows XP Home

Microsoft Works 8.5, Cyberlink
PowerDVD 5, Power2Go 4,
Powerproducer 3, Powerdirector 3,
Mediashow SE, PowerDVD Copy Pro,
Powercinema 4

Roxio Creator 7, Microsoft Works 8,
Bullguard Antivirus (1yr), MS Office
2003 (2mth), Napster (1mth)

Adobe Acrobat Professional (Try &
Buy) 7, Adobe Acrobat Elements 7,
Adobe Reader 7, Microsoft Works 8,
Microsoft Office 2003 SBE (Try & Buy),
Sonicstage 3.3, Sonicstage Mastering
Studio 2.1, DSD Direct, Adobe Premiere
Elements 2, Adobe Photoshop Elements
4, DVgate Plus 2.2, Vaio Edit
Components 6, WinDVD 6 for Vaio,
Roxio Digitalmedia SE 7, Click to DVD
2.5, Utimaco Privatedisk easy
(Try & Buy) 1, Norton Internet Security
2005 Antispyware Edition,
Norton Ghost 10 (Try & Buy), Vaio
Recovery Utility 2.6 - HDD recovery

Configfree, Connectivity Doctor,
Microsoft Office OneNote 2003, Sonic
Record Now, Intervideo WinDVD Creator
(2Platinum), WinDVD, Toshiba Summit,
Norton Internet Security 2006 (includes
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1yr RTB

1yr international warranty



Benefits of a dual-core notebook

Dual-core computing isn't new; in fact, powerful servers have been using this architecture for quite some time and to good effect. In theory, it speaks for itself – bestow a computer with two processors on one chip and it should be able to deal with data much faster.

AMD and Intel's moves to unlock dual-core computing to consumers has seen the biggest reaction within the notebook market. The dual-core architecture means that the pressure to increase clock speeds can be sidestepped, resulting in less heat generation, which means less cooling is required, which means less bulky computers and potentially extended battery life. From what we've seen, the theory seems to work in practice. Sub-2GHz dual-core notebooks are performing much better in Windows and with applications than their single-core Pentium M counterparts. Battery life has, on the whole, also improved.

However, while benchmarking tools such as PCmark, Sysmark and Mobilemark will give us lots of lovely figures and charts to mull over, the real proof can only be seen with real-world multi-tasking and multithreaded tests, which unfortunately are still thin on the ground. Where the real advantage of dual cores lies is in the ability to run multiple programs and background tasks without affecting overall system responsiveness, which is a hard metric to measure.

In this world of multimedia and digital content, software is becoming more demanding, requiring more processing power to edit high-definition video and pause and record hours of TV. Computers, including notebooks, are transforming into home-entertainment devices, so boosting their ability to handle multiple tasks with the new dual-core architecture is not just something of esoteric interest for power users.

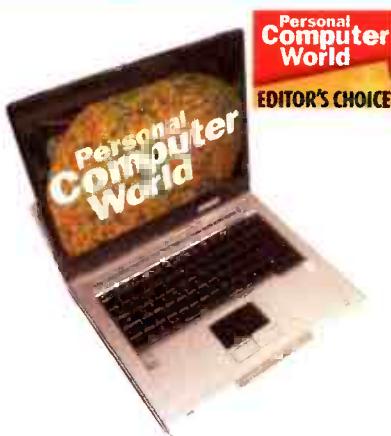
Nevertheless, while the Windows XP operating system is geared up to support multithreading and multitasking, presently not much software has been written to take advantage of these speedy CPUs. This usually means that both processors will be sharing all the work, using unnecessary resources and leaving users oblivious to any real benefit. (Tasks can be forced to use just one of the cores – launch the Task Manager, select the relevant process, right-click and choose 'Set Affinity', and untick one of the cores).

However, if you're in the market for a new notebook then, at these prices, a dual-core model is definitely the way to go. As previously mentioned, this technology is here to stay. As more software is written to take advantage of it, so dual-core notebooks will prove their worth. But as it stands, you'll be surprised at how much difference it can make to your daily computing experience.

Editor's Choice

Editor's Choice Evesham Voyager C550

Recommended Acer Travelmate TM4202



Evesham Voyager C550



Acer Travelmate TM4202

of all trades and master of none, but if the compromises made in terms of power to achieve good portability are acceptable, it's worth closer inspection.

For once, Sony's effort manages to represent better value for power and price. It's by far the best-looking notebook here, has the best battery life and the style-conscious will lap it up.

The Mesh and Evesham notebooks are very similar creatures, both scoring comparably in battery life and system performance. If you can live without 3D gaming then the Mesh Discovery is a safe bet; it will easily cope with most things thrown at it, and it isn't too heavy.

However, we think that the extra money spent on the Evesham is well worth it. For an extra £250 you get a faster processor, much better graphics, a far superior screen and a notebook that won't need replacing for a good few years. It could be lighter but it's fine for the occasional road trip and the inclusion of Windows Media Center makes it more of an all-rounder.

It's for these reasons that we give the Evesham Voyager C550 our Editor's Choice crown and the great-value Acer Travelmate

When planning this group test, we weren't expecting to get three notebooks under £1,000. But this shows how much the price of dual-core technology has already dropped. It's also interesting to see how much of a difference that extra core is making, especially when compared with similar single-core notebooks running at the same frequency – visit our online Labs database to see for yourself (www.reportlabs.com/testbed).

Acer should also be commended for building a dual-core notebook for under £650, even if it did under-perform in a few areas. However, its Sysmark 2004 SE score of 192 was one of the best here and, providing you're not looking for a lightning-quick notebook, loads of

storage space or a games machine, it's a fine choice and comes well recommended for those on a tight budget.

In the same money-saving vein, Toshiba has done wonders to create a 17in notebook that excels in most areas, including gaming. It looks good, weighs less than you would think and will speed through software applications. One benefit of Intel's Core Duo is extended battery life. However, the juice-hungry Satellite Pro P100 isn't the best example of this technology as it will power down less than two hours after being untethered from the mains.

If you're looking for a portable dual-core notebook, the Rock Pegasus is small, lightweight and offers excellent battery life. It may be a jack

'The Acer comes well recommended for those on a tight budget'

ASUS recommends Windows® XP Professional



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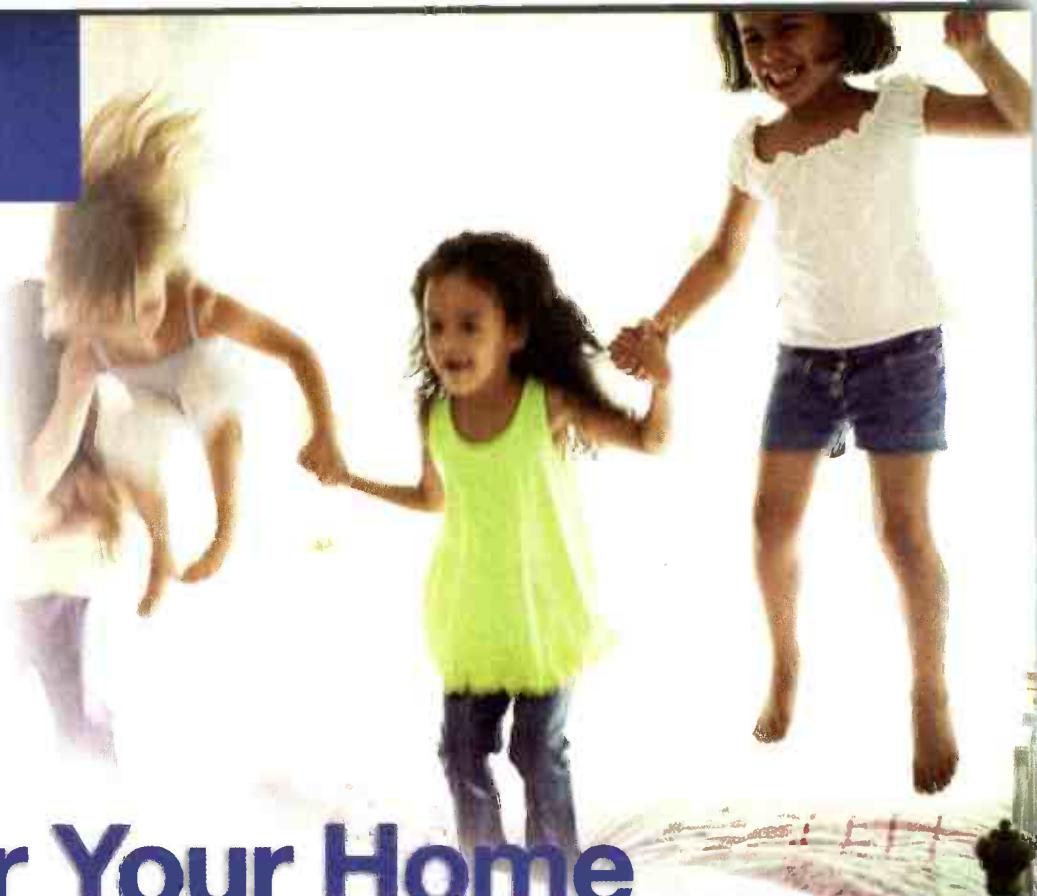
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CISCO SYSTEMS





ON TEST

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'The hassle-free approach to securing your computer is to install an all-in-one Internet security suite'

Safe surfing

As the list of Internet threats grows daily, so online safety needs to be a top priority. Paul Monckton puts six key security suites to the test to help improve your surfing safety

Life on the Internet just isn't safe. Every day there's more to worry about: hackers, viruses, spyware, email scams, spam, phishing, ID theft, Wifi exploits, the list goes on. Fortunately, there's plenty of software out there to help protect you from such unscrupulous individuals and malware, but do you really have the time to keep track of it all?

The hassle-free approach to securing your computer is to install an all-in-one Internet security suite. Look at the benefits. First, they're much cheaper than buying the components separately.

Second, not only will they provide one simple installation and a single user interface for all components, but also the tedium of keeping them up to date usually happens in one centralised, automated process, which is a much tidier solution than having several distinct

programs all updating themselves at different times. You also get to receive all your up-to-date information about current threats and virus outbreaks all in one place.

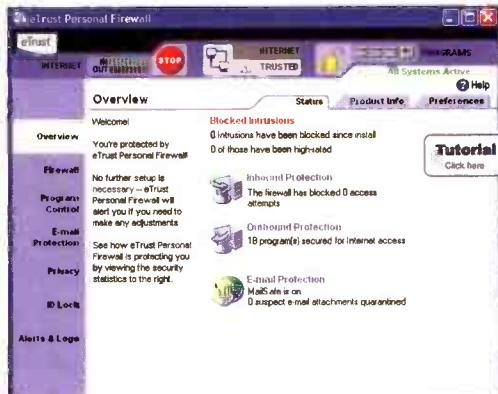
We've chosen to look at six of the most popular Internet security suites on the market. All of them contain a firewall and anti-virus program as a minimum, but some also provide protection against identity theft, anti-spam software and parental controls, while those with dedicated Wifi support will keep you secure while surfing in public hotspots.

With yearly subscriptions ranging from £38 to £54.99 there are various combinations of utilities to suit different requirements and budgets for novices and experts alike. We've rounded up six key security suites and put them to the test to see what's best for you and what to avoid.



CA Etrust Internet Security Suite

Price £39.95 Contact www.ca.com/uk



The Etrust Personal Firewall is a version of Zone Labs Zonealarm

The clean, uncluttered interface of CA's Etrust Internet Security Suite displays a clear status summary of the product's four main components: CA's EZAntivirus, a personal firewall, anti-spyware and anti-spam. However, each of these programs actually runs as a separate entity, each with its own icon in the Windows system tray.

On launch, the sharp-eyed among you will notice that the Etrust Personal Firewall is a version of Zonealarm (see page 128). Apart from the Etrust

branding, this interface is identical to the Zonealarm security suite, minus the anti-virus/anti-spyware options, which appear elsewhere, and Zonealarm's instant messaging (IM) security, which isn't provided here.

Bucking the current trend, anti-virus and anti-spyware are separate programs, the anti-spyware component being the popular Pestpatrol product acquired by CA in 2004. It can carry out scheduled and continuous scans, while two levels of scan provide a full, deep scan as well as a quick scan which takes only a few seconds to check locations where spyware most commonly installs itself.

We feel the product could benefit from better integration of its components: While anti-virus and anti-spam can be updated directly from the main window, the firewall cannot and it must be updated from within the firewall itself. Although the individual products are easy to use, they have quite different user interfaces. The built-in help also occasionally refers to features found only in CA's Etrust EZ Armor product.

Etrust Internet Security Suite may lack some of the features of other products, such as parental controls and IM protection, but it's an effective and inexpensive option for those who don't need them. Those with a desire for more functionality should consider Zonealarm Internet Security Suite, which uses the same firewall and anti-virus software but with extra features.

Verdict

Pros Ease of use; price; Zonealarm firewall

Cons No parental controls; not the best product integration; lack of configuration options

Features

★★★★★

Ease of use

★★★★★

Value for money

★★★★★

Overall Etrust Internet Security Suite provides all the basic protection measures at a keen price, but lacks sophisticated advanced control

★★★★★

McAfee Internet Security Suite 2006

Price £49.98 Contact <http://uk.mcafee.com>



McAfee's Securitycenter replaces Windows XP SP2's Security Center entirely

Like other packages, McAfee Internet Security Suite 2006 uses a single, integrated front end to access all the components. However, going one step further than most, McAfee replaces Windows XP SP2's Windows Security Center.

The status of your anti-virus, firewall, privacy service and anti-spam can all be monitored from here as well as five security indices, which report on your current overall level of security as well as individual anti-virus, anti-hacker, anti-abuse and anti-spam

configurations. However, it's not made clear to the user what these terms mean.

Installation is quite straightforward, but once complete it's apparent the software has taken control of your PC. Once installed you're required to first log in to McAfee's Privacy Service to access the Internet. If you're using a shared computer, each user should have their own account. The privacy service login window appears on top with no minimise button and attempts to browse the Internet without logging in will fail.

After installation, our security index was less than optimal, although no pop-up warning alerted us to that fact – we had to go and look in the Security Center to find out. After setting up a McAfee security account online and enduring a total of seven reboots our system was finally fully up to date.

Parental controls come under the control of the Privacy Service and consist of URL and keyword blocking, but you'll have to build up your lists of banned and approved sites yourself. From here you can also block ads and cookies on a per-user basis.

There are many sophisticated configuration options available, as well as tutorials and easy setup wizards. But the main setup doesn't take you through these procedures, so you have to go and find them yourself. And in our opinion, running the firewall setup is a crucial step in securing your system and shouldn't be optional.

Verdict

Pros Good set of features; automatic updates

Cons Laborious login procedure and initial setup; incomplete initial setup with multiple reboots

Features

★★★★★

Ease of use

★★★★★

Value for money

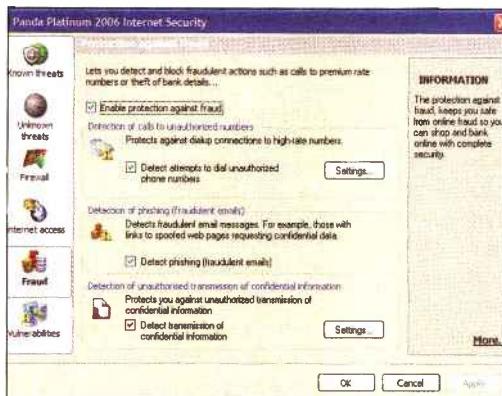
★★★★★

Overall Far too many reboots and not enough hand-holding for novice users, but powerful and relatively easy to use once you get going

★★★★★

Panda Platinum 2006 Internet Security

Price £44.99 Contact www.pandasoftware.com/com/uk



More detailed control is hidden behind the scenes, with sophisticated control over most options

The latest version of Panda's tried and tested Platinum Internet Security software adds many new functions to an already rich selection of programs including anti-virus, a personal firewall and web content filtering.

New to the 2006 version are privacy controls dedicated to protecting sensitive data, while anti-spyware, anti-spam, dedicated WiFi support and anti-phishing controls bring the package up to date with modern security threats, especially to mobile users.

Unlike McAfee's product, Panda automatically updated itself in the background without the need for configuration and popped up an alert to confirm that our test PC was protected. These alerts can be turned off, but it's good to show a first-time user what's going on.

Panda's main control window is simple and clear. From this status display you can drill down into the individual settings, which are clearly explained. It is necessary to register your software online to receive updates. You're given a username and password, which Panda enters into your software configuration for you.

Daily automatic updates are accompanied by alerts whenever there is a current high risk of virus infection, but Panda's new 'Truprevent' system analyses all running processes, checking for suspect and potentially damaging behaviour and increasing Panda's chances of blocking malware even before updates are made available. This is in addition to the more common heuristic scan methodology that scans for virus-like code within programs.

Web content control must be installed manually, but it comes with an easy configuration wizard that lets you select different classes of user, such as 'teen' or 'kids' with predefined access control lists you can then modify yourself. If you don't need anti-spam, privacy control or web filtering, consider Panda Titanium 2006 Antivirus and Antispyware for £31.99.

Verdict

Pros Easy to install and use; not intrusive

Cons Price; tidy control panel, but harder to access expert functions

Features

Ease of use

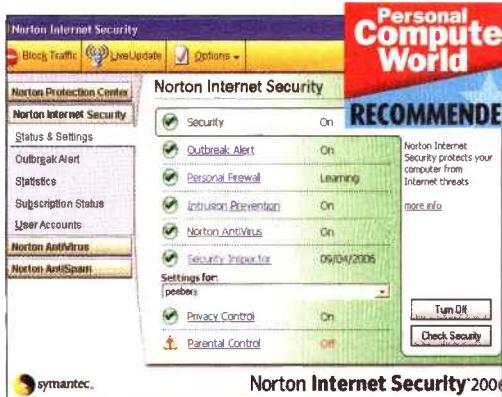
Value for money

Overall Panda Platinum 2006

Internet Security offers powerful pre-emptive anti-virus protection but lacks some of the features of the bigger packages

Symantec Norton Internet Security 2006

Price £54.99 Contact www.symantec.com



Symantec crams in a lot of information without sacrificing usability or clarity

The most expensive of the suites reviewed here, Symantec's Norton Internet Security 2006 is a flexible and feature-rich product with the ability to integrate with other products from Symantec.

Your £54.99 per year buys an integrated suite, comprised of a firewall, anti-virus (with anti-spyware) and anti-spam software. These are contained within Norton's 'Protection Center'. You also get placeholders allowing you to include features from Norton Systemworks with a link to buy extra software.

Its well laid out, hierarchical interface presents the basics in a way that's easy to read while providing access to the very deepest of settings, including writing your own firewall rules, by drilling down into the menus.

Setup was reasonably painless. The firewall starts up in 'learning' mode, adding programs to the list of those allowed to use the Internet as it goes. This avoids issues where the user has to know whether or not to grant access to processes they may never have heard of, before the software is fully up and running and able to guide their choices. Outbreak alerts sent from the web and very clear status information give you a strong sense of security.

A built-in security inspector checks for common situations that can compromise your Windows system security. These include inappropriately shared folders, user rights and poorly configured Windows services as well as guessable passwords and inappropriate entries in the Hosts file entries that could be used to redirect web page requests.

Parental controls extend beyond simple blocking of websites to Usenet newsgroups and control over which classes of applications can be run. You could, for example, lock out instant messaging or networked games. All of these settings are configurable on a per-user basis, which is ideal for a shared family computer.

Verdict

Pros Supports any Pop3/SMTP email client; sophisticated parental controls with per user settings; automatic updates

Cons Price; Windows 2000/XP only; integrates fully only with Microsoft Outlook/Outlook Express

Features

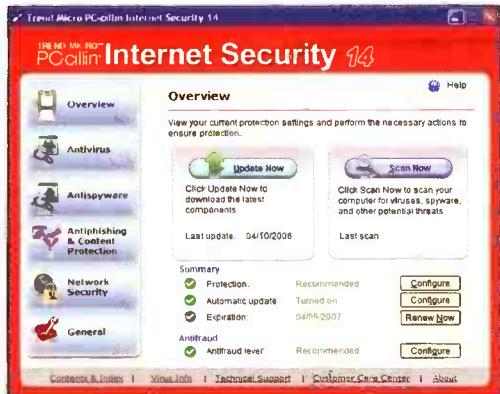
Ease of use

Value for money

Overall A highly recommended, if pricey, suite of essential Internet security measures that's easy to use and update

Trend Micro PC-Cillin Internet Security 14

Price £38 Contact <http://uk.trendmicro-europe.com>



PC-Cillin will give you an overview of your system, with options to run different checks

PC-Cillin Internet Security 14's installation is complemented by tutorials guiding you through configuration. The 'Getting Started' tutorial takes you through how to configure security in a way that's appropriate to network environment and usage.

However, the setup didn't run without a hitch. Before completion, the firewall notified us of an outgoing connection attempt. In the absence of a suggested action, we decided to block the connection which then turned out to be vital to the setup.

The anti-virus and anti-spyware tools are fairly discrete, but the options for running each are very similar, with manual and scheduled scans, quarantine management and realtime protection for both.

Trend Micro's anti-spam offering, available free of charge online, hasn't been integrated into the main installation. Instead, it's provided as a separate install that involves following the instructions in a text file. We found this rather disappointing considering PC-Cillin's excellent usability in other areas. It's also only compatible with Microsoft Outlook and Outlook Express.

A powerful anti-fraud system uses web filtering, which is also used to provide parental controls, to block access to known fraudulent sites and prevent attempts to add spoof entries into the Windows Hosts file. Slightly annoying is the fact that parental control has a single global filtering list that applies to all users.

Privacy protection blocks your PC from transmitting sensitive data over the Internet. As with other implementations of this feature it's more important not to use common words as passwords, as these may be blocked by the system and alert the PC user via a pop-up box that they've typed your password.

PC-Cillin has the ability to control other copies of the software on your network, giving you the ability to manage updates and check vulnerabilities remotely to keep your entire workplace or household secure.

Verdict

Pros Helpful installation and online help; remote management; ease of use

Cons Poor integration of anti-spam; no support for multiple user profiles on one PC

Features

Ease of use

Value for money

Overall Easy to use. Covers the main security areas but lacks some of the extras provided by competing products

Zonelabs Zonealarm Internet Security Suite 6

Price £49.95 Contact www.zonelabs.co.uk



Plain text descriptions accompany a well-structured interface with an animated tutorial

Based on Zonelabs' well-established Zonealarm firewall product, Zonealarm Internet Security Suite 6 incorporates anti-spyware and anti-virus from CA and includes instant messaging encryption.

The fully integrated user interface presents options in a way that's easy to understand. The front page contains a link to an animated tutorial and most security options have slider controls to select high, medium or low settings, complemented by fine tuning options tucked away behind 'advanced' or 'custom'

buttons. You can also turn on or off plain text explanations of the controls.

Zonealarm's firewall is a fully featured product that incorporates various forms of protection, including cookie management, ad blocking and control over mobile code such as VBscript, Javascript and ActiveX controls.

Unlike McAfee and Symantec's products, there's no provision for setting up individual profiles for multiple users on a shared PC. For example, the included parental controls allow you to block web pages by category, but you can't set up different profiles.

The highly configurable firewall is designed to run well with its default settings but there's plenty of user control over the type and number of alerts that are configured to pop up. Zonealarm's new 'triple defense' firewall installs the usual network firewall but also adds a 'program firewall' to protect running programs from attacks by malware and an 'OS firewall' which performs a similar function, protecting the OS itself from malicious modification. These are additional features not found in the version of Zonealarm supplied with CA Etrust Internet Security Suite.

On detecting a new network, you are prompted whether to add it to the trusted or Internet zones. This enables you to allow functions such as file sharing on your local network while blocking such requests from the Internet or public WiFi networks.

Verdict

Pros Well integrated software; powerful firewall; lots of features; very configurable

Cons Can be a little intrusive; no per-user settings; anti-spam works only with Outlook/Outlook Express

Features

Ease of use

Value for money

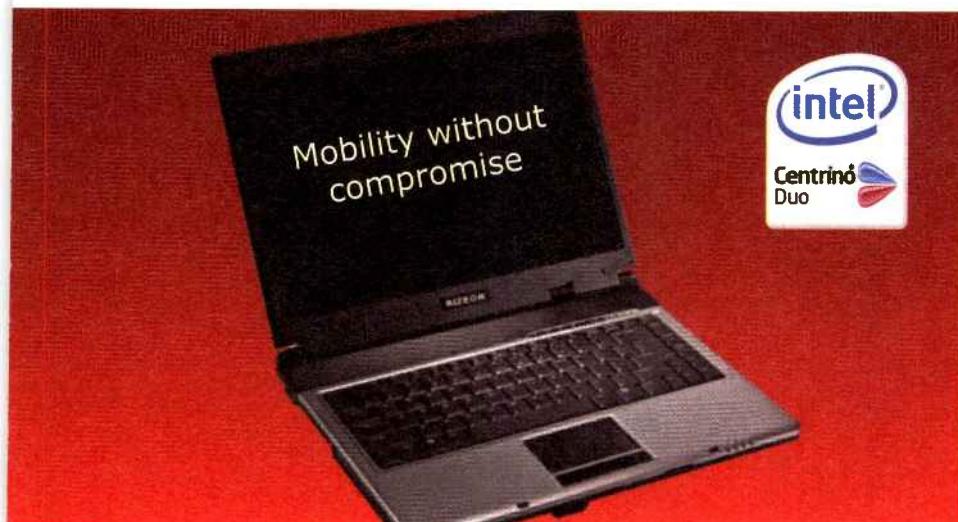
Overall An excellent all-round product with strong features and usability

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Extras	Extended download £2.99	Extended download £5.72; Backup copy on CD £10.56
Offers	N/A	Three users: £99.99
Length of subscription included	1yr	1yr
Purchase as download	✓	✓
Purchase physical shipment	✓	✓
URL	www.ca.com/uk	http://uk.mcafee.com
FEATURES		
Anti-virus	✓	✓
Instant messaging anti-virus	✗	✓
Anti-spyware	✓	✓
Heuristic detection	Not specified	✓
Detect virus-like activity	✗	✗
Phishing blocker	✗	✓
Specific Wifi intrusion detection	✗	✗
Fully integrated interface	✗	✓
Automatic security audit	✗	✓ (firewall)
Parental controls	✗	✓
FIREWALL		
Outbound program control	✓	✓
Automatic rule creation	✓	✓
Specific Wifi network support	✓	✗
ALERTS AND LOGGING		
Security event logging	✓	✓
Hacker tracking	✗	✓
SAFE SURFING		
Per-user settings	✗	✓
Internet privacy	✓	✓
Stops personal data transmission	✓	✓
Cookie management	✓	✓
Hosts file protection	✗	✗
Pop-up/under blocking	✓	✓
EMAIL PROTECTION		
Integrates with Outlook/Outlook Express	✓	✓
Supported protocols	Pop3/SMTP/Imap4	Pop3
Spam blocker	✓	✓ (Pop3, Mapi, web)
Blocks suspicious attachments	✓	✗
OTHER		
Outbreak alerts	✓	✓
Instant messaging encryption	✗	✗
Automatic updates	✓	✓
Bootable recovery CD	✗	✗
Creates rescue disks	✗	✓
Built-in tutorial	Partial	✗
Minimum system requirements	Windows 2000/XP: 128MB of Ram, 300MHz Pentium; Windows ME/98SE: 64MB of Ram, 233MHz Pentium; Outlook/Outlook Express: 55MB disk space	Windows 98/2000: 133MHz, 64MB of Ram; Windows ME: 150MHz, 64MB of Ram; Windows XP: 300MHz, 128MB of Ram, 100MB disk space; IE 5.5 or later
SCORES		
Features	★★★★★	★★★★★
Ease of use	★★★★★	★★★★★
Value for money	★★★★★	★★★★★
OVERALL	★★★★★	★★★★★



Windows 98/ME/2000 Pro/XP;
Pentium 300MHz; 128MB of Ram;
160MB disk space

Windows 2000/XP: 300MHz CPU;
256MB of Ram; 325MB disk space

Windows 98/98SE/ME/2000+SP4/XP
SP1/MCE 2004/2005: 128MB of Ram

Windows 98SE/ME/2000 Pro/XP:
Pentium III 450MHz, 50MB disk space;
Windows 98SE/ME: 48MB of Ram;
Windows 2000 Pro: 64MB of Ram;
Windows XP: 128MB of Ram



Putting together your own suite and free tools

While integrated software suites offer a simple one-step solution to Internet security, they're not right for everyone. You may already be perfectly happy with your current anti-virus software. Perhaps you're lucky enough not to be inundated with spam or just want to pick and choose from the utilities you like best. There are also many free tools available that can save you plenty of cash.

Most of the manufacturers in our round-up offer the major components of their suites as standalone products, although purchasing them this way often works out substantially more expensive than buying the suite. For example, Norton Anti-virus, firewall and anti-spam bought separately would cost you a total of £91.97, but only £54.99 for the suite. It's a similar story if you were to buy all of CA's component programs which would total £89.80.

Zonelabs' products seldom come as entirely standalone items. Zonealarm Anti-virus and Zonealarm Anti-spyware both sell at £19.95 each and come with the Zonealarm Triple Defence Firewall and Wireless PC Protection. In fact all but one of Zonelabs' paid-for products include its high-end firewall. If you want Zonelabs' Anti-virus and Anti-spyware at the same time you'll have to either buy both and get the firewall twice or go for the full suite.

With products like these it's seldom worth mixing and matching your Internet security components unless you have a very good reason to run a particular component. Furthermore, it may not even be possible to use the anti-virus of your choice in conjunction with a

software suite. Our test PC originally had Grisoft's free AVG anti-virus software running, but the installation of Norton Internet Security 2006 insisted that we remove it before the procedure could continue.

At the other end of the spectrum, Panda's Truprevent product is available for £19.99 as a standalone product. It complements your existing anti-virus solution by adding the same protection against unknown viruses available in Panda Platinum 2006 Internet Security. Its combined anti-virus and anti-spyware product is available on its own for £29.99.

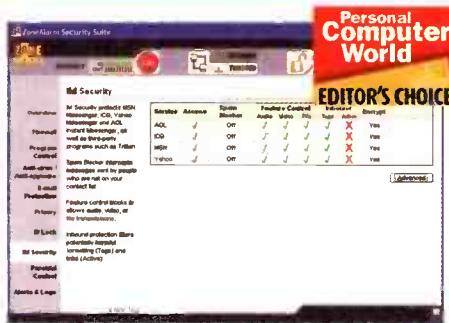
It's effectively very difficult to roll your own Internet security suite in a cost-effective manner from vendors who sell suites. However there are many less well-known standalone products that can co-exist quite happily, albeit without the integrated user interfaces provided by software suites. Unfortunately, your option is often either to go for a suite or obtain all the components yourself. It's not usually easy to change just one component in a suite for one you prefer, nor is it cost-effective to buy several individual suite components.

Thankfully, many excellent tools are available free of charge for personal and not-for-profit use. Firewalls, anti-virus, anti-spyware and spam blocking utilities are all available free and you can download them using our website (details below).

As a start we'd recommend AVG Free (anti-virus), Windows Defender Beta (anti-spyware), Zone Alarm (firewall) and Mailwasher (anti-spam).

Go to www.pcw.co.uk/downloads to get your free security tools

Editor's Choice

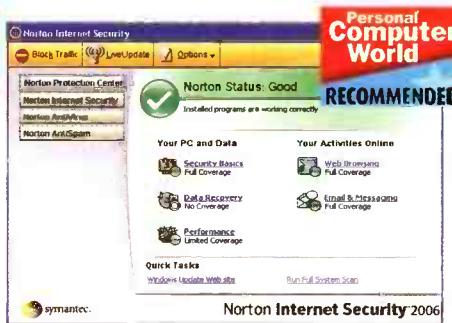


Zonelabs Zonealarm Internet Security Suite 6

There are many reasons to buy an Internet security suite. For many, it's simply a case of thinking 'I'd better have some sort of protection' without any real understanding of the threats. Others will have specific requirements: you may want a firewall that protects without becoming intrusive, or perhaps you want to control your employees' or children's surfing habits or just take control of spam email. Whatever your reasons, you'll want a product that's well integrated and easy enough to use without creating a pile of extra work.

We found it tough to choose an overall winner. The strong but basic features of

Editor's Choice Zonelabs Zonealarm Internet Security Suite 6 Recommended Symantec Norton Internet Security 2006



Symantec Norton Internet Security 2006

CA's Etrust Internet Security Suite are complemented by an aggressive price tag, but we felt better integration of its components is required before it becomes an ideal purchase.

Trend Micro's similarly priced PC-Cillin Internet Security 14 offers a better user interface but is let down by its 'bolt-on' anti-spam utility and lack of multi-user profiles. However, it does include a large number of features.

Panda's Platinum 2006 Internet Security is a solid performer with robust security protection against unknown malware and a good balance of features. It shields the novice user

well from confusing details, while providing key information in a clear manner.

The two most expensive packages in this round-up also turn out to be the best. Our Recommended award goes to Symantec Norton Internet Security 2006. Its comprehensive feature set goes hand in hand with excellent usability.

Without confusing the user with too much information, the Norton Protection Center provides easy access not only to all the many features, but also to online information in a clear and concise manner. At £54.99, it's the price that precludes it from receiving our Editor's Choice award, which goes to Zonelabs Zonealarm Internet Security Suite 6.

Zonealarm uses the same anti-virus engine and an enhanced version of the same firewall as CA's Etrust Internet Security Suite, but Zonealarm Internet Security Suite a much more coherent package with significant extra features. Data encryption and malware protection within instant messaging clients is becoming increasingly valuable and specific detection of fraudulent or phishing emails helps protect you from social engineering attacks. **PCW**



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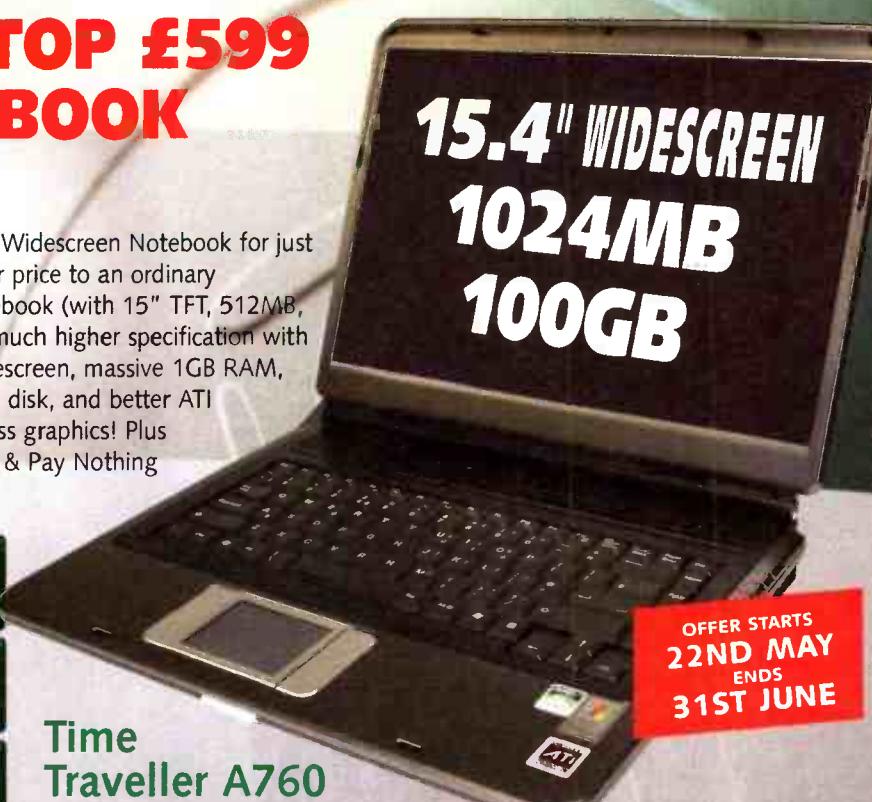
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FIND THE RIGHT IT SOLUTION

Remember when all you needed to run your business was a sharp pencil and a shoebox to file the receipts in? OK, maybe not, but times have certainly changed and few companies can now survive without IT.

The good news is that it's never been cheaper or, thanks to the web, easier to buy what you need. The bad news is that it isn't necessarily any easier to use, especially when you want to spend your time running the business rather than searching for the right small-business IT solution.

But don't give up just yet; our Business feature this month is all about the IT essentials no company can do without. No frills, no fuss, just good old-fashioned advice on what to buy, how much to pay and where to get it.

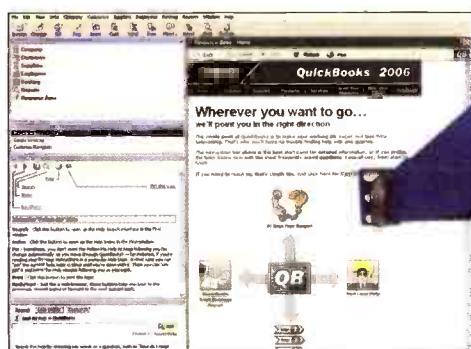
Plus we've reviewed some of the latest products, from the hardware needed to build a small-business network to the accounting, database and security software you'll want to run on it. It's all here – just read on.

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Left: Intuit Quickbooks Pro 2006 suits all levels of user

Above: Google Mini enables full searches at a budget price

OUR SCORING

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

OUR AWARDS

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

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

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



Editor's Choice
Business

Recommended
Business

Great Value
Business

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

'Sorting out the essential business tool from the passing fad can be difficult, especially if you're new to the game'

Read the feature on page 136

Essential IT tools

Every business relies on IT these days, but it can be hard to tell a crucial tool from the latest fad. Find out which hardware, software and services your small enterprise really needs

Being large or small, no business can manage without IT nowadays. But deciding what's important and sorting out the essential business tool from the passing fad can be difficult, especially if you're new to the game. In this feature we're concentrating on the essentials, to point you – the small-business buyer – at the hardware, software and services you really need.

Hardware must-haves

There's no lack of advice about choosing a PC, so we'll assume you've a desktop or two already, and maybe a couple of notebooks. But they may not be networked, which has to be the first step in building your IT infrastructure.

Networks (also known as local area networks or LANS) make it easy to share information and don't have to be expensive. An Ethernet switch, for example, costs around £50, and ready-made cables from just a few pounds. Most modern PCs will have compatible networking interfaces and, if they don't, a plug-in card or USB Ethernet adapter shouldn't cost more than £20 to £30.

Printers with network interfaces are available, but not essential, as a printer

Accounting software can be used to file PAYE and other returns online

attached to a networked PC can be shared with others. Wireless is tempting, but relatively slow, and on a business network only essential to support mobile workers. If you want a wireless network, you can connect users to the LAN via a standalone access point (around £50-£80) or using an Internet router with an access point built in.

Stick with the brand names, such as 3Com, D-Link, Linksys and Netgear, for all your networking hardware. Don't just connect one PC to the Internet and share the connection using Windows. It might work at home, but on a business network the connection needs to be available all the time, which means an Internet router.

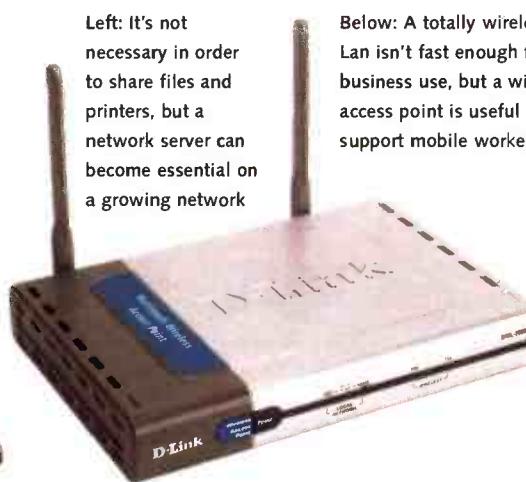
A firewall is a must-have and, possibly, a VPN (Virtual Private Networking) server for remote LAN access. This can all be incorporated into your Internet router, which will cost £90-£150. Again, go with a tried and tested brand-name component.

Serves you right

Your next decision might be whether to buy a server. They are not strictly necessary



Left: It's not necessary in order to share files and printers, but a network server can become essential on a growing network



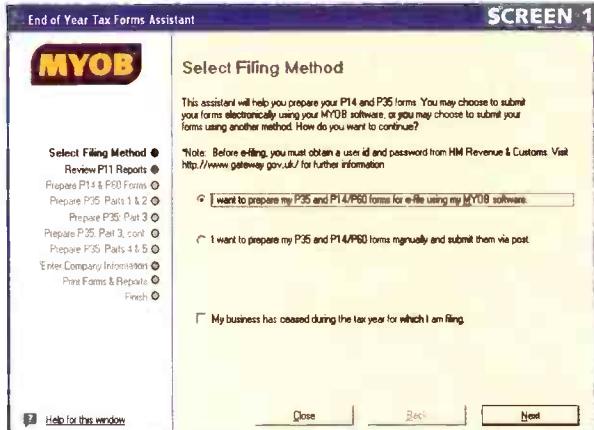
Below: A totally wireless LAN isn't fast enough for business use, but a wireless access point is useful to support mobile workers

as the networking facilities built into Windows make it easy to share resources on a peer-to-peer basis. However, such networks soon become unwieldy, and if you want to guarantee access to shared data a server is essential. This is especially true if you want to host your own email server or other shared applications.

Once an expensive purchase, server prices have dropped dramatically, with entry-level products from market leaders starting at just £150-£200. However, that doesn't include the operating system and, at that price, you can't expect a state-of-the-art product. But for a budget of around £500, you should easily be able to buy a ready-to-use server for five to 10 users from the likes of Dell, HP, IBM or one of the other leading vendors, with a full guarantee and support included in the price.

Software necessities

Hardware prices may have dropped over the past few years, but software can still be expensive. Despite this, it's important not to cut corners and opt for second-rate products or software designed for home use. Core productivity tools such as a word processor, spreadsheet and presentation graphics are important here. Choose a market leader such as Microsoft Office, Corel Wordperfect Office X3 or Sun's Star Office for those on a tighter budget, and buy from a reputable source to ensure what you buy is properly licensed, supported and upgradeable.



Next, look at tools to help you run your business. A proper accounting package should be high on this list. It's tempting to make do with a spreadsheet, but dedicated accounting software from companies such as Intuit, Sage and MYOB will make business life a lot easier (see screen 1). Such a package can even pay for itself, as most are now accredited with HM Revenue and Customs to file PAYE and other returns online, allowing you to claim substantial incentives by doing so.

On the server front, there are custom small-business programs that can deliver functionality without costing the earth, such as Microsoft's Windows Small Business Server 2003 (see screen 2). It gives you basics such as file and print sharing, plus a web server – a full copy of Microsoft's Exchange email and collaboration product and Windows Sharepoint Services to help build and support a company intranet.

Then there's security to worry about. After a firewall, anti-virus protection should be your main concern. Preferably, you should get a small-business product designed for shared network use from one of the market leaders such as McAfee, Sophos or Symantec.

Important services

Finally we have essential services, with Internet connectivity a top priority, if only to send and receive email. There are plenty of



Microsoft's Small Business Server 2003 is a cost-effective way of deploying your own web, email and collaboration servers

Pros and cons of open-source software

Linux and open-source applications are free or cost just a few pounds, compared to hundreds for the Windows equivalents. However, open source isn't necessarily a good choice for the small company, especially on the desktop.

Most people know how Windows and Windows applications work, but Linux alternatives require a bit of getting used to. That can affect productivity and make it difficult to recruit and retain staff.

More importantly it can be difficult and expensive to get help when things go wrong because, again, different expertise is required.



Small-business buyers should, therefore, steer clear of open-source software on the desktop unless they are absolutely confident they can master it. And only consider Linux for servers where well-supported products such as Red Hat Enterprise Linux or Suse Enterprise can make financial and practical sense.

Linux can also make sense when looking at network appliances where the open-source software typically involved is hidden away behind a user-friendly browser front end.

providers, so look for a service designed for office use with good backup and support and, if possible, guaranteed levels of service.

You don't have to use the free web space and email facilities bundled with your Internet connection. These can be bought independently to gain more functionality, capacity and performance. Starting at under £10 per month, for example, you can get a virtual Windows or Linux server, complete

with IIS or Apache web server and database if required. All you have to do is upload your website and the applications you want to run, and you can even get help with that.

Dedicated email services are also available. Rather than host your own email server, you'll find that a service provider will manage everything for you, from the core email server to anti-virus and anti-spam security setup. All your business needs is

Internet access and an email client, such as Outlook. You can even share address books and calendars, with hosted Exchange services from as little as £5 per mailbox per month.

There are plenty of other hosted services, including full ecommerce applications and hosted VoIP (Voice over IP) switchboards. But by going down this route you can end up totally reliant on your Internet connection to do business. That means making sure you have a backup service in case of problems, and a means of working locally should the hosted services become unavailable.

Not so essential

What about the tools you might be tempted to buy, but don't need? Network faxing is hardly essential, especially in a small office where a single shared fax machine is probably all you need. Likewise, there are easier ways to save on phone calls than using a VoIP telephone system.

There may come a time when these and myriad other IT products become worth looking at, but get the essentials right first before even considering anything else. **PCW**

What you need, why you need it, and where to get it from

WHAT?

A network

To enable files, printers and applications to be shared

Internet router

To share your Internet connection – most also provide basic firewall protection and some VPN (virtual private network) remote access

Server

To maximise file and print sharing and to host applications such as email and database servers

Office productivity

Word processing, spreadsheet and presentation graphics are all must-haves for the switched-on small business

Security

No need to ask – a must-have, with anti-virus protection the top priority

Email

An invaluable business tool – as essential as a phone system, either managed yourself or hosted online

Accounting package

Easier and more professional than a spreadsheet – can save money by filing online

Website

Your shop window – metaphorically or, with an ecommerce application, literally

WHY?

To enable files, printers and applications to be shared

To share your Internet connection – most also provide basic firewall protection and some VPN (virtual private network) remote access

To maximise file and print sharing and to host applications such as email and database servers

Word processing, spreadsheet and presentation graphics are all must-haves for the switched-on small business

No need to ask – a must-have, with anti-virus protection the top priority

An invaluable business tool – as essential as a phone system, either managed yourself or hosted online

Easier and more professional than a spreadsheet – can save money by filing online

Your shop window – metaphorically or, with an ecommerce application, literally

WHO FROM?

Belkin, 3Com, Dell, D-Link, Linksys, Netgear

Belkin, 3Com, D-Link, Draytek, Linksys, Netgear

Dell, Fujitsu-Siemens, HP IBM, NEC
Small-business server software from Microsoft and Novell

Microsoft, Corel, Sun

McAfee, Sophos, Symantec

Microsoft, Novell, MDaemon, Kerio, Gordano, plus a wide range of hosted alternatives

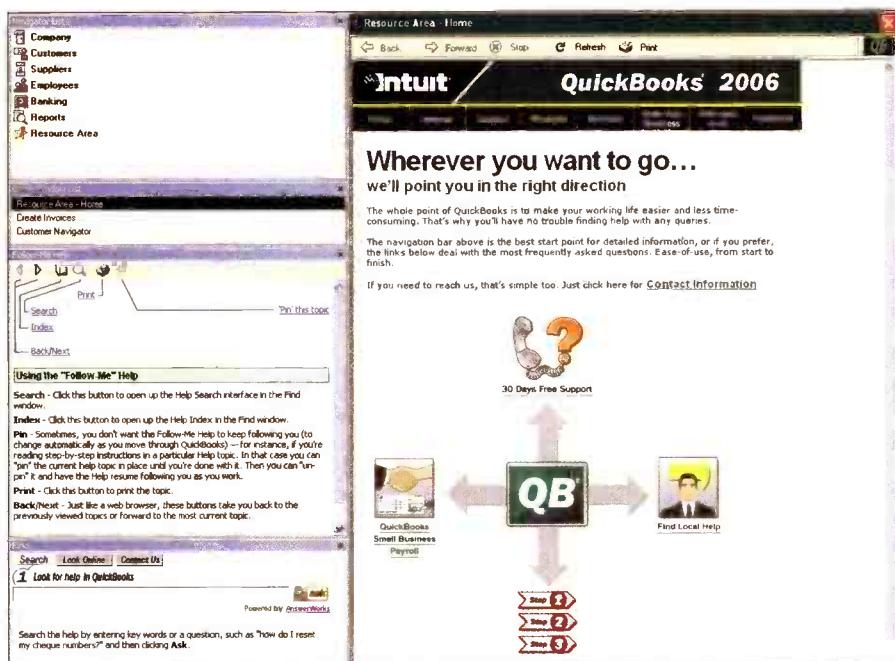
Sage, Intuit, MYOB

Microsoft, Apache or a hosted service

SMALL BUSINESS ACCOUNTING

Intuit Quickbooks Pro 2006

An excellent package made even simpler for users of all levels



The new resource area in Quickbooks Pro 2006 provides a one-stop shop for help and advice

Wherever you want to go...

we'll point you in the right direction

The whole point of QuickBooks is to make your working life easier and less time-consuming. That's why you'll have no trouble finding help with any queries.

The navigation bar above is the best start point for detailed information, or if you prefer, the links below deal with the most frequently asked questions. Ease-of-use, from start to finish.

If you need to reach us, that's simple too. Just click here for [Contact Information](#)



Amature and capable accounting package, Quickbooks manages to bridge the gap between the occasional user and financial expert, making it a popular small-business solution. It's also well supported, and not just by developer Intuit, which offers both technical and accountancy help, but by third-party service providers and certified professionals able to offer specialist advice.

Quickbooks is already known for straightforward setup and use, and the 2006 release is aimed at making the product even simpler, especially for those users who only spend a few hours a week using the package. To this end, a new resource area has been added, providing a one-stop shop when looking for help or access to the various add-on products and services available. Plus there's a revamped Getting Started guide that has removed a lot of tiresome jargon and is a huge improvement over previous editions.

The new guide is particularly useful when it comes to the biggest hurdle new users have to overcome – setting up the accounting software to suit their particular business. The terminology here can be hard to follow and mistakes at this stage can be difficult to rectify later. Another key feature of Quickbooks is its simple, interview-style setup routine, which helps demystify the process and highlight the potential pitfalls. The only drawback is the time needed to complete the interview, but it really does help and more experienced users can skip this step if preferred.

Users of Quicken can convert existing company files, plus it's possible to import existing product, customer and supplier lists to save the re-keying of such data.

All the expected accounting functionality is there in each of the different versions of Quickbooks, starting,

naturally, with customer management and invoicing, complete with a neat graphical document design tool and facilities to generate and email pdf invoices, statements and so on. VAT accounting and stock-control tools are also built in, with facilities to manage bank accounts and produce a wide range of financial reports. Plus there's an optional payroll service (£99.95 inc VAT per year for updates) to automatically calculate employee tax and NI deductions, with the Intuit software fully accredited with HM Revenue and Customs for online filing of PAYE and other returns.

A service to allow customers to pay by credit/debit cards is another recent addition, although it's not particularly cheap. On the Pro version we looked at there's support for payments through BACS, although this is, again, a chargeable extra.

Still, you don't have to buy into these services, and smaller companies that don't need them, or the multi-user support available with Quickbooks Pro, can opt for the cheaper Regular edition (£129 inc VAT) with an even cheaper cutdown version called Simplestart (£39.95), aimed at one-man bands looking to replace spreadsheet-based accounting systems.

Finally, for accounting professionals, there's Quickbooks Accountant, which in the 2006 release includes a new financial statements designer.

Of course, a knowledge of book-keeping will help to get the most out of the Quickbooks package, but it's not essential and you don't have to be a financial genius. Nor do you need to be a computer whizz-kid, with tasks such as backups and software updates all handled for you. The add-on services are also worth investigating, in a package likely to pay for itself in a very short time indeed.

Alan Stevens

Details

Price £299.95 (£255.28 ex VAT)

Best price www.pcw.co.uk/bestprices

Contact Intuit 0870 609 0601

www.quickbooks.co.uk

System requirements PC with 200MHz Pentium processor (350MHz Pentium II or above recommended) • 64MB Ram (96MB recommended) • 350MB hard disk space • SVGA monitor • Windows 98 or later • Office 97 components for Microsoft integration

Verdict

Pros Equally accessible to accounting experts and novices alike; optional payroll and other add-on services; Microsoft Office integration; integrated pdf document generator

Cons Add-on services not always competitive; company file requires regular maintenance for optimum performance

Features

Ease of use

Value for money



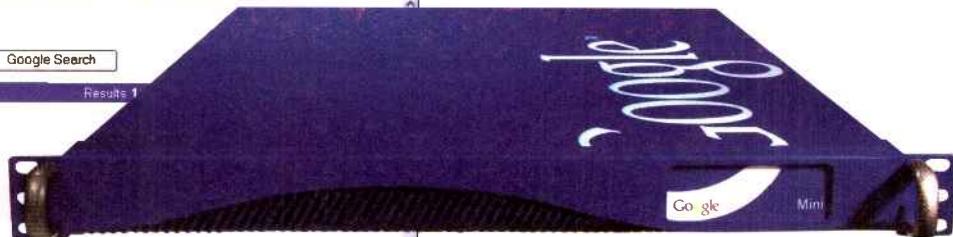
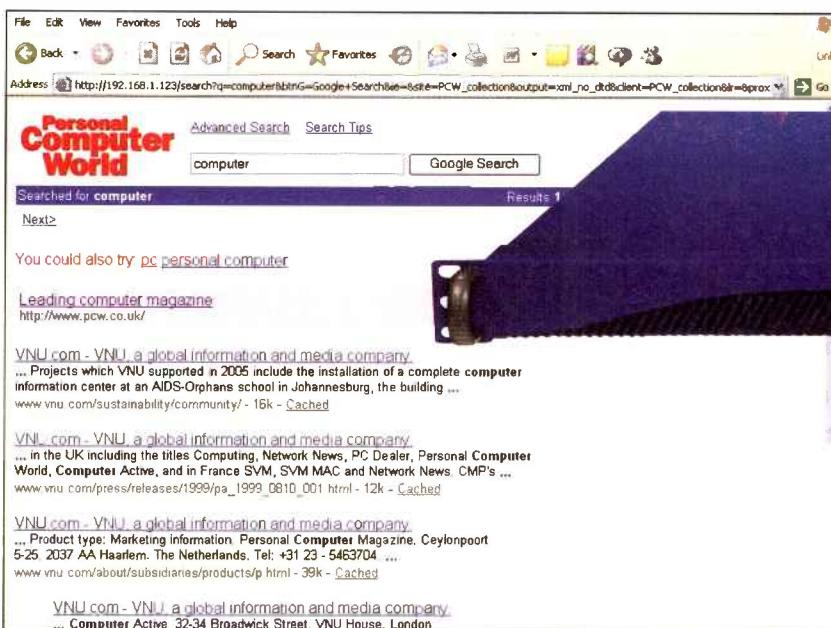
Overall An easy-to-manage accounting solution with something for everyone



SEARCH APPLIANCE

Google Mini

Perform full searches at a budget price suitable for even the smallest business



Above: Leverage Google's world-famous search technology with the affordable and easy-to-use Google Mini appliance

Left: You can customise the search interface and influence the results returned by the Google Mini

Would you like to add a search facility to your website, but think using Google's search engine is way outside your budget? If so, you'd be completely wrong. The Google Mini search appliance is specifically designed for small businesses and costs from just £1,295 ex VAT. And you don't need to be a rocket scientist to get it working, either. Just plug the Mini into the Lan, point it at the sites you want to index and leave the famous Google technology to get on with it.

There are lots of things you could use a Google Mini for. On an intranet, for example, it offers fast access to information regardless of where it's located, with built-in support for over 200 document types including Adobe pdfs and anything created with Microsoft Office, as well as HTML pages. Or it could be used to support public websites, with facilities to customise the search interface and integrate it into your own applications.

The hardware involved is a very modest 1U rackmount server, powered by a pair of ancient Pentium III processors, 2GB of memory and 120GB hard disk. All this is completely sealed inside a bright blue case, with a next-day swap-out service to keep you working should anything go wrong.

Installation is simply a matter of plugging in the colour-coded network cables provided and connecting the power. There's no on/off switch – the appliance powers up straight away, loads its Linux-based operating system, then plays a tune to tell you it's ready.

That done, you need to configure the network settings then browse to the management port, log on and tell the software which URLs you're interested in. A Google crawler can then be sent off to examine

those paths, searching through all the documents it finds before building a search index.

Some patience is required, depending on the number of URLs involved, the speed of the target servers, type of connection and so on. However, you'll soon have a working index that can be searched using an interface familiar to Google users the world over. And most of our searches returned results within a second or two – just like the real thing.

In addition, you get to influence the results by suggesting synonyms for search terms, and with custom Keymatches where highlighted URLs are displayed when matching keywords are specified. In our tests, for example, we were able to point users at the PCW website whenever the terms 'pc' or 'computer' were used. We were also able to use our own graphics rather than the standard Google logo, and change the way the results were ordered.

We did this through the management GUI (graphical user interface) while, for the more advanced developer, it's possible to upload an XSLT style sheet. For the ultimate in customisation, you can feed XML search results directly into applications.

A built-in scheduler simplifies the task of building and refreshing search indexes and, if the 50,000 URL/document limit of the standard Google Mini isn't enough, models that support more (up to 300,000) are also available.

Of course, it's not perfect. Special measures are needed to protect documents you don't want people to see and, although easy to deploy, it can take a while to fully appreciate what the Mini can do and to set it up to suit your requirements. However, it's not difficult, and the results really do speak for themselves. Alan Stevens

Details

Price £1,521.62 (£1,295 ex VAT)

Best price www.pcw.co.uk/bestprices

Contact Google

www.google.co.uk/enterprise/mini

Specifications 1U rackmount search appliance • Dual 1.26GHz Pentium III processors • 2GB memory • 120GB hard disk drive • Dual 10/100Mbps/sec Ethernet interfaces • Red Hat Linux O/S • Google search engine technology • One-year telephone support and swap-out warranty

Verdict

Pros Market-leading Google search technology; easy deployment with no special skills required; customisable user interface; XML feed option

Cons Special measures required to protect sensitive information

Features 

Performance 

Value for money 

Overall Gives even the smallest of businesses access to Google's search technology in an affordable and easy-to-manage format



NETWORK SECURITY

CA Business Protection Suite r2

Good backup, migration and security tools, but it's not easy to install or use



The Business Protection Suite has integrated management consoles for servers and desktops

The Business Protection Suite from Computer Associates (CA) looks like a good idea, providing small businesses with affordable and integrated access to top-name network security, backup and data migration tools. However, we found the implementation hampered by a lack of documentation and the end result was difficult to deploy and manage compared to other products designed to fill the same niche.

There's little to complain about in terms of what you get, as CA has combined a number of its market-leading products to create the Business Protection Suite.

Essentially this means you get Brightstor Arcserve for backup, together with Etrust Antivirus and the Etrust Pestpatrol anti-spyware applications.

Server and desktop versions of each of the components are provided, along with CA's Desktop DNA Migrator, which can be used to transfer user and application settings to a new PC. And you don't just get cut-down versions. There's full support for Microsoft Exchange, SQL Server and distributed backups in Arcserve, for example, plus automatic updates for the anti-virus and anti-spyware tools.

However, there's no anti-spam support – a major omission in a product of this kind, although, according to research carried out by CA, most small businesses have this already, especially those using hosted email services. Of greater concern was the lack of any method of distributing the desktop software via the network. Client PCs need to have the software individually installed. More troubling was the lack of support for anything other than Windows, especially given the prevalence of Linux-based servers.

On the positive side, integrated setup routines (one for the server and one for the desktop) simplify

installation, together with automated checklists to help with configuration. There's also an integrated Java-based management console to monitor and manage the server tools and a similar interface for the desktop software.

It can take a lot of work to get everything installed and running. There's very little in the way of documentation to point you in the right direction. The CD supplied contains a lot of manuals, mostly culled from the original product documentation, with no single 'getting started' guide. We did eventually get it all working, but then we're used to installing this kind of product and, even then, a lot of guesswork was involved.

The level of protection provided can't be faulted, with the software quickly identifying spyware on one of our test machines and intercepting and quarantining test viruses. However, the management console wasn't very responsive and only provided stop/start controls and limited status information. To configure and fully manage the individual components, we had to return to the native interfaces, and these differed from tool to tool with a separate sign-on for each one.

Packaging and pricing also take a little explaining. As well as the combined product we looked at, for example, separate server and desktop protection suites are available, along with others designed specifically for Microsoft's Small Business Server. Each edition is then licensed for five users with additional five-, 10- and 20-liscence packs available, plus optional support plans.

Given the pedigree, the Business Protection Suite ought to be a winner, but small-business buyers want and deserve products that are easy to install and manage, and the CA suite is neither. The tools by themselves are hard to beat, but on this showing the Business Protection Suite needs more work.

Alan Stevens

Details

Price From £801.17 – five users
Best price www.pcw.co.uk/bestprices

Contact Computer Associates
01753 242 679 www.ca.com/uk/

System requirements

Server components: Windows 2000, XP or Server 2003 • 512MB of Ram • 1GB of free hard disk space

Desktop components: Windows 2000 or XP (Home or Professional) • 512MB of Ram • 100MB free hard disk space

Verdict

Pros Top-brand anti-virus, anti-spyware, backup and data migration tools; unified setup routines; integrated management console
Cons Poor documentation; separate interfaces for component management; no anti-spam protection; Windows only

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

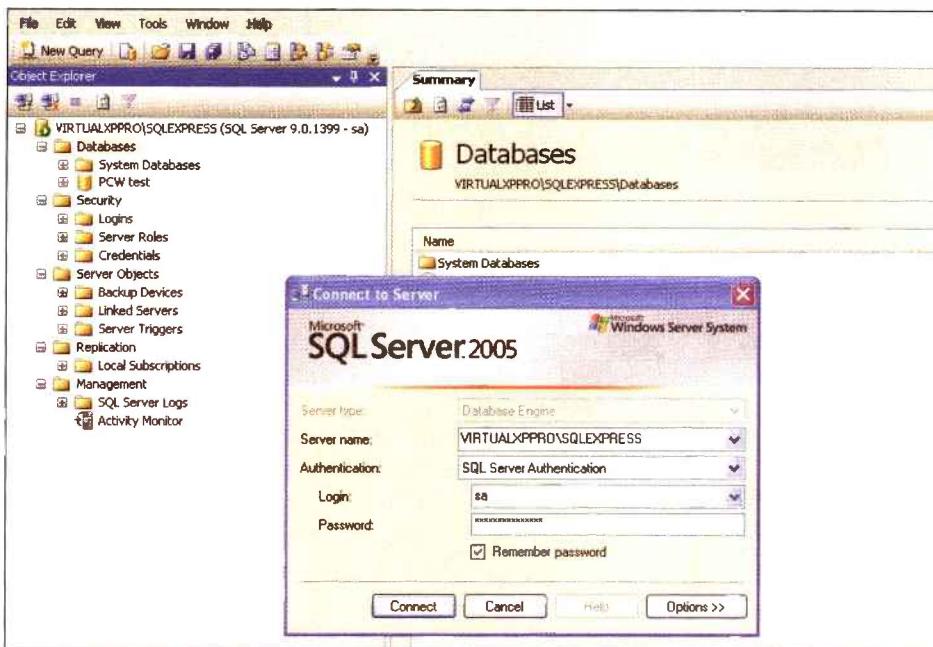
Overall A good idea in principle and you can't argue with the efficacy of the individual components, but it needs to be simplified to appeal to the small-business buyer

★★★☆☆

DATABASE SERVER

Microsoft SQL Server 2005 Express

A completely free database engine for developers and small businesses



A free set of graphical management tools is available for use with SQL Server 2005 Express

It's not often Microsoft gives stuff away and there's usually a catch, as with MSDE (Microsoft SQL Server Desktop Engine), the cut-down version of its SQL Server product, for example. Widely used by third-party developers and small businesses, MSDE may be free, but it suffers from performance and capacity limits, and a lack of management tools.

However, that's all history because, with the launch of SQL Server 2005 last year, Microsoft replaced MSDE with a free, yet full, implementation of its database engine, called SQL Server 2005 Express.

There are still a few catches, some of which might seem retrograde. SQL Express, for example, can only use one processor, whereas MSDE supported two, and it can't store data in more than 1GB of memory, compared to 2GB previously. Plus there's still a database size limit, although this has been raised to 4GB.

But there's plenty of good news. Out goes the workload throttle, which stopped more than five concurrent tasks being handled, and the MSDE connection limits, while the SQL Server 2005 engine itself is much nimbler than its predecessor. It's also a full implementation, complete with support for the Common Language Runtime (CLR) and new XML data types. Whereas MSDE only had a command-line interface, Microsoft has announced a free set of graphical management tools to go with SQL Express – SQL Server Management Studio Express.

We downloaded both packages and found them easy enough to install, although the process can take a while to complete. The downloads are large (53MB for SQL Express and 30MB for the Management Studio) and they need to be installed onto a well-specified PC running Windows 2000 (SP4), XP or Windows Server

2003. You also need Windows Installer 3.0, and version 2.0 of the .Net Framework. The setup program prompts for these if they're not configured already. Finally, it's important to register if you intend to distribute the database with your own software, although client licences aren't required.

A silent install option is still available – important if distributing with another application. There's also a new graphical setup tool with a wizard to guide you through the various setup options, including the choice of built-in security, NT authentication or mixed-mode deployment.

The new database is now tightly locked down, which means having to explicitly enable remote access using named pipes or TCP/IP. But that's easily done, and once installed the SQL engine runs as a background service, with a simple management utility to stop and start it and fine-tune the various parameters. Management Studio Express can then be installed separately, adding tools to create databases, design queries, edit data and take backups.

For developers, full integration with Visual Studio 2005 also comes as standard, and there's a free Express edition of that until 6 November 2006.

SQL Server 2005 Express is a welcome addition to a growing band of free database servers, which now includes Oracle as well as MySQL and other open-source products. Performance and capacity limits mean it can't be used for everything, but if you're a small software developer it's a no-brainer. It's also great for demonstrations, and for supporting a growing list of applications that need a database to run, such as network inventory tools and content management systems, where the cost of a full SQL Server licence might otherwise put such applications out of reach.

Alan Stevens

Details

Price Free download

Contact Microsoft 01234 121 3456 www.microsoft.com/sql/editions/express

System requirements Pentium III or better (1GHz processor recommended) • 192MB Ram (512MB recommended) • 525MB hard disk • Windows 2000 (SP4), XP (SP2) or Server 2003 (SP1) • .Net Framework 2.0 • Windows Installer 3.0

Verdict

Pros Full implementation of SQL Server 2005 engine with no workload or connection limits; free database management tools also available; simple upgrade to full package

Cons Supports only one host processor, 1GB of Ram and 4GB databases

Features

★★★★★

Ease of use

★★★★★

Value for money

★★★★★

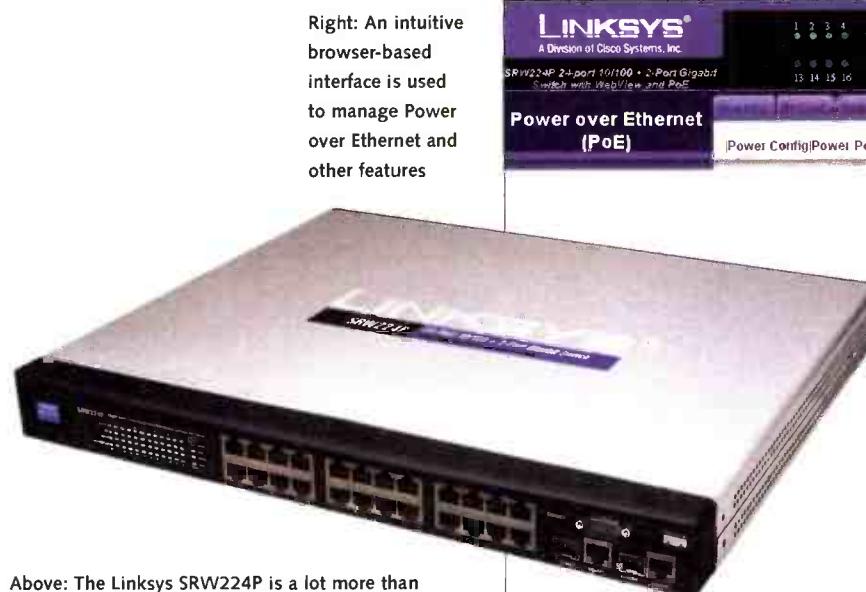
Overall Not quite SQL Server, but almost – a step up from MSDE for developers and small businesses alike

★★★★★

NETWORK SWITCH

Linksys SRW224P

Advanced features make this attractive to growing businesses



Right: An intuitive browser-based interface is used to manage Power over Ethernet and other features

Above: The Linksys SRW224P is a lot more than just an Ethernet switch

If you're looking for a network switch, don't be fooled into thinking they're all the same. It's worth shopping around. This is especially true if you're a business buyer looking for more than basic network connectivity. If this is the case, the SRW224P from Linksys could be just what you're after. This very affordable Ethernet switch adds support for Power over Ethernet (PoE) and remote management, plus mechanisms to prioritise network traffic and maximise bandwidth.

The SRW224P doesn't look that special, delivered in a standard 1U rackmount format (mounting brackets supplied), with a built-in power supply at the rear and 24 RJ-45 ports at the front. These are all auto-sensing, capable of working out the speed of the link (10 or 100Mbps/sec) and whether you're connecting to another switch or an end-point device, to eliminate the need for crossover cables.

Support for PoE means the switch can also work out whether attached devices conform to the 802.3af PoE specification. If they do, it can deliver DC power over the Lan, making for much simpler and neater deployment of things such as wireless access points and VoIP (Voice over IP) telephones. The maximum power available is 180W, so with up to 12 devices connected, each can get the maximum 15.4W specified by the 802.3af standard. This drops to 7.5W per port if all 24 ports are used, but is still enough for a wide range of devices.

A pair of Gigabit uplinks are also built in to connect to a faster backbone network, with a choice of either ordinary Cat5 or optical cabling. But beware – mini-GBIC modules are required to handle fibre-optic cabling, and they're not cheap. Indeed, at around £240 ex VAT, they cost almost as much as the switch itself.

Port	Admin Status	Priority	Power Allocation (3000-15400 milliwatts)
1	<input checked="" type="checkbox"/> Enabled	low	15400
2	<input checked="" type="checkbox"/> Enabled	low	15400
3	<input checked="" type="checkbox"/> Enabled	low	15400
4	<input checked="" type="checkbox"/> Enabled	low	15400
5	<input checked="" type="checkbox"/> Enabled	low	15400
6	<input type="checkbox"/> Enabled	low	15400
7	<input type="checkbox"/> Enabled	low	15400
8	<input type="checkbox"/> Enabled	low	15400
9	<input checked="" type="checkbox"/> Enabled	low	15400
10	<input checked="" type="checkbox"/> Enabled	low	15400
11	<input checked="" type="checkbox"/> Enabled	low	15400
12	<input checked="" type="checkbox"/> Enabled	low	15400

There's no dedicated stacking bus, as on some rival products. Any of the ports can be used to link switches together, and you get facilities to aggregate ports to create dedicated high-speed trunks. But each switch needs to be managed separately, which could be an issue on a larger network.

When it comes to management, you're spoilt for choice. You can, for example, connect a PC to the local console port, or use an SNMP console. Most people, however, will opt for the built-in web interface, which is much easier to use and requires nothing more than a web browser.

SSL support makes this a secure option with a clean and easy-to-follow interface, although a fair degree of technical knowledge is required to configure the more advanced features. These include the ability to define up to 128 Virtual LANS (VLANS) and a range of Quality of Service (QoS) settings to, for example, make sure that VoIP gets priority over ordinary data traffic.

Still, you can take your time implementing these, and there's plenty of help available in the accompanying user manual. We had no real problems and found the Linksys switch very easy to configure.

One last point is the cooling fan, which makes the Linksys quite noisy. But then all 24-port switches are the same and need to be located where they won't cause annoyance. Plus there's an extra attraction in the form of a cashback offer should you want to upgrade the Linksys switch to something more advanced from parent company Cisco.

There's a three-year limit on this, but it's a good offer on a switch that already offers a great deal to the growing small business.

Alan Stevens



Details

Price £284.35 (£242 ex VAT)
Best price www.pcw.co.uk/bestprices

Contact Linksys 0800 068 0327
www.linksys.com

Specifications 1U rackmount
 Ethernet switch • 24 RJ-45
 10/100Mbps/sec ports • 2 Gigabit uplinks (RJ-45 and mini-GBIC connectors) • 8.8Gbps/sec switching capacity • 128 VLANS • SNMP management • Web-based management • 802.3af Power over Ethernet support

Verdict

Pros 802.3af Power over Ethernet; intuitive browser-based management; extensive VLAN and QoS options
Cons No dedicated stacking bus; individual switch management; noisy fan

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

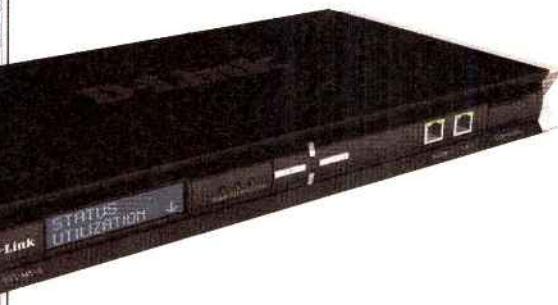
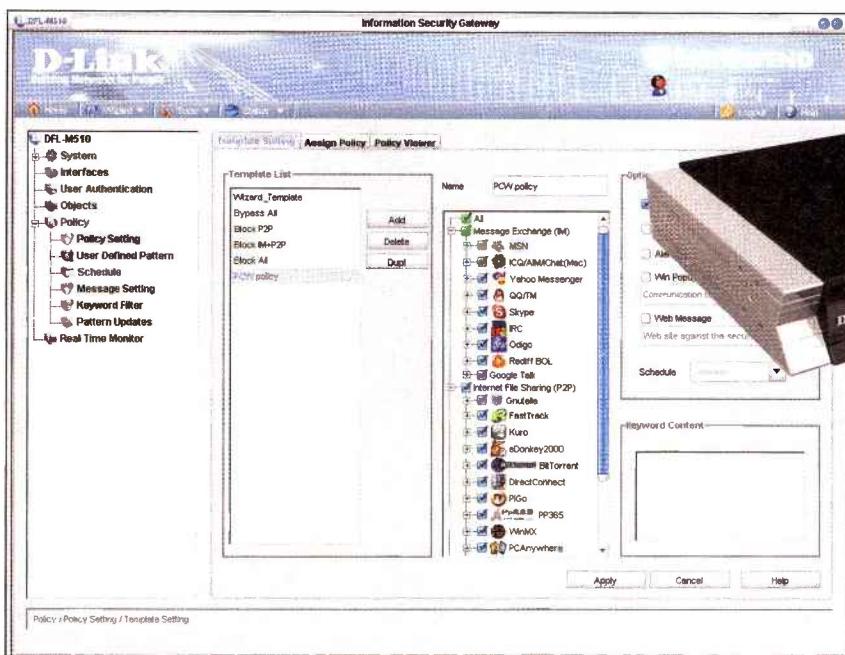
Overall A good buy for the growing business looking for more than basic Ethernet connectivity

★★★★★

SECURITY APPLIANCE

D-Link Netdefend DFL-M510

Get instant protection from the threats hidden in Internet communication technologies



Above: The Netdefend Information Security Gateway protects small-business networks against emerging Internet threats

Left: Customisable policies are used to filter and block instant messaging, P2P networking and other traffic

The D-Link Netdefend Information Security Gateway – DFL-M510 for short – is a very specific type of security appliance. Designed to block things such as worms and spyware, it ignores the conventional proliferation channels, concentrating on weeding out such threats hidden in instant messaging (IM), peer-to-peer (P2P) networking and other Internet communication technologies.

Implemented in the form of an Asic-based solid-state device, the DFL-M510 is a 1U rackmountable appliance (brackets supplied) with two 10/100Mbit/sec Ethernet ports on the front. One connects to the Lan, the other to the Internet, enabling the D-Link appliance to transparently inspect and filter all the traffic passing in and out, with no changes to the Lan setup required. Should the power fail or the hardware develop a fault, the two ports are automatically connected, bypassing the appliance to keep the Internet connection alive.

A Java-based interface is used to configure and manage the DFL-M510. This takes a while to get to grips with, but fortunately only requires a basic understanding of the technologies involved.

At its heart are customisable security policies specifying which of an extensive set of communication protocols and applications you want to block. That set includes all the more popular IM applications, such as MSN Messenger and Yahoo Messenger, plus Skype and Google Talk. A list of P2P applications is also provided, where the appliance can identify and block streaming media and more general file transfers. Web-based email services such as Hotmail, as well as ordinary Pop3/Imap communications, can also be intercepted.

Each application/protocol can be blocked or allowed through with customisable messages to tell

users what's happening when a blocking rule is applied. An initial setup wizard takes a lot of the pain out of creating and applying the default policy, while another can be run to make changes later if manual operation proves too complicated.

Security policies are assigned to groups of hosts on the Lan, with hosts auto-discovered then manually grouped. This can take a while, but isn't difficult, and you can assign policies to IP addresses and subnets. We were disappointed by the lack of facilities to assign policies to users, which would have been easier and more flexible.

In practice it all worked as claimed, blocking access to the various services as defined in the policies we configured. For example, we were able to stop network users connecting to MSN Messenger or Skype and prevents them downloading files via FTP. A realtime monitor lets you see what's going on, with built-in reports to help you decide what needs to be addressed. However, some care is needed when defining the policies because, as with a firewall, it's easy to block the wrong applications, or everything, unintentionally.

We liked the inclusion of a scheduler to enable different policies to be applied, for example, in and out of working hours. In addition, it's possible to define custom patterns of your own (by protocol or host server address) to filter applications and services not included in the built-in lists.

Keyword/URL blocking of websites is another benefit, although the DFL-M510 is limited in the number of rules that can be configured, and if you want categorised content filtering, look elsewhere. The DFL-M510 is far from a complete solution; it needs to be used in conjunction with a firewall, anti-virus, anti-spam and other, more conventional, security products. *Alan Stevens*

Details

Price £900 (£765.96 ex VAT)

Best price www.pcw.co.uk/bestprices

Contact D-Link 020 8731 5555

www.dlink.co.uk

Specifications Asic-based security gateway • 1U rackmount • Filter/block IM, P2P, file transfers, streaming media and personal email; limited keyword/URL filtering • 22Mbit/sec throughput (all functions enabled) • 4,000 concurrent TCP sessions • 150 users

Verdict

Pros Blocks IM, P2P and other traffic normally passed by other security products; policy-based setup; no network changes required

Cons Not a complete security solution

★★★★★

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Worth considering to manage emerging technologies such as instant messaging and P2P networking, but only alongside other security solutions

★★★★★

KVM REMOTE CONTROL

Raritan Z-Series Z4200U

Control your servers from anywhere – and save on rack space, too



There's no central switch in the Raritan Z-Series KVM solution, just daisychained server modules and a remote user station

KVM remote-control switches tend to conform to a common pattern, with a central rackmounted switch to which both the local management console and servers to be controlled are attached. But not so with the Z-Series from Raritan, which does away with the switch in favour of daisychained server modules and an independent remote user station.

The main benefit of the product is space saving, with rarely much room inside server racks, even in a small business. It also allows the console to be located at a distance from the servers to be managed, even outside the server room if required. The modules and user station are also connected using standard Cat5 cables, making it a lot neater and easier to put together than a conventional KVM (keyboard, video and mouse) solution.

Up to 42 servers can be managed using the Raritan Z-Series product, although the Z4200U starter kit we tested only comes with enough of the special Z-Series Computer Interface Modules (Z-CIMs) to cope with three to begin with. Additional modules cost around £99 ex VAT each.

About the size of a large box of matches, the Z-CIM units plug into the video connector on the back of each server with a couple of fly-leads attached for the keyboard and mouse. However, standard Din connectors are the only option here, which means using converters (at an extra cost of £54 ex VAT each) for servers with USB keyboards and mice.

A pair of RJ-45 ports on each module are used to build the daisychain, using either the Cat5 cables provided (2m) or longer leads of your own. The overall limit is 300m end to end, with a small terminator that

needs to be plugged into the module furthest away from the management console.

We found this arrangement quick and easy to set up. However, the Z-CIM modules themselves could be an issue, calling for a good 10cm of clear space at the rear of the servers, which may not always be available.

The console, meanwhile, is made up of a standard PC monitor, keyboard and mouse which are plugged into the small User Station module included in the kit. Powered by an external AC adapter this, again, can't be used with USB devices although, as well as ordinary PS/2 style connectors, a port for a Sun keyboard is provided.

A simple on-screen menu is used to manage the KVM chain, with each new module discovered automatically as it's connected, and given a name that can be edited to better identify the attached system. You can also choose the server to control from the on-screen menu, use predefined hotkeys to select targets or scroll through the chain using a couple of buttons on the front of the user station.

Maximum screen resolution is 1,600 x 1,200, which is more than adequate for server use with automatic adjustment when switching between servers with different video setups. This worked faultlessly in our tests, even when we unplugged servers from the chain and added others in, with no need to re-set anything when this happens.

The Z-Series product can also be used to extend other, conventional Raritan switches and an IP interface is also available. Drawbacks include a lack of password protection on the user station, plus it's a bit expensive for companies with only a few servers to manage.

Still, it's neat, works well and is worth considering where rack space is at a premium. *Alan Stevens*

Details

Price £535 for three-server starter kit

Best price www.pcw.co.uk/bestprices

Contact Raritan 020 7614 7700
www.raritan.com

Specifications Switchless KVM; daisychained Z-CIM modules connect to servers • Cat5 cable used for connectivity • Custom user station for local console, keyboard and mouse • Maximum 1,600 x 1,200 video resolution • On-screen menu

Verdict

Pros Saves on rack space; user station can be remote from servers being managed; Cat5 cable less bulky and easier to install than conventional KVM wiring

Cons No direct support for USB; space required at back of servers for Z-CIM modules; no password protection; expensive

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall A neat KVM solution where rack space is an issue, but expensive compared to conventional products and has few other advantages

★★★★★

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FREE HANDS ON COLUMNS

If you're a compulsive hoarder, then no doubt you'll have the past 10 years worth of *PCW* Hands on columns safely stashed away and indexed. For the rest of you, it's undoubtedly pretty frustrating when you can't lay your hands on (sorry!) that gem of advice you remember from way back when.

For some time, we've made pdf copies of Hands on columns available to buy on our website at www.pcw.co.uk/handson, but we've decided the time has come to start afresh. We're going to be putting a healthy selection of our more recent Hands on content online, with free access for all readers. Unfortunately, this reorganisation means that the existing archive will no longer be available online.

But as a special bonus for those of you buying the DVD edition of *PCW*, we're hoping to put some of the original Hands on archive onto the new 8GB cover DVD in a future issue.

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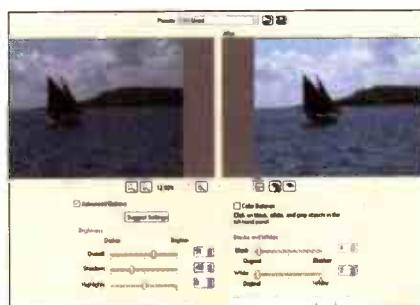
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Left: Upgrade the hard disk in your Sky+ box

Right: Use our tips to save time editing images

Advice from our experts

Let our team answer your queries and find solutions to your problems

HARDWARE

Data retrieval

Q My laptop recently died and the store where I bought it quoted more to repair it than it is really worth. I've come to terms with buying a new model, but would really like to see if I can get any data from the disk. What's the easiest way to do this?

Graham Francis

A If you're lucky, the data on your laptop's hard disk will be intact, so all you have to do is remove it from your old laptop and connect it to a working PC. Both steps should be quite straightforward.

Most laptop hard disks are fitted into drive bays that can be unscrewed and slid out. If you don't have the original manual or the store can't locate the right section for you, simply look underneath the unit for tell-tale signs. The drive bay will normally look like a rectangular panel on one side of the unit, held in place by a few screws. Undo these then see if the panel will slide out. Before long you'll find the one holding the disk.

Once you've removed the disk from your laptop and from the slide-in cage itself, you'll notice it's a smaller physical size than the one in a desktop PC. This is because laptop drives are 2.5in models compared to 3.5in for desktops, and they both have different connectors. Luckily they are electrically compatible, so all you'll need is an adapter.

If you'd like to connect it to a desktop, you'll need a 2.5in-to-3.5in IDE adapter. This will then allow you to connect it to your desktop, like any other hard disk. Adapters are available from www.mini-itx.com/store for around £10. Alternatively you could fit the disk into a 2.5in enclosure, effectively turning it into a portable USB2/Firewire drive. You can buy a suitable USB2 enclosure for less than £17 from www.directusbstore.co.uk, or a combo USB2/Firewire model for around £26.



Quick transfers

Q If you're transferring images from a camera to a PC, is it quicker to connect it directly or use a card reader?

Ben Askey

A This depends on the speed of the interface on the camera and the card reader. For the best performance you'll need USB2 interfaces at both ends, but beware as many cameras describe their ports as USB2 compliant when in fact they only operate at USB1.1 speeds.

The difference is considerable, so we'd advise connecting your camera directly to a USB2 port first and seeing how long it takes to copy a card full of images. The number of images will dictate the length of time, but generally speaking, if it's USB1.1, it'll take several minutes, whereas a USB2 connection should take less than a minute. If it's taking too long, consider buying a proper USB2 card reader.

Wireless coverage

Q I'm getting really poor range from my wireless router. Any suggestions?

Simon Donaldson

A First look at its location. If your router's on the floor behind furniture, this will greatly reduce its coverage. Try

raising its height a little. The other big problem can be interference from other devices operating on the same frequency, including wireless video senders, baby monitors, microwave ovens, Dect cordless telephones and, of course, other wireless networks. Most wireless kit can be adjusted to operate on different channels to minimise interference, so try changing these and liaising with immediate neighbours who have wireless kit to see if the situation can be improved.

If your house has thick internal walls, this can also have a drastic effect, and this is not easy to find a way around. In practice we've found Mimo-based routers are much better at getting good coverage in problem areas, and the prices are coming down – you can pick up a model with a built-in ADSL modem such as D-Link's DSL-G624M for under £90.

DATABASES

Simple sums

Q My question is short but sweet (I hope). I want to sum all values in Field X where Field Y contains the value 1 and Field Z contains the value 4. Is there an easy answer?

MJT

Microsoft Access

File Edit View Insert Query Tools Window Help

GroupBy : Select Query

Item2

ID Field X Field Y Field Z

Field:	Field X	Field Y	Field Z
Table:	Item2	Item2	Item2
Total:	Sum	Group By	Group By
Sort:	Group By		
Show:	Avg		
Criteria:	Min		
	Max		
	Court		

SCREEN 1

A This is an excellent example of where you'd use an Access Group By query.

These let you create summaries of records, letting you put like records together and then sum values, or average them, find the minimum value and so on.

Open a query grid, add the table and the fields X, Y and Z. Then click the Totals button (Greek E): a row labelled 'Totals' appears in the query grid with the default entry of Group By for each column. Set the criterion for Field Y to 1 and for Field Z to 4, then click in the Totals row for Field X and from the list of options, select Sum (see screen 1). The query now says wherever Field Y equals 1 and Field Z equals 4, add up the values in Field X to give a total.

Click View and Field X displays the total: check it's correct with a look at the original table and a little mental arithmetic.

DIGITAL IMAGING & VIDEO

Creating layouts

Q As a relatively new user of digital cameras (previously a keen 35mm fan, I now have an EOS350D) your columns have helped, particularly the info on Unsharp Mask.

In Photoshop Elements 4, I only have four layout options in the Picture Package bit and the same in the Labels bit (none of which are standard Avery sizes) of the Multiple Photos print option.

Are there any more layouts available anywhere (or on the installation CD)?

Rick Holt

A There are only four Picture Package and Label layouts for A4 paper, but if you click page setup you'll find others for different paper sizes including letter – which is close to A4. You can customise the Picture Package layouts to create your own; see the Hands on Digital imaging & video column in *PCW* September 2003 for more details.

The Photoshop Elements Picture Package layouts are text files located in *Adobe\Photoshop Elements 4.0\shared_assets\layouts*. Open one in notepad, or any text editor. Here are the contents of the one that puts two photos 100 x 148mm on an A4 page:

Trouble with vanishing toolbars

WINDOWS

Q A friend has a problem with Internet Explorer 6. All menus apart from File have disappeared from a horizontal point of view, though the Edit, View and so on menus appear on a dropdown list. Also, apart from the Back button, the rest have disappeared. Right-clicking to attempt to customise the toolbar shows that all the regular buttons are there, when in fact they're not. Any ideas how we can resolve this?

Martin Dennett

A It looks as if your friend has dragged the various toolbars onto each other's territory. If he grabs hold of the dotted 'handle' to the right of the File menu with the left mouse button he will then be able to drag the toolbar to the right,

or down a row, to reveal the rest of the menus. Repeat as necessary with the other toolbars.



It's a drag – grab the dotted 'handles' on the toolbar to reveal hidden menu items

c 19.0 27.7

A4 (2) 100x148

2.075 1.425 14.85 10

2.075 16.275 14.85 10

The first line is the page size (with margins), line two is the name as it appears in the pulldown menu, and lines three and four contain four numbers each – the first two are the co-ordinates of the top left corner of the picture, the second two are its size. To create a new A4 layout just edit the bottom three lines and save the file with a different name.

'There's a lot of interest in how to digitally archive analogue video'

VHS-to-DVD tips

Q I have a lot of VHS and S-VHS tapes to transfer to DVD. Would you recommend some – not hugely expensive – video-capture cards or USB video grabbers that would give me some good-quality results? Alternatively, could you point me to any reliable reviews of these devices?

I don't think *PCW* has done anything on these lines. I have bought *Adobe Premier Elements* to do the editing once I have the tapes on my PC.

Mic Hollis

A Try Pinnacle Systems Dazzle DV90 or the more recent and slightly cheaper Dazzle DV Recorder, which sells for around £40. With many people now making the switch from analogue VCRs to digital PVRs (personal video recorders), there's a lot of interest in how to digitally archive analogue video, and we'll be covering this in an upcoming Hands on column.

LINUX

Kmail export

Q I run KDE and use Kmail for my email. I'm about to buy a new computer and would like to export my email and details to my new computer, but I can't find any option to do it. Is it possible? I don't want to lose everything.

Howard Hardiman

A There are two ways to do this, depending on whether you want to transfer all your KDE settings or just the Kmail ones. KDE stores all settings under *~/.kde*, so the easiest way is to transfer the lot – just copy this entire directory (it links to another directory, such as *~/.kde3.5*).

Kmail stores the emails themselves under *~/Mail* in older versions and under *~/.kde/share/apps/kmail/mail* in newer versions. If your email is



Displaying negative numbers

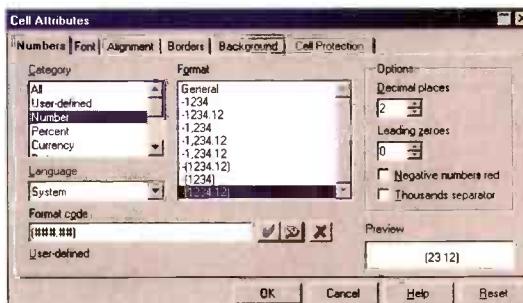
SPREADSHEETS

Q Is there a spreadsheet small enough to run from a Flash disk but also capable of showing negative numbers in brackets?

David Tallboys

A You could use Star Office. Unusually, it offers a `STYLE()` function but, doubtless more to your liking, you can also set a format for negative numbers as easily as in Excel. Press `Ctrl & Y` for the Style Catalog dialogue box and click the New button. In the resulting Cell style dialogue box, choose the Number tab and the User-defined Category. Enter `(###.##)` in the Format code box. Then when

you go back to the Number category, you'll find negative numbers in brackets will have been added to the listed examples in the adjacent Format box. Star Office also offers Conditional formatting. This is another way to show negative numbers in brackets, just like Excel.



How to display negative numbers in brackets in Star Office

stored under `~/.kde` there is nothing more you need to do: copying the contents of `.kde` will copy across all your email too. If instead you have a `~/Mail` directory you will need to copy this across as well.

Create an archive of the `.kde` link and the actual directory with the tar command:

```
$ tar cvvj kdebackup.tar.bz2
~/ .kde*
```

(Key: `v` code string continues)

And to extract these files on the new machine:

```
$ tar xfvj kdebackup.tar.bz2
```

The configuration and application files for Kmail are found under `~/.kde/share/apps/kmail` and in the files `~/.kde/share/config/kmailrc` and `~/.kde/share/config/emailidentities`. To copy across KDE settings alone, just copy the `kmail` directory and the two configuration files to your new setup, along with the `~/Mail` directory if necessary.

WINDOWS

Missing columns

Q In the Outlook Express window at the far left there is a column containing two items, Folders and Contacts. Under the latter is a list of all contacts in the address book and it is only necessary to click a name for a blank email, appropriately addressed, to appear. I must have clicked something I shouldn't have because both of these

disappeared. I managed to get the Folders column back but I've had no success in getting Contacts back.

Max Ashton

A This sounds as if you've closed the contacts pane with its 'X' button. To get it back go to View, Layouts and check the Contacts box.

WORD PROCESSING

Typing mystery

Q When I have typed some text in Word, say: 'controled' [sic] and then want to correct the mistake by bringing the cursor behind the I and then type another I there in order to get 'controlled', I often end up with 'controlld' [sic]. So the letter after the inserted one mysteriously disappears.

Frans van de Verte

A This is because you have overtype mode turned on. You can tell if this is so as the letters OVR appear clear, rather than greyed, in the status bar. This is usually caused by accidentally pressing the Insert key – press the key again (or double-click OVR) to revert to normal insert mode, where the existing text is preserved. If you find this irksome, then you can change the behaviour in Tools, Options, Edit – 'Use the INS key for paste'.

A5 printing query

Q I wish to make up an A5-size booklet, each double page being printed on an A4 sheet of paper. Thus page one would need to be printed with the last page, page two with the next to last page and so on. Using Word 2003, how do I set it up to print this way automatically? Peter Montgomery

A Word 2003 has this functionality built in, although it's not that easy to find. If you go to File, Page Setup, Margins, then choose 'Book fold' from the 'Multiple pages' list, this should do what you want.

Menu please

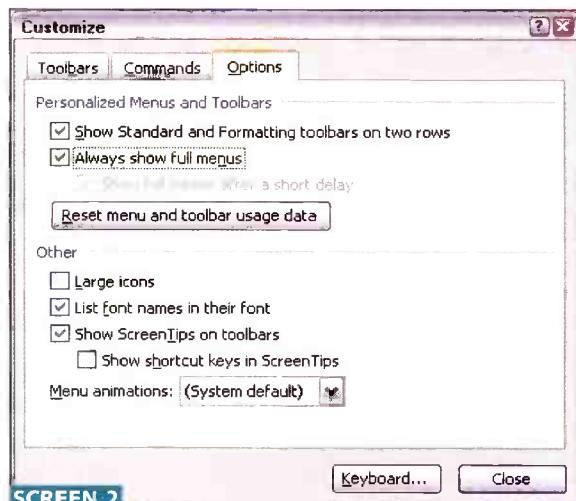
Q When I open menus in Word 2003, an abridged version of the menu is shown, but if I wait a few seconds, the full menu appears. Is it possible to skip this delay and show the full menu immediately? I've searched in Tools, Options without success.

Ray Walton

A You won't find anything in Tools, Options, but if you go to Tools, Customise, and then turn to the Options tab, you'll find what you want – 'Always show full menus' (see screen 2).

Losing line breaks

Q I often need to produce minutes of meetings. Within the text of each paragraph will be mentioned one or more things to be done. Our practice is to put the initials of the person who will do each action in the right-hand margin



SCREEN 2

on the same line where the action is mentioned. It can be done by using two columns, one almost the full page width and a narrow right-hand one. But the initials column then needs line breaks to fill the empty space, which need to be adjusted each time the main text is edited.

Simon Warren

A Text boxes would seem to be the best bet. It will help if you first turn off the 'Drawing Canvas' feature (Tools, Options, General). Then just draw the text box in the margin. If you right-click and format the text box, then set the Layout to square wrap, you should find that the box will stay in place relative to the start of the adjacent paragraph as you edit the main text.

SPREADSHEETS

I need a date

Q I work with financial investments and frequently need to know the date of the next Saturday and Sunday after an entered date. Is there a formula or function for this?

Iki Ahmed

A If your date is entered in cell A3 you can enter:

= (A3 + (7 - WEEKDAY(A3)))

in B3 for the next Saturday and:

= B3 + 1

in C3 for the next Sunday. Format B3 and C3 for a date. If you prefer a function, press Alt & F11 to open the VBA editor and create a user-defined one. On the Insert menu choose, Module. In the right-hand panel enter,

```
Function NextSat(FromDate As Date)
NextSat = FormatDateTime(
(FromDate + (7 - Weekday(FromDate))), 1)
End Function
```

The last argument is 1 if you want a long date format, such as 12 August 2006; or use 2 for a short format such as 12/8/06. In cell B3 enter =NextSat(A3) for the same result as before.

Worksheet display

Q Is it possible to display a specific worksheet in a workbook with many sheets when I open Excel? I do not wish to

The table shows the 'Universal Time of Each Contact' and 'Altitude of Moon at Each Contact' for London. The data spans from 2001 Jan 09 to 2008 Aug 16. The table includes columns for Date, Time, Pen. Mag, Umbr. Mag, Pen.E. Begins P1, Partial Begins U1, Total Begins U2, Great Eclipse, Total Ends U3, Partial Ends U4, O. Ends P4, Moon RA, Moon Dec (0 UT), GST, and Altitude (P1, U1, U2, Great, U3, U4, P4). A color key at the top right indicates moon position: yellow for Moon Above Horizon and gray for Moon Below Horizon.

put a macro in the workbook which would select a sheet when the file is opened; or do it by having a link from another application. Excel does recognise some startup switches, such as /e, to suppress the opening of a blank worksheet. Do you know if this architecture has been extended to allow a specific sheet within a named workbook to be opened?

Dick Drinkrow

A You are right that a shortcut on the worktop such as 'C:\Documents and Settings\Your Name\My Documents\2006\Exps2006.xls' can only open a particular workbook when Excel is started and not a specific worksheet. The usual answer to this is to have an Auto_Open() macro run when the file is opened. This can direct you to a specific sheet. But you don't want to do that, nor do you wish to open another workbook with a link to the required worksheet. As Excel always opens a workbook at the last worksheet displayed when the file was closed, you might wish to follow my practice: I click the tab of the worksheet of choice before I close the file.

Full-stop query

Q In the Dos version of Lotus 123, when you highlighted a range, you could move around the range by pressing the full stop. Does this facility exist in Excel?

Neil Hardy

A Yes, but use Ctrl & Period. Also you can press Enter to move from top to bottom within a highlighted range, or Shift & Enter to

Download an Excel file that calculates eclipses of the moon

move from bottom to top. Press Tab to move from left to right. If cells in a single column are selected, Tab moves you down. Press Shift & Tab to move from right to left within the selected range. If cells in a single column are selected Shift & Tab moves you up. For more such info look under Keyboard Shortcuts in the Excel Help files.

Predicting eclipses

Q I was interested in the article on calendar calculations in the March issue of PCW. Can you show me how to calculate the dates of eclipses of the moon for a particular location?

Jonathan Ellis

A I suggest downloading the small Excel file, LE2001-25.xls, from <http://sunearth.gsfc.nasa.gov/eclipse/LEvis/LEvis.html>. It will do the job for you. PCW

LET US HELP YOU

All our experts welcome your queries. Please respond to the appropriate address below

Databases database@pcw.co.uk

Digital imaging & video digitalimaging@pcw.co.uk

Hardware hardware@pcw.co.uk

Linux linux@pcw.co.uk

Networks networks@pcw.co.uk

Performance performance@pcw.co.uk

Sound sound@pcw.co.uk

Spreadsheets spreadsheets@pcw.co.uk

Visual programming visual@pcw.co.uk

Web development webdev@pcw.co.uk

Windows win@pcw.co.uk

Word processing wp@pcw.co.uk



Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the

Hardware column.

Email hardware@pcw.co.uk

Please do not send unsolicited file attachments.

How to upgrade a Sky+ box

All you need to know to add a larger hard disk and improve your viewing experience

An increasing number of consumer electronic devices use standard PC components. There's no point reinventing the wheel, so when a manufacturer wants to build, say, a hard disk video recorder, it makes sense to use existing technology.

This opens up fascinating possibilities for upgrading gear that manufacturers would prefer remained sealed. They want to charge you a hefty sum for what in PC terms might be a modest-priced upgrade, so they don't advertise the fact that much of the insides of their consumer-friendly appliances will be familiar to any PC enthusiast.

Opening a consumer appliance will usually invalidate your warranty, but if yours has expired, you might want to peek inside. Hard disk recorders are an ideal example, as you'll normally find standard PC hard disks in there. The question then is whether it's possible to swap the existing disk for a bigger one and enjoy loads more recording time.

As anyone who's upgraded the disk on a PC knows, there can be compatibility issues with the controller, Bios and operating system. A consumer appliance is no different and there are often additional heat and cooling considerations. Luckily, almost every disk-based consumer recorder has already been torn apart by early-adopting enthusiasts who've done the trial and error for us. They've seen what works and what doesn't, and reported back on various web forums.

These message boards are the first port of call for anyone upgrading a consumer appliance, and the best are at Digital Spy (<http://forum.digitalspy.co.uk/board>) and AV Forums (www.avforums.com). There's also a neat guide at www.morlocks.co.uk/disc-change-v2.htm.

Reading these forums had whetted my appetite for a Sky+ upgrade project some time ago, but not being an



owner, I had to wait for a friend's model to exit its warranty period. So many thanks to my brother-in-law, Jon, who bravely volunteered his unit to go under the Hands on screwdriver.

Necessary preparation

As with any PC upgrade, some preparation is essential. Before selecting the right components, we should remind you that these upgrades will invalidate your warranty and the manufacturer is unlikely to be sympathetic should anything go wrong. We're also unable to support you, so any upgrading you do is at your own risk – there's no guarantee it will work. That said, this particular upgrade is quite straightforward and much easier than the Tivo project we detailed in an earlier Hands on column.

In terms of components, the most obvious thing you'll need to buy is a new disk. You shouldn't just go for any model. Disk controllers and operating systems can be fussy about what you ask them to work with, and there are specific considerations for a Sky+ box.

First is capacity: you might fancy fitting a whopping new 400 or 500GB drive to maximise your recording time, but trial and error has proven 250GB to be the largest drive most Sky+ units can reliably deal with.

Opening a Sky+ box reveals an instantly recognisable standard 3.5in hard disk; this Amstrad Sky+ was fitted with a Seagate parallel ATA model

Second is spindle speed. Most hard disks today spin at 7,200rpm and, while these could be used in a Sky+, the standard units use slower 5,400rpm models. This is most likely to minimise both noise and heat, so while 5,400rpm drives may now be scarce, it's worth seeking one out.

Third is the manufacturer and model. Numerous Sky+ upgraders have found

certain models work better than others, and if you'd like the smoothest ride, you'd be wise to follow their advice. This can be infuriating if you have a spare 3.5in disk lying around, but if it's the difference between your machine recording a show or not, we'd sooner go for the closest thing to a guarantee.

Fourth is the manufacturer and version of your Sky+ box. There are three main models: two from Pace and one from Amstrad. Each has its own foibles, so you should identify your unit and check the forums for specific considerations. Ours was an Amstrad.

In terms of the disk, you're ideally looking for a 5,400rpm 250GB model. While various models have been recommended for different versions of Sky+, one seems to crop up more than any other: Samsung's Spinpoint

Removing and swapping the disk is straightforward





VI20CE 250GB. It can be quite hard to track down, but online retailer Komplett usually has them for around £72. The page on Komplett's site for the drive (www.komplett.co.uk/k/ki.asp?sku=308644&cks=SER) includes feedback from a number of buyers who've bought the drive specifically for Sky+ upgrades.

Finally, you may now have the right disk but without the right tools to open your Sky+, you'll fall at the first hurdle. Check the sides and back of your Sky+ to identify the type of screw that holds the case shut. Like most consumer appliances that aren't designed for user upgrades, you may find an unusual star-shaped (Torx) head on the screw. You'll need a size 10 Torx bit to remove it – luckily such tools are readily available from the likes of Maplin (www.maplin.co.uk).

Interestingly, despite most forums claiming our Amstrad Sky+ would be held together by such esoteric screws, it was in fact secured by nothing more exotic than three bog-standard Philips-head screws. Other forums mention the possibility of tamper-resistant Torx screws being fitted, which have a central raised pillar and need a special bit, but again these are widely available from hardware outlets.

Before powering down your Sky+ and opening the box, you should turn off the Instant Rewind feature to prevent any unexpected disk activity before and after the upgrade. This can be found in the Sky+ Setup menu under the main Sky services menu; make sure you save to apply the changes.

Inside the Sky+

Once you've deactivated the Instant Rewind feature, you can switch off your Sky+, remove the exterior cables, undo the screws on the case and slide the lid off. Inside you'll immediately notice a familiar 3.5in IDE hard disk with a parallel ATA ribbon cable. The physical side of the upgrade involves little more than swapping this disk for your new one and connecting it up.

Once you've removed the brackets from the old disk and attached them to the new one, you can screw it onto the four rubber pads in the case. The drive pictured is Samsung's Spinpoint V120CE 250GB, a popular model for Sky+ upgraders

The disk is held in place using a pair of L-shaped brackets. These are screwed into the sides of the disk, and sit on four rubber pads in the case to minimise vibration and noise. After you've disconnected the standard power and data cables from the back of the disk, you can remove the four screws that hold the brackets into the case and the disk will lift out.

You should now unscrew the brackets from the sides of the old disk; one screw may also be holding a grounding cable in place, so you'll need to unscrew this to lift the drive entirely free from the case. You can then screw the brackets onto your new disk, taking care it's the same way up as the old one.

Before mounting the new disk back into the case, you must ensure its jumpers – normally located near the power and IDE connectors – are set to CS, CSEL or Cable Select (the exact name used depends on the drive manufacturer), otherwise the Sky+ won't be able to recognise it properly. Be careful to follow the guide printed on the disk label when you're setting these jumpers, as a mistake here can cause all manner of headaches.

With the disk configured as Cable Select and the brackets screwed into its sides, you can reattach the grounding cable, lower the entire thing onto the four rubber pads, then screw it in place. Now connect the power and data cables, slide the case lid back on and screw it shut.

Powering up

Next, reconnect all the exterior cables including the power lead, but don't switch on the machine yet. Wait for two minutes before pressing the Sky button on your remote control. The system should then start up and begin the standard demonstration.

You'll now need to perform some housekeeping to configure the new disk using a hidden service menu. To access this, press the Sky button on your remote, then Services. Next press 4,

The new Samsung disk connected up to the power, data and grounding cables. After closing the case and connecting the power cord you'll need to perform some housekeeping



then 01 and Select to access the hidden service menu. Then choose option eight to perform a 'Full System Reset'.

According to various user reports, the process can take anything from a few minutes to 45 minutes, but ours was ready in about three or four minutes. You can then go into the standard setup menu, reactivate Instant Rewind, then start recording as normal. Try to fill the disk as soon as possible to ensure it's working properly.

Troubleshooting

Our upgraded Sky+ started recording fine, but with one crucial problem: it estimated that more of the disk would be required for recordings than before, implying a lower total capacity.

I hoped that once it had reached '100 per cent', it would realise there was more space and keep recording – sadly it did not. Then I remembered some people had reported similar problems until they'd ensured their Sky+ was running the latest firmware. So I forced a download of the latest firmware by unplugging the power cable, then holding down the Backup button on the case for four seconds as I reconnected the power lead. New firmware downloaded, but to no avail.

Convinced there may be an existing partition on the disk that was causing the problem, I fished it out and was about to connect it to a PC, when I checked the jumpers again. I realised I'd set the jumper not just to CSEL, but also selected the option to fix the drive's capacity to 32GB for compatibility with old PCs. As the original disk was 40GB, this exactly tied in with the unit's slightly higher percentage estimates for the same recordings.

I changed the jumper to CSEL only, reconnected it, performed another full system reset, then was delighted to see the estimated percentages fall from around five per cent for an hour to around one per cent for an hour.

Had I correctly set the disk jumper in the first place, this would have been a quick and pain-free upgrade. Even having endured a few days of confusion, I'd still say it was well worthwhile. The Sky+ now has five to six times the capacity for just £72, which is a bargain in anyone's book – especially seeing how much more the Sky+ 160 costs compared to the standard 40GB model. Considering the hefty requirements of high-definition broadcasts, I only hope upgrading the disk in the forthcoming Sky HDTV set-top box will be as simple. **PCW**



Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Performance column.
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Peace and a smell of burning

A solution to a noisy graphics card explained, and a power supply is pushed to its limit

In this month's column I'll be following up on the performance of two components previewed in earlier issues. But first, some advice for anyone who's upgraded their power supply (PSU) and processor fans in the hope of a quiet life, but been disappointed to find their PC still whirrs louder than they had hoped.

The culprit is usually the graphics card. Their tiny cooling fans can make a racket that becomes obvious once you've quietened other parts of your system. I was in that position recently when upgrading a friend's PC, so turned to quiet-cooling leaders Zalman.

Essentially, you have a choice between a larger heatsink and cooling fan, or a pair of fanless heatsinks that sandwich your card. I went for the former, knowing the fan could run in near silence but still provide some airflow to the chipset and memory.

The VF-700 in copper and aluminium for £21.15, or all copper for £24.67, from www.quietpc.com will do the trick. I got the cheaper version and it took about half an hour to fit. Cards and vendors vary, but most hold their heatsinks in place using a pair of pushpins. Once you've removed the existing heatsink, you just screw the supplied studs through the pushpin holes, which provide a mounting for the larger fan. Tiny heatsinks for the memory chips are also supplied.

Finally, connect the fan to the supplied adapter, which gives you the choice of two running speeds – I opted for the slower and quieter option which was more than sufficient to keep my Radeon 9700 Pro happy. I'd recommend the VF-700 for anyone who wants to quieten a graphics card.

PicoPSU on test

In May's Performance column I tried the PicoPSU, which, at around the same size as two AA batteries, is the world's

smallest snap-in DC-DC ATX PC power supply. The unit is powered by an external laptop-style AC adapter which, depending on the model, can deliver up to 120w of power. As explained in May's issue, you have to be certain your system consumes less than this amount at any time, including brief peaks such as during the initial power-up.

The PicoPSU is primarily designed for low-power platforms such as Via's Epia motherboards with laptop-style optical drives, but I wanted to try it with a more powerful platform. In May I confirmed that the power consumption of my Aopen i915GMm-HFS Pentium M system remained below 100w at all times, so it should have posed no problem for the PicoPSU. The Aopen board may be designed for a low-power processor, but is fitted with a 4pin supplemental power plug that must be connected for the system to boot up. But the PicoPSU was only equipped with the ATX motherboard connector and two 4pin Molex drive plugs, so I was temporarily stumped.

For this month's column I got a Molex-to-4pin supplemental motherboard plug and gave the PicoPSU a second chance. Upon attempting to power up the system, however, I was met with the smell of overheating

The PicoPSU is the world's smallest snap-in power supply, but it's best suited to low-power systems such as Via Epia boards with laptop optical drives

components, so I unplugged the PicoPSU from the mains. I'm looking into the cause, but in the meantime anyone considering powering a more traditional system with the PicoPSU should discuss it with the supplier or stick with a conventional power supply.

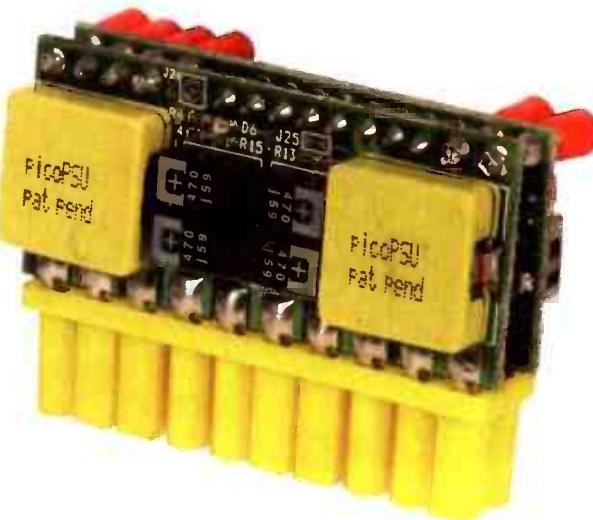
The PicoPSU does remain a perfect compact solution for its primary market of low-power systems such as the Via Epia. It's great for small PC projects from servers to robotics. The PicoPSU costs £45.82 from the Mini-ITX store at www.mini-itx.com/store, where you'll also find external power adapters including the 110w model for £41.13.

Terratec Cinergy hurdles

In April's issue I mentioned Terratec's Cinergy 2400i DT, the first dual-tuner digital TV PCI Express card. As a big fan of the Freeview system and media PCs in general, I was excited to try out the card, especially as it supports Windows XP Media Center Edition 2005.

I got the card for this month's issue and, as it requires a PCI Express x1 slot, tried it in my Aopen i915GMm-HFS motherboard. When Windows started, Device Manager reported there were insufficient resources available for the card to operate. I tried disabling the legacy serial and parallel ports, and later the onboard Ethernet, Firewire and audio facilities, but Device Manager still reported insufficient resources available.

I was unable to try the card in other motherboards for this issue, and neither Terratec nor Aopen could solve the problem. I discovered on some forums that I wasn't alone in having problems with this card and an Intel 915 chipset-based motherboard. I'll report back when I have more details, but in the meantime owners of 915 chipset motherboards may be better off with a pair of conventional PCI tuner cards. If you've had any experiences with this card or other tuners, let us know. **PCW**



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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.

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Tame XP's Autoplay

Get back in control and set default actions for today's plethora of media formats

Back in the days of Windows 95, 98 and ME, the Autoplay feature for audio CDs and CD-Roms was simplicity itself. The former would start to play in the default player and CD-Roms wouldn't do anything unless there was an Autorun.inf file in the root of the CD. This, in turn, specified a program to run – an installation setup for example. If you didn't want this to happen, you could go to System Properties, Device Manager, select the drive, open its properties and uncheck 'Autoinsert notification' on the Settings tab. Alternatively, holding down the Shift key when inserting a CD disabled Autoplay on a one-off basis – as it still does, at least in theory.

Mixed messages

With the arrival of Windows XP and the proliferation of other removable storage, such as card readers, memory keys, mp3 players and so on, things became much more complicated. To give an example, I've just plugged in a USB flash drive containing some doc, rtf, jpeg files and one wav file. XP pops up a box telling me it contains 'more than one type of content' and offers me the choice of playing the media files using Real Player, playing in Windows Media Player, printing the pictures using Photo Printing Wizard, viewing a slideshow of images, copying them using the Microsoft Scanner and Camera Wizard, copying them using Picasa, importing pictures and videos using Microsoft Digital Image Import Wizard, opening the folder using Windows Explorer or taking no action.

Which is insane, especially as there is no 'always perform' check box, and the most likely action for mixed content – opening the folder in Explorer – is second-to-last in the list. Things get better when I stick an SD card from my camera into a USB card reader, as I've



trained it to open image files in Explorer so that, eschewing the delights of the two Microsoft wizards or Picasa I can view the pictures as thumbnails or film strip, and copy them to my hard disk using the traditional technology of drag and drop.

But, hang on – most digital cameras can record sound and video as well as still pictures, and if I pop in a card containing such files, I get the full nine-item list described above. How this can be deemed in any way helpful or time-saving beats me.

How to set default actions

The problem gets worse with high-capacity media, such as DVD, as Windows devotes considerable time to what Microsoft developers call 'content sniffing'.

Waiting for Windows to finish 'content sniffing' can be tedious

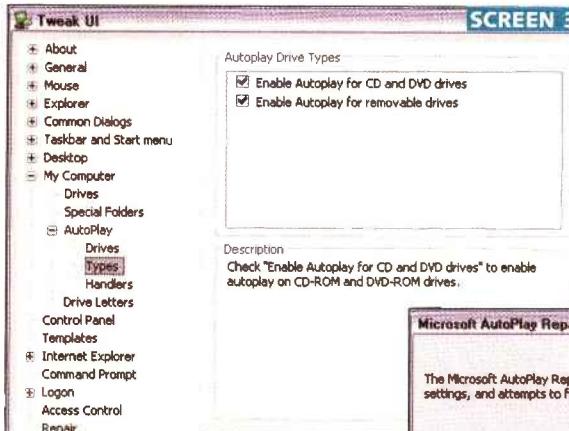
It's worth setting Autoplay defaults for a drive



sniffing'; that is, deciding what types of file are on the DVD, and entertaining you with the swinging torch animation while it does so (see screen 1). And it often gets it wrong. I've backed up my documents to a DVD, using Nero Back-it-up. Again there's a mixture of file types here, but the column you are reading now is pretty typical, with one document and five screens in gif format. After a lot of torch waving, Windows decides this is 'pictures' and offers me all the options previously mentioned apart from playing media files. I don't think I'm alone in finding this an annoyance – reader John Towell wrote that he'd like software CDs or DVDs to Autorun, as well as video DVDs, but data CDs, DVDs and other media to be left alone. In other words, pretty much revert to the old Windows 95/98/ME behaviour.

It's worth taking the time to set some defaults rather than dealing with the choices offered on an ad hoc basis. If you right-click on a CD or DVD drive and choose Properties, you'll get a tabbed property sheet with an Autoplay tab. Here you can set the default action for various content types – Music files (for example, mp3s or wmas), Music CD, Pictures, Video files, Mixed content and, on a DVD drive, DVD movies. Check the 'Select an action' button and for each type you can choose a different – or the same – action (see screen 2). If you click the Apply button after each selection you won't have to keep opening and closing the Properties dialogue.

The same applies to other removable media – if you attach a card reader or a memory key to a USB port you'll get the same options, apart from Music CD. Windows remembers the device rather than the port, so you can have, say, the contents of your camera trigger a different action to that of your USB key when you swap them over.



Left: Tweak UI lets you turn off Autoplay by letter or type



Below: The Autoplay Repair Wizard checks everything from the hardware detection down

Exceptions are the rule

There are a couple of problems here. One is that it doesn't always work. I have a DVD drive and a CD drive on my PC, and I've just set the former to play Music CDs in Ultralayer, DVD Movies in Windows Media Player, and open everything else in Explorer. So far, this is working a treat, as are my card reader and USB key, both of which are now opening everything in Explorer. As an experiment, I've set every content type on the other CD drive to 'Take no action'. Audio CDs don't autoplay. CD-Roms with Autorun.inf files don't Autorun. But everything apart from Audio CDs seems to be opening in Explorer. Stranger still, if I change Audio CDs to play in Ultralayer, they still don't Autoplay.

There is also an underlying philosophical problem here. In order to take a particular – or no – action, for a content type, Windows has to ascertain what that content is. So it's still going to have to wave the torch around until it realises that you don't want it to do anything. There are a number of ways of improving on this, but none is ideal. For example, you can hold down the Shift key when you insert the removable media. This is harder than it sounds – nearly every time I try, I've released the Shift key only to find this was premature and the thing is going to Autoplay anyway.

Tweak UI to the rescue

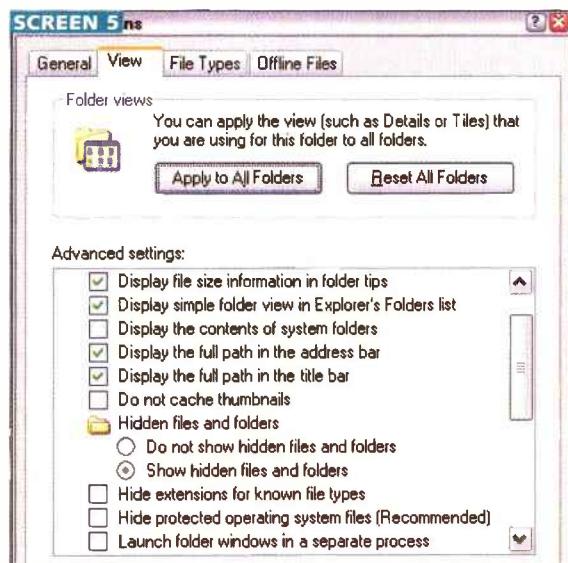
If you have the XP version of Tweak UI, you can turn Autoplay on and off completely on a per-drive or per-type basis (see screen 3). It will also let you edit or create 'handlers' should you have software that doesn't volunteer itself in the normal course of events, but we'll pass over that for now. There is a free tool available from Microsoft – the Autoplay Repair Wizard – which you can find at

<http://tinyurl.com/5s4x7>. This checks everything from the hardware detection down (see screen 4), but apart from changing the settings of the CD drive back to the defaults – that is, ask every time, it didn't solve the problem – 'Take no action' still opened the contents in Explorer.

Regedit sans frontières

How do you edit the Registry for another user on your XP computer? The obvious answer is to log in as that user and go from there, but if that user doesn't have Registry-editing privileges, this is a non-starter. Here's a better way. First, you must be logged in as an administrator, and second the targeted user must not be logged in, so if your PC is set for fast user switching, go to the Welcome screen (Log off or

Make sure 'Hide extensions for known file types' is unchecked before you try to load a hive



Please tell...

In May's column I gave instructions for turning off the error-reporting feature in Windows XP, and stated that 'I've yet to hear of anybody benefiting from sending a report'. Judging from your feedback, my cynicism was unjustified, as several readers have had replies (and even emails!) from Microsoft with information – such as the availability of third-party drivers or updates – that have solved a problem or otherwise been useful. So, apologies all round.

Switch user) and check that the user is properly logged off.

If you run the Registry editor (start, run, regedit) then select the HKEY_USERS branch, you'll see that the first-level subkey names are not very helpful. If you then go to the File menu you'll see a command to 'Load Hive'. A hive, in Microsoft-speak, is a set of Registry keys corresponding to one or more files. Most of these files are stored in Windows\System32\Config, but all users have their personal hives stored in their profile in a file named NTUSER.DAT. When they log on, the contents of this file populates the HKEY_CURRENT_USER branch of the Registry.

This file is hidden, so if you have not already gone to Explorer's Tools, Folder Options, View and selected 'Show hidden files and folders', close Regedit and do so now. While you are there, make sure the option to 'Hide extensions for known file types' is not checked as there are several files starting with NTUSER, including a NTUSER.DAT.LOG file that appears as NTUSER.DAT with extensions hidden but is not the file you want (see screen 5). Next, run Regedit, select the HKEY_USERS branch again, go to File, Load Hive and browse to the NTUSER.DAT file in the top level of the user's profile – for example, C:\Documents and Settings\Rosie. You'll be prompted to give a key name – it isn't compulsory, but it makes sense to use the target user's name. Having done this you'll see the name added to the first-level subkeys in HKEY_USERS, and you'll be able to edit the hive as you would HKEY_CURRENT_USER. Finally, when you've done your editing, highlight the loaded hive, go to the File menu again, and unload it. **PCW**



Barry Shilliday has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time he prefers to travel the world – and snap it with his camera.

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Kioslave labour

Find out how a feature of the KDE desktop can help simplify a variety of tasks

With Unix and Linux you are not restricted to a vendor-supplied desktop, as with OSX and Windows; you can choose whatever you want.

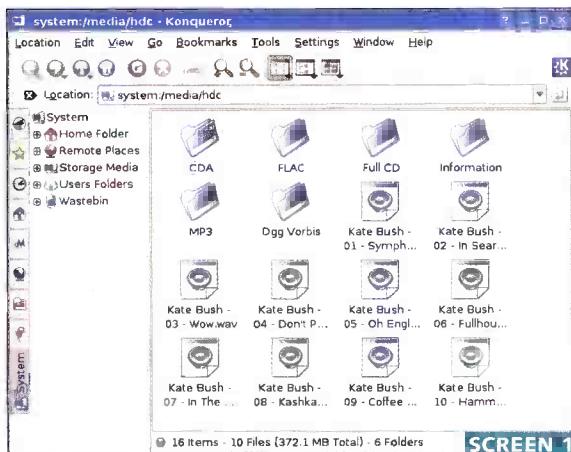
The two major open-source desktops are Gnome and KDE. These are complete desktop environments in that they implement features and consistency between the applications, such as letting programs send messages to each other, or using a standard print and file dialogue. If you have been following the recent Ubuntu series you will have been using Gnome.

Traditionally, Red Hat and Ubuntu have chosen Gnome for the preferred desktop, and Suse and Mandriva have chosen KDE. Although architecturally and visually very different, they do work together somewhat: you can run KDE applications in Gnome and vice versa, and some functions such as drag and drop will work between them. Both have some superb features, and we are going to look at one such feature KDE offers.

KIO explained

When a KDE application wants to perform input or output, such as reading or writing a file, it goes through the KDE Input/Output layer, known as KIO. This is a standard layer for applications to use (an application programming interface or API), and it is particularly useful as it is fully open and extensible. Anybody can write a plug-in that adds features using this application layer. These plug-ins are called kioslaves, as they do the input and output work on behalf of the application.

What makes this architecture impressive is that quite complex and intuitive tasks can be carried out



using normal KDE features, such as saving a file. Applications do not need to know about what a kioslave does or how it performs its task. As a simple example, if you click on a compressed file to open it, KDE uses the relevant kioslave to decompress the file and display its contents. As a desktop user you don't need to know that it does this, and a KDE application doesn't need to know either: it opens the file as it would any other.

The same functionality extends to all sorts of typical tasks. If you open an

Browse the contents of a CD virtually using KDE's kioslaves

Accessing a remote Mac over a secure connection is made simpler with kioslaves

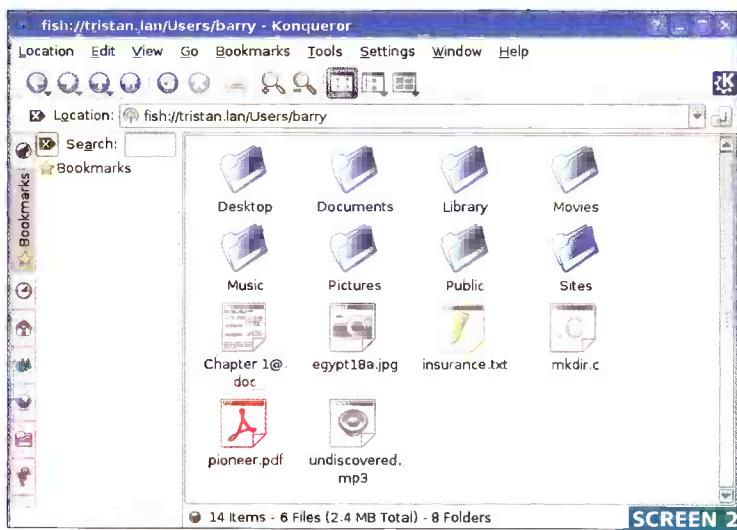
FTP connection in Konqueror to transfer files, the appropriate kioslave translates normal KDE activity, such as copying and deleting, into the relevant FTP commands; so if you drag and drop a file into an FTP window, for example, the kioslave sends the file to the FTP server and refreshes the window with the new contents. This isn't restricted to Konqueror: any KDE application can save to an FTP server this way – as far as the application is concerned, there is no difference at all from saving to a local folder, only the kioslave KDE uses changes.

There are many different kioslaves included in KDE. The HTTP kioslave allows you to render websites; the fonts kioslave allows you to browse available fonts and install new ones. And there are a couple of kioslaves that deserve some special attention.

The audiocd kioslave

The audiocd kioslave is responsible for accessing audio CDs in a useful way: CDs do not contain data files, so simply reading the CD like a disk would be pointless. The kioslave reads the track information on the CD

and checks an online or locally cached database for track information. It then presents the contents of the CD as standard wav files with each track named appropriately. It looks and behaves just like a normal directory, even though the files are not 'real'. If you drag a wav file from the CD's folder, the standard KDE behaviour would be to copy the file. The kioslave instead takes



this instruction and extracts the audio from the disc using the robust cdparanoia, and then passes the generated file back to be copied as normal. What seems a completely logical and intuitive step, but in fact involves a more complex procedure, is carried out transparently in a completely standard way.

It doesn't stop there. Since it is possible to extract audio information this way, why not go further and perform some encoding? The audiocd kioslave will encode to mp3, Ogg Vorbis and Flac. It presents a directory for each of the formats, each containing a file (appropriately named with the correct extension) for every track. As a desktop user you can simply drag the mp3 folder, and KDE will copy across all the mp3 tracks complete with tagged information. What happens is the audiocd kioslave extracts and encodes each of the tracks for you (see screen 1).

The fish kioslave

The OpenSSH protocol lets you log in to other systems over a secure and encrypted connection. It is ideal for remote administration and accessing other machines, and can be used to copy files securely. For transferring files it relies on the command line, and can be difficult and frustrating to use. KDE provides a unique kioslave for this task, called fish.

The fish kioslave uses OpenSSH to provide access to a remote system securely. It looks and behaves just like a regular local directory, but everything happens over the secure connection. Many remote systems accessible over the Internet require OpenSSH for general security reasons, and if you have to transfer files regularly then having fish can be a good reason for choosing KDE. To access a remote system, enter fish://username@servername to login; you can save the details of the connection for one-click access from any application. To use fish, all that is required is OpenSSH and Perl, which are provided with all Linux distributions and Apple's OSX.

You could combine these actions. Let's say you needed to extract a track from a CD, convert it to mp3 and then copy it to a remote Mac over a secure Internet connection (see screen 2). Each of these steps would normally have to be performed separately. With the kioslaves to do all the work, you can insert the audio CD, click to access

your remote Mac and drag an icon from one window to another. If you needed to email a file from your Mac, you could drag the file from the fish window to your email program. While this sort of thing is nothing new to local files, having the capability to use sophisticated kioslaves to implement much more complex tasks saves a lot of time and helps to keep things intuitive.

Wireless Breezy

Configuring wireless network cards on Linux has often been a bit of a problem: many manufacturers refuse to release specifications, making it difficult or impossible for third-party developers to write the necessary drivers. Reader Paul Burt has emailed to ask if his Asus WL-167G USB device can work under Ubuntu Breezy.

There is good news and bad; the good news is that the Asus device runs on Ralink's RT2570 chip, which has a Linux driver. Even better, Ralink released this driver (as well as its PCI and PC Card equivalents) as open-source software, and major

'If you transfer files regularly then having the fish kioslave can be a good reason for choosing KDE'

development has gone into making it work seamlessly under Linux. The bad news is that Breezy's kernel doesn't include the driver, so it is necessary to download and install it yourself. The procedure is a little fiddly, but follow these instructions and it should work without a problem.

First head over to the driver website at <http://rt2x00.serialmonkey.com>. There are two versions of the drivers here: the 1.x series for each type of supported chip, and the new 2.x series with all the supported types together. The new series requires a newer kernel than that included in Breezy, so download the latest 1.x driver for the RT2570 chipset. At the time of writing this was called 'rt2570-1.1.0-b1.tar.gz'. Extract the archive in the usual way:

```
$ tar xfvz rt2570-1.1.0-b1-  
tar.gz
```

(Key: ↵ code string continues)

If you haven't compiled any software before, you will need some

```
barry@breezy: ~/rt2570-1.1.0-b1/Module
File Edit View Terminal Tabs Help
CC [M] /home/barry/rt2570-1.1.0-b1/Module/rttmp_tkip.o
CC [M] /home/barry/rt2570-1.1.0-b1/Module/wpa.o
CC [M] /home/barry/rt2570-1.1.0-b1/Module/rttmp_wep.o
CC [M] /home/barry/rt2570-1.1.0-b1/Module/rtusb_info.o
/home/barry/rt2570-1.1.0-b1/Module/rtusb_info.c: In function 'usb_rt2570_ioctl':
/home/barry/rt2570-1.1.0-b1/Module/rtusb_info.c:4104: warning: 'verify_area' is
deprecated (declared at include/asm/uaccess.h:105)
CC [M] /home/barry/rt2570-1.1.0-b1/Module/assoc.o
CC [M] /home/barry/rt2570-1.1.0-b1/Module/auth.o
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CC [M] /home/barry/rt2570-1.1.0-b1/Module/md5.o
CC [M] /home/barry/rt2570-1.1.0-b1/Module/rtusb_io.o
CC [M] /home/barry/rt2570-1.1.0-b1/Module/sanity.o
CC [M] /home/barry/rt2570-1.1.0-b1/Module/rtusb_data.o
LD [M] /home/barry/rt2570-1.1.0-b1/Module/rt2570.o
Building modules, stage 2.
MODPOST
CC /home/barry/rt2570-1.1.0-b1/Module/rt2570.mod.o
LD [M] /home/barry/rt2570-1.1.0-b1/Module/rt2570.ko
make[1]: Leaving directory '/usr/src/linux-headers-2.6.12-9-386'
barry@breezy: ~/rt2570-1.1.0-b1/Module$ sudo cp rt2570.ko /lib/modules/2.6.12-9-386/
barry@breezy: ~/rt2570-1.1.0-b1/Module$ sudo depmod -a
barry@breezy: ~/rt2570-1.1.0-b1/Module$
```

The build process will create a file called **rt2570.ko**

additional packages before you can continue. The Linux headers package is required for building a new kernel driver module such as this. Also, because Breezy's kernel is compiled with gcc 3.4, you need this version of the compiler. To ensure you have the standard build tools, include the 'build-essential' package as well. You can install all these packages in one step:

```
$ sudo apt-get install linux-  
-headers-386 gcc-3.4 build-  
essential
```

The first package name is assuming you are using the 386 kernel; run 'uname -r' to check your running kernel. Its name will end in k7, 386 or 686. Now enter the driver's directory and build it:

```
$ cd rt2570-1.1.0-b1/Module  
$ make
```

All being well, the build process will create a file called **rt2570.ko** (see screen 3). This needs to be installed into the kernel's collection of drivers and the list updated:

```
$ sudo cp rt2570.ko  
/lib/modules/2.6.12-10-386/  
kernel/drivers/net/wireless  
$ sudo depmod -a
```

Again, replace '2.6.12-10-386' with the details returned by 'uname -r'. Each kernel needs its own driver, so if you upgrade to a new release this process must be repeated. We have included a version of the module for the basic install kernel on the cover disc, and you can use this pre-built module if you need to get the wireless device running without an alternative networking option to download the latest updates. Once these final two steps are performed, just insert the USB device; it is automatically detected and can be configured in the usual way with the Networking administration tool. **PCW**



Ken McMahon is a freelance journalist and graphic designer. His involvement with digital cameras began with a Commodore 64. He graduated to Macs and now works mostly with PCs.

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Ten time-saving tips

Save hours with this useful advice for editing images and video

Has anyone ever told you that you should get out more? It's nearly June. The days are long, and the nights are hot and humid. OK, I'm guessing – here in magazine land it's still March and the clocks have only just gone forward. But let's face it – before long, it'll be winter again, and you'll have no choice but to spend all your time stuck indoors in front of a PC. Right now you should be out there, taking pictures, shooting video, generating all that content you're going to need to sustain you through nine months of editing.

Because there are better things to do and you don't want to be overwhelmed by the task of editing the torrent of digital imagery you are busy creating, here are 10 ideas that might save you a few hours here and there. They work for me and, if you make a start now, you might save enough time to 'Turn off computer' for a few hours and make the most of the summer while it lasts.

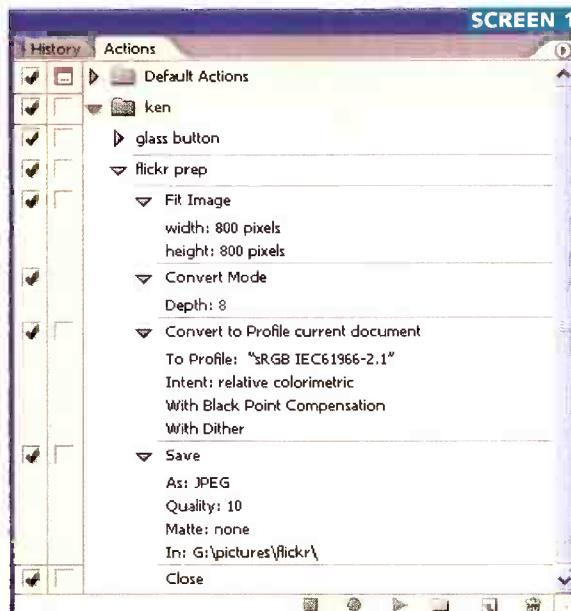
1 Quick clip selection in Ulead Videostudio

One of the most time-consuming video-editing tasks is clip selection – deciding what gems to keep from the hours of footage on your tapes. One approach is to capture everything, then edit out what you don't want. This is better than sitting there watching the whole thing in real time, but Ulead Videostudio 9's Quick Scan feature is like capturing in Fast Forward mode.

Quick Scan is the first step in Videostudio's DV to DVD Wizard, which quickly runs through capture, editing and authoring, so you'll be ready to watch your holiday movies before you've even unpacked.

2 Batch resizing in Photoshop

Whether you want to send them as an email attachment or upload to a



SCREEN 1

Screen 1 shows the complete action, which also converts my photos to 8bits per pixel sRGB images and saves them as jpgs, ready for uploading to Flickr.

3 Fast-track DVDs in Premiere Elements

Like Ulead Videostudio, Premiere Elements 2 users also have a fast track to DVD. In the capture panel, select the 'More' menu and make sure Scene Selection and Capture to Timeline are both selected (see screen 2). Premiere Elements creates a new clip for each scene and places it on the timeline. Delete the clips you don't want – the gaps are automatically deleted – then click the DVD button. When Elements asks if you want to automatically create DVD scene markers, click yes. Now all you need to do is choose a template and burn your disc.

4 Rate pics in Photoshop Elements 4

The Photoshop Elements Organizer offers any number of ways for you to display and search for photos. Display the timeline (Ctrl & L) and you can go to any date, or you can search for photos of your mum and dad in Brighton using tags. But if you're looking for a particular photo and can't

photo-sharing service, it's probably a good idea to downsample digital pictures first. Since I've become a Flickr addict (www.flickr.com) I've made a habit of downsizing all pictures to 800pixels wide (or tall) before uploading, in order to stretch my 20MB free account monthly upload limit as far as possible.

The difficult part of automatic image resizing lies in determining whether photos are landscape or portrait format. Using image size to reduce the width to 800pixels works fine for landscape photos, but portrait format ones will be 1,200pixels on the longest side.

The answer is to ignore image size and resize your photos using Fit Image, which you'll find on the automate sub-menu of the File menu. Fit Image allows you to specify a maximum for both the width and height pixel values. If you set both of these to, for example, 800, landscape images come out 800pixels wide, and portrait ones 800pixels tall.

Downsize your images quickly using Fit Image

Premiere Elements helps you get video onto DVD fast



SCREEN 2

remember when you took it, and if you've never bothered adding tags, you have a problem that's going to grow along with your digital photo library.

If you can't bear the thought of going back through every digital photo you ever took and adding keyword tags, just give them a rating. This is easy to do and the time it takes will more than make up for the hours saved searching. Display a folder of images in the Organizer's Photo Browser and select the first thumbnail. Press Ctrl & 1 to Ctrl & 5 to give it a rating from one to five stars. Then press the right arrow key to select the next image, rate it, and carry on through the whole folder.

Providing you're quite decisive, it'll only take a minute or two to do a folder. I'm not a terrible photographer, but 90 per cent of the pictures I take don't score above two stars. Given that it's unlikely anything I'm looking for won't be in that mediocre batch, by rating photos when I download them from a card I can eliminate them when I'm looking for something.

5 Quickly add transitions in Windows Movie Maker

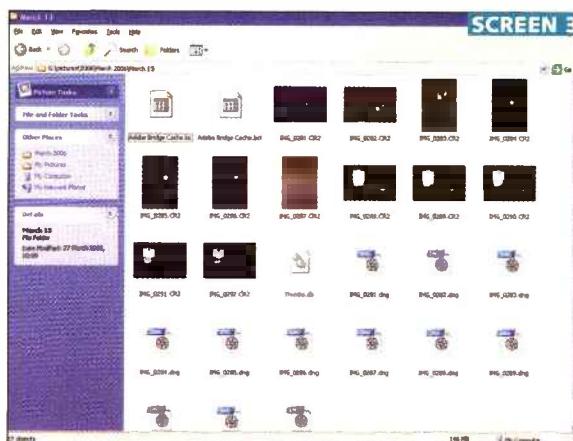
In Windows Movie Maker you can add transitions easily enough by dragging them from the contents pane and dropping them on the transition cells between two clips in the storyboard. But if there are a lot of clips in your movie, this is a slow and tedious process. The quick way to do it is to choose Select All from the Edit menu (or press Ctrl & A), then right-click the transition you want in the contents pane and choose Add to Storyboard. The selected transition will be added between every clip.

6 Scanning

If you're in the market for a new scanner, save yourself hours of retouching work and get one that includes Kodak's Digital Ice. Digital Ice automatically removes dust and scratches from scanned images. It used to be the case that only dedicated film scanners, such as Konica Minolta's Dimage Scan Elite 5400 and Nikon's Coolscan range, included Digital Ice, but now you can get flatbed scanners that include Digital Ice Photo Print Technology for use on print scans. You can find out more at www.asp.com.

7 Display raw thumbnails in Windows

If you shoot using your camera's Raw file format, you'll be used to



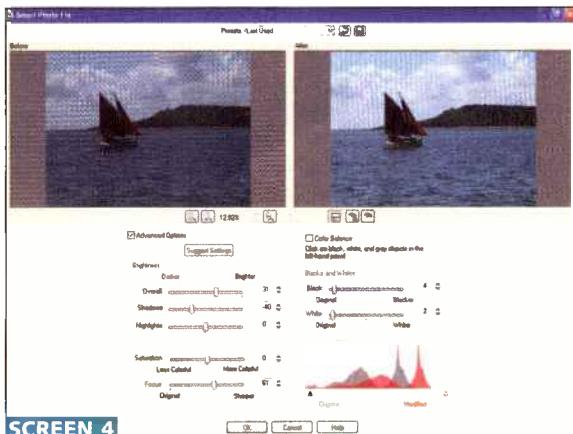
Viewing raw files is time-consuming, so use the thumbnails viewer for Windows XP

converting images to a viewable de-mosaiced file using either the camera manufacturer's software, Adobe Camera Raw, or another third-party application. However, you don't necessarily want to convert everything you shoot, and viewing raw files can be time-consuming.

You can speed things up considerably by using Microsoft's snappily titled Raw Image Thumbnailer and Viewer for Windows XP (see screen 3). This handy Power Toy consists of two components, a Windows XP shell extension that provides thumbnail rendering, printing and metadata display, and a raw image viewer which works in a similar fashion to Windows Picture and Fax viewer. Being able to see raw image thumbnails in folders saves you having to open an application just to see what they are, and if you hover over thumbnails you can even see some of the pertinent metadata.

The two main shortcomings are that you can't see big image previews in filmstrip view, and it doesn't work with Adobe dng files. Raw support is limited to Canon and Nikon's .crw, .cr2 and .nef formats. For a free download, a list of supported cameras and other information, go

Smart Photo Fix is a quick way to improve picture quality while still giving you some degree of control



SCREEN 4

to www.microsoft.com/windowsxp/using/digitalphotography/prophoto/raw.mspx.

8 Use Adobe Bridge

The Bridge cache (bundled with Adobe Creative Suite 2, Photoshop CS2 and other Adobe imaging products) stores image thumbnails and previews, as well as metadata for some file types and custom sort orders. There are two ways you can configure the cache – either a centralised file or distributed. Cache files are copied into the folders containing your images.

I'd recommend you open the Preferences pane (Ctrl & K), select Advanced and check the 'Use distributed cache files when possible' radio button. For one thing, this will save you having to export the cache when you burn images to a CD or DVD (or rebuilding it for the images on the disk). It will also avoid similar problems if you rename folders or move them on your hard drive.

9 One Step Photo Fix

If you're in a hurry, use Paint Shop Pro X's One Step Photo Fix to improve contrast and saturation and colour correct lacklustre photos. If, like me, you can't bear to leave such crucial adjustments to a machine, use Smart Photo Fix (see screen 4), which provides a degree of control over tonal and colour adjustments and sharpening – but don't forget to save presets for fixing common problems.

10 Get a card reader

If you connect a camera with a USB1.1 port to your PC to download your photos, you're going to be in for a long wait. At 400Mbits/sec, USB2 or Hi-Speed USB – theoretically, at least – can transfer data more than 30 times faster than USB1.1. In practice, 12 raw files totalling 86MB took more than eight minutes to transfer from my Canon EOS 300D, just over a minute and a half using a USB1.1 card reader and 11 seconds with a USB2 reader. Generally speaking, a card reader will be quicker than the camera, even if they both have the same speed port. You can get a good-quality USB2 CF card reader for under £15. Speed of transfer will depend on the card, the reader and what else your PC is doing when you're copying the files. If you want to know more about the performance capabilities of different CF and SD cards, there's a well-maintained extensive database at www.robgalbraith.com. PCW



Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

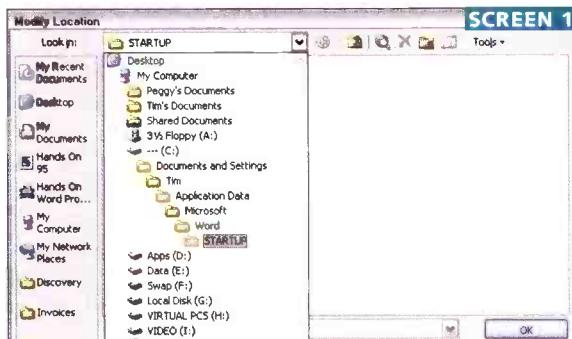
→ Comments welcome on the Word processing column.
Email wp@pcw.co.uk
Please do not send unsolicited file attachments.

Added extras and accents

How to find and manage Word add-ins and create accents with ease

There's an ancient proverb that I just made up, which states that if Microsoft Word doesn't give you enough grief on its own, try a few add-ins. So this month we're going to look at what they do, where they come from and where they live.

Normal.dot is the boss global template, containing macros, autotext, styles and toolbars, as we all know, but there can be other global templates – that is, ones that are loaded whenever you start Word normally. You'll find these listed in Tools, Templates and Add-ins, and they will usually be stored in the Startup folder under the Office programs folder. You may also have a personal Word Startup folder in your user profile – you can find out where this is by going to Tools, Options, File locations. If you can't see the whole path, double-click on it to get a file browser, then open the



dropdown list at the top of the browser window which should reveal the path (see screen 1).

Toolbars and Com add-ins

This is a good place to start if you are experiencing problems, particularly with third-party software, such as optical character recognition programs that add their own toolbars or menu items to Word. If you've ever been plagued by a toolbar that, no matter how you try to get rid of it, returns like the *Curse of the Mummy*, this is a good place to start. Even if you've uninstalled the program that introduced the interloper, templates often get left behind and it's these that recreate the toolbar at each session.

Another recurrent spectre is the prompt to save changes to Normal.dot, when no changes have been made. Although you can turn the prompt off from Tools, Options, Save, so changes are saved unprompted, this is not a good idea – macro viruses can also cause this message to appear, so suppressing it is akin to turning off your burglar alarm because you don't want to be woken up.

Com add-ins are another potential source of interference. Unlike templates, these are executables (EXE) or code libraries (DLL) and they replace the WLL add-ins in Word 97 and earlier. These don't show up in

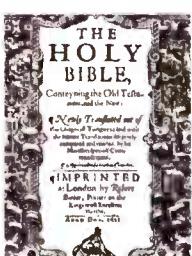
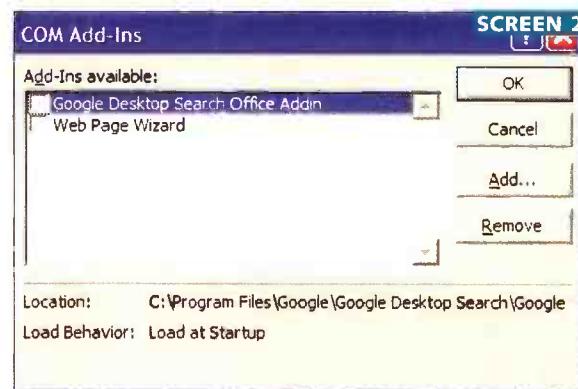
The dropdown list at the top of the browser should help you find the personal Startup folder

Templates and Add-ins, and to see them, you need to add the relevant command to Word. From Tools, Customize, turn to the Commands tab and select Tools from the list on the left. Drag 'Com Add-ins' to a suitable location, such as the Tools menu. Close the Customize dialogue and go to Tools, Com Add-ins. This will list all Com add-ins installed, where each is stored and how it loads – some load at start-up, others 'on demand' (see screen 2). If you are running Word XP or 2003, you can get this information from Help, About..., System Info. Branch down through Office Applications, Word, Com Add-ins and you'll see the same – or possibly different – information, as screen 3 shows.

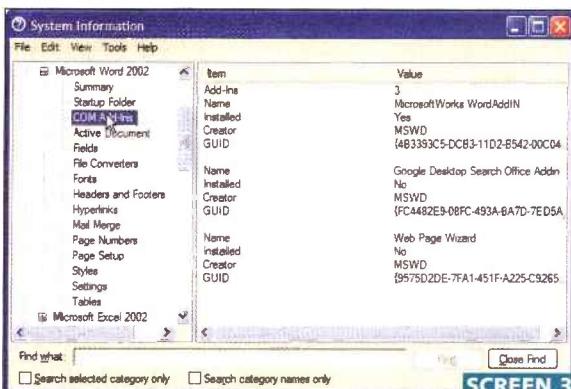
A fine Microsoft mess

Even Microsoft can write rotten add-ins. The Works add-in is a known culprit for producing the recurrent 'save Normal.dot' message. The Remove Hidden Data tool, mentioned in the October 2005 column, wouldn't work at all in Word at first. When we did get it to work, it did something very strange to the file menu – popping up unbidden when a different menu entry was selected. The tool is installed into its own subfolder of Office, but becomes a global template –

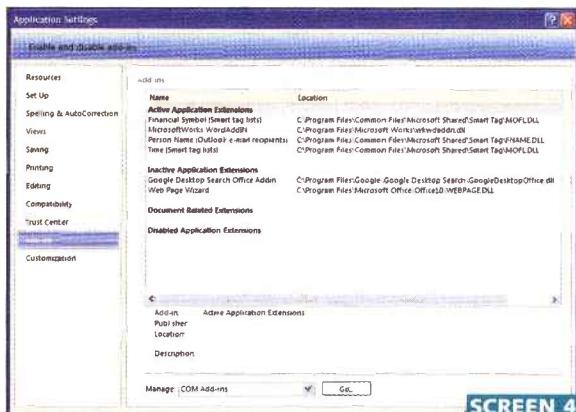
Some Com add-ins load at start-up, some load on demand



since medieval times, though before a paragraph rather than after, and you will find them in the 1611 King James Bible. If you want to put a printable pilcrow into your document, Alt & 182 on the numeric keyboard should work in any text-editing situation.



SCREEN 3



SCREEN 4

in other words, it is always loaded, like Normal.dot, unless you take preventive measures (see box above). You can remove it from Tools, Templates and Add-ins, but it will be back the next time you start Word. The only permanent solution seems to be to close Word and remove the tool using Windows Control Panel 'Add/Remove Programs'.

You'll probably find that, although this removes it from Templates and Add-ins, the command is still present in the File menu. If you go to Tools, Customise, you can drag the 'Remove Hidden Data' command off the File menu. When you close Word, you may get a message asking if you want to save the changes to Normal.dot – you do, as this refers to your removing the command from the File menu.

The whole management of add-ins in Word 2003 is frankly a mess, and we're pleased to see that the beta of Word 2007 contains a comprehensive one-stop control for these (see screen 4). What would also be useful would be a 'Details' button in the 'Save changes to Normal.dot prompt', which shows what changes have been made and by what or whom.

Recognising a mystery

There's an even stranger mystery that seems to be Microsoft-related.

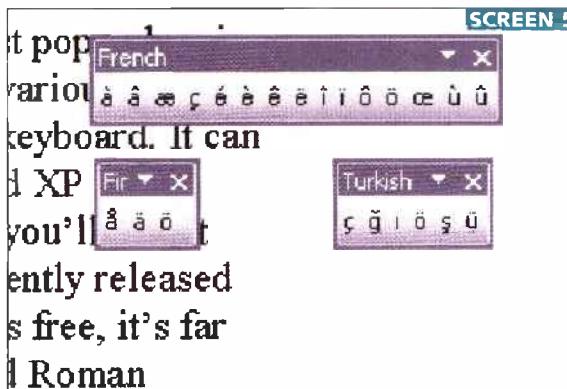
Top: You can get different views of Com add-ins on the same system

Bottom: The beta of Word 2007 has a one-stop control for managing add-ins

Microsoft's International Character Toolbar provides one-click accented characters

For a month or so I had the uncanny experience of Word – and several documents – vanishing completely when I tried to restore it from the taskbar. The first time this happened I wondered how I'd managed to do that – had I inadvertently clicked 'Close group'? Having determined that this was not the case, and getting weary of saving each document before switching focus to another Window, I did a little research.

Anecdotal evidence, from the somewhat oxymoronic Gladiator Security Forum, seemed to suggest that this behaviour might be caused by the 'Write anywhere' handwriting recognition software. Although this doesn't appear as an add-in, it is an optional component that comes with Office XP and 2003. So I tried



Switches to control Word start-up

There are a number of command switches that control how Word starts up. You'll find the full set somewhere in the help file by searching for 'word start', but here are the most useful. You can use them from the Windows Start, Run box or from a shortcut. Although the received wisdom is that you need to type the entire path to the executable, in Start, Run I've always found that winword.exe suffices. You do need the whole path in a shortcut, enclosed in double-quotes. Leave a space between winword.exe (or, in a shortcut, ...winword.exe) and the switch.

/tmytemplate.dot Starts with a new document based on mytemplate.dot. If the template name contains a space, enclose it in quotes, eg, /t"my template.dot". I've found that this switch doesn't work without the full

path to the template, in quotes, possibly because my templates are kept at a custom location.

/n Starts without a new blank document.

/mmacroName Starts Word and runs the named macro. It also stops any Autoexec macro running, as does /m on its own.

/a Stops add-ins and global templates (including Normal.dot) loading – a very useful troubleshooting strategy.

/safe Another useful diagnostic – but only for Office XP or 2003 users. If you have problems starting Word, then Safe Mode will attempt to fix, or failing that isolate, the cause. Various restrictions come into force – you won't see or be able to save any customisations for instance – and you can find out more from the Microsoft's Knowledgebase article number 827706.

removing this – it is not immediately obvious, but a trip to Control Panel, Regional and Language Settings, Language then hitting the Details button will expose it. And I won't say this is scientific proof, but the problem went away and didn't come back.

An accent on flattery

We've long been fans of Paul Herber's little Diacrit utility, which first popped up in this column exactly nine years ago. It's a set of toolbars that contain various characters that can't normally be accessed from the keyboard. It can be used in any text-editing situation, and with Windows NT, 2000 and XP offers access to the entire Unicode range. It costs £10 for personal use, and you'll find it (and a free trial version) at www.diacrit.sandrila.co.uk.

Microsoft released something similar – the International Character Toolbar. Although it's free (<http://tinyurl.com/akns4>), it's far more limited. It only works in Office 2003, you're limited to accented Roman characters only, and you can't customise it. But it's a lot easier than trying to remember the keystroke combinations for accents or trawling through the Insert Symbol dialogue to find exotica such as the Turkish dotless i or the Finnish a-with-a-circle-over (see screen 5). **PCW**



Stephen Wells is a freelance journalist and a regular contributor to computer magazines. He's been writing PCW's Spreadsheets column for over 10 years.

Comments welcome on the Spreadsheets column.
Email spreadsheets@pcw.co.uk
Please do not send unsolicited file attachments.

Saving made simple

Use Excel's PMT function to help make a decision, and get to grips with matrices

Savings						Credit	
	A	B	C	D	E	F	
1							
2		Amount	£2,000				
3		Annual interest rate	4%				
4		Monthly deposits	£163.09				
5				APR	19.9%		
6				Nominal rate	18.29%		
7				Monthly payments	£183.63		
8							
9		Total deposits	£1,957.08				
		Bank contribution	£42.92				
				Total payments	£2,203.56		
				Bank charge	£203.56		

SCREEN 1

When Lord Polonius first said to Laertes, 'Neither a borrower nor a lender be', it was before the introduction of savings institutions and the safety they can offer. Now we have the choice of renting money to or from banks. The interest can go into their pockets or ours. Everything we buy can carry a bank surcharge or a bank contribution. If you've never thought of it that way, let's use a spreadsheet to make a comparison and, in the process, investigate PMT – one of Excel's financial functions.

A number of banks offer special 'Christmas saver' accounts these days to encourage you to save up for large purchases you make during the festive season. But in fact you can choose any ordinary savings account and save up for any desired purchase costing any amount. The example here uses £2,000. Enter that amount in cell B2 of a new worksheet. We will calculate how much you would need to save each month to be able to buy the item for cash in a year. In B3 enter the annual interest rate paid on the savings account. You decide what that will be, but the illustration shows four per cent. The financial functions of most spreadsheets are very similar, but in this case we will use Excel. To

calculate how much you need to deposit every month, in cell B4 enter: =PMT(B3/12,12,0,B2,1)

The minus sign at the front is used because Excel considers cash you pay out to be negative and cash you receive, such as dividends or credit interest, to be positive.

In the first argument of the payment function, the interest rate is divided by 12 here, because this example account is compounded monthly. If it were compounded quarterly, you would divide by four, and so on. The second argument is the number of payment periods – in this case 12. The third argument is zero because the account starts with nothing in it until the first of our 12 deposits. The fourth argument is the amount we wish to end up with: 2,000. And the fifth argument is a 1, indicating the deposits are made at the beginning of each period.

In B6 enter: =12*ROUND(B4,2) to see how much you have

contributed. The payment is rounded because of all the decimal points calculated but not displayed. In B7 enter: =B2-B6 to see how much the bank has chipped in.

The lure of plastic

Now let's see what happens if you succumb to the seductive credit card. The annual interest rate may be quoted as an APR (annual percentage rate) or an APY (annual percentage yield). Payments are usually made and interest compounded monthly. If the interest rate is quoted as APY, enter that rate in cell E3. If it's quoted as APR, and that rate is, for example, '19.9% typical', enter that rate in E2 and in E3 enter:

=NOMINAL(E2,12)

to convert it into the nominal rate.

To calculate the necessary monthly payments, in cell E4 enter

=PMT(E3/12,12,B2,0,0)

The first three arguments are as before. The fourth argument here is zero as that's the amount we wish to end up with. The fifth argument is zero because the payment is made at the end of the period.

In E6 enter: =12*ROUND(E4,2) to see how much you have paid. In E7 enter =E6-B2 to see how much the bank has charged you.

This shows that with this credit card you would pay out £183.63 a month, a total of £2,203.56 (£183.63*12) of which £203.56 goes to the bank.

If you save the £2,000, you pay out only £163.09 a month, a total of £1,957.08 (£163.09*12), and the bank chips in £42.92 in credit interest to make up the needed £2,000 (see screen 1).

A	B	C	D	E
1				
2				
3		Protein	Fat	Fibre
4	Corn	0.25	0.40	0.30
5	Soybeans	0.40	0.20	0.20
6	Cottonseed	0.20	0.30	0.10
7				

SCREEN 2



Enter the parameters of the problem in Solver

SCREEN 3

Overall you are £246.48 ahead of the game (£2,203.56 – £1,957.08). Chances are you'll even get a newer model of whatever you are purchasing, because you waited a year!

The matrix

Our subject here is not the movie, but a rectangular array of elements in rows and columns that is treated as a single spreadsheet element.

Lotus 1-2-3 and Corel Quattro Pro offer a matrix menu option. CA-Supercalc for Dos had the easiest one to use. So it's a bit odd that Excel doesn't have a matrix tool. Still, it was always clever marketing rather than superior features that brought Excel to the fore. But here is a way to work with matrices using the Solver Add-In. If Solver doesn't appear on the Excel Tools menu, choose Add-Ins on that menu and check the box 'Solver Add-In'. If it's not available on the Add-Ins menu you can load it from your Excel or Office CD.

A matrix can be useful for a gardener projecting his soil-supplement needs; a doctor formulating a cocktail of drugs to prescribe; or a land developer calculating the assortment of housing needs on a new estate. But let's take as an example a farmer's animal-feed mix.

The feed has three ingredients: corn, soybeans and cottonseed. The feed should contain 22 units of protein, 28 units of fat, and 18 units of fibre. We know the content of protein, fat and fibre in each ingredient; these are shown in the table in screen 2.

If you wanted to look at the problem as algebraic equations, you could state that:

$$0.25x + 0.40y + 0.20z = 22 \text{ units}$$

of protein

$$0.40x + 0.20y + 0.30z = 28 \text{ units}$$

of fat

$$0.30x + 0.20y + 0.10z = 18 \text{ units}$$

of fibre

	A	B	C	D
1				
2				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

The mix of correct ingredients as units and percentages

Here, x represents the number of units of corn, y the number of units of soybeans, and z the number of units of cottonseed. The problem is to find the values of x, y and z.

If you have the content table in the range B4:D6, as in screen 2, then enter this formula in cell B9:

$$= (\$B\$13*B4) + (\$B\$14*B5) + (\$B\$15*B6)$$

(Key: ↵ code string continues)

Drag this down to B11 so that the formula in that cell now reads:

$$= (\$B\$13*D4) + (\$B\$14*D5) + (\$B\$15*D6)$$

It's important to enter a zero in cells B13, B14 and B15 because the Solver needs somewhere to start. Click on the Sum tool and then on cell B16 to create a total for B13:B15. That's simply because the Solver also requires a target cell with a formula in it.

Choose Solver on the Tools menu and make the required entries in the

Using the MMULT function to calculate the roofing mix for a housing estate

= MMULT(\$B\$2:\$D\$4,\$B\$7:\$D\$9)				
A	B	C	D	E
	Terrace	Detached	Semi	
1	Phase 1	5	3	0
2	Phase 2	3	8	7
3	Phase 3	4	2	3
4				
5	For each home:	Slate	Solar	Tile
6	Terrace	20	25	0
7	Detached	32	38	0
8	Semi	30	0	34
9				
10	Total:	Slate	Solar	Tile
11	Phase 1	196	239	0
12	Phase 2	526	379	238
13	Phase 3	234	176	102
14				
15				
16				

Solver Parameters dialogue box (see screen 3). In the Set The Target Cell: box enter: \$B\$16

Under Equal to: select Min. In the By Changing Cells: box enter: \$B\$13:\$B\$15

In the Subject to Constraints: box enter:

$$\$B\$9 = 22, \$B\$10 = 28, \$B\$11 = 18$$

The order in which those constraints are entered doesn't matter. Click the Solve button and you have your answer.

Add the labels in column A and row 8, (see screen 4). The range B13:B15 now shows the number of units of each ingredient to put in the mix: for each 40 scoops of corn, there should be 15 scoops of soybeans, and 30 scoops of cottonseed. If you would rather see this as a percentage enter: =B13/\$B\$16 in C13 and drag down to C16. Format C13:C16 as a percentage. Looked at this way, the animal feed should be 47 per cent corn, 18 per cent soybeans and 35 per cent cottonseed.

Multiplying matrices

It may look more complicated to multiply two matrices together, but oddly this is easier to do with Excel than the previous calculation.

Take the example of a roofing contractor bidding on a contract to roof a new estate of homes with different materials. Knowing the number of kits required for each type of home, he needs to estimate the total number of kits needed for each phase of construction.

The numbers of bungalows, semi-detached and detached homes can be entered in the range B2:D4. The number of kits needed for each type of home in each can be entered in the range B7:B9 (see screen 5).

It's clear that the five terrace homes in phase 1 will each need 20 slate kits, and the three detached houses in phase 1 will each need 32 slate kits, so for phase 1 a total of 196 slate kits is required.

But rather than make nine individual calculations, you can simply highlight the range B12:D14 and enter the formula:

$$=MMULT(B2:D4,B7:D9)$$

Then press Ctrl & Shift & Enter rather than Enter as this is an array formula. The MMULT function multiplies the values in one matrix by the values in the other producing all the answers at once. **PCW**



Nigel Whitfield edited computer magazines before going freelance in 1995. A specialist in Internet and consumer issues, he has a degree in Computing Science from Imperial College.

→ Comments welcome on the Web development column. It returns in the September issue. Email webdev@pcw.co.uk Please do not send unsolicited file attachments.

Hassle-free uploading

Discover the pros and cons of various ways of getting a website onto a web server

Designing your site is only one of the steps towards going online. It's surprising, although perhaps it shouldn't be, how much difficulty people have with what's often taken for granted as one of the basic parts of doing a website – uploading it to a web server. So, this month, I'll explain some of the ways sites can be uploaded, which ones you're most likely to come across, and what their pros and cons are.

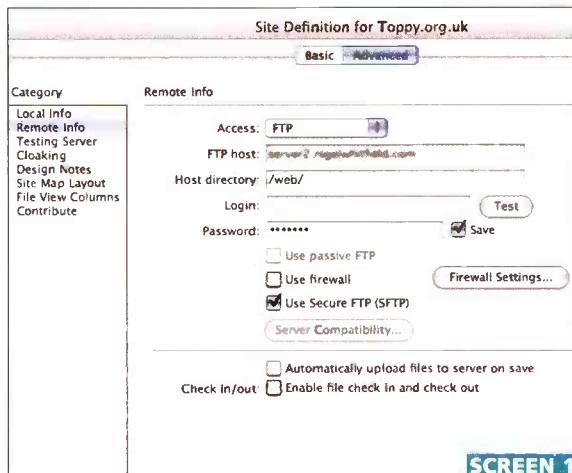
The most common method for uploading your site is via FTP (file transfer protocol); it's the method supported by many web-hosting providers and built into lots of web-design tools. And, if you don't have it included in your web editor, Windows, Mac OSX and Linux all provide a command-line FTP program to allow the copying of files.

Looking at my reader mailbox, it's obvious that a lot of confusion arises over where people need to put their websites when they upload them; these problems arise with FTP and other transfer methods.

Virtual confusion

There are a couple of key things to realise when it comes to copying your files to another system on the Internet. The first is that a computer can be called more than one name, and the second is that the same is true of a folder or directory on a computer.

So, hostnames first. Very often, especially if you're using a shared hosting service (that is, a server that's not dedicated to just your website), the computer that stores the files has a completely different name to the web server part of it. You might access a website using a name such as www.pcw.co.uk, but the computer that it's stored on may be webserver36.megahostingcorp.com.



SCREEN 1

Depending on how things are configured, you may be able to upload pages by connecting to your web server's name using FTP, or you may have to use the computer's real name.

When someone requests a page, the domain name system (DNS) directs www.pcw.co.uk to the same IP address as the server, and then the web server software looks at the name of the site that's included in the request for a page and fetches the appropriate file from the right directory on the server.

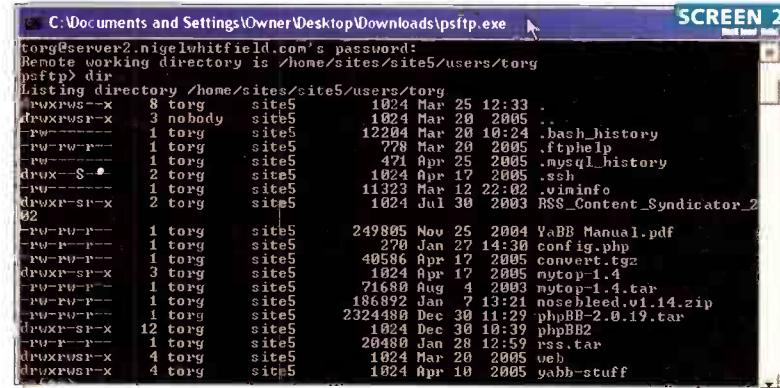
And that's where the next level of confusion can creep in; just because a file name immediately

Dreamweaver on the Mac includes built-in support for SFTP connections

follows the host name – for example, www.somethingorother.co.uk/index.html – doesn't mean it's in the top-level folder of the disk. It simply means it's in the top level of the web folders.

Straightforward enough, on the face of it. But often when you connect to a web server via FTP, you'll find that the folder you see first isn't the one where you need to store your files. For example, with one of my web servers, all the files for the site need to be stored in the folder called `/web`; copy them into the top level, and they won't be seen. On another one, the pages for www.nigelwhitfield.com have to be in `/home/sites/www.nigelwhitfield.com`.

Mix up some of these settings – or let your web-editing program try to fill them in automatically – and you can end up being unable to upload your files, or potentially having files created that have invalid links. Some versions of Dreamweaver, for example, may add the path you specify for FTP uploads to the web address, so it's vital to double check. An unnecessary `/web` in one of the paths, for instance, will mess up browser previews and cause havoc with any absolute links.



Transfer security

Now you should be clear on the difference between your site's URL, the hostname of the computer that it's saved on and the path to the site's files. How about the uploading?

As I said, FTP is one of the most common solutions; it's also a good one to avoid if you possibly can. Like some of the other early Internet protocols, with FTP your password is sent in clear text from client to server, which in itself is a security risk if someone's using a network packet sniffer.

More serious is the fact that FTP has had rather a lot of security holes over recent years, in some of the popular versions of the FTP server software. Pop an FTP server on the Internet, and it will be scanned and probed frequently by people looking to exploit the vulnerabilities. If they find one, you may end up with a site that's defaced, or a system that's compromised and used to help attack others.

'FTP has had rather a lot of security holes over recent years'

If your web server uses FTP, my advice is to turn it off and use something else more secure. If you can't turn it off, then you should ensure there's a decent firewall configuration that only accepts connections to FTP from trusted IP addresses.

So, if FTP isn't a reasonable solution for uploading pages, what is?

There are three alternatives you may come across. First up, Front Page extensions, which is a way of making your web server cope with the non-standard junk produced by some versions of Microsoft's web-editing tools. You can even get these extensions for Unix/Linux systems, but I wouldn't recommend it. Code web pages to a proper standard instead, and avoid patching your Apache installation for Front Page; last time I did it, the security was so fiddly to get right I decided it was safer not to bother. If you're using Front Page, make sure you don't rely on the extensions, and don't use the built-in upload tool.

Webdav is a web-based file-sharing system, supported by some servers and web editors; it's fairly simple to use, but chances are you won't find it on

Information doesn't come cheap

Keeping your website up to date is the best way to keep people coming back, but it can be tricky. One solution is to integrate information from elsewhere into your site, using tools such as RSS to provide headlines and similar material.

Lots of sites offer this free, but often you need to do a spot of programming or reformatting to use the information on your own pages, or have users redirected elsewhere when they click to read a full story.

Hosting company 1 & 1 Internet has launched Dynamic Content options for £5 a month (ex VAT), which gives you easy-to-use content integration and the ability to have the details of the content – the full stories – appear on your site, rather than elsewhere. It's a reasonable price if it's as easy to set up as the company says.

Not all data is free or cheap to obtain; a recent project of mine has been a system for programming a PVR (personal video recorder) via the web; handy when you hear about a great show from someone and can't get home

in time to program the PVR. It makes sense to have the TV listings as part of the website, so you can browse and click on a programme for details, or schedule a recording.

It would be pretty straightforward to do, except that the Broadcasting Act requires you to pay a copyright fee to the BBC and ITV for publishing full listings, and that fee is at least £200 per quarter. Channel 4 is legally entitled to cash, too, but has waived its rights.

Next, you have to get the information in electronic form, and while it's available for personal use from some sources and used in projects such as MythTV, that's not going to let you create a web-based EPG (electronic programming guide) for people to browse. To do that, you not only have to pay the copyright fee, but you'll be looking at paying a listings provider hundreds of pounds a month – over £4,000 just to provide listings for Freeview.

There's obviously a place for companies to charge for extra information, such as episode guides or programme reviews, or for providing it in a way that suits you. But should ITV's rapacious shareholders and the licence fee-funded BBC really require hundreds of pounds a year from everyone who wants to provide the details of the programmes they want us to watch? Freely available XML TV listings could provide thousands of sites with great content – the information's there already. So why not set it free?

Paying for TV reviews is fair enough, but shouldn't the BBC and ITV make their listings freely available?



that many web servers, and there aren't any compelling reasons to use it.

The best solution, for most people, is to use SCP/SFTP. These are part of the SSH (secure shell) family – tools that provide complete end-to-end encrypted links between two systems, with secure login so passwords aren't sent over the net in a readable form. If your web-hosting provider doesn't have ssh/scp turned on, then you should ask them to enable it; if you're running your own server, use it in preference to Telnet and FTP, but remember that, like any server-side piece of software, you do need to make sure it's up to date with security fixes.

Using SCP and SFTP

Some web-editing tools have support for SFTP built in; for

example, in Dreamweaver MX on the Mac, you use the tick box for 'Use secure FTP' (see screen 1), while on Windows the option labelled 'Use SSH encrypted secure login' will use secure the connection, but you have to download additional software.

If you don't have SFTP support built in to your web editor, or if you're using Dreamweaver MX on Windows, you can download software; Putty is one of the most well known, from www.chiark.greenend.org.uk/~sgtatham/putty (see screen 2). The putty.exe program provides you with an ssh facility, which Dreamweaver can use, while psftp.exe is a command-line tool for secure FTP, which works just like ordinary FTP but with a secure connection. **PCW**



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Alan Stevens has implemented and supported networks for over 25 years, working for IT vendors, system integrators and customers. He now mostly researches and writes about networking matters.

→ Comments welcome on the Networks column.
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Please do not send unsolicited file attachments.

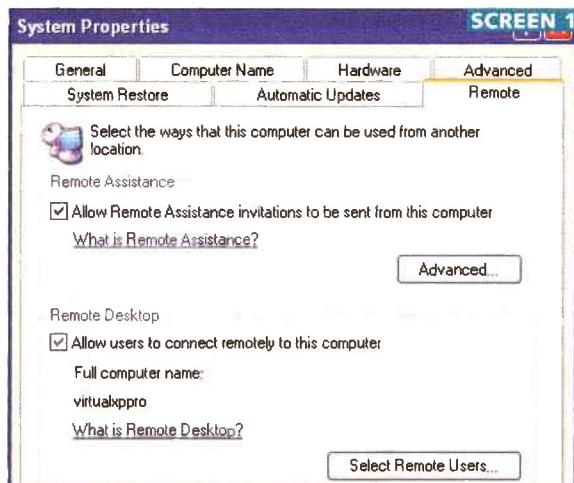
Get in the driving seat

Prevent frustrating phone calls by resolving users' PC problems via Remote Desktop

If you've ever been asked to help with a PC problem over the phone, you'll know how frustrating it can be. Especially when it's a friend or relative at the other end with little idea of what you're trying to achieve. This is where Remote Desktop in Windows XP comes in handy, allowing you to take control of a system over the Internet.

Although Remote Desktop is only available in XP Professional, that only applies to the PC being controlled (the host PC). The controlling PC, running the Remote Desktop Connection client, can be any version of Windows from 98 onwards. Plus there are plenty of alternatives that can be used to remotely control XP Home and other versions of Windows, including the very popular open-source VNC product (see box on the next page).

Of course, another requirement is for the two PCs (host and client) to be able to communicate with each other. That can be over a local network or the Internet, although you will have to configure any intervening routers and firewalls to let the traffic through (see the box below).



Turning it on

Assuming you have an XP Pro PC that you want to control, the first thing you have to do is enable the Remote Desktop software, which will have been installed by default but not turned on. Go to the Control Panel and double-click the System icon (located under Performance and Maintenance in the default Category view) then select the tab marked Remote (see screen 1). You may have to do this by phone if you

Remote Desktop is installed by default in XP Pro but needs to be enabled from the System applet in the Control Panel

can't be in front of the PC. You'll see two options – Remote Assistance, which I'll cover next month, and Remote Desktop, which is activated by clicking the tick box marked 'Allow users to connect remotely to this computer'.

If you haven't assigned passwords to user accounts, you'll probably see a message at this point warning that passwords are needed to prevent unauthorised remote access. You won't be able to use Remote Desktop unless the user accounts have a password.

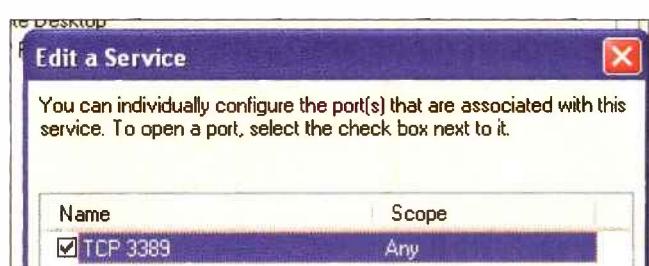
You can restrict access to specific accounts by clicking the button marked Select Remote Users, also on the Remote tab. An empty list of authorised user accounts will be displayed, which can be populated by clicking the Add button followed by the button marked Advanced in the Select Users window this brings up. No users will be listed here, either; click on Find Now to get a list of accounts on the host system, then choose the ones you want.

Alternatively, open the Administrative Tools folder in the Control Panel and use the Computer Management utility to manage user

Protocols and ports

The Remote Desktop service in Windows XP Pro relies on Microsoft's Remote Desktop Protocol (RDP) – the same protocol used to support thin clients connecting to a Windows terminal server. RDP requires access to TCP port number 3389, which means configuring any network firewalls located between the host and client PCs to allow traffic through for this port. The firewall with XP Pro has an exception rule that can be used to support Remote Desktop and this will be configured when it's enabled. On other firewalls, you'll need to make separate arrangements. You may need to open port 3389 on firewalls at the client end.

On a local network, or if connecting to a LAN over a VPN (virtual private network) tunnel, a host name will be all that's needed to locate the remote PC and the same can apply over the Internet if you have a resolvable DNS (domain name server) name. However, if that fails, an IP address will be required that can be either fixed or dynamically assigned, just as long as you know what it is.



The Windows firewall on the Remote Desktop host will be configured automatically when the service is enabled

If the host PC is behind a NAT (network address translation) firewall you may need further router changes. For example, you'll probably need to map one of the public addresses assigned to your Internet connection to the private LAN address of the PC running Remote Desktop. To restrict access more precisely, map just the port (3389) involved.

A remote alternative

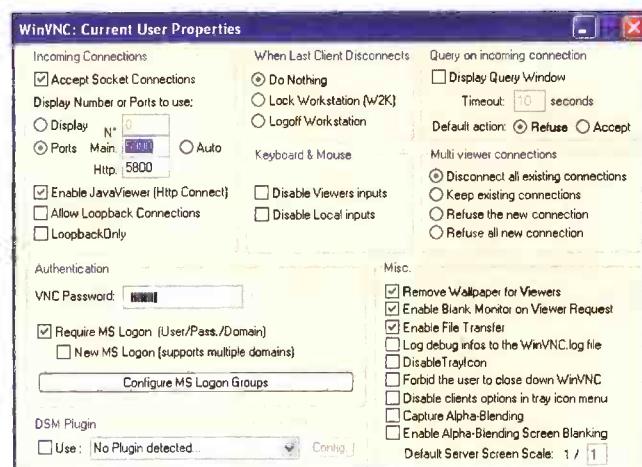
There are alternatives to Remote Desktop, including numerous commercial remote-control packages (see our Remote Access Software group test in PCW April 2006) and even free utilities, such as VNC.

Developed by AT&T Laboratories in Cambridge, VNC (Virtual Network Computer) is an open-source application that can be used to remotely manage not just Windows PCs, but Linux and other platforms. Different implementations exist, the most popular being Real VNC (www.realvnc.com) which has both a basic free download and chargeable commercial versions, and Ultra VNC (www.ultravnc.com) where the software is all free under the GNU general public licence. VNC is also bundled with most open-source Linux distributions.

VNC is made up of two parts – a server and a viewer – with the VNC server software installed on the PC to be managed and the viewer on machines that will be used as management stations.

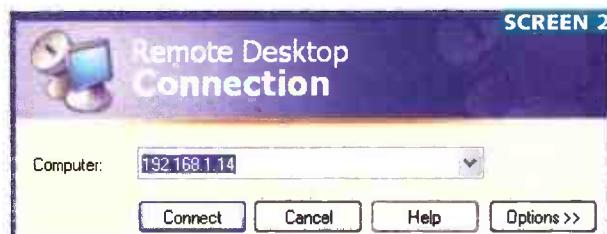
The server software can be started manually or run as a background task. Either way it listens out for viewer connections on TCP port 5900, which needs to be open in any intervening firewalls for the application to work. Java-based access via an HTTP browser is also supported, using port 5800 without the need for host web server software. You can choose your own ports for both conventional and Java access.

Security depends on the implementation. All versions offer basic password protection, with optional Windows domain authentication and data encryption in some, although these may be chargeable.



Open-source VNC software can be used to remotely manage PCs running any version of Windows, with support for Linux and other platforms too

Unlike Remote Desktop, VNC allows the local and remote users to share the same desktop. Indeed, you can have several clients attached to the same server – for teaching and demonstrations, for example. You can also choose whether to prompt the local user before allowing access, with file transfer and chat facilities another standard facility in most implementations.



accounts directly. A 'Remote Desktop Users' group will have been created when Remote Desktop was enabled, to which user accounts can be added.

The remote client

Next you'll need to configure a client and, unlike the host software, the Remote Desktop Connection client can be run on both XP Pro and XP Home. If you've installed SP1 or later, it will be configured and available already, on the All Programs/Accessories/Communications menu. An implementation of the client is also available for use with earlier versions of Windows, including Windows 98, NT4 and 2000, although for these you'll have to download the necessary software at www.microsoft.com/windows/xp/downloads/tools/rdclientl.mspx.

The interface is much the same, whichever version you're using. Start the Remote Desktop Connection client and you're asked for the name or address of the PC to connect to (see screen 2). The connection will then be made and a window showing the

To connect to a remote desktop you need to specify the name or IP address of the host system

remote desktop displayed, through which you'll be asked to log on.

Using Remote Desktop

When using Remote Desktop, XP is only licensed for use by one person at a time, whether local or remote. The local user will be disconnected when a remote session is started and vice versa. Warning messages are displayed at both ends of the connection and the local user will normally have to agree before access is granted (see screen 3). They can also log back on and resume control at any time.

I've said they will 'normally' have to agree because, if you wait a few seconds, the message will disappear and remote access is granted anyway. And if you use the same account name to log on at the local and remote

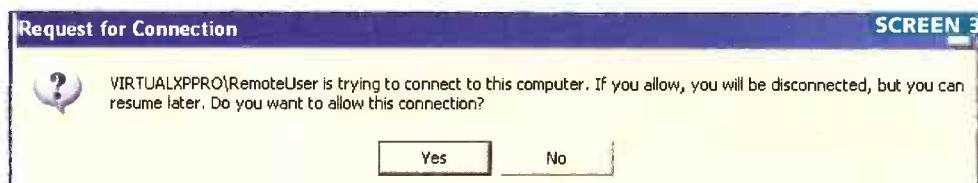
Only one user at a time can use Windows XP – when the remote user logs on, the local user will be temporarily disconnected

sessions, no warnings will be displayed and no confirmation asked for.

Once you're connected, what you see is effectively the same as when you log on locally, with a separate task bar at the top of the screen and an option menu that can be used to modify the way the software works. Using this, it's possible to display the remote desktop in a window or full screen and select the screen resolution. You can also opt to run a specific application when the remote session starts and make devices on the client PC appear as though they were connected to the remote system.

Local printers are automatically made available, and devices attached to the serial ports can be mapped along with local disk drives, making it easy to transfer data between the systems.

Web-based access to Remote Desktop gives the same remote control facilities via an ActiveX browser plugin. You'll need to download additional software from the Microsoft website, and the host PC needs to be running Microsoft's IIS web server software. This may not be an issue on a corporate network, but you wouldn't really want to configure it on your aunty's PC. PCW





Mark Whitehorn is one of those lost souls who actually likes databases. He splits his time between consultancy, writing, working for two universities and tinkering with old cars.

→ **Comments welcome on the Databases column.**
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Please do not send unsolicited file attachments.

Inside update queries

Make changes to your data; and a relational database speed fallacy exposed

We often use queries to extract subsets of data, but they can do so much more. Perhaps you want to increase by five per cent the price for all items with a product code starting with 'KP', or you want to delete all records where the customer's name is 'Smith'. These operations don't just return what's already in the tables; they perform some action on the data, making changes to what's stored in the database.

It's a slight oddity of the relational model that such operations are treated as queries. In Access, for example, the Query Type button on the menu bar offers a dropdown list of six query types: Update is the one we'll concentrate on here.

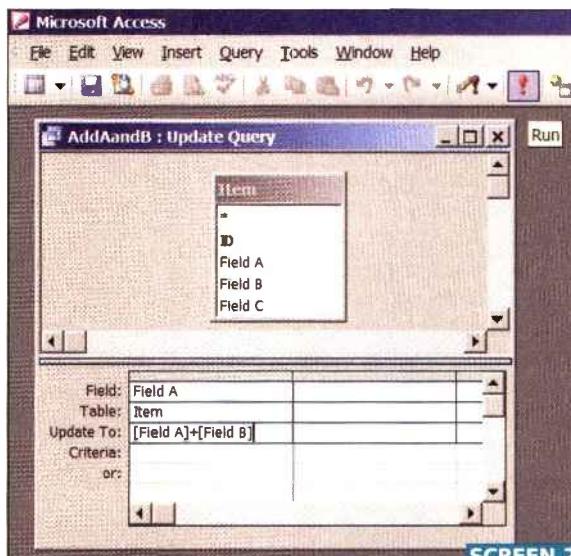
Mark Thornton emailed on this topic: he has a table of 100 rows and wants to update the values in Field A by adding the value in Field B to them. In another table of 3,000 rows, he needs to decrement the value in Field C by one. These are perfect operations for illustrating the joys of, in SQL terminology, Update queries. (The standard queries that just return a set of data are known as Select statements or queries.)

Imagine we are working with a 100-row version of the Item table shown (see screen 1). If you are doing this for real, you will of course be working on a copy of the table: update queries change data so it's important you check that updates behave in the manner you require before performing them on your tables. We want to add the value in Field B to that in Field A, which would, for the row with ID 4, give us the value of 4 in Field A. Open a query grid as usual and add the Item table, including Field A. Now click the down arrow alongside the Query Type button (showing the same glyph as the Query tab in the database window)

Item : Table				
	ID	Field A	Field B	Field C
1	1	3	1	6
2	2	5	3	2
3	3	3	2	2
4	4	3	3	9
5	5	1	4	2
6	6	3	2	6
*	(AutoNumber)	0	0	0

SCREEN 1

The original Item table: an Update query will add the value in Field B to that of Field A



SCREEN 2

and select Update Query. The query grid changes to give a row labelled 'Update To'. In the Update To row for Field A, enter:

[Field A]+[Field B]

which simply says add the contents of the two fields (see screen 2). The SQL reads:

UPDATE Item SET Item.[Field A] = [Field A]+[Field B];

(Key: ↵ code string continues)

Clicking the View button shows the existing values in Field A, which will be updated when we run the query. To perform the update, return to the

This Update query adds values in two fields and writes the answer into Field A

query grid and click the Run button (red exclamation mark), whereupon Access warns that you're about to update rows and that, once performed, updates cannot be reversed with the Undo facility. Click OK to go ahead. Inspect the table (see screen 3), and the Field A values have indeed been updated as required.

The second operation – decrementing a value by 1 – is performed using another Update query, shown in screen 4, and the SQL is:

UPDATE Item SET Item.[Field C] = [Field C]-1;

Access issues a warning when you run the query, and when you go ahead the table is updated as required (see screen 5). If you have bought the DVD edition of PCW you will find the database (DBC.JUL06.MDB) on the cover disc, or you can download it from www.pcw.co.uk/2151344.

Mark says he's presently working with a solution that uses VBA querying, but it is very slow. That's not surprising: VBA provides a sequential, procedural solution that will pull out a single row, do whatever is necessary and then move on to the next row. Because it handles rows one at a time, it is indeed slow. Writing the same queries in SQL adds speed – lots of it – because SQL is a set-based language.

Item : Table				
	ID	Field A	Field B	Field C
▶	1	4	1	6
▶	2	8	3	2
▶	3	5	2	2
▶	4	6	3	9
▶	5	5	4	2
▶	6	5	2	6
*	(AutoNumber)	0	0	0

Record: [◀◀] [◀] [▶] [▶▶] [◀◀◀◀] [▶▶▶▶] of 6

SCREEN 3

Left: The updated table

Below: An Update query to decrease numbers in Field C by 1

It is designed to handle sets of data; whole bunches of records at once rather than a record at a time. You give SQL a set, specify what you want done, and it's carried out on the whole set at a single stroke.

Of the query types offered by the Query Type list, Update, Delete, Append and Make-Table are all known as 'action queries' in Access, because they perform some action on your data.

Speed and the relational model

SQL is built for set-based operations and, as a result, it is very fast for certain operations. It tends to be regarded as a well-known fact that the relational database model, as a whole, is inherently slow; but, like many well-known facts, this is a fallacy.

However, it is such an accepted part of database dogma that I know I'm going to have trouble convincing you. So what I'll do this month is give you all the arguments that are typically presented to prove that the relational model is slow – then I'll give you some clues as to why these arguments are flawed. Next month's exciting episode will contain the *denouement*.

Proof of the inherent slowness

Suppose you have a large database that is organised according to the relational model and it is sitting on top of a relational database engine (Access, Oracle, SQL Server, DB2, whatever). You run this database (perhaps it is a finance system) on a certain server. You have tuned the database to the best of your ability (applied all the right indexes, and so on) and it now has an average query response time of, say, 20 seconds.

Now suppose you take exactly the same set of data and put it on exactly the same box, but this time you organise it as an Olap (Online Analytical Processing) cube. I would

DecrementC : Update Query	
Item	
ID	
Field A	
Field B	
Field C	
Field:	Field C
Table:	Item
Update To:	[Field C]-1
Criteria:	or:

SCREEN 4

expect to see the average response time fall to well under a second. Olap cubes are organised, not according to the relational model but to the multidimensional model of data.

Same data, same box; the only difference is the way in which the data is organised, so it must be the data model that makes the difference – relational slow, multidimensional fast. Simple.

If this isn't true, then businesses all over the world are wasting huge sums of money that they are investing in BI (business intelligence) systems that do precisely this. These systems reorganise the data in non-relational ways in order to get high query performance. Indeed, it is

Field C values have been reduced by 1

Item : Table				
	ID	Field A	Field B	Field C
▶	1	4	1	5
▶	2	8	3	1
▶	3	5	2	1
▶	4	6	3	8
▶	5	5	4	1
▶	6	5	2	5
*	(AutoNumber)	0	0	0

Record: [◀◀] [◀] [▶] [▶▶] [◀◀◀◀] [▶▶▶▶] of 6

SCREEN 5

precisely this area in which I do a great deal of consultancy work.

This makes for a totally convincing argument. I know because I have heard it multiple times – it just happens to be wrong. It is absolutely true that restructuring the data as an Olap cube will give you the huge performance boost I describe above.

Why relational means slow

The relational model is based around the concept of the table. A table is a two-dimensional structure – there are columns along the top and rows down the side. When we build a database that adheres to the relational model, we have to 'normalise' the data, which simply means each table stores data about a single class of entity. So a Customer table stores information about customers, and Order table stores data about orders, and we don't mix up the two types of data.

Of course, this means we end up with a large number of different tables; it is perfectly possible for a database to be made up of several hundred or even several thousand tables. The data in the database is thus distributed over a large number of different tables. When we query the database we can bring the data we need back together by following the joins between the tables that are defined by the foreign keys and primary keys.

As many people will tell you, this is the reason relational databases are slow – because every time you run a query, the database has to follow several or dozens of these joins in order to be able to answer your question.

However, as a clue to where the fallacy lies in all this, you'll notice that there is an implicit assumption that the tables shown here are stored exactly like this on the disk. Of course, the reality is that they aren't. **PCW**

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Tim Anderson is an IT journalist and software developer, and began writing for PCW in 1993. Since his first Commodore Pet, he has acquired expertise in Rad programming, Windows and the Internet.

→ Comments welcome on the Visual programming column.
Email visual@pcw.co.uk
Please do not send unsolicited file attachments.

The Ruby revolution

Take a free Rail journey and find out how to create your web applications

Ruby is a language that has been around for years, but is getting a lot of exposure now thanks to the web application framework called Rails, along with an increasing appreciation of dynamic languages (see last month's column).

Since both Ruby and Rails are free, there's no harm investigating whether Ruby might suit you. To get started on Windows, go to <http://rubyforge.org> and download the One-Click Ruby Installer for Ruby 1.8.4 or higher (see screen 1). This is a Windows installer that loads Ruby along with several essential add-ons, including the

Rubygems packaging system. You can then use Rubygems to install Rails. Open up a command prompt, switch to the Ruby directory, and enter:

gem install rails -include dependencies

(Key: ↵ code string continues)

You have to be connected to the Internet for this to work. Another thing to check if you experience problems is the system path, which should include the ruby.exe executable. All going well, gem will go and fetch the latest Rails, currently version 1.1. You can test Rails like this:

rails c:\rails\pcwapp

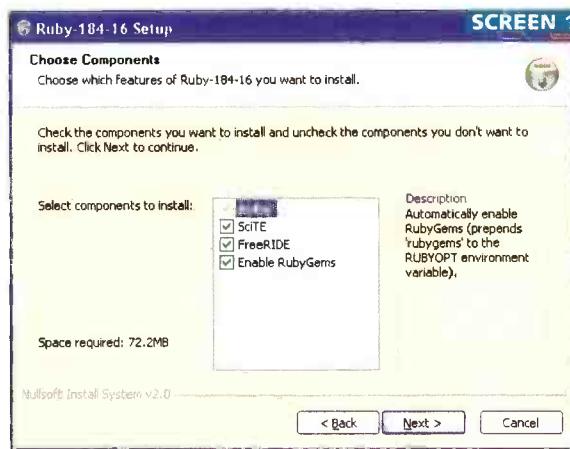
This command creates a skeleton Rails application at the specified location. Switch to the pcwapp directory and type:

ruby script/server

This starts the Rails application, usually on port 3000. You can then browse to <http://localhost:3000>. All being well, you will see the Rails welcome page, in which case both Ruby and Rails are installed successfully.

Getting content into Rails

When you create a Rails application, files and folders appear in the specified location. By adding very little code, you can make your application spring



into life. First, a word of explanation. Two key tenets of the Rails philosophy are 'don't repeat yourself' (DRY) and 'convention over configuration'. An example of this principle is the close relationship between classes, methods and the pages in your application.

To see how this works, open a command prompt, switch to the root directory of pcwapp, and type:

ruby script/generate Welcome

This creates several files, including Welcome_Controller.rb in the app/controllers directory. Edit this file and add a method called index. The code looks like this:

class WelcomeController <

The one-click installer makes it easy to get started with Ruby

Create a database for Rails using SQL Server Express



ApplicationController

```
def index
end
end
```

You have just defined a virtual path in your web application called Welcome, within which there is a page called index. In other words, the URLs in your application map to the Controller classes and methods. Index is also the default page, so if you navigate to <http://localhost:3000/welcome>, you will get an error message telling you the template index.rhtml is missing.

To fix this, create a file called index.rhtml and save it in the app\views\welcome directory. Files of this type are similar to PHP, ASP or JSP pages, in that they combine plain HTML with server-side script between special tags, as the following (rather contrived) example shows:

```
<html><head>
<title>PCW App</title>
</head><body>
<h1>Welcome to the Games review site</h3>
<h3>This site covers the following platforms:</h3>
<ul>
<% for i in ['XBox', 'XBox 360', 'PlayStation 2', 'PSP', 'DS']%>
<li><%= i %> </li>
<% end %>
</ul>
</body>
</html>
```

Everything between the `<% ... %>` tags is Ruby code executed on the server. The expression `<%=` asks Rails to output what follows into the HTML.

Variables defined in the controller can also be used in the template. For example, you could insert the following line into the index method:

`@title = 'PCW Games Reviews'`

and the following into the `<head>` section of the template:

`<title><%= @title %></title>`

Listing games

Game	Platform	Rating	Description	Comments
Ninja Gaiden	XBox	5	Action adventure from Team Ninja. Combats the man theme, but there are elements of RPG, puzzle and platform in there too.	The best action game on the XBox, this is a remarkable performance from the GPU resulting in fluid and engaging action. It's a tough game, but worth every minute you spend mastering it.
Rome Total War Gold Edition	PC	5	Strategy game set in the time of the Roman Empire. Includes Barbarian Invasion expansion pack.	Excellent strategy game, more sophisticated than the Age of Empires series though a tad more effort to learn.
Pinball Classics	PSP	3	Pinball simulation on the PSP, presents 11 classic machines made by Gottlieb.	Great idea but it is hard to find a satisfactory camera view, thanks to the problem of fitting a 3D pinball table onto the small PSP screen.

SCREEN 3

When you request the page, the value of the variable appears in the output. There is good reason not to put much code into templates. Rails makes it easy to put your code elsewhere; when you generate a Controller, the script creates a Helper module where you can put code for that set of pages.

Hooking up a database

To see the Rails magic, you need to hook up a database to the web application. By default, Rails uses the open-source MySQL, although there are drivers (called adapters) for several other database servers. On Windows I prefer SQL Server to MySQL, and it is free in the Express version (see screen 2). Here's how to use SQL Server 2005.

Both Ruby and Rails come out of the open-source community, and they are geared towards Unix-like operating systems in the same way ASP.NET is geared towards Windows. Using SQL Server takes a bit of extra effort. First, you have to obtain the file ADO.rb by downloading the source of Ruby-DBI from rubyforge.org. Copy this file to /lib/ruby/site_ruby/1.8/DBD/ADO/ADO.rb, within your Ruby directory.

The next step is to create a database. We are making a site for games reviews, so open up SQL Server Management Studio or your preferred SQL Server tool, and create a database called PCW with a table called games. The table must have an identity field called id, another example of convention over configuration. You can add other fields, such as game, platform, rating and comments. For convenience I set Allow Nulls to false for all the fields.

Next, open the file database.yml in the config directory of pcwapp. Here you have to figure out what to put for the three databases, development, test and production. I use integrated authentication for SQL Server, so this was my configuration:

```
development:
  adapter: sqlserver
  database: pcw
  username: anything
  password: anything
  host: DBI:ADO:Provider=SQLOLEDB;Data Source=machinename\sqlexpress;Initial Catalog=pcw;Integrated Security=SSPI;
```

Everything after host: is on one line, and machinename means the name of your computer. Go back to the command prompt in pcwapp and type:

ruby script/generate scaffold Game Review

The two arguments for the scaffold script are the name of the model, which is the singular of the database table name, and the name of the controller. If the script completes successfully, you are good to go; if not, check the connect string. Then restart the Rails server and navigate to <http://localhost:3000/review>.

This takes you to a blank listing of the rows in your database table. Click new game, complete the fields, click Create, and a record is added. You have a complete data-driven website, without writing any SQL or custom classes or designing any forms (see screen 3).

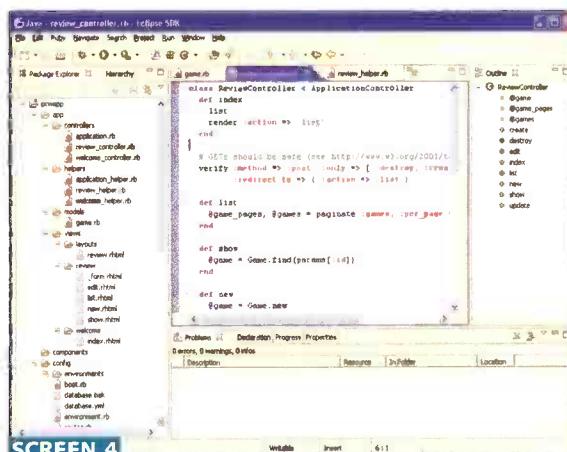
The scaffold-generated site is not intended to be put straight into production. It does give you immediate functionality while you design the application, and it is interesting to inspect the generated code and see how it works. The most remarkable feature of the code is how little there is. Here is the model, game.rb:

```
class Game < ActiveRecord::Base
end
```

As you can see, it is blank. All it does is to inherit from ActiveRecord. There is no list of columns. Yet you can still write code like this:

```
newgame = Game.new
newgame.game = "Halo"
```

Eclipse makes a strong IDE for Rails when the Ruby Development Tools are installed



```
newgame.platform = "XBox"
#etc
```

ActiveRecord works out what to do dynamically at runtime. It is the combination of Ruby's dynamic elegance, the ActiveRecord object-relational mapping and the well-designed web application framework that makes Rails compelling. The key is to consider how much of the code in a typical application is essentially mechanical: writing classes to map to databases, and doing the plumbing that makes it work. Rails eliminates much of that drudgery.

You will also have noticed that a testing framework is built into Rails. This means any robustness that is lost through dynamic typing can be recovered by writing thorough tests.

Rails is not perfect. It is a relatively immature framework, with version 1.1 just released. Deployment can be a hassle. Performance is satisfactory but not fantastic. The big win is productivity, once you have made the initial investment in learning.

Rails is also making an impact on other platforms. Monorail is a project that brings a Rails-like framework to C# and .NET, and even mainstream platforms such as ASP.NET 2 and various Java Frameworks are in some ways moving towards it.

Where next

You probably want an IDE for your Ruby work. The Ruby one-click installer includes an IDE called Freeride, or you can use Eclipse (see screen 4).

Eclipse is easy to configure for Ruby. First, install Eclipse 3.x from www.eclipse.org. Run Eclipse, open up Help – Software updates – Find and Install, and search for new features at: <http://updatesite.rubypeople.org/release>.

Follow the prompts to install the Ruby Development Tools and restart Eclipse. You can easily load an existing Ruby or Rails project into Eclipse. Choose File – New – Project – Ruby Project. Type a project name. Uncheck the Use default option for project contents, and browse to the root folder of the Rails project. Then click Finish.

The Ruby one-click installer includes an ebook called *Programming Ruby*, an excellent introduction to the language. The current interest in Rails means there are dozens of books coming out, along with the existing standard text called *Agile Development with Rails*. There is also an active Rails community on the web, offering plenty of advice and tutorials. **PCW**

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How to buy the best products tested by our Labs

This Buyer's Guide is a comprehensive listing of the best products PCW has tested across a range of areas, helping you to make the best decision when you're planning a purchase. Over the following pages you'll find products, their verdicts and ratings, plus information on where you can read the full review.

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Prices are for guide purposes only and may be subject to change



HOW TO BUY: PCs

Many of the choices you are faced with when buying a PC are covered in the following pages. You need to think about the graphics card, memory, onboard sound or separate soundcard, size and type of hard disk, CD burner or DVD burner and so on.

Once your budget is set, the starting point is the CPU (central processing unit), because it is the brains of your PC.

Intel and AMD offer a bewildering number of processors. The differences between the CPUs are in technical details that don't necessarily mean much to end users. Pricing is also competitive, with AMD PCs generally cheaper than comparable Intel models.

Budget PCs come with Intel's Celeron or AMD's Sempron CPUs. These are aimed at undemanding users. If your needs are for word processing tasks and surfing the Internet with some low-end gaming or image editing, a PC running either of these processors is fine. You won't need a huge hard disk - 80GB will be plenty - coupled with between 256MB and 512MB of Ram and a low-end graphics card, or even onboard graphics for the truly undemanding. You'll be fine with onboard sound, and can expect to pay up to about £500, depending on your monitor.

In the mainstream desktop market it's Pentium 4 and Pentium D versus AMD's Athlon XP and Athlon 64. The chief

- 1**  **Mesh X-treme G71**
£1,399 ★★★★
Reviewed July 06
www.meshcomputers.com
- 2**  **Shuttle XPC P 2500G**
£2,300 ★★★★
Reviewed July 06
www.shuttle.com
- 3**  **Philips Showline MCP9350i**
£999 ★★★★
Reviewed July 06
www.philips.co.uk

difference is that older Pentium 4 and Athlon XP models are 32bit CPUs, while some newer Pentium 4s, the Pentium D and Athlon 64 are 64bit models. To take full advantage of this, you need a 64bit operating system and applications.

More memory can be supported by 64bit systems - 32bit Windows or Linux systems are limited to 4GB of Ram, whereas a 64bit Windows or Linux system can support 128GB. Data is also moved in larger chunks, allowing a theoretical speed advantage.

AMD and Intel offer high-end processors with the Pentium Extreme Edition and Athlon FX ranges, both aimed at the hardcore gaming market. They also have dual-core CPUs. These processors effectively act as two CPUs in one and offer superior performance.

If you're choosing a PC running the above CPUs, other considerations come

down to your needs. If you store lots of music, video or photos, go for a big hard disk - 200GB or above. Memory will help speed up applications, so aim for 1GB or above and don't drop below 512MB. The latest games demand the latest graphics cards, but for most people, cards that were new six to 12 months ago will be powerful enough. And look at the CPU's cache memory, which helps eliminate data bottlenecks.

Most PCs are Windows XP, and the Home Edition is fine. If it's for a small business or you need features such as remote access, buy XP Professional. Few PCs are sold running Linux, and we'd recommend only the technically confident buy a Linux-only system. Linux can always be installed later. Finally, don't overlook the monitor, especially if you're using the PC for gaming or imaging; buy the best you can afford.

BUYER'S GUIDE

**78 PRODUCTS
REVIEWED TO MAKE
YOUR BUYING
DECISION EASIER**

GRAPHICS CARDS

1	Sub £200
	Gainward Bliss 6800GS GLH £176.19 ★★★★★ Reviewed July 06 www.occlockers.co.uk
	EVGA Geforce 7800GS CO-Superlocked £160 ★★★★★ Reviewed May 06 www.evga.com
	Sapphire Radeon X800 £114.99 ★★★★★ Reviewed February 06 www.sapphiretech.com
	Gecube Radeon X850XT Uniwise £269.97 ★★★★★ Reviewed May 05 www.gecube.com
	Gainward Bliss 7800GT GLH £244.89 ★★★★★ Reviewed July 06 www.occlockers.co.uk
	Powercolor Radeon X850XT Platinum Edition £320 ★★★★★ Reviewed July 05 www.powercolor.com
	Gecube X850XT Platinum Edition Uniwise £307 ★★★★★ Reviewed January 06 www.gecube.com
	ATI Radeon X1900 XTX £363 ★★★★★ Reviewed April 06 www.ati.com
	HIS Radeon X850XT Platinum Edition IceQII £370 ★★★★★ Reviewed June 05 www.hisdigital.com
	Nvidia Geforce 7800 GTX 512 £516 ★★★★★ Reviewed February 06 www.nvidia.com

NOTEBOOKS

1	Sub £200
	Evesham Voyager C550 £1,149 ★★★★★ Reviewed July 06 www.evesham.com
	Sony Vaio TX2-HP £1,498.99 ★★★★★ Reviewed June 06 www.sony.co.uk
	Samsung Q30 £1,499 ★★★★★ Reviewed June 06 www.samsung.co.uk
	Evesham Voyager C720 £1,499 ★★★★★ Reviewed February 2006 www.evesham.com
	Mesh Discovery D2400 PCW £899 ★★★★★ Reviewed July 06 www.meshcomputers.com

HOW TO BUY

Most graphics cards are based on either the Nvidia Geforce or ATI Radeon family of chips. Each has their strengths and both offer state-of-the-art image acceleration and comparable features.

Performance improves as you move up a range. Top chips offer more features and draw more pixels or textures in a single pass than cut-down, lower-cost options. All current graphics processors are fine for office work, but hardcore gamers favour Nvidia's Geforce 6800 or new 7800 series and ATI's latest X1900 XTX card.

Ensure the card you buy can display favoured resolutions with at least a 75Hz monitor refresh rate to avoid eye strain from flicker (if using a CRT monitor).

There are usually three clock speeds quoted (in megahertz). Core clock is the internal speed of the graphics processor. Memory speed (or memory clock) is the speed of data transfer between the graphics card's onboard memory and the graphics processor. Ramdac speed is the capability of the digital-to-analogue converter that provides the graphics output from the card.

Graphics cards use their own dedicated video memory to store data, images and textures. The more you have, the better the performance. A card with 64MB is fine for office tasks, but we

recommend at least 128MB or 256MB for the latest games and video applications.

Around £40 will buy you a Geforce FX 5200 or Radeon 9200 card with 128MB of Ram, which is good for 2D action/strategy games, image editing and less demanding 3D games.

To play 3D action games smoothly, look at £100-£150 cards. Serious gamers should consider the Geforce FX 6800 GT at £280-plus, Radeon 850 XT at £320-plus, or 7800 GTX at £350-plus.

Depending on the motherboard, you'll need an AGP or PCI Express graphics card. PCI Express is the newest interface standard, offering up to double the bandwidth of an AGP 8x slot for even faster and more complex graphics. Both ATI and Nvidia offer PCI Express versions of most of their cards. Nvidia also has its SLI (Scalable Link Interface) technology that lets you use two PCI Express graphics cards in SLI-enabled motherboards for ultimate performance. ATI's rival technology Crossfire is due soon.

Look for support for both analogue (VGA) and digital (DVI) displays, and S-video and composite video outputs for use with TVs. Some 'all-in-one' cards have a built-in TV tuner and video-capture options, so you can save money rather than buying separate cards.

HOW TO BUY

Notebooks have caught on like wildfire with consumers thanks to plummeting prices and massive marketing campaigns. However, there are so many options that it's easy to get confused.

Decide what you want your notebook for. If it's for occasional use, running some office applications, accessing the Internet and email, then almost any low-cost notebook will do the job. If it's for gaming or running video-editing software, you will be looking for a notebook with a large 15in/17in screen - possibly widescreen - a high-end Nvidia or ATI graphics chip, 1GB of memory and an 80GB (or bigger) hard disk.

In the low-cost arena, Intel has its Mobile Celeron chip and AMD has Sempron. In the midrange/high-end space, there are Intel's Mobile Pentium 4 or Pentium 4 chips, while AMD offers Mobile Athlon 64 and Athlon 64. Expect to find these in desktop replacement systems and those used by gamers.

For the best in performance with power-saving technology, go for Intel's Pentium M or AMD's Turion 64 processors.

Any notebook you get should have in-built Bluetooth and WiFi connectivity, a 30-40GB hard disk drive, 512MB of Ram, 14-15in screen, USB2 or Firewire ports, DVD/CD-RW combo drive and three to four hours' battery life.

MOTHERBOARDS

1		ECS PF88 £64.63 ★★★★ Reviewed August 05 www.ecs.com.tw	The PF88 is feature-packed and compatible with both Intel and AMD processors.
2		Aopen i915GMm-HFS £79 ★★★★ Reviewed July 05 www.aopen.com	The HFS makes the ideal platform for building a quiet, power-efficient Intel PC.
3		Asus A8N-SLI Deluxe £98 ★★★★ Reviewed April 05 www.asus.com	A good, all-round AMD SLI board that is packed with plenty of features.
4		ECS 915-A £61.81 ★★★★ Reviewed June 05 www.ecs.com.tw	All the features you'd expect from a modern Intel-based motherboard and outstanding value for money.
5		Asus K8N-E Deluxe £59 ★★★★ Reviewed November 04 www.asus.com	A tidy AMD board with lots of room around the major components and a wide range of features.
6		Epox 8HDA3+ £79.92 ★★★★ Reviewed July 04 www.epox.com	An AMD board that stands out from the crowd thanks to its dual Lan and external Sata support.
7		MSI 945P Platinum £99 ★★★★ Reviewed November 05 www.msi.com.tw	An Intel board that features DTS Connect, so you can output true DTS surround-sound audio.
1		Gigabyte GA-8N-SLI Royal £149 ★★★★ Reviewed October 05 www.giga-byte.com	Featuring an Nforce4 chipset, this model from Gigabyte supports all Intel 775 processors.
2		Abit Fatal1ty AN8 £119.80 ★★★★ Reviewed August 05 www.abit.com.tw	This AMD board has enough flexibility and Bios features to keep overclockers happy.
3		ECS PF22 Extreme £123 ★★★★ Reviewed February 06 www.ecs.com.tw	A good range of features including dual graphics support courtesy of ATI's Crossfire technology.

DIGITAL MUSIC PLAYERS

1		Apple iPod £219 ★★★★ Reviewed January 06 www.apple.com/uk	All the usual iPod features but now with the ability to play video.
2		Creative Zen Nano Plus £99 ★★★★ Reviewed December 05 http://europe.creative.com	1GB flash player that houses a radio, voice recorder and mp3 encoding from a line-in source.
3		Philips HDD6320 £229 ★★★★ Reviewed March 06 www.philips.co.uk	Sleek and stylish, this 30GB player from Philips is incredibly easy to use.
4		Apple iPod Shuffle £89 (1GB); £69 (512MB) ★★★★ Reviewed May 05 www.apple.com/uk/ipod	Small yet perfectly formed, it's easy to use, has good sound and is set to be a big hit.
5		iRiver H340 SE £339 ★★★★ Reviewed January 05 www.epinx.com	A good all-round player with a colour screen and built-in FM tuner.

HOW TO BUY

The motherboard dictates the type of processor you can use, how well the other components communicate, the features on offer and future upgrade potential.

Cheap boards limit processor support, graphics and expansion options. Around £70-£100 gets you the latest technologies.

Most desktop and tower cases use a standard ATX-size motherboard but, if you're building a small system, look at compact MiniATX or MicroATX designs. If using an existing case, make sure you buy the right form factor.

Your choice is also dictated by the processor. You'll need Socket 775 for current Intel processors, Socket A for AMD Athlon XP or Duron, and Socket 939 for an Athlon 64. The Athlon 64 FX series requires Socket 940. If using an older CPU, check the socket type.

We would recommend an Intel P4 or Athlon 64 for a good all-round system. The Athlon 64 can address one terabyte of Ram (1,000GB) and handle difficult calculations with relative ease.

The new generation of processors also change the way data is transferred. Whereas P4s rely on the motherboard chipset to shuttle data between processor and memory, Athlon 64s avoid this by integrating the memory controller into the CPU die.

Divided into northbridge and southbridge, the chipset handles the communication between all the components and dictates the features on offer. Today's leading chipset manufacturers include Via, Silicon Integrated Systems (Sis), ATI, Nvidia and Intel. Chipsets can include integrated graphics.

Today's motherboards mainly use DDR or DDR2 Ram, available in 200, 266, 333 and 400, 667 and 800MHz modules.

Also consider the number of slots available. Fit dual in-line memory modules (Dimms) in pairs if the chipset supports dual-channel operation.

The latest boards support both older IDE and new, faster Serial ATA (Sata) hard disks. Check the number of connectors available for both.

Some chipsets provide Raid support, so data can be spread across two drives for extra performance or backups. SCSI controllers can be found on more expensive boards, or be added with expansion cards.

Also important is the number of USB2 and Firewire sockets for external add-ons. You may need serial, parallel and PS/2 interfaces if using older legacy peripherals. Look out, too, for onboard Ethernet networking, a built-in 56K modem and onboard sound. The latter is fine for all but audio buffs or avid gamers.

HOW TO BUY

The mp3 music format recently celebrated its tenth birthday and in that short space of time it has revolutionised the music industry. On the way, it has spawned a global market for digital music players, none more famous than Apple's iPod and related offerings.

There are two main categories that players can be divided into: Flash memory-based players, which range in size from 256MB to 1GB and mini hard drive-based models, which run from 4GB to 60GB. Prices for a 256MB player start as low as £20 rising to around £300 for a 60GB player. In terms of songs, the difference is the ability to hold 40 on one and 15,000 on the other. If you just

want something for using on-the-move, then Flash-based players are the way to go, since they are very small and light.

The software used in many players determines how easy it is to use in terms of tracklisting and organising songs.

If you need a portable record store, then start by looking at the wide range of 4GB-6GB players and, if that's not enough, head for the 20GB, 40GB and 60GB models. Ensure whatever you buy supports playback in different formats. The ability to listen to FM radio and record voice is also a bonus. Most importantly, check out the battery life, since this can vary wildly between similar devices.

HARD DRIVES

INTERNAL	
1	
2	
3	
4	
5	
1	
2	
3	
4	
5	

Western Digital Raptor X

£243.17 ★★★★★

Reviewed June 06

www.wdc.com

Two 75GB platters combine to create one of the fastest non-SCSI hard drives.

Seagate Barracuda 7200.8 (ST3400832A) 400GB

£186.96 ★★★★★

Reviewed July 05

www.seagate.com

This massive 400GB drive offers impressive capacity and an 8ms seek time.

Hitachi Deskstar 7K250 (250GB Sata150)

£88 ★★★★★

Reviewed May 04

www.hitachi.co.uk

Those needing a large Sata150 drive will find this a great bargain.

Samsung Spinpoint P120S

£80.11 ★★★★★

Reviewed February 06

www.samsung.co.uk

This isn't the fastest drive on the market, but it is extremely cool and quiet.

Hitachi Travelstar 7K100

£175 ★★★★★

Reviewed June 06

www.hitachi.co.uk

A speedy 100GB 2.5in model to replace your ageing notebook hard drive.

Maxtor OneTouch II Firewire 800 300GB

£179 ★★★★★

Reviewed November 05

www.maxtor.com

A good-quality 300GB USB and Firewire hard drive that comes with backup software.

Western Digital My Book Essential Edition

£149 ★★★★★

Reviewed June 06

www.wdc.com

This is a stylish external hard disk drive, but it lacks a network option.

Lacie Safe Mobile Hard Drive 80GB

£149 ★★★★★

Reviewed December 05

www.lacie.co.uk

Featuring a fingerprint reader for security, this 80GB external hard drive would suit business users.

Buffalo LinkStation 120GB

£240 ★★★★★

Reviewed October 04

www.buffalotech.com

If you want easy-to-use external network storage, this is a great choice.

Buffalo Ministation HD-PHS40U2/UC

£70 ★★★★★

Reviewed April 06

www.buffalo-technology.com

This 40GB portable hard drive includes shock protection to minimise the risk of data loss.

DVD DRIVES

INTERNAL	
1	
2	
3	
4	
5	

NEC ND-4551A

£35 ★★★★★

Reviewed May 06

www.nec.co.uk

An excellent DVD drive supporting every format and Labelflash technology.

Pioneer DVR-110 Supermulti

£40 ★★★★★

Reviewed March 06

www.pioneer.co.uk

Supports all major formats, including DVD-Ram. Good value for money.

Toshiba SD-R6472

£83.42 ★★★★★

Reviewed September 05

www.span.com

A slimline dual-layer DVD writer that performs well and is perfect for small form factor PCs.

Philips DVDR16LSK

£59.99 ★★★★★

Reviewed October 05

www.philips.co.uk

An excellent Lightscribe-capable dual-layer DVD burner that's very keenly priced.

LG 12X Super Multi DVD

£116.99 ★★★★★

Reviewed January 05

www.lge.co.uk

Good-value external USB2/Firewire rewriter with all-format media support.

HOW TO BUY

If you're building a high-performance system, buy the fastest drive you can afford; if you just want lots of capacity then slower drives offer better value.

OEM or 'brown box' drives are cheaper - this is the bare drive without the extras, such as cables, included in retail boxed versions.

The transfer rates in today's Ultra ATA drives are 100Mbytes/sec (133Mbytes/sec for Maxtor drives), while Serial ATA (Sata) drives are rated at 150Mbytes/sec. Check the seek times, spindle speed, buffer size and the areal density of the platters (disks).

Usually in milliseconds, seek time is how long a drive's heads take to find data on the disk. The speed at which the spindle holding the disks spins ranges from 4,200rpm for a notebook drive to 15,000rpm for some SCSI drives. Generally, faster speeds give better performance.

The larger the buffer (cache), the more recently written or stored data is held in the drive's memory, resulting in less time seeking the data on the disk.

Areal density is the amount of data stored on a given area of a drive's platter. The more data per square centimetre (gigabytes per platter), the less disk movement is required to bring it under the heads.

Originally Integrated Drive Electronics (IDE), then Enhanced IDE (E-IDE), this common parallel interface is usually written as ATA (AT Attachment), modified with speed improvements in recent years to Ultra ATA/xxx, where xxx is the peak bandwidth in Mbytes/sec. To differentiate Ultra ATA from Sata, the term Parallel ATA is used.

Faster Sata drives are more expensive than Parallel ATA. Sata uses two pairs of high-frequency cables, working at low voltage.

SCSI (Small Computer System Interface) drives are technically no different to ATA drives, but support up to 16 devices on a single channel and you can have multiple channels in a PC. The disadvantage, though, is price.

Most motherboards support Raid (Redundant Array of Independent Disks), which connects multiple drives, to improve performance or provide fault tolerance.

One problem you may hit is the inability to access the new drive's full capacity. Some older Bioses only support drives up to 137GB. This may be solved by updating the PC's Bios. Retail boxed disks often come with software to fool the Bios into recognising the disk, or you can buy a separate disk controller card, which fits into a PCI slot.

HOW TO BUY

DVD drives have largely replaced CD-Rom, CD-R and CD-RW drives in all but a few entry-level PCs and notebooks. Many systems still offer DVD-Rom drives as secondary drives - used for playback of discs only - while a growing number have a DVD writer or rewriter for burning your own DVDs as the main system drive.

DVD burners can be divided into internal and external drives. Internal drives are cheaper than their external counterparts, but require a level of knowledge so you can install them yourself. You can opt for one of the external offerings which can be hooked up simply via USB2 or Firewire.

Most drives are multi-format, meaning they can write to all key media types, so make sure yours supports DVD+R, DVD+RW, DVD-R and DVD-RW discs. Newer double and dual-layer drives can write to new discs which can store 8.5GB versus the 4.7GB capacity of existing discs. This is useful for backing up your DVD movie collection or chunks of your hard drive on a single disc.

The dual-layer drives cost little more than single-layer drives, so are a good investment. The same cannot be said for the cost of dual-layer discs. A branded, dual-layer 8.5GB disc will cost around £3.75. Rewriteable dual-layer discs will not arrive until the end of 2006.

PRINTERS

1 PHOTO PRINTERS



Epson Picturemate 100

£100 ★★★★★

Reviewed January 06

www.epson.co.uk

This is a high-quality photo printer that is both cheap and easy to use.

2



Canon Pixma iP5000

£129 ★★★★★

Reviewed June 05

www.canon.co.uk

If it's pixel-perfect printing you're after, look no further than the iP5000 - a real bargain.

3



HP Photosmart 8450

£170 ★★★★★

Reviewed April 05

www.hp.com/uk

HP's Photosmart 8450 is a bulky printer, but it's capable of producing stunning photo prints.

4



Epson Stylus Photo R340

£149 ★★★★★

Reviewed February 06

www.epson.co.uk

Excellent-quality prints and the ability to function without a PC.

1 MULTIFUNCTION DEVICES



Canon Pixma MP800R

£329 ★★★★★

Reviewed July 06

www.canon.co.uk

A capable MFD with built-in wireless networking that's easy to set up and use.

2



Dell Photo All in One 944

£121 ★★★★★

Reviewed April 06

www.dell.co.uk

A bulky, but good-quality MFD that would suit both home and small office use.

1 LASER PRINTERS



Dell 1600n

£236 ★★★★★

Reviewed September 05

www.dell.co.uk

A good multifunction mono laser, perfectly suited to small or home offices.

2



Canon LBP-5200

£224 ★★★★★

Reviewed October 05

www.canon.co.uk

A great-value colour laser printer that's both small and capable of delivering quality prints.

3



Dell Laser Printer 1100

£93 ★★★★★

Reviewed November 05

www.dell.co.uk

A cheap mono laser printer, but it comes with a relatively small starter toner cartridge.

4



HP Laserjet 1020

£89 ★★★★★

Reviewed August 05

www.hp.com/uk

A great home laser printer that's fast, good quality and is one of the cheapest lasers available.

HOW TO BUY

If you don't need colour, consider a monochrome laser or LED printer. The latter tend to be cheaper and may last longer than a laser, but LED printers have a fixed resolution and can't take advantage of software-based resolution enhancements.

If you print hundreds of pages a week, a laser is the best option as they're cheaper and more reliable for high-volume printing. If you print a few pages a month, buy a cheap colour inkjet. If printing high-quality colour photos, buy a good photo printer.

Look for the manufacturer's quoted 'duty cycle' - this is how many pages a month the machine can handle. Choose a duty cycle three or four times larger than your expected average usage. Also check the printer's 'engine life' or 'total print volume' - after this expires, the printer's on borrowed time and uneconomical to repair.

Quoted printer speeds often refer to the speed the printer pushes a blank sheet of paper through the mechanism; for documents they tend to refer to lower quality settings. PCW's tests use real documents and photos, giving a better idea of print speed.

For serious inkjet photo printing, consider higher-end models that use six, seven or eight colour cartridges. Normal

inkjets use three colours (cyan, yellow and magenta) plus black, while specialised photo printers add extra shades to improve colour fidelity. Cheaper models often combine three colours in a single cartridge, which is not as economical as using separate cartridges for each colour.

Some 'convertible printers' use four separate black cartridges for longer-life mono printing and you can replace three of them with cyan, magenta and yellow cartridges for colour printing.

Laser models for business use often have a large number of paper-handling options. They're usually modular so you can add features as required. They also have a wider range of interface options and consumables.

You'll often find bundled software with a printer. Their quality varies, but there can be some useful programs.

The quality and usability of the driver software is vital, but it's difficult to assess before buying. Check PCW's reviews and online forums (www.pcw.co.uk/forums) and read the manufacturer's technical support site for any known problems.

Third-party or refurbished consumables generally work fine, but can cause problems with quality and reliability. Your warranty may not cover the use of non-approved consumables.

TV TUNERS

1



Terratec Cinergy Hybrid T USB XS

£89 ★★★★★

Reviewed June 06

<http://en.terratec.net>

A dual-format USB TV tuner complete with remote control and portable aerial.

2



Nebula Digitv

£99.95 ★★★★★

Reviewed August 05

www.nebula-electronics.com

This external USB2 tuner has a built-in web server to let you share TV over your network.

3



Twinhan Magic Box

£69.99 ★★★★★

Reviewed August 05

www.twinhan.com

A stylish external USB2 tuner with good software and an attractive price.

4



Terratec Cinergy 400 TV

£89.99 ★★★★★

Reviewed March 05

<http://en.terratec.net>

A PC Card-based analogue tuner with good software, it's a great buy for laptop users.

5



Visionplus VisionDTV

£69.99 ★★★★★

Reviewed November 04

www.twinhan.com

A bargain price and top-notch features make this a must-buy USB2 digital TV tuner.

HOW TO BUY

Internal TV tuners require a PCI slot. External options connect via USB and are easier to set up. Hi-speed USB2 is often needed and devices typically require Windows ME, 2000 or XP. Check if you run Windows 98 or NT.

A Freeview digital tuner offers the best channel choice, picture and sound, but may need an outdoor aerial or a wideband aerial (you can check at www.freeview.co.uk). Analogue terrestrial TV tuners may give better results if using an indoor receiver. If a digital tuner receives radio it doesn't always mean digital audio broadcasting (DAB) support. Look for Teletext and subtitle support.

Digital tuners record to disk for maximum quality; analogue signals need to be digitally encoded - look for mpeg-2 hardware for realtime video and audio encoding; cheaper tuners need your CPU to do this in software.

Most analogue systems let you capture video from a VCR or camcorder. Look for composite or S-video connectors and stereo phono inputs. Typically, an hour of mpeg-2 video uses up to 2GB of disk space. VHS-quality mpeg-1 gives just over an hour on a CD.

Better TV cards have personal video recorder functionality, letting you pause, fast forward and rewind live TV, and have an electronic programme guide to record shows to your PC.

MONITORS

1 20in		Sony MFM-HT205 £649 ★★★★☆ Reviewed June 06 www.sony.co.uk	An elegant widescreen multimedia monitor with superb image quality and a built-in TV tuner.
2		Belinea 10 20 30W £319.99 ★★★★☆ Reviewed July 06 www.belinea.co.uk	A high-quality MVA panel with great specifications, but lacks a DVI port.
1 19in		Acer AL1922HS £279 ★★★★☆ Reviewed September 05 www.acer.co.uk	The AL1922HS offers a great balance of features, performance and price.
2		CTX S966A £219 ★★★★☆ Reviewed September 05 www.ctxeurope.com	Excellent value for money and looks a lot more expensive than it really is.
1 17in+		LG Flatron L1732P £239 ★★★★☆ Reviewed February 06 www.lge.co.uk	Fast response times make this 17in panel a good choice for gamers.

DIGITAL CAMERAS

1 DIGITAL SLR		Canon EOS 350D £799 ★★★★★ Reviewed December 05 www.canon.co.uk	This is a hugely capable digital SLR camera that won't disappoint.
2		Konica Minolta Dynax 5D £649.99 ★★★★☆ Reviewed December 05 www.konicaminolta.co.uk	A very usable camera, although it's a little weighty. Anti-shake mechanism is excellent.
1 PROSUMER		Fujifilm Finepix S9500 Zoom £469.99 ★★★★☆ Reviewed February 06 www.fujifilm.co.uk	A serious contender to entry-level digital SLRs with a 10x zoom and 9megapixel CCD.
2		Olympus E-500 £600 ★★★★☆ Reviewed April 06 www.olympus.co.uk	The long awaited successor to the popular E-300 doesn't fail to impress.
1 COMPACT		Canon Powershot A520 £239 ★★★★★ Reviewed July 05 www.canon.co.uk	Perfect for those who want a versatile and easy-to-use digicam without spending a fortune.

ROUTERS

1 WIRELESS/MODEM		Netgear 108 ADSL router £159 ★★★★☆ Reviewed April 05 www.netgear.co.uk	If you need a Super-G router with built-in ADSL modem, this offering from Netgear is great value.
2		Ozenda 11g ADSL Router £70 ★★★★★ Reviewed November 04 www.ozenda.com	Ozenda has come up trumps - wireless ADSL doesn't get any easier than this.
1 WIRELESS		Linksys WAG54G (wireless) £76 ★★★★★ Reviewed August 05 www.linksys.com	This 802.11g wireless model offers advanced features for home and professional users.
2		D-Link DSL-G624M £110 ★★★★☆ Reviewed March 06 www.d-link.co.uk	Combines Mimo technology with Super G to give faster speeds and extended coverage.
1 VOIP		Intertex IX66+ ADSL Airstrip GW (wireless VoIP) £269.08 ★★★★★ Reviewed March 05 www.intertex.se	For a small business needing multi-user VoIP telephony, the Intertex IX66+ is hard to beat.

HOW TO BUY

Monitor resolution is the number of picture elements (pixels) displayed on a screen. In any TFT or LCD monitor, each pixel is composed of three sub-pixels coloured red, green and blue. The number of pixels equals the 'native' resolution; a 1,024 x 768 TFT will have exactly that number of pixels horizontally and vertically. Users wanting 1,600 x 1,200 will probably need an expensive 20in model - most 19in panels are currently limited to 1,280 x 1,024.

Modern TFTs can be viewed from a wide range of angles vertically and horizontally, but anything over +/- 45° makes no

difference in normal use. Response time is the time taken for a pixel to reach maximum brightness. Some newer monitors now have response times as low as 4ms, but 12-25ms is typical.

The ISO 13406-2 standard specifies minimum requirements for display contrast, viewing angle, brightness, reflections, flicker, contrast and defective pixels. ISO 13406-2 has stringent standards for defective pixels. Only Class I TFTs are guaranteed no defective pixels - most consumer models are Class II. Some manufacturers offer dead pixel guarantees with Class II TFTs - check the policy before you buy.

into the centre of the picture. Look at the selection of automatic or preset picture modes for standard shots, portraits, night shots and landscapes, plus macro modes for close-up photography.

Movie modes aren't as good as even a basic camcorder, but are fine for short movie clips to play on your PC. Most offer 15fps, but some are 30fps, which means the video will be smoother. Experienced photographers will want manual controls for aperture and shutter priority, white balance and focusing. Good cameras should also provide quick and easy access to image quality, resolution and format settings.

HOW TO BUY

The router is at the heart of any home network. Costing less than £100, they are an inexpensive way to exploit the advantages of being able to share information between the computing devices in your home. A router is a simple networking device to which you connect your PCs and notebooks using a network cable. They often include built-in firewalls and other security measures, making them ideal for protecting your PCs from intruders. The router connects to your broadband modem, as long as your modem uses an RJ45 Ethernet connection - most

routers don't support USB modems. Special broadband routers, also called ADSL gateways, come with built-in ADSL modems. If your broadband is provided via a cable company's set-top box, you should buy a standard router without a built-in modem. Once hooked up, your devices can share broadband as well as swap data. Wireless (Wifi) routers are increasingly popular in the home market, allowing devices to remotely connect to the Internet and each other without the need for cables - but wireless routers usually have network (Ethernet) ports to let you connect non-wireless devices.

PRODUCT INDEX

Below is a list of every product reviewed by PCW over the past three months, to help you find the full reviews quickly and easily in your back issues.

Key: ★ Editor's Choice ★ Recommended ★ Great Value All scores are out of five

COMPANY	PRODUCT	ISSUE	SCORE	COMPANY	PRODUCT	ISSUE	SCORE	COMPANY	PRODUCT	ISSUE	SCORE
01 Communique	I'm In Touch 5.10	April 06	4	Epson	Aculaser C1100N (laser printer)	May 06	4	Navman	ICN520 (sat nav)	May 06	2
★ 3am Labs	Log Me In Pro 2.30.523	April 06	5	Evesham	Axis Dominator 796T (desktop)	June 06	4	★ NEC	ND-4551A (removable storage)	May 06	5
★ 3am Labs	Log Me In IT Reach	June 06	5	Evesham	Axis SB (desktop computer)	April 06	4	★ Network Box	SME 250 (security appliance)	June 06	5
★ ACDsystems	Pro Photo Manager	June 06	4	Evesham	Blue Media BM6380GPS (sat nav)	May 06	2	★ Nexus	Anti-Vibration Mounting Kit	May 06	5
★ Acer	Aspire 9503EWSMi (notebook)	May 06	4	Evesham	Ebox V (Media Center PC)	June 06	4	★ Novogo	A30 (sat nav)	May 06	4
★ Acer	Travelmate 8204WLMi	April 06	5	Evesham	Nav-Cam 7000 (sat nav)	May 06	2	★ Nvidia	Geforce 7900GT (graphics card)	June 06	4
Acer	Travelmate C202TMI (tablet PC)	April 06	3	Evesham	Voyager A215 (notebook)	May 06	3	OKI	C3200 (laser printer)	May 06	3
Acoustic Energy	Wifi Radio	May 06	4	★ EVGA	7800GS CO Superclocked	May 06	5	★ Olympus	E-500 (digital SLR)	April 06	4
★ Actinic	Express (e-commerce software)	April 06	4	★ Freecom	DVB-T USB Stick (USB TV tuner)	June 06	3	★ Onspeed	Mobile (mobile Internet)	June 06	5
★ Activision	The Movies	April 06	4	★ Fujitsu Siemens	Amilo M 6450G (notebook)	May 06	4	★ Panrix	Mantis (Media Center PC)	June 06	4
Agatha Christie	And Then There Were None	May 06	3	★ Fujitsu Siemens	Lifebook P1510 (tablet PC)	April 06	4	★ Panrix	Magnum IQ 3700 (desktop)	April 06	5
★ AGM	CW-19 (monitor)	April 06	4	Fujitsu Siemens	S20-1W (monitor)	April 06	4	★ Pantone	Huey (image-editing software)	April 06	4
AJP	M551G-E (notebook)	May 06	3	★ Fujitsu Siemens	Scaleo E (Media Center PC)	June 06	4	Passive	HFX Silent Case Kit	June 06	4
Ambros	Shuttle SD36G5M (PC)	June 06	4	Fujitsu Siemens	Scaleo E (Media Center PC)	April 06	4	★ PC Nextday	Zoostorm 9-5401 (desktop)	April 06	4
Ambros	Shuttle SK21G Sempron 754	April 06	3	Gametrak	Real World Golf	April 06	3	Philips	SPC 610NC (webcam)	April 06	3
Anyplace Control	2.12 (remote access software)	April 06	3	★ Garmin	Street Pilot i3 (sat nav)	May 06	4	Pinnacle	PCTV USB Stick (USB TV tuner)	June 06	3
★ Apple	iLife '06 (multimedia suite)	May 06	4	Gigabyte	GC-PTV-TAF (TV tuner card)	June 06	4	Plextor	PX-EH40L (removable storage)	June 06	4
Apple	iMac	May 06	4	Hauppauge	WinTV-HVR 900 (USB TV tuner)	June 06	3	★ RDM	Remote Desktop for Mobiles 2	May 06	4
Apple	Ipod AV Connection Kit	May 06	2	Hawking Tech	HWU54DM (wireless adapter)	June 06	3	★ Rock	Xtreme 64 (notebook)	May 06	4
Apple	Mac Mini (Intel version)	June 06	4	Hela	Periflic Mouse	May 06	2	★ Roxio	Easy DVD Copy 2	April 06	4
Arturia	Storm 3 (audio-sequencing)	June 06	3	HP	Compaq tc4200 PV984ET	April 06	4	★ Roxio	MyDVD Premier (video-editing)	June 06	4
Asus	EN7800GT Top Silent	April 06	4	★ HP	Color Laserjet 2600n	May 06	4	★ Samsung	Pro 815 (digital camera)	May 06	4
Asus	W3V (notebook)	May 06	3	HP	Compaq nx6125 (EK157ET)	May 06	4	Samsung	SH-W163 (removable storage)	April 06	4
★ ATI	All-in-Wonder X1900 (graphics card)	May 06	5	Hi-Grade	OMS II 3200 (Media Center PC)	June 06	4	Samsung	P-P300ME (projector)	June 06	4
★ ATI	Radeon X1900 (graphics card)	April 06	5	Hi-Grade	OMS II 3200 (Media Center PC)	May 06	4	Sandisk	1GB Cruzer Titanium	April 06	4
Avanquest	Ghostsurf Platinum:			Hitachi	Notino C5515-1700 (notebook)	May 06	4	★ Scan	EVGA Geforce		
	Identity Protector	June 06	3	★ Image Line	7K100 (notebook drive)	June 06	4		7800GTX Black Pearl	April 06	5
Avanquest	Netobjects Fusion 9	May 06	4	Intellect	Human Concepts Orgplus 6 (utility software)	June 06	4	Seagate	Barracuda 7200.9 (hard disk)	March 06	4
Averagec	1050 (notebook)	April 06	3	Intervideo	FL Studio 6 (audio-sequencing)	June 06	4	Silentmaxx	ST11-Pro (computer case)	April 06	3
★ AVG	AVG Free for Linux (anti-virus)	June 06	4	iolo	Ivideo to go (video conversion)	June 06	3	★ Skype	2 (VoIP service)	April 06	5
Brother	MFC-820CW (MFD)	June 06	4	Jabra	System Mechanic 6 (utility)	June 06	4	★ Sony	MFM-HT205 (monitor)	June 06	5
★ Buffalo	Minestation HD-PHS40U2/UC	April 06	4	★ Kodak	JX10 (Bluetooth headset)	April 06	3	★ Sony	Vaio VGX-XL 100 (PC)	June 06	4
Buffalo	Terastation Pro (storage)	June 06	4	Konica Minolta	Easyshare v570 (digital camera)	June 06	4	Sony	VPL-HS50 (projector)	May 06	4
Cakewalk	Sonar Home Studio 4 (audio)	June 06	4	Kworld	Magicolor 2430DL (laser printer)	May 06	4	★ Steinberg	Cubase SE 3 (audio-sequencing)	June 06	5
Canon	Laser Shot LBP 5200	May 06	3	★ Laplink	DVBT-350U (USB TV tuner)	June 06	2	Symantec	PC Anywhere 11.5	April 06	3
★ Chillblast	Atlantis Crossfire (desktop)	June 06	5	Lexmark	Everywhere 4 (remote access)	April 06	4	Tandberg	420LTO (backup drive)	June 06	4
Citrix	GotomyPC 5.0 (remote access)	April 06	4	Logitech	C510n (laser printer)	May 06	4	★ Terratec	Aureon 7.1 (soundcard)	June 06	4
Codemasters	Toca 3	June 06	4	Logitech	Cordless Desktop S 530			★ Terratec	CinergyT USB XS (USB TV tuner)	June 06	4
Colour Confidence	Datacolor Spyder TV (TV plugin)	April 06	4		Laser for Mac	June 06	4	THQ	Psychonauts	May 06	4
CA	CA Etrust Internet Security Suite	May 06	3	Logitech	Wireless Music System	May 06	3	THQ	Stubbs the Zombie	May 06	4
Coolermaster	Stacker 830 (computer case)	April 06	4	Logitech	Z-5450 (speakers)	June 06	4	★ Tom Tom	One (sat nav)	May 06	4
★ Corel	Coreldraw X3	May 06	5	Lucasarts	Z-5450 (speakers)	May 06	4	Toshiba	Satellite Pro M70 (notebook)	April 06	2
Creative	Zen Vision: M	April 06	4	Magellan	Star Wars: Empire at War	June 06	3	Toshiba	SD-R6572M	April 06	3
Cube	247 Atlas ST3 (desktop)	April 06	4	Magellan	Roadmate 300 (sat nav)	May 06	3	Toshiba	TDP-TW90 (projector)	April 06	3
Cube	Cube 247 Omega ST2 (PC)	June 06	4	Magix	Roadmate 800 (sat nav)	May 06	4	Toshiba	Tecra M4 (tablet PC)	April 06	3
★ Dell	3100cn (laser printer)	May 06	5	Majesco	Music Studio 11 Deluxe (audio)	June 06	2	Trendnet	TEW-429UB (wireless adapter)	June 06	4
Dell	Dimension 5150c	May 06	3	Medion	Advent Rising	June 06	2	Trust	Mobile Laptop Alarm	April 06	2
Dell	Dimension 5150c (PC)	June 06	3	Mesh	Go Pal PNA350 (sat nav)	May 06	2	★ Ubisoft	Prince of Persia:		
Dell	Photo All in One Printer 944	April 06	3	Mesh	Cubex Media TV PCW (PC)	June 06	4		The Two Thrones	April 06	5
D-Link	DKVM-8E (KVM switch)	June 06	4	★ Mesh	Pegasus 3070 (notebook)	May 06	3	Viamichelin	X930 (sat nav)	May 06	3
★ Draytel	Vigortalk (VoIP adapter)	May 06	4	Mesh	Pegasus 7800 SLI (notebook)	June 06	4	Viewsonic	VA2012W (monitor)	April 06	3
ECS	KA1 MVP Extreme	April 06	3	Mesh	Pegasus 7800GTX (notebook)	June 06	4	★ VMware	Server (utility software)	June 06	5
★ Eizo	Flexscan S2110W (monitor)	May 06	4	Mesh	Titan X1800 Fire (desktop)	May 06	4	Viewsonic	VX922 (monitor)	May 06	4
★ Eizo	Flexscan S2410W (monitor)	June 06	4	Mio	Matrix Vector PCW (desktop)	April 06	3	VolPvoice	Uconnect	May 06	3
Elonex	Elonex Artisan VX (PC)	June 06	3	Motion Computing	268+ (sat nav)	May 06	3	Western Digital	My Book Essential Edition		
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★ Enermax	Laureate EB305C (storage)	June 06	4	MV	Mega Sky 580 (USB TV tuner)	June 06	3	Vonage	Xstarcom Wifi Phone	May 06	3
Elonex	EN-7473 Home Media Case	May 06	4	MYOB	Sirius+ (notebook)	May 06	2	Xerox	Phaser 6120 (laser printer)	May 06	4
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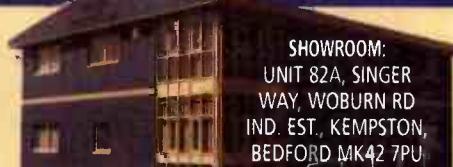
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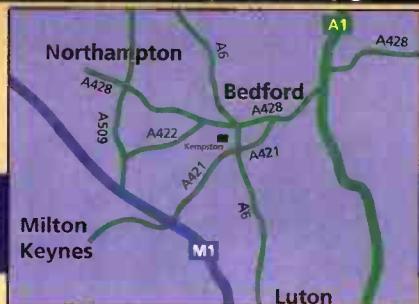
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The PCW cover disc uses a web-browser-style interface. To get full functionality, you'll need to use Microsoft Internet Explorer (version 5.5 or later). Unfortunately, Netscape doesn't properly support this software. However, we have also provided links to the featured programs so 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.

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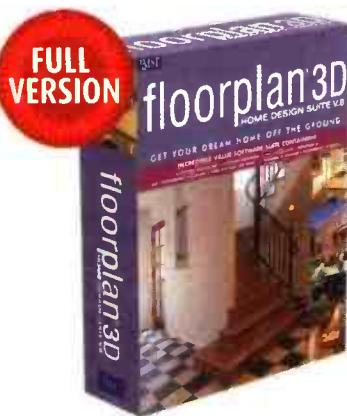
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Floorplan 3D v8

Plan a new room, home or garden with this drawing application

If you're planning to revamp your home, Floorplan 3D could be just what you need. Whether you want to redesign your kitchen, try a new garden layout or even build a house from scratch, this powerful drawing application has all the planning and visualisation tools you need.

The process starts by using walls to construct your house. Choose a wall size, click and drag on the work area, and draw walls to match the size and shape you need. If you get a dimension wrong, just click the relevant wall, then drag it back and forth until your room size is accurate.

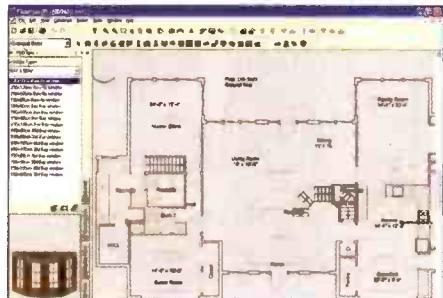
Carry on adding internal walls as required, then complete the basic structure with doors and windows. Floorplan comes with a library of over 60 different door types and sizes, and more than

100 windows, so you're sure to find something that suits your needs.

Dress each room with appropriate furniture and appliances, choosing from the hundreds of options available. Then add plumbing (sinks, baths, showers and more), electrical items (power outlets, light switches), and a wide range of accessories: mirrors, plants, rugs and more.

Finally, switch to 3D View, and Floorplan will generate an attractive 3D model of your building. Now you'll get to see exactly what your designs look like, and get a feel for how they'll work in real life. Resize and reposition anything that doesn't fit, until you're happy, and you're finished. Print the models to share with others, or export the design in dxf format if you'd like to share it with an architect.

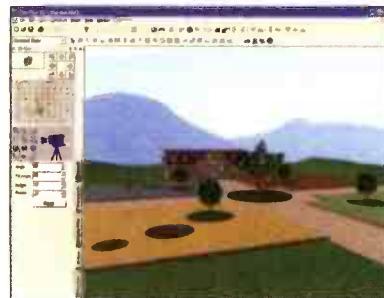
Easily plan, customise and visualise just about any home-design project



1 Floorplan starts in plain, basic Plan View, which looks a little dull. It's extremely easy to use, though: just choose what you want to draw from the Construct menu (walls, doors, windows, stairs and more), click and drag on the workspace, and that's about it. Right-click an object and select Edit Properties to modify it later.



2 Browse the Insert menu and you'll find hundreds of 3D objects available for dressing an office, living room, bathroom or kitchen. Click View > 3D View when you want to see how they'll look in reality, and use the left-hand camera and navigation controls to walk through your model. Select View > Render Mode > Rendered for the best image quality.



3 Floorplan doesn't restrict you to internal views. The Construct menu lets you add a drive, fences, gates and decks around the house, while clicking Insert > Site Information provides everything you need to design a complete garden: trees, shrubs, plants, pools and spas – even a gazebo.

UPGRADE OFFER

NEW FEATURES

- Now over 1,900 3D objects
- Improved garden/landscape features
- Improved materials library
- 1,001 customisable home plans
- Photorealistic 3D rendering
- Quicktime virtual reality files

FLOORPLAN 3D V10

The latest Floorplan provides even more 3D objects to populate your designs, and the landscaping tools have had some major improvements.

An improved materials library helps give them the precise look you need, while export options (photorealistic images, 3D Quicktime files) ensure everyone else will be able to enjoy your work.

Retailing at £27.99, readers can upgrade and save £5 by visiting www.avanquest.co.uk/vnu/floorplan/offer and entering FLOOR as the promo code to claim your discount.



INFORMATION

System requirements 128MB Ram, Windows 98 or later, 1GB free disk space

Contact www.magix.com

Registration Not required

Need to know No mpeg encoding or CD/DVD authoring/burning support. Some menu options lead to features that are only available in the Pro version. Click Help > Contents > Limitations to find out more

Magix Movie Edit Pro 10 Silver

Transform tired home videos into eye-catching, impressive movies

The key to producing a high-quality, professional movie comes in the editor: and that's why you need Movie Edit Pro 10 silver.

The program starts very simply. If you want to join a few film clips together, for instance, then just drag and drop them on to the timeline (mpeg, mov, avi and wmv formats are supported), and export the finished results as wmv files. It's all finished in a minimum of clicks.

Usually you'll want something a little more complex, of course, so the program comes with a variety of special effects. There's a whole range of filters to help correct problems with brightness, contrast, sharpness and colour saturation, for instance. You can precisely crop, resize or reposition an image with ease, and an

excellent Object Curve option helps you rotate, twist, pan or otherwise animate a clip in a variety of interesting ways.

Movie Edit Pro 10 also provides a flexible Title editor, letting you add all kinds of animated titles and captions with the minimum of effort. And there's an impressive selection of transitions. There are the usual wipes and scrolls if you need them, but the program also provides far more eye-catching 3D effects, glides, fades, image-in-image options and more.

For a final touch, add a narration or soundtrack. The program is particularly versatile here: not only does it support all the sound file formats you'd expect (wma, mp3, wav, ogg vorbis and Midi), but it even lets you drag in your choice of track from an audio CD.

Build stylish, professional movies in minutes



1 Click the Drives tab to locate any video clips you'd like to use in the finished movie, then drag and drop them onto the work area on the bottom half of the screen. Click Play to see how this first draft works, then drag the clips around if you need to re-order them. Use Files > Movie Properties to set movie resolution, sound quality and more.



2 Movie Edit Pro works with images and audio clips as well as video, so add stills, an mp3 soundtrack, or whatever you like. Switch to Timeline mode by pressing Tab to get a feel for how these tracks are layered into a single movie, and to rearrange tracks by dragging them backwards and forwards. Press Play again for an occasional movie preview.



3 Finally, get creative with special effects features such as The Story Maker. Press F2 to launch it and tweak the picture (brightness, contrast, colour), apply one of 19 professional transitions, resize or reposition the image, add titles and more. Play around until you're satisfied, then click Files > Export Movie > As Windows media movie to save the results.

UPGRADE OFFER

NEW FEATURES

- Automatic scene recognition
- Clean and stabilise video clips
- More transitions, borders, styles
- Export in avi, mpeg, mov formats
- CD/DVD menu editor
- Burn CDs and DVDs

MAGIX MOVIE EDIT PRO 10

Move to this version of Movie Edit Pro and you'll get automatic scene recognition, where the program splits large clips into smaller individual scenes.

Clean them up with the motion stabiliser, compensating for unsteady camera work, then try out all the new effects and transitions you have available.

Finally, export the finished movie in a range of file formats, or burn it to CD or DVD with a custom menu.

Click Upgrade on the splash screen to order, for a mere £33.99.

Pdfcrypter Standard



Adobe's Portable Document Format (pdf) is the first choice when you want to share information with a wide audience, but if your pdf is sensitive, you might want to add some security. Pdfcrypter Standard is the easiest way to protect your file.

You can password-protect the files using the various Acrobat standards, for instance: AES or RC4 encryption with 40 or 128bit key lengths. It's also possible to apply documentation restrictions, perhaps preventing readers printing your pdf file, copying parts to the clipboard, changing your content, or adding content of their own.

It doesn't take long to work your way through the program wizard, applying these settings

INFORMATION

System requirements Windows 98SE or later, 20MB disk space, Outlook 2000 or later (for Outlook integration)

Contact www.pixelplanet.com

Registration Get your licence key from <http://10years.pixelplanet.com/vnu>

Save common encryption settings in customised profiles for speedy application later

manually, but there is a quicker way. Launch the program, select 'New Profile', and define all the settings in one go. It's a good idea to do this first, as the default profiles are in the original German. Right-click the pdf file you'd like to encrypt, on the desktop or in Explorer, click 'Pdcrypter export', and the files will be secured for you.

Sending encrypted pdf files via email is simple with an Outlook add-in (2000 or later). Pdfcrypter adds its own tab to the Options dialogue, letting you choose the default encryption profile, the level of encryption to use, and so on. And the New Mail Message dialogue features an 'Encrypt pdf' button, automatically encrypting pdf attachments.

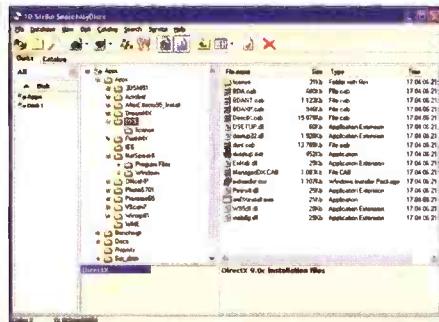
UPGRADE OFFER

PDFCRYPTER PROFESSIONAL

Upgrade to the Professional version of Pdfcrypter and you'll gain strong certificate-based security, including high-level symmetric AES and RC4 encryption (40 to 128bit), and asymmetric encryption with certification. You'll also be able to encrypt several pdf files simultaneously, run the program via command-line parameters, or monitor specified folders and automatically encrypt any new files.

Both single and multi-user licences are available. Head to www.pixelplanet.com for pricing information.

Searchmydiscs



CDs and DVDs make it easy to back up important files, but finding the discs later isn't always so straightforward. Searchmydiscs is designed to solve this problem.

The program starts by building a catalogue of your entire disc collection. That's a little tedious, but you only have to do it once, and at its simplest the process is entirely automatic. Searchmydiscs then scans through each CD and DVD, recording the file and folder structure in its database. You may then use the program's Search feature to find any particular file name later, and Searchmydiscs will tell you exactly where it's located.

INFORMATION

System requirements Windows 98 or later, 3MB disk space

Contact www.bluesquad.co.uk

Registration Get your serial number from www.bluesquad.co.uk/vnu/searchmydisks/register

Searchmydiscs builds a catalogue of your backup CDs and DVDs, making it easy to locate any file

Of course you generally won't remember the exact name of a file, and so Searchmydiscs also lets you organise your data in a catalogue. Just drag and drop your files and folders into one of the built-in groups (Games > Strategy > Space, Programs > Multimedia > Graphics > Editors or whatever), or add whatever others you need to keep things organised.

If that isn't enough, you can always tag individual files and folders with multiple plain text descriptions. The Search function then lets you find files based on keywords contained in their description. Searchmydiscs is an extremely useful way to categorise and locate all your most important files.

UPGRADE OFFER

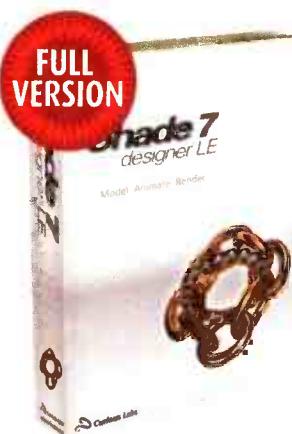
SAVE 25% ON SEARCHMYDISCS

2.5

The very latest Searchmydiscs automatically saves descriptions for Word and HTML files, as well as extracting thumbnails from jpeg, psd and other graphics file formats.

New optimisations to the database and right across the scanning process ensure your disc archive is built faster than ever.

While most people pay £19.95 for a copy of Searchmydiscs 2.5, you can upgrade for only £14.95: just buy a copy as normal at www.bluesquad.co.uk, entering the promotional code **SEARCHDISKS** to qualify for your special discount.



INFORMATION

System requirements 800MHz Pentium III or above, 256MB Ram, Windows 2000/XP, 250MB disk space

Contact www.e-frontier.com

Registration To obtain your serial code, head to www.contentparadise.com/us/user/product_17830

Shade 7 Designer LE

Produce breathtaking 3D images and movies

Getting started with 3D graphics normally requires lots of patience, a Pixar-sized budget and an understanding of vector maths, but it doesn't have to. Shade Designer LE is packed with design, modelling, rendering and animation features, yet is accessible to most people. It has over 200,000 users worldwide, and you should consider trying it out for yourself.

Take the initial drawing side, for instance. Where the competition drowns you in toolbars, Shade opens with a single floating palette. And this uses a menu approach, so adding basic shapes is as simple as clicking Create > Sphere: there are no cryptic icons to decipher.

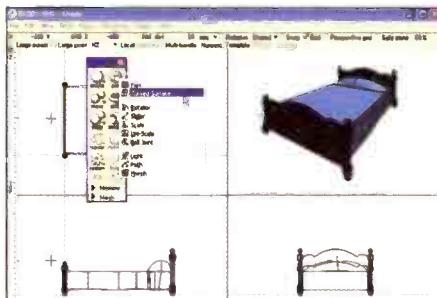
Building more complex shapes is easy, too, with support for Bézier modelling. Create a 2D line shape using as many control points as you

need, then use simple commands to convert them into curved surfaces or complete 3D objects. The program can also handle Boolean modelling and polygon meshes for adding fine detail.

Your models don't have to be static, either. Joints can be used to simulate realistic 3D character movements, while automatic key frame creation with interpolation will animate your models with the minimum of effort.

Of course true realism requires each model to look the part, which is why the program comes with a powerful rendering engine. The support for ray tracing, path tracing, radiosity and more makes it easy to generate photorealistic models. And if you want to share the results with others, then export them in jpeg, tga, tiff, bmp, eps and dxf for stills, avi or Quicktime mov for animations.

Three reasons you need to try this product



1 There's no struggling to get started with this package. Click File > Import > Shapes, browse to the Shade Sample Files\Shapes folder, and you'll find prebuilt objects from faces to furniture, dragons to diamonds, all ready to use. And a straightforward control system means it's easy to tweak them to suit your needs.



2 Once you've added extra detail with advanced features such as Boolean modelling, the rendering engine (see Rendering > Rendering Settings) will transform your model into a photorealistic image. You can produce images up to 1,600 x 1,200 pixels in size, although such a high-resolution picture will take a while to render.



3 If you're really ambitious, why not animate your model to produce a mini movie? Joint and motion settings, along with advanced animation features such as inverse kinematics, combine to impress. And you can export the results as avi or Quicktime movies, or a sequence of still images (pict, bmp, tga, tiff).

UPGRADE OFFER

NEW FEATURES

- More content and 3D objects
- Create Quicktime VR panoramas
- Make movies with 3D sound
- Render 4,000 x 4,000 images
- Export in VRML, Shockwave and more
- Stereo rendering for 3D output

SHADE 8.5

Shade 8.5 comes with more prebuilt 3D objects, including a 'Cars and transportation' pack incorporating over 690 models (cars, bikes, trucks and more). There are enhanced animation features, and you can export your models as Quicktime VR panoramas, VRML or Shockwave models, movies with 3D sound, or in stereo printouts for 3D viewing.

Readers can upgrade and save over \$100 on the retail price. For instance, purchase Shade 8.5 Standard for \$89.99 (about £50), more than 50 per cent off the list price of \$199.90. Or purchase Shade 8 Professional for \$699.99 (about £386), \$200 off the list price of \$899.99. All prices exclude local VAT and all offers expire on 31 August 2006. To upgrade, head to www.e-frontier.com/go/vnu/shade.

ON OUR
COVER
DVD

Serif Webplus 7

Build stylish websites with this speedy development tool

Creating a simple website doesn't have to involve mastering a complex development environment or ploughing your way through a huge manual. Webplus 7 takes a different approach, closer to Serif's desktop publishing packages, which ensures you'll get an attractive site online with the minimum of effort.

Choose the Web Wizard option from the splash screen, and you'll be presented with a range of templates for business and personal sites. Pick one and customise it with details such as your name, email address, titles for various pages, then choose a colour scheme.

When you're finished, Webplus automatically generates the site, which will include several common pages ('About', 'Photo Gallery' and 'Links' for a personal site, say). If you don't need

anything else, then completing the site is simply a matter of replacing the default text and images with your own.

If you'd like to get more creative, Webplus has plenty of tools to help. There's Logoplus for designing fancy headings and text effects. You get libraries of graphical logos, flashes and backgrounds. And you can apply different colours, a range of gradient fills or transparencies just by one or two mouse clicks.

Webplus is all about the visuals, so it's no surprise there's a lack of web-development tools. It's mainly aimed at creating simple static HTML sites. If you have more advanced needs, then click Insert > Web Object for some assistance: here you can add Java applets, or custom HTML code and Javascript for added interactivity.

INFORMATION

System requirements Windows 98 or later, 70MB disk space

Contact www.serif.co.uk

Registration Follow the instructions presented within the application

Design your own attractive website in three simple steps



1 Launch the program, click 'Use a Web Wizard', and choose the type of site you'd like to create: business or personal. Then browse down the list of templates, looking for a design you like. When you've located the best one, select it, click Finish, and complete wizard details such as your name, email address, page titles and colour schemes.



2 Click the tick box to the right of the wizard to finish it, and Webplus will generate the various site pages. Use the forward and back buttons at the bottom of the screen to browse through these, replacing the default text with your own words. Do the same with each image: right-click, select 'Replace picture', and point the program to your own files.



3 Customise the pages further by adding touches such as a colourful logo. Click the Gallery tab, select Text Effects, then drag the best logo onto the page. Double-click the logo to edit it with your own text, choice of colours, and so on. Finally, click File > Publish Site > to Web, fill in the FTP details of your site, and Webplus will upload the pages for you.

UPGRADE OFFER

NEW FEATURES

- Import existing HTML pages
- Customise sites with themed styles
- Automatic navigation bars/menus
- Comprehensive site management
- Preview site in any browser
- Improved HTML standards support

SAVE 50% ON WEBPLUS 9

Upgrade to Webplus 9 and you'll be able to create sites by importing existing web pages, then customise them with new Themed styles. This includes co-ordinated colours, buttons, navigation controls and bullets, and can be customised to suit your requirements. The new navigation bar automatically incorporates your site structure, while a site manager simplifies your use of text, fonts and images.

To get all this for £29.95 instead of £59.99, call 0800 376 7070 (or +44 (0)115 914 5454) quoting code RO/PCW/WP7/0506. Offer expires 17 June 2006.

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System requirements: Available USB 1.1 or 2.0 port. Windows 98SE/ME/2000/XP.

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COMPETITION

WIN! A quiet, stylish Shuttle PC and monitor

In computer terms, bigger is not always better. Shuttle has made its name from pioneering small form factor PCs and we are pleased to be able to offer its quietest system yet: the XPC G5 1100H.

The stylish machine combines the three most important elements when it comes to computers: style, performance and silence. It will look great on your desk with its brushed-aluminium exterior, rounded corners and intuitive front panel, and it makes a smart choice for those with limited space, as well as the design-conscious.

Despite its compact size – 20 x 18.5 x 31cm (w x h x d) – the G5 1100H does not compromise on performance. It is packed with a range of powerful features and an external power supply makes it silent. Hidden behind flipdown panels on the front are a 16-speed DVD burner, a multiformat media-card reader, two USB2 ports, a four-pin Firewire port and headphone and microphone jacks. The back panel has two more USB2 ports; a 6pin Firewire port and VGA, DVI and S-video connections. There's also a Gigabit Ethernet jack, an 802.11b/g wireless-Lan antenna and 7.1 audio outputs.

The G5 1100H uses a 1.73GHz mobile Pentium M 740 processor, making it a great performing machine. There is 512MB of system memory and a powerful GMA900 integrated graphics card. The 200GB hard disk gives plenty of room for software and files, while a DVD writer takes care of burning movies and backing up important files and it can write to high-capacity dual-layer discs too.

Shuttle is giving one reader the chance to win the sleek G5 1100H. Also included in the prize is the XP17 monitor (see review at www.pcw.co.uk/2044946), which delivers crystal-clear images from any angle.

Designed to match the design and performance aesthetics of the XPC, the 17in TFT display offers excellent flexibility. Take it on the road, hang it on the wall or turn it to portrait mode – it works equally well for the perfect gaming experience as for enjoying the latest movies.

For more information Shuttle and its products, visit www.shuttle.com or, for your chance to win this G5 1100H PC, just answer the question on the competitions page of the PCW website (www.pcw.co.uk/competitions) or by filling out the adjacent coupon.

PCW Shuttle competition

How to enter

For your chance to win the prizes from Shuttle tick the box next to the correct answer to the question below, fill in the coupon and send it to Shuttle competition, PCW, PO Box 10218 Sutton Coldfield, B76 1ZB by the closing date. Or go to www.pcw.co.uk/competitions and follow the instructions. The competition opens on 18 May and closes on 23 June.

How many USB2 ports does the G5 1100 have in total?

- a) 2
- b) 4
- c) 6

Name: _____

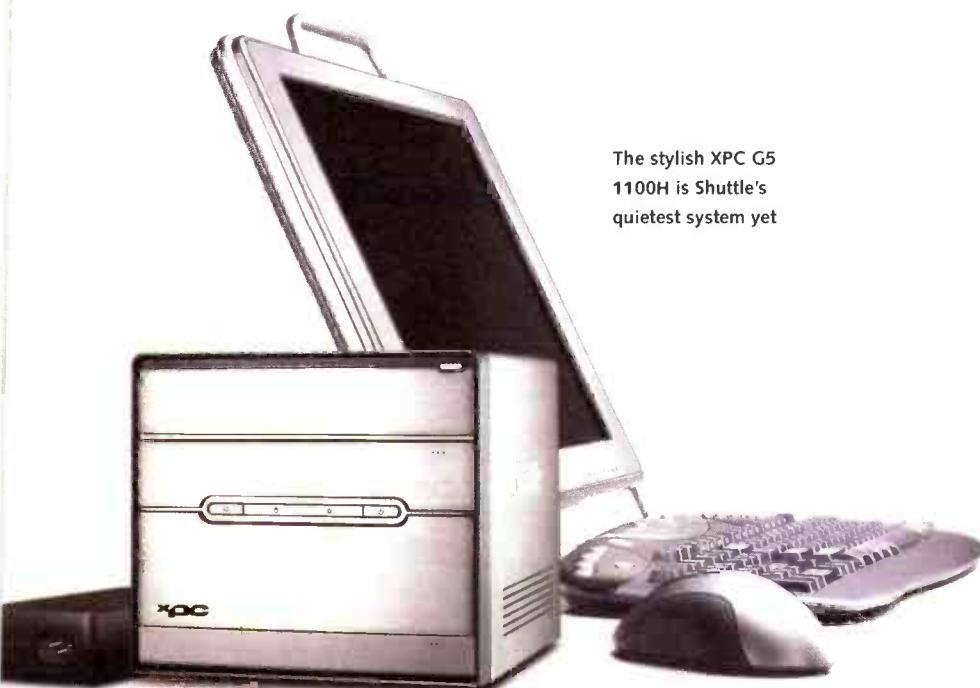
Address: _____

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Daytime phone no: _____

Email: _____

This competition is open to readers of PCW, except for employees (and their families) of VNU Business Publications and Shuttle. 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 will use the details provided to contact you regarding this competition. Tick box to receive information about products and services from the VNU Group by email. Tick box to receive information about products and services from selected companies by email. Tick box if you do not want to receive information about products and services from the VNU Group by post/telephone. Tick box if you do not want to receive information about products and services from selected companies by post/telephone.



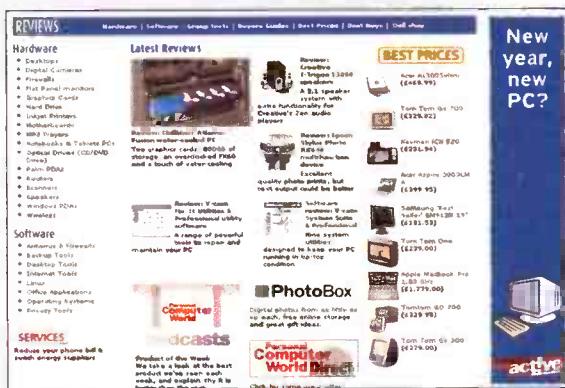
The stylish XPC G5 1100H is Shuttle's quietest system yet

The winners of the May competition, who each win a copy of Symantec Norton Internet Security, are Hannah Allan, James Bow, RD Christon, Melvin Elmy, Peter Griffin, Colin Groombridge, Eric Hart, Terry Heathcote, Sidney Hollands, P James, Christina Jebb, Caroline Lashley, Cath Parmar, Brendan Ryan, M Soder, T Spencer, Mary Syddall, Shaun Vaughan, Michael Wiltshire and Robert Wong

On the web

www.pcw.co.uk

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The Test Bed

Our labs blog, the Test Bed, gives you regular updates on the latest gossip, technology trends and products. We also have a performance area, where test results can be compared so you can see how well rival products fare against each other. Our database of products makes it the most comprehensive tool you will find and the perfect complement to our Buyer's Guides and reviews.

→ <http://labs.pcw.co.uk> → <http://www.reportlabs.com/testbed>

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You may recognise some entries in this blog from our Letters pages, but they are published here first, letting you add your views and comments.

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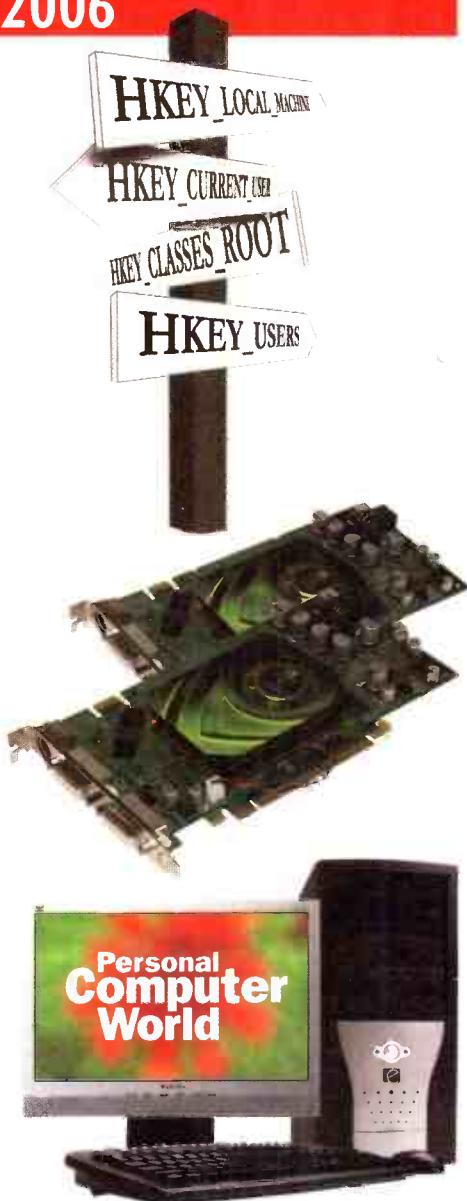
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Guide to the Windows Registry

Experts have long known that the Windows Registry is the ultimate Windows tuning tool. In this practical guide, we'll demystify the Registry and show you how to use it to improve your PC's performance, security and usability.

Dual-graphics power

ATI has Crossfire and Nvidia has SLI – but which is the best dual-graphics technology, how do you set them up, and what are the differences? We'll explain it all in this special group test, and show you just how much better two graphics cards are than one.



£899 dual-core PCs

Continuing the double-everything theme, we've rounded up a batch of great low-cost dual-core PCs for you to choose from. Why buy a single-core PC when you can get twice the power for this price?

Colour management explained

You take your digital pictures, you edit them, then print them out only to find that your family look like aliens. Managing colour on a PC is a highly complex subject, but we'll explain why it's so difficult and what to do to get the best results out of your system.



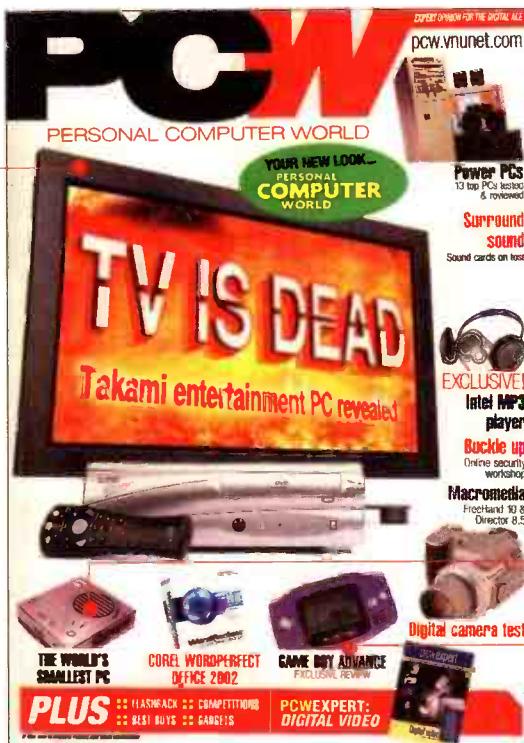
There's lots more in August's PCW
DON'T MISS IT...

JULY 2001

To put the current convergence fad in perspective, in July 2001 we proclaimed 'TV is dead', referring to our review of the first 'entertainment PCs'. Tiny's Takami Plasma was a PC in different clothing which the company was keen to present as 'just another piece of consumer electronics'.

We liked its smooth curves and aluminium casing, but were not too impressed by the choice of Windows as the operating system as it proved 'way too clunky' to use on a device such as the Takami.

We were impressed by the amount that Tiny had managed to stuff inside the PC case, considering the small mini-ATX form factor.



From the archives: Take a look at the important events in technology five, 15 and 25 years ago.

We also had a look at the pint-sized MicroPC from Jadetec. Billed as 'the smallest PC in the world', it measured only 157 x 146 x 45mm. It weighed in at under a kilo, making it very portable and perfect for people who work on the move. It was available as an 866MHz Pentium III or an 800MHz Celeron, which was £60 cheaper than the £938 Pentium version. We liked the MicroPC, but its limited expansion capabilities brought the total score down a bit.

Nintendo let us have a play with its new Game Boy Advance handheld console before anyone else. It was only available on Japanese import at the time but it still sold well. Its stylish exterior was nothing compared to the technical specs. At the centre of the GBA was a 32bit Risc CPU running at 16MHz. Along with the 32KB of on-chip memory, 96KB of VRam and a further 256KB of WRam, it was very powerful indeed. We also liked the screen and the compatibility with old games.

JULY 1981

The cover illustration pretty much says it all; the story was about accident research and how Tom Ravensdale used his Tandy TRS-80 and a pocket calculator to investigate road accidents. After collecting a range of vehicle and accident data, he was able to run routines to work out key factors, such as the safe negotiating speed for a given bend, the collision speed, and the influence of aquaplaning. Armed with his system, Tom had the potential to make a fortune by applying the same principles to shipping and airplanes, but he continued with his vital work on road safety.

Contrasting the practical use of computers with their employment in leisure, Shogi is a Japanese game that chess lovers find intriguing. David Levy considered the implications of designing a Shogi-playing program, highlighting that the 40 pieces, the 9 x 9 board and the possibility of re-using pieces captured from your opponent made programming tricky. To get round this, Shogi heuristics or 'proverbs' could be used to reduce the list of legal moves to a manageable size.

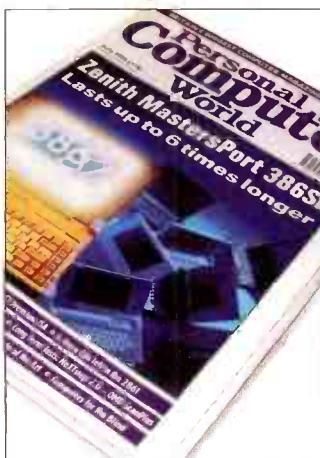


JULY 1991

The Zenith Mastersport 386SL graced our cover 15 years ago, with the promise of a battery life six times longer than the average notebook. Main selling points were the standby and sleep modes, but Simon Rockman didn't expect it to be much more efficient than a 386SX.

MS-Dos 5 made its way into the pages of PCW with Robert Schifreen examining Microsoft's claim that it was the biggest overhaul of the operating system since it was first introduced, he felt it was the MS-Dos that users had been waiting for.

In an article entitled 'Freedom in sight', Joseph Lazzaro, co-founder of Talking Computer Systems, examined hardware and software that could be used to make computers accessible to the blind and visually impaired. With Speech Synthesis and Screen Reader, a blind user would have a computer with an interactive keyboard and monitor. Braille'n'Speak was also featured, which could be used to take notes with a Braille keyboard, and allow users to access email and the Internet via a modem. The product is still going strong today.



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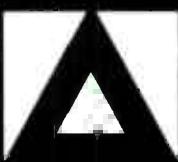
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