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OCTOBER 2006

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Dell recommends Windows® XP Professional.

When buying a PC, it's important to do your homework. Dell only sells direct; it doesn't have expensive store overheads or inventory so can offer high quality computers for fantastic prices. Your PC is built to order so you can get exactly what you want and only pay for what you need, plus its delivered direct to your door. And Dell's great value is never at the expense of quality. We have nearly 3,000 engineers employed to develop and test our PCs. It all adds up to why we're the world's number one PC manufacturer⁶.

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- **NOW WITH: Intel® Pentium® 4 Processor 531** (3GHz, 1MB Cache, 800MHz FSB)
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E-VALUE Code: PPUK-D08311

Further enhancements¹

- 3 Year Basic Services Package **£99** Incl. VAT
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Dell Inspiron™ 1300

- **Intel® Centrino® Mobile Technology** with Intel® Pentium® M Processor 735 (1.70GHz, 2MB L2 Cache, 400MHz FSB)
- **Genuine Windows® XP Home Edition**
- 1024MB DDR2 SDRAM (Was 512MB)
- 60GB Hard Drive (5,400RPM)
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- Intel® PRO/Wireless 2200 802.11b/g MiniPCI wireless LAN
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- Integrated 8x DVD+/- RW Drive²
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- 90 Day Collect and Return Service⁴

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MEMORY**

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Further enhancements¹

- 3 Year Basic Services Package **£94** Incl. VAT
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- Dicotac Backpack **£46** Incl. VAT

Accessories¹

924 All-In-One Photo Printer

Enjoy colour printing, scanning and photocopying. Produce professional looking documents with rich colour printing - up to 16 A4 pages per minute (ppm) and 20 ppm in black.

£59 **£69**
£50 **£59**
Excl. VAT. Incl. VAT.

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964 All-In-One Photo Printer

Enjoy colour printing, scanning, faxing, photocopying and photo features with Dell's performance powerhouse. It delivers fast performance with up to 24 A4 pages per minute (ppm) in black and 19 A4 ppm in colour.

£110 **£129**
Excl. VAT. Incl. VAT.

2 Year Exchange Support £45 Incl. VAT



944 All-In-One Photo Printer

Enjoy colour printing, scanning, photocopying and PC-based faxing plus advanced photo features with the Dell Photo All-In-One Printer 944. With up to 20 A4 pages per minute (ppm) in black and 16 A4 ppm in colour.

£93 **£109**
£80 **£93**
Excl. VAT. Incl. VAT.

2 Year Exchange Support £22 Incl. VAT

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5210N Mono Laser Printer

The Dell Workgroup Laser 5210N is Dell's latest-generation networked monochrome laser printer, providing workgroup versatility and superior performance for a wide variety of documents and users. Prints up to 38ppm.

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E196FP Monitor

The Dell E196FP 19-inch Flat Panel LCD Monitor redefines the performance of LCD displays with a stylish new design and advanced functionality. This monitor offers resolution of up to 1280x1024.

£169 **£199**
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Excl. VAT. Incl. VAT.

20% Off



Dell 1200MP Projector

The new Dell 1200MP Projector delivers the performance and ease of use you've come to expect from Dell. Our new projector delivers 2100:1 contrast ratio and a stunning 2000 lumens⁵ for performance that will wow any audience - at a price that won't require a new line of credit.

£469 **£522**
Excl. VAT. Incl. VAT.

2 Year Exchange Support £66 Incl. VAT



Multiple choice from Dell



Dell™ Dimension™ 3100C

- **NOW WITH: Intel® Pentium® 4 Processor 531** (3GHz, 1MB Cache, 800MHz FSB)
- **Genuine Windows® XP Home Edition**
- 256MB DDR2 RAM
- 80GB Serial ATA Hard Drive (7,200 RPM)
- Integrated Intel® Graphics Media Accelerator 900
- 48x CD-RW/DVD Combo Drive
- 90 Day Collect and Return Service⁵

£179 **£270**
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**INCLUDES
PROCESSOR
UPGRADE**

E-VALUE Code: PPUK-D083C1

Further enhancements¹

- 3 Year Basic Services Package **£94** Incl. VAT
- Microsoft® Office Basic Edition 2003 **£106** Incl. VAT
- 17" Flat Panel Monitor (17.0" v.s.) **£165** Incl. VAT

Dell Dimension 5150

- **NOW WITH: Intel® Pentium® D Processor 915** (2.80GHz, 2x 2MB Cache, 800MHz FSB)
- **Genuine Windows® XP Professional**
- 512MB DDR2 RAM
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**INCLUDES
PROCESSOR
UPGRADE**

E-VALUE Code: PPUK-D08512

Further enhancements¹

- 3 Year Basic Services Package **£141** Incl. VAT
- Microsoft® Office Small Business Edition 2003 **£212** Incl. VAT
- 5.1 5650 Speakers with Subwoofer **£71** Incl. VAT

Dell Dimension 9150

- **NOW WITH: Intel® Pentium® D Processor 945** (3.40GHz, 2x 2MB Cache, 800MHz FSB)
- **Genuine Windows® XP Professional**
- 1024MB DDR2 RAM
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- 256MB PCI-Express® nVidia® GeForce™ 7900 GS
- 16x DVD+/-RW Drive²
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E-VALUE Code: PPUK-D08912

Further enhancements¹

- 3 Year Basic Services Package **£153** Incl. VAT
- Microsoft® Office Basic Edition 2003 **£106** Incl. VAT
- Kensington® Slim Microsaver Lock **£25** Incl. VAT

2407WFP UltraSharp™ Widescreen Monitor³

The Dell UltraSharp™ 2407WFP 24-inch Widescreen Flat Panel LCD Monitor is a wide aspect desktop display that redefines the performance of LCD displays with a stylish Dell design and advanced functionality. With the UltraSharp™ 2407WFP monitor, you can watch DVDs in natural format, run multiple applications simultaneously and improve productivity with less scrolling and toggling.

£699 **£821**
£525 **£616**
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Off**



Dell Axim™ X51v 624¹

The Dell Axim™ X51 is the ultimate handheld device that delivers performance, connectivity and a brilliant VGA display at an affordable price. Powered by the Intel® XScale® PXA270 Processor at 624MHz, Microsoft® Windows Mobile® 5.0 software with Windows® Media Player 10 Mobile.

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£220 **£259**
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Off**



2 Year Exchange Support **£44** Incl. VAT

Dell Multifunction Laser Printer 1815dn¹

This fast, durable printer offers easy-to-manage printing, scanning, copying and faxing in one device. Ideal for a small workgroup or single user. Offering low toner cost per page and networking as standard without sacrificing performance and value.

£275 **£323**
£234 **£275**
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2 Year Onsite Support **£62** Incl. VAT



Dell 37" LCD TV¹

This Dell 37" HD Ready LCD TV boasts fantastic sound and picture quality to give a great viewing experience. Watch your favourite programmes, the latest film or surf the net, all on a stylish LCD TV from Dell. Featuring built in Digital TV (Freeview) and 16 x Audio, Video and PC inputs.

£1106 **£1299**
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Dell 3400MP Projector¹

Small enough to fit in your hand and weighing only 1.09Kg, the 3400MP features 1500 lumens⁴ brightness, 2100:1 contrast ratio and native XGA resolution.

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£679 **£798**
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2 Year Exchange Support **£199** Incl. VAT



**15%
Off**

Dell 2400MP Projector¹

The Dell 2400MP is the newest member of the Dell Projector family with amazing features such as 3000 ANSI lumens⁴, 2100:1 contrast ratio and weighing just 2.5 kg.

£999 **£1174**
Excl. VAT. Incl. VAT.

2 Year Exchange Support **£103** Incl. VAT



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Dell recommends Windows® XP Professional.



Dell Inspiron™ 6400

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- **Genuine Windows® XP Home Edition**
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E-VALUE Code: PPUK-N08641

Further enhancements¹

- 3 Year Basic Services Package **£176** Incl. VAT
- Microsoft® Office Small Business Edition 2003 **£212** Incl. VAT
- Targus® Style and Comfort Backpack **£34** Incl. VAT

Dell UltraSharp™ 1907FP¹

The Dell® UltraSharp™ 1907FP 19-inch Flat Panel LCD Monitor redefines the performance of LCD displays with a stylish new design and advanced functionality. The monitor offers resolution of up to 1280x1024 pixels and also provides 8 ms (black-to-white) response time to enable crisp clear images when using the display for fast motion video.



£229 **£269**
£183 **£215**
Excl. VAT Incl. VAT

**20%
OFF**

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Make your documents look their best with the stylish Dell Laser Printer 1110. Crisp, sharp documents from a fast, small and lightweight monochrome laser printer: a great choice for all laser quality print requirements in your home or small office, and at a great price too! With print speeds up to 16 A4 pages per minute (ppm) and a print output quality of 600x600 dots per inch (dpi).



£69 **£81**
£59 **£69**
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Dell XPS M1210

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E-VALUE Code: PPUK5-N08X21

Further Enhancements¹

- 3 Year Next Business Day On-Site Service **£188** Incl. VAT
- Dell XPS Gen 2 Nylon Backpack **£60** Incl. VAT
- Kensington® Pocket Mouse PRO/Wireless **£22** Incl. VAT

Dell XPS 1710

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- 80GB SATA Hard Drive (5,400 RPM)
- 17" UltraSharp™ WUXGA display with TrueLife™
- 256MB PCI Express® nVidia® GeForce™ 7900GS
- Integrated 24x CDRW/8x DVD Combo Drive
- 56K Modem and Ethernet Port with Tiscali UNLIMITED Broadband for £14.99/month + First month FREE*
- 1 Year Euro Collect and Return Service*
- Intel® PRO/WLAN 3945 802.11a/b/g 54Mbps

£999 **£1234**
Excl. VAT & Shipping Incl. VAT & Shipping

E-VALUE Code: PPUK5-N08XPS1

Further Enhancements¹

- 3 Year Next Business Day On-Site Service **£188** Incl. VAT
- Dell XPS Gen 2 Nylon Backpack **£60** Incl. VAT
- Kensington® Pocket Mouse PRO/Wireless **£25** Incl. VAT

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- Optional CERC SATA RAID Controller
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E-VALUE Code: PPUK4-PE081801

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Dell Workgroup Laser Printer 5310n

The Dell Workgroup Laser 5310n is Dell's fastest networked monochrome laser printer, providing workgroup versatility and superior performance for a wide variety of documents and users. Designed specifically for the printing needs of large workgroups, the 5310n combines fast, crisp output quality with a low total cost of printing. Up to 38 pages per minute.

£599

£510

Excl. VAT.

£705

£599

Incl. VAT.



Dell Colour Laser Printer 3110cn

Designed for departmental or workgroup use, with networking as standard, the Dell Colour Laser 3110cn is a mid-range colour laser printer. The 3110cn prints crisp high-speed output in colour or monochrome for impressive, easy-to-read business documents. High-performance – print speed up to 17 A4 pages per minute (ppm) in colour, 30ppm in monochrome.

£319

Excl. VAT.

£375

Incl. VAT.



Dell Colour Laser Printer 5110cn

Fast, high-quality colour laser printer, ideal for departmental or medium to large workgroup use. With networking and duplex (print both sides) as standard, the Dell Colour Laser Printer 5110cn offers high-speed A4 printing (up to 35 pages per minute (ppm) in colour, 40 ppm in monochrome) with very competitive purchase and running costs.

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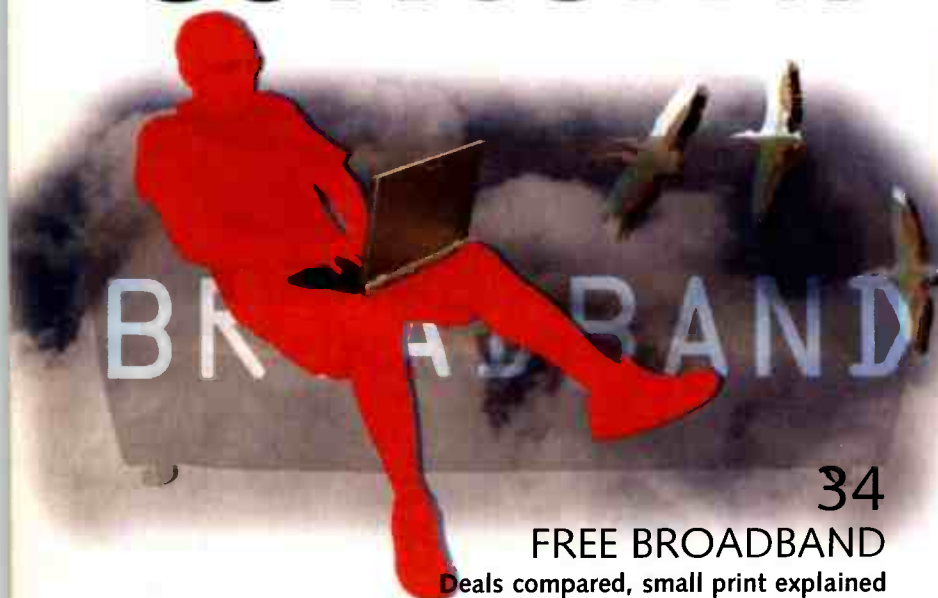
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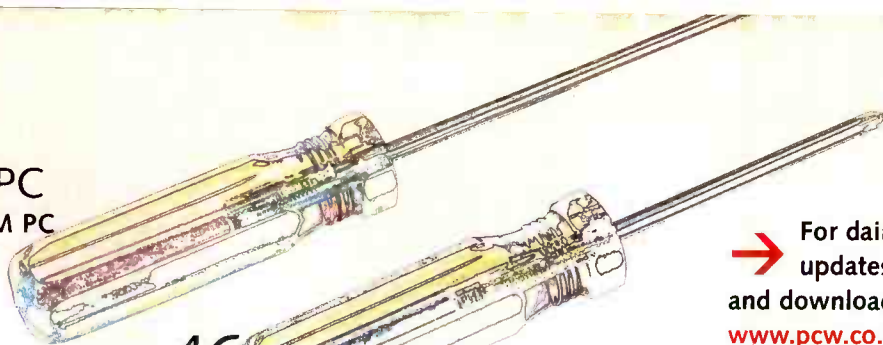
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Exceptional Graphics Performance



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Instant Fun PLUS Direct Multimedia Access

>F3F-AP010H

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- Mobile Intel® 945GM Express Chipset
- Intel® PRO/Wireless 3945ABG Network Connection
Microsoft® Windows® XP Home
LCD TFT 15.4" WXGA, Colour-Shine, ASUS Splendid Video Intelligence Technology
NVIDIA GeForce Go 7300 DDRII 256MB with TurboCache
SATA HDD 80GB(5400rpm)
RAM 1024MB(512x2) DDRII SDRAM
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ASUS Bag & ASUS Mouse

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Editorial

When the IBM PC meets MTV anything is likely to happen

As we celebrate the 25th birthdays of MTV and the IBM PC, Kelvyn Taylor looks at what they have spawned

Where on earth is the internet heading? The fastest growing website on the planet is Youtube (www.youtube.com), which lets anyone upload home-grown video clips to share with the world. In one week in July, around 12.8 million visitors went there, mostly to watch Zinedine Zidane's infamous head-butt in the World Cup final, and in the same month the total page views were around 724 million, according to the internet metrics company Nielsen/Net Ratings. Alexa, the website rating service, ranks it the sixteenth most visited site on the web.

Youtube's most recent claim to fame was when one of its users, an American girl called Brooke 'Brookers' Brodack was signed up for an 18-month development deal by a US production company on the basis of a series of videos she'd been uploading. Ironically, the one that got the most attention wasn't an original idea, but a Karaoke homage to a parody of an animated tribute to an obscure but catchy Romanian pop song that's been doing the rounds on the web for at least three years (you can see the first version at <http://tinyurl.com/4a3xx>, and Brodack's at www.youtube.com/watch?v=N6j475Xl1Xg).

One of Youtube's many clones (over 200 at the last count) is Revver (www.revver.com). It hit the headlines when an

experimental drama group's video showing them creating fountains using Diet Coke and peppermint sweets, raked in an alleged \$30,000 in cash-for-clicks advertising that Revver inserts at the end of all its videos.

'This makes Youtube simply a free lunchtime video jukebox with added juicy bits'

So who's watching these videos and why? According to Alexa and Nielsen figures, most visitors are male and between 12 and 17 years old, who watch around 10 videos each. Most videos are two to three minutes long, which in my mind makes Youtube simply a free lunchtime video jukebox with added juicy bits.

The content is incredibly varied, from blurry webcam monologues, through badly captured TV clips, to semi-professional films. But a sizeable chunk seems to be just young hopefuls lip-synching to pop songs with the misguided dream of finding fame and fortune in the wake of Brookers' lucky break. It's entertaining spending an hour or two browsing, but the novelty soon wears off and you realise why good film makers are paid so much money. Maybe I'm just becoming a grumpy old killjoy.

These may all make interesting news stories, but none of these sites have yet found a way of making big money out of the incredible amount of traffic they generate. Youtube isn't making a profit, if statements from its founder are to be believed. These sites can't find a revenue model. The big advertisers are wary of stumping up money to have their products showcased next to (or, in Revver's case, within) some dodgy home video that might contain copyrighted or tasteless material. Users won't pay to view or upload content. The only ads at the moment on Youtube are Google AdSense listings – Google has a competing free video site, so it's not hard to see who's got the best deal.

So from a young, bored-with-TV-and-video-games user's point of view, perhaps it's rich free pickings at the moment. But what about the rest of us? Is this just a fad? Unfortunately I don't think so. Every man and his codec is trying to blast as much TV and video across our broadband connections as they can, and some people are starting to worry that the internet's infrastructure can't take the strain. They may or may not be right, but one thing's for sure: when MTV launched 25 years ago and the IBM PC a few days later, no-one had the faintest inkling of what would happen when their paths converged. **PCW**

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see page 176

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NEWS

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PC meets MTV 25 years on

PCW celebrates the 25th birthday of the PC this month, as Intel launches a new generation of desktop processors (opposite page) and the Wintel platform takes its first tentative steps as a true mobile.

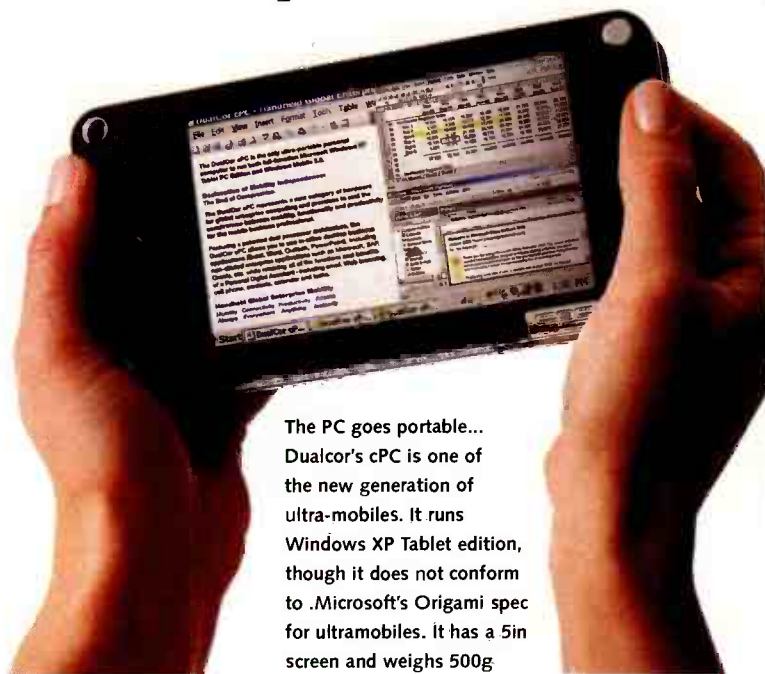
The IBM PC, launched on 12 August 1981, was not the first personal computer. Desktop models called 'micros' (as in Microsoft) had been available for five years, thanks to the invention of the integrated chip, which could pack in hundreds, and eventually billions, of transistors.

Intel saw its microprocessors as replacements for expensive mechanical switch arrays and failed to spot what was coming. It was youngsters like Microsoft's Bill Gates and Apple's Steve Wosniak who saw the potential of the new chips as low-cost computers.

Micros became so popular that IBM could not afford to ignore them. The first IBM PC was unremarkable, even dated, as our reprint of the first PCW review (page 58) makes clear. It did not even use the latest Intel processor.

Our reviewer, former PCW editor Dave Tebbut, recalls on page 19 that he had no idea how important the design would be.

With hindsight, it is clear the industry needed a standard platform because applications had to be rewritten or tweaked for each new model. The PC quickly became the first platform of choice for software developers because IBM was then by far the world's most powerful computer company.



The PC goes portable...
Dualcor's cPC is one of the new generation of ultra-mobiles. It runs Windows XP Tablet edition, though it does not conform to Microsoft's Origami spec for ultramobiles. It has a 5in screen and weighs 500g

PC sales soared because so many applications, including free utilities, were available for the machine. But it was the astonishing fact that hard-nosed IBM had created an open architecture that made the PC what it is today. Compaq started making PC clones and soon lots of companies were doing it – often better than IBM.

Apple managed to stay afloat by being first to market with a graphical interface, and making a virtue of its closed architecture. Macs and their peripherals were more expensive, and offered less choice, but buyers could be sure they worked together.

Acorn in Britain tried to push groundbreaking designs such as the Archimedes against the PC tide,

and not entirely in vain: its Risc technology underpins the success of chip designer ARM, a spin-off of the company.

Now IBM's PC business is owned by Chinese company Lenovo, and little remains of that first PC in today's models. Processors still use the same x86 code, with some additions: the old parallel and RS232 serial ports are rapidly becoming redundant, and the Bios kernel code, invented by Gary Kildall (see page 18), is soon to be superseded.

The PC platform hit a plateau five years ago when hardware finally caught up with software, so that even entry-level PCs could run mainstream applications well. A recent emphasis on power efficiency, with processors doing more work on fewer watts, has moved the platform on, allowing the PC to become truly portable.

At the same time, networks and wireless links have matured to the extent that a mobile PC can have the world's online resources, including music and movies, permanently on tap. Curiously, music TV station MTV was launched just days before the IBM PC. A quarter-century later, their worlds have converged. *Clive Akass*

Desperately seeking...

We have had complaints from readers who have been unable to contact PC maker Panrix Computers, of Sheepscar Street, South Leeds. The company does not appear to be trading, though when we went to press it was still listed at Companies House and its website at www.panrix.co.uk was live, albeit not for transactions.

We have had no replies to our calls or emails, and local police tell us that the premises appear to have been cleared of stock. If you have a complaint against the company, you are advised to contact the local trading standards helpline on 08454 040 506.

Conroe ends Pentium era

Intel has unveiled 10 new processors based on its new Core architecture which, as we revealed last month (PCW, September, page 14), has regained the performance lead from AMD.

The new range – Core 2 Duo – marks the end of the Pentium era, both in branding and design. There are five new desktop processors codenamed Conroe, and five mobiles codenamed Merom. All have dual cores.

No prices were available for the five Meroms as we went to press, which were expected to be available in late August. They clock between 1.66GHz and 2.33GHz, with a 667MHz front-side bus (FSB). The fastest three (the T7200, T7400 and T7600) have a 4MB Level 2 (L2) cache; the other two (the T5500 and T5600) have 2MB.

The Conroe chips all have a 1,066MHz FSB. The most expensive is the 2.93GHz T7600 at

£536, a special Extreme Edition for gamers, which scored 7,404 in our PCmark test – the highest yet.

Next in performance come the 2.66GHz E6700 at £284, and the 2.4GHz E6600 at £170. They all have 4MB L2 cache.

The remaining two Conroes, the 2.13GHz E6400 and the 1.86GHz E6300, cost £120 and £98 respectively, and have 2MB of cache. Prices are converted from dollars and are subject to change.

Rock's Xtreme Pro CTX notebook is one of the first in the UK with the Merom mobile processor – the T7200. Prices start at the £1,499. www.rockdirect.com



PCW Labs test results for the new range are at tinyurl.com/fszsk, reviews of a number of machines using them are at tinyurl.com/jr68h, and Marc Delehanty's review of the chips themselves is at tinyurl.com/lxs5n.

Intel rival AMD plans to launch quad core versions of its Opteron server chip early next year, which will be pin-compatible with its dual core. Intel said it will launch quad cores by the end of this year.

AMD bets \$5.4bn on ATI marriage

AMD's \$5.4bn purchase of graphics specialist ATI is a 'risky bet', analysts have warned. The chipmaker, however, says the deal will create a 'processing powerhouse' that will enable it to meet a growing demand for chips with integrated graphics.

A report from analysts Gartner said AMD was banking on using its in-house graphics capabilities to take market share from Intel, and that a notebook processor with integrated graphics planned for 2007 would deliver a longer battery life than the company's current chips.

But Gartner warned that ATI's rival Nvidia could benefit in the short term as AMD integrates its acquisition, and that the deal could antagonise partners such as Sis, Via and Broadcom.

"Intel could take advantage of this situation and put pressure on AMD by helping Nvidia capture a larger share of graphics revenue associated with Intel-based systems," according to the study.

→ www.amd.com

Centrino flaw

The Wifi system on some Centrino notebooks has flaws that could enable hackers to spread rogue code between laptops, Intel says. The company blames Windows drivers for the 2200BG and 2915ABG Pro wireless subsystems. Intel has posted details at tinyurl.com/menf3 and says users should contact their vendor for machine-specific fixes. See Wifi vulnerable, page 20, for more.

US site lists green computers

The US Government has set up a database of electronic products it classifies as environmentally friendly.

Under the Electronics Products Environmental Assessment Tool system, products are rated bronze, silver or gold. Criteria set out in a standard called IEEE 1680 are used to rate the products. Government agencies will only buy electronic products that qualify for a rating.

Bronze-rated products conform to all compulsory criteria, silver satisfies 50 per cent of optional criteria, and gold 75 per cent.

Most products listed on the site www.epeat.com were from Dell and Hewlett-Packard, and a couple were Apple products. However, none were rated gold. See this month's feature 'Our PCs, our planet' on page 38.

In brief

Free broadband

New offers of free or low-cost web access were coming in last month, even as we were finalising our broadband guide (page 34). Lately, Namesco announced a 512K link, capped at 2GB per month, free for 12 months, subject to a £60 sign-up fee. It costs £10.95 after the first year and is targeted at light users.

→ www.names.co.uk

Sibelius sold

London-based Sibelius Software, which sells a suite of score-based music programs, has been bought by US firm Avid for £12.3m. Its software has become a favourite among professional musicians and schools.

→ www.sibelius.com



Flash flood

LG's MFJM53 music player has 8GB of flash memory – the most capacious yet for devices of this kind, and 3GB more than that of iPod's mechanical hard disk. LG showed the MFJM53 at an industry event – see page 16 – although the product is on sale now for £199.

→ www.lge.com

Portable HD

NEC unveiled a way of packing logic and gigabit-class memory into a single module to enable high-speed, high-definition image processing in portable devices. The system-in-a-package can cope with data speeds of 100Gbits/sec.

→ www.pcw.co.uk/2161527

Megapixel war

The camera definition war continues, with both Samsung and Casio announcing models with 10-megapixel sensors.

Samsung is offering the £200 S1000 and £239 NV10, which include shake-reduction technology. It also unveiled three 7-megapixel models – the S700, NV3 and NV7.

Casio has announced its 10-megapixel Exilim Z1000, reviewed at <http://tinyurl.com/o2foc>.

Data finder

Search and Recover 4.0, the latest version of Iolo's disaster-recovery software, is said to locate and retrieve data that has been deleted, damaged or destroyed – even years later. It costs \$39.95 (£23) for a three-PC licence. A free evaluation copy may be downloaded at www.iolo.com/downloads.

Mobile viewer

Glasgow-based Pictel Technologies has launched what looks like an excellent file viewer for Symbian, Windows Mobile and Palm OS 5.4 mobiles. Pictel Proviewer allows you to zoom and scroll your way around rich documents in their native formats. It costs \$14.99 (£8.50). → www.pictelpowered.com

8GB MMC card

Samsung has announced an 8GB Multimedia Card (MMC) storage card, with what it says is the world's highest data density. It has also announced a new line of MMCplus cards that more than triple the performance of regular products. → www.samsung.com

Vista preview

Microsoft's new Vista operating system may not ship until next year, but publisher John Wiley wants you to be prepared for it. It has launched a special £6.99 preview of *Windows Vista for Dummies*, by Alan Rathbone, based on the Beta 2 version of the software. → www.wiley.com

Early Christmas stockings

Christmas starts in midsummer for companies preparing products for the great seasonal spendathon, and they were out in force last month giving the press a preview of their new line-ups.

Robots, a big hit of the past few years, have gone out of fashion, but there was plenty to attract kids, such as Oregon Scientific's £39.99 Barbie B Book fashion laptop, which packs 30 educational games.

An £89.99 Smart Globe from the same company offers geographical information about any point you touch with a special pen.

Sagem was one of several companies offering Bluetooth stereo headsets, which can be used both for telephony and listening to music. It also showed off its £185 (Sim-free) my700x mobile phone, which has an mp3 player, an FM radio and a 1.3-megapixel camera.



Clockwise from top left: Archos music player; LG Electronics monitor with pivot screen; Barbie laptop; and Smart Globe

LG Electronics showed sleek monitors, including the 19in L1932P, which comes with a pivot stand and software that lets you use the display in portrait or landscape.

The £249 monitor has a contrast ratio of 700:1 and a response time of four milliseconds.

Archos showed its portable media players – the 404 (£220) and 604 (£270) – which have 3.5in and 4.3in screens respectively.

Both players come with 30GB of storage.

The same company will also offer the AV700, which it says is the first mobile media player capable of direct recording from TV. It has a 7in screen and comes in 40GB and 100GB versions at £449.99 and £599.99, respectively.

→ www.archos.com
→ www.lge.com
→ www.oregonscientific

Acer Ferrari notebooks slot in VoIP phone

Two Ferrari notebooks, and two low-cost models targeted at students starting college, are among a range of Acer products unveiled last month.

The stylish Ferrari 5000 and 1000 have a similar configuration built around a 2GHz AMD Turion 64 X2 dual-core processor, and are classed as 'Vista Capable', which means they can be upgraded to the next version of Windows when it launches next year.

The 5000, which has a 15.4in screen, costs £1,699 and the 12.1in 1000 costs £1,349. Both come with a built-in camera with auto-track and auto-zoom features that keep you in frame and in focus during video calls.

They also have a rather neat Voice over IP (VoIP) phone that can



Acer's Ferrari 1000 model has a camera and VoIP phone, and is classed as Vista capable

They will be available within the next two or three weeks.

Acer also launched what it describes as 'a PC inside a consumer electronics device'. The Acer Idea looks like a piece of hi-fi equipment but is, in fact, a computer conforming to the Intel Viiv entertainment PC spec and running Windows Media Center. It costs £899, without a monitor.

In addition, Acer announced three projectors, a GPS navigator and an 8-megapixel digital camera, the CP-8660, which manages to include a 6x optical zoom in a case that's only 2.83cm thick.

→ www.acer.co.uk

Instant speech recognition

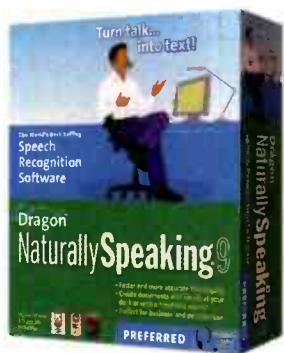
The latest release of market-leading speech-recognition package, Dragon Naturally Speaking, dispenses with the tedious training exercise that previous versions required.

Dragon Naturally Speaking 9 (DNS9) comes in several editions, one of which is bundled with a wireless Plantronics headset so users can walk around as they dictate to their computer.

Developer Nuance claims DNS9 is "99 per cent accurate", which it says is a 20 per cent improvement over the previous version.

But Nuance solutions manager Simon Howard admits this figure is only an "incremental" increase in accuracy as it measures a change in an already low error rate.

This figure represents what can be achieved by experienced users. Judging from earlier releases, though, it is useful even for novices.



Older versions required first-time users to read out a script to train the program to recognise their speech patterns. And in successive releases this script was too small to be read by anyone with poor sight. This was a lingering irritation, especially for the technology's early adopters – the visually impaired.

Howard said DNS9 still needs training. "But the accuracy is good enough for it to be used straight away. It learns as you use it."

DNS9 comes in five editions: £79.99 for Standard; £149.99 for Preferred, which includes support for handheld devices; £199.99 for Preferred Wireless, which supports Bluetooth headphones; and £199.99 for Preferred Mobile. A Professional version, which can be customised for businesses, costs £549 ex Vat.

Nuance has also launched Paperport Professional 11, the latest version of its flagship document-management software, which features a one-button scanning system, Pdf compression and a new search agent making it easy to locate documents.

Among its 50 new features are the ability to scan, search and organise files and photographs on a PC or across a network.

Paperport Professional 11 costs £99; the Home version is £49.

→ www.nuance.com

Free reader to aid blind

A free screen reader is available from Screen Reader, a not-for-profit company run by a blind couple, Margaret and Roger Wilson-Hinds, from their home in Peterborough.

The utility, Thunder, allows blind and partially sighted people to use internet sites, shop online, and have their emails read out to them. It will also read out to them as they type, making it easy for them to create letters and other documents.

Thunder can be downloaded at www.screenreader.net.

Support ends

Microsoft has ended support for Windows 98, 98 SE and ME after delaying the move for three years because of user protests. It advises users to upgrade to XP as they could be vulnerable to online attacks.

DrayTek Broadband Firewall/Routers



Vigor3300V



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Vigor2900

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).



Vigor3100 SDSL



Vigor2800 Series

DrayTek VoIP-equipped routers let you use your broadband line to make and receive voice calls. Calls to any other VoIP-equipped users are completely free and you can make calls to regular phones via DrayTEL with national & international calls from just 1p/min.



Available from

SEG

020 8381 5500

VoIP : 800800@draytel.org

For full details of all models visit
www.draytek.co.uk

Specification subject to change. Facilities vary with model.

The man who gave Bill Gates the world

The birth of the IBM PC was also the making of Bill Gates, thanks to a door-step farce that has become an industry legend.

IBM at the time had dominated the industry for a quarter-century, though it had been late getting into digital computers, and even later getting into what were then called microcomputers, which it tried to pretend were not a threat to its mainframe business. By the late 1980s 'micros' (as in Microsoft) could not be ignored, and IBM set up a team to design one (see p19).

The obvious person to provide the software was Gary Kildall, head of a company called Digital Research, who had written CP/M – the operating system used on almost all micros.

Legend has it that two suits from IBM called by appointment at Kildall's home, but he was off flying and had left his wife Dorothy to do

the talking. She balked at signing a non-disclosure agreement and showed them the door.

So they turned instead to a fledgling company run by a 24-year-old college dropout whose name was Bill Gates. Microsoft did not even have an operating system and promptly bought one called QDos, virtually a CP/M clone, for \$50,000 from a Seattle engineer called Tim Patterson.

The legend is essentially true, though what really hassled Dorothy Kildall when IBM showed up was the fact that she was preparing to go on holiday the next day, according to former Symantec chief executive Gordon Eubanks, who knew everyone involved. No-one at the time knew that the IBM computer was going to become the industry's major standard platform.

And the real reason Kildall did not get the contract was that he



Gary Kildall: Life would have been so different had he been more strategic

was simply too laid back to be a good businessman, Eubanks told me in 1996. "Gary could have owned this business [ie, computing] if he had made the right strategic decisions... He did not care that much. Dorothy ran the business and

he ran the technical side, and they did not get on."

It was Gates who had the vision. "Bill was extremely focused and driven," Eubanks recalled.

Microsoft tweaked QDos a little and called it MS-Dos. It ended up running in nine out of 10 of the world's PCs, and traces of it can still be found buried in Windows XP.

CP/M lingered on for a few years and Novell bought Digital Research in 1991. Kildall died in 1994 at the age of 52 from injuries received in a biker bar brawl during a night out in Monterey, California.

Kildall was one of the founding fathers of desktop computing, but he seems destined to go down in history as the man who gave Bill Gates the world. *Clive Akass*

● A longer version of the 1996 Gordon Eubanks interview can be found at <http://tinyurl.com/o398y>.

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First impressions of the first PC

The first IBM PC seemed like just another microcomputer when former PCW editor David Tebbut wrote the review we've reprinted on page 58. He recalls how few knew the impact it would have

Personal Computer World was my baby from the summer of 1979 to the autumn of 1981.

I nursed it from near-death to become a robust infant during the years when desktop machines were generally called microcomputers.

Then I handed the editorship to Peter Rodwell, and guess what my first freelance writing job was? It was to review the IBM PC and meet some of the development team in Boca Raton, Florida.

For the first time, *Personal Computer World* was going to review a machine actually called a personal computer. How weird is that? At least it validated Angelo Zgorelec's choice of title when he founded the magazine in 1978.

Time was short and I didn't have the usual luxury of taking the machine home with me. I had to beg and plead with IBM for every millisecond I spent with it. My aim was to maximise hands-on time and minimise attempts to influence me. We were paranoid about IBM in those days.

In the event, the Boca Raton team were nothing like any IBMers I'd ever met. The machine had been announced the previous working day and caused quite a stir. So they were distracted, but otherwise they were fine.

There was absolutely no chance of me taking the PC to bits and reassembling it (my usual first steps). I just had to work with it where it sat, poking around as best I could whenever my minds were out of sight.

It was good to meet Don Estridge and some of his 'skunk works' team, who had put the machine together. His real name was Philip and, sadly, he was killed in a plane crash in Texas in 1985. Little did he and his team know what an impact they would have on the microcomputer world. Or maybe they did; perhaps it was just Big Blue (IBM's nickname) that was surprised by what happened.

I remember looking for the CP/M operating system, which



most desktop computers had used up until then. But the IBM was running something very similar called PC-Dos. I didn't know at the time, but this was created by Seattle Computer Products as QDOS – Quick and Dirty Operating System. As far as I was concerned, Microsoft's Bill Gates had negotiated a nice deal with IBM to provide the operating system to users at \$60 a throw, and goodness knows what margin to his own company.

Gary Kildall, the man behind CP/M, had belatedly persuaded IBM to offer CP/M-86 as an option at some horrible multiple of the PC-Dos price. I thought it was \$180, but Wikipedia tells me it was \$240. So that was the end of Kildall's dominance. Amstrad later gave CP/M a brief new lease of life

with its PCW machines – what is it about the title of this magazine that makes people want to name their computers after it?

The IBM PC looked very corporate, very IBM-ish and very boring. But, from the point of view of the potential customers, it was reassuring. After all, it had an IBM badge on it, even if it was largely made from standard components. IT departments were still sniffy about such toy computers, but middle management took to them in their droves, especially when the Lotus 123 spreadsheet arrived.

I just went into my garage to rummage for the notes I took for my review, but I reckon I must have put them somewhere safe after the last time someone asked me about the birth of the PC. All I have left is my memory.

The IBM PC looked very corporate, very IBM-ish and very boring. But for customers it was reassuring

I remember being impressed that Peach Tree Software had written some business applications to run on the machine. Looking back, I shouldn't have been that impressed. A machine without applications is no use to a business user. The slots for the plug-in cards seemed to have lifted a good idea from Apple, but I'm not sure I fully understood the implications in terms of the third-party industries that this would create.

Estridge's team was not only smart, it was prepared to run against the grain of IBM's proprietorial instincts. Anyone was able to add hardware and software to the platform as long as it conformed to IBM's standards.

Of course, Gates was even smarter because he made sure he could license his own version of the OS to the clones that came along later. Needless to say, I foresaw none of this. Nor, I suspect, did IBM.

All it took was for some smart engineers to replicate the functionality of the Bios and the clone business took off.

But that was all for the future. Leaving Boca Raton, I was pleased that IBM, which until then had restricted itself to big corporate computers, had joined 'the rest of us' at the desktop.

On the other hand, I was disappointed at the drabness of the machine. And, it has to be said, its limited functionality. I had already been using an Intertec Superbrain, with a twin floppy drive, as my own perfectly satisfactory workhorse for a while. The big differences with the IBM were its badge, the 16-bit processor, the open architecture and PC-Dos.

In the light of history, this simple formula was enough to eventually bury all of its then competitors, apart from those who managed to migrate to the clone business.

Wifi subject to security breach

Wireless networks are extremely vulnerable to hackers, even with encryption switched on, according to leading security experts.

Foundstone, a division of McAfee, warns that tools needed to do this are freely available on the web and that some distributions of Linux are preconfigured for the task. No specialist knowledge is required to break Wifi encryption, so there's a wider pool of potential hackers to guard against.

Wep encryption is particularly susceptible to network 'sniffing', whereby hackers listen in on Wifi traffic. When enough data packets have been gathered it is easy to crack the encryption and reveal the network's password.

WPA encryption is stronger but can be exploited by eavesdropping computers signing on to a network. Foundstone stresses the importance of changing the network key often and choosing a password that will be difficult to crack. It says that 10 per cent of people still use one of the top 50 most common passwords.

Foundstone says IT managers should simply assume anyone can break the network key and that it should only be the first of a layered defence against intrusion.

Martin Pivetta, market development manager at McAfee, says he is highlighting the issue "not to sell products but to create awareness". *Marc Delehanty*

Digital delay

The 'digital home', where wireless audio and video can stream to any room in the house, is a decade away, according to streaming music specialist Sonos.

Chief executive John MacFarlane says audio streaming is starting to take off, but video will take longer. He told the BBC: "It will happen in the next 10-20 years, not two years."

"Video takes up too much bandwidth to be delivered over current wireless networks. The next Wifi standard is not ready for the mass market yet. TV works, but streaming video does not work successfully right now."

Frugal DAB chips go portable

Next-generation DAB (Digital Audio Broadcasting) audio chips will be much more viable on mobile devices, thanks to a 50 per cent reduction in power consumption, according to leading UK manufacturers.

The power consumption of early DAB radios made them too costly to run on batteries, though products coming out late this year are expected to use rechargeables.

Yet there are moves to extend DAB broadcasts to deliver TV and other multimedia-to-mobile devices, such as phones and PDAs, which use only tiny batteries. Korea has been leading the way on this, using a standard called DMB.

A second standard, DAB-IP, has just been approved by the European industry body Etsi. This packetises the data and adds error correction,



This DAB radio is made by Dualit and styled after its fashionable toaster. It costs £199.99 from John Lewis

because the multimedia broadcasts need to be more robust than pure audio. New DAB chips, which will power devices going on sale in 2007, will be able to cope with the two standards, according to Prem Rajalingham, Frontier DAB product manager. "You will also see chips supporting both DAB and DVB-H," he said, referring to a rival multimedia broadcasting technology

based on the TV signal used for Freeview TV. Frontier, which claims a major share of the DAB processor market, uses a combination of hardware acceleration, software, and a general-purpose digital-signal processor (DSP) in its chips.

Rajalingham says all multimedia broadcasting standards use the same OFDM modulation, enabling each of them to be supported by tweaking software or hardware.

He says Frontier's next-generation devices will be 35 per cent cheaper and 40 per cent smaller than their predecessors and will have a power consumption of about 80milliwatts.

Frontier's major rival, Radioscape, says power consumption on its new DAB has been halved.

→ www.radioscape.com

→ www.frontier-silicon.com

Intel launches mobile broadband chip

Intel has launched a chip supporting the new mobile version of Wimax wireless broadband, which is expected to become a standard on portable computers in future.

The Rosedale 2 chip will be used mostly for fixed Wimax initially, using the 802.16d standard, because mobile services are not yet on offer. But it will enable devices to support them in the future.

The mobile Wimax standard, 802.16e, was approved late last year. Intel has set up a company

with UK provider Pipex to offer fixed Wimax services. They will probably go mobile if they get regulatory approval.

Mobile Wimax would be in direct competition with 3G and 3.5G services. Intel Wimax business development manager Chris Beardmore says the fastest data rates to individual users will be single-digit megabits.

"But the advantage of Wimax is that the hub is a smart Layer 2 switch. It means we can offer

different data rates at different prices." It also makes Wimax more efficient than current cellular networks, Beardmore said.

Wimax will eventually face competition from 4G networks, though opinion is divided on what they will comprise.

Japanese phone giant NTT Docomo says it will roll out a 4G service in 2010 using technology that offers 1Gbit/sec to stationary users, and 100Mbit/sec to those on the move.

iPod radio set to become legal

The UK is likely to lift a ban on low-power FM transmitters that allow mp3 players to feed music wirelessly to home hi-fi sets and car stereos. Devices such as the iTrip are in common use abroad and freely available here, though it is theoretically illegal to use them without a licence.

Ofcom has begun a 10-week consultation about reviewing the law. Ofcom hopes to have a

Europe-wide agreement on the use of these devices this autumn. Germany, Iceland, Switzerland, Liechtenstein and Estonia have already made it legal.

There have been no prosecutions under a 57-year-old law covering the devices. Enforcement tends to concentrate on pirate radio transmissions that interfere with the emergency services.



iTrip docking station on sale at www.griffintechology.com

Free calls cut loose from PC

A new service offering free national and international calls between ordinary phones is to cut loose completely from the desktop.

The Jajah service currently requires users to enter their phone number, and that of the person they are ringing, using a web browser. Jajah then calls both numbers and connects them.

Co-founder Daniel Mattes says the company is exploring ways to avoid any need for a computer.

Most offers of free calls refer only to those that can be made end to end over the web, using Voice over IP (VoIP). International calls to standard phones have to be paid for, though they are cheaper because they are routed over the web to local gateways that pay local connection rates.

Jajah differs in that even these calls are free – even though the company is having to foot those local phone bills. The free offer applies only to landlines to certain countries, but they include the US, Australia, most European



countries, Canada, China and parts of South America.

You can even make free calls to mobile phones in the US and many Asian countries, including India. Mattes believes that Asians living in Britain will be among the service's biggest users.

Charges for other mobile calls and countries, and to people not registered with Jajah, are at very competitive rates.

So what is the catch? There isn't one, according to Mattes, though customers are asked not to go over the top with the free calls and to

To make a call using the Jajah service, simply enter your number, and the number you want to call, and Jajah does the rest, at no cost to you

make some use of the paid-for services, including SMS messaging.

The service went live in February and already has 700,000 users, Mattes said. The more users there are, the lower Jajah's own call costs are and the higher its revenues. "There comes a point where the revenues are higher than the costs," Mattes said, sketching the figures out in a graph. "We hit that point after two weeks."

Mattes founded Jajah with his friend, fellow Austrian Roman Scharf, after they realised that while 95 per cent of people on the web use a browser, only three per cent use VoIP. The company is backed by Sequoia Capital, which bankrolled Google and Yahoo.

Another VoIP provider, Babble, is offering PC-to-landline service free of charge for three months.

→ www.babble.net

→ www.jajah.net

Sip left out in scramble to offer web calls

Jajah is not the only company trying to get round the hassles of making web calls. The situation is very like that of email in the days before the internet, when you could only write easily to someone using the same mail-service provider.

Devices supporting Session Initiation Protocol (Sip) should all be able to communicate, but some of the biggest players in Voice over IP (VoIP) do not support it. Skype doesn't, and neither does Windows Live Messenger, which supersedes MSN Messenger.

But Windows Live has struck a deal with Yahoo Messenger that allows subscribers of both services to exchange voice and text messages.

There are also efforts to detach VoIP from the computer. Philips is selling the Messenger, a cordless phone that can make standard calls, and free or low-cost web calls, to Windows Live subscribers.



Lazy blogging for the egeneration

A personal publishing service targeting 'people who are too busy to blog' aims to become a Myspace for adults.

Etribes allows users to create, at the push of a button, a web page on which they can post news and pictures for friends and family – or for anyone who cares to visit it.

Founder Simon Grice believes there is an 'egeneration' of people who have grown up with technology and are not intimidated by it, but who are simply too busy to maintain a blog. He adds hastily, careful not to limit his market: "A lot of older people embrace technology, and they too are part of the egeneration."

Grice says that about five million people in Britain would like an easy way to share news and pictures with their 'tribe' of friends and family.

The service costs £2 a month, and gives subscribers 20 free text messages which can be typed in at a PC, 10GB of storage space and an Etribes web address.

→ www.tribes.com

In brief

Adult browser

A US firm has launched Heatseek, an Explorer-based web browser for surfing porn. It purports to keep browsing history secret by encrypting history and cookie files, and has a panic mode that closes the program immediately.

→ www.pcw.co.uk/2160267

BT top for DSL

BT came out as best supplier of consumer ADSL broadband in tests of leading suppliers by ISP watcher Eptiro. Virgin, AOL, Demon and Orange were runners-up. Eptiro assessed them on speed of service, connection, email services and upload/download speeds.

→ www.eptiro.com

Google video

Google has launched a UK version of its video service, which lets users upload and share personal videos and view professional content.

→ <http://video.google.co.uk>

New Firefox

Mozilla has released a beta version of its forthcoming Firefox 2.0 browser, which includes anti-phishing features.

→ www.pcw.co.uk/2160287

Mobile T-mail

T-mobile is offering email on the move as an alternative to the Blackberry. The Microsoft-based service will be bundled with its MDA phones to lure customers to its web 'n' walk unlimited data transfer tariff.

→ www.pcw.co.uk/2159925

Skype notebook

Packard Bell has launched a notebook optimised for Skype web calls with a built-in webcam and a one-touch calling button. The Easynote Skype costs about £699.

→ www.pcw.co.uk/2158983

Firm offer

AOL has launched a messaging service tailored for corporates.

→ www.pcw.co.uk/2160702

Proposals for file-share fees

The Association of Independent Music is proposing the introduction of a licensing scheme that allows ISPs to host file sharing for a fee that would go to record companies and musicians. The proposal has been submitted to a government review of intellectual property law.

Music labels have proposed moving away from prosecuting individuals to charging providers for acting as 'intermediaries'.

A Stitcher-up

Realviz has released three versions of its panorama software, Stitcher, which joins contiguous small views into one big picture. Entry-level Stitcher Express 2 costs \$119 (£67); Pro 5.5 costs £198; and Unlimited 5.5 for professional panorama photographers costs £328.

→ <http://stitcher.realviz.com>



PC-free burner

Sony is launching two DVD burners that allow users to transfer VCR and camcorder videos to disk without using a PC. The £170 VRD-VC30 and £200 VRD-MC3 differ in that the latter can handle still pictures as well as video. Both have LCD screens to help you choose what to burn. There is also a wide selection of connection options.

→ www.sonyisstorage.com/dvdirect

Microsoft tops

Microsoft tops a poll of the UK's favourite consumer brands, beating the BBC into second place. A survey of 2,373 consumers by consultancy Superbrands and market researcher Yougov drew from 650 brands chosen by industry experts on the basis of quality and distinctiveness.

→ www.superbrands.org/uk

U-turn on Office 2007 format

Microsoft has done a U-turn over the Open Document Format (ODF), a rival to its own new Office formats, by sponsoring an open-source project to translate between the two.

The news follows growing support from the EU and elsewhere for an open standard to allow rich documents to be exchanged freely between different platforms.

Microsoft's OpenXML formats would not qualify, even though they have been submitted in its OpenXML formats to the European standards body ETSI as a fast-track to getting International Standards Organisation (ISO) approval. Odf is already an ISO standard.

Microsoft stands to lose lucrative contracts if it cannot get OpenXML accepted. Belgium has decreed that all government documents should be in Odf from September 2008. Two French ministries have made a similar ruling and Holland has stated that government documents must use an open format.



Microsoft has tweaked the ribbon bar (top) in Office 2007, currently in beta testing, to make it more usable. The bar has been criticised for talking up too much screen space, though you have always been able to toggle it off (bottom) by pressing Control-F1. In the early beta versions, if you pressed one of these tabs, the ribbon remained visible even after you had taken your choice of its options. Now it disappears, making the ribbons visible only when needed. You can now also right-click to minimise the bar.

OpenXML and Odf are based on Extended Mark-up Language (XML). Microsoft had previously said third-party developers would provide translation software.

Microsoft software engineers who created OpenXML say they have retained control over its development not for commercial reasons, but because of the sheer impossibility of reconciling a cumbersome standards process with the need to create complex backwards-compatible formats.

Almost as surprising as Microsoft's U-turn is the fact that it is backing an open-source project for the translation. The code will be posted on sourceforge.net, leaving people free to contribute to the development like any other similar project, says Office 2007's UK product manager, Darren Strange.

Is there not a danger of helping to build open-source credibility? "That's the kind of judgement we have to make," said Strange.

Pirate-detector tool under flak for false positives

Microsoft has been fending off criticism over Windows Genuine Advantage (WGA), a tool that identifies pirated copies of Windows.

According to Paul Thurrott, who runs www.windowssupersite.com, there have been complaints by users that WGA mistakenly brands genuine copies as pirated. But in his blog, WGA licensing manager Alex Kochis writes that one enterprise licence key stolen from a US university ended up being used on a million Chinese PCs.

Big businesses receive a single key to unlock thousands of copies of XP for large rollouts which

do not use the activation process that locks a registration to a particular PC.

Kochis said that one in five of the 300 million PCs tested worldwide turned out to be running pirated Windows. Of these, 48 million were using a stolen licence key, compared with only a tiny fraction which gave a false positive. But a tiny fraction of these numbers equates to a lot of false positives, which goes some way to explaining the complaints.

Kochis says most of those caught using pirated copies of Windows are aware, at some level, that the software is dodgy, if only because of its low price.

Blu-ray and HD drives open to piracy

Blu-ray and HD DVD high-definition formats contain a major hole that allows anyone to pirate HD movies, according to German magazine *c't*.

The magazine's team managed to take high-resolution screenshots of HD movies played on Windows XP PCs or laptops by simply pressing the Print Screen key (PrtScr).

This function can be automated easily to take screenshots of the entire movie. It could then be recompiled in a movie format with the separately captured audio track mixed back in.

This copy-protection hole applies to Sony's first Blu-ray PC, Vaio VGC-RC 204, and Toshiba's first HD DVD notebook, Qosmio G30.

Both systems use special OEM versions of Intervideo's WinDVD player software.

Toshiba confirmed the flaw and said software updates and graphics card drivers that will close the hole are on the way. The findings by the magazine were monitored by security website Heise.

→ www.heise-security.co.uk

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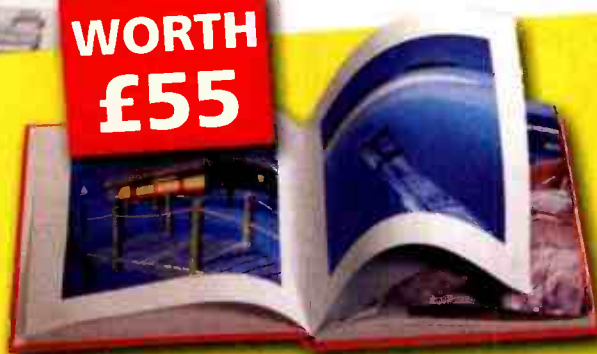
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LETTERS

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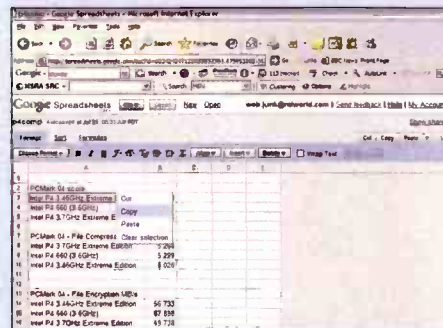
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★
LETTER OF THE MONTH

Web 2.0 – a thief's toolkit?

Mike Curry (Letters, PCW, August 2006) makes an interesting point about remote servers. However, I would have thought the likes of Google have the resources to make sure their servers have a high level of uptime and failover capabilities. Mike knows exactly where his backups are, and he probably even keeps his anti-virus software up to date. This puts him in the minority. Many people are not as technically savvy. For the home market, I think Web 2.0 has many attractive benefits.

For business use, I think IT managers should be cautious about allowing access to these tools. Before Google Spreadsheets, I would load up my spreadsheet in Excel, load my data from my hard drive or network drive and save it back there. The company's valuable data stays within my employer's control. If I leave the company I surrender my laptop and



passwords. To take the data with me I have to copy it to removable media, an obvious and conscious act of theft. If a spreadsheet were saved on Google's server, my employer may not even know what copies I've retained and would be powerless to revoke my access. And since one of the largest sources of security breaches is staff themselves, this could be seen as a thief's toolkit.

Peter Jackson

LAPTOP POWER CONNECTORS

As a system builder and repairer, I am frequently asked to repair laptops. One of the more common problems I encounter is broken DC power connectors, often due to careless handling when the power supply unit (PSU) is connected to the laptop.

This is a big repair. The entire computer needs stripping down just to gain access to the connector and remove or resolder it. This is labour intensive and usually costs the customer £80-£100. Then there is the problem of the part – none are standard!

There is a simple solution: a standard part designed to slide or screw into a holder attached to the motherboard. The back of the connector would have two copper contacts which would mate with two matching contacts on an assembly fixed to the motherboard.

Access to the removable connector would be by a removable cover, much like the one that covers the memory modules. The part would be industry standard, so practical to stock. This repair would take minutes, and cost a few pounds. Why has no-one thought of that?

And why do laptop makers insist on charging more than £200 for a 15in TFT screen? The same screen can be bought for just £120, complete with circuit board, casing and PSU in the form of a flat-panel monitor.

Roger Malone

Kelvyn Taylor replies: A good point, and we can only speculate that cost is the motive. With wafer-thin margins on laptop manufacturing these days, every fraction of a penny counts. We do like Apple's clever magnetic power connector on the new MacBook Pro, though. It certainly would help prevent breakages.

THE PRICE IS WRONG

In your September issue of PCW, one review which caught my eye was that of the Fujitsu-Siemens Scenicview P24-1W monitor. The product looked good and the price was also decent for a monitor that size – £839.

However, when I looked for the monitor on the internet the nearest price I found was £972 at the same place www.pcw.co.uk/bestprices you mention in your article.

Has the price really risen by over £100 between you printing the article and me reading it on the first day of issue, or did you make a mistake? As a comparison, the Viewsonic VP2330wb listed at £1,173.82 in the magazine could be found at £982, close to £200 cheaper.

What is the point of showing these prices if they are so wildly off on the first day of issue? I could understand if it was a

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.

recommended retail price, but a best price that can't be found within £100 is meaningless.

Steve Gray

Kelvyn Taylor replies: All product prices are supplied by the manufacturer and are correct at the time of going to press. PCW's Best Prices service is powered by Kelkoo and, as it's an automated price comparison, we have no control over the prices it lists.

WHY BOTHER WITH BOOT CAMP?

I read with interest your article on Boot Camp www.pcw.co.uk/2158876, using the Intel processors of recent Macs to run Windows instead of Mac OSX.

Why bother? It takes an age to boot Windows and little less time to boot Mac OSX. All this rebooting to switch applications will take a substantial chunk out of your working day.

Far more useful to the Mac user who wants, or needs, to run Windows applications is Parallels Desktop for the Mac, which allows Windows to operate simultaneously with Mac OSX, so users can switch instantly between Windows and Mac apps.

Eric Coxon

DIGITISING VHS TAPES

While I enjoyed Ken McMahon's erudite article on digitising VHS tapes (PCW, September 2006), I am no longer sure the PC-based way he describes is the way to go.

I have struggled with complications such as sound getting out of sync with picture. Then I found that standard consumer DVD recorder/players had come down in price to the point where they cost little more than analogue video capture devices for the PC.

They are dead easy to use (Scart connectors from VHS to DVD and two buttons to press) and some offer limited editing. The final DVD can then be fed into the PC, as and when more advanced editing is needed.

Ian Macpherson

ANY OLD PORT IN A STORM

In the excellent Windows Registry Guide (PCW, August 2006), under the heading 'Restrict USB access' on page 51, there is an interesting remark. It states: "If you turn USB off at Bios level, you will then have to connect mice and keyboards serially." I guess that will be instead of...erm...serially?

Nevertheless, a useful and informative article, with insight into some valuable tweaks.

I'd welcome further articles that look at some of the mysteries of the Registry, perhaps focusing on one aspect each month.

Ian Grant

Kelvyn Taylor replies: The standard PS/2 keyboard and mouse ports also use a serial communication protocol, but yes, we should have specifically named the PS/2 port to make it clear.

STOP KNOCKING SKYPE

Alan Stevens' article about VoIP for small businesses (PCW, September 2006) barely mentions Skype other than to damn it as being ideal for home use. The accompanying review of IP phones by Terry Relph-Knight concentrated on IP phones with only a small section on so-called alternative phones, including a paragraph on Skype. An earlier article by Alan Stevens (PCW, July 2006) did cover Skype but concentrated on the drawbacks; ie, that the phone handset or adapter must be connected to a PC (this will change with new remote handsets being introduced) and that the service is proprietary. Aren't they all once you sign the contract?

Skype is arguably the largest, most successful, internet phone service and it is now owned by Ebay. Connection and call quality in the UK is acceptable. Overseas calls are of a similar standard to PSTN and are better than PSTN for calls to some parts

of the world such as the Middle East and South-east Asia.

Add to this the significant cost savings which have enabled us to conduct business with clients around the world at a similar cost to UK calls. An example is a recent 60-minute PSTN conference call to the Middle East, which cost £250, whereas a similar Skype call costs only £5.

Skype is suited to business use with group billing, regional phone numbers (we have London and Houston business numbers), Wifi connections for travellers, voicemail and a wide range of handsets and adapters for PSTN phones. New handsets are coming along that will travel with the user and software is available to enable PDAs to work as standalone phones through Wifi connections.

Skype also provides good video connections, which have enabled me to have face-to-face conversations with my family when I am overseas.

Perhaps PCW could do a balanced article on getting started with Skype that will help readers.

Martin Basil

Kelvyn Taylor replies: We have always considered Skype to be a great consumer VoIP service and have said as much in PCW. However, it doesn't, at the moment, offer the same versatility as standards-based business systems, such as the ability to integrate with, or even replace, a PBX. And Sip-based services are not proprietary – that's the beauty of them. Any Sip user can use any Sip-compatible service or hardware. But, as it's free, we agree that Skype can be a useful extra tool for business users.

EVERY BIT HELPS

Many thanks for your latest group test on VoIP phones (PCW, September 2006). I already have the Grandstream Budgetone BT101 and can confirm it's a good piece of kit. However, I was also

US Robotics 9600A:
One phone, two uses – and it's cheap

looking for a cheap USB phone and am delighted to pass on to your readers my solution. The Tesco Internet Phone E337 Handset at £14.97 is identical to the US Robotics 9600A, which many other outlets are selling at over £20. The neat trick, however, is that this can be both a standard USB VoIP phone that will function with X-Lite and other Sip softphones, as well as a feature phone with Skype. If you download the US Robotics driver file from its website, you will get full Skype functionality.

One phone, it's cheap and has two uses. So how do you tell the difference? If the US Robotics program is running the display says Skype; if not, it says VoIP. This will only work if you don't run Tesco's software installer.

Ian Murray

Kelvyn Taylor replies: Thanks for the tip – and an added bonus is that US Robotics now also has a beta Mac driver for the 9600A.



The Disc Stakka is an automated device that stores, protects and retrieves optical media, such as CDs, DVDs and games discs. It holds up to 100 12cm discs and can be linked to a PC or Mac via its single USB connection. The carousel can be stacked up to five-high and hold up to 500 discs in any format.

The Disc Stakka comes with Opditracker content management software, which includes a database and search engine that can find and eject any disc within seconds. For more information on the Disc Stakka, go to www.imation.co.uk.



THE ADVISER

COVER YOURSELF

- Keep good records; store all receipts in one safe place – as proof of purchase is vital.
- 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.
- 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.

MORE INFO

- For more information on consumer law in England and Wales, visit www.oft.gov.uk/consumer. In Scotland, visit www.scotscourt.gov.uk.
- You can also get advice from Consumer Direct, a DTI-backed agency, at www.consumerdirect.gov.uk.

I BOUGHT ILLEGAL SOFTWARE

In May, I bought a copy of Nero 7 Premium from Savapoint.com and recently had cause to contact Nero for help with a problem with the software.

But when I provided the registration number of the installation, Nero emailed me to say that my copy of the software was illegal. I have received further correspondence from Nero's legal team quoting the serial number from this purchase as being illegal. I have contacted both companies asking for an explanation and resolution to the problem, but have received no reply. Alan Wiseman

This case highlights a problem that is growing in the IT retail sector, where legitimate traders unwittingly sell versions of software that are not intended for the UK market.

Savapoint.com said it had bought the copies of Nero 7 Premium from one of its regular wholesale suppliers, complete with paperwork to show that the software was legitimate. The problem was that version of Nero had not been officially released in the UK, and Nero's head office in Germany contacted Savapoint to object to its sale.

The item was removed from Savapoint's website immediately, and the company is now selling Nero 7 Essentials Suite 1, which it obtained from Nero's own UK distributor.

Savapoint said any customer who had bought a copy of Nero 7 Premium could get their money back by returning the product and then calling to provide bank details for a refund. It would have been

PCW GIVES ADVICE ON YOUR RIGHTS

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



Panrix: Failing to live up to its promise that it would honour orders for the Magnum IQ 3700 PC. Meanwhile, the company has gone Awol

better if the company had simply emailed all those who bought the product in good faith in the first place.

PANRIX PANNED

Our article in the September issue of PCW concerning Leeds-based retailer Panrix prompted a string of emails, with readers saying that owner Gulberg Panesar has failed to live up to his promise to honour orders for the Magnum IQ 3700 PC reviewed in our April issue.

The situation seems grim. Neither Panrix nor Panesar have responded to PCW's emails and telephone calls. We contacted the local police, and a member of the CID told us that the shop seems to have been cleared of stock.

Leeds Trading Standards Office has so far failed to respond to our request for comment. Customers who have outstanding orders or warranty enquiries, and who paid by credit card, should contact their card provider.

IMPORT DUTY

I ordered a smartphone from Photoshop-Store.org.uk and was unhappy to receive an invoice from the courier for import duty. I contacted the supplier who pointed me to the

site's terms and conditions. These stated that there may or may not be an extra charge from HM Revenue & Customs (HMRC) in relation to the importation of goods. The supplier's argument is that he tells all his customers to read his terms and conditions. I'm afraid I did not do this as I thought most terms were fairly standard.

Andrew Trueman

It's important to find out where goods come from, especially when buying from websites that offer discount prices, as you may be left with a bill for importation. Import charges apply to goods that originate outside the European Union, while Vat is charged on goods from EU suppliers if the item purchase is Vat-rated.

You can learn more about import charges on the HMRC website at <http://tinyurl.com/aqwt>.

We sympathise with Mr Trueman in this case, especially as the invoice he received made no specific mention of duty charges, although to be fair the Photoshop-Store website order form does include a tick box where buyers are required to indicate that they have read and understood the company's terms and conditions.

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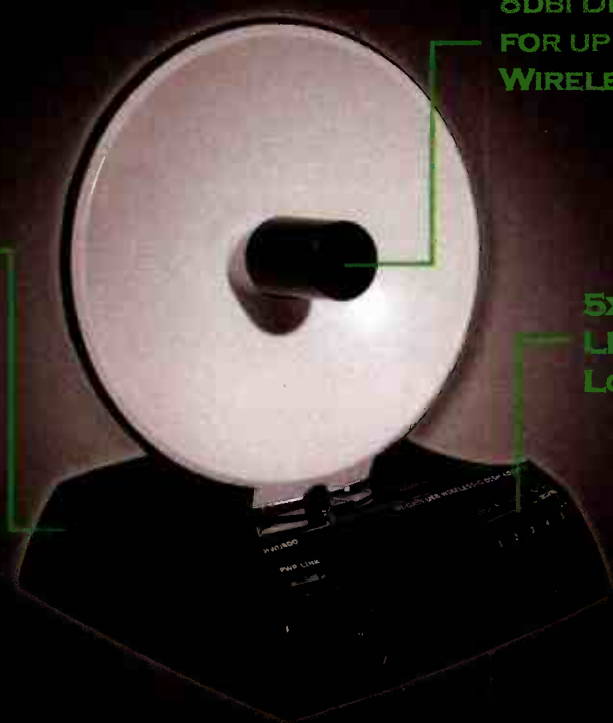
*Windows® IT Pro, The Impact of Disk Fragmentation white paper.





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'High' with a little help from my friends

Stroll into any reputable TV retailer and you'll find TVs for sale in 'full HD'. Gordon Laing offers the ultimate high in definition

When is high definition not high definition? When it's full high definition! Head into well-stocked TV dealers and you'll now find not just HD sets, but new, premium models described as 'full HD'. Isn't normal HD good enough any more?

Anyone familiar with HD knows that the source material typically comes in two flavours – 720p and 1080i. 720p uses a lower resolution (1,280x720 pixels), but delivers it in a flicker-free, progressive scan format; hence, the 'p'. In contrast, 1080i boasts higher resolution (1,920x1,080 pixels), but delivers it in an interlaced format; hence the 'i'. HD-ready sets can display either format using scaling to fit their native resolutions.

Enthusiasts argue about which format is superior, but most agree the progressive nature of 720p better suits fast motion such as sports, while

1080p sources would also be 50fps over here and 60fps over there, but that's not always the case.

1080p at 50fps or 60fps would result in an almost unmanageable degree of information and is unlikely to be offered by many sources other than a PC. In fact, PCs aside, the most common 1080p content is likely to be at 24fps, from movies either shot or professionally archived in HD.

The important question then becomes what kind of 1080p does your player output and your TV accept? Ideally, you'd want a display that could properly handle 1080p at 24fps for Blu-ray and HD-DVD movies, along with 50fps and 60fps for future (or PC) use. The trouble is, some 1080p displays may not handle certain input signals very well, while some players might not do a great job of converting 24fps into other progressive formats.

Further muddying the waters are reports from some early HD-DVD adopters that certain titles claiming 1080p content have come from poorly de-interlaced 1080i sources. So is 1080p to be avoided? Absolutely not! If you want the ultimate HD experience, you should definitely buy an HD set with 1,920x1,080 pixels. The question is whether to go for a model that can handle full progressive signals or just 1080i at best. I'd consider a set that can natively handle progressive signals, but only if it displays 24fps, 50fps and 60fps inputs without judder.

If the set can only handle a 1080i input, though, that's not the end of the day. Most panel displays are natively progressive and have to convert interlaced content for viewing. Indeed, depending on the player and TV combination, the best 1080 experience from Blu-ray and HD-DVD may involve setting the player's output to 1080i at 50fps and allowing the display to de-interlace it into 1080p. In this instance, a 1,920x1,080 pixel panel with 1080i inputs would do.

Remember, lower resolution models with excellent processing will almost always produce a better picture than high-resolution screens with poor processing. Finally, to reassure anyone who has bought a lower resolution HD-ready set, it'll still accept and display 720p or 1080i inputs from any HD source. 1080i/p sources may not look as sharp as a set with 1,920x1,080 pixels, but you will still get a fantastic picture. **PCW**

'Televisions that exploit every single pixel are being described as true HD or full HD'

slow-moving documentaries can exploit the extra resolution of 1080i without being compromised by the interlaced aspect. The one thing that silences any argument, though, is the mention of HD's holy grail: 1080 lines in a progressive scan format. Delivering both the highest resolutions and flicker-free images, 1080p is the ultimate video format. And TVs that exploit every single pixel are being described as 'true HD' or 'full HD'.

But not everything is as it appears. Take 1080p TVs: you'd imagine they'd sport both 1,920x1,080 pixels and the ability to take a 1080p input, but many can only accept a 1080i signal, which is then de-interlaced into progressive scan for display.

Where are the 1080p sources anyway? Sky, like other HD broadcasters, will only deliver HD in 720p and 1080i formats, as 1080p would simply occupy too much bandwidth. And while the box inserts of the first Blu-ray and HD-DVD movies claim 1080p encoding, cheaper players may only output an interlaced version.

That said, it's worth looking at Blu-ray and HD-DVD more closely. When talking about 720p and 1080i in the UK and US, the frame rates are normally 50fps and 60fps. You'd assume that

Barry Fox



barryf@pcw.co.uk

Keeping an eye out for a simple Vista

Vista and Office 2007 are just around the corner but Barry Fox worries that we're fed up with learning new procedures

Getting fined €200m by the EU is the least of Microsoft's problems. What matters is what happens when the next versions of Windows and Office are launched.

Will Microsoft chant the traditional Gates mantra and promote Vista and Office 2007 as 'rich' with yet more features that most people don't want, and with a different look and feel that many people turn off in favour of Windows Classic; or will Microsoft promise that the new offerings fix problems and offer options that people have wanted for 10 years?

Its Access database offers far too much for most users. Likewise, Word has rafts of features that I have never had time to learn.

What I want from Word is the option to 'click here for simplicity'; pick a font, page size and margins that fit the printer, with a Queen's

'Unless Microsoft admits XP was fatally flawed, most people will just say No to Vista'

English spell check. Once I've chosen a setting I want it to stay set until I choose to change it. When I type my postcode (1ST) I don't want Word to change it to the abbreviation for 'first' and then display the rest of the page in Lilliputian type. If I want a shedload of fancy formatting, I can 'click for complexity'.

The problem, Dear Bill, is that it's not the cost of the software that deters people from buying new packages, it's the time spent unlearning the old and then learning new procedures. So it may now be too late to ditch unintuitive options, like pressing Start to shutdown and the confusing Explorer file display panel layouts.

Vista is Microsoft's last-ditch attempt to make us use a Media Center [sic] instead of a CD or DVD player and TV. Promotion for Windows XP Media Center Edition (MCE) is in limbo. Microsoft's only press release on MCE for months reports that: "Sportal.com and BBC 7 radio have joined existing industry partners to deliver sport, entertainment and news services to customers using Windows XP Media Center Edition 2005."

Gee. Hold the front page.

Consumer electronics giants such as Philips have made only half-hearted token efforts at selling the Media Center PCs they proudly announced last year. No wonder. I just helped a friend who had bought a new Dell with Media Center XP.

Out of the box there were half a dozen electronic EULAs (End User Licence Agreements) to 'sign'. Norton needed activation online and then 13 updates totalling 13,426KB. Windows Update announced it needed to run, but Norton insisted on a reboot which made the Windows Update option disappear.

When I forced Windows to update, it was blocked by Adobe with another EULA. Windows Update then insisted on two Validation Updates before it would start looking for updates. It then found 27 High Priority, 11 Optional Software and 1 Optional Hardware updates – totalling 47.2MB and needing another reboot.

The trial version of Corel Photo Album 6 then popped up asking for a Critical Update of 48.83MB. When this was done, Corel launched into repeated offers of the chance to buy a fuller version.

AOL 9.0 had been pre-installed but before doing anything useful insisted on a software update to make it work with XP.

Vista could be the 2007 equivalent of the Millennium Bug. But this time people really will lose data.

Or will Vista come with a utility that scans an existing PC for all collected files, and offer an easy option to transfer them to a new Vista PC? If so, how will it filter out all the audio, video and graphics files that come with programs such as Encarta? Will Digital Rights Management allow music file transfer, or block it as pirate copying?

Vista might well be worth the sweat if it offers real advantages over XP, like a Restore function that reliably restores with faster boots, fewer reboots needed, fewer 'lost' USB devices and networks that stay networking.

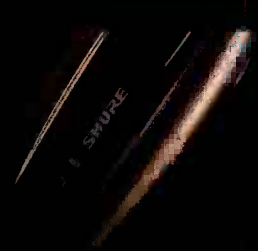
But this could all be done with updates to XP, unless Microsoft admits that XP was fatally flawed. Most people will just say No to Vista and stick with XP. If Microsoft tries to force the change to Vista by ending support early for XP, it could well be the final straw that encourages Windows users to try Linux and Open Office. Or switch to a Mac. **PCW**



Put the awe in audio.

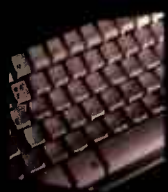
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Guy Kewney



guykewney@gmail.com

Dabbling in the art of everything

Some day, we will see PCs that function like a hybrid vehicle – ones that not only operate a GPU but edit video, says Guy Kewney

Imagine Britain in 50 years, and imagine you're designing an aeroplane. Half the airfields are under water even at low tide, and you conclude that your plane needs to perform better on the ground. Bear with me: the idea of hybrid vehicles such as flying boats, aquacars and hovercraft simply fascinates me.

In 2056, the world will have changed, and the distance from the plane park to the runway will be a significant factor in running costs. After all, the cost of aviation fuel will have quadrupled by then, and it will no longer be a viable option to taxi under jet engine power. Economics will dictate that planes are towed to the runway, which is cheaper in fuel, but a very slow process. As the plane's designer you will need a way of using the jet engine to drive the wheels directly.

Now, what of a hybrid PC? In 2010, PC

time at all. Then hit Save and watch time stand still. The fastest dual-core processor overheats like a marathon runner in Greek sunshine.

All the operations that are taking so long for the general-purpose processor are things a GPU could do in real time. And so video editors will say: "Hand these parameters to the video chip, save the results to disk and your new film is created as fast as the disk can suck the data up."

So, when you read analyses about what AMD is trying to do by taking over ATI, ignore the bit about how AMD is being foolish by trying to compete with motherboard makers such as Nvidia. Ignore the suggestions that it will spoil the comfortable relationship between motherboard makers, too. What AMD is trying to do is create a new generation of processors that allow the programmer to offload these graphics instructions to a processor that really knows how to do them, while the x86 code cruncher gets on with x86 code – the operating system, the page-file admin, the user interface, and so on.

It's a risky venture. I can think of half a dozen conversations with software developers in the past year since I saw my first GPU-based video editor prototype. Each developer was complaining that none of the tools at their disposal could write code for the GPU. "It has to be hand-coded, and it's badly documented. While we can see exactly how easy it would be to run it, we simply can't write it. And we definitely can't debug it!"

Brave words are emerging from AMD about how it can break the Intel monopoly with this move. That's bravado. What is really going on is that AMD is being targeted by Intel. Intel has started making its Netburst architecture obsolete, and has also discovered that chip temperatures are important. The latest Core 2 Duo designs will come close to matching anything that AMD can do right now.

That means AMD has to find its next trump card. Its 64-bit x86 got it where it is today, coupled with some clever dual-core technology. But Intel doesn't sit still.

I don't think GPU integration with the CPU is a magic spell that will crush Intel, but it is the sort of thing AMD has to come up with if it hopes to keep the ground it has gained. **PCW**

'Developers complain that none of the tools at their disposal can write code for the GPU'

designers will find ways of using the graphics chip to do real computing work when the PC's not running games or video. It's something people are trying to do already. The general-purpose graphics processing unit (GPU) does a lot of things really well – things that are not remotely like drawing images fast. To quote the Wikipedia entry: "GPUs include support for programmable shaders which can manipulate vertices and textures, with many of the same operations supported by CPUs, oversampling and interpolation techniques to reduce aliasing and high-precision colour spaces. Because most of these computations involve matrix and vector operations, engineers and scientists have increasingly studied the use of GPUs for non-graphical calculations."

Non-graphics? Such as? Well, cryptography for a start. It will make crime harder to detect, will make life a lot harder for traffic-shaping on the internet, and let's not even discuss insider trading. Yet there's a demand for it.

Then there's video. Not on-screen graphics but video editing. With a simple video editor such as Quicktime Pro or Windows Movie Maker you can cut and paste video clips into a sequence in no

Broadly speaking

UK ISPs all seem to be offering free broadband at the moment. But is free broadband ever really free? Nigel Whitfield investigates the fine print behind these seemingly fine offerings



When we last looked at broadband (PCW, February 2006), it was apparent there were lots of new developments on the horizon, with ADSL2 and 2+ offering faster speeds, TV over broadband, and a wider range of options from providers putting their own equipment in exchanges rather than having to rely on the choices available via BT's network.

Since then, a surprising amount has changed and – depending on where you look – you can get broadband packages that appear to offer incredibly good value, as well as complete packages that cover internet access, home and mobile phones, or even add TV services into the mix.

So, what's the state of play now? Are some of the high-profile offers of free or bargain broadband just too good to be true? If you wait a while, will there be even more changes over the next six months, or should you take one of the packages on offer now?

State of play

One of the most significant changes in UK broadband over recent months isn't technological, it's a plain old-fashioned case of marketing, thanks to Carphone Warehouse and its Talktalk brand, with a much-publicised offer of free broadband.

It's not the only one getting in on the act: Orange is offering a free deal, too, courtesy of its rebranded Wanadoo service, and BSkyB has recently announced an offer of free

broadband to its existing TV customers. Telewest and NTL have merged, and then joined forces with Virgin's mobile network.

Other changes in recent months include the rise in popularity of sites such as Youtube, and Channel 4's decision to make almost all its programming available online for broadband users. With a summer of sport as well, there's more and more content for people to look at, and better reasons to consider moving to a faster broadband link if you're on one of the original services.

As this article went to press, in fact, Google announced a UK version of Google Video, bringing even more things for broadband users to watch.

Users of some services have seen downsides over recent months too: Cable &



Left: Orange's free broadband service comes with the Livebox wireless router, which also provides Voice over IP

Below: AOL is rumoured to be considering radical restructuring, which may even open up the company's content to anyone who has a broadband link



'Disconnecting early could invoke penalty charges that make "free" costly'

charges that make it rather more costly than the headline 'free broadband' would imply.

In any event, neither service is really free: you're being offered broadband as a way of enticing you to use something else. In the case of Orange, the offer is open to those who sign up for an 18-month mobile contract that costs £30 per month or more, and for the best VoIP (Voice over IP) call rates, you need to add an extra package – all of which is on top of the BT line rental charge. Besides that, there's a 2GB monthly download allowance: check the small print and you'll find that emails of more than 10MB are disallowed.

Talktalk, while offering 40GB of data per month, only provides free broadband when you take out an £8.99 monthly subscription to a call plan, plus £11 per month line rental, so the free service

is actually £19.99 per month.

Similarly, while BSkyB is offering existing network customers a 2MB Base package for free, anyone who isn't already a subscriber will have to pay a £40 connection fee and £50 installation fee for the 2GB 'free' monthly limit. Its other packages, all of which offer the free broadband, vary in speed, limit, usage and, of course, connection/installation fees. In the end, the broadband has to be paid for somehow!

And it's perhaps that issue that's going to determine how well these and other, more traditional services fare in future. In the case of Talktalk's offering, the charges levied by

Wireless – parent of Bulldog – has decided to pull out of the consumer broadband access market. AOL in Europe is widely rumoured to be up for sale, and the US service is reportedly considering making its closed content available to anyone with a broadband connection.

Back home, low-cost broadband outfit E7Even has stopped providing a service, leaving many users without connectivity at short notice, although it did do a deal with another provider to help out subscribers.

Meanwhile, large phone companies in the US are pushing to be allowed to introduce different tiers of pricing for internet data (see box below), with potential implications for the rest of the world. So, while there may not have been any major leaps forward in technology, there's certainly plenty of change afoot in the way broadband is being marketed and sold.

On the face of it, free broadband sounds like a great deal. After all, who wouldn't want something for nothing? Also on the face of it, the offers from Talktalk and Orange

aren't cutting corners on bandwidth, either – both will give you speeds of up to 8Mbps/sec download, if your phone line is suitable and you're connected to an unbundled exchange.

But that, of course, is the headline figure. If you're not on an exchange where one of the firms has its own equipment, you may find your speed limited to only 2Mbps/sec.

And watch for the conditions, too, as neither service, for example, would be useful to anyone who moves around a lot, such as students, since the free offers require an 18-month commitment. Disconnecting early could invoke penalty

Net neutrality or a neutered net?

At the moment, there is much talk about a controversial issue – especially in the US – called 'internet neutrality'. It's a simple concept: in essence, net neutrality means the internet doesn't care what's being sent over it. All data is treated equally, whether it's a web page, an email, streaming video or a file download.

Some, including the inventor of the web, Sir Tim Berners-Lee, argue that it's the neutrality which has allowed new applications to flourish: invent something and it'll just work on the internet.

Not for much longer, perhaps. Some of the major network carriers in the US are lobbying the Government hard to be allowed to charge a premium. Bandwidth-hungry video, for example, might warrant an extra charge to ensure smooth playback. It may seem a sensible argument, but proposals go way beyond that.

For example, a penny per email to ensure prompt delivery is one suggestion. And it may well stop spammers, but such ideas will also disenfranchise the less privileged – perhaps the biggest user group to benefit from internet access. And, of course, there's the commercial imperative – as the phone companies that operate the long-distance cables lose out on call revenue to Voice over IP (VoIP), charging for VoIP from other companies to pass over their networks will cushion the blow.

While the debate at the moment is centred around the US, rest assured that network operators the world over are looking carefully to see what happens. And with so much traffic passing to and from America, it's almost inevitable that if charging is introduced in the States, it will likely spread across the globe.



BT's Home Hub, supplied as part of its Total Broadband package, provides wireless access, VoIP and will support BT Vision later this year

to sustain a loss while they roll out their own equipment into exchanges, not all ISPs are able to do so, and smaller ISPs may well feel the pinch. While the ADSL Max product that offers up to 8Mbps/sec downloads is being rolled out by BT, and available to its resellers, some are privately concerned that there's no guarantee on the long-term pricing of the product. The bundled approach of the larger players, whether based on extra services such as TV or mobile phones, or just on cut-price phone calls via the internet, allows them to cross-subsidise broadband: smaller

players simply don't have that luxury.

Future perfect?

Does that mean more small ISPs will cease operating, like E7Even? It's hard to say: certainly, a smaller organisation that has tried to keep prices low by cutting costs to the bone will find it hard to compete with firms such as Carphone Warehouse. Those that aim to provide a more tailored service, perhaps at a higher than usual price – for example, by catering to more technical users – will likely fare better: the free offers and bundles are aimed firmly at the mass market.

Where next?

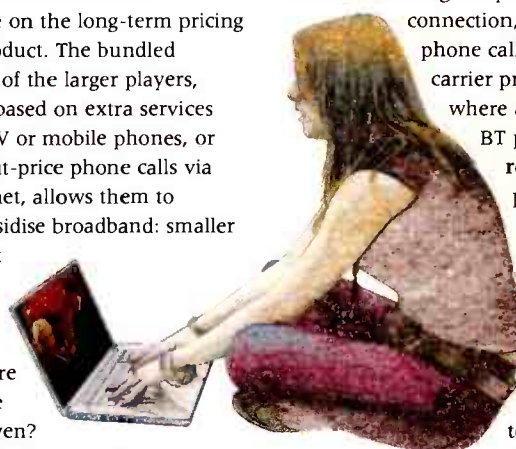
What's coming next is always hard to predict. There are only a few organisations that may be able to offer free broadband, but more and more bundles are likely to be on offer, such as the BT Total Broadband package, which includes VoIP and will have BT's Vision TV-over-internet service available as an option when that launches. Similarly, Namesco's TV Max service combines a Freeview service with broadband and a set-top box that can access TV over ADSL.

Meanwhile, other ISPs, such as Pipex, have VoIP offerings you can subscribe to alongside your broadband connection, or deals for phone calls based on carrier preselection, where all calls from your BT phone line are routed via a specific phone company.

And, as the year progresses, you can expect faster speeds all round: BT's network is capable of providing them to most users now, and some resellers are

offering upgrades at no extra cost. LLU isn't just affecting the largest suppliers, either. As well as using it to enhance their own offerings, companies such as Tiscali are now providing a wholesale ADSL product so that other ISPs can piggyback on its network instead of relying upon BT's network.

There's little doubt that the broadband market is becoming more and more



'You're being offered broadband to entice you into using something else'

BT for access to the network mean there's little or no profit for the company when it connects someone via the BT network. The real money only starts to flow when it connects you to its own LLU (local loop unbundling) equipment, which the company is rolling out as fast as it can. Even so, with massive demand, there's already a waiting list for users to be connected.

While Orange, Sky and Carphone Warehouse have the deep pockets necessary

ADSL bundles and free offers from UK providers

ISP	PACKAGE	CONTACT DETAILS		MONTHLY FEE	LINE RENTAL	SETUP FEE	MAX SPEED
AOL	AOL Platinum, AOL Talk	www.aol.co.uk	0800 200 6045	£29.99	£11 ⁽¹⁾	Free	8Mbps/sec
BT	Total Broadband Option 3	www.bt.com/broadband	0800 389 8714	£26.99	£11 ⁽¹⁾	Free	8Mbps/sec
Bulldog	Unlimited Plus	www.bulldog-broadband.com	0800 056 6745	£24.50	£10.50	30	16Mbps/sec
Eclipse	Home Broadband Option 4; Talkmore 3	www.eclipse.net.uk	0845 1224 111	£29.99	£11 ⁽¹⁾	Free	8Mbps/sec
Freedom2Surf	Cascade Plus; VoIP	www.freedom2surf.net		£23.99	£11 ⁽¹⁾	Free	8Mbps/sec
Homechoice	Base pack max speed	www.homechoice.co.uk		£27.99	£11 ⁽¹⁾	£1	8Mbps/sec
Namesco	TVmax	www.namesco.com	0845 363 3630	£25.95	£11 ⁽¹⁾	Free	8Mbps/sec
Nildram	Nildram Broadband 2	www.nildram.net	0800 072 0407	£25.99	£11 ⁽¹⁾	£47	8Mbps/sec
NTL	Value Pack	www.home.ntl.com	0845 045 0019	£49.99	Included	Free	4Mbps/sec
Telewest	Family bundle	www.telewest.co.uk	0845 142 0220	£34.49	Included	Free	2Mbps/sec
Orange	Free broadband	http://freebb.orange.co.uk/offerinfo		£30 ⁽²⁾	£11 ⁽¹⁾	Free	8Mbps/sec
Pipex	Pipex Max broadband; Anytime calls	www.pipex.net	0845 077 2537	£27.49	£11 ⁽¹⁾	Free	8Mbps/sec
Plusnet	Package 3	www.plus.net	0845 140 0200	£21.99	Included	Free	8Mbps/sec
Sky	Max Plus Sky Talk	http://broadband.sky.com		£15	£11 ⁽¹⁾	Free	16Mbps/sec
Talktalk	Talk 3 International	www.talktalk.co.uk	0870 444 1820	£8.99	£11	£29.99	8Mbps/sec
Tiscali	Anytime Talk	www.tiscali.co.uk	0800 107 9000	£19.99	£11 ⁽¹⁾	£17.99	2Mbps/sec

Notes: Prices and details correct as of 1.8.06; 1 Standard BT line rental fee; 2 Monthly fee is for an Orange mobile contract; spend £30 or more to qualify for free broadband;

Inside the complexities of swapping providers

Swapping broadband providers continues to be one of the recurrent bugbears of *PCW* readers, despite moves to put in place a system for migrating from one service to another.

Tiscali, for example, uses BT's Datastream service rather than the IPStream system used by most providers, which resell BT's wholesale service. Steve Horley, Tiscali managing director of consumer business, says a lot of the issues were caused by the system of Migration Authorisation Codes (MACs) not originally applying to Datastream services – a situation that has now been resolved.

If you've been hoping that the news on migrating would be getting better as providers become used to the process, you may be disappointed. In some respects, the situation may now be worse for those wanting to switch providers.

While in the past most providers were simply reselling BT's product, with a relatively small number installing their own equipment in exchanges, or using Datastream, that is changing rapidly, with more and more ISPs investing in LLU (local loop unbundling). Some, like Plusnet, are moving some of their customers to equipment owned

by other companies, in effect replacing BT's wholesale service with one from another company.

While a move between two resellers of BT's service just means updating entries in the BT computer systems and minimal downtime, switching to and from an LLU service or between two different LLU services requires work to be done in the telephone exchange, connecting your line to a different provider's equipment. And reports on some web forums suggest that not all providers are at ease with the processes involved in co-ordinating the work. It may often be simplest to 'cease and re-provide', which means cancelling one service and then ordering another – something that's likely to leave you without a connection for a few days.

Indeed, according to Horley, the current system for migrating between shared LLU services – where BT provides the phone and others provide the broadband – still relies on a paper form for each customer. It's likely to be the end of the year before an automated system is in place that takes care of not just connecting users to LLU services in the first place but also of moving them between different ones.



Namesco's TVmax service uses Netgem's iPlayer to access TV over the internet

argument for waiting. Early adopters of Talktalk's offer have had to wait to be connected, and in a few months' time it'll be much clearer whether issues such as technical support will be a problem for a relative newcomer with a rapidly growing number of users.

There will also be more offers

from other players, with Cable & Wireless' Bulldog potentially up for grabs by other phone companies, all keen to persuade you to sign up for all your communications on one simple bill. You can expect other mobile

phone companies, including O₂ and Vodafone, to investigate their options as well.

So, with the current offers asking for an 18-month commitment, it may be prudent to wait a few more months and see what other type of services are on the horizon before signing on the dotted line.

Don't forget, too, that whichever company supplies your existing broadband connection, you can almost certainly add services such as VoIP to it, or use an alternative phone provider, mixing and matching to get the level of service and the price that suits you. It may even be worth asking your existing provider about faster speeds, and you may be pleasantly surprised by its reply. *PCW*

competitive, but should you jump at one of the offers that's available right now, or wait to see what comes along?

With unbundled services more widely available than ever before, there's a good

MONTHLY CAP	SUPPORT HOURS/COST	CONTRACT LENGTH	EQUIPMENT INCLUDED	SERVICES BUNDLED	COST OF CALL OPTION	INCLUSIVE CALLS
Unlimited	8am-midnight (free)	12 months	Wireless router	CPS telephony ⁽⁴⁾	£2.99 off-peak; £7.99 anytime	UK geographic
40GB	24 hours (0845)	12 months	Wireless router, VoIP handset	Wifi roaming, VoIP telephony		UK off-peak
Unlimited	9am-8pm (free)	12 months	Modem	LLU telephony	£12 for UK unlimited	Bulldog customers only
40GB	8am-8pm (0845)	12 months	Wireless router	CPS telephony ⁽⁴⁾	£5.99	UK geographic
50GB	9.30-5.30 (0870)	3 months	None	VoIP	Free	VoIP
Unlimited	8am-11pm	12 months	Router	Television	£5	UK geographic
10GB	Online only	18 months	Set-top box	Television	N/A	N/A
50GB	24 hours (0870)	1 month	None	CPS telephony ⁽⁴⁾	Included	500 UK minutes
Unlimited	8am-midnight, 7 days, (0871)	12 months	Set-top box, modem	Telephony, cable TV	Included	UK evening and weekend
Unlimited	24 hours (0845)	12 months	Set-top box, modem	Telephony, cable TV	Included	UK weekend
2GB	24 hours (0870)	18 months	Wireless router	Mobile, VoIP telephony	Included ⁽³⁾	UK off-peak
Unlimited	9am-8pm (0845)	12 months	Modem	CPS telephony ⁽⁴⁾	Included	UK geographic
15GB	24 hours	12 months	None	LLU telephony	£15	Unlimited UK, certain international destinations
Unlimited	24 hours	12 months	Wireless router	CPS telephony ⁽⁴⁾	Included	Unlimited UK landline
40GB	8am-9pm (0871)	18 months	Modem	CPS telephony ⁽⁴⁾	Included	Unlimited UK, certain international destinations
Unlimited	8am-midnight (0870)	12 months	Modem	CPS telephony ⁽⁴⁾	Included	Unlimited UK geographic

³ Call options refer to VoIP calls via internet, rather than via the mobile contract; ⁴ CPS = Carrier Preselect, meaning you keep your existing line and phone number.

Our PCs, our planet

*Technology marches on, but at what cost to the environment?
Nigel Whitfield looks at the impact of PCs on our planet*

The digital world has many benefits but, let's face it, it's not the greenest of worlds. As our everyday gadgets go digital – PCs, monitors, personal video recorders (PVRs), chargers, printers, and so on – we are increasingly leaving them on standby, ready to bounce back on instantly.

It's more than a decade since equipment first started sporting the US Environmental Protection Agency's (EPA) Energy Star logo; awareness of pollution and ecological issues is much higher than it used to be, and two recent pieces of legislation – the Waste Electrical and Electronic Equipment (WEEE), and the Reduction of Hazardous Substances (RoHS) directives – mean that manufacturers and suppliers must pay more than just lip service to the environmental aspects of their products. But just how does the typical PC affect our planet?

Facts and figures

In a way, PCs aren't that much different from cars; when people talk about the environmental aspects, they concentrate on day-to-day use – how much fuel is consumed, or pollution caused, and so on. And, of course, we could all cut our carbon emissions by switching to a new electric or hybrid model and scrapping our old cars.

But things aren't as simple as that – it takes a lot of energy to scrap an old car, and to build a new one, and the same is true of PCs. You could buy the greenest PC imaginable and switch it off at the wall every day. But most of the damage has been done already in the construction and shipping of it. That's not to underestimate the need to switch it off, of course. According to the Government's recent energy review (www.dti.gov.uk/energy/review/), eight per cent of domestic electricity consumption is incurred by devices in 'standby' mode.

In fact, according to a study made a couple of years ago by the United Nations University (www.it-environment.org), the amount of energy used in making a typical desktop computer is equivalent to burning 260kg of fossil fuels. Over the typical life of a PC, that means 80 per cent of all the energy used will have been during manufacturing.

But fear not, you can make a difference by extending your PC's lifespan and ensuring that when you no longer need it, it reaches someone who can do something with it, saving them, too, from having to buy new equipment.

Unfortunately, all that is easier said than done. The requirements of each new generation of software are increasing, needing ever more powerful machines, which are being churned out at faster and faster rates, to meet the needs of not just ourselves, but of fast-growing and modernising economies, such as China and India.

The amount of energy consumed in making a new PC isn't the only reason to

'It takes a lot of energy to scrap an old car and the same is true of PCs'

avoid scrapping your existing one, of course. The components that make up your PC, while safe enough as long as they're sitting under your desk, can cause real problems when you come to dispose of them.

So, what's a typical PC made of? Why is it a problem? And what can you do about it? And, more to the point, what is anyone doing about it?

What's in the box

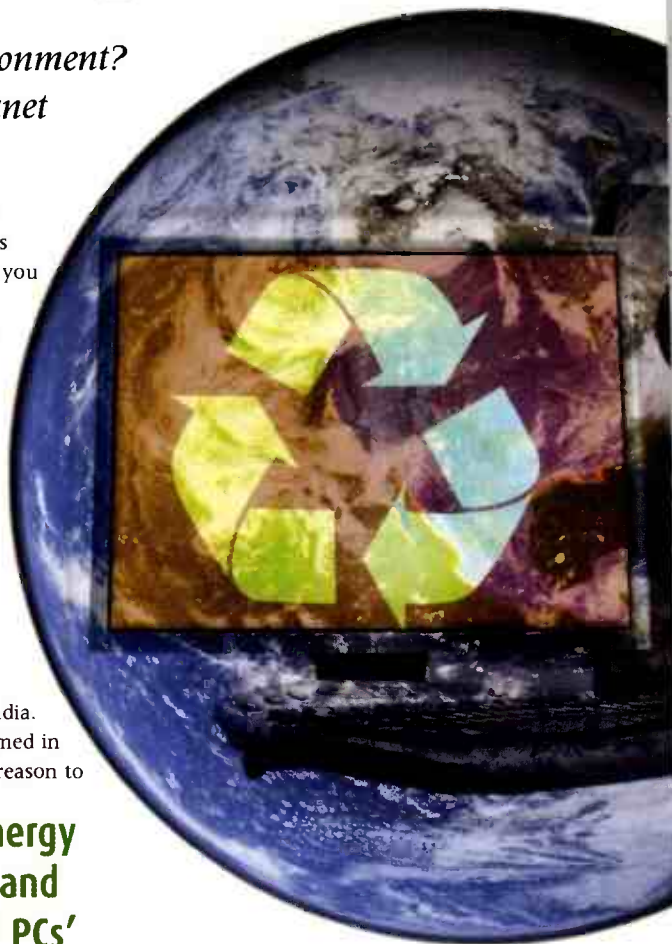
Starting on the outside, many computers, and other pieces of electrical equipment, are treated with flame retardants, using a class of

chemical called brominated flame retardants. Obviously, you don't want your computer catching fire and these chemicals, used in boards and plastic cases, help stop that. But, according to research, they don't break down easily in the environment, and long-term human exposure can cause memory or learning problems, and interfere with the thyroid gland.

Some metal casings, meanwhile, use hexavalent chromium to harden them, a compound that can be very toxic, and that is released by burning.

Your monitor, whether flat-panel TFT or traditional CRT, is also a cause for concern. CRTs contain lead, which is well known for its longer-term effects on the body; flat-panel displays often use mercury in the backlight illumination.

Sites such as WEEE Directory can help businesses find recycling services for their old equipment



Inside the PC, you'll find cadmium in Cmos batteries, which can affect kidneys and bones, more flame retardants in the circuit boards as well as, especially in older motherboards, beryllium. When motherboards are destroyed, beryllium dust can be released, which can affect the lungs.

Most visible inside your computer you will find lots of PVC, a material that we often take for granted, but when it is burned, poisonous substances can be released.

Disposal

But while there may be some pretty awful things inside your PC, they are not going to kill you. The chemicals and compounds that make up your computer are stable; it's simply when they're not disposed of properly that things can become a problem.

There are two solutions to this; the first is not to include them in the first place. The EU's RoHS (restriction of the use of certain hazardous substances in electrical and electronic equipment) directive, which came into force this year, restricts the amount of lead, mercury, cadmium, hexavalent chromium and brominated flame retardants that can be used in a wide range of products, including computer gear – although, oddly, it doesn't cover guidelines on batteries.

The second solution is to make sure that waste is disposed of properly, and the WEEE directive imposes requirements on manufacturers to take back equipment and ensure that it is recycled in an appropriate way.

So far, so good, you might think. There will be less of the nasty stuff in the future, and our existing stuff can be disposed of safely; in theory, households should be able to return used equipment free of charge, so it can be recycled.

Sadly, though, while the directive was supposed to be law by August 2004, many member states – including the UK – have been a little tardy in its implementation. Try calling a UK PC supplier and explain that you have an old computer of theirs that you no longer need, and you will almost certainly discover that they won't offer to take it back to recycle it.

If you're a business customer, you may have better luck; some firms, such as HP, have recycling services available, although these are often contingent upon you buying replacement equipment from the company.

It's not all bad news on the recycling front. A growing number of firms are offering to recycle or re-use old computers. They will either dispose of them safely, or ensure that they reach someone who can make use of them. This is often, as we explained earlier, a better option and goes towards extending the life of equipment as much as possible.

Where does it all go?

With EU directives on waste and toxic chemicals still waiting to be fully

Resources

Computer Aid International

www.computer-aid.org

Charity that accepts donations and gives computers to developing countries

Donate a PC www.donateapc.org.uk

Site that allows donors to list kit they have available for good causes

Greenpeace www.greenpeace.org/

international/campaigns/toxics/electronics

Details of Greenpeace's campaign about high-tech waste

IT & Environment Initiative

www.it-environment.org

Research and publications about IT and the environment

WEEE Recycling Directory

www.weeedirectory.com

Searchable directory of recyclers

Industry Council for Electronic Equipment Recycling (ICER)

www.icer.org.uk

List of WEEE recyclers and accredited UK recycling/refurbishing companies

implemented, what happens to your PC when it is thrown away?

A study in 2003 estimated that more than 130,000 tons of IT or telecoms equipment

What's lurking inside your PC?

PLASTIC CASE

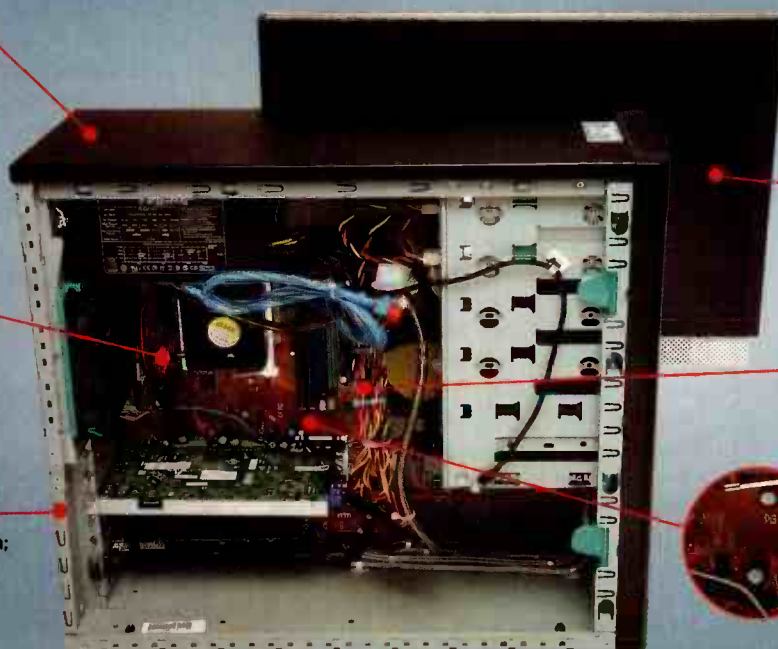
Brominated flame retardant; can cause neurological damage

BATTERY

Cadmium; causes kidney damage

METAL CASE

Hexavalent Chromium; a known carcinogen, also damages liver and kidneys



CRT

Lead; can cause neurological damage

FLAT-PANEL DISPLAY

Mercury; damages nervous system, may be linked to heart disease

CABLES

PVC; releases toxic compounds when incinerated

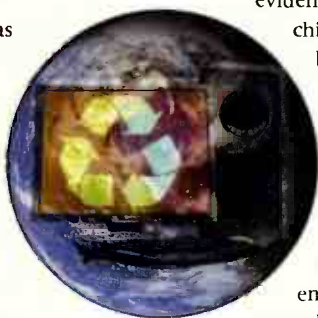
MOTHERBOARD

Beryllium, causes respiratory problems



was exported from the UK alone. Meanwhile, a Swiss study of the amount of electrical waste generated in the UK per year came up with a total figure of more than 900,000 tons – although that includes domestic appliances as well as computer equipment.

A key concern of many people is what happens when waste is exported. A report in 2002 by the Silicon Valley Toxics Coalition and the Basel Action Network, *Exporting harm: the high-tech trashing of Asia*, reported on how computer equipment is shipped overseas, primarily to



Sustain or collapse

Recycling, energy consumption and elimination of hazardous substances are only one aspect of the bigger issue of the sustainable use of natural resources.

As lucidly explained by Jared Diamond in his recent book, *Collapse: How Societies Choose to Fail or Survive*, the problems we face at the moment boil down to either ending our profligate exploitation of the planet's resources – whether renewable or non-renewable – or perishing as a civilisation, and perhaps even as a species.

For example, take two metals used widely in PCs: copper and aluminium. Both metals are non-renewable, finite resources, yet they are both eminently recyclable without loss of quality. For example, it's estimated that about 80 per cent of the copper ever mined is still in use.

But unlike, say, wood and paper products, consumers have no easy way of knowing how much of a PC's raw materials come from recycled sources, and thus are in no position to vote with their wallets, which is the most effective way of forcing the issue: DIY superstores selling non-sustainable timber products found this out over the past few years.

Perhaps it is time for us to start asking manufacturers exactly what we are buying so that we can do so with a clearer conscience.

Kelvyn Taylor

Don't just bin your PC – sites such as Donate A PC can help ensure it goes to a good cause

countries such as India and China, where it is recycled in less than ideal conditions.

For example, bundles of wire are often burned to destroy the PVC insulation to retrieve the copper cores, a process that can release toxic fumes. Circuit boards are burned or placed in acid baths to extract metals, a process often carried out in the open air, exposing workers to fumes and other contaminants. Worse still, photographic

evidence exists showing young children at work in scrap yards, being exposed to substances that can have a damaging effect if absorbed into the body at a young age.

It is not, then, sufficient to simply pass on your PC to someone who says they will dispose of it for you; you must ensure it is done in a responsible way that will not expose workers to more hazards, or pollute the environment.

When you buy a new one, it's worth investigating which companies have committed to remove toxic substances from their systems; you might think they should all be doing so with EU directives mandating it, but some are certainly lagging behind others.

RoHS compliance is a self-certification process, with no watertight guarantees of compliance. According to the environmental group Greenpeace, some companies are even going back on previous promises to remove problem substances (see box, right).

What can you do?

Recycling is a process that is, presently, much easier for companies to carry out than for individuals. But you can make choices that will help – for example, putting off buying a new PC until it is necessary. In many cases, a memory upgrade or a new graphics card may give your existing system the extra oomph it needs to keep going for longer (see Hands on Hardware, page 136).

And when it is time to finally buy a new system, find out about recycling options, or schemes in your area that will take your old computer and pass it on to those who need it, either locally or elsewhere in the world. Most local authority tips should by now have a drop-off point for electrical and electronic equipment.

It's also worth considering the environmental record of the

The front page may have a Recycle link, but there are no recycling schemes for personal users in the UK

Green credentials

You might think that, faced with a market of 300 million Europeans, and a directive that restricts the substances that can be used in products, as well as mandating recycling, that major companies would have everything in place to comply.

Unfortunately, that's not the case. Neither Dell nor HP, for example, has arrangements for consumers to return old computers to them. Both have, though, set goals for eliminating banned substances from their products, and HP is committed to working with others in the industry on finding new solutions.

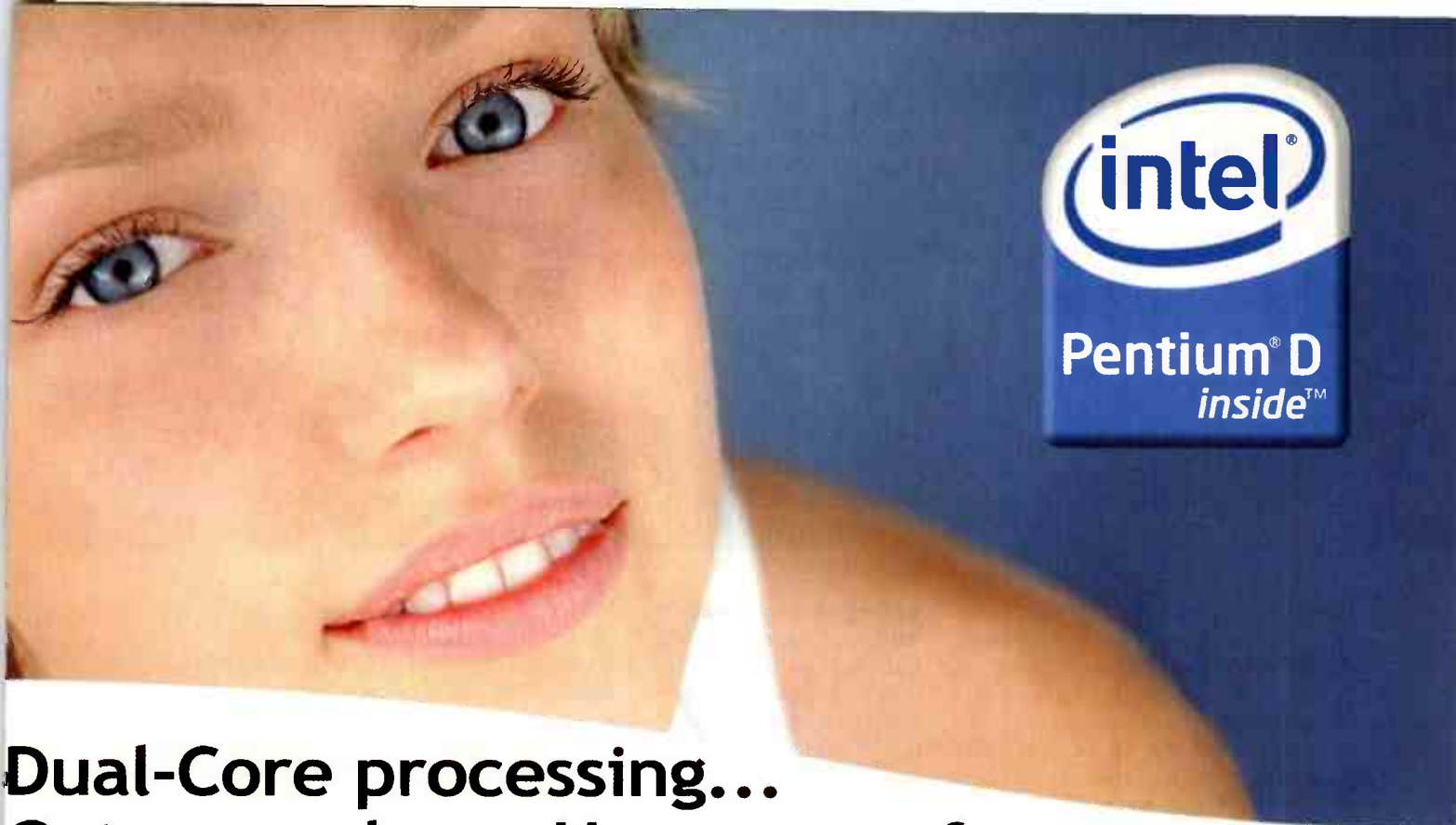
According to Greenpeace, the best companies – which include Nokia and Sony – are promising to remove extra harmful substances, rather than just the ones identified by laws around the world. Others, though, are doing the bare minimum to comply with rules such as RoHS. Greenpeace says one example is Lenovo, the Chinese company that has taken over IBM's PC business, which is worrying given China's poor record on pollution.

When it comes to not having any system in place for returning old computers, Dell and HP are not alone. We spoke to several other manufacturers that are still working to have something in place by the time the UK is officially compliant – a date that has been pushed back again from June of this year, following another round of consultation.

Evesham, for example, told us it is working with an industry group that is also providing WEEE services to the British Retail Consortium, to provide the necessary facilities, but the final details are still unclear.

company from which you're thinking about buying a PC – some are more committed than others to safe recycling and disposal. Don't be afraid to ask if they intend to comply with the EU directives and what other environmental policies and procedures they have in place. PCW





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Planning for Vista

When Windows Vista is finally released next year, many will wonder whether they should buy a new PC or upgrade their existing system. Paul Monckton sheds some light

For a few weeks during June 2006, Microsoft released Windows Vista Beta 2 as a free download to the masses for a sneak preview, prompting many people to think about gearing up to run the next generation of the Windows operating system.

The more adventurous among you will have downloaded and installed Windows Vista already, while the more cautious – or simply unlucky – will wonder how well the new operating system will run on current PCs – if at all.

With a redesigned user interface, different driver models for many classes of hardware and significant changes in the way programs are executed, there are many reasons a current PC may not transition seamlessly to Windows Vista, but in the interests of extending a current PC's useful life we'd suggest it's a topic worth investigating.

Microsoft has posted plenty of information online, perhaps too much to take in, as it's certainly a lot to wade through. Thankfully, there are some simple tools available (also still mostly in beta) that help you examine your PC and peripherals, and help you to decide whether it's possible to upgrade your current system, or whether you should just buy a new one.

In many ways, buying a new PC that's ready for Vista is simple. By looking out for the Vista Capable logos appearing on most PCs you can be confident that the new OS will run. If you simply must buy a new PC, then this is surely the way to go, although the logo doesn't tell the whole story.

Peripherals vendors also have the option of certifying their products under Microsoft's 'Designed for Windows' logo programmes, so you should be able to find out before you lay down your cash whether your new purchase will work properly with Vista.

But what of your existing hardware? Will you have to throw away and replace perfectly functional hardware due to a lack of drivers? What about the new digital media copy protection systems? Will your system be able to display high-definition content and play premium copy-protected audio? This simple guide will help.

Buying new hardware

Right now, if you want to buy a new PC that's ready for Windows Vista, you'll need to look for the Windows Vista Capable logo (pictured below). However, this logo in itself doesn't guarantee the slick, speedy Vista experience you may be hoping for, as the hardware requirements are very basic (see Minimum specs box below).

To most people, the minimum specs for a Vista-capable system describe a PC that is, not to put too fine a point on it, basically rubbish. A specification such as this is the minimum required to run the Home Basic version. If you own a system such as this, we recommend – quite strongly – that you *don't* try installing Vista if you want to remain sane.



You'll be seeing a lot more of the Windows Vista Capable logo over the coming months

In reality, you're unlikely to find a PC of this specification on sale today from large vendors. While 512MB of system memory and DirectX 9-capable graphics cards are commonplace, modern 800MHz CPUs are not. The term itself is rather vague – just what is a 'modern CPU'? Here the main CPU vendors have come to our rescue and produced their own list of suggested processors for use with Windows Vista (see table, page 44).

Current indications are that 512MB of Ram, while adequate for an entry-level XP installation, is going to be a severe performance bottleneck under Windows Vista. Expect to see plenty of systems on sale with 2GB and 4GB of Ram as standard – we'd recommend you prioritise

the amount of memory within your budget constraints.

Intel, ATI, Nvidia, S3 and Via have also posted information detailing which of their graphics chips support the new Windows Display Driver Model (WDDM) drivers required by Vista's Aero interface (see Aero graphics needs, opposite). Links to all these requirements can be found at the end of this feature, (see Links box).

The Windows Vista Logo

A minimum specification is far from useful when choosing a new system. As with previous versions of Windows, Microsoft has set up a more stringent certification programme that allows vendors to use logo stickers on compliant systems.

The Windows Vista Logo Program offers two levels of compliance: Basic and Premium logo levels can be applied to all Home Premium, Business, Enterprise and Ultimate editions of Windows Vista (there is no Premium logo for the Home Basic edition).

According to Microsoft, a product bearing the Vista Basic logo 'ensures reliability, stability, security and proper installation, as well as functionality that takes advantage of some of the latest Windows innovations'. That is all wonderful marketing speak, of course, but not very informative.

A product with the Premium logo enables enhanced capability with Windows, enabling a 'Premium experience' which refers to better graphics and multimedia capabilities. For example, audio devices with a Premium logo must support high-fidelity audio rather than the basic audio required to meet the Basic logo requirement.

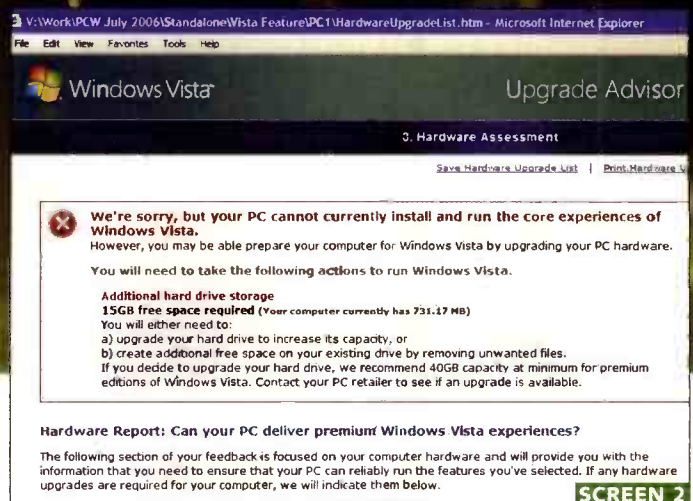
Minimum specs

According to Microsoft, the minimum hardware requirements for a Vista Capable PC are as follows:

- A modern processor (at least 800MHz)
- 512MB system memory
- A DirectX 9-capable graphics card, with WDDM drivers for Aero interface



SCREEN 1



SCREEN 2

Aero graphics needs

- Supports a Windows Display Driver Model (WDDM)
- Supports Pixel Shader 2.0 in hardware.
- Supports 32-bit per pixel colour depth
- 64MB of graphics memory to support a single monitor at resolutions less than 1,310,720 pixels
- 128MB of graphics memory to support a single monitor at resolutions from 1,310,720 to 2,304,000 pixels
- 256MB of graphics memory to support a single monitor at resolutions higher than 2,304,000 pixels
- Meets graphics memory bandwidth requirements as assessed by Windows Vista Upgrade Advisor running on Windows XP

If these descriptions seem rather vague, it's largely because the full list of requirements is so complex, but these can be found at www.microsoft.com/whdc/winlogo/hwrequirements.msp. But beware – there's a lot of information to wade through and it's subject to ongoing amendment as Windows Vista progresses from beta to final release. At the time of writing, the current version of the requirements is 3.04 (released 19 July 2006). It comprises three long documents and a 657-row spreadsheet.

For both levels (Basic and Premium) there are different requirements for five types of PC, each of which can appear under a consumer or business banner. It's really not going to be easy for ordinary users to keep track of it all.

Evaluating your existing hardware

If you do not plan to buy a new computer just to run Windows Vista, all is not lost. Microsoft is developing a small application to help determine beforehand whether your PCs and peripherals are up to the task. The

Windows Vista Upgrade Advisor beta is a small application, downloadable from Microsoft, that analyses your current Windows XP system and tells you whether it's ready to run Windows Vista, detailing what steps you should take to bring it up to scratch. You can try the Windows Vista Upgrade Advisor beta at www.microsoft.com/windowsvista/getready/upgradeadvisor.

Running Vista Upgrade Advisor

After running the system scan, you can select from a list of small advertisements for Windows Vista, choosing which of the features you'd like to be able to use (see screen 1). From this selection, the program will suggest the most appropriate edition of Windows Vista for your needs. Leaving only the minimum selected will get you Home Basic, whereas selecting them all will assess your readiness for the Ultimate edition.

The next screen (see screen 2) presents you with a hardware assessment, letting you know whether your system is currently capable of running the selected version of Windows Vista. Unfortunately, some

A software assessment checks devices



SCREEN 3

A hardware assessment will let you know whether your system is running Vista-compatible devices

work is still needed in this area: our test system failed on the grounds of insufficient free hard disk space. Although it contains four hard drives, only the primary hard drive is evaluated.

Finally, the section entitled Software Assessment gives you a report based on your PC's installed devices and the current availability of compatible Windows Vista drivers (see screen 3).

Here your devices, such as network adapters, printers and soundcards, are checked for compatibility. If current drivers for Windows Vista are available, then you're laughing – otherwise you're directed either to

Links to Vista-compatible hardware information

CPUs

Intel: www.intel.com/business/bss/products/client/vistasolutions/index.htm

AMD: www.amd.com/windowsvista

Via Technologies:

www.via.com.tw/en/products/vista/cpu.jsp

Graphics cards

Intel: www.intel.com/business/bss/products/client/vistasolutions/index.htm

ATI: www.ati.com/developer/windowsvista.html

Nvidia: www.nvidia.com/page/technology_vista_home.html

S3: www.s3graphics.com/en/products/vista/index.jsp

Via: www.via.com.tw/en/products/vista/platform.jsp

obtain new drivers online or to contact the manufacturer yourself to see if it has drivers in development.

If after having run the Upgrade Advisor you feel your devices are supported, then you should be able to install Windows Vista without too many nasty surprises.

Like Windows Vista itself, the Upgrade Advisor is also in beta and therefore subject to change. One proposed improvement is to evaluate your installed applications for compatibility, although as usual you can expect a rash of application patches and version updates over the coming months as the Vista launch date approaches.

Evaluating your hardware

Windows Vista itself has a built-in performance calculation, designed to rate your system's performance. In the public beta 2 release of Windows Vista, this is called the Windows System Performance Rating and it's this version that we'll look at here.

Subsequent development builds of Vista have renamed this feature the Windows Experience Index and changed many details. Again it must be emphasised that all of these features may continue to change between now and the final release of Windows Vista, but it's reasonably certain that some version of this feature will be in the final product.

The Windows System Performance Rating measures the performance of five key areas of your PC's hardware: CPU, Ram, hard disk, graphics and gaming graphics are given individual scores designed to be compared against scores that will be printed on the packaging of new PCs and peripherals.

Software vendors will also be able to use these scores to recommend performance levels suitable for running their applications by using a single number rather than resorting to long lists of technical specifications. The

Anti-piracy measures dictate hardware choices

Pressure from Hollywood and from the creators of 'premium' content (especially high-definition video) has been the impetus behind the huge amount of work that has gone into preventing such content from being copied illegally. The support for such content protection in Windows Vista unfortunately brings about compatibility issues never before seen in a Windows OS.

To play back premium content, devices such as monitors, graphics cards and soundcards will have to be compatible not only with Windows but with the copy-protection mechanisms used to protect the content. Device drivers will also have to be approved and digitally signed. And if software or hardware is hacked, mechanisms are in place to revoke their ability to play content. It's all very 1984-ish, but it remains to be seen how many of these capabilities are implemented by content creators. For example, most Hollywood studios have backed off from implementing the full range of DRM (Digital Rights Management) features (such as hobbling video resolution on analogue displays) in the first Blu-ray and HD-DVD releases for fear of consumer backlash.

Key to these copy-protection systems is High-Bandwidth Digital Content Protection (HDCP) support, without which multimedia content can be configured by the creators to refuse to play.

Today, HDCP-compliant monitors, such as Samsung's SM940BW, are available and you should opt for such models if you're planning to upgrade to Vista. Graphics cards have recently become available with HDCP support, but beware of earlier models that claim 'HDCP compatibility' but lack the vital encryption keys required for the system to work. If you intend to buy a graphics card that will play back HD content in the future, then make sure it contains a Key Rom, or a chip such as the popular solution from Silicon Image.

Nvidia's flagship Geforce 7950 GX2 products have full support for HDCP, although these are outside the price range of most consumers. ATI's HDCP-complaint solutions are based on much more affordable X1600PRO and X1300 GPUs, although neither offer enough power to decode the highest quality H.264 HD content.

application currently has built-in links to online resources to help you find suitable software. Of course, this is a political minefield – after all, no vendor wants to brag about how resource-hungry its software is.

The system as it stands is not without its problems. Due to the beta status of the rating tool, Microsoft isn't yet releasing full details of how these metrics are calculated or what scores you should expect to achieve. The overall system score is simply the lowest score taken from the five individual tests. In our case, it's the primary hard disk

that's holding us back, although none of the other installed hard drives have been taken into consideration.

Planning for the future

By the time the delayed final version of Vista appears there will be other twists and tweaks we haven't anticipated. But at least you should now be able to start formulating your buying or upgrading plans if you're still intent on moving to Vista. As ever, we'll keep you abreast of the latest developments in the magazine and at www.pcw.co.uk. PCW

Recommended CPUs

MANUFACTURER	INTEL	AMD	VIA
RECOMMENDED BUSINESS CPUs	Pentium 4 6xx with HT technology and EMT64	Athlon64 FX	C7
	Xeon (Dual-Core)	Athlon64 X2 Dual-Core	Eden
	Pentium Extreme Edition (Dual-Core)	Athlon64	
	Pentium 4 with HT Technology Extreme Edition	Sempron	
	Pentium D (Dual-Core)		
	Pentium 4 with HT Technology		
	Celeron D		
RECOMMENDED MOBILE CPUs	Core Duo	Turion64 Mobile	C7-M
	Core Solo	Mobile Athlon64	
	Pentium M	Mobile Sempron	
	Mobile Pentium 4 with HT Technology		
	Mobile Pentium 4		
	Celeron M		

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3WWLPW	Sony Docking Station for Vaio BX	133.25	113.41
4064PW	Sony USB Mouse - FS Series	33.45	28.47
3R4HPW	Sony On-Site Warranty for VGN-S3HP	218.55	186.00



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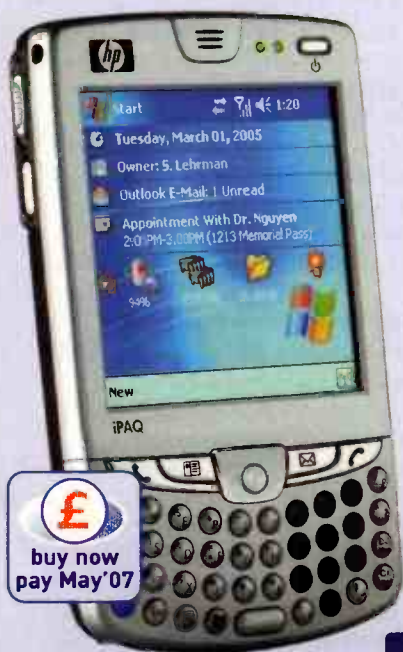
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quicklink 3W6NPW



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Microsoft's free tools

Hidden deep within Microsoft's web servers are several gigabytes of very useful free tools. Mark Schröder checks out over 100 of the best for Windows, security, internet, Office and multimedia

Every year, Microsoft publishes more than 1,000 new downloads. Its official website at www.microsoft.com/downloads lists about 8,800 files; in addition to these there are the development tools from the Microsoft Developer Network (MSDN) and administrative utilities at Technet (<http://technet.microsoft.com>).

With so many add-on utilities, updates, widgets and documents, it is almost impossible to find the download to solve your problem or to perform a particular task. And Microsoft's policy of not allowing magazines to distribute these programs and tools on their cover discs means that many of these useful programs go unnoticed.

So, in the tables later in this feature, we've done the donkey work and given you direct links to each piece of software – most of them are very small in size, so shouldn't take too long to download, even for those using dial-up internet access.

Tools from Microsoft's labs

Microsoft's Download Area is not your only point of contact for software. We have frequently found tools, officially still under development, that work fine. You can often find these programs online in Microsoft's Research Area (<http://research.microsoft.com>) or as links in blogs posted by Microsoft workers.

Examples include the Scalable Fabric desktop management system, which transforms the XP interface into a virtual desk; or the Virtual Wifi tool, that allows connections to multiple wireless networks using a single hardware adapter.

Security under Windows is always a big discussion topic. Spyware has become a serious problem and Microsoft is working on solutions. Windows Defender is one solution to the problem of effective data protection. Another everyday problem is the difficulty when taking group photos – there is always someone who isn't looking at the camera. Group Shot solves this problem by merging multiple segments from separate pictures.



USB Flash Drive Manager can be used for backup and to transfer WLAN access profiles from one computer to another

WINDOWS TOOLS

Microsoft makes available a wide range of utilities for Windows, ranging from universally useful programs, such as Windows Desktop Search, to specialist utilities, such as the Color Control Panel Applet.

Windows Desktop Search Find data on your PC quickly and reliably

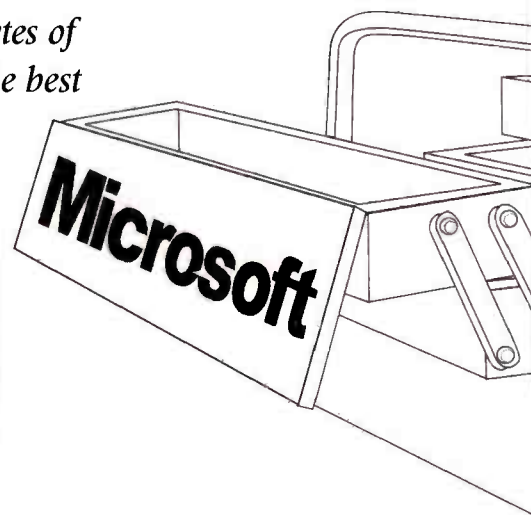
Compared with the built-in search tools in Windows XP, Windows Desktop Search will also find words or phrases in emails, attachments, chat records or documents. You can also search through music and video files. The utility adds itself to the Taskbar – unobtrusive, but always ready for use.

Hits can be displayed either in a pop-up window or in your browser. You can access the last-used search terms, preview the hits and start an online search with just a mouse-click. Filters for other file types, such as Pdfs or Open Office documents, can easily be added.

Group Bar

Control the way programs are grouped on the Taskbar

Group Bar guarantees the user control over a large number of programs that are running at the same time.



Using Group Bar, you can arrange various tasks into different application-independent groups. So you can put one Excel file into one group and another spreadsheet into another group.

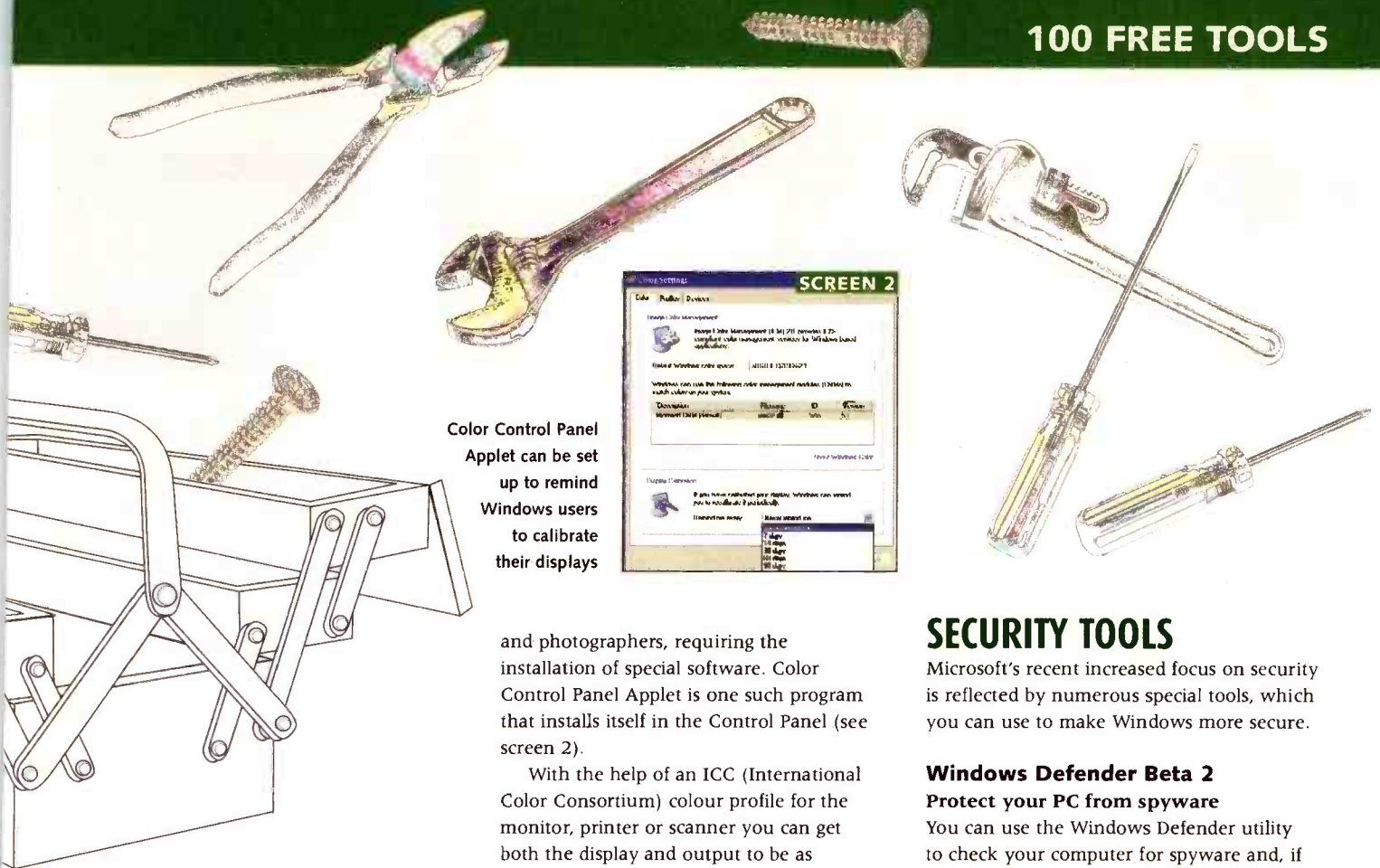
You can control how the grouped tasks are displayed by right-clicking on the green grouping areas: minimise them, arrange them next to one another, save the current view as a Snapshot or close them all at once.

USB Flash Drive Manager Synchronise data between a removable USB memory key and a PC

USB Flash Drive Manager offers functions for synchronising data between USB media and your hard disk, including the synchronising of drives, folders and, if required, individual files (see screen 1). Just a few clicks on the Settings tab enables you to transfer, for example, the configuration settings for a wireless Lan from a desktop computer to a USB key for use in configuring further PCs.

Shared Computer Toolkit The best way to lock down a shared computer

You can use the Shared Computer Toolkit to protect publicly accessible PCs or your own home computer from unauthorised access. This utility also prevents writing to or deleting from the hard disk. An eight-step wizard guides you through all the necessary configuration options. Included is a password checker and a limited user profile checker.



Color Control Panel Applet can be set up to remind Windows users to calibrate their displays

Keyboard Convert Service Use a foreign keyboard layout in English XP

You can use Keyboard Convert Service to switch between keyboard layouts. It makes use of the keyboard languages installed by Windows, such as Arabic, Czech, Greek and Russian. Keyboard Convert Service can switch the layout before text is entered or can alter the properties of selected paragraphs in Word so they appear as though they were entered with a foreign keyboard.

Color Control Panel Applet Advanced control of Windows colour management settings

Colour management is essential for designers

and photographers, requiring the installation of special software. Color Control Panel Applet is one such program that installs itself in the Control Panel (see screen 2).

With the help of an ICC (International Color Consortium) colour profile for the monitor, printer or scanner you can get both the display and output to be as accurate as possible. If there is more than one ICC profile installed on the system, you can use the Color Control Panel Applet's Profiles tab to compare profile graphs by clicking on the magnifier in the lower-right corner of the window.

Scalable Fabric

A Vista-like interactive desktop for Windows XP

Scalable Fabric is a novel experiment in user interaction for Windows XP. This tool can be used to define a 'boundary area' on your desktop. Inside this area, all open program windows behave as usual and are displayed at normal size, but if you drag a program window out of the boundary area, it is automatically minimised.

The mini-views get smaller the further a

program is dragged to the edge of your desktop. If two or more miniaturised programs are placed on top of each other, you can create groups of tasks which react together if moved within, or are dragged out of, the focus area (see screen 3).

In the blue focus area of Scalable Fabric, program windows appear at original size, but outside it they are miniaturised



SECURITY TOOLS

Microsoft's recent increased focus on security is reflected by numerous special tools, which you can use to make Windows more secure.

Windows Defender Beta 2

Protect your PC from spyware

You can use the Windows Defender utility to check your computer for spyware and, if necessary, remove any malicious code.

Quick Scan checks the typical places where spyware hides on a PC, such as the Registry. The optional Full Scan goes through the whole system looking for suspicious code. You can carry out a manual check using the Software Explorer from the Tools which also checks for running programs (see screen 4). This function also provides an overview of applications in the Autostart folder, loaded programs and utilities with an active network connection.

Regular updates, which can be set to download automatically, prevent new spyware from installing itself. Officially, this software is still in beta, but in our tests it worked fine.

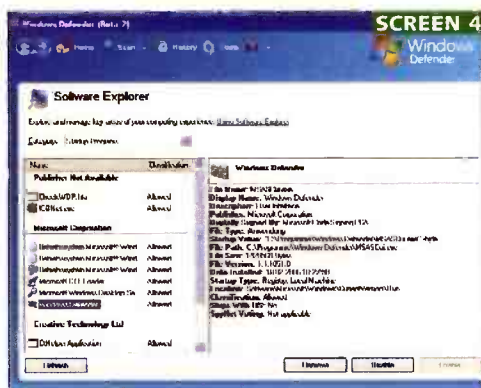
Malicious Software Removal Tool

A tool to clean up after a virus infection

The Malicious Software Removal Tool helps owners of infected PCs to clean up their systems. It has search and removal routines for widely distributed internet parasites, such as Blaster and Mydoom, plus hundreds of variants of viruses and worms.

Microsoft adds new virus definitions every month. You can run the program without installing it. If the tool finds malicious programs, it removes them automatically and records any modifications made in a log file.

However, it does not offer protection against virus infection, and therefore we strongly recommend that you also install a virus scanner.



Software Explorer, part of Windows Defender, also analyses Autostart programs

Promqry UI

Check the security of your internet connections

Promqry UI checks all of a system's available network interfaces for security. After starting a Query, all the installed adapters are interrogated. Promqry UI investigates whether or not they are working in Promiscuous Mode.

This can indicate the activity of network sniffers that might be logging or spying on network traffic. To check the communication within a network, you can scan the data traffic between a remote computer or several remote computers by entering an IP address or an IP range.

Port Reporter/PR Parser

Analyse your software's network traffic

Port Reporter installs itself as a service under Windows. It can be started either manually or automatically at boot-up, and it then logs all TCP and UDP network activity.

Port Reporter stores its log files in the Windows\System32 directory. The log files contain a detailed report on which programs are using which ports and which remote computers they communicated with. PR Parser acts as a viewer for the log files.

Outlook 2003 Junk Filter Update

Spam filter for Outlook

The level of frustration caused by spam is enormous, especially as the number of spam messages often far exceeds the number of genuine emails.

Microsoft now publishes new spam definitions at the same time as the regular monthly updates for the Outlook 2003 junk filter. The update is worthwhile, as its definitions enable the otherwise rudimentary Outlook anti-spam function to reliably weed out advertising.

To increase the filter's effectiveness, select Tools/Options in Outlook and click on the Junk Email button on the Settings tab. On the Options tab, alter the aggressiveness of the junk filter. In addition to this, you can add Trusted and Blocked senders to further limit who can contact you by email.

Add-in to remove hidden data

Get rid of hidden text from office documents

Word, Excel and Powerpoint save metadata, which could contain sensitive information, along with the visible content.

The Remove Hidden Data tool deletes such things as the record of changes, author details, hyperlinks or highlighted text. This utility adds itself to the File menu in Office applications. Clicking on Remove hidden data opens a dialogue box for you to enter a name for the cleaned-up version of the document. The add-in then scans the original files and removes all misleading or unwanted information.

MULTIMEDIA TOOLS

Your computer can double as a music box, photo album or video recorder by extending Windows XP with suitable free utilities.

Video Screensaver Powertoy

Use your own videos as screensavers

Instead of the fluttering 3D Windows flags, XP users can be entertained by videos during breaks (see screen 5).

The Video Screensaver Powertoy

uses not just videos in Windows' own Wmv format, but the program will also accept Avi, mp3 and Wav files. Winamp playlists can be used as a source too.

The configuration of the screensaver is done via the Control Panel's display settings. In a dialogue box, you can specify whether the videos should be played at an accelerated or slowed-down speed. You can preview the files using the Windows Media Player.



Instead of the fluttering Windows flag, the Video Screensaver Powertoy plays music or videos

Windows Media Connect

Transfer music from your PC to your stereo system

Windows Media Connect transforms your XP computer into a media server. On UPnP (Universal Plug and Play)-capable devices this software can stream user-selected multimedia content via a wired or wireless network.

Any directories on the PC or in the network domain containing music, photo or video files can be streamed. With the right UPnP hardware the content can then be played back on a television or stereo system. The program can use mp3 and Wav as well as Wma audio files and video in Avi, DVR-MS, Mpeg1/2 or Wmv formats. It can also use Winamp playlists.

Raw Image Thumbnailer and Viewer

Display Raw files from your digital camera

This add-on for Canon and Nikon digital cameras adds functions for viewing, organising and printing camera Raw format files to Windows XP.

As soon as it has been installed, you can manipulate the Raw images. For example, you can display thumbnails in Windows Explorer and view the file metadata. You can also use the Properties button to show a view, in a translucent window, of all the information stored in the Raw file (see screen 6).

Group Shot

Clever fixing tool for group photos

With a few mouse clicks you can use Group Shot to paste together a perfect group picture from several failed shots.

To do this, use the rectangular selection tool to select the correct portion of each of the originals. There is no need for precision, as the software recognises edges, shadows and overlapping objects automatically (see screen 7).

Rotation of the source material and brightness and contrast adjustment can also be set automatically, although you can do the corrections manually from the Tools menu. Group Shot can use photos in Bmp, Jpeg and Tiff formats, but can only export finished compositions as Jpeg files.

INTERNET TOOLS

Microsoft is having to pile on the pressure in the internet service market to compete with Google and others. The best results so far are the MSN Screen Saver and the Search Result Clustering Toolbar.

Search Result Clustering Toolbar

Sorting tool for web search results

The SRC (Search Result Clustering) internet search engine, which automatically categorises results from the MSN Index, is a product of Microsoft's Chinese research labs.

Enter a search term into the toolbar as normal and in a few seconds you get a list of matches in your browser. In addition, SRC shows clusters of hits within the numbers of results in the left margin. These groups are sorted according to the number and relevance of the sites found. You can then browse the cluster just as you would a directory tree in Windows Explorer.

MSN Screen Saver

RSS-enabled screensaver

MSN provides a screensaver that

Raw Image Viewer displays exposure information about the Raw image data in a translucent window

displays Jpeg images and shows information from RSS feeds in a translucent window.

Several feeds from the US channel MSNBC are included as standard, but you can easily add your own favourite feeds.

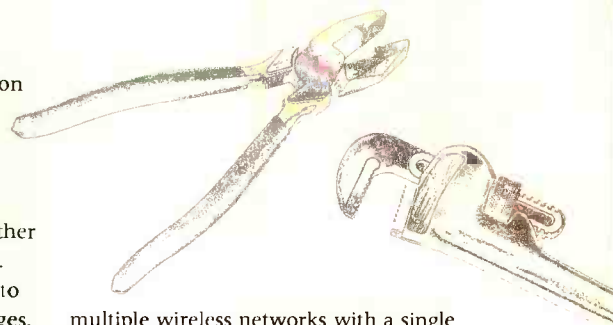
Another window displays current weather data – although for selected US cities only. The MSN screensaver can establish a link to MSN Messenger to recall incoming messages. The program can even automatically check Hotmail accounts for new messages.

Virtual Wifi

Access multiple Wifi networks

simultaneously using a single adapter

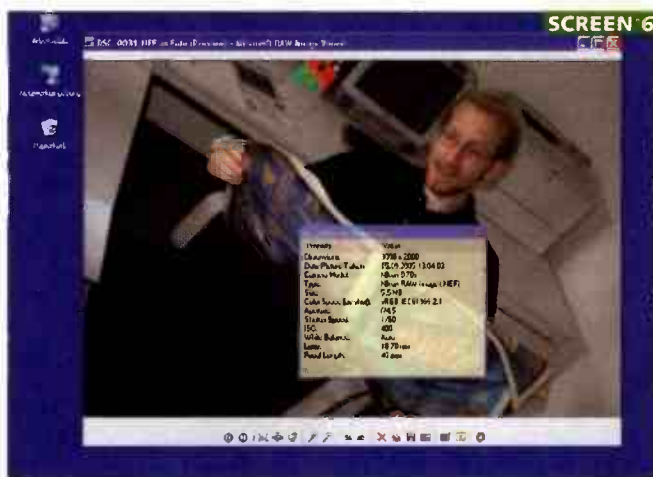
Virtualisation is a topic on everyone's lips. Virtual Wifi works by tricking the operating system into thinking there are several wireless network adapters installed. This makes it possible to simultaneously access



multiple wireless networks with a single hardware device.

Under XP, those programs can access the virtual Wifi adapter and use it for data transfer, just like a real one. It is also possible to connect to wireless networks using different standards (such as 802.11a and 802.11g) if the hardware adapter supports them.

For Virtual Wifi, Microsoft's developers use a process that rapidly changes the connection back and forth between the various networks.



Remote Desktop Connection Software

PC remote control via the web

To allow you to carry out support tasks directly on a remote PC, Windows XP has a feature called Remote Desktop Connection.

This allows you to demonstrate how to do things directly on the screen of another computer over the internet. If the target computer is not running XP, but an older version (Windows 9x, ME, NT4 or 2000), then this function will not be available.

But help is at hand in the form of the Remote Desktop Connection Software. After installing the client software on the remote computer you can access it from a Windows

Multimedia tools

PROGRAM	FUNCTION	URL
Audio Watermarking Tool	Generates digital watermarks as identifiers for music files	http://tinyurl.com/olpzt
Codec Installation Package	Complete set of Windows Media 9 Codecs for PCs without internet connection	http://tinyurl.com/l8jkk
Expression Graphic Designer 4.0.0.1015	Drawing program with support for vector and bitmap graphics	http://tinyurl.com/gr9yw
Expression Interactive Designer 0.1.2557.0	Design tool for interactive and multimedia GUIs	http://tinyurl.com/gyohr
Group Shot	Combines multiple photos into perfect group shots	http://tinyurl.com/cahdj
Max 1.0.60222.3	Photo manager with a slideshow engine and photo-sharing function	http://tinyurl.com/zydxl
Media Info Exporter	Write content of media library to Excel table or Word file	http://tinyurl.com/cbxbjk
Photo Story 3	Image editor for creating photo shows with commentaries	http://tinyurl.com/4cato
Plus Portable Audio Devices	Windows Media Player used as file manager for connected audio player	http://tinyurl.com/hocxw
PowerToy Wallpaper Changer	Changes desktop wallpaper at regular intervals	http://tinyurl.com/2meyw
Ratings Migration Power Toy	Copies user ratings from the media library to mp3 files	http://tinyurl.com/j9e29
Raw Image Thumbnailer and Viewer 1.0	Adds ability to view/print Raw format photos	http://tinyurl.com/cq8t9
Song Signature Plugin PowerToy	Adds information about songs being played to email as a footnote	http://tinyurl.com/nsqx8
Tweak MCE PowerToy 2.0	Tuning tool for Windows XP Media Center Edition 2005	http://tinyurl.com/5dp5j
Tweak MP PowerToy	Provides access to all options in Windows Media Player 9 and above	http://tinyurl.com/qjzv4
Update Rollup 2 for Windows XP Media Center Edition 2005	Adds support for DVB-T radio, the X-box 360 and double tuner for TV reception	http://tinyurl.com/86w6t
Video Cube	Plays back Avi files in 3D cube	http://tinyurl.com/psftk
Video Screensaver 1.0	Plays video files as screensaver	http://tinyurl.com/8pbpyf
Video Screensaver PowerToy	Plays multimedia files as screensaver	http://tinyurl.com/s2e36
Windows Media Connect 2.0	Transfers multimedia content via network to UPnP hardware	http://tinyurl.com/6t4ah
Windows XP Media Center Edition 2005 Create DVD Update	Update adds support for DVR-MS files to DVD burning engine	http://tinyurl.com/lyjnl
Yule Log Viz	Flames visualisation for Windows Media Player	http://tinyurl.com/ghyvk

XP Professional system on which the Remote Desktop Connection is active.

To do this, click the Start button and select the corresponding entry under Programs/Accessories/Communications and enter the remote computer's IP address.

OFFICE TOOLS

Office 2003 has been on the market for nearly four years, and Office 2007 with its new-look interface will soon be released. However, there are a few real gems among the free Office tools.

Lookout

Advanced search for Outlook emails

Lookout makes it possible to search for emails, attachments and address data within Outlook.

A toolbar embeds itself in the Outlook interface. Type a search term into an input field, and Lookout then displays the matches in a new window. In this window, you can use the Restrict option to filter, for example, results from a certain time period or certain contacts. Microsoft also uses the technology from Lookout in Windows Desktop Search and Outlook 2007.

Snarf

Social networking add-on for Outlook

Email clients have not yet fully mastered

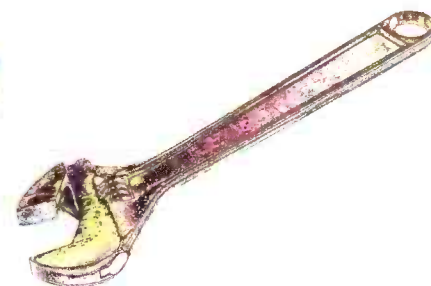


Group Shot generates perfect group photos from two or more attempts

social networking. Outlook might have lots of filters and sorting options, but it is lacking routines for analysing the relationships between email contacts.

Microsoft has changed this with Snarf (an abbreviation for Social Relationship and Network Finder). The program sorts mails, for example, into personal messages, mail-to lists and subscribed newsletters.

A special function of Snarf is the virtual meeting, in which a conversation is shown as a flow chart. Snarf prioritises correspondents with whom you frequently exchange email in a process



called 'email triage', to assess the importance of unread emails and display them with the most important at the top.

Word Redaction

Black out sensitive passages in documents

Microsoft Word does not have a function for blacking out sensitive words. The Word Redaction Add-In adds a tool bar to Word 2003. You use the mouse to select passages to obscure; these then appear on screen with a grey background.

The Redact Document menu option then creates a new file in which the selected words are replaced by black blocks. To be really certain that a word can't be guessed from its length, the amount of black around the hidden word can be increased. This will foil those readers who want to work out the original text based on the length of the blacked-out area. PCW

Windows tools

PROGRAM	FUNCTION	URL
.Net Framework 2.0	Run-time environment with features for Microsoft programs	http://tinyurl.com/8vgak
3D Windows XP screensaver	Screensaver with 3D animated Windows logo	http://tinyurl.com/4el4j
Activesync 4.2	Synchronisation tool for data exchange with PDAs/mobiles	http://tinyurl.com/rnxpu
Alt-Tab replacement	Displays preview of running program when switching tasks	http://tinyurl.com/2meyw
Clear Type Tuner	Improves the legibility of texts on LCD monitors	http://tinyurl.com/2meyw
Color Control Panel Applet 1.0	Extension for control panel to enable colour management	http://tinyurl.com/2meyw
Debugging Tools for Windows 6.6.3.5	Key to Windows blue-screen error code	http://tinyurl.com/2zost
Experience Pack for Tablet PC 1.0	Collection of six tools for Windows XP Tablet PC	http://tinyurl.com/3ufvx
Group Bar	Additional task bar with new style of grouping application windows	http://tinyurl.com/mwvdj
Keyboard Convert Service 1.0	Changes between country-specific keyboard layouts	http://tinyurl.com/pe6au
Log Parser 2.2	Powerful viewer for text and log files	http://tinyurl.com/5uoxz
Open Command Window Here	Adds a command window option to Explorer context menu	http://tinyurl.com/2meyw
Calculator Plus 1.0	Advanced calculator with currency converter	http://tinyurl.com/4lxa3
Scalable Fabric	Advanced window manager for the Windows desktop	http://tinyurl.com/wfa7
Scriptomatic 2.0	Generator for creating scripts to carry out admin tasks	http://tinyurl.com/dksk8
Shared Computer Toolkit 1.0	Secures the configuration on publicly accessible computers	http://tinyurl.com/a8vdm
Sync Toy 1.2	Synchronises data between files, folders and mobile devices	http://tinyurl.com/2meyw
Time Zone 2004	World time clock for the Windows desktop	http://tinyurl.com/5ws74
Tweak UI	Secret and hidden Windows configuration options in single window	http://tinyurl.com/2meyw
USB Flash Drive Manager 1.0.0	Synchronises data on USB stick and desktop PC	http://tinyurl.com/dktrj
Virtual Desktop Manager	Distributes Windows desktop on up to four screens	http://tinyurl.com/2meyw
Visual Studio 2005 Express	Cut-down version of the software development environment	http://tinyurl.com/2cqat
Windows Desktop Search 2.6.5 Beta	Finds search terms in emails, attachments, music and video files	http://tinyurl.com/oualw
Windows Installer 2.0 for Windows 95, 98, and ME	Run-time environment for current setup routines on older Windows version	http://tinyurl.com/6sqyy
Windows Installer 3.1	Run-time environment for current setup routines	http://tinyurl.com/4tyk9
Windows XP Tablet PC Edition 2005 Recognizer Pack	Extra languages for tablet handwriting recognition	http://tinyurl.com/b9yel

Security tools

PROGRAM	FUNCTION	URL
128-bit security for Pocket Internet Explorer Version 3.0	Add-on enables 128-bit encryption of internet transfers on PDAs	http://tinyurl.com/ql7cu
Account Lockout Status 1.0.0.60	Delivers detailed information via a special user account	http://tinyurl.com/ha5b6
Adware T.V. Media Removal Tool 1.1	Removes the advertising-financed TV Media software from Windows PCs	http://tinyurl.com/7wls1
Baseline Security Analyzer 2.0	Checks all settings with security implications on a PC	http://tinyurl.com/akmny
Cipher.exe	Completely erases deleted data from a Windows 2000 system	http://tinyurl.com/oulvb
Diagnostics for Microsoft VM 1.0a	Checks PCs for Microsoft's Java Virtual Machine or its components	http://tinyurl.com/5bqg8
File Checksum Integrity Verifier 1.0	Command-line utility to check for MD5 or SHA1 hashes	http://tinyurl.com/lfmn4
ISO image for security updates	Monthly CD image with all the latest security updates	http://tinyurl.com/ole8y
Make Me Admin	Allows users with restricted privileges to temporarily assume administrator status	http://tinyurl.com/c2zsc
Office 2003/XP-Add-in to remove hidden data 1.1	Removes treacherous metadata from Office files	http://tinyurl.com/6w8zl
Outlook 2003 Junk-E-Mail-Filter update	Monthly update for the Outlook 2003 spam filter	http://tinyurl.com/7wex7
Port Reporter 1.01	Tool to log TCP and UDP port activity	http://tinyurl.com/j6phm
Promqry UI 1.0	Identifies weaknesses in network interfaces	http://tinyurl.com/eawef
PR-Parser	Viewer for log files generated by the Port Reporter	http://tinyurl.com/bsym4
Rights Management Add-on for Internet Explorer 1.0	Shows content with restricted rights in IE	http://tinyurl.com/4nkpv
Security Assessment Tool 2.0	Evaluates organisation-wide observance of IT standards	http://tinyurl.com/2efex
Sub In ACL 5.2.3790.1180	Allows administrators to call up security information	http://tinyurl.com/6x22x
URL Scan 2.5	Restricts security-critical queries by the Internet Information Server	http://tinyurl.com/8l53r
User Profile Deletion Utility 5.2.3790.1060	Allows secure deletion of user profiles	http://tinyurl.com/cq78a
User Profile Hive Cleanup Service 1.6d	Ends all system processes before changing users	http://tinyurl.com/6g8nd
Windows Defender Beta 2	Spyware protection program with immunisation function	http://tinyurl.com/dyvaw
Windows Rights Management Client	Supports programs restricted by Windows Rights Management	http://tinyurl.com/c6oxm
Windows tool for malicious software removal 1.14	Checks for and gets rid of malware on Windows PCs	http://tinyurl.com/6bb67

Office tools

PROGRAM	FUNCTION	URL
Education Pack for Tablet PC 1.0	Five Office tools for Windows XP Tablet PC Edition	http://tinyurl.com/ayym4
Excel 2000/XP/2003 Add-in: Treemapper	Generates tree maps from Excel files	http://tinyurl.com/k7qr5
High Encryption Pack for Pocket PCs 1.0	128-bit encryption for PDA internet financial transactions	http://tinyurl.com/jh3fv
Lookout 1.2	Searches emails and attachments in Outlook	http://tinyurl.com/486pl
Lotus Notes Add-in for Windows Desktop Search 1.0	Access Lotus Notes email folders with Windows desktop search	http://tinyurl.com/fno3k
Office 2003 Add-in: Office Web Components	Components for publishing Office files on the web	http://tinyurl.com/2os9h
Office 2003-Add-in: Language settings	Controls the language settings in Windows, Internet Explorer and Office	http://tinyurl.com/cd8ot
Office XP/2000 Add-in: Visual Keyboard 2000	On-screen keyboard for multilingual text input	http://tinyurl.com/3hmvf
Outlook 2002 Connector 1.0	Access to Lotus Domino Servers for Outlook users	http://tinyurl.com/pn27s
Outlook 2003 Add-in: Personal folder backup	Saves personal folder contents at regular intervals	http://tinyurl.com/oh4l
Outlook Mobile Manager 2.0	Information manager, which only sends important messages to Windows PDAs	http://tinyurl.com/ntqcr
PST Import Tool for Entourage 2004	Import filter for Outlook 2001 for Mac PST folders	http://tinyurl.com/c3cwc
SMS Sender	Compose SMS messages on your desktop PC and send them on a mobile	http://tinyurl.com/m82wl
Snarf	Visualises social networks within email traffic	http://tinyurl.com/76uaw
Toolbar for international characters	Inserts foreign-language characters into Office documents at a click of a mouse	http://tinyurl.com/akns4
Visio Viewer 2003	Visio file viewer for PCs without Microsoft Visio	http://tinyurl.com/4l9ej
Windows Journal Viewer 1.5	Journal file viewer for PCs without Windows Journal	http://tinyurl.com/5x3pe
Word 2000/XP/2003 Add-in: Read in Microsoft Reader 1.1	Converts Word documents into ebooks for Microsoft Reader	http://tinyurl.com/e8akc
Word Add-in: Redaction	Tool to black out sensitive text passages	http://tinyurl.com/7v9mo

Internet tools

PROGRAM	FUNCTION	URL
Clear Cache Feature for Internet Explorer 1.0	Automatically deletes the contents of the IE cache	http://tinyurl.com/oejrc
HTML Slide Show Wizard	Generates slide HTML format	http://tinyurl.com/2meyw
Location Finder 2.0.0	Finds your current location on PCs with internet access	http://tinyurl.com/gtr76
Media Transfer 1.0	Transfers multimedia content as streams from desktop to tablet PCs	http://tinyurl.com/5nxwj
MSN Messenger 7.5	Instant Messenger with speech and video functions	http://tinyurl.com/7uf8f
MSN Screen Saver 1.00.0831.0	Displays news, weather and emails in a screensaver	http://tinyurl.com/9fr96
MSN Search Toolbar 02.05.0001.1119	Includes the PC in online searches	http://tinyurl.com/k3xs2
MSN Weather Add-in for MSN Search Toolbar 1.0.1536.0	Shows weather reports for selected US cities in the browser toolbar	http://tinyurl.com/jlgr8
Remote Desktop Connection Software 6.0.2600.0	Remote access to Windows PCs over the internet	http://tinyurl.com/5ztda
Search Result Clustering Toolbar 1.12	Clusters results from MSN Websearch into groups	http://tinyurl.com/zu9xs
Virtual Wifi	Software that enables you to access multiple WLANs with a single adapter	http://tinyurl.com/bpfk
Webcam Timershot	Webcam automation program that takes, reduces & saves photos at regular intervals	http://tinyurl.com/2meyw



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End of the office Stone Age

The new office file types from Microsoft and Open Office will create more cross-application compatibility when using Office documents. Mark Schröder explains the benefits



Small, compatible and secure are the watchwords of the new generation of office files. In future, all the important office software manufacturers are planning to use XML-based file formats. Despite this, there's no sign of a standard format emerging.

There are already two rival camps: the Open Document format being promoted by IBM, Sun (Star Office) and Openoffice.org, and Microsoft's own variant of XML. Office 2007 will read and write Microsoft's own Open XML files, but it won't support Open Document out of the box. Microsoft has recently relented somewhat with the announcement of its Open XML Translator project, which will let developers create a bridge between the rival formats.

Although this is being presented as a battle of the document formats, both sides are technically quite similar. Both file types have a common basis in XML (Extensible Markup Language). All alphanumeric document content – presentations, text or tables – is stored in XML files. All other document elements, such as graphics and

OLE (Object Linking and Embedding) or VBA (Visual Basic for Applications) objects, are strictly separated from them.

Further XML files belonging to the document can hold supplementary information (known as metadata) about format templates and definitions, comments, paths to linked resources, the author, number of characters and so on.

Open minded

In both Open Document and Open XML, all the constituent parts of the document are kept together in a Zip container file that appears as the actual document to the user. Both types of file use a compressed archive, which reduces the storage space required.

XML is slim, but this makes it smaller still. Embedded picture files are converted into a space-saving format during saves and then the lossless Zip compression shrinks them further. In our tests, files which were saved in the new format shrank by 50-90 per cent compared with their original size.

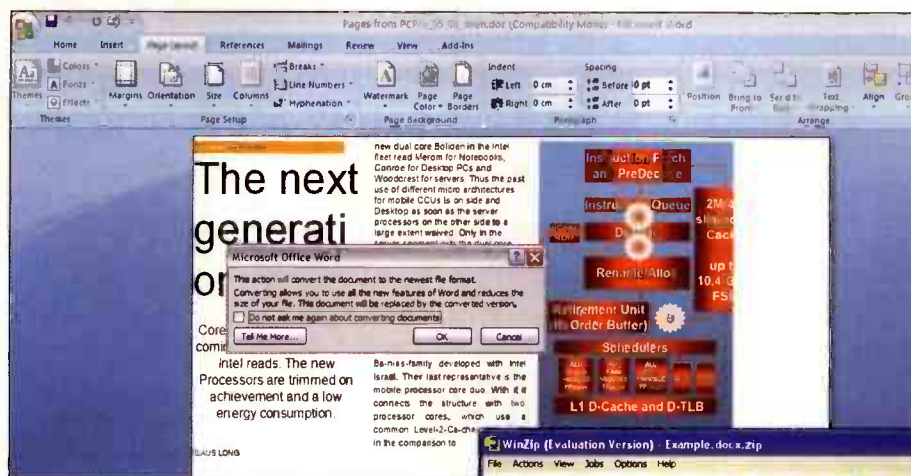
Better data integrity is promised by the use of a CRC checksum (Cyclic Redundancy

Check) – a familiar component of the Zip compression algorithm. This checks the integrity of each file in the archive. The CRC is highly sensitive to any modifications to the archived data. But even if part of the Zip archive contains errors, you can still make use of the remaining data.

Once a document has been saved from Star Office (Odt, Open Document Text) or Microsoft Word (DocX, Word Open XML), you can rely on the content being stored securely, having been checked by a proven algorithm. Separate data storage, compression and CRC testing also have other advantages.

As Windows has its own decompression routine, the use of Zip compression is a plus point. If need be the files can be worked on without any special software. Simply change the document extension from Odt or Docx to Zip. You can then view the data container like a compressed file with Windows Explorer or a Zip-compatible compression utility such as PKzip for Windows.

In the case of Openoffice.org, all the text is saved in pure XML files. You can use copy and paste to move it to another program –



The beta version of Word 2007 asks whether you want to upgrade an Office 2003 document to Open XML

for example, a text editor – without having the suite's Writer component installed on your PC. By using a PHP script and the add-on PCLZip (www.phpconcept.net/pclzip) it's possible to extract the content from large quantities of documents automatically.

The possibility of harvesting all or part of the content from Office files is very attractive for organisations needing to process the data from document management systems, and XML simplifies this process.

Data integrity

The differences between Open Document and Microsoft's Open XML begin at the file component level: Open Document places all the content, text, headers and footnotes into one file. Microsoft's Open XML also takes this data from the main XML file, which Word 2007 saves in the DocX container using the name Document.XML. The DocX file will also contain, for example, Header.XML, Footnotes.XML and Endnotes.XML. However, these only contain the footnote or header definitions.

From a user's point of view, the differences between the formats can have

If you change the extension of Open Document and Open XML format files, Winzip will open them like compressed directories

other consequences. In defective or only partially loaded new-generation files, things like embedded pictures can go missing, without the text content being damaged. This makes it easier to recover data from partially corrupt files. Microsoft's Open XML, thanks to its even stricter division between content and format, has an advantage over Open Document in this respect.

In Open Document, format definitions are stored together and storage space is used more sparingly than with Open XML. On average, Open XML files are two to three times larger than their Open Document equivalents.

The software manufacturers are moving in different ways to implement the competing file formats in their office suites. The Open Document faction – consisting of the Openoffice.org developers as well as Koffice, Sun, Novell, Oracle and IBM – uses the Odt file type by default, while still allowing conversion to previous formats and alteration of the default settings. Writer, part of Openoffice.org, saves as Odt not Doc. The same principle goes for Office 2007 and Open XML: XML is the default format, but in compatibility mode Word, Excel and

Powerpoint read and save the existing binary format files.

To allow users of older Microsoft programs can open Open XML files, conversion tools are supposed to be released at the same time as Office 2007. Users of Office 2000, XP and 2003 will then be able to read and write Open XML documents.

Although Microsoft promises to make the Open XML definitions available without charge, the format differs in this aspect from

Open Document. Its requirements are already public and developers can integrate them in their own products. The standards body Oasis (Organisation for the Advancement of Structured Information Standards) does not levy any licence fee for this.

Free tools for Open Documents

The availability of the Open Document standard is also bearing fruit in other areas, and tools have been developed that show the potential of future applications. An Open Document Converter (AODC) converts Open Document files into HTML pages. ODF Reader displays Open Document text in a Firefox 1.5 browser window. Still under development is the Open Open Office (O3) Plugin, which will allow Microsoft Office users to work on Open Document files.

Even if it looks as if there will be a format war between Open Document and Open XML, the users will be the winners, as the common basis of the file types – XML – will mean more cross-application compatibility and portability when using office documents.

Further information

Definition of the Open Document standard
www.oasis-open.org/specs/index.php#opendocumentv1.0

Open XML Formats Developer Group
<http://openxmldeliverer.org>

Microsoft Open XML Translator project
<http://sourceforge.net/projects/odf-converter> PCW

Programs that support Open Document formats

SOFTWARE	URL	OPEN DOCUMENT IMPORT/EXPORT	OPEN XML IMPORT/EXPORT
Abisource Abiword 2.4.2	www.abiword.org	✓/✓	✗/✗
AODC 1.2.0.1 Beta	http://aodl.sf.net	✓/✗	✗/✗
Corel Wordperfect Office X3	www.wordperfect.com	Planned/Planned	Planned/Planned
Google Writely	www.writely.com	Planned/Planned	✗/✗
IBM Workplace 2.6	www.lotus.com/workplace	✓/✓	✗/✗
Koffice 1.4.2	www.koffice.org	✓/✓	✗/✗
Microsoft Office 2007	www.microsoft.com	✗/✗	✓/✓
ODF Reader 0.1.1 for Firefox	http://addons.mozilla.org/extensions	✓/✗	✗/✗
Openoffice.org 2.0.2	www.openoffice.org	✓/✓	✗/✗
Open Open Office for MS Office	http://o3.phase-n.com	Planned/Planned	✗/✗
Sun Star Office 8	www.sun.com/staroffice	✓/✓	✗/✗
Softmaker Textmaker 2006	www.softmaker.com	✓/✗	✗/✗

Other programs support the Open Document formats. The most important are listed here



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Happy birthday, PC!

In PCW's November 1981 issue, David Tebbut wrote a world exclusive review of the very first IBM PC. This is an abridged version to commemorate the 25th anniversary of its launch

With more than a little help from its friends, IBM has come up with a real stunner and, much to *PCW*'s delight, has named it the IBM Personal Computer.

The system has much to commend it, both for serious and fun applications, since it can grow from a fairly expensive cassette-based configuration to a full-blown twin disk/colour graphics machine that offers the competition a fair run for its money. It almost goes without saying that the computer is well made, keeping up IBM's almost legendary reputation for quality.

After watching the growing personal computer industry very carefully, IBM finally cranked its own PC project into action about 14 months ago. The public was becoming aware of the usefulness of these machines and prices were dropping. This was enough for the grey giant and it made its move.

By swearing certain key people and companies to secrecy, IBM was able to discuss its plans with those who already knew what the microcomputer game was all about. Microsoft, for example, was involved right from the beginning. However, at the moment the machine is only sold in the US. IBM will not say when, if ever, it will come to Britain.

The minimum configuration is in two parts: a system unit, which houses the memory, processor, loudspeaker, power supply and slots for up to five expansion cards; and a keyboard, connected by a six-foot coiled flex. One or two 5.25in disk drives can be installed in the front of the system unit. A monitor or domestic television is also needed and, for those without disks, a domestic tape recorder with a DIN connection. IBM supplies an Epson printer as its standard listing device, although you can attach a printer of your own choosing.

The whole design is very pleasing and all the parts clearly belong together. Everything is designed with a first-time user in mind. IBM has gone overboard to make the system as easy as possible to configure and use. IBM supplies a monochrome monitor with a very steady, clear display of 25 rows of 80 characters; a colour monitor or the TV gives



This IBM Personal Computer Model 5150 is *PCW*'s very own example that's still in perfect working order – apart from a couple of missing case screws

you an option of 24 rows of either 40 or 80 characters. The graphics resolution is not as good in colour: each character is 7x7 dots in an 8x8 box, compared with 7x9 in a 9x14 box in monochrome.

IBM warns that certain televisions and monitors (not its own) can cause data errors on disk transfers unless the screen is at least 12in away from the system unit. The colour monitor requires a special adaptor in one of the expansion slots which supports up to 16 colours in text mode, up to four in medium resolution (320x200) and only black and white in high resolution (640x200).

It also allows you to define 128 graphics characters of your own. The board can also handle a light pen. To use your TV you'd have to buy an RF modulator.

The IBM monochrome monitor is a very high-quality 11.5in green phosphor device with an antiglare screen. It gives a rock-steady display with no trace of flickering or that high-pitched whistling that sometimes occurs. The steadiness is achieved by using a high-persistence phosphor coating that takes a fraction of a second longer to clear than most screens, although I can think of one or two machines that are far, far worse.

In normal use, it's doubtful you'd even notice it. The mono display adaptor, which occupies one of the expansion slots, doubles as a port for the Epson printer, so this will need a separate adaptor if you choose colour.

The standard device is the Epson MX-80 tractor feed with some soundproofing. The cable costs \$55 extra (£30 at today's exchange rate). The 'typamatic' keyboard is a work of art. Offering tactile feedback and automatic repeating on certain keys, it contains every key you could imagine using, all in a well-designed unit that owes a lot to IBM's experience in typewriter design.

It has 10 function keys, some assorted control keys and a separate numeric keypad that, when you toggle the NumLock key, accesses insert, delete, cursor, page up and down, home and end functions.

Tabbing can be both forward and backward, and a Prtscr key allows you to dump text from the screen to the printer. When programming in Basic, you can print most of the commonly used commands by hitting a single key with the Alt key depressed. The 10 function keys are defined to give single-stroke facilities such as Save and Load, and you may redefine them by using the Key command in Basic. However, a mysterious key called Scroll Lock doesn't actually do anything.

The Benchtest systems each had two drives taking disks holding 160KB in 40 tracks of 8 x 512-byte sectors. Inside the System Unit is an 8088 processor which has an internal 16bit structure, 8bit data transfer and 20bit addressing capable of addressing up to 1MB of memory.

The 8bit data bus makes the 8088 compatible with the popular 8080/8085 support circuits. You get from 16KB to 256KB of RAM, plus 4KB or (with colour) 16KB of display memory on the adaptor card. Up to 64KB is held on the processor board and additional memory comes in 32KB or 64KB boards that plug into one of the expansion slots.

Other cards currently available are a game control adaptor and an asynchronous communications adaptor – an RS232C/current loop interface which can be driven between 50 and 9600 baud. Typically, a colour/graphics card takes one slot, the printer another, and the disk drives another. This leaves two slots free for games, communications and extra memory.

I'd say this package will suit 99.9 per cent of prospective purchasers' requirements. Microsoft's Cassette Basic interpreter, which takes up in 40KB of ROM with some I/O routines, comes as standard.

Enhancements and the Disk Operating System (DOS) are loaded from disk. Every peripheral is interrupt-driven, which means that when a particular device is not doing anything, it is ignored. Once it has something to say, it interrupts the processor to demand attention. This makes programming much easier and also makes the machine run significantly faster by avoiding waiting time.

Our Benchmarks weren't designed to highlight this sort of activity so, although they're fast, they're not extraordinary. At switch-on the system runs its own internal diagnostic routines and beeps when it is ready for you to load programs or whatever. It will also react to certain key combinations. For example, if you want to reboot the DOS, press Esc, Alt and Del [sic], while Ctrl with NumLock suspends program execution.

Software

All software except Microsoft's Cassette Basic is sold as an extra. Products available during benchtesting include Disk Basic, Advanced Basic, DOS, EasyWriter, VisiCalc, Adventure, some accounts and communications software, and a Pascal Compiler.

IBM didn't see any point in starting software development from scratch and got companies to produce the IBM versions of their packages. Microsoft published the Basics, Pascal compiler, DOS and the Adventure game. Personal Software published VisiCalc – a souped-up version of the [spreadsheet] program we know and love.

EasyWriter, from Information Unlimited, is an interesting word processing package

'I'm not too sure about the hobbyist being able to afford it'

because it is entirely memory-resident. This means that individual text files can't exceed 18,500 characters; however, a linking function allows EasyWriter to treat a number of separate files as a single file. You can move blocks of text around to do word counts and even undelete stuff, provided you haven't moved the cursor since the delete took place. Even my lovely SpellBinder doesn't offer the last two functions.

The built-in Cassette Basic is a superset of Microsoft's Basic-80. It allows you to use all 256 characters, plot in medium or high-res graphics, play sounds through the loudspeaker and control light pens and joysticks. It can handle up to 17-digit precision, full floating-point arithmetic. It does borrow 4KB of user memory.

Disk Basic uses 24KB, plus a 1.5KB for the communications facilities. It allows you to handle disk-based files, keep track of the date and time, handle two additional printers and drive an RS232 port.

Advanced Basic pinches 29KB of memory, plus that extra 1.5KB for communications. It includes a graphics macro language which offers statements such as Put, Circle, Get, Paint and Draw. A neat trick in text mode allows you to define an active page and a visual page. One screen can be on display while your program prepares the next for display.

Configuration

CPU	Intel 8088, 4.77MHz
RAM	16-256KB, plus 4KB or 16KB video RAM
ROM	40KB
Disks	Up to two drives, each 160KB
Cassette	Accepts user's own cassettes

A music macro language allows you to create music and sound effects. Having initiated the playing process, the system gets on with it while you do something else, so you can play a musical background to a game, for example.

No, this isn't the same DOS as the IBM mainframes. Some people call it PC-DOS just to differentiate, but I'll stick to DOS for this article. Not surprisingly, it is similar to CP/M in its range of facilities, but it is a lot more friendly. For example, if you want to copy files in CP/M you have to load the PIP facility and then give the necessary instruction. In DOS you simply type Copy, the name of file to be copied and the new file name. However, with PIP it's back to front – you have to start with the new file name.

Other DOS functions allow you to copy a whole disk, compare the contents of two files or a pair of disks, erase files, rename files, format a disk, list the contents of a disk, type the contents of a file and put the DOS on to another disk. Nothing unusual about that I hear you say. Well, that's true, except all the instructions are near enough in English; for example, DISKCOPY.

Who'd use it?

IBM sees its Personal Computer being used in the home, the office, the lab and the school. It defines its users as small businesses, the self-employed, departmental users, home users and hobbyists. That just about covers everyone, doesn't it? I'm not too sure about the hobbyist being able to afford it. All the hobbyists I know are beavering away on low-budget equipment, with half the fun being able to make these puny systems really perform. I'm not sure they'd be happy with everything done for them.

All the dealers appointed by IBM have to agree not to exaggerate the capabilities of the equipment and to do warranty work, regardless of where it is bought. So, if the IBM Personal Computer ever comes to Britain, you have some idea what to expect.

This is probably the most professionally put-together system I have seen. The only thing missing at the moment is a wide selection of packages, but I rather feel that the whole world and its grandmother will be frantically trying to fill that particular gap.

IBM has paid great attention to the details of the hardware, software, documentation, distribution and support. In a word, it's a knockout. I wish it were on sale here. **PCW**



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THE CORE OF MATTERS

If you've been keeping an eye on the reviews on our website, you'll already know that Core 2 Duo has been breaking all previous performance records. The fastest, Chillblast's overclocked Core 2 Duo system (see page 62), powered its way to a gigantic score of 424 in our Sysmark 2004 SE benchmark. Core 2 Duo for notebooks is due for release in late August, and we're expecting a similar leap in performance.

With Vista looking set for a January 2007 launch, anyone thinking of buying a new PC will want to make sure it's able to handle Microsoft's new operating system. Although minimum specs for Vista are very low (800MHz processor, 512MB of Ram), if you want to have the full Vista experience you'll need something with a bit more grunt. With this in mind, we've taken a look at a group of £1,299 PCs that will take Vista in their stride. Head to page 95 to read more.



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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.



Editor's Choice



Recommended



Great Value

REVIEWS



'Our round-up of high-end PCs brings you an assortment of Vista-ready PCs to fit your budget'

Read the review on page 95

CORE 2 DUO PC

Chillblast Fusion Hardcore Crossfire

Overclocking makes this PC the fastest we've ever seen



A Zalman fan keeps the Core 2 Duo processor cool

The launch of Intel's Core 2 Duo and Core 2 Extreme processors herald a new dawn for computer gaming enthusiasts.

Both are fabricated using a 65nm manufacturing process, which Intel initially used to construct high-end Pentium D chips.

They are well equipped with 4MB of Level 2 cache and an effective front-side bus speed of 1,066MHz (actually 266MHz, but data is transferred four times per clock cycle).

Such a large unified cache and speedy channel to access Ram, among the other architectural improvements, more than make up for the clock speed deficiency of these chips when compared with the later revisions of the Pentium D that reached 3.6GHz.

The Core 2 Duo processor that powers this PC is the fruit of Intel's Core Micro-architecture research. The CPU is significantly more powerful than the Pentium D or AMD's X2 dual core, but is also more power efficient.

The Chillblast Fusion Hardcore Crossfire has a Core 2 Duo E6700 with a regular clock speed of 2.67GHz overclocked to 3GHz. No changes to stock voltage need to be made, but an Arctic Cooling Freezer 7 pro cooler is used to prevent the processor running hot.

It didn't disappoint in performance benchmarking, managing a whopping score of 424 in Sysmark 2004 SE and an equally impressive 7,930 in PCmark05.

This is the fastest PC we have ever had in the PCW labs. It has regained the top spot on our Test Bed PC performance charts for Chillblast which was knocked off, albeit only for a day, by Hi-Grade's Core 2 Duo PC: the Ultis Tachyon (see www.pcw.co.uk/2160263).

To cement the gaming credentials of this PC, Chillblast included 2GB of Ram and two ATI X1900XTX graphics cards connected in a Crossfire configuration. A great, if not world-beating, score of 10,410 in 3Dmark05 was achieved with this setup.

Four monitors can be supported with the two DVI outputs on each of the cards, but only two when Crossfire is enabled.

Storage space isn't a problem in this PC as 474GB is supplied by way of a 74GB Western Digital Raptor and a 400GB Seagate hard disk. The high-speed 10,000rpm Raptor is used for storing data and programs that are regularly accessed.

The potential for you to build upon the current hard disk setup is aided by the motherboard that supports Raid. An external Sata connection allows you to hook up an external drive with a faster channel than if you were to use an external USB2 or Firewire drive.

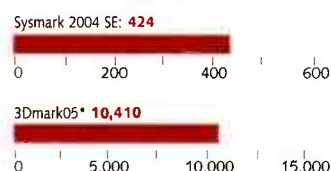
The PC is housed in a dark metallic CoolerMaster case, which has a solid feel. Access to the NEC DVD Burner is via a door on the front panel. Along the top lie two USB ports, a Firewire port, headphone and microphone sockets. Four additional USB ports are located at the back. Two Gigabit Ethernet ports and 54Mbps/sec wireless capability are provided for the ultimate level of network connectivity. The PC is shipped with Windows XP Professional.

This PC delivered unparalleled benchmark scores in the context of pre-Core 2 Duo computing, so high-performance users and gamers will be well served.

You can find more Core 2 Duo and Core 2 Extreme reviews on our website www.pcw.co.uk, and you can also listen to a podcast on this PC at www.pcw.co.uk/podcasts.

Marc Delehanty

Performance



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

Details

Price £2,099.95
Best price www.pcw.co.uk/bestprices
Contact Chillblast www.chillblast.com
System requirements Intel Core 2 Duo E6700 (2.67GHz) overclocked to 3GHz • 2GB DDR2 Ram • Asus P5V DH Deluxe m'board • Western Digital Raptor 74GB disk • Seagate Barracuda 400GB disk • NEC ND-4571 DVD Burner • ATI Radeon X1900XT Crossfire 512MB graphics • ATI Radeon X1900XTX 512MB graphics

Verdict

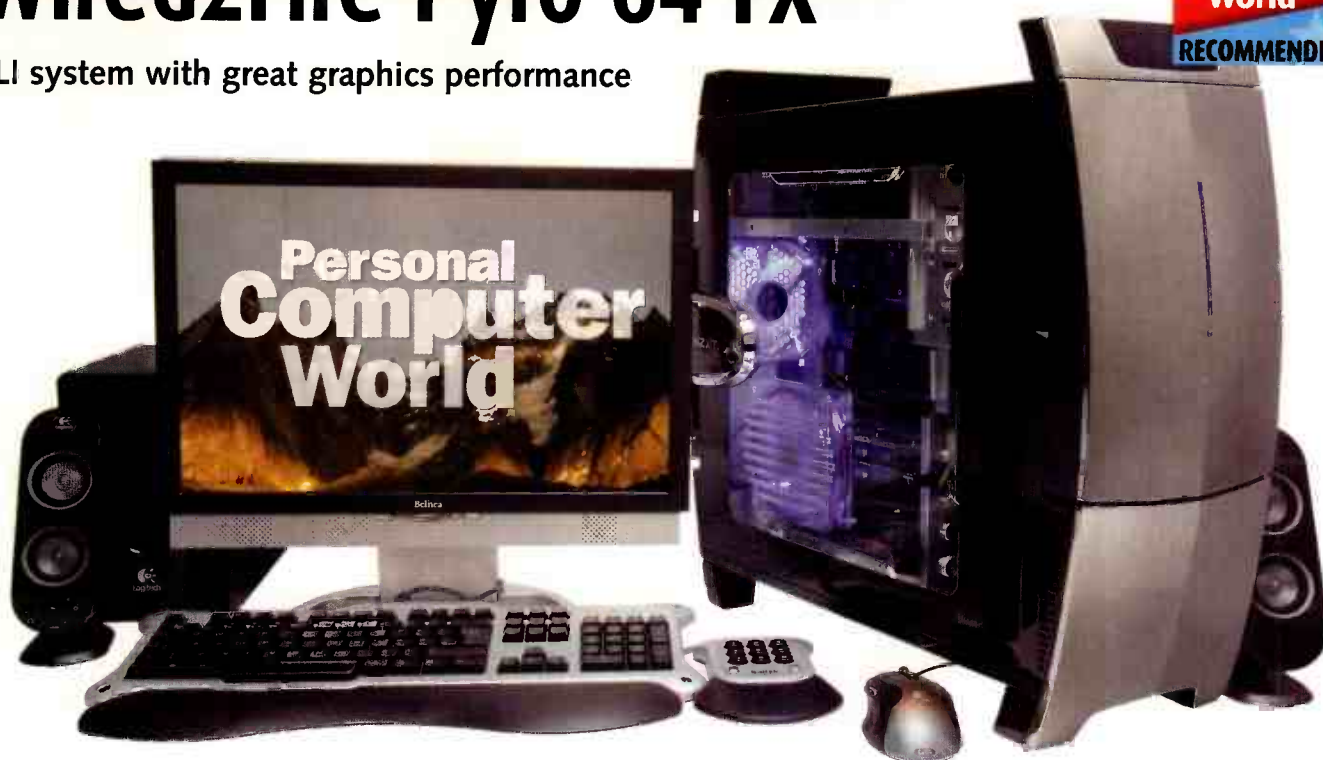
Pros Pre-overclocked
Cons No monitor; expensive
Features ★★★★★
Performance ★★★★★
Value for money ★★★★★

Overall With an overclocked Core 2 Duo processor, Raptor hard disk and ATI Crossfire graphics, this PC is lightning fast
 ★★★★★

AMD GAMING PC

Wired2Fire Pyro 64 FX

SLI system with great graphics performance

**Personal
Computer
World**
RECOMMENDED


The Pyro 64 FX is Wired2Fire's latest gaming PC. While most of the desktops we've seen recently have been Intel Core 2 Duo models, Wired2Fire is sticking with AMD. This model is powered by a dual-core Athlon X2 4800+ via an AM2 socket.

Thanks to recent AMD processor price drops, Wired2Fire was able to slash £200 off the RRP for this system while we had it in for testing, pricing it at just under £1,700.

The motherboard and components are housed in a visually appealing NZXT Lexa case. It has a striking design and a metallic-looking front, which opens up to reveal a card reader, USB port and two optical drives. Although it looks impressive, the front access door isn't particularly sturdy and has a plastic feel to it.

Two USB and one Firewire port, along with a microphone and headphone jack, are all easily accessible at the side of the case. A panel at the top of the case digitally displays the CPU, hard disk and system temperatures.

The case is raised about 1.5in off the floor, enabling a fan to be placed at the bottom. A side window provides a glimpse of the system in action, while a huge fan at the back keeps this PC running cool.

The Pyro 64 FX flew through our benchmarking tests, with scores of 270 in Sysmark 2004 SE and 5,846 in PCmark05. Results such as these are impressive, but must also be assessed in the context of other PCs being released based on Intel's Core 2 Duo, some of which – although expensive – are achieving Sysmark 2004 SE scores in excess of 400: see our performance results at www.reportlabs.com.

Gamers will be pleased to see the inclusion of a top-end Nvidia Geforce 7950GX2 graphics card.

Although a single card, it runs in SLI (Scalable Link Interface) mode as a result of having two GPUs. Having SLI on one card in this fashion means there are only two DVI outputs, but it does leave the door open for Quad-SLI at a later stage.

A 3Dmark05 score of 12,763 puts the Pyro 64 FX in the top five gaming PCs we've seen in our labs. All this means is that even the latest games will run smoothly at high resolutions: we recorded a consistent 91fps (frames per second) in our Far Cry test.

They look good, too, as Wired2Fire ships this PC with a 20.1in widescreen Belinea 10 20 35W TFT, which supports a screen resolution of 1,680x1,050. It has built-in speakers, but unless you're short on desk space you'll want to use the included Logitech X-230 2.1 speaker set instead. For true immersive gaming, consider upgrading to a 5.1 surround-sound set.

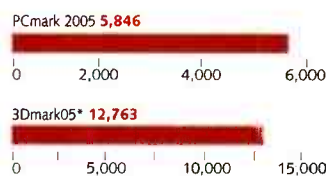
PC manufacturers often skimp on peripherals in order to cut costs, but this certainly isn't the case with Wired2Fire. The gaming credibility of the Pyro 64 FX is enhanced by the inclusion of a Logitech G5 laser mouse and Saitek Lit keyboard.

The mouse is comfortable and has some great features, including the ability to change cursor speed using buttons on the mouse, and low-friction pads on the underside to aid movement. Furthermore, an adjustable weight cartridge can be fitted inside the mouse to customise its movement. The only drawback is that it isn't wireless, but those who've suffered drained batteries during an online shootout won't mind.

Although it doesn't top our performance tables, this is still an incredibly powerful PC at a good price. Wired2Fire has done an impressive job of tailoring the system towards gamers.

Marc Delehanty

Performance



*Tested at 1,024x768 in 32-bit colour

Details

Price £1,699.99

Best price www.pcw.co.uk/bestprices

Contact Wired2Fire

www.wired2fire.co.uk

System requirements Athlon X2 4800 AM2 • 2GB Corsair DDR2 800MHz Ram • Belinea 10 20 35W 20.1in TFT • Nvidia Geforce 7950GX2 • Asus M2N32-SLI Deluxe • 320GB hard drive • NEC 4550 DVD-RW • BTC DVD-Rom • Saitek Lit keyboard • Logitech G5 laser mouse • Windows XP Home Edition • Two-year warranty

Verdict

Pros Fantastic graphics performance; good price; decent peripherals

Cons Considerably slower than Core 2 Duo alternatives

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Good value for a high-end gaming PC, albeit a bit slow

★★★★★

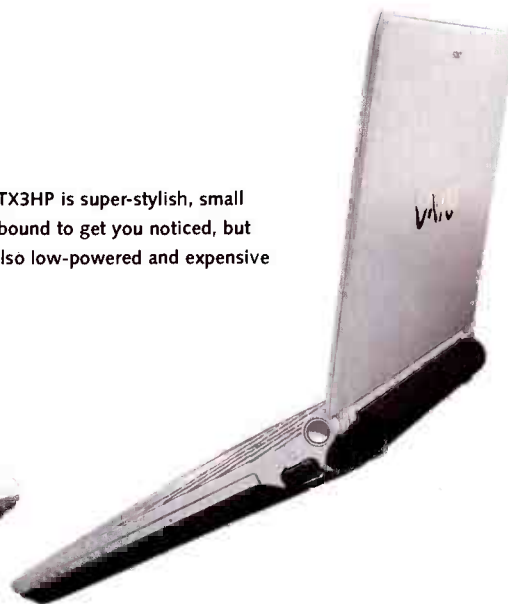
ULTRAPORTABLE NOTEBOOK

Sony Vaio TX3HP

Ultra-stylish, small and light, but will its performance be good enough for you?



The TX3HP is super-stylish, small and bound to get you noticed, but it's also low-powered and expensive



Sony's Vaio range of notebooks will always appeal to the fashion-conscious. As with previous models, the TX3HP is ridiculously small. At just 272mm wide, 195mm deep and weighing just 1.25kg, you'll hardly notice it in your bag.

When first opened up, we were alarmed at how much the screen flexes although, somewhat reassuringly, it doesn't have much of an effect on the display. Squeezing the chassis in various places also resulted in a fair bit of movement. However, since the TX3HP is constructed from carbon fibre, it should be able to take a knock or two.

In our review of its predecessor, the TX2 (see www.pcw.co.uk/2152281), we highlighted that in our PCW Interactive blog there were a fair number of unhappy Sony customers (http://interactive.pcw.co.uk/2005/04/sony_vaio_revis.html) complaining of poor build quality. Indeed, the complaints are still coming.

Although we didn't have any problems during our time testing the TX3HP, Sony would do well to address the problems highlighted by our readers. Improving on the paltry one-year return-to-base warranty offered as standard would be a good start.

This version of the TX3 uses Intel's Ultra Low Voltage U1300 Core Solo processor, which runs at 1.06GHz and is supported by 512MB of Ram. If you're willing to pay over £200 extra, the TX3XP model comes with a faster 1.2GHz processor and 1GB of Ram.

As you'd expect, the TX3HP struggled through our benchmarks. In Sysmark 2004 SE it hobbled to a score of 98, while the poor 3D performance of Intel's GMA950 integrated graphics were highlighted by the 3Dmark05 result of 286. In short, this notebook is most definitely not for gaming, but it will have no

problem with general office tasks, internet browsing and movie watching.

Battery life was more impressive, with the TX3 lasting for seven hours, 14 minutes in our productivity test and five hours, nine minutes during DVD playback.

An 80GB hard drive lies within and is cared for by Sony's G-Sensor Shock Protection system; this parks the drive's head should any severe movement, such as a fall, be detected. A super-slim dual-layer DVD writer sits on the right-hand side, while Sony Memory Stick and SD card slots are at the front.

The 11.1in widescreen display features Sony's glossy X-Black technology, which improves the definition of images. The native resolution of 1,366x768 provides a reasonable amount of space on the Desktop without making you squint.

When viewed straight on, the display produces clear, crisp and colourful images. Viewing angles are pretty limited though, which could be a problem if you're using it to demonstrate to a small group of people.

Despite the miniature chassis, Sony has squeezed in a keyboard with decent-sized keys. The touchpad also has a good feel to it, although the left and right buttons sit right on the edge of the casing and can be awkward to use.

The TX3HP is a stylish piece of kit and you'll certainly be the centre of attention should you pull it out on a train – and there are few ultraportables of this size that manage to house a built-in DVD writer.

However, very little has changed from the TX2 and, as is always the case with Sony, you're paying for the Vaio badge on the front – £1,498.99 is a lot of money for such a low-powered notebook.

Will Stapley

Performance

Sysmark 2004 SE: 98



Mobilemark 7:14 (hours:mins)



Details

Price £1,498.99

Best price www.pcw.co.uk/bestprices

Contact Sony www.sony.co.uk

System requirements Intel ULV U1300 Core Solo (1.06GHz) • 512MB Ram • 11.1in X-Black display • 80GB hard drive • Dual-layer DVD writer • Intel GMA950 graphics • Windows XP Professional • Bluetooth • 802.11b/g Wifi • One-year RTB warranty • 272x195x28.5mm (wxdxh) • 1.25kg

Verdict

Pros Small; light; stylish; excellent battery life

Cons Poor warranty; expensive; performance

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

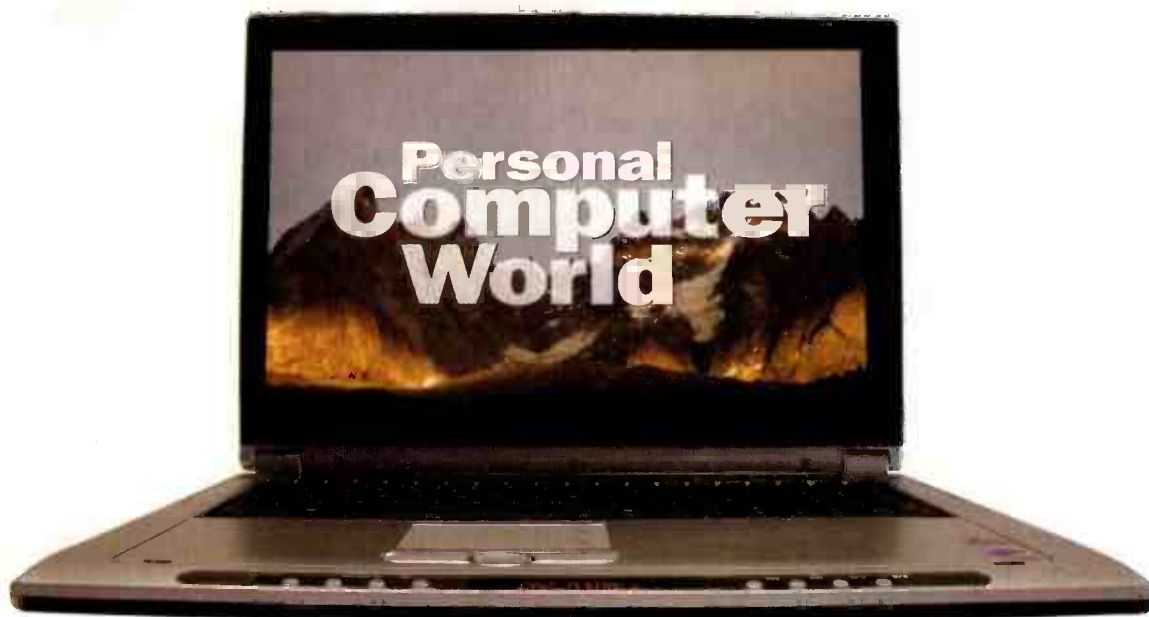
Overall Sony should include a better warranty, but the TX3 is a competent ultraportable

★★★★★

CORE DUO NOTEBOOK

Rock Xtreme CTX T2700

The fastest notebook we've seen, but Core 2 Duo is just round the corner



Intel's Core 2 Duo notebook platform might be just round the corner, but if you're after a powerful notebook and can't wait a second longer, the Xtreme CTX T2700 from Rock certainly delivers.

The design of the notebook's chassis should appeal to gamers. The silver casing looks and feels great, while the lid is home to a classy laser-etched X symbol. Weighing 4.25kg, it's unlikely you're going to carry it around much, but powerful notebooks always tip the scales in the wrong direction.

It's powered by the latest Intel T2700 Core Duo processor, which has a clock speed of 2.33GHz, 667MHz front-side bus (FSB) and a sizeable 2MB of Level 2 cache. In an effort to appeal to mobile gamers, Rock has supplied it with 1GB of DDR2 677MHz Ram and, far more importantly, an Nvidia Geforce Go 7900 GTX. This super-fast mobile graphics card is supplied with 512MB of devoted memory – double the 256MB we're used to seeing.

As a result, the Xtreme CTX T2700 took our benchmarks by storm. The processor-intensive Sysmark 2004 SE returned a score of 252, which is way above what many desktops can achieve, indicating that this notebook will have no problems with heavyweight applications such as video editing.

The powerful Nvidia graphics card helped push the 3D benchmarks to similarly impressive scores. In 3Dmark05 it notched up 8,589; again, something most desktop PCs struggle to accomplish. Our Far Cry test ran at 86.89fps (frames per second), while in PCmark05 it ended up with a score of 5,592.

All in all, these are pretty astounding scores for a notebook. You can see just how well it compares with other notebooks we've reviewed by taking a

look at our performance benchmarking site at www.reportlabs.com.

With such powerful graphics and a gaming audience in mind, Rock has taken the sensible decision to fit a 17in display as standard. With a native resolution of 1,920x1,200, this screen is capable of getting the most out of the 512MB Geforce Go 7900 GTX. For an extra £57 you can upgrade to an X-Class display. Although this increases reflections, it also improves colours and widens the viewing angles. We'd recommend upping your budget to accommodate it.

Plenty of storage is available, thanks to the 100GB hard drive. A dual-layer DVD drive is on hand should you want to archive data to free up space. Alternatively, you can upgrade to a 120GB hard drive for £29 when you order the notebook.

In terms of networking, you get an internal 802.11a/b/g Wifi adapter, along with Bluetooth and a Gigabit Lan port. A multiformat card reader is also provided, while a built-in webcam just above the screen will be useful for online video conversations.

Battery life isn't so important with a notebook this heavy, but in our Mobilemark battery test it achieved two hours, 14 minutes in the productivity test and one hour, 52 minutes during DVD playback, which isn't bad.

If you're looking for a powerful notebook that's more than capable of replacing your desktop, the Xtreme CTX T2700 will deliver the goods. At £1,761.33 it's by no means cheap, but when you look over the impressive spec sheet you soon realise just how much you're getting for your money.

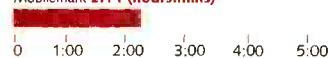
However, with the Core 2 Duo launch so close to release, many potential buyers will want to hang on to their cash until its release on 28 August. *Will Stapley*

Performance

PCmark 2005 **5,592**



Mobilemark 2:14 (hours:mins)



Details

Price £1,761.33

Best price www.pcw.co.uk/bestprices

Contact Rock www.rockdirect.com

System requirements Intel Core Duo T2700 (2.33GHz) • 1GB DDR2 677MHz Ram • 17in TFT (1,920x1,200) • Nvidia Geforce Go 7900 GTX 512MB • 100GB 7,200rpm hard drive • 802.11a/b/g Wifi • Gigabit Lan • Dual-layer DVD writer • 397x294x22mm (wxdxh) • 4.2kg • Three-year collect & return warranty

Verdict

Pros Powerful processor; good design; fast graphics

Cons Core 2 Duo for notebooks is just around the corner

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

Overall The Rock Xtreme CTX T2700 is a powerful notebook, but if it's top performance you're after then wait for Core 2 Duo

★★★★★

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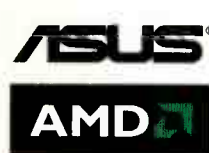


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- Sound Card High-End Onboard 6 channel sound
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SATELLITE NAVIGATION

Tom Tom Go 510

A stylish, well-featured GPS from the market leader



The 510 is the base model in Tom Tom's new Go range, yet is packed with enough features to satisfy any tech-hungry GPS customer.

One notable addition to the features you get in the cheaper Tom Tom One is the integration of major roads of Europe (MRE) into the standard Great Britain map which, while not enough to guide you through the cobbled backstreets of Rome, offers straightforward routes between major European towns and cities.

Other additions include hands-free Bluetooth support for your mobile phone, which allows you to make and receive calls through your mobile using the 510 while on the move. There's also a pre-installed safety camera database that allows you to set up alerts for speed cameras you might encounter en route.

Particularly impressive is the 4in widescreen LCD which, combined with thumb-size buttons, makes it easy to navigate or adjust settings on the move.

Tom Tom's software has always been impressive, most notably because of the intuitive interface. So even if you've never used a Tom Tom before, you'll find it only takes seconds to get a route up and running.

There is a host of options to configure the interface or behaviour of the device, from customising a list of most useful points of interest categories, to changing the language, voice type and map display preferences.

You can also access the Tom Tom Plus services that are available to all Tom Tom GPS users, allowing you to download additional features directly to your device, including audio books, weather and traffic reports, safety camera updates, maps and points of interest.

You get a free one-month trial of traffic updates, after which it costs £40 for annual UK updates, £55 for European and £27 for speed camera updates.

Setting up your phone to pair with the device via Bluetooth is a simple process, requiring a few button presses. Once configured, it works flawlessly in diverting voice calls to the built-in speaker.

When you are up and running, navigation is fast and accurate, with a wealth of information on screen that's easily configurable. Traffic reports are also effective and, when enabled, the main map shows a small column on the right that pops up with a traffic warning as alerts are flashed up for your route. You can then press the bar to configure the device to avoid the jam, or continue on your journey.

If the 510 suffers from anything it's that Tom Tom appears to have spent more time improving its added features and services over the past year than its basic mapping software. Maps don't appear as detailed as some of the alternatives available from rivals, and the refresh rate on the screen is a little slow.

Tom Tom is continuing its 'move the map under the car' approach to navigation, as opposed to alternatives that move the car along a road and simply refresh the map when necessary. This isn't a big problem (the red and green bars on the map make it obvious where you're going), but the position of the car on the map lags a little behind the actual position on the road, which can cause problems on busy intersections. Aside from this, and the fact that the power button at the top right of the device is far too easy to press by accident, the 510 is a solid navigational aid.

Existing Tom Tom users probably won't need to upgrade unless they want to take advantage of the hands-free mobile integration or MRE support. Although rich and impressive, the features are much the same on the Tom Tom One and preceding devices. *Paul Lester*

Details

Price £349

Best price www.pcw.co.uk/bestprices

Contact TomTom www.tomtom.com

System requirements 4in widescreen display (480x272 pixels, 64,000 colours) • 400MHz processor • 64MB Ram • Lithium-Ion battery (maximum four-hour operation) • SD card • 112x66x81 (wxdxh) • 300g

Verdict

Pros Excellent features; well-designed interface; fast and accurate route planning; great screen
Cons Refresh rate on map is a little slow; positional display not as good as it could be

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

Overall If you think you'll use the additional features, the Go 510 is a decent GPS. If not, the Tom Tom One is still a more than adequate alternative for the price difference

★★★★★

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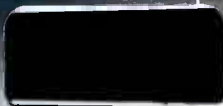
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£1,445.96 EX VAT

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August 2006

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- BBE, SRS® WOW Technology and Dolby Digital for enhanced audio
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- Wall mountable



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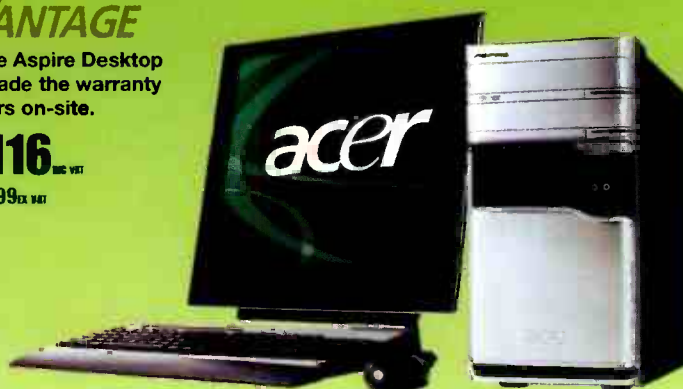
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Graphics Card, Speakers, Modem, Keyboard and mouse

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Acer Advantage Aspire Desktop
Warranty, upgrade the warranty
to 3 years on-site.

£ 116 INC VAT
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monitor not included

Acer Monitors

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Acer AL1717AS

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- Contrast Ratio 500:1
- Response Rate 8ms
- Speakers
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- Resolution 1440 x 900
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- 75mm VESA Wall mount spec
- 3 Year Warranty

£ 169 INC VAT
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Acer AL1923

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- Speakers
- 3 Year Warranty

£ 269 INC VAT
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Acer AL2051WS

- 20" Widescreen CrystalBrite TFT
- Resolution 1680 x 1050
- Viewing Angle 150°
- Brightness 300 cd/m²
- Contrast Ratio 800:1
- Response Rate 8ms
- Digital (DVI-D) and Analogue inputs
- Speakers
- 3 Year Warranty

£ 349 INC VAT
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SATELLITE NAVIGATION

Mio C210

A budget device for newcomers to sat-nav systems

The C210 is Mio's budget, in-car satellite navigation (sat-nav) system and is built in the same style as the compact Tom Tom One.

Intended to be a low-cost solution with a straightforward set of features, we weren't expecting to be bowled over by its feature set or versatility. But we did expect its overall performance and usability to justify the £200 asking price.

First impressions on this front were mixed. The device takes four AA batteries, but the design of the battery housing means quite a bit of fiddling is required to place the batteries into the correct positions; something that could have been sorted out in the design stage.

When we started up the device for the first time, a welcome message appeared within about 10 seconds, and the device gained a satellite lock. Our position was pinpointed shortly after that.

However, plotting a course is far more troublesome. You're faced with just a single address button and no obvious alternative for entering postcodes, which is the easiest way to pinpoint an address. Mio boasts about the device's seven-digit postcode capability, yet the company has done an exceptionally good job of hiding this feature away.

Location searches are first split into cities. You have to choose the relevant city and can then start a search by road name.

Results are filtered as you add more characters to a road name, which is useful, but if you want to perform a simple postcode search it takes a bit more work.

The manual provides no clues, so trial and error taught us that you first need to change your chosen city, add another city and, provided you have the right country, run a postcode search. It's rather troublesome for what should be one of the most common ways of navigating.

What's more, you can forget about doing any of this while on the move. The buttons are barely large enough for you to press with a finger. We would have liked a built-in stylus to help.

Once you get a location logged, you'll find that the performance of the device is very good. Apart from qualms about the small fiddly buttons, the mapping software is detailed, responsive and very easy to browse around.

On-the-move directions were accurate and route recalculation was done with a minimum of fuss.

Viewing a route itinerary and choosing roads to avoid in order to tailor your route from the one offered is straightforward. A flyover feature takes you on a tour of the route before you depart.

The software highlights your route with a different colour road, so it's pretty obvious where you're going, although the tiny black arrows that

confirm your direction at tricky junctions and roundabouts are small and not particularly clear.

Combined with the size of the screen and a less-than-impressive viewing angle, this means a split-second glance at the device (which is all you might get in heavy traffic) might not be enough to confirm your next turn.

Elsewhere you'll find the basic features you'd expect, such as route history, methods of travel (taxi, pedestrian and bicycle, among others), languages, voices and screen settings, but you'd expect these in even the most basic sat-nav system.

The C210 is touted as an entry-level device and, in terms of the features on offer, it gets the job done. The mapping software is impressive and the routes are calculated and recalculated fairly quickly.

However, the 2.7in screen is very, very small and the on-screen controls are even smaller still.

The menu system can be both confusing and frustrating. And even though it is probably something you'd get familiar with in time, we've seen budget alternatives that can do a better job for around the same price.

Paul Lester



Details

Price £199

Best price www.pcw.co.uk/bestprices

Contact Mio www.mio-tech.com

System requirements 2.7in TFT

65K • 4 AA batteries (car power adapter included) • UK maps included • Built-in speaker • Speed camera alerts (free updates for one year) • SD memory card slot • 59x40x85mm (wxdxh) • 110g

Verdict

Pros Clean mapping software; smooth navigation; effective route planning

Cons Small screen; fiddly controls; confusing menu; limited features

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Functions well enough, but hindered by poor interface and fiddly controls

★★★★★

TRIPLE-HEAD GRAPHICS ADAPTER

Matrox Triple Head 2Go

Create a large, widescreen display without forking out for a 30in panel



If you run a game across two screens, the crucial action occurs slap-bang in the middle. Unless your chosen entertainment involves a faithful recreation of the Morris Minor c1954, you won't enjoy staring straight at the split between the two displays. This is where Matrox's concept of triple-screen surround gaming comes in.

With an odd number of monitors, the centre of the action takes place in your centre monitor, which is precisely what's intended. The two monitors to the

left and right serve to fill in your peripheral vision – an effect that works very well. It's such an immersive experience that the gaps between your monitors are far from distracting and you soon forget about them.

The TH2Go (Triple Head 2 Go) cleverly masquerades as an ultra-wide monitor – a role which it then sub-contracts out to three physical displays. To your PC, it appears as a single display capable of resolutions of up to 3,840x1,024 pixels, which just happens to be the combined resolution of three standard 17in or 19in panels. You simply attach these three panels to the TH2Go. It then acts as a go-between, converting them into a single virtual display.

The TH2Go gives you the best of both worlds by piggybacking onto your existing graphics card without the need to upgrade or open up your PC. This also means you can use it with a laptop.

Although the TH2Go is very simple to set up and use, there are some compatibility issues. To help with this, the TH2Go comes with the Surround Gaming Utility, a regularly updated utility which automatically configures your installed games to work with the TH2Go in surround gaming mode.

The TH2Go is expensive, but it's still cheaper than buying a 30in TFT monitor. *Paul Monckton*



Details

Price £199.75

Best price www.pcw.co.uk/bestprices

Contact Matrox www.matrox.co.uk

Specifications Maximum 3,840x1,024 resolution • Supports ATI and Nvidia graphics cards • Compatible with Windows 2000/XP • 107x92x25mm (wxdxh) • 168g

Verdict

Pros Adds multiscreen capability without the need to install hardware; highly portable

Cons Compatibility issues; analogue-only connection

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall An easy way to add triple-screen capability to compatible systems without opening up your PC

★★★★★

PRINTER CALIBRATION

Colorvision Printfix Pro

Professional printer calibration at an affordable price



The Printfix Pro from Colorvision is an affordable printer calibration tool. The package includes both hardware and software, and will appeal to professional photographers and designers.

The Datacolor 1005 Spectrocolorimeter is used to examine test targets, while a variation of Printfix printer profiling software handles the calibration.

Reflective colorimeters such as this work by illuminating their colour targets with a stable, high-intensity light source. Normally this is a specialised,

high-voltage lamp, driven by complex control circuitry. Every so often these must be recalibrated, using a known reflective target shipped with each colorimeter.

Datacolor's 1005 Spectrocolorimeter cuts manufacturing costs by using an array of six low-voltage LEDs of different colours. These are not as stable as a specialised lamp, so the associated Printfix software insists on calibration before every measurement run.

A triangular plastic calibration base with an embedded enamelled white spot and a square of black ceramic tile is included for this purpose.

More expensive systems use a motor drive to automate the process of moving the colorimeter across a printed colour target. With the Printfix, costs are kept down by making this a purely manual system.

There are three levels of print target accuracy: 150 patches on A4, 225 patches on A4, or the expert level 729 patches on three pages of A4 or one page of Super A3.

Readings are taken by clicking the top of the colorimeter and acknowledged by a flashing LED. Each reading takes about one second.

Despite the cost-cutting compromises, the Colorvision Printfix Pro represents a huge step forward in low-cost printer profiling. *Terry Relph-Knight*

Details

Price £410.08

Best price www.pcw.co.uk/bestprices

Contact Colour Confidence <http://shop.colourconfidence.com>

Specifications Datacolor Spectrocolorimeter 1005 • USB powered • Mini-USB cable included • Printfix Pro software • Windows 2000/XP • Mac OS 10.2 or higher • One-year warranty • 120x108x35mm (wxdxh) • 90g

Verdict

Pros Hardware colorimeter; reliable printer profiles

Cons No target measurement automation

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall The Colorvision Printfix Pro is a print profiler solution that gives professional results at a relatively low price

★★★★★

19IN TFT MONITOR

Samsung Syncmaster 940MW

With a built-in tuner, this 19in TFT is suitable for both work and play



From its not-too-stylish looks it is difficult to tell if this is a TV that works as a monitor or a monitor with a built-in TV. Put it on your desk and it looks like a monitor; in the bedroom and it looks like a telly. When you switch it on you will find the TV side of the Samsung Syncmaster 940MW is first to greet you.

Selecting your world location configures the monitor automatically for use in your country. It's an analogue-only tuner, so you won't be able to pick up digital Freeview broadcasts.

The on-screen menu is also large enough to be viewed from the comfort of your armchair and you will be navigating it using the full-size remote control supplied in the package.

A large number of audio and visual enhancements come as standard. Dolby Virtual Surround Sound adds extra excitement through twin 5W speakers, while a selection of colour modes and widescreen formats provide a variety of viewing conditions.

At first we were disappointed with the TV image quality: the colours looked garish and unrealistic. Fortunately, with a little tweaking of the colour settings, we were able to achieve a much more pleasing image.

It is also perfectly capable as a PC monitor, with VGA and HDCP-compliant DVI inputs and a 1,440x900 pixel resolution. The monitor also comes with colour calibration software that helps you match your on-screen images to output from your printer.

The Picture-in-Picture function allows you to continue working while simultaneously viewing live TV or images from any of its large selection of inputs.

It may not have the style or performance of more expensive products, but it's easy to set up and use, as well as being easier on the pocket. *Paul Monckton*

Details

Price £359

Best price www.pcw.co.uk/bestprices

Contact Samsung

www.samsung.co.uk

Specifications 19in TFT • 16:10 aspect ratio • 1,440x900 resolution • Integrated analogue TV tuner • 8ms pixel response time • 700:1 contrast ratio • Brightness: 300cd/m² • 160° viewing angles • VGA, DVI • 2 3W speakers • 466x216x406mm

Verdict

Pros Easy TV setup; good connectivity

Cons TV picture quality requires tweaking; analogue tuner only

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall The Samsung Syncmaster 940MW is well put together, has a great set of features and is easy to use, but image quality could be better

★★★★★

19IN WIDESCREEN TFT MONITOR

Iiyama Prolite E1900WS-B1

A no-frills, 19in widescreen display at a reasonable price



The best-value model in Iiyama's new range of low-cost TFT monitors is this no-frills 19in widescreen display that costs only a little more than the standard 17in version. Three models make up the new range: standard format 17in and 19in displays, and the 19in widescreen model reviewed here.

All share the same basic specification and come in either a black or silver finish with bright, high-contrast TN-based panels (see www.pcw.co.uk/2149165 for more information on TFT technology) boasting a

true 5ms (black-to-black) response time that will attract gamers.

Our review model supports a standard native resolution of 1,440x900 and uses an analogue VGA connection to hook up to your PC. This is encased in a bezel with a cunning, bevelled design that makes it appear somewhat thinner than it really is.

A pair of subtly presented stereo speakers sits below, although there is no headphone socket or volume controls. If you delve deep into the manual, you'll discover that pressing a combination of buttons simultaneously will enable a mute function.

Being a budget monitor, you don't get fancy features or software. There are no luxuries such as preset brightness modes or calibration programs, while the stand is a simple snap-together affair.

Despite its low cost, the build quality is good and the design is stylish. For normal desktop work, image quality is good, helped by the 300cd/m² maximum brightness and 700:1 contrast ratio. Text looked a little over-sharp on close inspection and, while it's not ideal for photo editing, most users will find this display pleasing to use and good value for money.

With a neat design and a low price, this is a good-quality, budget monitor. *Paul Monckton*

Details

Price £175

Best price www.pcw.co.uk/bestprices

Contact Iiyama www.iiyama.co.uk

Specifications 19in 16:9-format widescreen display • 1,440x900 resolution • 300cd/m² brightness • 700:1 contrast ratio • 5ms response time • ISO-13406-2 Class II panel • TN panel technology • VGA analogue input • 443x202.5x379.5mm • 4.5kg

Verdict

Pros Tidy design; low price; built-in speakers

Cons No software support; basic stand and features

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall The Iiyama Prolite E1900WS-B1 is a well-made, well-priced, budget monitor, with decent brightness, contrast and response times

★★★★★

15IN TFT MONITOR

Hannspree Hannsvaas

A 15in panel, complete with a TV tuner, in a truly unique design



One glance at Hannspree's website leaves you with the distinct impression that its products may well exist only to boggle the mind. It would seem that Hannspree sees monitors, like clothes, as a form of personal expression.

The Hannsvaas consists of two basic products housed in radically different cases. The 9in models are strictly LCD TVs, but the 15in models come with VGA connectors, qualifying them for use as PC monitors.

The polished black, walnut wood-grain finish has curves crafted in the shape of a cello flanked by

powerful stereo fabric-coated speakers. These also curve inwards, leaving the only straight edges to the panel itself. Far from seeming cheap, it's made from quality materials and has a very up-market feel.

In operation, the display is bright and clear. The auto-tuning feature makes TV setup easy. The sound quality is excellent, and you can turn up the volume extremely loud without a hint of distortion. The built-in SRS-Wow feature (see www.srslabs.com) produces a very convincing 3D audio effect.

A full-size remote control provides the usual TV functions as well as access to the display's on-screen menu, which we found unexpectedly slow. You can actually see the pages redrawing in front of your eyes. And if you're used to whizzing around menus, it'll certainly slow you down.

All the control buttons are placed in a recessed area on the top of the monitor, keeping the front entirely free of controls and maintaining its elegant appearance. The buttons themselves are large and fingertip-sized, and have a tactile positive response.

Part monitor, part TV and part furniture, the Hannsvaas is unique. If you're looking for something a little bit different, then buy something else – the Hannsvaas is *completely* different. *Paul Monckton*

Details

Price £399.99

Best price www.pcw.co.uk/bestprices

Contact Hannspree

www.hannspree.com/eu/en

Specifications 15in TN panel • 4:3 aspect ratio • 1,024x768 resolution • 150° horizontal/135° vertical viewing angles • 500 cd/m² brightness • 500:1 contrast ratio • 16ms response time • Stereo 3W speakers • SRS Wow technology • RF, S-video, composite video, VGA inputs • Headphone socket • Wireless remote control • 459x179x357mm (wxdxh) • 7kg

Verdict

Pros Unique design; superb build quality; bright screen; remote control

Cons Price; small screen; slow OSD

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

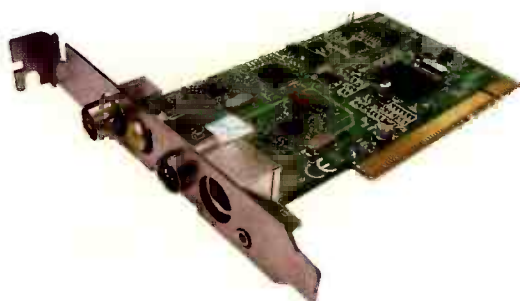
Overall A high-quality designer product at a designer price. It's a definite talking point

★★★★★

PCI TV TUNER

Kworld Dual TV Tuner DVB-T 220

Receive digital and analogue TV signals, but not simultaneously



When the term dual tuner is used with respect to computer TV tuner cards, the product usually comes with two digital or two analogue tuners, so one channel can be recorded while you watch another.

But that's not the case with the Kworld Dual TV Tuner DVB-T 220. There are two tuners onboard, but one is digital and the other is analogue.

Kworld claims the Dual TV Tuner is the first device of its type, but the benefits of having separate digital and analogue tuners aren't entirely clear. Besides, with Gigabyte's GC-PTV-TAF Hybrid TV Tuner (see www.pcw.co.uk/2152233) doing the same job, we have to question Kworld's claim.

It is possible to record analogue while watching digital (or vice versa), and you can even record both inputs at once. But given that analogue broadcasts are limited to five channels with a lower-quality cropped image, this scheme would seem less useful than, say, a card with twin Freeview tuners built into it.

Compatibility with analogue TV broadcasts around the world is one claimed benefit. But since the DVB-T 220 is a PCI card, it's unlikely to find itself installed in a portable, globetrotting PC. In addition, each tuner requires its own separate signal feed.

A small internal antenna is provided for those who don't have two aerial points next to their computer, but we found that this didn't give us particularly good reception on either analogue or digital. Even plugged into an external aerial and receiving a strong signal, Kworld's digital tuner suffered from picture break-up.

The software application offers some useful features, such as timeshift recording, DVD burning and video capture. But neither the on-screen interface nor the remote control are particularly intuitive to use, with lots of confusing, unfamiliar icons to represent functions.

With occasional hangs between changing channels and a virtually non-existent electronic programme guide, the bad outweighs the good. *Jonathan Parkyn*

Details

Price £49.99

Best price www.pcw.co.uk/bestprices

Contact Kworld www.kworld.com.tw

Specifications Dual analogue and digital (DVB-T) PCI tuner card • FM radio tuner • Composite video, S-video and analogue audio input • Mpeg1/2/4 recording • Jpg and Bmp screen capture • Remote control and infra-red sensor • Windows Media Center Edition 2005 compatible

Verdict

Pros Record and watch different channels; analogue and digital tuner

Cons Analogue/digital combination has limited usefulness; requires two separate aerial inputs; multimedia application is often not intuitive

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Unless you require analogue and digital TV, there is little to gain from this dual tuner

★★★★★

IPOD SPEAKERS

Sonic Gear i-Steroid

Add extra warmth to your music collection with this valve amplifier for the iPod



The latest device to prove the iPod accessory market is still going strong is Sonic Gear's i-Steroid. This unusual-looking speaker system also boasts some unusual technology.

The i-Steroid is, in fact, a valve amplifier and satellite system that does away with components such as solid-state transistors and integrated circuit chips in favour of a much simpler system.

The main selling point for valve amplifiers is their ability to project a more natural sound; the valve technology enables them to warm up the harsh edges of compressed digital audio. However, valve amplifiers

are traditionally very expensive and reserved for only the most audio-hardy of music fans, so at £160 we were interested to see just how it performed.

Getting it going is no different than setting up any other 2.1 speaker system: attach the two satellites to the main subwoofer unit, plug the audio source (in this case an iPod) into the line-in socket and switch it on. The only disparity is waiting for the i-Steroid to warm up (for about 10 minutes) before cranking up your latest tracks.

Once music flooded the mini-satellites, we were very impressed. Pushing the i-Steroid to its volume limit didn't result in the expected crunch of noise and the bass response came across smooth and rounded rather than punchy and flat.

A simple remote control is supplied for adjusting bass and volume levels but the separate i-Steroid Cradle U100 (included in the package) can be attached to add features such as battery charging, full iPod control and both audio and video outputs. The U100 isn't compatible with the iPod Shuffle, though.

There's no denying this iPod speaker system provides enthusiast-style audio quality, but whether folks will shell out £160 when a £2 cable can connect it to a big home stereo is another matter. *Luke Peters*

Details

Price £160

Best price www.pcw.co.uk/bestprices

Contact Sonic Gear

www.sonicgear.com.sg

Specifications Valve technology

• 2 6W satellite speakers • 16W subwoofer • Remote control • iPod docking station • 3.5mm line-in • Available in black and white

Verdict

Pros Warm, rich sound; docking station for charging and remote-controlling an iPod

Cons Expensive; have to wait for it to warm up

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall The Sonic Gear i-Steroid proffers lovely sound for portable music players but at a cost

★★★★★

PORTABLE SPEAKERS

Minispeakers K8000

Outstanding sound quality from this compact speaker system



There is a host of options available for people who are looking to buy a mini speaker system for an mp3 player or notebook. Little-known UK company Minispeakers is the latest to have a go, claiming to offer a better-value solution by sourcing and importing directly from the manufacturer.

Housed entirely in stainless steel and at over a kilo in weight, the K8000 isn't exactly light, but it is among the more compact models you can find on the market today.

The three-way speakers (two mid/high-range side speakers and a built-in subwoofer) are entirely housed within the unit, wrapped in a minimalist but very stylish design.

The casing has a soft-touch volume control and two switches to turn extra bass and treble on or off to suit different styles of music, or indeed to make peace with neighbours. When we put the K8000 through its paces the quality was outstanding.

The dynamic range of the mid-range/treble speakers is excellent, delivering crystal-clear sound on all the tracks we tested, but it's not until you jack up the volume and put the sub to the test that it really excels.

Bass response is superb, and the speakers are loud enough for all but the most tinnitus-affected techno-head to have to turn it down a few notches.

All in all the clarity and power of the K8000 means it would easily pass for a permanent audio solution for your desktop PC, notebook or games console, let alone an mp3 player.

It's a tad heavy to be lugged around for long, so a semi-permanent placement is more practical, but with no battery support you'll need to be near a mains outlet anyway.

Outstanding sound quality from the K8000 mini speaker system makes the high price bearable. There are few rivals out there that offer such a powerful solution for the price and none with such small dimensions. *Paul Lester*

Details

Price £99

Best price www.pcw.co.uk/bestprices

Contact Minispeakers

www.minispeakers.co.uk

Specifications 8W subwoofer • 3W left and right speaker output • 187x99x82mm (wxhxd) • 1kg

Verdict

Pros Outstanding performance; stylish; compact

Cons Expensive; minimal controls; no carry case or other extras

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall You'd be hard pushed to find better sound from a device this size, but these speakers are expensive

★★★★★

HD MEDIA PLAYER

Mediaman Multimedia Player HVX-3500

Turn any 3.5in hard drive into a high-definition media player



With HD-ready television sets flying off the shelves, and precious little in the way of high-definition source material to pump through them, here's an interesting DIY approach.

The Mediaman is an external hard disk drive casing with lots of audio-visual outputs and built-in media player software.

Pop in a great big hard disk (or buy one with the disk pre-installed) and rip all your DVDs, CDs, photos and various other digital media to it. Then hook it up

to your TV/amp and you have your very own home-made multimedia jukebox.

Commonplace analogue video connections (S-video and composite) are on hand, but quality isn't a patch on the DVI and component options, which offer HD output resolutions (720p and 1080i).

The unit will even upscale a standard-definition image to HD, which can make quite a difference.

Digital audio output – either optical or coaxial – is also possible, and a whole bevy of stereo and 5.1 surround-sound analogue connections is available.

Picture and sound are generally very good, and the on-screen menus and remote handset are easy to use.

Unfortunately, there are a couple of drawbacks.

First, the HVX-3500 doesn't have any video inputs or a facility to record video to its hard disk. Second, no software is provided to rip and/or convert media to the HVX-3500's preferred formats. Users will have to scour the web for useful freeware alternatives.

The only other aspect that's absent is some kind of built-in network ability – either in the shape of Wifi or a plain old Ethernet socket. That said, the type of technology enthusiasts who might be attracted to the HVX-3500's do-it-yourself style will undoubtedly find a way of networking it anyhow.

Jonathan Parkyn

Details

Price £149

Best price www.pcw.co.uk/bestprices

Contact Playengine

www.playengine.co.uk

Specifications External IDE housing

• Suitable for 3.5in disk drives • DVI, component, S-video, composite video output • HD video output at 720p and 1080i • Built-in audio decoder • Optical and coaxial digital audio output • USB2 • Infra-red remote control handset

Verdict

Pros Great-quality picture and sound; easy to set up and use; sturdy design; HD upscaling

Cons No video input or recording; no file ripping/converting software

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall A clever little box of tricks, with a wide selection of connections and HD capabilities

★★★★★

PORTABLE AUDIO PLAYER

Maxfield G-Flash Metal

A stylish music player, but it's low on features and has a high price



Maxfield's G-Flash Metal is yet another flash memory mp3 player to hit the market.

Light and stylish, the stainless-steel-effect casing and organic LED screen certainly look appealing, but during testing the G-Flash fell short in several areas.

As with most mp3 players, the drive also acts as a mass storage device, so getting your own music tracks on there is simply a case of connecting it via USB to your computer and dragging and dropping tracks over.

You also get Mp3 Maker from Magix and some of Sennheiser's excellent MX 300 bud earphones, which do a great job of delivering on the admittedly impressive music quality.

However, aside from a rudimentary graphics equaliser and a built-in voice recorder, there's precious little else to say about this Maxfield player, and nothing to suggest that it's worth the high asking price.

Usability is no more impressive, with little innovation in the functionality of the seven control buttons dotted around the front and sides – more than necessary, you'd think, for a device so low on features.

What's more, the sturdy carry case offers no access to the controls or screen. If you do use the case, you'll have to stop what you're doing and remove it every time you want to change a track or adjust the volume.

The G-Flash feels quite hollow, suggesting it could have been slimmed down more, and the removable cap that covers the USB connection isn't particularly snug, so expect it to be left lying in your pocket more often than not.

It's hard to justify the price of the G-Flash, given its few benefits. Poor layout of controls and design will leave you frustrated and wishing you had bought one of the many cheaper, better players around.

Paul Lester

Details

Price £110

Best price www.pcw.co.uk/bestprices

Contact Maxfield

www.maxfield.de/en

Specifications Organic LED screen

• Mp3/Wma support (including DRM files) • 1GB capacity • USB2 • 1 AAA battery • Maximum 18-hour battery life • 87x35x21mm (wxdxh) • 45g

Verdict

Pros Good sound quality; decent headphones

Cons Basic features only; very high price; poor control layout

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Low on features and so expensive it's difficult to recommend it over a number of worthy competitors

★★★★★

DIGITAL CAMCORDER

Sanyo Xacti VPC-C6E

A pocket camcorder that doubles up as a quality digital camera



The current crop of ultra-compact digital still cameras can all shoot video clips, and the Sony Xacti VPC-C6E is no exception. It can take both video and stills, but here the emphasis is on shooting video with a solid stills capability.

Designed to be held upright in one hand, its body houses a flip-out 2in LCD, which also serves as a switch to take the camera in and out of standby mode.

Upon opening the screen, the camera is ready to shoot in well under two seconds. In its default

configuration an enthusiastic female voice greets you with helpful hints on how to get started. Thankfully, this can be turned off.

All camera controls have been placed to fall conveniently under the thumb. Individual buttons activate video recording and shoot stills, and a zoom slider sits between them.

With the Xacti CPV-C6E there's no need to interrupt video recording to take a still. Unlike its bigger brother, the Xacti VPC-HD1E (see www.pcw.co.uk/2158807), this model isn't able to record high-definition video. Instead, the maximum resolution is 640x480 at 30fps (frames per second) – the same as that offered by most digicams. You can fit an hour of footage on the supplied 1GB card in high-quality mode, which matches up well with a 60-minute battery life.

Unlike some digital camcorders, the VPC-C6E offers full 6-megapixel resolution images with a selection of stills-shooting modes and a built-in flash.

A docking station provides easy PC and TV connectivity so you can dump your recordings directly onto video tape or a DVD recorder, or copy your recorded Mpeg4 files and Jpegs directly to your PC.

With high-quality video and photos, the VPC-C6E is an impressive piece of kit. *Paul Monckton*

**Details**

Price £350

Best price www.pcw.co.uk/bestprices

Contact Sanyo www.sanyo.co.uk

Specifications 5.8x optical zoom • 6-megapixel CCD • 640x480, 30fps video • Mpeg4 compression • Image stabiliser • Pictbridge • Stereo audio recording • 2in LCD • 1cm macro mode • Docking station • AC adapter • USB and AV cables • 108x230x680mm (wxdxh) • 159g

Verdict

Pros Small and light; easy to operate; no tapes or discs; bright LCD panel; quality video and pics

Cons Short optical zoom; left-handed operation can be tricky

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall Ideal for those who shoot more video than photos but still want good-quality stills

★★★★★

MULTIFUNCTION DEVICE

Lexmark X3480

A cheap inkjet printer, scanner and fax, but colour output isn't its strong point



What sets the X3480 apart from its lower-cost stablemates is a single-line, 16-character backlit LCD panel.

Designed for use away from the computer, as well as when connected over USB, the X3480 communicates in plain English rather than using baffling sequences of flashing lights. You can select options and alter settings directly from the built-in menu.

Using a single ink cartridge makes the X3480 easy to set up and operate – an advantage that Lexmark is

quick to emphasise. While it does make things simpler it can also cause you to waste a lot of unused ink when one colour runs out before the rest.

The X3480 is reasonably good at photo prints, but there are some visible compromises in quality because the three-colour ink cartridge contains no black ink. This is also evident when printing black text, which is achieved by combining colour ink rather than using deep, pure black.

Lexmark's software offers a menu of creative tasks, such as emailing images, enlarging/reducing images, running OCR (optical character recognition) or using your PC's modem to send faxes directly from the scanner. The web toolbar makes it easy to print from web pages without text getting cut off at the edges and optionally omitting unwanted ads.

The front-facing Pictbridge port allows direct printing from a compatible digital camera and two memory card slots support five different formats.

Printing directly from memory cards is made easy by printing a contact sheet, which you mark up by hand and then scan to obtain your selected prints.

Although the X3480 costs £20 more than the similar X2470, it is well worth the extra money for the improved ease of use it provides. *Paul Monckton*

Details

Price £79.99

Best price www.pcw.co.uk/bestprices

Contact Lexmark

www.lexmark.co.uk

Specifications Three-colour inkjet • Colour copying, printing and scanning • 24bit scanner • 600x1,200dpi scanning • 17ppm draft mode • 5ppm normal mode • 100-sheet input tray • Borderless photo printing • Pictbridge • USB • 1,000 page per month duty cycle • One-year warranty • 375x286x152.5 (wxdxh) • 4.9kg

Verdict

Pros Built-in display; compact size

Cons Single three-colour cartridge; lacklustre performance

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall The X3480 is a more sensible entry-level choice than Lexmark's lower-cost options

★★★★★



Akasa AK-HC-01-WH

Price £22.27 Contact www.overclockers.co.uk Overall ★★★★★

The white finish of this card reader will appeal to Mac Mini owners (a black version is also available), and its size will attract notebook users. Measuring just 102x54x18mm (wxdxh), the card reader has three USB2 ports. It runs off USB but, should your USB power be shared across multiple devices, the included AC adapter can give it a boost.

Unlike many other card readers, this model accepts Transflash/Micro SD and RS-MMS cards, without the need for fiddly adapters. It also supports the usual formats, including Compact Flash I/II, Memory Stick Pro, Memory Stick Duo, Smart Media and Secure Digital. The only notable omission is support for XD Picture Cards.

Simon Crisp

Overall Small, stylish and supports a variety of cards

Enermax Vanguard

Price £17.55 Contact www.overclockers.co.uk Overall ★★★★★

There's no shortage of 3.5in external hard drive enclosures, but there are relatively few 2.5in models.

Enermax's Vanguard has a smart aluminium case with power and activity LEDs, while heat is dissipated via the small heatsinks attached to either side of the chassis. The effectiveness of these heatsinks is improved by the included thermal-conductive rubber pads that stick on the top and bottom of the drive.

Using a bridge, Vanguard converts your hard drive's IDE interface into a notebook-friendly USB2 version.

Simon Crisp

Overall A cheap way to convert a 2.5in disk into a portable hard drive



Enermax Warp PC case fans

Price £5-£9 depending on size Contact www.enermax.co.uk Overall ★★★★★

A fan coated in a thick layer of dust not only looks bad, but also impacts on the fan's cooling performance. What makes matters worse is that most fans are incredibly fiddly to clean.

Enermax has come up with a solution with its Warp series of fans. By applying gentle pressure, the entire blade assembly can be popped off, allowing you to clean the dust from the frame as well as the blades.

It's not exactly rocket science, but it works. Of course, you'll still have to clean the fans regularly, although it should be a fairly painless process. Enermax also supplies a fan speed controller that screws into the fan's frame.

Simon Crisp

Overall A novel approach to the problem of dust removal

Gigabyte GA-965P-DQ6

Price £164.44 Contact www.giga-byte.com Overall ★★★★★

The GA-965P-DQ6 motherboard has enough features to allow it to claim its high-end status, and it supports the new Intel Core 2 Duo/Extreme processors. It caters for 1,066/800/533MHz FSB (front-side bus) Intel processors, while the four Dimm slots provide memory support for up to 8GB of 800/677/533MHz DDR2 Ram.

There's a wealth of tweaks in the Bios for adjusting FSB and PCI speeds, as well as voltage settings for the CPU, memory, PCI Express, MCH (memory controller hub) and FSB.

Although expensive, this motherboard is loaded with features that will appeal to overclockers.

Simon Crisp

Overall Powerful, with a Bios full of tweaks and Core 2 Duo support



SKY+ UTILITY

Sky+ Remote Record

Schedule television programme recordings via your mobile



Remote Record allows you to instruct your Sky+ box via your mobile to record programmes

Remote Record from Sky looks set to end the nightmare that is forgetting to set your Sky+ box to record your favourite show before leaving the house.

The basic service works by text message (you send a request, Sky will then send back confirmation), but by using the Sky by Mobile version (which requires a 3G/GPRS handset) you can browse the seven-day EPG (electronic programme guide) and perform programme searches.

Once a record request is received, Sky will beam a message to your Sky+ box. There's no need to worry about someone being on the phone when this message is sent since it's all done via satellite and not through the Sky+ box's phone link.

In order to set up the service you'll need to access the Sky Active service from your Sky+ box and enter a few details, including your mobile phone number. To use the more advanced Sky by Mobile service you'll also need to register at Sky.com.

We tried out Remote Record with a Nokia N70 3G phone. After registering for Sky by Mobile a link for the application download was sent directly to our phone. At first, the application hung at the Authenticating User stage, but when we tried about 30 minutes later we managed to log on without a problem.

You can browse the EPG just as you would on your Sky+ box and, despite the relatively small screen on our Nokia N70, we were able to see the next hour's schedule for seven channels per page. Since you need to wait for the page to reload whenever you move around the guide, scheduling recordings using this method can be frustratingly slow.

If you know what it is you want to record, you're far better off using the Search feature. This lets you search by name, channel, time or date, or a combination of all four.

Upon scheduling a recording, a notice appears stating that it could be up to half an hour before the message is sent to your Sky+ box; something that could pose a problem if you want to record a programme that's just started. That said, when we tried it, most record requests were received almost immediately.

Interestingly, a week or so into the testing we found that a couple of recordings we scheduled via this service didn't make it to the Sky+ box. This only happened a few times, but if it doesn't work every single time it could become frustrating – especially if you're paying for each request.

Sky doesn't charge for the Sky by Mobile service, but you will have to pay data charges as determined by your mobile network. To help you keep track of costs, a screen pops up telling you how much data has been transferred; a single request should only clock up around 15KB of data. If you want to work out exactly how much this will cost you, contact your network operator and ask for current pricing.

If you don't like the idea of paying for SMS text messages or GPRS/3G data charges each time you schedule a recording, you'll be pleased to hear Sky is planning to offer the Remote Record service on its website in the near future.

Remote Record is a well-designed and easy-to-use service that will be well received by Sky's subscribers. Once the online scheduling service is running, which won't result in data charges each time you schedule a recording, it should become more popular. *Will Stapley*

Details

Price Free (SMS costs 25p per confirmed request)

Best price www.pcw.co.uk/bestprices

Contact Sky www.sky.com

System requirements Sky+ digibox (HD or standard) • Sky+ subscription • Mobile phone (3G/GPRS for Sky by Mobile)

Verdict

Pros Easy to use; great companion for Sky+; search facility

Cons SMS requests are fiddly; searching the EPG is slow

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

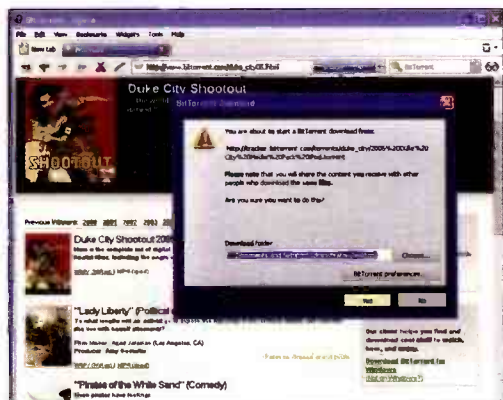
Overall Sky+ Remote Record adds an extra touch of class to what is already a hugely impressive service

★★★★★

WEB BROWSER

Opera 9

Loads of new features added to an already excellent browser



When any software reaches maturity, it can become hard for manufacturers to justify new releases. Opera 9, however, comes equipped with a selection of new features that don't render the existing ones obsolete.

One new addition that might cause some controversy is built-in Bit Torrent support. There is nothing intrinsically wrong with Bit Torrent but, apart from Linux ISO images, it does have a reputation for being used in piracy. Despite this, it's a useful tool,

especially as the Opera method helps you avoid exceeding your ISP's bandwidth restrictions.

Bit Torrent works on the premise that everyone who downloads a file also makes it available for others to download. This can lead to a lot of traffic. The option in Opera to turn sharing off might seem selfish, but it will help avoid some nasty bills.

Downloading files in this way is simple and the Bit Torrent lists can be searched from the toolbar. Opera 9 also comes with its own widget engine for displaying newsfeeds or other small applications such as clocks. Although helpful in avoiding the installation of more software, there are some drawbacks. Unlike the Yahoo widget engine there is no hotkey to bring the widgets to the foreground, which is a little odd, especially since it was possible with the beta of Opera 9. Each widget also has an entry on the Windows Taskbar, which can lead to a certain amount of congestion.

Unlike some rival browsers, there is no way to create extensions yourself, so using widgets is the only way to add extra functionality to Opera 9. In addition, there is no built-in calendar, which is a shame because Opera 9 already handles email and contacts. Despite these shortcomings, Opera still excels as an internet browser. It is small, fast and secure.

Tim Smith



Details

Price Free
Best price www.pcw.co.uk/bestprices
Contact Opera www.opera.com
System requirements Windows 98 or higher

Verdict

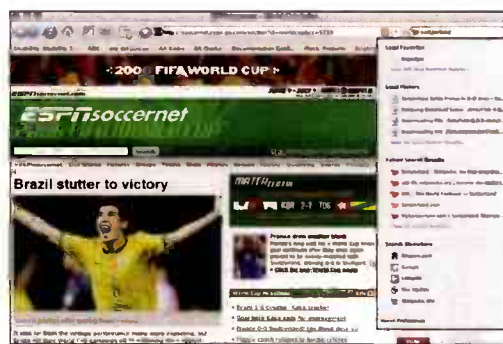
Pros Secure; small download
Cons No user extensions; no way to bring widgets to foreground
Features ★★★★★
Ease of use ★★★★★
Value for money ★★★★★
Overall Opera 9 is an excellent browser, but it's facing some stiff competition from newcomers such as Flock



WEB BROWSER

Flock

A quality browser, with extra features for bloggers



With the rise of blogs, photo sharing and RSS newsfeeds, much has been said about Web 2.0. Flock is a browser built on top of Mozilla Firefox, with all these technologies in mind.

Setup is painless and Flock will take all the settings from Firefox, including page history and cookies. This makes the transition the most painless of all browser upgrades, although it won't help those moving from Internet Explorer or Opera.

The interface is similar to most browsers, although the most recent browsing history is revealed by right-clicking on the Back button rather than there being a

discrete menu. On a more favourable note, it is possible to add icons for the blogging, photo and news tools.

A search box in the toolbar is nothing new, but the extra twist from Flock is that it searches dynamically as text is entered. The results vary depending on the words, but it is a much faster way of searching.

Flock is an ideal tool for anyone who wants to record their web experiences in a blog. Simply select an area of text or even an image, and then select the 'blog this' option. An editor appears with both a Wysiwyg editor and a source editor. It is compatible with Blogger, Typepad and other popular blogging tools.

A shortcut button can be added to the toolbar for creating blog posts without external content. This is not a complicated tool, but it makes creating blog posts really easy. Flock comes with a handy RSS newsfeed reader. Blogs are organised in folders, each with its own summary, and a summary page of the entire collection can also be viewed.

Images are not forgotten, with a Photobar that can be shown at the top of the screen for moving images in and out of online spaces such as Flickr, Myspace and Ebay. Although it doesn't have as many extensions as Firefox, Flock is a decent browser with good blogging features and an excellent search tool.

Tim Smith



Details

Price Free
Best price www.pcw.co.uk/bestprices
Contact Flock www.flock.com
System requirements Windows 2000/XP • Mac OSX 10.3.9 or higher • Linux

Verdict

Pros Useful blogging tools; dynamic search
Cons Fewer add-ons than Firefox
Features ★★★★★
Ease of use ★★★★★
Value for money ★★★★★
Overall Flock is a good browser for keen bloggers and photo sharers, and comes with an excellent search tool



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Please contact us direct if your model isn't shown new devices added regularly.



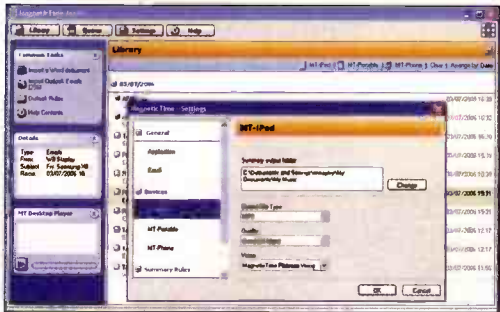
Operating System

Palm OS 5.2.1, 5.2.8, 5.4.5, Windows Mobile 2003 4.20.1081 (Build 13100), 4.20.0 (Build 14053), 4.21.1088 (Build 14235.2.0.0), Windows Mobile 2003 SE 4.21.1088 (Build 14132), Windows 2000/XP, Symbian and RIM

TEXT-TO-SPEECH UTILITY

Magnetictime

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Magnetictime aims to let you take your emails and Word documents with you wherever you go by converting them into audio files. The idea is you can transfer all your emails and documents to your mp3 player before a commute and listen to them on the go.

Documents and emails can be individually or bulk-converted to speech using the main Magnetictime interface. A shortcut button is also added to Microsoft Word and Outlook, allowing you to quickly convert the email or document currently on screen. Once converted, you can then transfer your files to any mp3-capable device.

The female voice is reasonably easy on the ear, but it is a little stunted at times and, as expected, struggles to consistently emphasise words correctly.

During testing, we found signatures and other types of email furniture resulted in painfully long audio files being created, leaving you to either frequently fast-forward through the file or listen to the voice struggle to pronounce email addresses and complicated headers.

Other issues we found included phone numbers being read out as ordinary numbers (ie 0207 would be read out as 'zero two hundred and seven'), but on the whole we were quite impressed with the pronunciation and handling of unusual words.

This latest version includes support for abbreviated text speak, allowing it to read 'c u l8r' as 'see you later'. However, when we supplied it with a list of the most common text speak abbreviations it struggled with the majority. Since Magnetictime is aimed primarily at business users, this feature does seem a little redundant – when was the last time your boss sent you an email proclaiming 'ur doing gr8 m8'?

Text-to-speech applications have never really taken off and we don't see Magnetictime bucking the trend. It's an interesting tool and has some good features, but at £22.99 it's also pretty expensive. *Will Stapley*

Details

Price £22.99

Best price www.pcw.co.uk/bestprices

Contact Magnetictime

www.magnetictime.com

System requirements Intel

Pentium II 350MHz • 128MB Ram

• Windows 2000/XP • Microsoft

Office 2000/2002/XP/2003

Verdict

Pros Easy to use; integrates with Microsoft Office

Cons Expensive; voice is a little stunted; some pronunciation issues

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

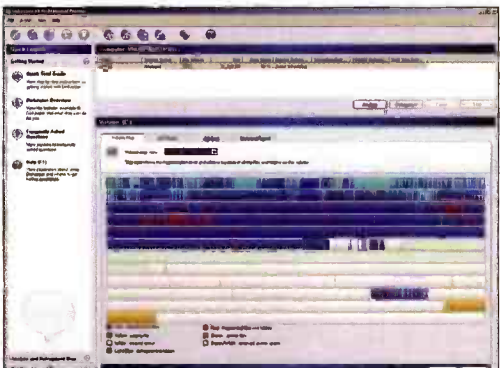
Overall Magnetictime will appeal to those who want to listen to long documents on the go but it has its fair share of issues

★★★★★

DISK MANAGEMENT

Diskeeper 10 Professional Premier Edition

A defragging program that will give you more than Windows XP's utility



Diskeeper 10 is aimed at people who want a faster, more powerful defragmenting program than the limited utility bundled with Windows XP.

It runs in the background and takes up around 11MB of space on the hard drive. Windows recognises Diskeeper as the new default disk management tool; this prevents any confusion resulting from both tools attempting to optimise your drive(s).

The depth and breadth of the disk statistics provided should be enough to satisfy the most knowledge-hungry of power users. For less

experienced users, Diskeeper generates recommendations for settings on the basis of the disk usage data it gathers.

The Job Scheduler lets you configure both the disk and CPU priority of the background defragmenting process. Once your hard drive has been thoroughly optimised it's merely a matter of routine maintenance to keep it that way.

One advantage Diskeeper has over the Windows tool is the ability to efficiently defragment drives that are low on free space. The software doesn't waste time processing massive files that don't warrant defragging.

Alongside the defragmenting tool, Diskeeper's drive performance calibration tool, I-Faast, improves disk access on NTFS drives by studying drive usage patterns over a week or more.

You can achieve much of what Diskeeper provides by downloading a selection of freeware/shareware. However, on the whole they will not be so neatly presented or tightly packaged as Diskeeper.

Drives used mainly for archival purposes won't use this package to its full potential. Regular PC users should instead look at the Home Edition (£23), which includes the main defragmenting options without the advanced tools. *Marc Delehanty*

Details

Price £93

Best price www.pcw.co.uk/bestprices

Contact Diskeeper

www.diskeeper.com

System requirements 11MB hard disk space • NTFS/Fat16/Fat32 file systems • Windows XP/NT/2000/x64

Verdict

Pros Easy to configure; produces detailed statistics

Cons Expensive; full potential unlikely to be achieved by most users

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall A must for serious disk fragmentation management, but overkill for most users

★★★★★

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ROLE-PLAYING GAME

Titan Quest

Prepare yourself for a good, old-fashioned role player of titanic proportions



So far, 2006 has been a good year for fans of the role-playing game (RPG) genre. Many gamers are currently still locked into the seemingly endless Elder Scrolls IV: Oblivion. But for anyone who has actually managed to work their way through all of Cyrodiil (a province within Oblivion, for those who don't know), here comes Titan Quest to kill off the last remaining vestiges of your social life.

In stark contrast to Oblivion's next-generation visuals and gameplay, THQ's new role player has a retro look and feel that almost wants to pretend the past 10 years worth of games development never happened. That's not meant to be a negative statement, either.

Many aficionados consider the golden age of RPG gaming to be a decade ago, when titles such as Diablo defined the genre. If you are such a person, then it's quite possible Titan Quest will represent a significant slice of wish fulfilment pie.

Ignoring the recent trend for realistic first- or third-person action, Titan Quest opts for a high-angle, bird's-eye view that'll be instantly familiar to anyone who has ever played Diablo and its ilk.

Similarities with Blizzard's popular RPG don't end there, either. Titan Quest may be set in Ancient Greece (with forays into Egypt and Asia) rather than a made-up fantasy land, but both the control system (traditional mouse-based point 'n' click) and gameplay (explore, kill monsters, loot cool stuff) are all very familiar.

The game begins when the Titans – at one time defeated and imprisoned by the Gods of Mount Olympus – break free and promise to wreak merry havoc across the land. You are, of course, the only one who can stop them. Initial creation of your character is reduced to the absolute bare minimum (choosing

his/her sex and tunic colour) before you're shoved into Titan Quest's big, bad world.

This may seem a bit restrictive, but as the quest progresses players will find they have plenty of opportunity to tailor their character with all manner of items and specialised powers. As is traditional in RPGs, your character will be allotted experience points for various heroic deeds. Reach a certain number of points and your character will level up. Whenever you reach a new level you'll be given the chance to customise your character further by assigning points to various skills.

Visually, it's easy to write off the game for seeming a bit dated. But the high-angle viewpoint hides some extremely detailed characters and environments that can only be appreciated by zooming the camera closer into the action. Character animation, too, is excellent. Voice acting, however, is a bit odd. Particularly annoying are some of the game's comedy foreign accents.

Titan Quest is vast, both in terms of its virtual geography and the amount of time it takes to work your way through the main storyline and side missions. Should you ever finish the single-player game, you'll find there's still plenty of fun to be had. Online multiplayer, for example, offers an excellent co-operative option that allows you to slash your way through gorgons and hydras with up to six other real, live players at your side.

As with many RPGs, Titan Quest takes quite a while to get going, and there are moments when it feels a bit samey. Some aspects of its gameplay are a little clunky and we can't help feeling that its overall style is old hat. Nevertheless, it provides an absorbing adventure on a massive scale. All in all, Titan Quest is a rip-roaring, old-school role player. *Jonathan Parkyn*

Details

Price £34.99

Best price www.pcw.co.uk/bestprices

Contact THQ

<http://titanquestgame.com>

System requirements Pentium 4 1.8GHz or AMD Althon XP • 512MB Ram • 5GB hard disk space • DVD-Rom drive • Windows 2000/XP

Verdict

Overall It may feel a little dated to some, but Titan Quest is what many role-playing fans have been yearning for



3D ACTION ADVENTURE

Pirates of the Caribbean: Legend of Jack Sparrow

Ubisoft's new take on the movie tie-in has all the appeal of the delightful Sparrow himself



With the latest instalment of Disney's swashbuckling series setting sail round the cinemas this summer, it was always a given that Depp, Bloom and Knightley would, at some point, end up in pixelated pirate form. Interestingly, developer Ubisoft has opted not to follow the plot of the latest *Pirates of the Caribbean* movie, but to instead flesh out the back story of its lead character, Jack Sparrow.

The premise is pretty good. Betrayed by some less trustworthy pirates early on, Sparrow and Will Turner

(Bloom) face execution. To gain some time, Jack – voiced by Depp himself – wows the crowds with tall tales of his own heroism. These exaggerated yarns then form the playable episodes of the game.

During each sequence you are accompanied by either Will or Elizabeth Swann (Knightley), both of whom are also playable. Certain puzzles involve switching to the other character to use his or her special ability (axe throwing in Knightley's case, apparently). In the additional co-op mode, two players can fight their way through the game side by side.

Gameplay is largely of the hack-and-slash-button-mash variety, so it's a blessing that USB gamepads are supported. There's not a huge amount of variety, apart from the occasional obstinate boss. As such, the game is pretty easy, particularly since your character comes back to life whenever their health runs out.

A direct Playstation 2 port, *Pirates* isn't particularly pretty to look at. Depp's voicework, meanwhile, is a bit patchy and sounds like he might have been contractually obliged to phone in his performance. The game is also frighteningly brief. But kids will probably love it. So if you can find a cheap copy, it might help keep the younger ones distracted for a bit as the summer hols stretch on into autumn. *Jonathan Parkyn*

Details

Price £29.99

Best price www.pcw.co.uk/bestprices

Contact Ubisoft

<http://pirates.bethsoft.com>

System requirements 800MHz

Pentium III or AMD Athlon

processor • 256MB Ram • 4GB

hard disk space • DVD-Rom drive

• Windows 2000 or XP

Verdict

Overall Not the worst movie adaptation we've ever played, but still a bit of a wasted opportunity. Definitely one for younger cabin boys and girls

★★★★★

RPG AND 3D ACTION

Rise and Fall: Civilizations at War

This genre-spanning historical epic is part role-playing game and part action



Every so often an interesting title comes along that tries to mix things up a bit by blending gameplay styles from different genres: an RPG like *Oblivion*, with a heavy action slant, for example, or a shooter such as *Half-Life 2 Episode One*, with a high puzzle quotient.

Midway's *Rise and Fall: Civilizations at War* is a brave attempt to combine real-time strategy with a more action-oriented, third-person gameplay. The game takes place in the ancient world among the

armies of the Greeks, Romans, Persians and Egyptians. Historical accuracy, however, is to be taken with a pinch of salt. Two campaigns are available – one centred around Alexander the Great and one based on Cleopatra – as is an instant-action skirmish mode and network or online multiplayer.

The main bulk of the game will be familiar ground for most strategy fans: build up forces, make allies, conquer enemies, etc. As with many strategy games, *Rise and Fall* has a hero system, where the leader of a faction can be deployed on the battlefield as an ultimate weapon. In this instance, players can also switch to Hero Mode and briefly step into the sandals of the character to dish out the damage in person.

On paper, this might sound like an attractive mix of cerebral strategising and hands-on hack-and-slash. In practice, the two styles sit together awkwardly, which isn't helped by the fact that the strategy side is a flat, repetitive experience, while the action component is simplistic and occasionally frustrating.

The truth is, many strategy gamers aren't that keen on 3D action titles, while fans of the action genre tend to avoid strategy games like the plague. Since neither aspect is particularly well executed, *Rise and Fall* is a bit like a marriage made in hell. *Jonathan Parkyn*

Details

Price £29.99

Best price www.pcw.co.uk/bestprices

Contact Midway

www.riseandfallgame.com

System requirements 1.5GHz P4

or higher • 256MB Ram • 3GB hard

disk space • DVD-Rom drive •

Windows 2000 or XP

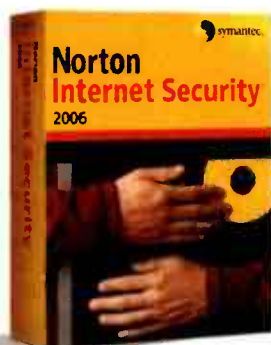
Verdict

Overall A great idea, but its awkward execution, mediocre visuals and occasional gameplay hiccups are unlikely to appeal to fans of either strategy or action games

★★★★★

THREAT	RELEASED	DECEASED	THREAT	RELEASED	DECEASED	THREAT	RELEASED	DECEASED
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Linux.Plupli.C	19/2/06	19/2/06	PWSteal.Tarno.R	20/1/06	20/1/06	W32.Beagle.CZ@mm	20/12/05	20/12/05
W32.Beagle.DU	18/2/06	18/2/06	Trojan.Mdropper.E	19/1/06	19/1/06	W32.Dasher.D	19/12/05	20/12/05
OSX.Inqtana.A	17/2/06	18/2/06	SymbOS.Sendtool.A	18/1/06	19/1/06	PWSteal.Tarno.Q	19/12/05	20/12/05
W32.Alcra.F	17/2/06	17/2/06	SymbOS.Pbstealer.D	18/1/06	19/1/06	Trojan.Mdropper.D	18/12/05	18/12/05
PWSteal.Metafisher	16/2/06	17/2/06	SymbOS.Bootton.E	18/1/06	19/1/06	SymbOS.Skulls.R	16/12/05	16/12/05
OSX.Leap.A	16/2/06	16/2/06	PWSteal.Changgame	18/1/06	18/1/06	SymbOS.Cardtrp.P	16/12/05	16/12/05
W32.Beagle.DS@mm	15/2/06	16/2/06	Trojan.PWS.QQPass.H	18/1/06	18/1/06	W32.Beagle.CY@mm	16/12/05	17/12/05
Bloodhound.Exploit.59	14/2/06	14/2/06	W32.Looksky.H@mm	17/1/06	18/1/06	W32.Dasher.C	16/12/05	16/12/05
Linux.Backdoor.Kaiten	14/2/06	14/2/06	W32.Redplut	17/1/06	17/1/06	W32.Dasher.B	16/12/05	16/12/05
Trojan.Satiloer.C	14/2/06	14/2/06	W32.Blackmal.E@mm	17/1/06	17/1/06	Trojan.Swepdat	15/12/05	16/12/05
W32.Exvid.A@mm	13/2/06	13/2/06	W32.Feebs.J@mm	16/1/06	16/1/06	SymbOS.Cardtrp.O	15/12/05	15/12/05
Bloodhound.Exploit.58	10/2/06	10/2/06	Trojan.Tabula.D	14/1/06	15/1/06	Trojan.Lodear.F	15/12/05	16/12/05
Trojan.Goldur							05	15/12/05
W32.Kedebe.I							05	15/12/05
W32.Beagle.D							05	15/12/05
W32.Beagle.D							05	15/12/05
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W32.Beagle.D							05	15/12/05
W32.Jalabed.C							05	15/12/05
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SymbOS.Card							05	15/12/05
SymbOS.Card							05	14/12/05
SymbOS.Card							05	13/12/05
W32.Kiman.B							05	13/12/05
Backdoor.Pro							05	13/12/05
W32.Beagle.D							05	13/12/05
SymbOS.Card							05	13/12/05
Trojan.Mancs							05	13/12/05
W32.Beagle.D							05	13/12/05
W32.Beagle.D							05	13/12/05
W32.Kiman.A							05	11/12/05
W32.Loxbot.F							05	10/12/05
Backdoor.Naninf.D	1/2/06	1/2/06	Bloodhound.Exploit.56	27/12/05	28/12/05	W32.Spybot.ABDO	10/12/05	10/12/05
Backdoor.Naninf.C	31/1/06	1/2/06	Backdoor.Dckane	27/12/05	27/12/05	W32.Aizu.G	9/12/05	9/12/05
W32.IRCBot.I	31/1/06	31/1/06	W32.Neshuta	27/12/05	27/12/05	W32.Looksky.E@mm	9/12/05	9/12/05
Trojan.Gpcoder.D	31/1/06	31/1/06	Trojan.Lodear.I	24/12/05	25/12/05	Trojan.Chuvazada	9/12/05	9/12/05
Backdoor.Doroku	29/1/06	29/1/06	Linux.Mare	24/12/05	24/12/05	W32.Sober@mm!dam	8/12/05	9/12/05
W32.Antinny.AX	28/1/06	28/1/06	W32.Feebs.B@mm	22/12/05	22/12/05	Trojan.Zlob.F	8/12/05	9/12/05
SymbOS.Cardtrp.Q	27/1/06	28/1/06	Trojan.Lodear.H	22/12/05	23/12/05	W32.Kelvir.JJ	7/12/05	7/12/05
SymbOS.Cardtrp.R	27/1/06	28/1/06	W32.Beagle.DB@mm	22/12/05	23/12/05	W32.Mytob.MR@mm	7/12/05	7/12/05
SymbOS.Cardtrp.S	27/1/06	28/1/06	W32.Mytob.MX@mm	22/12/05	22/12/05	Trojan.Spaxe	6/12/05	7/12/05
Backdoor.Dragodor	27/1/06	27/1/06	W32.Beagle.DA@mm	22/12/05	22/12/05	Trojan.Farknew	6/12/05	6/12/05
W32.Imav.A	26/1/06	26/1/06	Trojan.Mitglieder.S	22/12/05	22/12/05	Trojan.Welomoch	6/12/05	6/12/05
W32.Lodav.A	26/1/06	26/1/06	W32.Spybot.ACDM	22/12/05	22/12/05	Trojan.Zlob.E	6/12/05	6/12/05
Trojan.Lodeight.B	25/1/06	26/1/06	W97M.Ruleden	21/12/05	22/12/05	W32.Mytob.MN@mm	5/12/05	7/12/05
Trojan.Bomka	24/1/06	25/1/06	W32.Wisfc	21/12/05	21/12/05	Trojan.Ruindem	2/12/05	3/12/05
PWSteal.Wowcraft.C	24/1/06	24/1/06	W32.Feebs.A	21/12/05	21/12/05	Bloodhound.Beagle	2/12/05	2/12/05

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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.

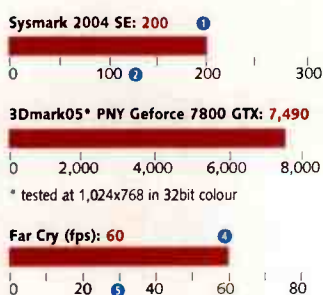
It's true that speed isn't everything, but it's an important part of the buying equation, especially when there are so many components out there. As many of our PC group tests are based on price bands, checking the performance is even more important – if the core system is underperforming, you need to 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



- ① A score of 200 indicates that the system is twice as fast as the reference PC
- ② The reference PC (2GHz P4 512MB of Ram) scores 100
- ③ A Geforce 7800 GTX would score in the region of 7,490
- ④ A score of 60fps (frames per second) or higher is most desirable
- ⑤ A result of 30fps or above means the machine can produce playable frame rates at the tested resolution



Far Cry is a real-world DirectX 9 test



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Editor's Choice

'You may see a PC in shop sporting a Vista Capable logo, which certifies it meets the minimum requirements to run basic Vista'

Louis Pasteur once said, "Fortune favours the prepared mind." So, prepared to find a Vista-friendly PC for £1,299 or less, Cliff Joseph tested a selection of six offerings

£1,299 PCs

It is often said that PCs these days are obsolete the moment you buy them because the pace of technology means there's always something better, faster and cheaper coming along. We don't hold with that view: after all, no PC is obsolete as long as it can still perform the tasks for which you bought it.

Even so, when you're buying a new PC it's still worth spending a little extra to make sure you get something that can keep pace with new technologies – for a few years at least. And, of course, the biggest new development looming on the horizon right now is Microsoft's Windows Vista operating system.

As the (probable) January 2007 launch of Vista approaches, you may start to see PCs in the shops sporting a little 'Vista Capable' logo. This certifies that the PCs meet the minimum system requirements needed to run the basic version of Vista, which includes an 800MHz processor, 512MB of Ram and a DirectX 9 graphics card.

There's a catch here, though, as this is very much a minimum requirement and doesn't guarantee you'll be able to experience all of Vista's new features, such as the eye-candy graphics of the much-touted Aero interface.

To get the full Vista experience you need something a bit heftier. To run the Premium Edition of Vista properly Microsoft says you'll need at least a 1GHz processor, 1GB of Ram and a DirectX 9 graphics card with at least 128MB of dedicated video memory – preferably 256MB.

So, with one eye on Vista, we've rounded up a few high-end PCs that should have all the horsepower you'll need to experience Vista in all its glory.

Ambros Shuttle SD36G5 PC System

Price £1,299 Contact www.ambros.co.uk



Housed in one of Shuttle's trademark small form factor chassis, Ambros' SD36G5 PC System packs a lot of power into its compact design.

It's not, admittedly, the fastest overall performer. It's equipped with a 3.2GHz Pentium D processor and, like all the Pentium systems in this group, it lags a little behind AMD-based rivals such as those from Mesh, Evesham and PC Nextday. Even so, the Pentium D processor is no slouch, and the SD36G5 will still be

more than adequate for business applications and even demanding multimedia work such as video editing or music creation. The 2GB of Ram will be handy too, although the 250GB hard disk is a bit stingy compared with the larger hard disks found in most of its rivals.

The only relatively minor weakness is the choice of a Geforce 7600GS graphics card. This is noticeably slower than the Geforce 7900 card used by a number of other PCs here. Even so, with a score of well over 65fps (frames per second) in our Far Cry test, it is still fairly respectable.

The SD36G5 scores well in other areas, too. It's a fully Viiv-compliant PC, boasting a wide range of multimedia features, including a TV tuner card, 7.1 surround sound, and both video input and output. Our only real concern about the SD36G5 is that its compact chassis provides very little room for future upgrades. There's only a single free drive bay, and no additional expansion slots. Even upgrading the existing graphics card could be tricky as any new graphics card will need to have a very small fan in order to fit into the limited space available.

The SD36G5 is a good choice for home users who want a powerful yet compact PC that isn't going to take up too much room. However, power users who like lots of upgrade potential will probably opt for one of the larger tower designs on offer.

Verdict

Pros Good performance; compact design; good multimedia features
Cons Little room for future upgrades; relatively small hard disk

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

Overall Compact design and versatile multimedia features will appeal to many home users

★★★★★

Cube Pegasus ST6

Price £1,299 Contact www.cube247.co.uk



Cube often opts for small-form designs for its PCs. On this occasion, however, it clearly thought a high-end PC deserved a full-scale tower design. And Cube has certainly made good use of the expansion options provided by the tower chassis.

The Pegasus ST6 comes equipped with a healthy 2GB of Ram and a thumping 750GB (3 x 250GB) hard disk capacity. Combine those features with surround sound and digital audio output, twin DVD drives and

more USB and Firewire ports than you're ever likely to need, and you've got a PC with audio/video workstation written all over it. It has a full set of surround-sound speakers, so it will make a good home-entertainment system as well as handling any demanding PC software you want to run on it.

The bulky tower chassis provides plenty of scope for future expansion, with three spare drive bays and x1 PCI Express slots available for upgrades. We were also pleased with the way in which the internal cabling was neatly arranged, making it easy to gain access to all these slots and bays.

The only minor disappointment comes when examining the Pegasus' performance results. The 3.6GHz Pentium 4 processor provides a solid level of basic performance – certainly more than enough to cope with demanding audio and video work. But the choice of an ATI Radeon X1600 graphics card lets it down a little when it comes to 3D performance.

The best 3D and games performance in this group comes from machines with Nvidia cards. While the Pegasus managed a respectable 59fps in our Far Cry test, serious gamers will likely opt for a rival machine that has an Nvidia Geforce 7900. Of course, that won't matter much to anyone but a hardcore gamer, and the Pegasus' impressive storage and expansion options do make it a good choice for multimedia work.

Verdict

Pros Lots of Ram and hard disk storage; plenty of room for internal upgrades; includes surround-sound speakers
Cons Average 3D performance

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

Overall An excellent choice for creative users looking for an audio or video workstation

★★★★★

Evesham Visto

Price £1,299 Contact www.evesham.com



Evesham's Visto is an excellent all-round performer that also boasts a comprehensive set of multimedia features.

Based on an Athlon64 X2 4600+ processor running at 2.41GHz, the Visto produces consistently good results in all our benchmark tests. The processor is backed up by a Geforce 7900 graphics card that manages to top the 80fps mark in our Far Cry test. This ensures that the Visto will provide all the 3D

graphics performance needed by hardcore gamers, not to mention coping admirably with business applications and demanding audio, video and graphics work. And, of course, it should be ideal for running Windows Vista when that finally arrives.

The Visto's performance results are also complemented by an impressive range of multimedia features. Like most of the PCs in this group it is supplied with the Media Center Edition of Windows XP. Evesham has also included a TV tuner card and a full set of 7.1 surround-sound speakers, so the Visto really does give you all the audio and video features you need for a versatile entertainment system.

There's plenty of upgrade potential inside the machine too, with a spare expansion slot for a second graphics card and room for up to four additional hard disks. Our only minor criticism is that the twin x16 PCI Express slots drop down to x8 speed if you use both of them, whereas rivals such as Mesh and PC Nextday provide two full-speed x16 slots for maximum performance.

Even so, the Visto still provides all the performance that most home users – and even creative professionals – are ever likely to need. Combine that with the peace of mind provided by Evesham's three-year warranty and you've got a thoroughbred PC that will earn its keep for years to come.



Verdict

Pros Great all-round performance; versatile multimedia features; plenty of upgrade potential
Cons Only 1GB of Ram; bland tower design; not ideal for SLI graphics setups

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

Overall An excellent home PC that combines strong performance with versatile multimedia features

★★★★★

HP Pavilion Media Centre TV m7475

Price £1,185.99 Contact www.hp.com/uk



It doesn't have quite the same raw horsepower as some of its rivals, but HP's Pavilion Media Centre TV is still a respectable performer, and boasts one or two clever design features.

The Pavilion's 3GHz Pentium D may be one of the less powerful processors in this group of PCs, but it's still more than adequate for running pretty well any application you throw at it. The Geforce 7900GS graphics card also performs quite well,

allowing the Pavilion to clock up almost 70fps in our Far Cry tests.

But while the Pavilion makes a competent games machine, its real focus is clearly on its multimedia capabilities. It runs the Media Center Edition of Windows XP and is equipped with a TV tuner card, so it will work well as part of a home-entertainment system. We also like the way that HP has placed the audio and video input connectors conveniently on the front of the unit. This will be handy for anyone who does a lot of video editing or audio recording.

However, the Pavilion's most unusual feature is its Personal Media Drive. This is a removable 300GB hard disk that can either be used as a conventional external USB drive or slotted into a bay on the front of the machine. This means you can simply use it to add extra storage to the Pavilion, or to transfer large audio or video files from one place to another. It's a neat idea, and will certainly appeal to people who do a lot of audio and video work, or want a simple archiving solution.

The only real disappointment – although perhaps to be expected considering it costs over £100 less than its rivals – is the fairly basic set of stereo speakers built into the tiny 17in flat-panel monitor. Even so, the Pavilion's features and clever design make it a good choice for anyone wanting a versatile multimedia workstation.

Verdict

Pros Solid all-round performance; versatile multimedia features; removable drive
Cons 17in monitor; no separate speakers

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

Overall A good choice for anyone who does a lot of audio, video or digital photography work, although upgrading the monitor might be a good idea

★★★★★

Mesh Matrix² AM2 5000 PCW

Price £1,299 Contact www.meshcomputers.com



We were almost – but not quite – tempted to give the Matrix² AM2 5000 a bonus point for the glowing meters and dials on its front panel. These don't really add very much to the machine's functionality, although they do hint at the complexity of its internal cooling system, which is festooned with multiple fans and heatsinks. So this is probably a good choice for experienced users who are confident enough to experiment with overclocking.

However, most of us will be more than content with the high levels of performance provided by the Matrix², with its AMD Athlon64 X2 5000+ processor and Nvidia Geforce 7900GT graphics card. These provide strong all-round performance that will suit business users, creative users and gamers alike. Fortunately, the 20in widescreen Viewsonic TFT monitor is a great model for either work or play.

Audio support is a particular strength too, as the Matrix² is equipped with a gold-plated Creative X-Fi Extreme soundcard, which provides multiple audio input and output. The system is also supplied with Windows XP Media Center Edition, along with a full set of 7.1 surround-sound speakers and twin DVD drives, providing you with the basis of a really versatile entertainment system. There's even a good old-fashioned floppy disk drive for old times' sake.

We did have a couple of minor concerns, though. The 1GB of Ram and 300GB hard disk are really the minimum you should expect in such a high-end machine. We also noticed that the internal expansion slots are partly obscured by the complex cooling system and the cabling for the soundcard, so you may not have quite as much scope for future expansion as you might expect. Still, the Matrix²'s strong performance and range of features will be more than enough to satisfy even the most demanding home user.

Verdict

Pros Strong all-round performance; good audio support and 7.1 speakers

Cons Expansion slots obscured by internal cabling; complex cooling system

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall A good performer with particularly strong audio support – and glowing lights on the front
★★★★★

PC Nextday Zoostorm 5-7502 Advanced PC

Price £1,299 Contact www.pcnextday.co.uk



Personal
Computer
World
EDITOR'S CHOICE

Verdict

Pros Excellent all-round performance; useful multimedia features; bundled webcam and wireless networking

Cons Few free expansion slots; vendor contact by email only (no phone helpline)

Features ★★★★★

Performance ★★★★★

Value for money ★★★★★

Overall With great performance and features, Zoostorm 5-7502 is worth every penny of its £1,299 price tag
★★★★★

tests. Only the X2 5000+ processor used by the Mesh Matrix² allows it to nudge ahead in the Cinebench test, which is biased towards raw processor performance. However, the Zoostorm has the more powerful graphics card, allowing it to pull ahead in all our other tests, including 3D and games performance. Gamers will appreciate the spare x16 PCI Express slot on the ECS KN1 SLI Extreme motherboard, which will allow an upgrade to a twin SLI (Scalable Link Interface) graphics setup in the future.

Add to that a full 2GB of Ram and capacious dual 320GB hard disks and you've got a PC that can handle anything from business software to video editing or the latest 3D games. The 512MB of video memory on the graphics card will also come in handy for the graphical bells and whistles of Windows Vista's Aero interface.

PC Nextday has also included loads of additional features. Several of the PCs in this group include surround-sound speakers and dual optical drives, but the Zoostorm also comes with a webcam, wireless network card and TV tuner. The only noticeable flaw is that the TV tuner, wireless and soundcards use up most of the expansion slots, leaving only the x16 PCI Express slot available for the second graphics card. Some professional users might prefer a machine with a few more expansion slots, but Zoostorm's features and performance stand out even among this group of impressive PC systems.

It's hard to find fault with PC Nextday's Zoostorm 5-7502 Advanced PC. The machine's performance is excellent, and it boasts an impressive range of features and bundled accessories.

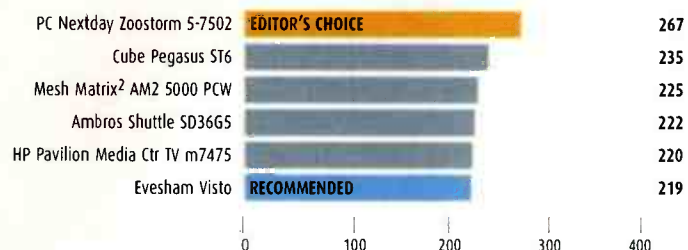
The Zoostorm is based on an AMD Athlon64 X2 4600+ processor running at 2.41GHz, and is backed up by an Nvidia Geforce 7900 GTX graphics card with a full 512MB of video memory. That combination allows it to take the top spot in all but one of our benchmark

Lab results

This range of PCs, although varying in performance and features, are equipped to handle the basic version of Vista when it is finally released at the start of 2007

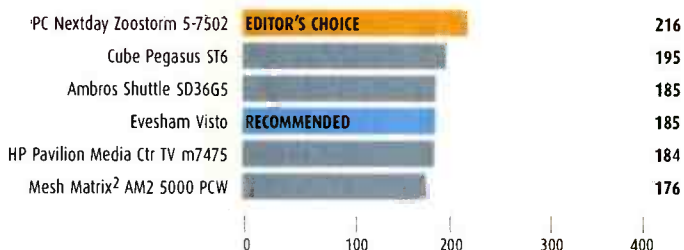
Sysmark 2004 SE (overall)

Bigger is better



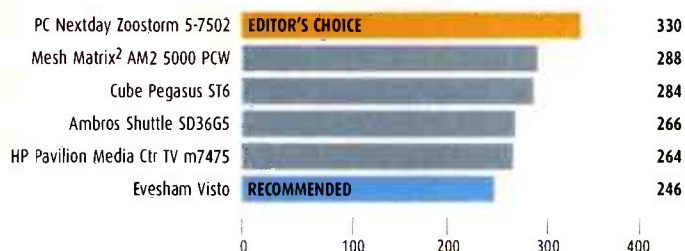
Sysmark 2004 SE (office productivity)

Bigger is better



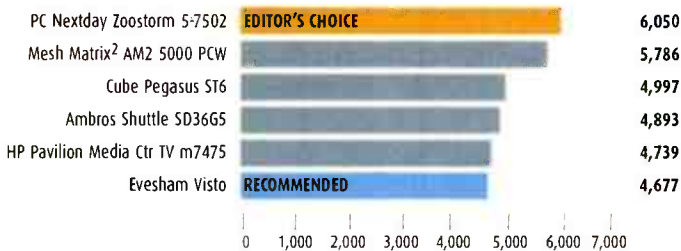
Sysmark 2004SE (internet content creation)

Bigger is better



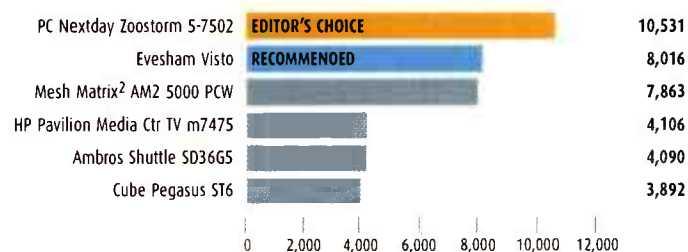
PCmark05 (overall)

Bigger is better



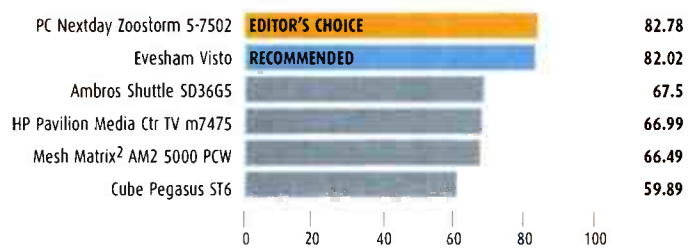
3Dmark05 (1,024x768 in 32-bit colour)

Bigger is better



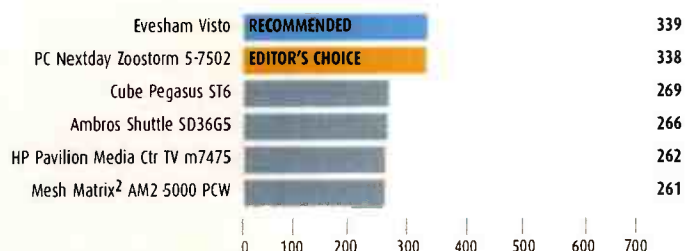
Far Cry (1,024x768 in 32-bit colour)

Bigger is better



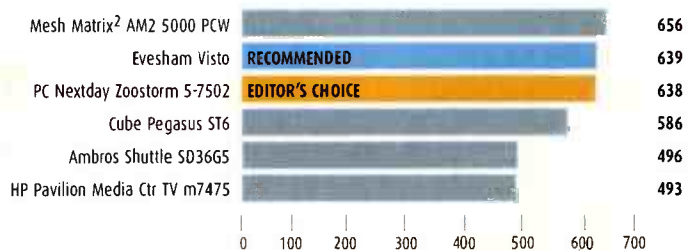
Cinebench (1 CPU)

Bigger is better



Cinebench (2 CPU)

Bigger is better



Please see page 93 for an explanation of how we tested the PCs

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BenQ

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- Intel Core Duo T2500 processor
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SONY

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- Up to 15 ppm max print speed
- 1 year manufacturer warranty





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£1,299 PCs

		
MANUFACTURER	AMBROS	CUBE
Model name	Shuttle SD36G5 PC System	Pegasus ST6
Price	£1,299	£1,299
Sales telephone	020 8998 1010	0870 242 1179
URL	www.ambros.co.uk	www.cube247.co.uk
HARDWARE		
Processor	Pentium D 940 3.2GHz	Intel Pentium 4 960 (3.6GHz)
Motherboard	Shuttle FD36	Asus P5LD2
Chipset	Intel i945P Express/ICH7DH	Intel 945P
Available memory/type	2GB PC5300 DDR2	2GB PC5300 DDR2
Occupied/spare memory slots	2/0	2/2
Max memory supported by motherboard	2GB	4GB
Hard disk manufacturer and model	Maxtor 6V250F0	Seagate ST3250824AS
Secondary hard drive	N/A	2 x Seagate ST3250824AS
Total storage space	250GB	750GB
EXPANSION AND I/O		
No of 3.5/5.25in bays	2/1	6/4
No of free 3.5/5.25in bays	1/0	1/2
No of PCI/PCI-x16/PCI-x4/PCI-x1 ports	1/1/0/0	3/1/0/3
No of free PCI/PCI-x16/PCI-x4/PCI-x1 ports	0/0/0/0	1/0/0/3
No of USB2/Firewire ports	4/2	13/4
No of serial/parallel/PS/2 ports	1/0/2	1/1/2
MULTIMEDIA		
Primary optical drive	NEC ND-3550A	NEC ND-4570A
Optical drive formats and DVD write speed (max)	16x DVD, 16x DVD +/-R, 8x DVD +RW, 6x DVD -R, 8x DVD +R DL, 6x DVD -R DL	16x DVD, 16x DVD +/-R, 8x DVD +/-RW, 6x DVD-RW DL, 8x DVD-R DL, 5x DVD-Ram
Secondary optical drive	N/A	LG GDR8164B
Optical drive formats and DVD write speed (max)	N/A	16x DVD
Soundcard	Integrated Realtek ALC882 7.1 high-definition audio	Integrated Realtek ALC882 7.1 high-definition audio
Speakers	Hercules XPS 2.101/2.1 stereo	Creative Inspire 5800/5.1
Graphics type/memory	Nvidia Geforce 7600GS/256MB	ATI Radeon X1600/512MB
Screen type, size and (maximum resolution)	TFT, 19in, 1,440x900	GNR TS900 TFT, 19in, 1,280x1,024
OTHER INFORMATION		
Modem/other hardware	Microsoft wireless keyboard and mouse, 22-in-1 card reader, digital Freeview TV card	None
Network	Gigabit 10/100/1,000	Gigabit 10/100/1,000
Operating system	Windows XP Home SP2	Windows XP Home SP2
Bundled software	Power DVD, Nero, Open Office, Bullguard three months	Nero, PowerDVD
Standard warranty: return to base (RTB); collect and return (C&R)	One-year RTB (optional two years RTB for £69)	One year RTB
SCORES		
Features	★★★★★	★★★★★
Performance	★★★★★	★★★★★
Value for money	★★★★★	★★★★★
OVERALL	★★★★★	★★★★★

			
EVESHAM	HP	MESH	PC NEXTDAY
Visto	Pavilion Media Centre TV m7475	Matrix2 AM2 5000 PCW	Zoostorm 5-7502 Advanced PC
£1,299	£1,185.99	£1,299	£1,299
0870 160 9500	0845 270 4142	08447 360 440	Online enquiries only
www.evesham.com	www.hp.com/uk	www.meshcomputers.com	www.pcnextday.co.uk
AMD Athlon64 X2 4600+ (2.41GHz)	Intel Pentium D 830 (3GHz)	AMD Athlon64 X2 5000+ (2.6GHz)	AMD Athlon64 X2 4600+ (2.41GHz)
MSI MS-7250	Asus Emery UL8E	Asus M2N32-SLI Deluxe	ECS KN1 SLI Extreme
Nvidia nForce5 570	Intel i945P Express/ICH7	Nvidia nForce5 590SLI	Nvidia nForce4 SLI
1GB PC6400 DDR2	2GB PC5300 DDR2	1GB PC3200 DDR2	2GB PC3200 DDR400
2/2	4/0	2/2	2/2
8GB	4GB	8GB	4GB
Western Digital WD3200JD	Western Digital WD3000JS	Maxtor 6V300F0	Western Digital WD3200KS
N/A	N/A	N/A	Western Digital WD3200KS
320GB	300GB	300GB	640GB
3/4	1/2	6/4	5/5
1/3	0/1	4/1	2/3
3/2(1x8)/0/2	2/1/0/0	2/2/1/1	3/2/0/0
2/1(1x8)/0/2	1/0/0/0	1/1/1/1	0/1/0/1
6/2	4/1	8/2	6/1
1/0/1	0/1/2	1/0/2	1/0/2
Sony DW-G120A	TH-H552L	Sony DW-G120A	Philips DVDR1660P1
16x DVD, 16x DVD +/-R, 8x DVD+RW, 6x DVD-RW, 8x DVD-/RW DL	16x DVD, 16x DVD +/-R, 4x +/-RW, 4x +/- DL	16x DVD, 16x DVD +/-R, 8x DVD+RW, 6x DVD-RW, 8x DVD-/RW DL, 5x DVD-Ram	16x DVD, 16x DVD +/-R, 8x DVD-/RW, 8x DVD +R DL, 4x DVD-R DL
Sony DDU1615	N/A	Sony DDU1615	OEM 16x DVD
16x DVD	N/A	16x DVD	16x DVD
Integrated Realtek ALC883 7.1 high-definition audio	Integrated Realtek ALC882 7.1 high-definition audio	Creative SB X-Fi	Creative SB X-Fi
Creative Inspire T7900/7.1	Stereo speakers built into monitor	Creative Inspire T7900 - 7.1 Surround	Philips MMS460/5.1
Nvidia 7900GT/256MB	Nvidia 7900GS/512MB	Nvidia Geforce 7900GT 256MB	Nvidia Geforce 7900GT/512MB
Viewsonic TFT, 20in, 1,680x1,050	HP 17in TFT, 1,280x1,024	Viewsonic TFT, 20.1in, 1,680x1,050	AOC TFT, 20in, 1,600x1,200
Wireless optical keyboard and mouse, Hauppauge Nova-T 500 TV tuner card	HP wireless keyboard and mouse, 7-in-1 card reader, remote control, HP media drive, Asus Europa II TV card	Logitech internet keyboard and mouse	Wireless optical keyboard and mouse, webcam, 802.11g wireless card, 7-in-1 card reader, TV tuner card and remote control
Dual Gigabit 10/100/1,000	10/100, 802.11b/g Wireless	Gigabit 10/100/1,000	10/100
Windows XP MCE SP2	Windows XP MCE SP2	Windows XP MCE SP2	Windows XP MCE SP2
Microsoft Works 8.5, Bullguard Antivirus 5, Roxio Easy Media Creator 7, Adobe Acrobat Reader 6, Cyberlink PowerDVD 6	Microsoft Works 8.0, Norton Internet Security, Sonic Digital Media Plus	Cyberlink Video Editing Suite, Microsoft Works 8.5	Nero 6, Power DVD
Two years on site, one year RTB	One year RTB, parts and labour	Three years on-site parts and labour	One year RTB, parts and labour
★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★

Vendors of group test products are only obliged to sell them at the prices quoted here (which include delivery and credit card surcharges) for the life of this PCW issue. They may also change components under certain circumstances.

Virtualising Vista

Windows Vista hasn't been officially released yet, but for a brief period in June and July Microsoft made a public beta version of the operating system available for download from its website (www.microsoft.com/windowsvista). Installing a beta version of an operating system onto your PC is always a bit risky, but there is a safer way of trying out Vista if you manage to download it.

A technique known as virtualisation (spelled with a 'z' in the US in case you decide to Google it) allows you to install multiple operating systems onto your PC and run them side-by-side.

In order to do this you'll need a suitable virtualisation program. The most well-known options are VMWare Server (free for personal use, see www.pcw.co.uk/2160265 or if you've bought the DVD edition of PCW you'll find it on the over disc) and Parallels Workstation (\$50 from www.parallels.com). Microsoft has its own virtualisation program, called Virtual PC (<http://www.microsoft.com/windows/virtualpc/default.msp>), which is now free to download and use, although this hasn't been updated for quite a while.

Let's suppose you're currently running Windows XP and want to try out the beta version of Vista (or almost any other OS) without ditching or breaking your existing XP installation. You can install one of these virtualisation programs on your PC and it will treat your original XP installation as the main host operating system. It will then allow you to install additional guest operating systems onto the PC separately, each of which is stored in the form of a virtual machine (VM). Each virtual machine can run alongside the XP host without affecting XP itself. It looks and acts just like a real PC complete with its own Bios, hard disk, optical drive, network card and graphics card running in a window. There's significant processing overhead, however, so don't expect performance to be startling.



Vista can run easily on a virtual machine in VMWare Server

Each virtual machine is stored on your PC's hard disk as a set of files, allowing you to easily save a copy of the virtual machine onto DVD or an external hard disk. This means you can install Vista – or Linux, or even old versions of Windows – onto a virtual machine on your PC. If anything goes wrong you can simply replace the VM file to restore it to working order straight away. Your original host installation of Windows XP will be unaffected by anything that happens to the Vista virtual machine, as the VM has no direct access to your real PC's hardware.

Because of a lack of DirectX hardware acceleration, a few of Vista's more advanced graphical features may not work when it's running as a virtual machine, but you can certainly get a feel for this latest version of Windows without risking any damage to your PC's original operating system or files.

Editor's Choice

Editor's Choice PC Nextday Zoostorm 5-7502 Advanced PC Recommended Evesham Visto



PC Nextday Zoostorm 5-7502 Advanced PC



Evesham Visto

A group of PCs aimed at a specific price point often tend to have similar features and performance. These £1,299 systems all performed very well – enough to earn their keep for years to come and (as far as it's possible to predict) to cope with the demands of Windows Vista when it arrives. For more information see our feature on page 42.

However, the design and features of these PCs varied more than we had expected.

Ambros stood out with its compact Shuttle chassis, which will obviously appeal to home users who don't want a bulky tower PC in their front room or bedroom.

A number of these PCs were running the Media Center Edition of Windows XP, with its emphasis on home entertainment, but HP took top honours in the entertainment PC category with its aptly named Pavilion Media Centre TV. This was clearly designed with audio and video

work in mind, as shown by its conveniently located audio and video connectors and ingenious Personal Media Bay, which provides a useful method for handling large audio and video files.

Ultimately, though, there were two PCs that stood out for their all-round combination of high performance and versatile features. Evesham's Visto and the Zoostorm 5-7502 Advanced PC from PC Nextday both produced strong performance in all our tests, including 82fps scores in our Far Cry tests, which should keep even hardened gamers happy.

There wasn't much between these two in performance terms, but the Zoostorm squeezed ahead on sheer value for money, thanks to its impressive range of features. The Zoostorm had twice as much memory and hard disk space as the Visto – useful for running Windows Vista as well as for multimedia work.

PC Nextday also managed to include added extras such as a webcam and wireless network card, providing the most comprehensive set of features in this group. The Zoostorm 5-7502 therefore emerges as our clear Editor's Choice, with the Visto taking a thoroughly deserved Recommended award. **PCW**

Isn't it time PC's looked the part too?

New ASUS Desktop Solutions offer style effortlessly merged with technology

Pundit P1-AH1 – The Ultimate Media Centre PC
The ASUS Pundit P1-AH1 has combined a host of industry-leading specifications into a bookshelf form factor that gives your home a powerful, quiet and good looking heart to your entertainment system. The revolutionary bookshelf design is available in understated black or eye-catching white.

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High on power, low on space

The Pundit P1-AH1 squeezes top-end components into its small bookshelf form factor. Inside you can find a Socket 939 giving you the flexibility of using AMD's Athlon™ 64 and 64 X-2 processors, support for up to 2GB DDR RAM, NVIDIA's nForce 4 chipset, and GeForce 6150 integrated graphics all engineered inside a case 9cm x 35.6cm x 28.5cm small.

Recover Pro -

Innovative data protection against virus attacks. Virus' will always be around to affect your system at all levels – deleting files, adding unwanted one, changing user settings, opening security holes and generally creating unfixable havoc. Until now? Recover Pro is an always-available recovery tool. It stores user data, applications, and the operating system in a host-protected area of the drive and automatically creates multiple restore points enabling easy recovery to your system's original state without restore CD's or booting the operating system. With just a few clicks of the mouse, your system recovery is almost instantaneous.

The all round multimedia desktop

The Pundit P1-AH1 comes equipped with a host of connections and ports enabling the creation of an entertainment powerhouse – DVI Output, D-Sub, S-Video, TV Output, S/PDIF input & output, 7.1 High-Definition Channel Audio, CF, MS, SD, and MMC Card Readers, Firewire, Gigabit Ethernet, 4 USB 2.0 ports and more are on offer.

Pundit P1-PH1 –

Want to go down a different route?

The Pundit P1-PH1 shares the beautiful design aesthetics of its Pundit P1-AH1 brother but at its heart beats a Socket 775 mainboard for support for a 64bit Pentium® 4 CPU up to 3.8GHz, up to 2GB of DDRII RAM, and Integrated ATI™ Radeon® X300 graphics. In addition the small form factor sports a DVI output, D-sub, S-video, TV output, S/PDIF input/output, 5.1-channel audio, a CF card reader and 3-in-1 card reader (MS, SD, MMC).



▲ Pundit P1-PH multimedia PC

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With innovative system backup technology, creative space-saving design, rich multimedia features and stringent quality testing, the Pundit P1-AH1 and P1-PH1 are the ideal foundations for your home PC.



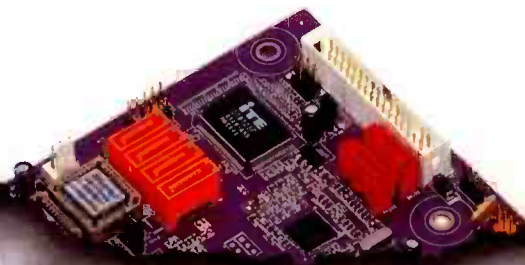
▲ Easily install wireless antenna on Vintage V2-AE1 (Optional)

P1-AH1 Specifications

Processor	AMD Socket 939 Athlon™ 64/X2 up to 4600+
Chipset	NVIDIA Crush 51PV/NVIDIA MCP 51
FSB	1000/800/400 MHz
Memory	2 x DIMM DDR 400/333/266 Support Max. 2GB
Graphic	Integrated GeForce 6150 based Graphics
Audio	Realtek ALC861 7.1 Channel HD Audio
LAN	10/100/1000 Mbps

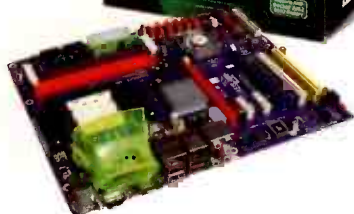
P1-PH1 Specifications

Processor	Intel Socket 775 P4 up to 3.8 GHz (Northwood/Prescott)
Chipset	ATI™ Radeon® Xpress 200
FSB	800/533/400 MHz
Memory	2 x DDRII DIMM DDRII 667/533/400 Support max. 2GB
Graphic	Integrated Radeon® X300 based Graphics
Audio	RTL ALC655 6 Channel Codec
LAN	10/100 Mbps



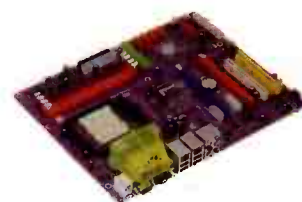
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- 8 SATAII, 10 USB 2.0, 2 1394



KA3 MVP ATI CrossFire™ Xpress 3200



RS485M-M ATI Radeon Xpress 1100

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**ON TEST**

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- 112** IPTC and keywords
Editor's Choice

'In addition to searching, some album applications allow you to organise images into categories or collections'

One for the photo album

Building up a large collection of digital photos is easy, but finding specific pictures later on can be frustrating. Ken McMahon looks at album software that helps you organise your collection

Organising digital photo collections can be a nightmare, especially if you simply dump them in the My Pictures folder and hope for the best. When you've got hundreds, or thousands of photos, finding the one you want can be a chore. Thankfully, there are plenty of inexpensive packages out there to help and here we've looked at six of them.

Album software organises all your photos so that you can find and view them with very little effort. You can usually remember roughly when you took a particular shot so a popular method is to present photos in a timeline, calendar, or other date-based format.

By far the best way to ensure you can easily locate photos is to caption them, or add keyword tags. This requires a little effort, but the reward is that you can easily find photos of anything with a simple keyword search. It also

means you can compile a collection, slideshow, or web album of, say, children as they grow up, or all your sunset, night, or snow scenes.

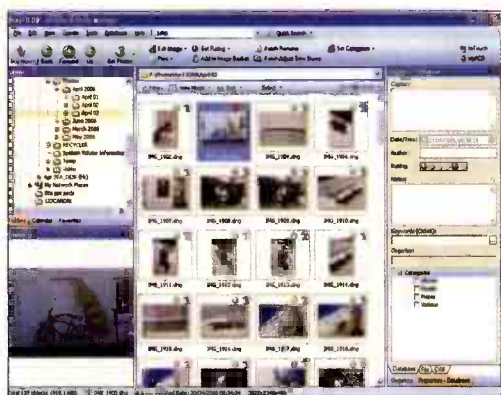
In addition to searching, some album applications allow you to organise images into categories or collections. The software references the original image file so you can include a photo in several collections without filling up your hard disk with lots of copies. You can also apply star ratings so that you can easily locate your best shots from the merely average ones.

Album software does many other useful things, not least of which is back up your photo collection to a removable disc. You can also create slideshows and web photo albums, print contact sheets and carry out basic photo-editing tasks, such as cropping, removing red-eye and improving image quality. They're indispensable, but which are the best? Read on to find out.



ACDSee 8 Photo Manager

Price €46.39 (about £31) Contact www.acdsee.com



ACDSee 8 Photo Manager bristles with panels, but could be a turn-off for novices

The first thing that strikes you about ACDSee 8 Photo Manager is the sheer number of panes on the screen: in Browser mode there are no fewer than 12 of them. If you like your interfaces simple and uncluttered, this isn't for you. However, it's better to have too much information than too little and you can close what you don't need and rearrange things to your own preferences.

A Folders pane displays everything on your computer Windows Explorer-style and you can switch views to

display favourite folders or a calendar view. Thumbnails are displayed in the middle and on the right an organiser pane is used to categorise photos and add ratings. In contrast to some other applications (most notably Microsoft Digital Image Library) ACDSee was extremely quick to load and display a large folder of Jpegs.

Exif (Exchangeable Image File Format) data is displayed on a tab of the properties pane which can also be used to display file information, the caption, rating, category and keyword information from ACDSee's database and the embedded IPTC (International Press Telecommunications Council) metadata. Existing keywords in our imported files were retained and to add to or edit any of this data, you simply type in the properties pane. Editable fields are helpfully picked out in blue.

In addition to the organisational features, an editing mode provides a wide range of editing tools including basic things such as crop and sharpen, as well as heal and clone brushes and an extensive collection of filters.

ACDSee won't suit everyone. The complex layout, vast amount of information on display and wide range of options for organising, tagging and searching photos will be intimidating for novice digital photographers. But if the prospect of having access to every last snippet of Exif data in your photos – and the power to manipulate it – appeals to you it won't disappoint.

Verdict

Pros Highly configurable; access to all metadata

Cons Busy; interface may be intimidating for some

Features ★★★★★

Ease of use ★★★★★

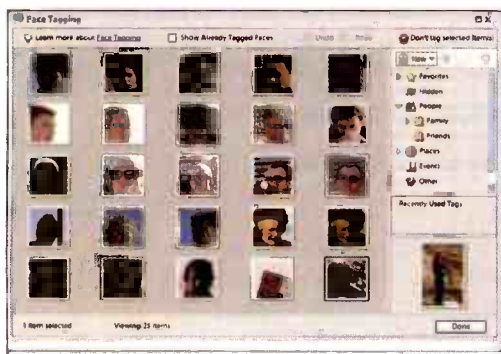
Value for money ★★★★★

Overall Powerful organisational tools for those with the confidence to use them

★★★★★

Adobe Photoshop Elements 4.0

Price £69.32 Contact www.adobe.co.uk



Elements' face tagging makes identifying photos of people much easier

Although many people will think of Photoshop Elements 4.0 as a photo-editing application it's also, in equal measure, a photo organiser. In fact, it's really two tightly integrated applications, an editor and an organiser.

Adobe also produces a product called Photo Album 2.0. When it was first launched, Album shared many features of Photoshop Elements' Organizer program, but it hasn't been updated for a couple of years now and, although it's cheaper than Elements, it falls a long way behind in terms of features.

Editing tools aside, one of the Elements Organizer's biggest assets is its interface, which makes easy work of viewing and sorting large photo collections. As well as the default browser view, which displays resizable thumbnails, there's a date view that overlays images on a calendar-style display.

Tags are conveniently grouped into categories, you can create your own and to apply them you just drag and drop. For applying people tags, the Elements Organizer has a nifty new feature called 'Find faces for tagging' which does exactly what it says. When it has searched through a folder of photos, all of those that show people's faces are opened in a separate window ready for tagging.

Searching for tagged photos is similarly straightforward using the same pane from which the tags are applied. To search for all images with a particular tag you just click its checkbox. You can search for multiple tags and if it can't find an exact match, Elements shows you those photos that come close to matching your search criteria.

Other features, such as the slideshow, full-screen and side-by-side views, version stacking and the ability to easily change the camera date and time stamp, have the feel of something designed in response to the real needs of photo enthusiasts. Even if you never edit photos, it's worth buying just for the organiser features.

Personal
Computer
World
EDITOR'S CHOICE

Verdict

Pros Well designed; easy-to-use tag and search features

Cons Easy to lose track of moved photos, and laborious to reconnect them

Features ★★★★★

Ease of use ★★★★★

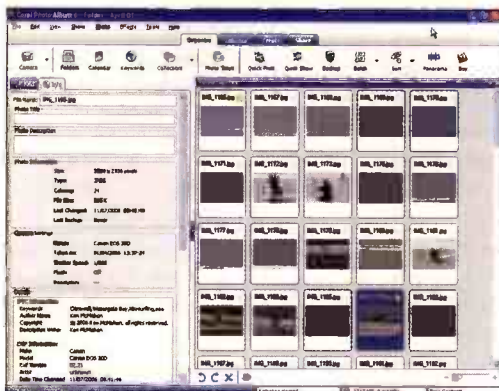
Value for money ★★★★★

Overall Takes a lot of the time and effort out of organising and tagging photo collections

★★★★★

Corel Photo Album 6

Price £25.85 **Contact** www.corel.com



The Photo Album 6 interface is well organised – you can edit the IPTC title and description in the info panel

Like the Adobe Photoshop Elements Organizer, Corel Photo Album 6 has a well laid out and logically organised interface. Tabs provide access to tools for organising, enhancing (basic photo-editing tasks such as cropping, sharpening and 'quick fix' among others) and sharing photos, and a fourth adds projects including greetings cards, calendars and CD labels.

You can browse your hard disk for photos, nominate favourite folders, use a calendar layout to view pictures by date, and view recent downloads.

Like Elements, Album allows you to sort photos into collections, so you can organise photos into categories – all the pictures of your dog, for example, without having to move or make copies of the original files. Album takes this idea a step further with 'trays' into which you can drop images that you want to email, print, or upload to a file-sharing service.

Exif info for selected thumbnails is displayed in a tab which has editable fields for the filename, photo title and description. Other metadata, including the camera info and IPTC fields are displayed, but you can't edit this. To add keywords you use the Find tab which includes an assign keywords option, as well as tools for adding and editing keywords.

You add keywords by selecting thumbnails then clicking checkboxes in a categorised list. Keywords are written directly to the file, but beware if you've previously added keywords to photos with another application, as they will all be deleted.

Corel Photo Album doesn't give you full-on access to all the metadata in images, but it's not alone in that. For most people the ability to add, edit, sort and find keywords – tasks the program is more than capable of accomplishing – is all that's required. It's also available as a Standard Edition bundled free with Paint Shop Pro X – but that version doesn't include batch processing, video CD and web gallery features.

Verdict

Pros Easy to use; writes keywords to files

Cons Limited metadata editing; overwrites existing keywords

Features ★★★★★

Ease of use ★★★★★

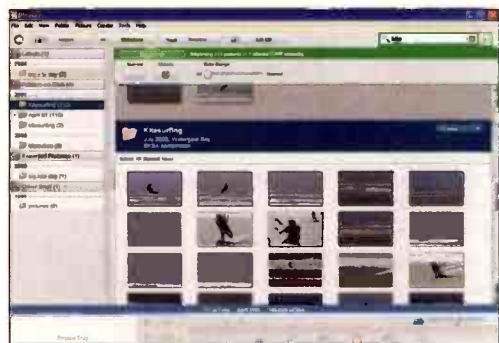
Value for money ★★★★★

Overall Minor niggles don't detract from an excellent photo album application

★★★★★

Google Picasa 2

Price Free download **Contact** <http://picasa.google.com>



As you'd expect, Picasa's search feature is simple, but very effective

Picasa is a free Google application for managing digital photos and, like most of the software reviewed here, also offers basic editing features. The layout and design is clean and simple and ideally suited to those who would rather spend time looking at their photos than delving into the Exif metadata.

When you first start Picasa you are given the option of searching your entire PC or only certain folders for pictures. Unlike earlier versions, Picasa 2 maintains the link to files on your hard disk, so if you rename, move or delete photos within Picasa, the

original files on disk are amended. The 'Folders on Disk' collection displays imported folders, but not the folder tree. This can be confusing if you have several subfolders with the same name, such as 'holiday', in different folders, for example 2002, 2003 etc. In Picasa they just appear as holiday (1), holiday (2) and so on.

Picasa can organise pictures into collections based on labels. You can, for example, create a label for all of your fishing photos, or all photos of your mum or, your mother's hobbies permitting, both. Newly created labels are added to a pulldown list and can easily be applied to individual or multiple photo selections. There's also a simple rating system that allows you to attach a single gold star to favourite photos.

Embedded Exif metadata looks as if it's a bit of an afterthought, but you can display exposure and other camera data in the Properties dialogue box and IPTC keywords are supported. Picasa maintained the existing keywords in our import images, adding new ones was straightforward and all were embedded in exported pictures.

As you'd expect from Google, Picasa's search features are exemplary. As soon as you type anything in the search field it goes to work displaying those photos that contain the term in the filename, labels, or Exif data – even with a large collection the search results are displayed virtually instantaneously.



Verdict

Pros Uncomplicated; excellent search features

Cons Truncated folder display; limited Exif support

Features ★★★★★

Ease of use ★★★★★

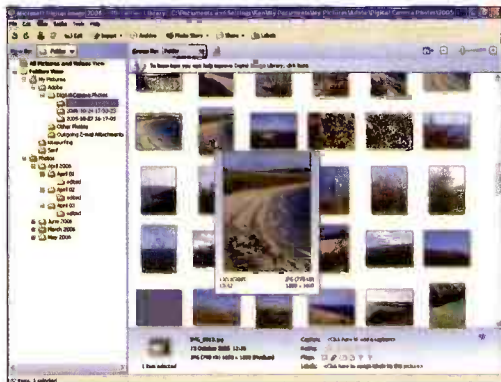
Value for money ★★★★★

Overall An excellent album application despite, and perhaps because of, its limited scope

★★★★★

Microsoft Digital Image Suite 2006

Price £59.99 Contact www.microsoft.com



Hover over a thumbnail in Library to see an enlarged view and file information

Microsoft Digital Image 2006 is available in various editions that include different applications and content, but the photo album application, called Library, is common to them all.

The workspace is mostly given over to a viewing area that displays image thumbnails. A 'View by pane' displays folders in an Explorer-style layout. Initially, this shows only the My Pictures folder; to see the contents of other folders they must be manually added, or you can scan a drive. In one respect, this is a good thing as

it keeps things clear and uncluttered, but it also means you can't browse disks for images.

The thumbnails are resizable and when you hover over them you get an enlarged view complete with keywords and other file info. This information, along with the caption, a rating, flags that earmark images for review, printing, retouching and other actions, and labels (keywords) appears in a preview pane.

You can enter captions in the preview pane and adding a rating or flags is simply a matter of clicking the appropriate icon. Adding keywords is done in a Label editor dialogue box, which lists all the available labels split into four categories – keywords, people, places and events. A useful 'Library Painter' window allows you to assign multiple labels to thumbnails.

Library displays existing keywords and doesn't overwrite them, but labels added in Library aren't appended to the image file itself, so if you send the file elsewhere it won't retain the Library labels. The 'View by label' option filters images, displaying only those that have the labels whose checkboxes are ticked in the pane view.

Library doesn't provide a convenient way to view all a photo's Exif data in one place. To do this you must display the properties dialogue box. Generally speaking, the Library interface, which relies heavily on dialogue boxes, is not its strongest asset.

Verdict

Pros Basic, no-frills approach

Cons Lack of non-modal Exif display; keywords aren't embedded

Features ★★★★★

Ease of use ★★★★★

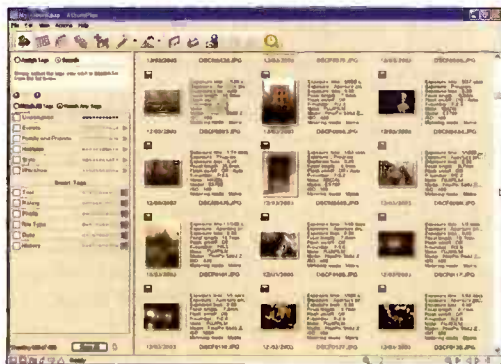
Value for money ★★★★★

Overall Lacks the style of competitor products from Adobe and Corel, but gets the job done

★★★★★

Serif Album Plus 4

Price £59.99 (with Photo Plus 10) Contact www.serif.com



Display of Exif information is limited and cramped

In stark contrast to ACDSee 8 Photo Manager, Serif Album Plus 4, which is only available with Serif's image-editing application Photo Plus 10, is a model of simplicity. Simplicity that stems not from a sleek, well-crafted interface, but rather from a basic lack of features.

Album Plus has four view modes – album, year, month and date. The first of these displays all of the images in the album, and if you've used the search feature to add everything on your hard disk this could amount to a lot of photos. The remaining three are variations of the calendar feature. For some reason

the year and month views swap the areas of the screen allocated to thumbnail display with the smaller pane on the left, devoting nearly all of the screen to a massive calendar display, leaving you to squint at tiny image thumbnails.

Date view displays everything in chronological order with photos taken on the same day split into groups. The fact that most of the time you're dealing with your entire album and that you can't view images from individual folders on your hard disk makes any kind of task, be it adding tags, creating a slideshow, or searching for photos, rather unwieldy. That Album Plus lacks any kind of temporary, or permanent storage, like ACDSee's baskets, or Adobe Elements' and Corel Photo Album's collections makes this even more of a serious issue.

Adding and searching for tags is done in Album view using the checkbox method that is common in other applications but, other than displaying a small subset of the camera data (camera model and exposure details), Exif data is all but ignored. The existing keywords in our test images were not overwritten, but neither were they displayed anywhere in Album Plus.

Given the advanced level of editing tools available in Photo Plus 10, it's disappointing that the companion album software is so limited.

Verdict

Pros Easy to pick up

Cons Poor design; lack of features

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall The least capable package of those on test

★★★★★



Photo album software

MANUFACTURER	ACDSEE	ADOBE	COREL	GOOGLE	MICROSOFT	SERIF
Product	Photo Manager 8	Photoshop Elements 4.0	Photo Album 6	Picasa	Digital Image Suite 2006	Album Plus 4
Price inc VAT	€46.39 (about £31)	£69.32	£25.85	Free	£59.99	£59.99
Telephone	None	020 7365 0733	01628 589 800	None	0870 601 0100	0800 376 7070
URL	www.acdsee.com	www.adobe.co.uk	www.corel.com	http://picasa.google.co.uk	www.microsoft.com	www.serif.com
REQUIREMENTS						
Operating system	Windows 2000/XP	Windows XP	Windows 2000/XP	Windows 2000/XP	Windows 98SE/ME/2000/XP	Windows 98SE/ME/2000/XP
Processor	Pentium III 500MHz	Pentium III 800MHz	Pentium II 400MHz	Pentium 300MHz	Pentium 700MHz	Not specified
Memory	128MB	256MB	128MB	64MB	128MB	64MB
Free hard disk space	100MB	900MB	Not specified	50MB	300MB	130MB
Display	1,024x768 16-bit	1,024x768 16-bit	1,024x768 16-bit	800x600 16-bit	800x600 16-bit, 1MB video Ram	800x600 16-bit
Other	Internet Explorer 5.0	DX9-compatible graphics card, CD-Rom drive	Internet Explorer 5.1, Flash player 7	Internet Explorer 5.01, DirectX 7	Internet Explorer 6, CD-Rom drive	None
FEATURES						
Import from camera	✓	✓	✓	✓	✓	✓
Collections/categories	✓	✓	✓	✓	✗	✗
Database keywords	✓	✓	✓	✓	✓	✓
Display/edit Exif	✓/✓	✓/✗	✓/✗	✓/✗	✓/✗	✓/✗
Display/edit IPTC	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✗/✗
Search database	✓	✓	✓	✓	✓	✓
Search Exif	✓	✓	✓	✗	✓	✗
Search IPTC	✓	✓	✓	✓	✗	✗
Write database keywords to IPTC	✗	✓	✓	✗	✗	✗
Image rating scale	Five stars	Five stars	One star	One star	Five stars	Six stars
Database backup	✓	✓	✓	✗	✓	✓
Photo backup	✓	✓	✓	✓	✓	✓
Date/time change	✓	✓	✓	✗	✓	✓
Rotate pictures	✓	✓	✓	✓	✓	✓
Sort pictures	✓	✓	✓	✓	✓	✓
Calendar view	✓	✓	✓	Timeline	✓	✓
File/folder view	✓	✓	✓	✓	✓	✗
Compare images	✓	✓	✗	✗	✗	✗
Slideshow	✓	✓	✓	✓	✓	✓
Photo editing	✓	✓	✓	✓	✓	✓
Camera Raw support (check with vendor for specific Raw formats supported)	✓	✓	✗	✓	✓	✓
Movie display/playback	✓	✓	✓	✓	✓	✓
Web photo album	✓	✓	✓	Blogger	✗	✗
Print contact sheet	✓	✓	✓	✓	✓	✓
Batch operations	✓	✓	(not in Standard Edition)	✓	✓	✗
SCORES						
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Ease of use	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
OVERALL	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

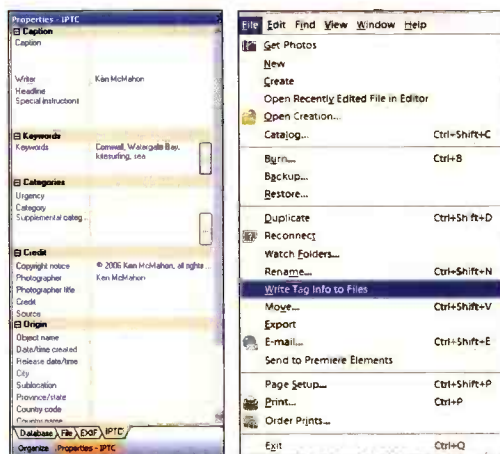
IPTC and keywords

As well as picture data, image files contain extra information known as metadata which tells you about the photo – metadata literally means ‘data about data’. Some of this metadata is recorded at the time the photo is shot and includes details of the camera make, model and serial number, the exposure settings, the time and date, whether the flash fired and even which way up the camera was held. This camera data is in a standard format called Exif (Exchangeable Image File Format).

Another acronym that you’ll see applied to image metadata is IPTC (International Press Telecommunications Council). This applies to data added after the photo was taken, including a title, description, copyright notice and keywords. The IPTC standard originated with the need for information in a standard format to accompany press pictures. It includes many other fields providing additional information about the image content as well as the photographer, but photo album software, if it supports IPTC at all, tends to include only the title, description and keyword fields.

Photo album applications are simply databases for images. In order to be able to quickly locate and display individual photos, or groups of photos from among thousands, they store information about your pictures in a text-only database. The advantage of using a database is speed, the disadvantage is that your photo files and the information about them are stored in two separate locations, some of it is in the photos themselves, the rest is in the album application’s database.

For Exif data this isn’t really an issue because you don’t usually change it and it remains embedded in the original photo file. With IPTC data, if you mean to use it as intended (to provide information about your photos to others) you must ensure your



Far left:
ACDSee lets you write IPTC and Exif data to the image file

Left: Adobe Photoshop Elements Organizer lets you append tags to IPTC keywords

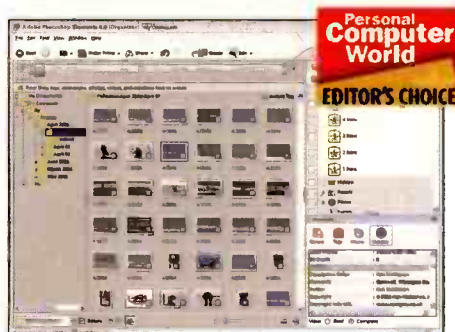
album application can write the data from the database back into the photo file.

The issue is more critical (and confusing) when it comes to keywords. Typically these will exist independently in two locations – the IPTC keywords field in the photo file and the album application’s database. This isn’t necessarily a problem – some applications just ignore the IPTC keywords, others support them and allow you to append database keywords to the IPTC keywords. However, Corel Photo Album 6 overwrote the existing IPTC keywords in our tests with new keywords.

As well as being aware of the difference between database and image file data, for obvious reasons you must also ensure your album database is regularly backed up.

Editor's Choice

Editor's Choice Adobe Photoshop Elements 4.0
Recommended Google Picasa 2



Adobe Photoshop Elements 4.0

Like organising anything, getting your photo collection into some semblance of order is going to take a little work, with the emphasis on little. The most important criteria for photo album software is how easy does it make the job?

Adobe Photoshop Elements 4.0's organiser made it very easy indeed and so gets our Editor's choice award. The Elements Organizer manages to provide a multitude of view options – folders, timeline and date view, together with all the information most people are likely to want – without ever looking cluttered.



Google Picasa 2

Creating and applying keyword tags and keyword searching is made extremely easy. Closely matching results are displayed, not just those that exactly match search criteria. This works when you search using multiple tags. Elements shows you photos that at least match some of the criteria. If you're not sure what you're looking for, Elements provides the best chance of finding it.

Elements isn't limited to tag searching which, though simple, may not offer the best means of finding what you're looking for. As well as limiting the date range using sliders on the

timeline, you can search IPTC captions, camera Exif data, by filename or media type. Elements also includes search tools designed for the 'organisationally challenged'. When all else fails, being able to look for photos on the basis of their resemblance to other photos, or what you last did with them, might be your only option.

The 'Find faces' feature, which searches pictures for faces and then displays them close-up so that you can easily identify and tag them, is something that none of the other applications have.

The Elements approach to preserving and embedding IPTC metadata is safe and sensible. It preserves existing keywords, maintains a clear distinction between embedded keywords and database tags and provides a straightforward option for appending database tags to the embedded metadata keywords.

Lastly, although we've largely ignored photo-editing features in this group test, Photoshop Elements also provides the best available.

For those who balk at paying for software, for its simplicity, speed and effectiveness Google Picasa 2 is our Recommended choice. While it lacks any metadata handling, it does an excellent job of cataloguing and finding photos. **PCW**

It's different here, dude



Welcome to California, the land of beaches, Hollywood and beautiful computer cases. Antec's world headquarters, senior management and design team are all right here, in the heart of California's Silicon Valley. The place where digital dreams turn to reality. We'd like to think that gives us a unique perspective that finds its way into all of our products and is why Antec stands out from the components crowd with market leading designs. Like NeoHE, our environmentally friendly power supply line or our path breaking QuietComputing™ cases, such as the world famous Sonata. So whether you want a computer that's totally gnarly or one that will just chill out, Antec is the word.

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dabs
com

MAPLIN
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Insight

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OVERCLOCKERS UK

savastore.com
a division of WATFORD electronics

OVERCLOCK
make the right choice

Create. Store. Backup. Go.

LACIE



LaCie Brick Hard Drive

- Design by Ora-Itto
- Easy and fun professional storage
- Only 112 x 188 x 44 mm & 990g
- USB 2.0 interface - all cables included
- For music, photos, videos and office files
- 2 years manufacturers' warranty as standard

Available models:
160GB, 250GB, 300GB, 500GB



LaCie Triple Interface FireWire 800/400 & USB2.0 d2 Hard Drives

- Sleek, aluminium heat dissipating robust case
- 7200rpm ideal for DV Video - silent operation
- Fast FireWire 800 'Extreme' up to 88MB/s sustained
- FW 400, USB2.0 & FW 800 (all cables included)
- Compatible with Windows® backup utility
- 2 years manufacturers' warranty as standard

Available models:
160GB, 250GB, 300GB, 500GB,
600GB, 1000GB, 1200GB, 2000GB



LaCie USB/FireWire 2.5" Mobile Drives

- Ultra-portable - only 7.6 x 12.9 x 1.7cm & 200g
- USB2.0 and/or FireWire interface - cables included
- AC adapter-free, powered by USB or FireWire
- Ideal for notebook/laptop users as mobile storage
- Sleek, robust enclosure - Design by F.A. Porsche
- Compatible with Windows® backup utility
- 2 years manufacturers' warranty as standard

Available models:
USB2.0 - 40GB, 60GB, 80GB, 100GB
FireWire & USB2.0 - 40GB, 60GB, 80GB, 100GB



LaCie 'Biggest Disk' FireWire 800 & USB2.0 RAID

- Up to 2000GB, RAID 0, 0+1, 5, 5+ hot spare
- Exceptionnaly high transfer rates of 80MB/s FW 800
- Sturdy aluminium enclosure & ultra quiet operation
- Compact size - only 15.3 x 29.8 x 17.6cm
- Hot swappable hard disks; superior RAID security
- Automatic online rebuilding with RAID 5
- 2 years manufacturers' warranty as standard

Available models:
1000GB, 2000GB



LaCie d2 'LightScribe' FireWire or USB2.0 16x DVD +/-RW's & CD-RW

- LightScribe direct disk labelling technology
- For professional looking created media
- Double layer DVD up to 8.5GB capacity
- Dual format DVD +/-RW (and CD-RW)
- Super fast write and re-write speeds
- Bundles include DVD authoring software
- 2 years manufacturers' warranty as standard

Available models:
DVD +/-RW 16x4x16x Double layer & CD-RW
CD-RW 52x32x52x



LaCie d2 'Ethernet Disk Mini' Network Hard Drives and USB2.0

- Share data across a network by unlimited users
- Easily administered via any web browser
- Quick and simple installation - no drives needed
- No server required, NAS hard drive
- Fast ethernet connection or USB direct attach
- For Windows®, Mac OS® and Linux
- 2 years manufacturers' warranty as standard

Available models:
'd2' mini NAS & USB2.0 - 250GB, 500GB
Ethernet Disk XP embedded - 1000GB, 2000GB



LaCie 100 Series Monitors

- Extremely high contrast ratio of up to 1000:1 (119 model)
- Wide viewing angles of 170° horizontally/vertically
- Premium MVA LCD panel
- Height-adjustable stand, tilt, swivel
- 3 years advance replacement warranty
- Exclusive LaFrame for maximum visual confort

Available models:
119 TFT/LCD Monitor - 19"
120 TFT/LCD Monitor - 20"



LaCie 300 Series Monitors

- DVI and VGA connectors
- Highest specification Superfine TFT Panel
- 321 - maximum resolution 1600x1200
- 321 - response time 20ms
- 321 - dot pitch 0.27
- 321 - 176 degree viewing angle (S-IPS)
- 3 years advance replacement warranty

Available models:
321 - 21"
319 - 19"



LaCie Blue Eye Pro Colour Calibrator

- Automatic hardware calibration
- Creates and activates advanced ICC profiling
- Time saver colour test module
- Switchable colourimetric environments
- Designed to complement the LaCie 300 Series
- USB interface - all cables and software included
- 2 years manufacturer's warranty as standard

Available models:
Blue Eye Pro
Blue eye 2

Please visit www.lacie.com/uk

LaCie products are available from leading resellers - E-mail: info.uk@lacie.com



AN OPEN DIALOGUE

The focus of this month's Business Section is on Linux and all things open source. A contentious subject at the best of times, it's likely to elicit a deluge of emails and letters from both sides of the Windows-Linux divide. Still, that doesn't mean the two can't get along. In our feature, we look at just what Linux and open source can offer small business, what's available and how it fits into a Windows-centric world.

We've also got a review of that rising Linux star, Ubuntu, the latest version of which is targeted a lot more towards business deployment. We also look at a Linux-based thin client from NEC, uniquely delivered in the form of a wireless notebook, and a new release of the Gordano Messaging Suite, available for both platforms.

And there's more: from removable disk backup to a fully hosted remote desktop service – all of which will interest small businesses everywhere.

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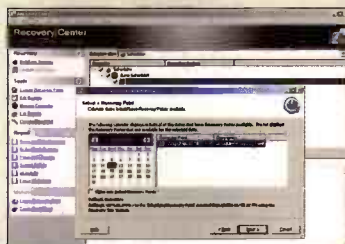
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127 Gordano Messaging Suite 12

128 Storcase Data Express

for Backup

NEC Thin Client



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.

BUSINESS



'Small businesses are opting for disk-based backup solutions such as the Storcase device'

Read the review on page 128

Linux for business

Open-source operating systems and applications can have numerous attractions for small businesses, not least of which is cost savings. Alan Stevens explains

As PCW readers, you will all have read about Linux in the various reviews, features and hands-on articles we've devoted to the topic over the years. Having said that, you may not be aware of all the business uses for Linux and the applications written to run on the open-source operating system. This is an omission we're aiming to put right in this feature, which examines why a small business might consider running Linux instead of, or alongside, Windows.

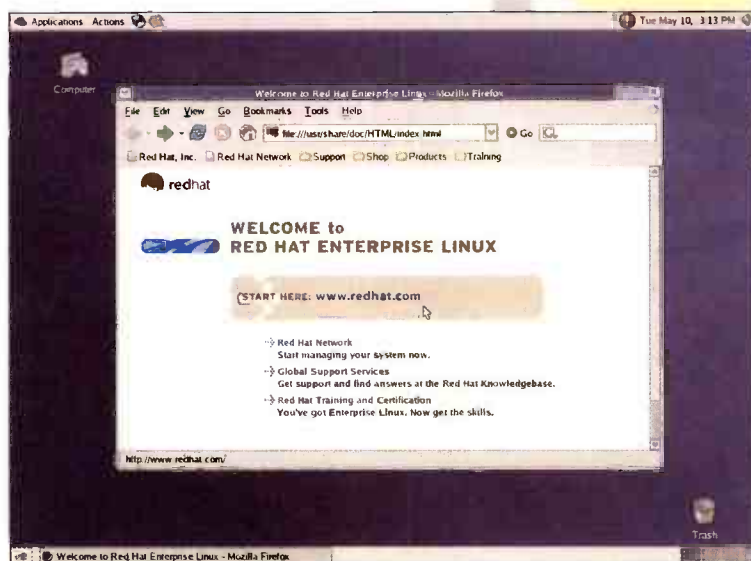
It's an open secret

The biggest advantage to using Linux is the fact that it's open source. So, when you get a copy of Linux you get the source code, not just the executable software, as is the case with a proprietary platform such as Windows. You can then change and recompile that source code to fix problems, add functionality or develop new applications of your own. The only stipulation is that you continue to make the modified source code available freely to anyone who wants it.

This is a potential advantage to companies involved in software development, but most companies simply want tools to help run their businesses. The other advantage is that most open-source software can be distributed for free so that, for example, you can install the same copy of Linux on every PC and server in your company without having to worry about licence fees or visits from the Federation Against Software Theft inspectors. And much the same applies to most of the open-source applications written to run on Linux.

It's important to understand, though, that open-source software is still licensed and therefore not *always* free. In fact, there are lots of different licences that can be applied, many of which involve some kind of payment. However, most open-source software is free, typically distributed under a GNU General Public Licence.

Another benefit is the masses of bundled application software you get with most of the Linux distributions. This can result in a huge cost saving, although that is not the only benefit. In addition, there can be advantages



Red Hat Enterprise Linux 4 is open source, but is only available on subscription, for which you also get access to automatic updates and support

in terms of reliability and security, with far fewer Linux viruses and other vulnerabilities compared with Windows. Some, of course, would argue that this is because of its lack of popularity, with a lot more Windows users than those running Linux.

On the downside, Linux isn't Windows and, although some of the skills required to install, manage and maintain the software are transferable, many are not. This is something that can be a big issue for the small business already short on PC skills, and one that needs to be weighed up before embarking on any Linux-based project.

Distros for courses

Unlike a proprietary operating system such as Windows, Linux distributions (also known as 'distros') differ depending on the developer involved. They can come with different user interfaces, different setup routines, management tools and hardware support options. Some will also be targeted at desktop deployment, while others concentrate on servers or sometimes both. Levels of support available can vary enormously, too, from so-called community support, where you are reliant on finding other people who've had the same problems, to full-blown commercial service contracts.

For a complete list of Linux distros, take a look at www.distrowatch.com, where you will

find answers to most of your questions. However, remember that most Linux packages are aimed at home users and enthusiasts; just a handful are designed for business use.

Minding your business

Business-oriented distros tend to be much more stable releases. They won't be replaced with new versions every six months, as is common with enthusiast-focused packages, and are widely used as standard development platforms, making for easier application deployment if you go for one of the business brands compared with the others. You can also expect a higher level of support, both from the Linux community and, in many cases, commercially as well.

The market leader in business Linux is Red Hat, which pulled out of the personal market to concentrate on its Red Hat Enterprise Linux (RHEL) product line. However, despite being an open-source solution, you need a subscription to obtain the executable code for RHEL, as well as automatic updates and access to its online support service, Red Hat Network.

The end result will still be cheaper than a comparable Windows deployment, but it's not totally free. Red Hat subscriptions are based on the number of processors and users involved with several different server and desktop packages. For high-end server use,



Left: Ubuntu 6.06 LTS being configured to share files on a Windows network using bundled Samba software

Linux can also be used to host business applications. There are no big technical issues; it's just that the business-oriented products make life a lot easier with longer release cycles, better industry support and other services that business buyers require.

Likewise, it's important to stress that Linux by itself is of little use. It is application software that provides most of the functionality a small business may require. That is, functionality such as file sharing or the ability to host an internet or public web server, an email and collaboration server, SQL database and so on. But then, as we've already mentioned, one of the biggest advantages to using Linux is that application software to support most of this will be bundled with the distros already.

Right: the Windows version of the open-source Firefox browser is being used to view an open-source Apache Web server running on RHEL 4

for example, RHEL AS is licensed for any number of processors and any amount of memory. There's full support for 64-bit processors, SMP (symmetric multiprocessing) and a wide range of architectures with implementations, for example, on IBM Power and mainframe systems, as well as Intel platforms.

For the small business, the RHEL ES package is a better, more affordable option, licensed for dual processors and up to 16GB of memory. For desktop use, there's RHEL WS, designed for dual-processor workstations, and RHEL Desktop for PCs with a single CPU.

All versions are well documented and supported, making good business platforms, with RHEL available as a factory-installed option on servers from IBM, HP, Dell and others (see Linux servers box, page 118).

Hats off to Suse

The biggest rival to Red Hat is Suse, now owned by Novell, which has both consumer-oriented and business distros. Business users should look at the recently released Suse Linux Enterprise 10, which is available both for servers and desktop PCs.

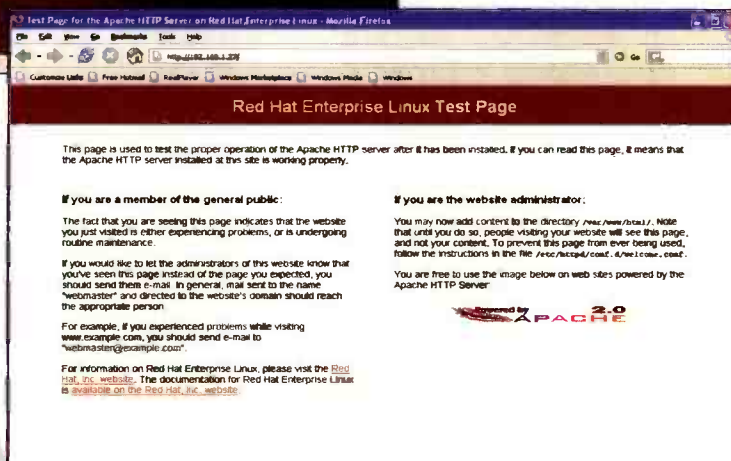
As with RHEL, you have to pay to use Suse Linux Enterprise 10, and the licence fee also covers updates and commercial support services. Licences are typically priced on a per-server or per-user basis, and are very competitive compared with Windows. A free evaluation copy of the software is also available, but it times out after 60 days. There's also support for a wide range of industry-standard hardware platforms. Suse Linux Enterprise comes preinstalled,

or as an option from most of the big server vendors.

Red Hat and Suse aren't the only players in the business Linux market. Ubuntu, for example, has recently started to target the business market with its release of Ubuntu 6.06 LTS (see review on page 121). Based on Debian Linux, Ubuntu has been hugely popular with individual users and attracts wide community support. Server and desktop implementations of the latest release are both available, plus you can buy into a range of commercial support services from lead developer Canonical and others. Unlike the others, however, you don't have to subscribe to a support contract to use Ubuntu.

Mandriva is another developer with a business-oriented Linux distro. But (before anyone writes in) it's important to understand that most of the other flavours of

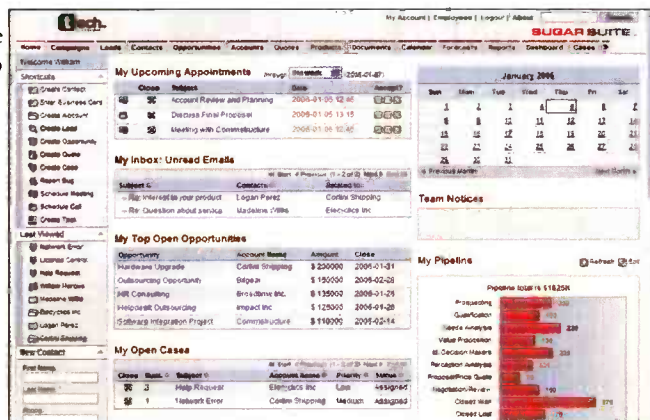
Among the various applications available for Linux is SugarCRM, a commercial customer relationship management package



replace a Windows domain or Active Directory controller and will generally be installed, ready to use along with the core Linux OS.

Apache is another virtually standard inclusion. Arguably the most popular web server on the internet, Apache gives you everything required to support a high-performance internet or intranet web server. Most Linux distributions also include a variety of add-ons to provide support for Active Pages, PHP and other common web server technologies so that it really doesn't matter whether you're using Linux and Apache or Windows and IIS.

A variety of email server and collaboration tools will also be included along with SQL databases, such as MySQL or PostgreSQL,



and a lot more besides. However, don't run away with the idea that you can just install Linux and start using these applications. Some will be configured for you but not all, with a fair amount of post-installation setup and management work also required. But, of course, Windows applications can require just as much work to get up and running.

Add-on applications

And finally, there are lots of other Linux applications from which to choose. Indeed, with Linux now a very mature platform, it's unusual to find a developer without a Linux version of at least some of its products. This is especially true when it comes to big-name vendors such as SAP, IBM, Novell and Oracle, which recently released a free Linux implementation of its Oracle 10g database.

Smaller commercial developers also abound, with Exchange-like email and collaboration servers a popular offering. PCW has reviewed one in this issue, the Gordano Messaging Suite, on page 127, but there are others, such as Open-Exchange Server and Zimbra, all of which can be used instead of Microsoft Exchange.

Similarly, there are excellent content management packages such as Joomla, which can be of real help to the small business looking to set up and maintain its own website. Plus customer relationship management (CRM) packages such as SugarCRM and, inevitably, masses of security tools written to run under Linux.

The free VMWare Server virtualisation platform can also run on Linux, plus a huge amount of community developed and supported niche business software. It's just a matter of looking around and finding the one that suits your needs. **PCW**

Linux servers

Linux desktops are relatively rare, with most vendors focusing on business customers with preconfigured Linux servers. These often have optional Linux implementations of popular software applications and commercial support services.

IBM

Arguably the most committed Linux vendor, IBM supports the OS on all its X-series servers, as well as selling specific Linux-configured models. In the small-business sector, the company is also keen to stress support for Linux on its Risc-based Power (Linux on Power) systems.

Red Hat and Novell/Suse are the preferred distributions, with close ties to both companies. IBM also offers a range of installation, migration and support services, and is a leading developer of middleware and other applications for Linux.

Hewlett-Packard

A similarly committed proponent of Linux and open source, HP has partnered with both Red Hat and Novell/Suse. The software can be preinstalled on the company's industry-standard ProLiant servers, including rackmount and blade products. Linux is also supported on HP Risc platforms.

HP and its resellers offer a comprehensive set of installation, support and outsourcing services to help businesses deploy Linux. The company also offers widespread Linux support across its software products.



IBM supports Linux on virtually all its platforms including, for the small business, both x86-based X-series servers and those based on its own Power processors

Dell

Dell will preinstall Red Hat Enterprise Linux onto its Poweredge industry-standard servers, including blade server products, and can also supply other distros. The exact implementations available will depend on the server specified. The company also has a Linux community website at <http://linux.dell.com>, plus a range of installation and support services.

Sun

In addition to its Unix-based Solaris 10 operating system, Sun is committed to supporting Linux, both on its own Ultrasparc and industry-standard server hardware based on AMD Opteron processors. Solaris 10 can also run Linux applications natively, plus Sun is responsible for the development of the Java Desktop, Star Office and other open-source applications.

Not just Linux

Although often mentioned in the same breath, open source and Linux aren't joined at the hip. Indeed, there are proprietary applications for Linux and open-source programs to run on Windows and other platforms.

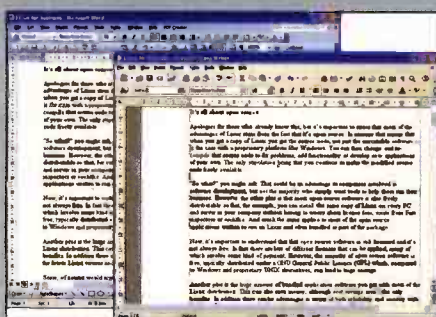
Openoffice.org is a good example, giving Windows users functionality more or less equivalent to Microsoft Office – minus the hefty licensing fees, which can run into hundreds of pounds per user in a small business, even if you only use Word and Excel. It's also easy to try it yourself. Simply download the install package from

www.openoffice.org (it's also regularly included on our cover DVD) and load it on as many Windows PCs as you like to get a word processor, spreadsheet, presentation graphics, drawing and database tools.

There are no licences to buy and functionality is on a par with Microsoft Office, with all the usual spellcheckers, charting and drawing tools you'd expect. The look and feel is also very Office-like. The only major drawback is the lack of ready-trained staff. Still, that's not particularly hard to address, and in a small business the savings could run into thousands.

Neither should you worry about talk of competing open document standards. Documents created in Microsoft Office can be worked on using Openoffice.org and vice versa, with a huge range of compatible formats from which to choose. And it needn't stop there. If you want an open-source browser, then download Firefox. Or the Thunderbird open-source client for email, both available for the Windows platform from developer Mozilla.

Likewise, you can get open-source Windows RSS clients, such as RSSOwl, media players, podcasting applications and a lot more besides. Check out www.opensourcewindows.org for more on what's available.



Open-source Openoffice.org is available for Windows and offers functionality on a par with Microsoft's Office package

10

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Supports WinX64, Linux families



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32-bit PCI BUS interface
Supports WinX64, Linux families



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LINUX DISTRIBUTION

Ubuntu 6.06 LTS

One-click server deployment and long-term support are just some of the enhancements



You can download
Ubuntu 6.06 LTS and
try it out without
installing anything

Ubuntu, if you haven't ever heard of it, has been a real hit, especially with enthusiasts wanting a complete and easy-to-use Linux desktop. And now there's a new release, designed to appeal just as much to business users, with new features and enhancements, plus a one-click integrated server implementation and long-term support guarantees.

Commonly still referred to by its Dapper Drake codename, the new version is officially Ubuntu 6.06 LTS (long-term support) which, in Ubuntu-speak, means security and other updates for at least five years.

Commercial support from a number of third parties is also available, adding to the usual community help available from other Linux users. Ubuntu, of course, is by no means unique in this respect, but unlike some vendors its software remains free to copy and use, with automatic updates available, regardless whether you buy into a support contract or not.

When it comes to that software, the Debian Linux on which Ubuntu was originally based is completely revamped in this release, with version 2.6.15 of the kernel tuned for desktop or server deployment dependent on the version involved. There's also a separate high-end kernel for servers with eight or more processors, and an Ultrasparc implementation for Sun Fire T1000 and T2000 servers as well as support for x86, 64bit Intel/AMD and PowerPC processors.

There are big changes, too, when it comes to deployment. You still only need to download or order a single CD-Rom (both free of charge), but the desktop CD now boots and runs Ubuntu directly, enabling the software to be tried out without needing to install anything. A new graphical install

procedure replaces the old text-based routine with, on the server version, the option of a preconfigured LAMP (Linux, Apache, MySQL and PHP) server setup – a very common setup.

Unfortunately, the Ubuntu server doesn't install with a graphical interface, which can be a bit of a shock if you're not expecting it. However, it's easy enough to remedy using either Gnome, the default on the desktop implementation, or an alternative KDE desktop if preferred.

Brown remains the desktop colour of choice, but with a new theme and a more up-to-date Firefox browser installed by default. Video playback facilities are similarly enhanced, with better power management and wireless networking among other improvements.

On the application front, the Ubuntu desktop comes preconfigured, with the latest Open Office suite of productivity tools (v.2.0.2), plus an Evolution email and calendaring client. Added to which – although not bundled as standard like other Linux distributions – there are lots of other open-source applications, which can be downloaded and installed using the easy-to-use Debian Advanced Packaging Tool (APT).

As a small-business solution, Ubuntu 6.06 LTS has a lot to commend it, not least of which is the fact that it's one of the most complete and ready-to-use free Linux distributions available. It's also one of the easiest to get to grips with, although when it comes to small businesses it's likely to be more popular as a server than as a replacement for Windows desktops. That said, we're happy to be proved wrong. Automatic updates, commercial support and, of course, the fact that it's free, make Ubuntu 6.06 LTS worth considering as a Windows alternative.

Alan Stevens

Details

Price Free download or free shipped CD-Rom

Best price www.pcw.co.uk/bestprices

Contact Ubuntu

www.ubuntu.com

System requirements Intel x86, AMD64 or PowerPC processor • 64MB (server version) or 256MB Ram (desktop version) • 500MB free disk space (server) or 3GB disk space (full desktop deployment) • Bootable CD-Rom or DVD drive for installation • Supported graphics and other interface cards

Verdict

Pros A very complete Linux distribution; bootable LiveCD for trialling of desktop; single-click LAMP (Linux, Apache, MySQL and PHP) server deployment; well supported; automatic updates

Cons No GUI on server deployment

Features ★★★★★

Ease of use ★★★★★

Value for money ★★★★★

Overall A good starting point for the small business looking to use Linux as either a server or desktop platform

★★★★★

BACKUP

EMC Retrospect 7.5

Never lose a file again using this versatile backup application



Each backup set contains a complete inventory of the files on the host system, so recovering lost data is easy

A member of the EMC Insignia family of small-business products, Retrospect is a deceptively easy yet versatile backup application that does away with the need for the complex media rotation schemes required with some alternative products. It can also take backups to a wide range of devices other than tape drives, including writeable CD/DVD drives and Nas appliances, plus removable disk systems such as the DX115 from Storcase, reviewed on page 128.

Several versions of the EMC software are available, all written to run on Windows (32 and 64-bit versions), and a Mac client is also available. We tested Retrospect Professional, designed to protect up to three Windows desktops or notebooks, with a single server version (£699 ex Vat) and multiserver package (£1,449 ex Vat) also available. The multiserver version provides facilities to back up unlimited networked clients.

Alternatively, if you're using Microsoft's Small Business Server, the Retrospect Small Business Server package (£499 ex Vat) is worth looking at as it includes tools to protect the bundled Exchange and SQL Server programs at no extra charge.

Whatever the version, installation takes no more than a couple of minutes, and it doesn't take much more than that to start taking backups. Wizards are provided to guide you through the steps involved, and an alternative advanced mode is available for anyone wanting more control over the process.

The expected facilities to schedule and automate backups are provided, along with tools to initialise and check on media availability and monitor activity. You also get built-in reporting facilities, plus compression and data encryption options, support for virus scanning and the backup of Registry and other system information.

It's all quick and easy, thanks mainly to a patented technology known as progressive backup. Rather than create backups from scratch every time, this adds files to existing backup sets, only ever backing up each file once to a media set until it has changed in some way, optionally rotating sets for extra security.

The end result is that there's no such thing as an incremental backup with Retrospect. Each backup set contains a complete inventory of the files on the host system, making it easier to recover lost data. When updated files are added to the backup, earlier copies are retained along with detailed file system snapshots, making it possible to recover to different versions as well.

Of course, to start with, each backup will take a while to run as the backup set is seeded with files. However, once this has been done, subsequent backups can be completed in minutes, compared with the hours it takes using more conventional products.

Restoring files is equally straightforward, with a user-driven web interface in this latest release. However, the Retrospect approach can sometimes be too easy. For example, it's not always obvious when things go wrong, and the progressive backup technology can make it difficult to troubleshoot.

That apart, Retrospect is a comprehensive backup program, whose latest 7.5 release contains useful client distribution tools. Full 'bare metal' disaster recovery is another valuable option (standard in both packages), with add-ons to handle Exchange, SQL Server and more general open file backups. An advanced tape support pack for multidrive tape libraries further rounds off this impressive yet easy-to-use backup solution.

Alan Stevens

Details

Price From £151.58 (£129 ex Vat)

Best price www.pcw.co.uk/bestprices

Contact EMC (+33) 1 5533 0200

www.emcinsignia.com

System requirements Windows 98 SE or later for desktop backup, Windows NT4 (SP6) or above for servers • Pentium-class processor (1.5GHz or greater recommended) • 256MB Ram • 1GB free disk space • Supported standalone tape drive, autoloader or library • Local or networked hard disk • Writeable CD/DVD drive • Removable disk system

Verdict

Pros Fast backup times; easy to manage; disk-to-disk and Nas backup support; user-driven restores; restore to previous file versions; disaster recovery option

Cons Can be difficult to troubleshoot when things go wrong; add-ons can be pricey

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

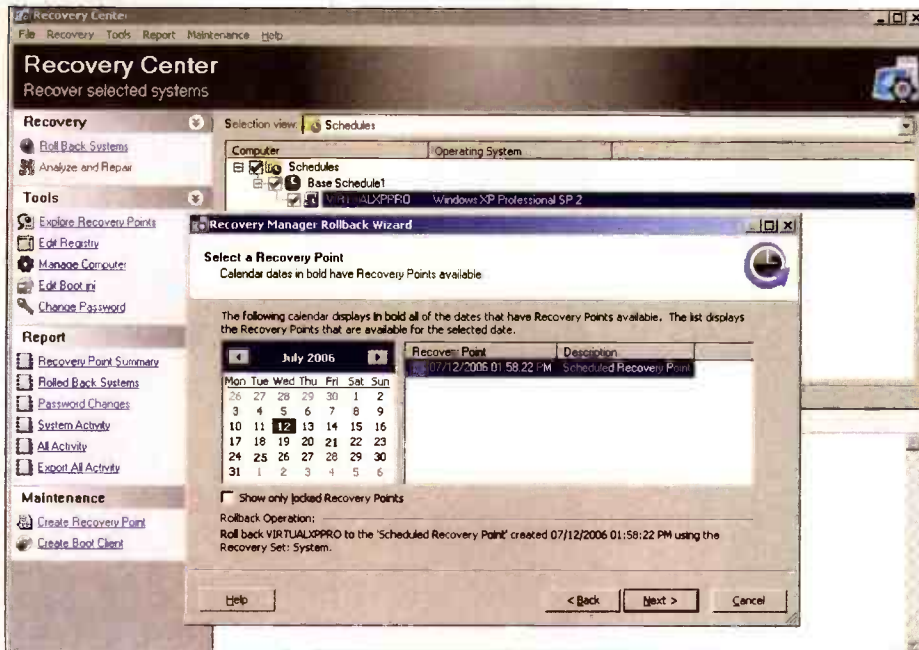
Overall A comprehensive yet easy-to-use application that takes the hassle out of small-business backups

★★★★★

DISASTER RECOVERY SOFTWARE

Winternals Recovery Manager 3.0

Remote rollback and recovery of damaged PCs



Recovery Manager lets you remotely roll back a damaged PC or server to an earlier, stable state

If you've ever needed to recover a corrupted Windows XP PC you'll probably have used the System Restore feature, which lets you return, or roll back, the OS to a previous, stable state. Winternals Recovery Manager builds on this concept with tools to protect and recover almost any Windows PC or server remotely, and do so even if it's completely unbootable.

Recovery Manager uses its own snapshot technology to capture recovery information from any version of Windows from NT onwards, storing the snapshots from multiple clients in a central SQL database – the recovery point store. However, you don't have to invest in a full SQL Server to use Recovery Manager, as a copy of MSDE is included and installed along with the rest of the package. Plus, with the latest 3.0 release, you can now configure multiple file stores to, for example, speed up the recovery process in remote offices.

Support for 64-bit Windows is another important addition in Recovery Manager 3.0, and so is the ability to take snapshots of open files such as databases. Plus there is a new bare metal recovery option to rebuild a complete PC or server from scratch.

It took us about five minutes to install Recovery Manager 3.0 on a server running Windows Server 2003 R2, after which we were able to configure schedules to take snapshots using the wizard supplied.

As the name implies, a schedule tells Recovery Manager when to take snapshots and what information to include. Basic system file and configuration data is always harvested, in addition to which you can choose to protect the Program Files directory, user Registry settings and even data files. In fact, you can even protect all the files on client PCs. However, this will

have a major impact on performance, and Recovery Manager shouldn't be viewed as a backup alternative.

Schedules can be applied to individual PCs or groups on the network. These can be selected from a list. On networks running Active Directory, schedules can be assigned to Organisational Units (OUs) or complete domains. There's also a Smartbind option to protect new PCs added to an OU after a schedule has been created.

It's all fairly straightforward, although a small client agent does need to be installed before snapshots can be taken. This can be pushed out when the schedule is run but, depending on how the clients are configured, that doesn't always work. We had problems with desktop firewalls and client PCs, where administrative shares were disabled for security reasons. However, the software can be installed separately using third-party distribution tools or Windows Group Policy.

Once up and running, Recovery Manager is an easy application to use, with an intuitive Recovery Centre console from which you can selectively roll back and recover individual or multiple PCs, compare and explore stored recovery point data, and produce management reports. It also lets you edit Registries, reset passwords and make other client changes remotely.

Recovery Manager was a lot more reliable than XP System Restore, working on almost every PC we tried, even virtual ones and those with unformatted hard disks. Of course, it takes time to set up, and snapshot data can take an age to collect. However, the built-in automation allows most of the preparation work to be done out of hours, and automated recovery is a lot faster than doing it by hand. Winternals has now been bought by Microsoft, but no details are yet available on whether this will affect pricing or support. *Alan Stevens*

Details

Price Workstations – £37.60 (£32 ex Vat); Servers – £411.25 (£350 ex Vat)

Best price www.pcw.co.uk/bestprices

Contact Pillar Solutions
01732 363 670

www.pillar-solutions.com

System requirements

Recovery Manager Schedule Console:
Windows 2000 (SP4) or later •
900MHz x86 processor • 256MB
Ram • 100MB disk space
Clients: Windows NT4 (SP6a) or later
• 400MHz x86 processor • 256MB
Ram • 10MB disk space

Verdict

Pros Remote rollback and recovery of multiple PCs and servers; central management and automated collection of recovery data; bare metal recovery

Cons Client agent distribution can be problematic; recovery point snapshots take a while to build

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

Overall Requires a little work to set up, but once configured provides an invaluable safety net for both desktop PCs and servers

★★★★★

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The image features a collage of several PC World magazine covers. The central cover is the 'Personal Computer World DVD EDITION' with headlines: 'UPGRADE WINDOWS XP', '30 EXPERT WAYS TO FIX SECURITY HOLES IN YOUR PC', 'TOP 30 BUYS FOR XMAS', and 'Our favourite products of the year'. Other visible covers include 'ULTRA PORTABLES' (7 laptops on test), 'TOSHOP ELEMENTS 4', 'BULLGUARD Internet Security 6', 'ConceptDraw MINDMAP', and 'Ultimate Financial Forecaster 2'. A blue oval overlay on the left contains the text: 'PLUS a FREE DVD with every issue'.

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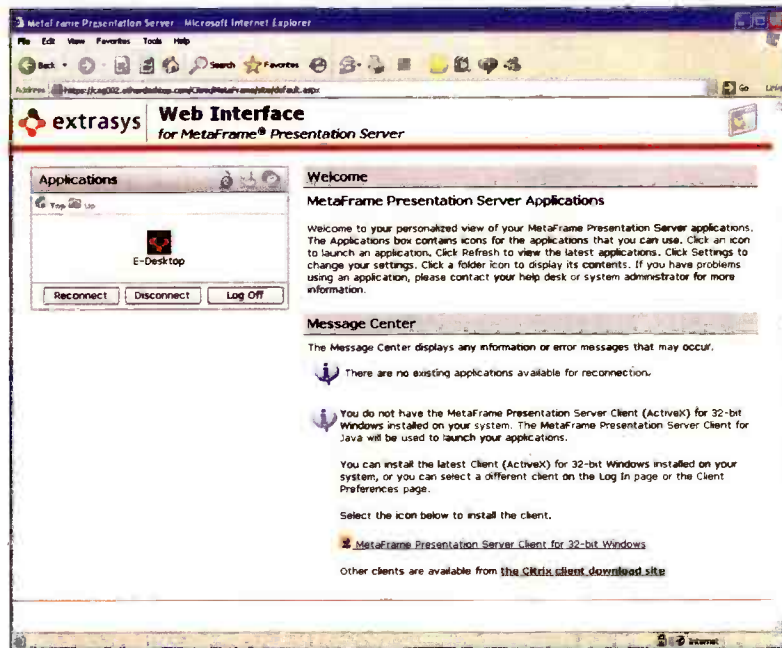
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HOSTED APPLICATIONS

Extrasys Hosted Desktop

Access your desktop and applications any time, any place, anywhere



Connect to your Extrasys-hosted desktop using either the Citrix ICA or Java

Hosted application services have never really taken off, primarily because of poor availability and performance. However, with the spread of fast broadband and wireless internet access, some providers are giving them another go. Among them is UK start-up Extrasys.

Aimed at the small-business market, the Extrasys service delivers an internet-hosted Windows desktop, complete with Office and other applications for a fixed monthly fee. Citrix Metaframe is used to run the software, hosted on Extrasys servers, and all you need is a PC or thin client with a browser and internet access.

Extrasys set us up with a test account and an optional Safeword token for secure access. These enable you to log on to the service, whereupon you are presented with a window showing any applications you may have left running, which can be resumed, plus an icon to start the hosted desktop.

Click this and you are connected to a server-run Windows session using either a Citrix ICA client or Java. Citrix is the preferred option and if you have not already done so, download the necessary software and install it from the Extrasys welcome page – a process that takes just minutes.

It takes a while for the desktop to start but, because it is running on a remote server, performance is, for the most part, pretty good. The exceptions would be if you were using a really old PC or on a very slow link, such as dial-up.

We tested using a 3Mbps/sec ADSL service using both a Windows PC and the NEC notebook thin client reviewed on page 128. We did notice the odd delay here and there, but most of the time it felt as though we were running the applications locally.

One slight concern was the Windows 2000 desktop environment which feels a little clunky if you're used to XP. However, that doesn't matter a great deal as the desktop comes fully loaded with Office Professional 2003, which includes the latest versions of Word, Excel, Powerpoint and so on.

Outlook, too, is included as standard and comes ready connected to a hosted Exchange server using your preferred email addresses. Browser access to this mailbox is also available and, for an extra £20 ex Vat per month, plus the cost of the device itself, you can have messages delivered to a Blackberry PDA.

Adobe Acrobat Reader also comes pre-installed along with Internet Explorer. Other applications can then be configured and hosted for an extra fee. Extrasys uses Softricity to virtualise and deliver a variety of other programs more or less on demand.

Anti-virus and spam protection are included in the basic monthly subscription, along with 500MB of mailbox space and a further 500MB for general storage of files and documents. Additional space can be purchased on 1GB increments and everything gets backed up twice a day.

It all worked as expected and the few teething problems we had were quickly resolved by the Extrasys helpdesk. However, whether or not it is worth it, is a decision you will have to make yourself.

On the plus side, there are benefits in terms of not having to install, license or maintain local applications. You can also work from home or when travelling, with full access to your applications and data at all times. On the downside, you are entirely dependent on internet access and service availability to do business. The choice is yours.

Alan Stevens

Details

Price From £152.75 (£130 ex Vat) per user/month

Best price www.pcw.co.uk/bestprices

Contact Extrasys 0800 051 1788 www.extrasys.com

Specifications PC or thin client with internet access • Citrix ICA client or Java needs to be installed

Verdict

Pros No local applications to install, license or maintain; full desktop access from home or when travelling; choice of Citrix or Java clients; hosted Exchange access included

Cons Total reliance on an internet connection and service availability for desktop access; Linux clients can be problematic to configure

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

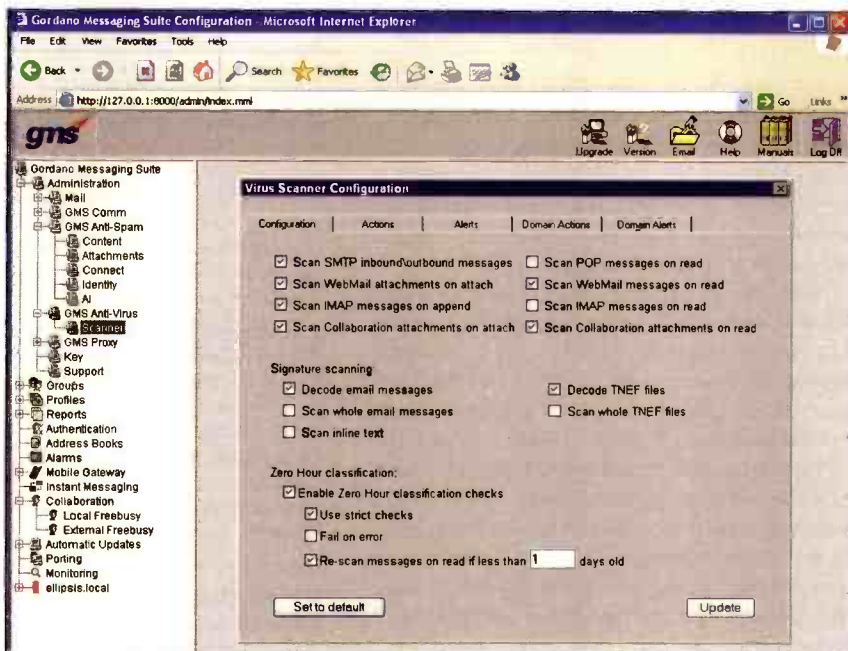
Overall Offers clear business benefits, but reliance on an internet-hosted service to do business could still be a step too far for many

★★★★★

EMAIL AND GROUPWARE

Gordano Messaging Suite v12

Not as easy to use as some, but this rivals Exchange in functionality



Version 12 of the Gordano Messaging Suite offers zero-hour anti-virus and spam protection

Version 12 of Gordano Messaging Suite (GMS), includes implementations for Linux, Solaris and AIX platforms as well as Windows, all with the same features and add-ons. Anti-virus and anti-spam security modules are among those options, plus an Exchange-like collaboration server, with enhancements to all three platforms.

Because it is modular it can take a while to work out which bits of GMS you need. We opted for a small-business setup, comprising the core GMS Mail server, Webmail and Collaboration server components. These we installed onto an IBM xSeries server running Windows Server 2003, a process that took about 10 minutes to complete using the setup utility supplied.

Some post-install setup was then required to configure the primary domain (multiple domains are supported) and arrange for inbound SMTP messages to be routed correctly. Alternatively, Pop3 message retrieval can be configured with a straightforward web-based interface used for all management and monitoring activity.

The enhancements in version 12 are mostly to do with email security and Outlook integration with, on the security front, 'zero-hour protection' to cope with emerging mail-borne threats. This uses a patented Recurrent Pattern Detection technology from Commtouch, whose detection centre analyses millions of emails a day looking for malware activity. Mail servers connected to the Commtouch network can be updated within minutes of a new threat being detected.

Zero-hour protection is added to the existing mechanisms supported by GMS. However, the anti-virus module does add to the price (£555 ex Vat for 25 users) as does the anti-spam module (£138 ex Vat).

The other enhancements, around Outlook integration, make the Gordano software almost indistinguishable from Exchange, both in terms of email and collaboration features.

In earlier releases Gordano had already added Mapi support, giving Outlook users access to a global address book, server-held message stores, contacts folders, calendars, and so on. Folder sharing had also been added along with support for free/busy time allocation, meeting invitations and other groupware options. However, Outlook users still saw the GMS server as a separate set of folders (inbox, calendar, contents and so on) with a special local database, created during client setup, that was needed to hold synchronised copies of server data.

Now, in version 12, Outlook users see a single navigation tree, just as with Exchange, which is less confusing and easier for customers to migrate from Microsoft to the Gordano software. A standard Outlook Pst file is also used to hold the local data, improving performance and addressing compatibility issues when synchronising to PDAs and other devices. Calendar sharing is also a lot easier in this version.

However, Gordano does not have additional client setup. Outlook naturally assumes that Exchange will be used, so extra work is required to get it to use the GMS Collaboration client. Still, it is not that difficult and once the client is loaded it is hard to tell that you're not connected to a Microsoft server.

We didn't find GMS the easiest mail server to manage and the array of options can be confusing. However, it does the job well and, in functionality terms, is about as close to an Exchange clone as it is possible to get.

Alan Stevens

Details

Price £1,086.88 (£925 ex Vat) for 25 users – GMS Mail, Webmail and Collaboration Server

Best price www.pcw.co.uk/bestprices
Contact Gordano 01275 345 100
www.gordano.com

Specifications Host server running Windows NT4 or above, Linux, AIX or Solaris • 450MHz processor or greater recommended for Windows with 64MB Ram or greater • Disk space requirement dependent on number of users (158MB recommended for 25 Imap mailboxes) • Support for Pop3/Imap4, Mapi and browser-based clients

Verdict

Pros Multiplatform support; Exchange-like collaboration features available to web-based and Outlook clients; enhanced email security features in latest release
Cons Can be expensive when buying several of the add-on options; not as easy to manage as some alternatives
Features ★★★★★
Ease of use ★★★★★
Value for money ★★★★★

Overall Does a good job in matching Exchange in terms of functionality, but as a small-business solution not necessarily cheaper or easier to manage

★★★★★

DISK-TO-DISK BACKUP

Storcase Data Express for Backup

Quick and reliable small-business device at a reasonable price



With hard disks now very cheap, small businesses are increasingly opting for disk-based backup as a cheaper, faster and more flexible alternative to tape. Data Express for Backup is a compete disk-to-disk backup solution that provides the hardware and software required, in addition to support for disk hot-swapping.

The Storcase hardware takes the form of a drive enclosure and removable drive carrier, available in both internal and external (USB2) models. These are guaranteed for 12 years, with connectors rated for up to 50,000 insertions, plus built-in, soft-start technology to eliminate power spikes during disk spin-up.

A key lock can be used to prevent unauthorised disk removal, with a choice of either Pata (parallel ATA) or Sata (serial ATA) technology on the internal models. A disk is included in the kit.

We tested the Sata-based DX115 fitted with an 80GB Seagate Barracuda, although a much larger 500GB version is available if required.

A screwdriver, suitable interface card and cables are all needed for installation. A separate standalone interface is also recommended, rather than hooking up the drive to an existing Raid controller.

Order the desktop version of DX115 and the backup software will be EMC Retrospect Express 7.5 (see page 122), with Retrospect disk-to-disk for the server version. You also get Driveswap, a utility that allows disks to be removed and replaced without having to power down the host system, which Windows doesn't normally allow.

Performance will depend on the disks and storage controller used, although the Storcase hardware will always be faster than a comparable tape setup. We tested on a Dell Poweredge 1800 with 1.5Gbits/sec Sata disks and managed to back up 80GB of data in under half an hour. OK, so you need to buy extra disks and carriers for off-site storage, but for performance like that from tape you'd need to pay more. *Alan Stevens*

Details

Price £296.10 (£252 ex Vat)

Best price www.pcw.co.uk/bestprices

Contact Storcase

01932 738 900

Specifications 5.25in half-height removable hard disk enclosure • Sata power and data interface (3Gbits/sec rated) • 3.5in Seagate Barracuda • 80GB, 7,200rpm Sata 1.5 hard disk in removable disk carrier • Windows hot-swap utility • EMC Retrospect Backup 7.5 software

Verdict

Pros Extremely robust, removable drive hardware; Windows hot-swap utility; bundled backup software

Cons No interface adapter or cable

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

Overall A faster, more cost-effective alternative to tape for small-business backup

★★★★★

THIN CLIENT

NEC TCM160

A portable terminal with optional wireless networking



It looks like a notebook, but NEC's TCM160 is, in fact, a portable terminal for use with Windows Terminal Server, Citrix and other thin-client apps.

With no internal disk, the TCM160 is lighter than most conventional notebooks and, thanks to a low-power Via Eden processor, has no noisy cooling fan. Other than that, it's fairly ordinary, with a 15in TFT display in the lid, integrated keyboard and touchpad, plus integrated audio and a modem as standard.

A 10/100Mbps/sec Ethernet port is on the back panel, or you can use the optional built-in 802.11g

wireless adapter to connect to the local network.

Five USB ports are also arranged around the sides, plus there's a PC Card slot available, if needed.

The Linux-based operating system loads from Flash memory and can be started with either a Windows-like desktop or in 'kiosk' mode, where users choose from a list of preconfigured server connections.

The connections can use Microsoft RDP, Citrix ICA or X-Windows protocols, with a built-in agent for the Citrix Program Neighbourhood, plus local Thinprint, Telnet and VNC clients, support for Java and the ability to configure secure VPN connections using PPTP.

A Firefox browser is provided for direct web access, which is fairly ancient (v.0.8), and comes preconfigured with Pdf, Flash and media player plug-ins.

Local legacy terminal emulation isn't provided and the Linux processor isn't exactly state of the art, but then performance is mainly down to the host server and, as a Windows thin client, the TCM160 acquits itself well. With a battery life of five hours, portability is also an advantage. It's also a secure solution, with no disk to get corrupted, although you can add external USB storage as well as printers and other devices.

For thin client users looking for portability, it's well priced and there's very little to beat it. *Alan Stevens*

Details

Price £374.83 (£319 ex Vat)

Best price www.pcw.co.uk/bestprices

Contact NEC 0870 010 6328

www.nec-computers.co.uk

Specifications 800MHz Via Eden processor • 64MB Ram • 15in TFT display (1,024x768 resolution) • 5 USB2 ports • Integrated modem • Integrated 10/100Mbps/sec Ethernet interface • Unichrome Pro 2D Gfx video controller • Optional 802.11b/g wireless adapter

Verdict

Pros Portable; five USB ports; optional wireless networking; Firefox browser; VNC and Telnet clients; RDP, X-Windows connectivity

Cons No legacy terminal emulator

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

Overall The benefits of a secure thin client, but a specialist buy

★★★★★

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FUTURE VISION

Although the World Cup is long over, the interest in high-definition TV continues to grow. This month's Performance column from Gordon Laing takes a look at what you need to be able to watch high-definition content on your PC, whether from broadcasts or pre-recorded DVDs. But before you try that, it might be better to read his Hardware column to find out how to give your PC a quick and free speed boost.

In the past couple of issues of *PCW*, we've been looking, in some depth, at the complex issue of colour management. Ken McMahon continues the theme this month in Digital imaging and video with some valuable tips on how to make it all work in practice.

Mark Whitehorn's recent visit to Microsoft's TechEd conference revealed some disturbing developments in Access – read all about it on page 154. And finally, a reminder that you can now read many previous Hands on columns (for free!) online at www.pcw.co.uk/handson.

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HANDS ON

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- HARDWARE SOLUTIONS
- SOFTWARE SOLUTIONS
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HARDWARE

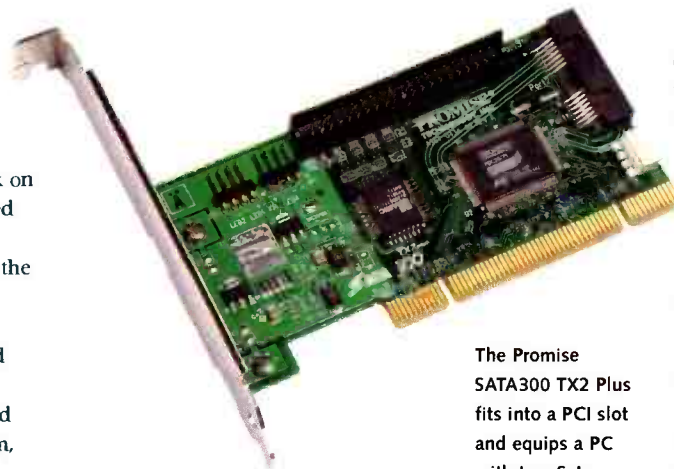
Large hard disk

Q A friend of mine has just installed a large hard disk on an old PC and encountered the problems highlighted in your June Performance column, that is, the PC is unable to record capacities larger than 137GB. He's tried a Bios upgrade but this has not fixed the problem. Would a possible solution be to remove the drive and connect it to a more modern system, then partition the drive into two 100GB segments?

James Price

A Sadly this won't work on your friend's system, as the underlying Bios and disk controller still won't recognise disks bigger than 137GB. Since he's already running the latest Bios update, he'll need to either fit a new disk controller card, such as the Promise SATA300 TX2 Plus (pictured), or try an external drive enclosure on a USB2 or Firewire port.

The solution you suggest is applicable to systems where the hardware recognises the disk's full capacity, but the operating system will not. Under these circumstances, you could temporarily fit the disk to a newer PC to partition and format it as required, before reinstalling the disk in the old system.



The Promise SATA300 TX2 Plus fits into a PCI slot and equips a PC with two Sata ports and one parallel ATA connector, all supporting disks bigger than 137GB

Linking PC to TV

Q In August's Performance column you hinted at connecting a PC to a high-definition (HD) TV using a component video link, but didn't go into any details. I've come across some cards that will output video streams over component but not the normal Windows Desktop too. What would you suggest?

Andy Lucas

A Most modern graphics cards support component video connections using a supplied cable and breakout box. These normally connect to a small plug on the card's blanking plate and end with the three Y, Cr and Cb component plugs; these can then be connected

directly to a TV with component inputs, or to a longer lead if some distance between them is required.

The next step is to ensure your PC is outputting the right kind of signal for your TV to lock onto.

Component is a standard video connection, so the trick is to select standard video modes using your graphics driver.

If you're using a standard-definition UK TV, choose a 576i mode, corresponding to a standard Pal TV signal. If you have an HD-Ready TV you could choose either 720p or 1080i; some newer sets may even support a 1080p mode. Simply try each of them and stick with the one that looks best to you; this will vary depending on your combination of card and display.

If your display has an RGB monitor connection, you may enjoy better results than component. You must again use standard video modes to drive it, but instead select the appropriate Desktop resolution. For example, on a standard-definition TV, choose a resolution of 720x576 pixels. For an HD-Ready TV, try resolutions of 1,280x720, 1,280x768, 1,366x768 or 1,920x1,080 pixels. Again some trial and error is required for the best result, but you should be able to enjoy both the video output and Windows Desktop.

How to make sure your hardware is fully supported

LINUX

Q I'm interested in getting more into Linux but I'm worried about what hardware is supported, and how to find out if future purchases will be supported or not. What's the best way to find out?

Stephen Oakes

A As we explained in our Linux feature in the September issue of PCW, most typical hardware – graphics cards, soundcards, network cards, and so forth – are

fully supported without you having to do a thing, so don't worry too much. On installation, things will usually all 'just work' without any driver downloads.

If you're not sure then a quick search on Google is always a good plan, and will normally answer your question. Some distributions have a hardware database, so an alternative is to check that out.

The main problem area is with Wifi cards, so always have a look around before buying one of these.

Disabling graphics

Q I'm trying to install an Nvidia Geforce 6200 graphics card into my Compaq Presario 6000. The instructions require me to disable the integrated graphics on the motherboard. How should I do this, and can the process be reversed?

David Howells

A Integrated graphics can normally be disabled using a simple setting in your PC's Bios menu; some systems may alternatively require a jumper switch to be adjusted or removed on the

motherboard itself. There'll be full details in the manual for your motherboard. This process is completely reversible.

If you can't find the manual and don't know which motherboard your particular Presario is housing, you could gamble that the option will be in your Bios. Fit your new graphics card and connect the monitor to it. As your PC starts up, it should report that pressing a certain key, such as Delete, will enter your Bios setup options. Press this, then use the cursor keys to carefully navigate the options. Look for one referring to the integrated or onboard graphics, and select disable.

LINUX

Grubby Linux

Q I have installed a new hard drive as my boot disk, and can no longer boot Linux unless I boot from my old drive, using the Bios option. How can I fix this problem? I don't really want to reinstall everything.

Rob White

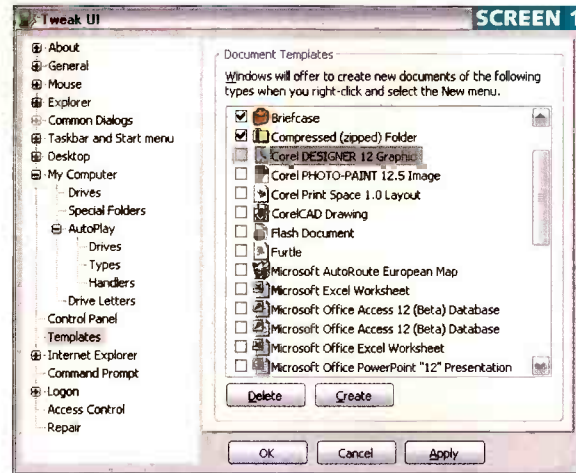
A You are quite right. Grub, the bootloader, is sitting on your old drive and you cannot start Linux without booting it. Some distributions offer a rescue option on the installation CD, so that may be worth a try. Alternatively you can manually install grub on the new hard drive, though you need to know a little about what you are doing here.

Run grub from within Linux and enter 'root (hd0,x)', where 'x' is the number of the partition where the /boot directory is found, counting from 0. So if that is /dev/hda5, you would use (hd0,4). Next, install the grub bootloader. If you want to install onto the MBR (the usual case), enter 'install (hd0)'. To install on a partition, use the same format as before, for example 'install (hd0,1)' for /dev/hda2.

DATABASE

Explicitly joined

Q I've read books on Access programming and so on, but while they all explain how to create relationships by either method, I haven't found one that says if there is an advantage with making permanent relationships on the Relationship screen in addition to the relationships one has to make within



the SQL. Does it speed up the Access Engine in some way?

Ian

A The major advantage of declaring permanent relationships (apart from ensuring that they then appear, by default, in the query builder) is that you can enforce referential integrity. This is a huge benefit for helping to ensure the integrity of the data. So declaring the joins is more about data integrity than querying. Not declaring the joins explicitly is fine if you are sure that your users cannot subvert the data. If not, then explicitly declaring them is much safer.

WINDOWS

Command control

Q I seem to remember that there is a command to run specific Control Panel items without having to open the Control Panel folder itself. In particular, I'd like to get at the Sounds and Audio dialogue.

RA Holmes

A Yes – all you need to do is run the relevant .cpl file. For example Start, Run (or a shortcut to) mmsys.cpl will bypass Control Panel and bring up the multimedia properties in any version of Windows from 95 onwards.

New menu

Q When I right-click in a folder or on my Desktop and choose New, I am presented with a long list of items that takes a long time to appear. All I really want is New folder and New shortcut. Is there a way of getting rid of the rest?

Pruning the 'New' menu will allow you to customise what type of document you can create with a right-click

Are they stored in a folder like the 'Send to' contents?

Phil Butler

A They are not stored in a folder, but in the Registry. Each file type that appears in the list will have a 'ShellNew' key under its extension name in the Hkey_Clases_Root section. Fortunately, there's an easy way to get these.

Download and install the appropriate version of TweakUI. The XP version is at www.microsoft.com/windowsxp/downloads/power toys/xppowertoys.msp, and for all other versions of Windows is at www.microsoft.com/ntworkstation/downloads/PowerToys/Networking/NTTweakUI.asp. Look under Templates (XP) or New to enable or disable each type (see screen 1).

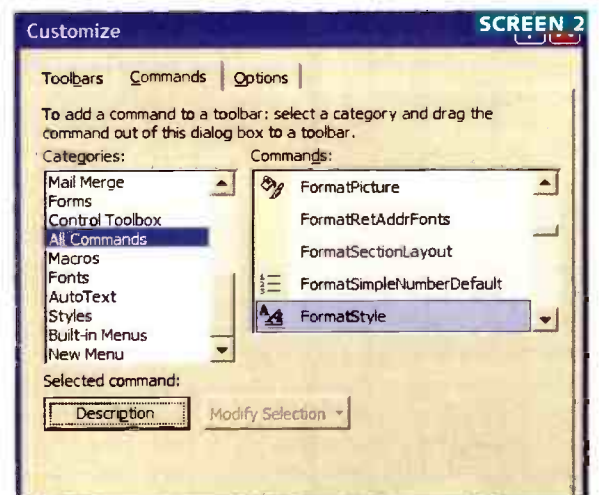
WORD PROCESSING

Style seeking

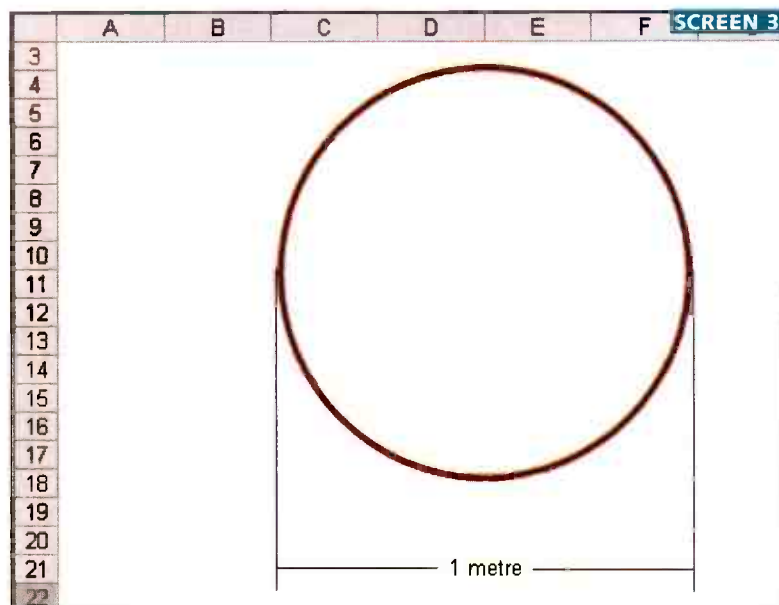
Q I seem to remember that some time ago you published a way of getting the Word 97/2000 Styles dialogue from the Format menu in Word XP or 2003, rather than having to go through the Task Pane. Could you remind me how this is done?

Peter Lyall

A Certainly – we last covered this 18 months ago, so it's about time for a reminder. Go to Tools, Customize and select the Commands tab. In the left-hand pane, select All Commands. Scroll through the commands in the right-hand pane until you reach FormatStyle (see screen 2). Select this, and drag it out



Reclaim the Styles dialogue so it's available from the Format menu



Drawing a perfect circle in Excel is possible using the Drawing toolbar

Close the blank document, then open the template as before – you should then be able to edit the macros as normal. When you've made your changes, saved and closed the template, you can reinstate its add-in status.

SPREADSHEETS

Circle time

Q I am one of those sad people who, when graphing a circle using Excel X Y Scatter charts, I would like to see a circle on the graph rather than an ellipse. However, there does not seem to be an easy method to achieve this other than by playing around with the axis limits until the function 'looks' like a circle. Are you aware of any trickery whereby you can configure the chart such that the x axis is using the same value as the y axis?

Simon Randall

A Interesting. I've never seen anyone use an X Y Scatter chart to draw circles and presumably Microsoft wasn't anticipating anyone doing it either. If you want to input a radius figure and create a circle from it you'd do better with a drawing package.

Spreadsheets such as Excel do offer two round charts, the Pie and the Doughnut, but they don't appear to be what you're looking for. You could, however, display the Excel Drawing toolbar, hold down the Shift key and use the Oval tool. Then you can draw a perfect circle (see screen 3).

Display by value

Q I want to have rows on a spreadsheet displayed, or not, depending on a value in that row. For example: If cell C4 contains value TRUE, then I want the entire row 4 to not be seen at all. But if a formula's calculation results in cell C4

of the dialogue and on to the Format menu. The latter will open and you will be able to drop the command anywhere you want in the menu contents, where it will appear as 'Style...'.
Close the Customize dialogue and the command will then be available. Depending on whether you have the option enabled in Tools, Options, Save, you may be prompted to save the changes to Normal.dot when you close Word – do so, as this will save your menu customisation.

Make a long dash

Q How can I get long dashes – like these – in Word (en-dashes), rather than hyphens?
Stephane Perez

A If you type word<space><hyphen><space>word, then Word should Autocorrect this to an en-dash. This will only work as you type, so if you want to edit an en-dash into existing text, use Control & the minus sign on the numeric keypad.

Open or Star?

Q We run a small business with eight PCs, and at present have standardised on Office XP, which we use mainly for word processing. With the imminent release of Office 2007, and budgets being tight, we are thinking of moving to Star Office or Open Office, rather than face another Microsoft upgrade.

What's the difference between them, and which is better?
Gordon Hockley

A Essentially, they are the same open-source code. Open Office is free to download or available on CD for a token media cost. Star Office, at time of writing, had a recommended price of £69.99, though shopping around can save a considerable amount of cash. You get a boxed version that includes a manual and technical support from Sun Microsystems. If you want technical support in Open Office, then you will need to access user-group forums.

Editing macros

Q I've created a template in Word that contains macros, and added it from Tools, Templates and Add-ins. However, I now find I can't edit the macros – if I select one from Tools, Macro, Macros, specifying the template in the 'Macros in' box, the Edit button is greyed out. How can I get back editing rights on my own macros? I have not put any protection on the template.

Georgina Keeley

A You'll need to open the template itself, rather than create a new document based on it. Make sure there are no other documents or instances of Word running. If you still have problems, then close Word, re-open it with a new, blank document, go to Tools, Templates and Add-ins, then untick the added-in template.

The index of available colours for highlighting particular cells

The following illustration shows the color-index values in the default color palette.

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40	41	42
43	44	45	46	47	48	49
50	51	52	53	54	55	56

SCREEN 4

reading FALSE, then row 4 should be displayed as normal between rows 3 and 5. Is this possible?

Gray Sharpling

A Enter the same number in cells A4 and B4. In C4 enter `=IF(A4=B4,"True",`
 `"False")`

(Key: `\` code string continues)

In the VBA editor choose Insert Module and create this macro:

```
Public Sub HideRow()
If Worksheets("Sheet1").Cells(4, \3).Value = "True" \
Then
With
Worksheets("Sheet1").Rows(4)
.RowHeight = 0
End With
End If
End Sub
```

When you run the macro, row 4 will be hidden if cell C4 displays TRUE.

Zero display

Q I'd like to develop a formula for calculating an entry in column N (Profit) to prevent anything being displayed until a value is entered in column M (Sales Price). Currently M2-L2 shows a negative value based on the entry in column L (Purchase Price). This would enable our Stockbook to reflect the true position.

Andrew McHutchison

A In N2 try, `=IF(M2>0,M2-L2,0)`. If M2 is empty then N2 will display a zero, a hyphen, or nothing, depending on the options you choose.

Pointing out cells

Q Is it possible to point out all the cells on an Excel worksheet containing formulas? That is, excluding cells with data, errors, or those that are blanks.

Daniel Taylor

A One way is with a short macro. Press Alt & F11 to open the VBA editor and choose **Insert Module**. Then type in `\` this macro:

```
Sub ColorAllFormulae()
ActiveSheet.UsedRange.SpecialCells \
Cells _ \
(xlCellTypeFormulas).Interior.\
ColorIndex = 27
End Sub
```

Finding the cause of faulty scanning

DIGITAL IMAGING

Q After reformatting my hard drive, my previous HP 2001c scanner started to scan all the white areas with a blue cast. I called in a professional who said the problem was a faulty scanner. I have purchased a new scanner, a Tevion Elite MD90090, and still have the same problem. Any ideas how to cure this?

Jim Brown

A To have two scanners with the same hardware fault would seem both unlikely as well as very unlucky, so let's assume the problem lies elsewhere. You don't say whether you are using colour management, but as you don't appear to be having colour problems other than with scanned input we'll assume that the scanner is the source of the problem.

You also don't say what software you are using, but the most likely explanation is that

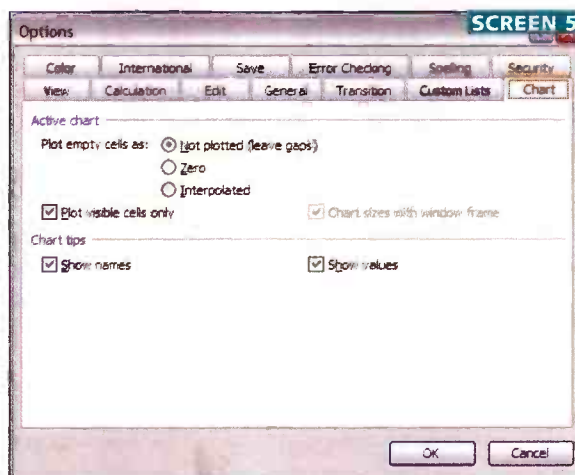
the scanner driver configuration is at fault.

The best way to try and isolate the problem is to scan either a test image, or the white background of the scanner lid using the driver software supplied with it – usually you can run this in standalone mode, or as a plug-in from a photo-editing application.

First try setting all the options to the factory defaults – there may be a button for this. You should also produce test scans using different bit-depths and resolutions. If there's an auto-adjustment feature, make test scans with it turned off and on.

If you still can't find the problem, try running the Windows Camera and Scanner Wizard from the Start>All Programs>Accessories menu.

This will allow you to control the scanner using the Microsoft WIA (Windows Imaging Architecture) driver, rather than the supplied Twain driver and may help you to isolate the cause of the problem.



You could give it a shortcut like, Ctrl & Shift & C. You can choose the colour of your choice by consulting the colour index shown in screen 4. There is a choice of SpecialCells methods. Instead of using SpecialCells (xlCellTypeFormulas) you could use SpecialCells (xlCellTypeComments) to highlight all cells with notes in them or SpecialCells (xlCellTypeAllValidation) for cells having validation criteria.

A line doesn't have to drop to zero when there is no data

Chart plotting

Q If you're plotting an Excel chart and the source data has some blank cells, how do you stop the lines dropping down to zero?

Mark Bridgett

A On some types of chart this can be a real problem as it's not feasible to provide a solution. But with line charts, Excel offers a choice of outcomes. The feature is not on the Chart menu but on the regular Tools menu. Select the chart, then Options on the Tools menu and go to Active chart under the Chart Tab (see screen 5).

Here you are offered the choice of 'Not plotted' in which case a gap is left; 'Zero' in which case the line drops to zero when there is a blank cell; or 'Interpolated' where the blank cell is ignored and the line runs from the last point before the blank cell to the next one. PCW

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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.

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Boost PC speed with a tune-up

Sometimes a few tweaks and a good clean-up is all the upgrade your PC needs

There comes a time for every PC owner when they realise it's time for an upgrade.

Maybe you're into encoding video but find the conversion process has become intolerably slow. Perhaps games are your thing, but your current hardware won't support the kind of resolutions and frame rates you're after.

For me, it's Adobe Photoshop. Well, not so much Photoshop itself, but the kind of files I want it to process. Ever-increasing digital camera resolutions are all very well, but the subsequent strain their files put on your system can take it to breaking point.

When faced with their PC grinding to a halt, different people opt for different solutions. Some upgrade specific components hoping they'll alleviate the problem. Others tweak what they've got, squeezing every last drop of performance from them. Some simply buy an entirely new PC.

It won't surprise you to learn I fall into the tweaking category, only upgrading specific components where absolutely necessary. Which parts you should target for tweaking or upgrading depends on what aspect of your PC you'd like to improve, but even then it's easy to bypass the obvious and opt for something unnecessarily complex or expensive. Sometimes a simple, or even free, solution is staring you in the face.

Take the gamer who wants faster 3D. Most people know the graphics chipset has the greatest influence on 3D performance, as long as the main CPU and memory subsystem are fast enough to keep up.

The solution, therefore, is a new graphics card, but it's always worth updating the driver before splashing out, as graphics companies release



High-res digital cameras such as Canon's EOS-5D are all very well, but their larger file sizes place a greater strain on your PC, especially if several are opened at once

new drivers frequently and, if yours is a few versions old, you might have untapped performance waiting to be unleashed. It's surprising how many people forget free software updates in their eagerness to get their wallets out.

I was in a similar situation. Photoshop eats memory like nobody's business, so a memory upgrade was a no-brainer, but there's at least one other thing I could do to improve the performance of my entire user experience. It wouldn't require any new components and wouldn't involve tweaking the Bios or overclocking.

Baseline performance

To put the theory to the test, I set about benchmarking my main PC system. It's based on a Shuttle SB75G2 XPC chassis (pictured right), fitted

You can upgrade the performance of a PC, in this case a Shuttle SB75G2, using the minimum of new parts

with a 3GHz single-core Pentium 4, 1GB of Crucial DDR PC3200 memory, an ATI Radeon X800 graphics card from Connect 3D and a Seagate 160GB Barracuda 7200.7 serial ATA (Sata) hard disk running Windows XP Media Center Edition 2005.

In order to perform comparisons, I ran a series of benchmarks. To address the main problem, I timed a few Photoshop functions. To test disk performance, I ran HD Tach and timed how long Windows took to start from a cold power-on.

For general processing and memory performance, I timed a DivX encode of an Mpeg2 Vob file, along with measuring how long it took Imatest, a photographic analysis tool, to run its resource-intensive distortion module on a 12.8megapixel image (www.imatest.com). Finally, to measure any differences in 3D performance, I ran 3Dmark05.

With no modifications, my PC started Windows in 45 seconds (to the user login screen), while HD Tach measured the average disk read speed as 45.9Mbytes/sec. 3Dmark05 scored 4,893 in XGA mode with no anti-aliasing, while the DivX encode took 16 minutes, 48 seconds. The Imatest distortion module took three





Extra Ram will benefit any PC, especially one used for image processing. Upgrade to 2GB using a pair of Crucial 1GB

minutes, 42 seconds to process my 12.8megapixel image.

In Photoshop CS2 I then opened a large psd file consisting of four layered 12.8megapixel images overlapping each other as a panorama. The file measured 217MB and the dimensions were 11,460x2,912 pixels.

Rotating this file by two degrees took 11 seconds, while the period between clicking OK on the print dialogue box and actually seeing a preview on my Epson 1290's utility took 34 seconds. They may not sound like a long time, but delays such as these can seriously slow your workflow, especially if you're processing many files.

Adding more memory

As mentioned earlier, the biggest single step you can take to improve Photoshop's performance is to feed it more Ram. As always when buying Ram, it's important to ensure it'll be compatible with your system. Fortunately, the websites of memory suppliers such as Crucial offer comprehensive databases of motherboards, allowing you to discover which modules are compatible.

I went to www.crucial.com/uk and used the Memory Advisor tool to look up the Shuttle SB75G2 XPC. Like all Shuttle XPCs, the compact motherboard has only two memory slots which, on my system, were already occupied by a pair of 512MB Dimms. Since it needed matching pairs, the only upgrade option was to swap the existing Dimms for a larger pair.

It's always tough removing existing memory for an upgrade, but at least I had other systems that could benefit from it. So out went the two 512MB Dimms, and in their place a Crucial 2GB DDR PC3200 kit consisting of a pair of 1GB Dimms (pictured above) and costing £121.

Interestingly, the extra Ram made absolutely no difference in some of my tests. Windows took the same amount of time to start up and the DivX encode was no quicker, while both HD Tach and 3Dmark05 scored the same results. Photoshop CS2 also took the same time to open the file and rotate

it, but at times, when the swap file would previously have been hammered, the upgraded system leaped ahead.

Take the print preparation process, which previously took 34 seconds. With 2GB, it was ready in just three. Also, as more operations were applied, Photoshop's 'Undo' buffer took longer to fill, allowing immediate reversals if desired. I could also open multiple images quickly while still enjoying responsive control.

The resource-intensive Matlab libraries behind Imatest also benefited from the extra Ram, with the distortion module completing its analysis in two minutes, 13 seconds compared with three minutes, 42 seconds on the 1GB configuration.

Doubling my Ram made a huge difference in specific applications, but there were still times when I was kept waiting by the disk whirring away. Clearly, some means by which you could speed up the disk would be beneficial, but when defragging makes little or no difference, are there any options that don't involve a new drive? I'd say so.

Ultimate spring clean

If your disk has always kept you waiting, it could be time for a new model. But if most people think back to when they first got their PC, it never seemed a problem. Certainly, people's expectations increase over time but the fact is, your PC's disk was almost certainly quicker in the past.

Old age hasn't slowed it down: you have. It doesn't matter how careful you are at uninstalling applications or removing unwanted files. Windows – in my experience – simply gets clogged as time goes on and gradually slows down. Then, after a few years, most people get fed up with their system and consider investing in a new one instead. If this sounds like you, I have an alternative:



Over time, Windows installations can become clogged with unnecessary files, slowing down overall performance. A new disk is one solution, but cleaning up your old one can also work wonders

back up your data, reformat the hard disk, then reinstall Windows and your applications. I'm talking about wiping the slate clean and starting from scratch. I guarantee your PC will feel faster immediately. Of course, not as fast as a brand new PC, but a measurable improvement on before.

Obviously, erasing your hard disk has crucial implications. First, you must be absolutely certain you've backed up all your personal data. The whys and wherefores have regularly been covered in PCW, so I won't go into them here, but just remember to make a secure copy of your emails, photos, documents, videos, music, media licences and Internet bookmarks onto removable media such as tape or optical disc. While there are tools that may be able to retrieve data from a formatted disk, it's best to prepare yourself for it being gone forever.

Second, you'll need access to your operating system and application discs. Annoyingly, many PCs are sold without a physical copy of Windows, so always check before formatting your hard disk; your PC manufacturer may be able to upgrade your licence to a CD for a fee.

Third, the entire process of backing up, reformatting, then reinstalling everything you need – and make sure you only do this for apps you really do need – will take the best part of a day, so allow for two.

I was about ready to replace my disk with a new model, but I thought I'd try reformatting and reinstalling first. About 10 years ago, this used to be an annual event for me, but strangely I'd fallen out of the habit, lazily upgrading components instead.

I can tell you, though, I'm glad to have given it another shot. Sure, my system's not as quick as it would have been, given the technology of a newer bigger disk, but it feels a world apart from before. Windows almost halved its startup time to 27 seconds, and HD Tach reported at least 10 per cent higher performance. Applications start quicker and the chattering disk access of before has been replaced by an eerie calm.

Doubling Ram and reinstalling Windows has, in effect, made my PC feel like new, while only costing £100 and taking a day or so. Admittedly there will be occasions when a complete overhaul is necessary for significant results, but it's always worth taking a step back and considering a proper clean-up instead. **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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Watch HD video on your PC

Discover the benefits of the newest digital video compression system

High-definition (HD) video playback is set to become a popular application for PCs. And, like DVD before it, HD has its own technical requirements.

One requirement is the processing muscle needed to decode certain types of HD video smoothly. While DVD's Mpeg2 format can support HD video, the bulk of future HD material is likely to be encoded in the newer, more sophisticated H.264 format.

H.264 video occupies less space than Mpeg2 and has the ability to look even better, but demands far more processing power to decode.

What is H.264?

H.264 is a compression system for digital video. It's part of the Mpeg4 specification and is also known as Mpeg4 Part 10 or Advanced Video Coding (AVC). While the ageing Mpeg2 system is also capable of transporting HD content, the newer H.264 has several benefits.

Most importantly, H.264 is much more efficient than Mpeg2, delivering the same quality with much lower bit rates, thereby requiring less storage or allowing reduced bandwidth or quicker downloads. H.264 is also capable of delivering better quality than Mpeg2, thanks to a number of technologies, including a smaller block size and in-loop deblocking.

Most video compressors work by dividing the image into a series of blocks, but these are often visible, particularly at low bit rates. Mpeg2 employs a fixed block size of 16x16 pixels, whereas H.264 allows for different and smaller block sizes down to 4x4 pixels, enabling it to better show fine detail. H.264 additionally uses in-loop deblocking to hide the joins between blocks, reducing this familiar and undesirable video compression artefact greatly.



In order to watch HD content encoded in the H.264 format with your PC, you'll need a compatible software player, such as Cyberlink PowerDVD 7 Deluxe

What software do I need?

Like Mpeg2 and other compression systems, H.264 requires an appropriate software 'codec' (coder/decoder) installed on your PC in order to view content. H.264 codecs are already integrated in many of the latest software DVD decoders.

PowerDVD 7 Deluxe, for example, comes with the H.264 codec and costs £40.29 to download from www.cyberlink.com. Numerous upgrades from earlier versions are available, including one from PowerDVD 6 Deluxe for £11.49.

PowerDVD 7 Deluxe will also equip other software players with H.264 playback capabilities, including Windows Media Player and Windows Media Center Edition. Apple's Quicktime 7 also supports H.264, although the free version won't equip any other media players with the codec.

What hardware do I need?

For low bit-rate H.264 video, such as Apple's 720p HD trailers (see the next section, Where can I get content?), a 2.8GHz system should be sufficient, but for higher bit rates or 1080p source material, even the fastest processors will need extra help.

Like Mpeg2 before it, the solution comes from graphics cards featuring hardware video acceleration. These take much of the decoding strain from

the main CPU, allowing smooth playback with modest overheads.

ATI supports hardware H.264 acceleration from the Radeon X1000 series onwards. Nvidia supports it from the Geforce 6150 upwards, with a couple of exceptions. For more information, visit www.ati.com/avivo and www.nvidia.com/purevideo.

To exploit H.264 acceleration, you'll need the latest drivers and a compatible software player, such as PowerDVD 7 Deluxe. Protected content will require an HDCP-compliant (high-bandwidth Digital Content Protection) PC and display (see www.pcw.co.uk/2160498 and the High Definition feature, PCW December 2005).

Where can I get content?

Many movie trailers are encoded in H.264, and a good selection can be found at Apple's Quicktime site, www.apple.com/quicktime/guide/hd.

The UK's HDTV service uses H.264 and, although you'll need a Sky HD box to access the full line-up, a number of free-to-air channels are available to suitably equipped PCs. Certain satellite tuner cards can receive some broadcast HD content with the help of a dish, while anyone in range of London's TV transmitters may even be able to persuade a DVB-T card to tune into the BBC's terrestrial HD trial. In both instances, you'll probably need a third-party program such as TSReader (www.coolstf.com/tsreader) to record the streams.

Finally there's the first raft of HD-DVD movies which are encoded using H.264, although you'll need an HD-DVD drive and very probably an HDCP-compliant PC and monitor.

Support for H.264 will be crucial for PC owners who wants to enjoy a broad range of HD content, and that means having a graphics card with suitable hardware video acceleration. **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.

→ Comments welcome on the Windows column.

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Outlook Expressionism

From font sizes to command prompts, four Outlook Express mysteries are resolved

It's been a while since we looked at Outlook Express, and we're happy to report that it is still full of surprises. This month we look at four mysteries – the first we've discussed before, but the sheer wackiness of both the problem and its solution deserves a return visit.

Reader Stan Thomas noticed that whenever he printed an email, although he had the font set to 11-point Bookman Old Style, it came out in what appeared to be 16 or 17-point. Even more curiously, copying and pasting into Word resulted in the correct size font on screen and in print.

And if you think that's bizarre, here's the official Microsoft cure. Start Outlook Express. Go to Tools, Options, Read and click on the Fonts button. In the Font size box, choose Smallest (see screen 1). OK out twice, then close OE. Now start Internet Explorer. Go to View, Text size and choose Smallest. Close IE and restart the computer. Start OE again, and change the font size to Medium. Close OE, open Internet Explorer and change the Text size to medium. Close IE, restart the computer and all should be well.

The second mystery involves seemingly random changes to the Pop3 server settings. When you try to get your mail you may be asked for a username and password, and you'll find that the Pop3 incoming mail server – usually something like pop.mysp.co.uk – has changed to 127.0.0.1. This is the IP address of the 'localhost' – that is, the computer you are using. The cause is most likely to be anti-virus software, specifically the email protection module.

Unfortunately we don't have room to give a blow-by-blow account for every security package, but with most you will find that you can go to the settings and update the correct Pop3 server details from there. In a worst-

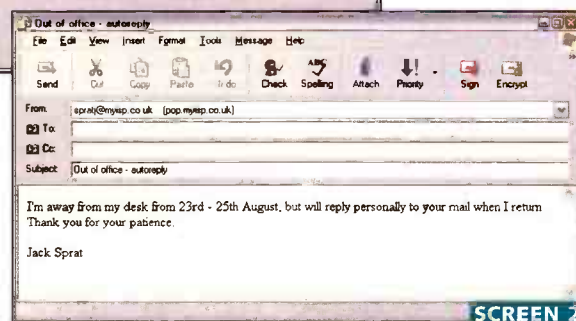


case scenario, you can disable incoming email protection – you'll still be protected from viral attachments.

No help from this assistant

The third OE item is rather more fun. If you are away from your PC for a while you may want to set up an automated reply to messages that arrive in your absence. This can be done in the full Outlook by using the Out of Office Assistant, but Outlook Express has no such assistant. Although it isn't too hard to set up manually, there are a few pitfalls to avoid.

The first thing is to go to File, Work offline. Create a new message, with nothing in the To: or CC: boxes, and with the Subject and contents of your choice (see screen 2). Make sure you have Plain text selected on the format menu. Now go to the File menu and Save as... Browse to the folder of your choice; you'll find that the filename is



Top: Starting the OE font dance

Bottom: Writing the autoreply message

taken from the message subject. Make sure the 'Save as type' box is set to 'Text Files (*.txt)' rather than 'Mail (*.eml)' (see screen 3). Having saved the file, close the message window.

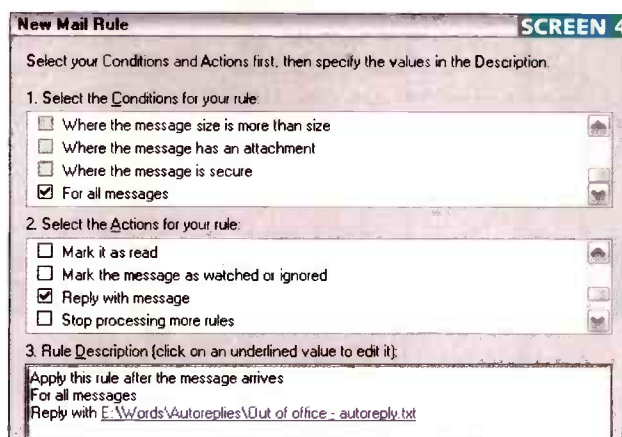
You now need to set up a rule, so in the main OE window go to Tools, Message Rules, Mail. In the Message Rules dialogue, click New. This will open the New Mail Rule dialogue. In the top box – conditions – select 'For all messages', and in the actions box below select 'Reply with message'. You'll then see both these entries appear in the third, Rule Description, box, with 'message' appearing as a blue underlined link. Click this and browse

to your saved message. The rule description will update accordingly (see screen 4). Give the rule a suitable name, then OK out of the dialogue box.

Now this is the point where I made an

embarrassing mistake, which is why you should set this up offline. Anxious to test out the autoreply, I clicked the 'Apply now' button, chose the Inbox, and OE promptly started sending my autoreply to every message in my inbox. By the time I realised what had happened and disconnected, about 50 messages had gone out. So, before you go online or apply the rule, create a new local folder and move the contents of the inbox to it as a temporary measure.

If you already have other rules set up, make sure they don't negate your new rule, such as a 'Stop processing more rules' entry. You will need to have OE running during your absence, and set to check for mail at regular intervals (Tools, Options, General) so



Far left: Saving the message as a text file

Left: Defining the rules

this probably isn't an eco-friendly idea if you are off on holiday for a fortnight. Finally, on your return you can turn off the rule by unticking it in Tools, Message Rules, Mail.

On a related note, the 'Save As...' command can be used on any message in your OE folders, so you can preserve mail messages as text files anywhere on your PC – as stated earlier, the subject line becomes the filename. Unfortunately this can only be done on individual messages – you can only export an entire local folder to the full Outlook or Exchange.

Rule the rules

Our final piece of OE lore returns to rules. If you've gone to the trouble to set up rules or compile a list of blocked senders, then you might want to back this up. Unfortunately, OE doesn't provide a built-in way of doing this, but you can achieve it with a little excursion into the Windows Registry.

Although the backing up doesn't in itself make any changes to the Registry, it's always wise to back this up (Windows 98 or earlier) or create a System Restore point. Start, Run, regedit, then navigate down to Hkey_Current_User \Identities \{string-of-hexadecimal-numbers} \Software \Microsoft \Outlook Express \5.0 \Rules. Highlight this key and go to the Registry menu (File in XP) and choose Export Registry File (see screen 5). Browse to the folder where you want to store the backup, check the 'Selected branch' option, give the file a name and click Save. Repeat the process for the Block Senders key. This will give you two .reg files, and double-clicking on these will merge the contents back into the Registry.

If you want to transfer your rules and blocked senders to another computer, this takes a little more cunning as the identity – that string of

32 hex digits officially known as a GUID – won't be the same. So, on the new machine you must first set up your mail accounts, then copy the two .reg files across. Back up the Registry on the new PC (or create a restore point), then run regedit on the new PC, go to Hkey_Current_User \Identities \{string-of-hexadecimal-numbers}, highlight this, right-click and 'Copy key name'. Close regedit and right-click, Edit one of your copied .Reg files.

You'll now be able – very carefully – to highlight each occurrence of Hkey_Current_User \Identities \{old-string-of-hexadecimal-numbers} and paste Hkey_Current_User \Identities \{new-string-of-hexadecimal-numbers}. Save under a new name so you can check you have everything right against the originals, then close Notepad, right-click the edited .reg file and merge it into the Registry on the new PC.

If all this seems far too stressful, then there are utilities to do it all for you. We have found two – the Outlook Express Backup Wizard at www.outlook-express-backup.com and Backrex at www.backsettings.com/outlook-express-backup.html. Neither is free – though limited demos are available –

but both will back up any or all aspects of OE, including messages, addresses, rules and blocked sender lists.

Quote, and quote again

The command-line Start command has been with us since Windows 95. Its main use is in batch files – as well as programs, you can open folders or run associated files, and specify things such as whether the next 'start' item should wait for the last one to finish.

In XP you can also specify priority and other options. As it is a command prompt utility, if you specify a filename, or a path with a space in it, then you need to enclose this in double quotes – for example:

Start C:\program files\my \prog\prog.exe

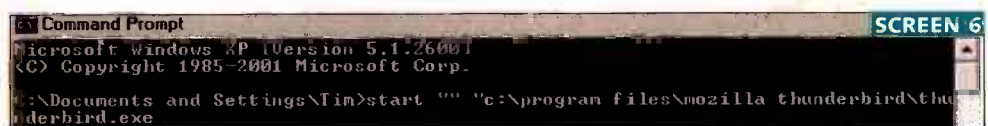
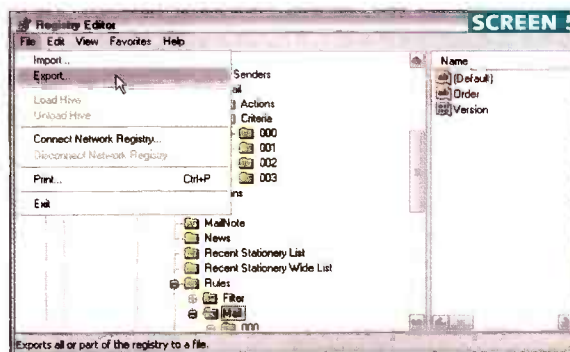
(Key: \ code string continues)

will fail when it hits the first space, with a Windows message complaining that it can't find 'C:\program'. However, if you enclose this in double-quotes, it still won't work. What you'll get is another command window, with the path and filename specified in the title bar, and nothing happening.

The catch here is in the quotes. The numerous options in XP (type 'help start' at the command prompt) include one to specify a title for a new command window by placing this, in quotes, at the beginning of the command line. Which is exactly what we just did. To get the program to run, you need an extra pair of quotes, which need not contain anything, followed by a space, followed by your quoted path and file. If you are feeling really lazy, you can usually get away without typing the final double-quote (see screen 6). PCW

Below: Exporting OE rules from the Registry

Bottom: Using quotes with the Start command





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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Understanding Dapper Drake

All you need to know about installing and configuring the latest Ubuntu release

After a short delay, Ubuntu 6.06 (Dapper Drake) was released in June. Originally scheduled for mid-April, the developers decided to let the date slip six weeks to allow for concentrated bug fixing and some final polishing. The previous version, 5.10 (Breezy Badger), was immensely successful, and Dapper's release was, not surprisingly, long awaited. Earlier this year we ran a series on installing and configuring Breezy (available for free online at www.pcw.co.uk/2150862), and so this month we will update that to cover this latest release. The new version was also included on last month's cover DVD.

There are several options to consider before installing Ubuntu. First of all there are four versions to choose from: the original Ubuntu itself and its three variants Kubuntu, Xubuntu and Edubuntu. Ubuntu is the prime platform, and the one we will concentrate on here. It is the best supported of the four and where the focus of the development goes. Kubuntu gives you a KDE desktop as opposed to Ubuntu's Gnome; Xubuntu provides the lightweight XFCE desktop environment, suited especially to older PCs; Edubuntu is a special version of Ubuntu aimed at schools and younger people. It is important to note that these are not different distributions – just different software selections. If you download and install the KDE desktop in Ubuntu, you will get the same system as you would installing Kubuntu directly.

There are three supported processor architectures to choose from. The x86 release, which most people will use, runs on any 32bit PC. The 64bit release runs only on the latest CPUs that have 64bit support; these machines can run either the 32 or 64bit releases. For Mac users there is a



PowerPC (PPC) release. The newer Intel-based Macs are not yet supported. Most people will want the 32bit x86 version, and if you are not sure which to use, pick this one. The 64bit version will run faster for CPUs that support it, but you may run into some problems with closed-source binary software, such as Macromedia Flash or Google Earth.

Finally, each version comes with two options for installing from CD. Dapper replaces the 'live CD' from previous releases with the 'Desktop install' CD. As before, you can boot your chosen release straight from CD (see screen 1), but now you can also install directly from the live system to your hard drive, and it lets you browse the web or chat to friends online while installing. This option takes less than 10 minutes to install the entire system but offers relatively few installation options. You may repartition your drive and select the language to use, but not much more. For advanced installations there is the 'Alternate install' CD, which is the text-based method used with Breezy and earlier Ubuntu releases. If you want to install Dapper alone on a PC, or in a simple dual-boot configuration, the desktop install is a great option. For more

complex installations, the alternate install CD is needed.

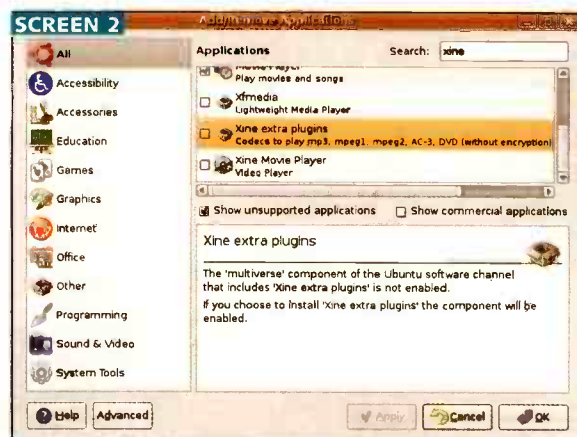
Post-install procedures

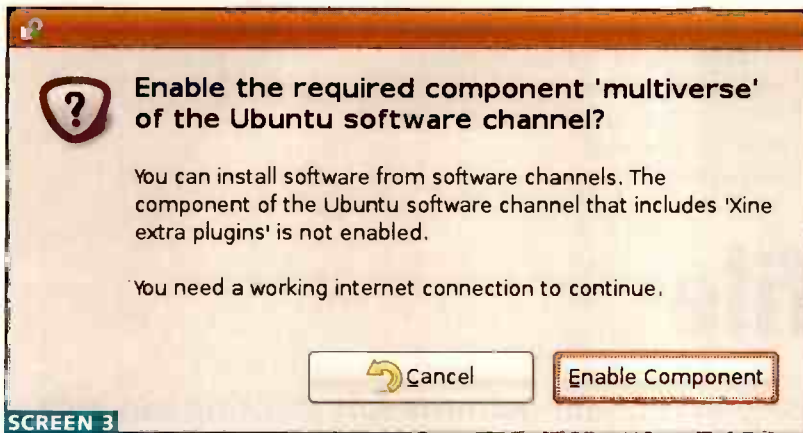
Once installed, apply any updates that are available via the update notifier; this is a fully automatic process. After the updates, a few extra tasks need to be carried out to get it fully 'desktop ready'. This is mainly concerned with multimedia applications or restricted licensing. Due to US software patents, Ubuntu does not distribute many useful packages affected by such patents. These concern almost all multimedia codecs except for open formats like Ogg Vorbis and Flac.

In the earlier series on Breezy we looked at Ubuntu's repositories, where thousands of packages are held for automatic download and install, and are also known as software channels in Ubuntu. There are three official repositories: Main, Universe and Multiverse. Main contains only software that is fully supported by the Ubuntu developers. Universe contains 'community-supported' packages, though many of these packages are unofficially supported, and this repository is much larger than Main. Multiverse contains software that is restricted by licence or patents.

The new graphical installer runs from the bootable desktop CD

The Add/Remove Application allows easy, single-click installation of many useful programs





Now you can have the necessary repositories added for you

searching on 'flashplugin' in Synaptic. A dummy installer will prompt you to agree to the licence, then go ahead and download and set up the browser plug-in for you. Installing the Java plug-in is much easier as Sun's implementation is now in the Multiverse repositories. Find the Sun Java plug-in in Synaptic and, as with Flash, agree to the licence and everything else is taken care of automatically (see screen 4).

Some other multimedia packages are useful, though not essential. These will also allow some audio files to play automatically in the file browser if you hover your mouse pointer over them. Open up a terminal and run the following to install them all at once:

```
$ sudo apt-get install sox &
lame mpg321 vorbis-tools &
flac flac123
```

(Key: < code string continues)

It's advisable to install the binary drivers for Nvidia and ATI cards. Nvidia cards have no hardware-accelerated 3D support at all without them. Install 'nvidia-glx' or 'xorg-driver-fglrx' for Nvidia and ATI cards respectively. The 'nvidia-glx-enable' utility can switch to the binary drivers. Alternatively edit the /etc/X11/xorg.conf file and change the driver reference from 'nv' to 'nvidia'. If you should run into problems with the graphics configuration, try running the following command:

```
$ sudo dpkg-reconfigure xserver-xorg
```

If you need common Microsoft fonts for Open Office or browsing websites, install the 'msttcorefonts' package. These fonts are copyrighted but it is legal to download them this way. **PCW**

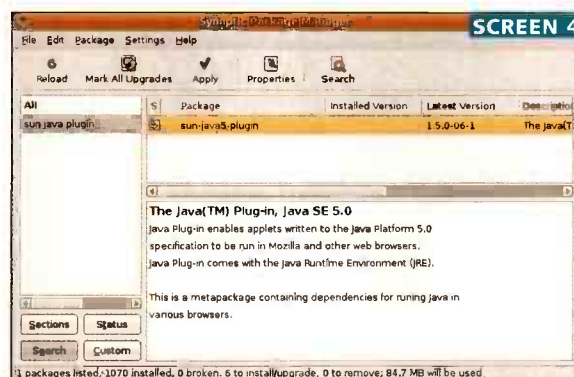
Adding support for these repositories is much easier in Dapper than with previous releases. The Add/Remove Applications tool (see screen 2) will automatically add both repositories if you choose to install something that requires packages from either. Load up the tool and tick the 'Show unsupported applications' box. Enter 'xine' in the search box and tick to install 'Xine Extra Plugins'. This pops up a warning (see screen 3) to tell you it will add the Multiverse repository (it silently adds Universe too).

Adding the remaining packages is best done through the general software GUI tool, Synaptic. The Add/Remove Applications tool offers a smaller hand-picked selection of applications that you can browse and add and remove.

Multimedia support

The Xine package installed previously adds support for almost all multimedia codecs to applications using the Xine framework (www.xinehq.de). However, Ubuntu's Totem player uses the Gstreamer framework (www.gstreamer.org) for video and audio playback. Switch to the Xine framework by installing 'totem-xine'. By installing this, Synaptic automatically removes 'totem-gstreamer'. KDE applications use Xine instead of Gstreamer, so nothing extra needs to be done here if you are using Kubuntu.

For Gstreamer applications (such as Rhythmbox), install some extra Gstreamer plug-ins. These are provided conveniently as 'meta packages': gstreamer0.10-plugins-good contains a set of well-written plug-ins with open licences; gstreamer0.10-plugins-bad contains plug-ins that may lack quality in some way, but are nonetheless useful; gstreamer0.10-plugins-ugly contains plug-ins that are difficult to distribute. Each set also has



Synaptic is a versatile software management tool. Install the Java environment and plug-in in minimal time

a '-multiverse' version with packages mainly affected by patents. Enter 'gstreamer0.10-plugins' into the search box in Synaptic and install all of these packages. Doing so will pull in many other useful packages as dependencies, so follow this step even if you do not wish to use Gstreamer-based applications. Disk usage is minimal.

Mozilla Firefox is pre-installed by Dapper, but cannot display Flash content or run Java applets without additional software. The installation method has changed for both since earlier releases. Install Flash by

Installing DVD playback code

Regular readers will know about the problem with DVD playback under Linux. As a result of US legislation, the code required to play back DVDs in open-source code cannot be provided directly by distributions, as it is technically illegal in the US.

Fortunately, it isn't elsewhere, and it is simple to get hold of and install. Point Firefox at <http://download.videolan.org/pub/libdvdcss> and find the latest 'deb' version (1.2.9 at the time of writing). In Dapper you can install the downloaded package with a single click (see screen, right). Alternatively run 'sudo dpkg -i pkgname.deb' at the command line, if you prefer to do it that way.

Totem, when using Xine, can play back DVDs and launches when you insert a disc. A more reliable player is the Xine GUI. To get it, install 'xine-ui' through Synaptic or at the command line.



Install this library to enable DVD playback



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.

→ Comments welcome on the Digital imaging & video column. Email digitalimaging@pcw.co.uk Please do not send unsolicited file attachments.

The right profile

Colour management when printing is complex; find out how soft proofing can help

Despite operating system support for colour management, and the proliferation of ICC colour profiles for cameras, scanners, monitors and printers, colour management is far from easy. My guess is that, for many people, the fact that what comes off their inkjet printer bears only a passing resemblance to what they see on their monitor is just one of those digital shortcomings you have to live with. Anyone who has taken a stab at implementing colour management may – after much research, more experimentation and a degree of luck – have achieved some success.

Garbage in, garbage out

One of the obstacles to effective colour management is the failure of generic profiles to reflect the colour characteristics of individual output devices accurately. In the case of printers, this is usually due to differences in ink and paper combinations from the ones used to create the profile. There is also the question of how to configure settings in the printer driver correctly, so that it doesn't interfere with the colour management software's efforts.

For monitors, the situation is similar. Even if you manage to set things up correctly – and the manufacturer's instructions don't always make this as straightforward as they could – there's a chance that your individual display's characteristics will vary from that of the device used to produce the profile. Add to that the potential for the display's characteristics to change with time and environmental effects (ambient lighting, reflections from clothing or brightly coloured walls, etc), and the fact that colour management can be made to work at all becomes more like a matter of faith than computer science.



But it can be made to work – and not just by professionals. The old programming edict 'garbage in, garbage out' neatly sums up the source of most colour management problems. If your profile isn't right, no amount of tweaking will make a difference. If you are not achieving good results using a generic monitor or printer profile, there's a fair chance that replacing it with one produced specifically for your device will make all the difference.

The right tools

Hardware profilers for colour displays were once the preserve of design studios and print shops, but now you can pick them up for as little as £60 (see picture above). The hardware consists of a sensor device incorporating a colorimeter, which you attach to the front of the screen. A software utility runs a series of tests, outputting individual RGB colours and other combinations, which are measured by the hardware sensor. Analysis of the data is then used to compile a profile.

Because the colours are measured directly from your monitor in situ, its individual characteristics are reflected in the profile. It's the only way you can ensure the profile is accurate.

The Pantone Colorvision Colorplus in action, characterising my LCD panel

Kodak's Color Management Check-up Kit provides profile-tagged image files and prints, allowing you to check monitor accuracy

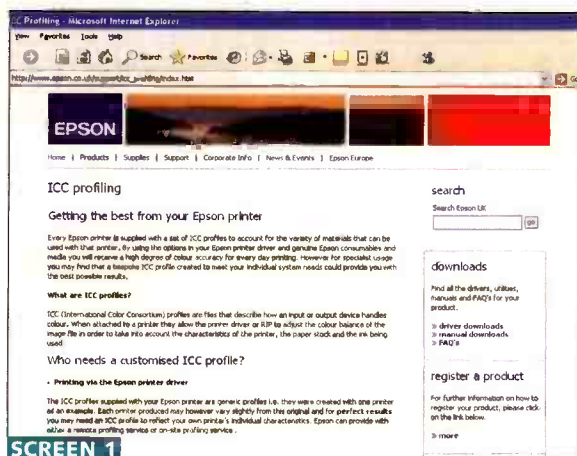
Before you run the program you need to ensure your monitor is set to the factory defaults, that it's positioned well – away from bright lights, strong colours, etc – and has had sufficient time to warm up.

The entire process takes about 10 minutes at the end of which the newly created profile is installed in the C:\Windows\system32\spool\drivers\color folder and set as the default monitor profile. Although the utility allows you to switch between before and after profile versions of the display, you probably won't be getting too excited at this stage as there's no way of telling whether the new custom profile is any more accurate than your previous setup.

You could try printing a test image, but this will probably just highlight the shortcomings of your printer profile more accurately. You could use Kodak Professional Colour Management Check-up Kit (pictured below), which consists of a CD with a folder of images that have been scanned using an accurately calibrated and profiled scanner, and printed on an accurately profiled and calibrated printer.

The prints can be compared with your display to assess the accuracy of your display profile. Although printed output can never match a colour display exactly, once you've calibrated





SCREEN 1

your monitor, it should provide a fairly close match to the printed images. If you are using Photoshop, Paint Shop Pro or another application that supports soft proofing, you can use it to evaluate the accuracy of the monitor profile.

Often the reason printed photos fail to match what you see on screen is that the viewing conditions are not ideal. The Colour Management checkup kit includes an image with an ingenious strip called a GATF/RHEM light indicator. If the light by which you are viewing the prints isn't reasonably close to the colour temperature of daylight (5,500K), vertical stripes are visible in the strip. Only when the stripes disappear can you be sure that any mismatch is due to colour management problems.

Print and be damned

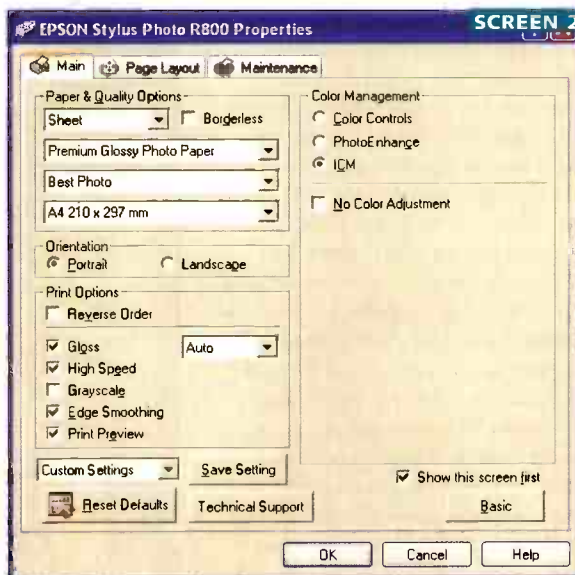
Half a colour management system is as much use as none at all, and the next step is to get hold of an accurate profile for your printer and ink/paper combination. If you are currently using a 'generic' profile supplied by the printer manufacturer, the first thing to do is ensure you are using the correct inks and paper.

If you are using ink and/or paper from another manufacturer, you'll need the right profiles and you might be able to obtain them from the manufacturer's website. For example, Kodak provides profiles for its Professional Inkjet Photo Paper for use with a number of popular printers. It's worth checking before you buy paper or third-party ink that profiles are available for your printer. Without one the chances of getting good or, at any rate accurate, results are slim.

Even if you do source a profile for your choice of ink and paper, it's subject to the same caveats as any generic profile. The characteristics of individual printers, ink and paper

Epson provides a custom profile service on its website

Getting accurate prints using colour management requires careful setup of the printer driver



SCREEN 2

Useful links

<http://shop.colourconfidence.com>

Online shop for Pantone Colorvision Colorplus. Shop also sells more advanced Spyder colorimeter and printer profiling products, and Kodak Colour Management Check-up Kit.

www.uk.kodak.com/global/en/professional/products/papers/inkjet/main.jhtml?id=0.1.22.16.3.20&lc=en

ICC profiles for printers using Kodak Professional inkjet photo paper.

www.lyson.com/Technical%20Support/ICCPC.html

ICC profiles for popular printers using Lyson inks and papers.

www.pixl.dk/index.htm

Online profiling service for all devices.

www.chromix.com

Colorvalet profiling for all devices. Printer profiles cost \$99 each.

www.gretagmacbeth.com/

Eye-One Display 2 monitor profiler and other profiling products.

www.epson.co.uk/support/icc_profiling/index.htm

Online profiling service for Epson printers. Profiles cost £100 each.

batches can vary. If you are still having problems, your only solution may be to produce a custom printer profile.

Although you can buy devices that measure printer output and enable you to produce a custom profile, they are complicated to use and costly. There are, however, companies that provide profiling services. They can either send you – or you can download from their website – a test pack that consists of calibrated test charts which you print on your printer. You then send the printouts to the company for analysis using a spectrophotometer – a measuring device similar to the monitor calibration hardware already mentioned. The data is then analysed and a custom profile is emailed to you.

Epson provides such a service for its range of inkjet printers (see screen 1).

It costs £100 per profile, which may sound expensive but is slightly less than the cost of replacing all the ink cartridges in my Stylus R800.

These profiles only work with the Epson printer driver (see screen 2). If you're using a Rip (Raster Image Processor) you'll need the on-site service, which at £850 per day is aimed at colour output bureaux.

There are other independent colour consultants that offer similar profile by mail services, some of which are mentioned in the links box above. Or try typing 'inkjet printer custom ICC profile' into a search engine. **PCW**

Soft proofing

Implementing a colour-managed workflow won't guarantee that your printed output will match what's on screen. This is impossible because of physical differences in the way the two systems represent colour – one uses transmitted light and the other reflects it. Your monitor can, however, show you how something will look when it is printed. This is called soft proofing.

Many photo-editing apps, including Photoshop and Paint Shop Pro, will allow you to soft proof. In Paint Shop Pro X, select Color Management from the File menu and check the Proofing radio button. Select your monitor and printer profiles from the pulldown menu on the left and 'Match' from the 'Rendering intent' pulldown menu on the right, then click OK.



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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Email wp@pcw.co.uk
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Turning the tables

Header and footer issues with landscape tables, line spacing, plus laying out minutes

Back in May's Question time, we promised ways round the perennial problem of getting a page in a Word document that has the normal header and footer, but consists of a table or chart laid out sideways. If you insert section breaks and make that page landscape, you'll find that the header and footer will also move, spoiling the consistency of the document.

The simple answer is don't do it – just make the table smaller, or split it over a two-page spread. However, in the world of business and technical reports, using the full size of the paper can make sense with objects that are wider than they are tall – you can either get more information on the page or make the same information more legible.

The quick and dirty solution we proposed in May was to incorporate a page in the document that was blank apart from a header and footer. Print the entire document, then print the landscape page (without a header or footer) onto the blank sheet.

A more sophisticated approach is to treat the item as a graphic. Create this in a separate document, copy it to the clipboard, switch to the main document then Paste Special, Enhanced Metafile. You'll end up with a picture of the object, which you can then resize and rotate as any other graphic (see screen 1). Obviously, you won't be able to edit the text without going back to the source document, then repeating the copy and paste.

Heads and feet

Purists probably won't like either of these approaches, so we'll look next at attacking the headers and footers themselves. Let's assume you've already created your landscape page by inserting section breaks before and at the end of the page, then setting the

SCREEN 1

	January	February	March	April	May	June	July	August	September	October	November	December	Total
North	17	11	24	22	19	24	27	21	19	18	11	14	227
South	23	21	28	32	31	35	37	29	22	22	19	23	322
East	31	32	45	48	54	58	62	45	44	38	39	41	537
West	25	28	29	37	43	47	52	53	46	38	35	28	461

orientation for the section as landscape. Make sure you swap the top/bottom and side margins so that the print area corresponds to that of the portrait pages.

Now go to View, Header and Footer and put some suitable text in the header, and a page number in the footer of the first page. In the Header and Footer toolbar, click the Show Next button, which will take you to the header or footer of the next section – your landscape page. Turn off the 'Same as previous' option by clicking its button on the Headers and Footers toolbar. At this stage you should still see the header and page number as you set it on the first page. Select and cut the text of the header.

Now with the header still active, insert a text box – either from the Insert menu or the Drawing toolbar. Don't worry too much about size and position at this stage, just paste the text cut from the header into the box.

Right-click the box and Format Text Box. On the Colours and Lines tab, select No fill and No line from the respective colour lists. On the Layout tab, choose 'In front of text'. Close the dialogue, and with the text box still selected, change the text direction (either from the Format menu or the Text Box toolbar) to suit.

You can then drag and size the text box accordingly. Even when dragged out of the header area the text box will still be logically contained in the header – it's a trick we've seen before and used to get watermarks in earlier versions of Word. A similar process of turning off the 'Same as previous' in the footer, deleting the page number then creating a page number in a text box takes care of the footer.

Finally, you need to go to the next header and footer – ie, the start of the next portrait section – turn off the 'Same as previous' option, delete the text boxes and set the header and footer to match the first section (see screen 2). Unless you are very lucky, or very skilled, you'll probably find you need to experiment to get the text boxes in the right place. Also bear in mind which way you are rotating the page, so everything is the right way up.

Paste a table as a picture, then rotate

Getting portrait headers in a landscape page

SCREEN 2

	January	February	March	April	May	June	July	August	September	October	November	December	Total
North	17	11	24	22	19	24	27	21	19	18	11	14	227
South	23	21	28	32	31	35	37	29	22	22	19	23	322
East	31	32	45	48	54	58	62	45	44	38	39	41	537
West	25	28	29	37	43	47	52	53	46	38	35	28	461

Flash numbering

If you've looked at the Office 2007 public beta or read our review (see www.pcw.co.uk/2156902), you may have come across the rather elegant trick of getting page numbers in circular or triangular shapes in the left and right margins. Using similar techniques to those above, this can be done in earlier versions of Word. Here's how we did it using Word 2003.

Having gone to View, Headers and footers, we drew an isosceles triangle in the header using the autoshapes in the Drawing toolbar, and a text box into which we inserted a page number from the Header and Footer toolbar (see screen 3). We right-clicked on the triangle and chose Format AutoShape. On the Colours and Lines tab we selected an orange fill and no line and on the size tab we rotated it 90°. We then formatted the text box with no fill and no line and dragged the triangle down to the left margin, then dragged the text box containing the page number on top of it.

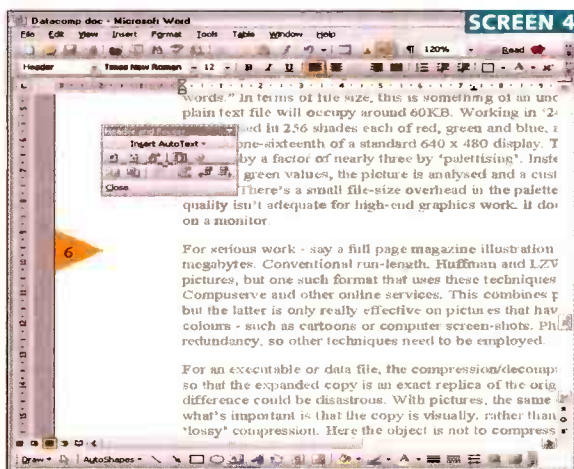
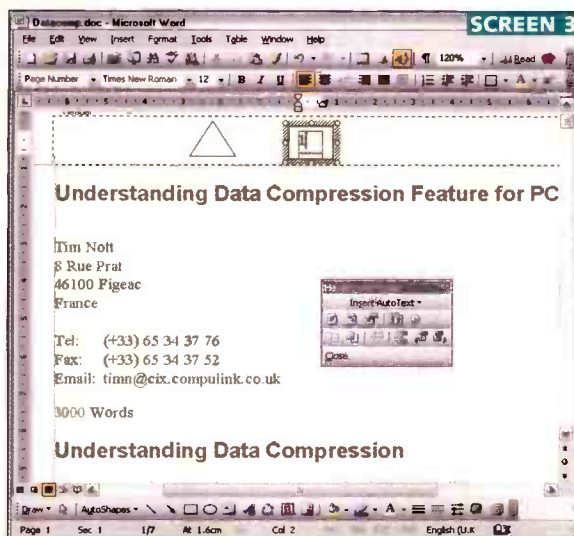
Note that if you then don't see the page number it will be because the text box is beneath the triangle – select the former, and from the Drawing toolbar, open the Draw menu, Order, Bring to Front (see screen 4). You'd probably want to set up different odd/even headers so the number is always in the outside margin, but we're sure you can work that out.

Small steps in space

For those who like that sort of thing, Word has toolbar buttons to increase or decrease the font size of selected text, either in one-point steps or by the steps seen in the font drop list – ie, 10, 11, 12, 14, etc. If these aren't on your toolbar, you can find them in Tools, Customize, Format – look for Grow Font and Shrink Font and you'll find the standard and one-point versions.

Wouldn't it be good if you could do the same thing with line spacing? Word 2003 and 2002 (XP) have a toolbar control for this: if it is not present on the formatting toolbar, you'll find it in Tools, Customize, Format, Line spacing (see screen 5). This gives you a button with an arrow beside it – the latter gives a drop list offering 1, 1.5, 2, 2.5 and 3 (where 1 is normal single spacing and the rest are multiples), as well as a More... entry that summons the Paragraph Indents and Spacing dialogue.

The control is 'sticky' – if you choose double spacing once then you



Top: Fancy page numbers without Word 2007 – the ingredients...

Bottom: ...and the finished product

don't have to drop the menu to apply this to another paragraph – just click the button. A second click on the button restores any existing spacing to single. Earlier versions of Word don't have this control, but they do have individual buttons for single, 1.5 and double spacing. All versions also have the built-in keyboard shortcuts – Control & 1 for single spacing, Control & 5 for 1.5 and Control & 2 for double.

Which still doesn't answer the wish of having two buttons to increase or decrease the line spacing, which can be useful when you are trying to fit some text to a vertical space. So, here's a pair of rough and ready macros to do just that.

```
Sub Spaceout()  
With Selection.  
ParagraphFormat  
.LineSpacingRule =  
wdLineSpaceExactly
```

Quick line spacing – but for XP and 2003 only

```
.LineSpacing = .LineSpacing + 6  
End With  
End Sub
```

(Key: \ code string continues)

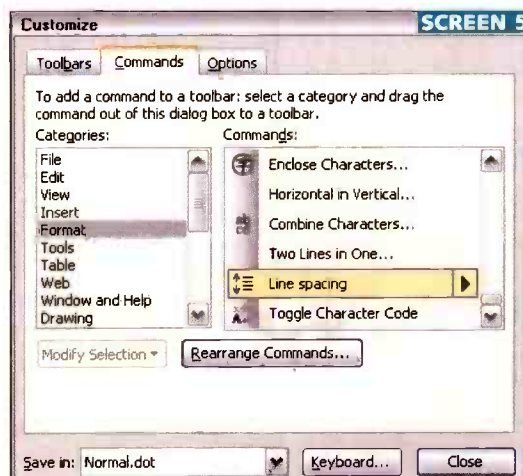
```
Sub Spacein()  
With Selection.ParagraphFormat  
.LineSpacingRule =  
wdLineSpaceExactly  
.LineSpacing = .LineSpacing - 6  
End With  
End Sub
```

These will increase or decrease the spacing in six-point steps – the equivalent of half a line in normal text. You could change this to give larger or smaller steps. We leave refinements such as preventing negative line spacing as an exercise for the reader.

More minutes

In July's Question time, Simon Warren was looking for a way to provide spaces for initials in the right margin of minutes of meetings. We suggested text boxes, but several readers have pointed out better ways. Bill Alexander reckoned a two-column table with borders turned off was the answer. Christopher Lare, Bob Rae and Piers Glydon went for three columns – topic and number in the first column, details and resolution in the second and the initials of who is responsible for any actions in the third column.

We have to agree that tables are better in this case, especially as one can set the vertical and horizontal alignment of each cell, and the rows will expand to contain the longest text. Ron Lester came up with a different, but most ingenious, solution. Set the right page margin to allow sufficient room for the initials, then set a tab outside that margin. Type a sentence – tab – initial – return to the next item. 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
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The Report Manager

Compiling a printed manuscript, creating a flashing cell, and counting coloured cells

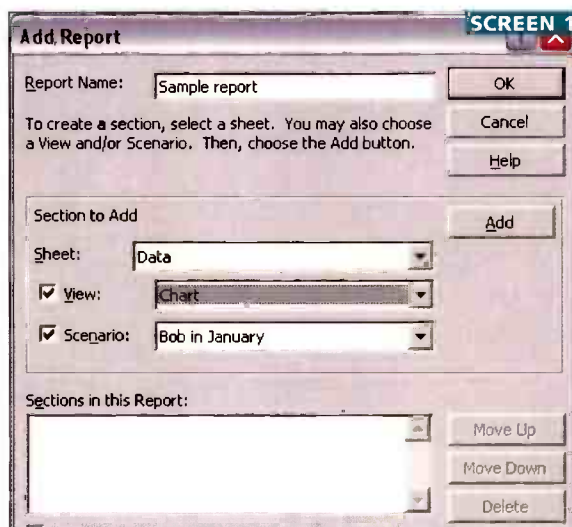
If you want to compile a printed manuscript from bits and pieces of an Excel workbook, the Report Manager can be a real help. This accessory has been included as an add-in with Excel since Version 4. For Excel 2002, Microsoft brought out a new improved version, but then strangely stopped including it on the CD. You have to download it from the Downloads section of Office online (<http://office.microsoft.com>). The file you need is rptmgr.exe. It's a self-extracting file and only 165KB in size. Follow the instructions on the Download page to install it.

Reports can include worksheets, Views and Scenarios. I talked about Views in the May column (www.pcw.co.uk/2154982) and about Scenarios in the April column (www.pcw.co.uk/2152995). To recap, Views are useful if you are passing

'Reports can include worksheets, Views and Scenarios'

a file on to others, as you can specify how it is to be displayed. A View can specify column widths, row heights, whether rows and columns are displayed or hidden and you can fix a Zoom setting, though you should bear in mind the resolution of the screens on which it will be viewed.

With a View you can stipulate whether to display zero values, sheet tabs, column indicators and anything else offered under the Options, View tab on the Tools menu. You can set up the Window details including size, position, and whether split tiled, horizontally, vertically, or cascaded. A View will retain any Outline or Grouping settings and filter settings including AutoFilter and Advanced



Filter options. Print settings, including defined print areas, are also saved.

Scenarios present different versions of content. If you are modelling outcomes of various strategies you could put them on different worksheets but when the changing assumptions include many related factors, recording them in Scenarios is the better way to go.

Each View or Scenario carried in a workbook is given a name. So when you are using the Report Manager to compile a printed tome, you can not only specify the worksheets to include but the Views and Scenarios chosen by their names.

Once you've installed rptmgr.exe, Report Manager should appear on the View menu. If it doesn't, Choose Add-Ins on the Tools menu and check the box by Report Manager. Then click Report Manager on the View menu.

In the Report Manager dialogue box now displayed, click the Add button. This opens the Add Report box (see screen 1). In the Report

Making selections from a workbook to include in a report

Two short macros to start, and stop, a cell flashing

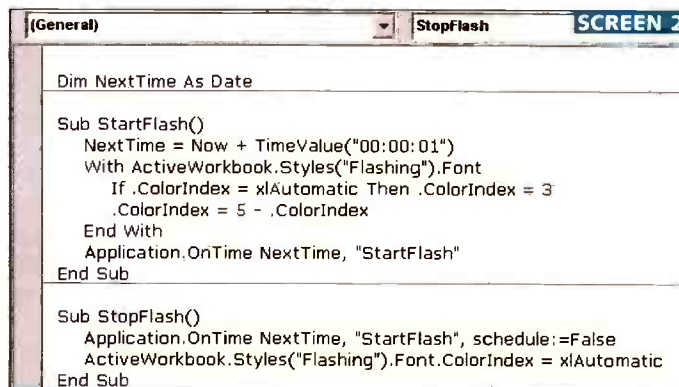
Name: box, type a name for your report. Then, using the dropdown arrow beside the Section to add, Sheet: box, choose the first of the worksheets to include. Similarly, using the dropdown arrow by the View: box choose the first View you want to include. Then pick the first Scenario and click the Add button. The names of your selections are now displayed in the Sections in this Report: box. Continuing to build up this new manuscript you can now make further selections and add them.

When ready, choose whether you want the various pages to be continuously numbered or not and then click OK. This returns you to the Report Manager dialogue box and you can add another report if you wish, edit the existing one, or print it.

Whenever you want to reprint this report you can choose Report Manager on the View menu and select the report by name.

A little respectable flashing

Some months ago, reader Barrie Briggs asked about creating a flashing cell in Excel. I have stumbled across a way to belatedly satisfy his request. He was probably inspired to ask because you can make a phrase flash in Word. You just highlight the phrase and choose Font on the Format menu, then click



the Text Effects tab and choose from half a dozen ways of animating the text.

In Excel you need a couple of short macros. Here's the one to start flashing. Press Alt & F11 to open the VBA for Excel editor. Choose Module on the VBA insert menu and type in the following:

```
Dim NextTime As Date
Sub StartFlash()
NextTime = Now + \
TimeValue("00:00:01")
With ActiveWorkbook.Styles \
("Flashing").Font
If .ColorIndex = xlAutomatic \
Then .ColorIndex = 3
.ColorIndex = 5 - .ColorIndex
End With
Application.OnTime NextTime, \
"StartFlash"
End Sub
```

(Key: \ code string continues)

The variable NextTime is declared before entering Sub StartFlash(). This may seem odd but it's done so that NextTime maintains its value from one run of the StartFlash macro to the next.

Assuming you also want a macro to stop the flashing then enter, under the above, as in screen 2, the following:

```
Sub StopFlash()
Application.OnTime NextTime, \
"StartFlash", schedule:=False
ActiveWorkbook.Styles \
("Flashing").Font.ColorIndex \
= xlAutomatic
End Sub
```

Save the workbook and close the VBA editor or press Alt & F11 again to return to Excel. Now we need something to flash so, on a clean worksheet, enter into any cell your choice of word. In this example, I've used 'NOTICE'. Highlight this cell and choose Style on the Format menu. In the Style dialogue box (see screen 3) click Modify and then set the font colour to red. In the Style name: box make sure you call this style Flashing, because that's the name of the style used in the two macros above.

Finally, we need a way to activate the two macros. If you'd like to have responsive buttons on the worksheet, you need to create a couple of objects. Display the Drawing toolbar. On this, choose the Rectangle shape and draw a rectangle over a cell. Right-click on this and choose Add Text (see screen 4).

Inside the drawn button, enter 'Start flash'. Right-click again and choose Format AutoShape. Choose Centre, Centre in the Alignment tab, pick a colour for the Fill, select No line in the Line section, and your choice of

Seeing red: how to count coloured entries

When I receive the inevitable monthly query about how to count cells in an Excel worksheet with entries of a certain colour, my first question is, are you using Conditional Formatting? If the reader is, then all they have to do is use a similar formula. Supposing the Conditional Format for a cell's font turning red states, Cell Value is greater than 50. Then all you need to do to count the cells with red numbers in column B is enter this formula in a cell: `=COUNTIF(B:B,">50")`.

However, if they have manually reformatted the font colour in a number of cells then there is no similar built-in macro. You have to create your own. This example creates a Custom Function called COUNTCOLOURS. In column A is a list of club members' names. The men's names are in red. The ladies' names are in black.

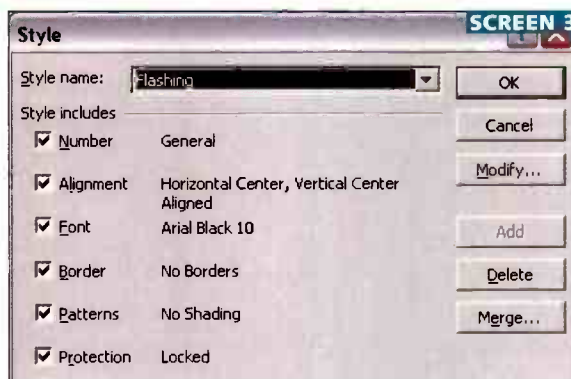
Press Alt & F11 to open the VBA for Excel editor. Choose Module on the VBA insert menu and type in the following:

```
Function COUNTCOLOURS(SelectedCells \
As Range)
```

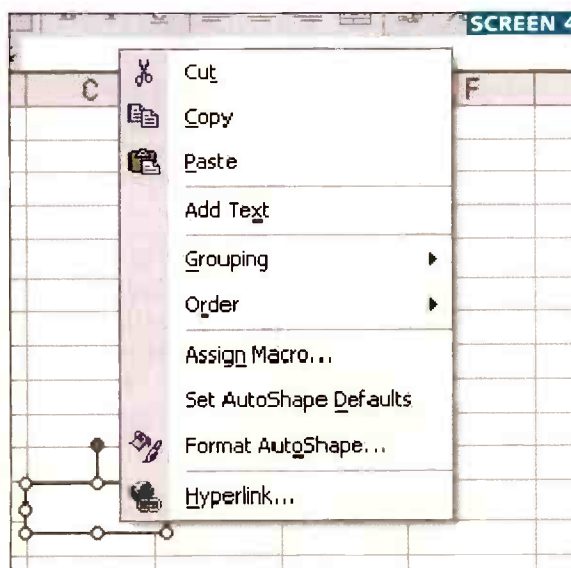
```
Dim Cell As Object
Dim x As Double
x = 0
For Each Cell In SelectedCells
If Cell.Font.ColorIndex = 3 Then
x = x + 1
End If
Next Cell
COUNTCOLOURS = x
End Function
```

Save the workbook and close the VBA editor. Choose any empty cell. Click the fx sign on the left of the Formula Bar. When the Insert Function dialogue box appears, click the down arrow and choose the last category, User Defined. The COUNTCOLOURS function will appear below. Click OK.

A Function Arguments dialogue box is displayed. Click the red arrow at the end of the Selected Cells box and drag the mouse over the range of cells containing all the members' names. Click OK. The number of the club's male membership will then appear in your selected cell.



Setting the Style for a flashing cell



Right-click on a drawn rectangle and choose Add Text

'Click the Start flash button and the word will animate'

Font and its colour. Drag the end of the box out until the wording fits inside. Right-click again and choose Assign Macro and in the displayed dialogue box choose StartFlash. Right-click once more and choose Copy, then Paste a copy of this button on the worksheet.

Right-click on the second button, choose Edit Text and change Start flash to Stop flash. Right-click again and choose Assign Macro and in the dialogue box choose StopFlash.

Now when you open the workbook the word Notice will be in black. Click the Start flash button and the word will animate, alternating between red and a blank cell.

Incidentally, you would think Excel would let you instruct a macro to run with a formula like

```
=IF(G60<G40,"StartFlash",0)
```

Regrettably it doesn't. You can, however, activate a macro with what in VBA is known as an Event. There is an event called Worksheet_Change, for example, which is triggered when a value is entered, though it will not start a macro when a formula result changes. But this is a subject for another column. PCW



Niall Magennis has been dabbling in Midi and digital audio since the days of the Atari ST. He writes for a number of music magazines and lives in London in a flat overrun with music equipment.

→ Comments welcome on the Sound column. It returns in the December issue. Email sound@pcw.co.uk Please do not send unsolicited file attachments.

Ableton Live Automation

Use audio effects more creatively with the automation features in Ableton Live

Ever since the early days of music studios, audio effects have been pivotal to the recording process. Initially, effects were used to replicate natural sounds such as reverb, but over the years more and more bands have used effects as an integral part of their sound. For example, effects are so tightly woven into the fabric of Pink Floyd's songs that stripping them away would destroy much of the appeal of the band's work. Hearing *The Wall* minus effects would be a bit like trying to enjoy a jammy dodger minus the jam.

With effects playing such a large role in today's music it's not surprising that all the major sequencers, such as Steinberg Cubase and Ableton Live, are stuffed full of them. However, now they're so readily available it's easy to fall into lazy working patterns for how you make use of them. For example, you may end up adding delay effects across a whole track when it would be better to just add a little bit to a specific track during the chorus.

One way to force yourself to think more about how you apply effects is to get to grips with effects automation. All the major sequencers now let you attach automation data to the built-in effects plug-ins. Using automation, you can dictate when and how an effect is applied to a track. Once you learn how automation works it will open your eyes to how creative you can be with the latest effects plug-ins.

Living with Live

So this month we're going to look at how you use automation in Ableton Live's sequencer. As its name suggests, Live is designed to be used for live performances and as such it also makes it relatively easy to automate effects. You can record the changes that you make to plug-ins in real time while a track is playing and come back



SCREEN 1



SCREEN 2

later to edit this automation data in great detail.

We're going to use Live version 5 for this walkthrough but if you've got the previous version of the software, you should still be able to follow our tips.

To get started you first need to create a simple track. Click on the File Browser 1 button on the left-hand side of the user interface. Open the clips folder and then create a simple tune using 'Upetty - 165 - Groove 1.alc' from the Beats folder, 'Noisy Bass - Var 1.alc' from the Bass folder, 'Driller - Var 1.alc' from the Lead folder and finally 'Chuggin - Var2.alc' from the Rhythmic folder (see screen 1).

Now that you've created a track, you need to start adding some effects.

Top: Start off by creating a simple track in Live using prerecorded loops

Bottom: Here we've added the Ping Pong Delay and Audio Filter plug-ins onto the B Return channel strip

If you're not in the session view, switch to it by clicking on the small icon located in the top right-hand corner of the main Live window. You need to add in a master effect so click on the B Return channel strip to highlight it. Now you need to select an effect from the Live Device browser. Click on the devices button on the far left of the main window and scroll down to the Audio effects folder. Drag and drop the Ping Pong Delay plug-in onto the window at the bottom of the screen.

Let's add another effect while we're at it. Select Auto Filter from the Audio Effects section in the Devices list and drag it onto the bottom window to sit beside the Ping Pong Delay.

It's time to add some of these effects into the mix, so click on the channel strip for the first track and then crank the dial for Send B fully to the right. Next click on the channel strip for Return B and push its volume up fully to make sure plenty of the effects signal is being fed back into the master channel (see screen 2).

Recording the changes

You now need to zero all the settings on the effects before you start recording automation changes. First of all, crank the Dry/Wet dial on the Ping Pong Delay all the way to the left so it's set to be fully dry and then make the display on the Automatic filter show a straight line so it's not processing any signal. Finally, turn the effects off completely by clicking the green button in the top left-hand corner of each of their interfaces.

Now you can start the fun part of recording your automated changes. Luckily, Live makes it really easy to record automation data. Just click on the Record button on the transport bar and then click Play. While the track is playing, click on the On button on each of your effects and then on the



SCREEN 3

The plug-in controls that have automation data associated with them are highlighted with a red dot

Ping Pong Delay, gradually turning the Dry/Wet knob all the way to the right to introduce the effect into the mix. You should be able to hear the delay acting on your drumbeat. Next, start dragging around the dot on the Auto Filter screen to filter the drumbeat.

All the changes you make are being recorded in real time by Live as automated events. When you've played around a bit, hit the Record button to stop recording.

Click the Play button to hear the automated changes you've just made. You'll notice that the knobs and buttons you've touched during recording are marked with a red dot (see screen 3). They will start to move automatically to recreate the changes you made while you were recording. If you want to remove the automation data associated with a button or knob, just right-click on it and select Delete Automation.

Graph it up

As well as recording automation data in real time, Live also lets you graphically edit this data in minute detail. Graphical editing has to be carried out from the Arrangement View, so click on the Arrangement button in the top right-hand corner of the Live window.

Now that you're in the Arrange window you need to select the track you want to work on. In our case, it's track one containing our drumbeat so click on it in the main window. To see the automation data click on the down arrow on the Return B tab in the lower-half of the arrangement pane. It expands to show you a graphical representation of the automation data for the Dry/Wet control on the Ping Pong Delay plug-in. If you want to switch the view to see data recorded for the Auto Filter plug-in just click on the down menu currently marked Ping Pong Delay and select Auto Filter. You can edit automation data for pretty

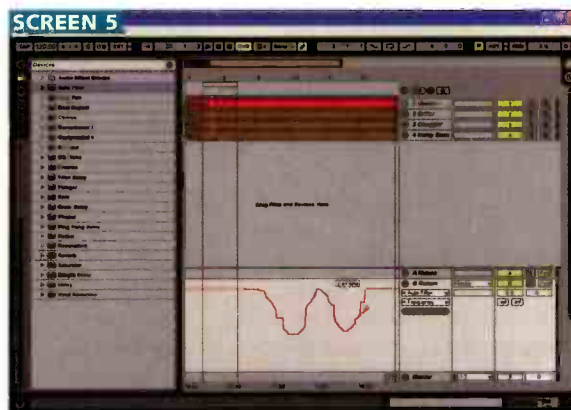


SCREEN 4

You can edit automation data for pretty much any of the plug-in's controls

much every knob and button present on a plug-in's interface. Click the box under the plug-in name and you'll see a list of all the controls that can be recorded and edited. Controls marked in red have already got data recorded for them (see screen 4).

Let's edit one of these controllers. The control that has the most obvious effect on the sound of our track is the Frequency Cut Off level in the Auto Filter plug-in so let's use that. Select Auto Filter in the first B Return box and then choose Frequency from the second box. Switch to draw mode by clicking on the pencil icon to the right



SCREEN 5

You can add in new automation data using the Pencil tool in Draw mode

Get creative with effects routing

If you want to get creative with effects, try chaining multiple plug-ins together in your sequencer. Different effects work on different parts of the signal so you can achieve startling results if you choose your plug-ins carefully.

Ableton Live allows you to insert any effect on any track and lets you run up to four effects

buses at the same time so your signal routing options are actually pretty broad.

The buses have their own send controls so you can send effects to other effects or, for really wacky routing, send an effect back into itself. Just be careful not to create huge amounts of feedback.

Orderly process

The order in which one effect runs into another can make a huge difference over the type of sound they produce. For example, if you route a sound through a flanger plug-in and then onto a distorting plug-in, the flanger will be much less prominent in the sound than if you routed the two plug-ins the other way around. The moral of the story is that if you're not getting the type of sound you were expecting, try changing the running order of the effects in your sequencer's signal chain.

of the transport controls and turn off Grid mode by clicking on the Options menu and deselecting Snap to Grid.

Now just select a point on the red line and click the mouse button to start drawing in new data (see screen 5). If you need to delete any data that you've added, just click on the Edit menu and select Undo.

If you find your drawing skills are a bit limited you can always switch to Break Point editing. Just click on the pencil button again to deselect Draw mode and you'll see a number of points highlighted on the red line. You can click on these to drag them around the line. Alternatively, to create a new point, double-click on any part of the line. Break points allow you to quickly create an envelope ramp because you can create two points, drag them apart and then set one to a high value and another one to a low value.

Now that you've grasped the basics of how to create and edit automation data you should be able to make more creative use of effects in your tracks. Automation will allow you to use effects in much more precise ways than simply applying an inserted effect across a whole track. **PCW**



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.

Email networks@pcw.co.uk
Please do not send unsolicited file attachments.

Practical wireless streaming

Enjoy music, photos and videos on your home-entertainment system, on demand

As a concept, multimedia streaming gets written about a lot, but theory is one thing, doing it yourself quite another, especially if you want to stream data to a TV or hi-fi rather than another desktop PC. So in this month's *Networks*, I want to give you an idea of what's involved, using hardware you can buy and install to stream music, photos and video to a home-entertainment system.

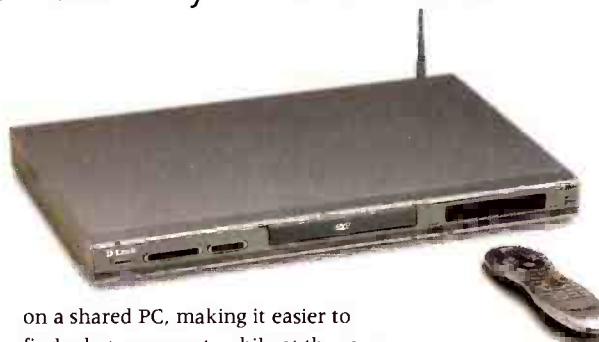
However, before diving into the nitty gritty, it's worth recapping on some of that theory.

What's in a stream?

The idea behind streaming is to send a steady flow or 'stream' of data to an end-user application or device, at such a rate that it can play the music and/or display the video signals involved in real time without any perceived pauses or gaps. To do this some kind of streaming server is, typically, required to compress, encapsulate and transmit the data, plus there needs to be a compatible receiving device or application at the other end to decode, buffer and display it.

The sending server and receiving device can be some distance apart, connected by a wired or wireless LAN or even the internet. However, for this article I'm sticking to wireless, which means you can have the server more or less where you want without having to run any extra cable around the house.

And why would you want to do this, you might ask? Well, streaming allows music and movies to be sent to a PC or home-entertainment system on demand, so you can listen to and watch what you want, when you want. If you configure your own streaming server you can also store all your digital photos, mp3 tracks, recorded (or even live) TV and movies



on a shared PC, making it easier to find what you want, while at the same time doing away with all those boxes.

All of which sounds pretty good and, if you look hard enough, it's not that difficult to find a range of multimedia streaming solutions. However, for this walkthrough I've used a D-Link Medialounge DSM-320RD wireless media player. Not because it's the best there is, although it does seem to work well. And not because it's the cheapest solution either, with plenty of software-based servers able to stream data to a multimedia PC. But because, if you want to stream data directly to your home-entertainment system, it's a neat and affordable solution that comes with just about everything required to get started.

Plugging it together

Available online for around £180, the D-Link DSM-320RD looks like a domestic DVD player with the usual pop-out drawer to take disks at the front and an impressive row of connectors at the rear for

The D-Link DSM-320RD comes with everything you need to stream music, photos and movies to your TV

The wireless interface can be configured using the TV-like remote control

attachment to your home-entertainment system. This model also has slots to take a variety of memory cards and both wired and wireless networking interfaces.

Hardware installation is a matter of connecting the DSM-320RD to your TV/audio system, just like a DVD or video player. I opted for Scart, because the TV involved didn't support anything else, although if you want higher quality, leads for progressive scan video output are provided, plus connectors for both coax and optical digital audio.

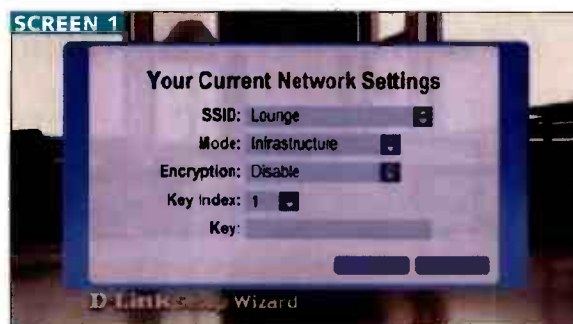
You then either connect the player to a wired network using the 10/100Mbps/sec UTP interface or, as I did, use the built-in 802.11g adapter to stream data to the unit wirelessly.

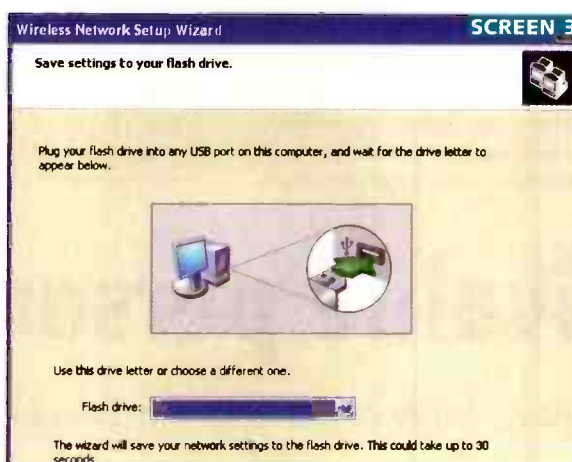
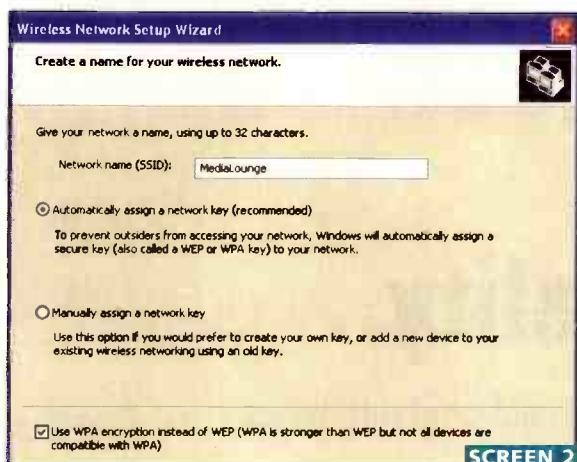
Configuring the hardware

Before that can happen you have to configure the wireless interface. There are two ways of going about this, the first of which is to key in the parameters directly, using a TV-like remote control.

Turn on the DSM-320RD and it runs a built-in setup wizard from which you can give the device a custom name and choose the network interface you want to use. You can also scan for available wireless networks or manually specify the SSID (the network name). You then tell the player whether to use ad-hoc or infrastructure networking, the type of security to apply (you will have encryption turned on, won't you?) and the keys required (see screen 1).

The IP address can also be specified or DHCP assignment selected, all using the remote control. An on-screen keyboard helps but it can still be a bit fiddly so the second option is to use Microsoft's Windows Connect Now technology to configure the interface.





A USB flash memory stick is used to transfer the wireless networking configuration

To use Connect Now, a USB flash memory stick is required. This is used to transfer wireless network settings from a Windows XP PC to other devices, such as another PC, a wireless router (if you can find one with support for this option) or the DSM-320RD. You'll also need Service Pack 2 installed on the XP PC, on which you need to run the Wireless Network Setup Wizard, in turn, found on the All Programs – Accessories – Communications menu.

Click Next when the wizard starts up and you'll be asked to provide a name or SSID for the wireless network and to choose between automatic and manual assignment of a network key.

If you've already configured your wireless network you'll need to specify the key manually, otherwise you may just as well opt for automatic assignment. You can also choose the more secure WPA encryption rather than Wep, as I did in screen 2.

You're then given the choice of printing out the settings generated and manually configuring the network, or using a USB flash drive to transfer the settings. Take the USB option and you're prompted to plug a memory stick into the host PC and wait for its drive letter to appear (see screen 3).

Click Next and the wireless parameters are copied to the flash drive which you then remove and plug into the connector marked 'Windows Connect Now' on the back of the DSM-320RD. A message will appear on the TV asking if you want to apply the WCN settings on the USB stick (see screen 4). Click OK using the remote control and the DSM-320RD will be connected to your wireless Lan.

The server

The DSM-320RD player itself is only half of the Medialounge product – to use it you need to install the Media

Windows Connect Now can be used to configure the DSM-320RD, using the XP wireless network setup wizard to specify the settings

Plug the USB stick into the DSM-320RD and use the Windows Connect Now data to configure the wireless interface automatically

Server application, also provided. But that doesn't mean you need a big network server, just a reasonably quick PC running Windows 2000 or XP with at least 128MB of memory.

Once installed, the Media Server program starts whenever the host PC is booted with an icon on the taskbar for management. Not that there's that much to manage – all you have to do is point the Media Server at folders containing the files you want to stream.

These can be audio files in mp3, Wav, Wma and open source Ogg Vorbis format, Bmp, Gif, Jpeg, Png or Tiff photos, or video files in Mpeg1, 2 or 4, Xvid or Avi format. And you don't have to locate each individually, as the media server finds the files and makes them available for streaming automatically, with a built-in scheduler to update the play lists as new files are added.

Playing files

Out at the DSM-320RD, the media player will (hopefully) have connected to the wireless Lan and been assigned an IP address, after which it searches for and connects to the media player.

In fact the D-Link player is Universal Plug and Play (UPnP) compatible which means it can be used with other UPnP media servers, not just the one supplied by D-Link. For example, I was able to get it to

work with the Twonkyvision server (www.twonkyvision.de), available to run on Windows, Linux and even some Nas (network-attached storage) appliances.

All you have to do at the player end is select what you want to see or hear using the remote control. Click on My Media and you'll see separate menus for available music, photo and video files. Scroll down the list and select what you want and it's streamed to the player using HTTP as the transport.

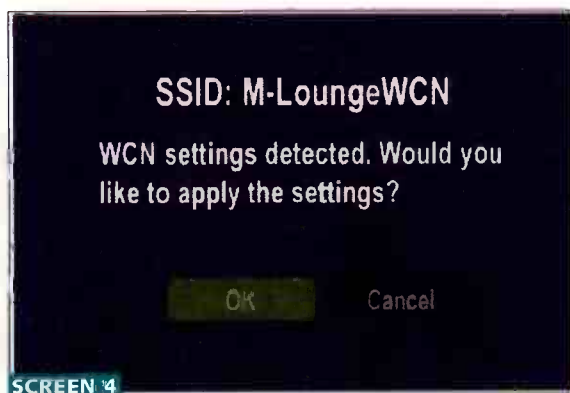
You can also connect the media player to online radio services or plug in memory cards from mp3 players, digital cameras and so on, and access the content on those. Or if you're still bored, insert a DVD into the player and watch it directly.

How good?

The results weren't bad. Sound and picture quality will depend on the files concerned and the TV and sound system involved, although the fact that it was connecting via a wireless Lan didn't seem to be an issue.

The DSM-320RD attached first time every time, both to a couple of access points and a wireless router, with good signal strength in each case despite being on a different floor. I also tried both Wep and WPA encryption and had no problems. The relative lack of bandwidth wasn't an issue either.

The remote control interface takes a little getting used to and there's a definite delay when selecting a new file but the only other issue was the limited range of formats supported. As a hardware device you can't easily add to the codecs used by the D-Link player and some formats failed to play despite being on the supported list. Still, it did what was claimed and is an interesting use of wireless networking for home entertainment. **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.

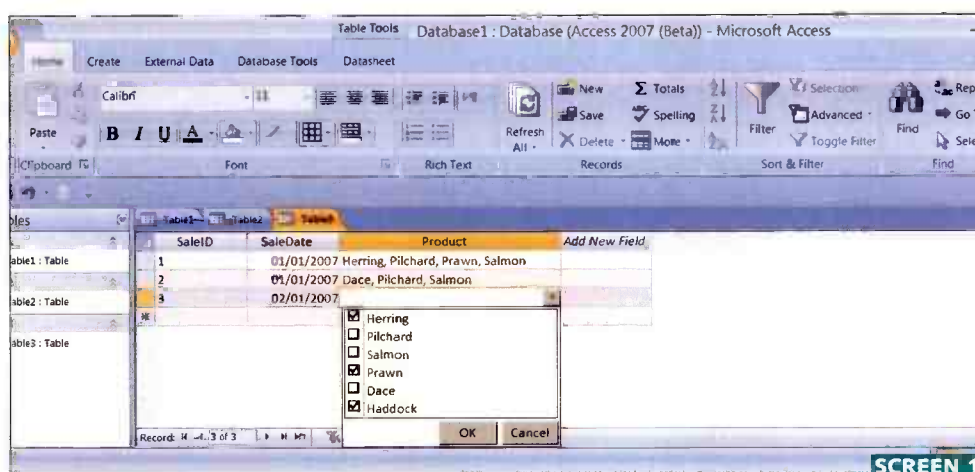
→ Comments welcome on the Databases column.

Email database@pcw.co.uk

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Multivalue personality

Jet becomes Ace, and Access breaks a basic rule of relational databases



SCREEN 1

for compatibility with Sharepoint, which already supports multivalued fields. Access users might well ask why they should care about Sharepoint compatibility, which is a fair question and one I can't answer. Microsoft sees the compatibility as important for its own reasons and had made its decisions accordingly. We just have to live with it.

The second reason concerns what Microsoft wanted to achieve in this version of Access. Let's face it, the product has suffered from a lack of development in the past. But that period of the product's history is now over and the product team was keen to bring it up to date. However, there is only a certain amount that a version change can encompass and, for this version, Microsoft focused on the power user rather than the developer.

When many is too many

Power users, in this definition, include people who create simple databases using the graphical interface tools rather than the programming language. Microsoft believes such users find the creation of many-to-many joins between tables conceptually very difficult because of the need for a joining table.

A multivalued field lets you create many-to-many relationships within data. An example would be multiple sales, each of which can refer to multiple products. In a relational database this is handled with a

The future of Access has been a matter of debate for some time. When pushed, Microsoft made all the right noises. For example, only last year Clint Covington, then Access lead program manager, told the Access User Group that Access had a secure future. But he wouldn't be drawn on the future of the Jet database engine, and it wasn't directly clear about the function Access would have. Would it continue in its current role or be relegated to, for example, acting as a front end to SQL Server?

Access granted

At Microsoft's Tech Ed developer conference in Boston this summer, Suraj Poozhilil, program manager at Microsoft, revealed all (well, almost).

Access is to retain its own database engine for the foreseeable future. The Jet engine has undergone a 'very significant update' in this release for Office 2007 and has been renamed Ace. I mourn the passing of the name: the Jet engine sounds powerful, with a faint hint of Dan Dare. But I always have been a reactionary. This is excellent news for enthusiasts, who can continue to have database fun.

However, there is, on the face of it, something very strange going on in the world of Access. It is acquiring some new data types, one of which is a multivalued field.

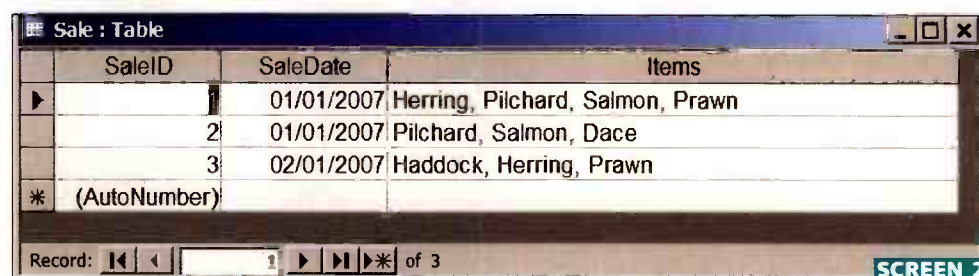
A multivalued field, as the name suggests, is a field that can contain multiple data items (see screens 1 & 2). As the new Microsoft documentation says: "With the multivalued field, you can now select more than one value; for example, assign a task to more than one person in each cell."

Anyone who is a fan of both relational database theory and well-designed databases will find their toes curling up in their shoes on reading this. But if your toes are still straight, you might want to read the section 'Problem unsolved' on the next page.

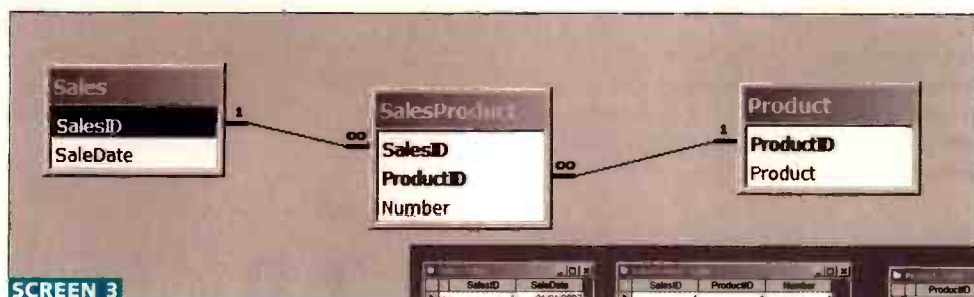
Suraj explained there are two main reasons Microsoft has done this. One is

A multivalued field in Access 2007 beta storing products sold

A multivalued field created in a text field in Access 2003, just to give you a feel for how the new data type may behave



SCREEN 2



SCREEN 3

joining table. Traditionally, we'd use a set of three tables to represent the many-to-many relationship described above (see screen 3). We could use a form in the database application to hide this complexity from the end user. The Access database dbcaug.mdb demonstrating all of this is available at www.pcw.co.uk/2151344 or if you've bought the DVD edition of PCW, you'll find it on this month's cover disc.

According to Suraj, Microsoft believes many users find this too difficult to do and a multivalued field lets those users achieve the same end in a simpler way (see screen 4).

The problem is you're then sorely compromised because querying becomes more difficult and very different from the way in which it behaves with single-value fields (see below). The difficulties associated with multivalued fields were first identified and discussed in the 1980s, so the problem, as they say, has a history.

There is a bit of good news here, though it's only obvious when approached from an odd angle. For a start, Microsoft is quite right that multivalued fields are conceptually easy for users to understand, which is why the company has taken this route.

It is possible to separate the ease of use of multivalued fields from the actual implementation. So, for example, while the user might be able to put multiple values into a single field, it is perfectly possible, under the covers, to store the data in the traditional manner, in three separate tables. So the graphical interface can present the power user with what appears to be a multivalued field but, in fact, the engine could store the data as a normalised set of data in three tables.

So you think, "Aha, that makes perfect sense: Access 2007 is making it appear easy for the user while handling the data in a correct relational way." Well, it is, but up to a point.

If you address the Ace database programmatically, you can see all three tables. If anyone (including developers) looks at the tables in any other way, for

SCREEN 4

The traditional solution to the creation of a many-to-many relationship

example using the database design window, they will only see two tables, one of which has a multivalued field. You may think this borders on the worst of about three different worlds, and I would have to agree. What has happened is that the development team could only achieve a certain amount in the time available and hasn't managed to present the full set of three tables in the database window.

Suraj says this will happen in a future version but, in the interim, we have to contend with this odd half-implemented feature. The user sees multivalued fields (which are easier to understand) and the data is held in a fully relational way. The weird bit is that the GUI designed for developers won't show you those perfectly formed tables (see screen 5).

The complexity can be hidden from the end user in a form

SCREEN 5

My advice is simple: don't use the multivalued field. It is simply an adjunct to the tools we have always had so you can continue to work in the traditional way. While it may make life slightly easier for the power user, it makes life potentially more difficult for the Access developer. But then, as I said before, I have always been a reactionary.

Problem unsolved

So, what's wrong with multivalued fields? In a nutshell, everything. If you want a rule-based, technical answer, they are forbidden by

Codd's Rule 2 – the guaranteed access rule: *Each and every datum (atomic value) in a relational database is guaranteed to be logically accessible by resorting to a combination of table name, primary key value and column name.*

This is impossible if the column can contain multiple values. If you want a more pragmatic answer, SQL stops working in the way it's supposed to function. For example:

```
SELECT Sale.Items
FROM Sale
WHERE Items="Herring";
```

What should this return? Two rows (1 and 3) because both of those Sales included Herring, or none because none were for Herring alone?

In one sense, the behaviour is still predictable (it will return zero rows), but to find a sale that includes Herring, the multivalued field forces us to write SQL in a different way.

It is difficult to stress the problems caused by multivalued fields too strongly: the relational model is predicated on the notion that each field can only contain a single value. Changing that is a serious step. It breaks the model. Once that is done, the beast is loose: the falcon can't hear the falconer; this is the end of days.

So, anyone who does it had better have a good reason for doing so. PCW

What a mistake to make!

In the August issue of PCW (www.pcw.co.uk/2160189), I discussed the use of a delete query, but the code I showed was of a select query. Sorry about that. The problem was entirely of my own making, but it does illustrate a point that should be made about delete queries.

In the original version of the column, I had written the query twice – once as a select query and once as a delete query. I used this to make

the point that it is usually wise, before actually running a delete query, to test run it as a select query because badly written delete queries can be pretty terminal operations for your data.

Sadly, the column ended up with too many words, so I ultimately had to shorten the section on delete queries. Even sadder, I then proceeded to delete the wrong part of the delete section. The irony is not lost on me either...



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.
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Coding Flash with Flex 2.0

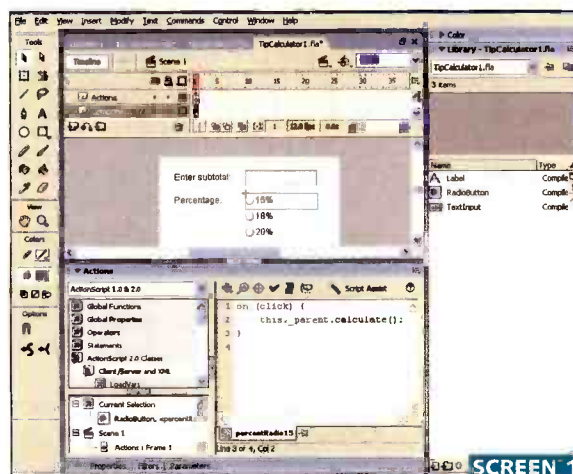
Get hands on with Adobe Flex 2.0 and code multimedia web content for free

Most web browsers have Adobe's Flash player installed, enabling impressive multimedia effects in web pages. A major benefit for web authors is that it runs consistently across platforms, so that Windows, Mac and Linux users get the same content. Flash is also appearing on mobile devices. The Flash player supplies not only a graphics engine, but also an interpreter for Actionscript, Adobe's implementation of Javascript.

Since this is all you need to build applications, Adobe is encouraging developers to use Flash as an alternative to Java for cross-platform client applications. These can run either within the browser or directly on the desktop. An upcoming product, codenamed Apollo, adds easier access to local storage and synchronisation, so you can create applications that work both online and offline.

One of the obstacles to the use of Flash, beyond multimedia effects, is that the Flash IDE (integrated development environment) is designer-focused (see screen 1). You have to understand its Timeline, a critical element in creating movies and animations but unfamiliar to Visual Basic or Java developers. Adobe's answer to this problem is a new approach to coding for Flash, called Flex. Instead of using the Flash IDE, developers work in XML and Actionscript. A compiler then takes these files and generates an Swf File (Shockwave Flash File), the binary format understood by the Flash player.

A side-effect of this approach is that any programmer's editor can now be an authoring tool for Flash. Adobe has recently released Flex 2.0, part of which is a free command-line SDK (Software Development Kit), so you do not have to spend money to create Flash applications. There are two



The Flash IDE is fine for designers, but awkward for developers

further pieces to Flex. One is the official Flex IDE, based on Eclipse, which is called Flex Builder and includes a drag-and-drop visual designer. The other is a server-side piece called Flex Data Services.

The thinking is that enterprises will want to hook up Flex clients to server-side applications. Flex can do this using standard HTTP calls or Soap (Simple Object Access Protocol) web services, but using Flex Data Services enables Flex clients to call methods on remote Java objects and allows the use of more efficient protocols.

A restriction of Flex Data Services is that it is Java only; Adobe has talked about a .Net version but does not seem inclined to deliver it. If you use standard web services instead, the Flex client can work with any server-side platform that can deliver them, including .Net and PHP. There is a free version of Flex Data Services, but it is restricted to a single application on a single CPU machine.

Coding for Flex

To get started with Flex, go to www.adobe.com/flex and download the Flex 2.0 SDK. There is also an option to download a trial of the Flexbuilder

IDE and Flex Data Services, but these are not used in this simple example.

Once you have installed the SDK you can fire up your favourite text or XML editor and create your first application in MXML, the Flex XML layout language. This example (see box for full code) shows a classic tutorial subject – a to-do list (see screen 2). Although simple, it shows several key features, including event handling and controlling objects through code. Here is a guide to how it works.

It is possible to specify external Actionscript files, but in this case everything is in one file, with the script included within an `<mx:Script>` element and surrounded by a CDATA block. In XML terms, this means that the script is character data that is not to be treated as XML mark-up.

When creating a Flex user interface, it is easiest to start with the visual elements and then add the script later. The to-do list has a Panel container, and nested within it are a Label, a List, a TextInput field, and two Button elements. This example uses absolute layout (note the attribute on the Panel), but it's also possible to use constraint-based layouts with anchoring and percentage sizes to create user interfaces that resize well.

The to-do list application is created with Flex SDK



Four routes to better performance

Search giant Google is just one company attempting to combine the broad reach of browser-based web applications with local desktop applications. But plain HTML pages are inadequate for these rich applications, and so the focus is on executing more code locally, without losing the benefit of web delivery. Four major techniques for accomplishing this are described below.

Flash and Flex

Flex is an authoring tool for Flash. Advantages include access to multimedia services, cross-platform capability, and freedom from compatibility issues presented by different web browsers. Disadvantages include dependency on the Flash player, and that the application must be coded in Actionscript rather than the more powerful Java or .Net languages.

Ajax

Ajax (Asynchronous Javascript and XML) means, in its broadest sense, using the dynamic HTML for the user interface and the browser's Javascript as the runtime engine for an application. Advantages include complete vendor-independence and zero deployment. Disadvantages include cross-browser compatibility issues, and the limitations of HTML as a GUI.

Java

Java's GUI abilities are much improved in recent versions, and it offers a familiar, powerful and high-performance platform for coding.

.Net

You can host .Net applications in the browser, but runtime requirements are restrictive. This may change if WPF (Windows Presentation Foundation) takes off. WPF includes XAML, an XML language for defining a GUI layout.

The attributes of each element are equivalent to properties in Visual Basic and, in fact, can be treated as properties in Actionscript code.

It is similar to working with dynamic HTML, where you can specify the appearance of the page either with static HTML at design-time, or with Javascript and the Dom (Document Object Model) at runtime. Despite that, there are many differences between Flash objects and HTML objects. Much of the learning curve with Flex is about what objects are available and how they behave.

Flex is based on a Model – View – Controller (MVC) architecture. One of the goals of MVC is to separate data from its view, or presentation. You can see this at work in the way the List control is populated. Rather than adding data to the List control itself, the MXML specifies only that the List is bound to a collection variable, called `arrColl`. This collection variable is initialised from an Array object, which handles the underlying storage.

The event handling is again similar to DHTML. Each Button element has a click attribute which is set to an Actionscript function. There is also an Application event called `initialise`,

which is used to construct the collection for the List.

Once you have created the MXML application, save it with a `.mxml` extension and open the Flex SDK command prompt. Type `mxml HandsOnToDo.mxml` to compile. You may want to specify `-debug="true"` to add debug information. All going well, the compiler then creates a `.swf` file. You can double-click to open this in the Flash player, or create an HTML wrapper page so that users can launch the application from a local HTML file or from the web.

Flex advantages

Flex is interesting and relatively affordable, with its free SDK or the Flex Builder offered at less than £400. One of its advantages is that, although it is geared towards developers rather than designers, it has not lost all its designer-friendly features. With a Flex application, you can easily specify transition effects and apply styles that would be difficult to achieve in a traditional desktop application, let alone in plain HTML and Javascript.

Microsoft's XAML and WPF also bring these features to

To-do list code

```
<?xml version="1.0" encoding="utf-8"?>
<mx:Application <
  xmlns:mx="http://www.adobe.com/2006/mxml"
  layout="absolute" <
  initialize="initData()">
  <mx:Script>
  <![CDATA[
import mx.collections.*;
public var listArray:Array = new Array();
[Bindable]
public var arrColl:ArrayCollection;
public function initData():void {
  arrColl = new ArrayCollection<
  (listArray);
}
public function AddToList():void {
  arrColl.addItem(NewItem.text);
}
public function RemoveFromList():void {
  var selindex:int = <
  ToDoList.selectedIndex;
if (selindex > -1) {
  arrColl.removeItemAt(selindex);
}
}
]]>
</mx:Script>
  <mx:Panel x="20" y="20" width="400" <
  height="300"
  layout="absolute">
  <mx:Label x="20" y="10" width="300" <
  id="title"
  fontFamily="Arial" fontSize="14" <
  fontWeight="bold"
  text="Hands On with Flex - to-do list <
  example" />
  <mx:List x="20" y="30" width="344" <
  height="160" id="ToDoList"
  editable="true" data <
  Provider="{arrColl}" />
  <mx:TextInput x="20" y="200" <
  text="Text" width="344"
  id="NewItem" />
  <mx:Button x="20" y="230" label="Add" <
  id="btnAdd"
  click="AddToList()" />
  <mx:Button x="80" y="230" <
  label="Delete" id="btnDelete"
  click="RemoveFromList()" />
  </mx:Panel>
</mx:Application>
```

(Key: < code string continues)

Windows applications, and overall is a more powerful application framework, but with the disadvantage of being tied to Windows and dependent on a much larger runtime. Flex is well worth exploring. Adobe Flex 2.0 SDK is free. Flex Builder 2.0 costs £370.12 including VAT. Visit www.adobe.com/flex for more information. 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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DVD drives

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TV tuners

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Digital cameras

Routers

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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

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.

1		Chillblast Fusion Hardcore Crossfire PC £2,099.95 ★★★★★ Reviewed October 2006 www.chillblast.com	An overclocked Core 2 Duo processor makes this a lightning-fast PC.
2		Evesham Solar Plus £1,399 ★★★★★ www.pcw.co.uk/2160983 www.evesham.com	A good performing Core 2 Duo PC for those on a budget.
3		Hi-Grade Ultis Tachyon £2,097 ★★★★★ www.pcw.co.uk/2160263 www.higrade.com	A super-fast PC with a Core 2 Extreme processor and SLI graphics.

BUYER'S GUIDE

78 PRODUCTS
REVIEWED TO MAKE
YOUR BUYING
DECISION EASIER

GRAPHICS CARDS

1		Gainward Bliss 6800GS GLH £176.19 ★★★★★ Reviewed July 06 www.overclockers.co.uk	A terrific graphics card for those who like to dabble with overclocking.
		EVGA Geforce 7800GS CO Superclocked £160 ★★★★★ Reviewed May 06 www.evga.com	An excellent choice for AGP owners who demand fast graphics but don't want to spend a fortune.
		Sapphire Radeon X1600 XT Ultimate £110 ★★★★★ Reviewed September 2006 www.sapphiretech.com	Not totally fan free, but still one of the quietest cards around and performs well.
1		Gecube Radeon X850XT Uniwise £269.97 ★★★★★ Reviewed May 05 www.gecube.com	A single-slot design using Gecube's own cooling system, and it offers good performance.
		Gainward Bliss 7800GT GLH £244.89 ★★★★★ Reviewed July 06 www.overclockers.co.uk	A little expensive, but this card has plenty of overclocking potential.
		Powercolor Radeon X850XT Platinum Edition £320 ★★★★★ Reviewed July 05 www.powercolor.com	Based on ATI's fastest Radeon processor, this card will run the latest games with ease.
1		Gecube X850XT Platinum Edition Uniwise £307 ★★★★★ Reviewed January 06 www.gecube.com	High-end performance and quiet cooling for AGP motherboards.
		MSI NX7950GX2 £408.85 ★★★★★ Reviewed September 2006 www.msicomputer.com	A dual-core card that paves the way for DIY quad-SLI.
		HIS Radeon X850XT Platinum Edition IceQII £370 ★★★★★ Reviewed June 05 www.hisdigital.com	Making use of the IceQII efficient cooling system, this is a quiet and super-fast card.
3		Sapphire Toxic X1900XTX 512MB £421.83 ★★★★★ Reviewed August 06 www.sapphiretech.com	This is a water-cooled, overclocked and blazingly fast graphics card.

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 an alternative.

Look for support for both analogue (VGA) and digital (DVI) displays, and S-video and composite video outputs for use with TVs. Some 'all-in-one' cards have a built-in TV tuner and video-capture options, so you can save money rather than buying separate cards.

NOTEBOOKS

1		Rock Xtreme CTX T2500 £1,526.33 ★★★★★ Reviewed September 2006 www.rockdirect.com	Uninspiring design, but excellent overall performance and good battery life.
2		Evesham Quest Nemesis £1,599 ★★★★★ Reviewed September 2006 www.evesham.co.uk	A great notebook for 3D gaming, but battery life isn't exceptional.
3		Samsung Q30 £1,499 ★★★★★ Reviewed June 06 www.samsung.co.uk	An ultraportable notebook that has style, but is not for those after performance.
4		Sony Vaio TX3HP £1,498.99 ★★★★★ Reviewed October 06 www.sony.co.uk	Not particularly powerful, but small, sleek and incredibly light.
5		Mesh Discovery D2400 PCW £899 ★★★★★ Reviewed July 06 www.meshcomputers.com	Big and bulky, but a dual-core notebook with fast performance and decent battery life.

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

SUB £100		ECS PF88 £64.63 ★★★★★ Reviewed August 05 www.ecs.com.tw	The PF88 is feature-packed and compatible with both Intel and AMD processors.
		Aopen i915GMM-HFS £79 ★★★★★ Reviewed July 05 www.aopen.com	The HFS makes the ideal platform for building a quiet, power-efficient Intel PC.
		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.
		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.
		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.
		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.
		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.
£100+		Gigabyte GA-965P-DQ6 £164.44 ★★★★★ Reviewed October 06 www.giga-byte.com	A decent Core 2 Duo motherboard that's loaded with overclocking features.
		Asus M2N32-SLI Deluxe Wireless Edition £136.59 ★★★★★ Reviewed www.pcw.co.uk/2156925 www.asus.com.tw	This is one of the new motherboards to support the AMD AM2 socket.
		ECS PF22 Extreme £123 ★★★★★ Reviewed February 06 www.ecs.com.tw	A good range of features including dual graphics support courtesy of ATI's Crossfire technology.

HOW TO BUY

The motherboard dictates the type of processor you can use, how well the other components communicate, the features on offer and future upgrade potential.

Cheap boards limit processor support, graphics and expansion options. Around £70-£100 gets you the latest technologies.

Most desktop and tower cases use a standard ATX-size motherboard but, if you're building a small system, look at compact MiniATX or MicroATX designs. If using an existing case, make sure you buy the right form factor.

Your choice is also dictated by the processor. You'll need Socket 775 for current Intel processors, Socket A for AMD Athlon XP or Duron, and Socket 939 for an Athlon 64. The Athlon 64 FX series requires Socket 940. If using an older CPU, check the socket type.

We would recommend an Intel P4 or Athlon 64 for a good all-round system. The Athlon 64 can address one terabyte of Ram (1,000GB) and handle difficult calculations with relative ease.

The new generation of processors also change the way data is transferred. Whereas P4s rely on the motherboard chipset to shuttle data between processor and memory, Athlon 64s avoid this by integrating the memory controller into the CPU die.

Divided into northbridge and southbridge, the chipset handles the communication between all the components and dictates the features on offer. Today's leading chipset manufacturers include Via, Silicon Integrated Systems (Sis), ATI, Nvidia and Intel. Chipsets can include integrated graphics.

Today's motherboards mainly use DDR or DDR2 Ram, available in 200, 266, 333 and 400, 667 and 800MHz modules.

Also consider the number of slots available. Fit dual in-line memory modules (Dimms) in pairs if the chipset supports dual-channel operation.

The latest boards support both older IDE and new, faster Serial ATA (Sata) hard disks. Check the number of connectors available for both.

Some chipsets provide Raid support, so data can be spread across two drives for extra performance or backups. SCSI controllers can be found on more expensive boards, or be added with expansion cards.

Also important is the number of USB2 and Firewire sockets for external add-ons. You may need serial, parallel and PS/2 interfaces if using older legacy peripherals. Look out, too, for onboard Ethernet networking, a built-in 56K modem and onboard sound. The latter is fine for all but audio buffs or avid gamers.

DIGITAL MUSIC PLAYERS

1		Sandisk Sansa e260 £149 ★★★★★ Reviewed September 06 www.sandisk.co.uk	User-friendly and feature-rich, this mp3 player is capable of being a Nano-killer.
		Apple iPod £219 ★★★★★ Reviewed January 06 www.apple.com/uk	All the usual iPod features but now with the ability to play video.
		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.
		Philips HDD6320 £229 ★★★★★ Reviewed March 06 www.philips.co.uk	Sleek and stylish, this 30GB player from Philips is incredibly easy to use.
		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.

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		Seagate Barracuda ST3750640AS £352.44 ★★★★★ Reviewed August 06 www.seagate.com	An internal hard drive that provides you with a whopping 750GB capacity.
		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.
EXTERNAL		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.

HOW TO BUY

If you're building a high-performance system, buy the fastest drive you can afford; if you just want lots of capacity then slower drives offer better value.

OEM or 'brown box' drives are cheaper – this is the bare drive without the extras, such as cables, included in retail boxed versions.

The transfer rates in today's Ultra ATA drives are 100Mbytes/sec (133Mbytes/sec for Maxtor drives), while Serial ATA (Sata) drives are rated at 150Mbytes/sec. Check the seek times, spindle speed, buffer size and the areal density of the platters (disks).

Usually in milliseconds, seek time is how long a drive's heads take to find data on the disk. The speed at which the spindle holding the disks spins ranges from 4,200rpm for a notebook drive to 15,000rpm for some SCSI drives. Generally, faster speeds give better performance.

The larger the buffer (cache), the more recently written or stored data is held in the drive's memory, resulting in less time seeking the data on the disk.

Areal density is the amount of data stored on a given area of a drive's platter. The more data per square centimetre (gigabytes per platter), the less disk movement is required to bring it under the heads.

Originally Integrated Drive Electronics (IDE), then Enhanced IDE (E-IDE), this common parallel interface is usually written as ATA (AT Attachment), modified with speed improvements in recent years to Ultra ATA/xxx, where xxx is the peak bandwidth in Mbytes/sec. To differentiate Ultra ATA from Sata, the term Parallel ATA is used.

Faster Sata drives are more expensive than Parallel ATA. Sata uses two pairs of high-frequency cables, working at low voltage.

SCSI (Small Computer System Interface) drives are technically no different to ATA drives, but support up to 16 devices on a single channel and you can have multiple channels in a PC. The disadvantage, though, is price.

Most motherboards support Raid (Redundant Array of Independent Disks), which connects multiple drives, to improve performance or provide fault tolerance.

One problem you may hit is the inability to access the new drive's full capacity. Some older BIOSes only support drives up to 137GB. This may be solved by updating the PC's BIOS. Retail boxed disks often come with software to fool the BIOS into recognising the disk, or you can buy a separate disk controller card, which fits into a PCI slot.

DVD DRIVES

		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

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

PHOTO PRINTERS		Epson Picturemate 100 £100 ★★★★★ Reviewed January 06 www.epson.co.uk	This is a high-quality photo printer that is both cheap and easy to use.
		Canon Pixma IP5000 £129 ★★★★★ Reviewed June 05 www.canon.co.uk	If it's pixel-perfect printing you're after, look no further than the IP5000 – a real bargain.
		HP Photosmart 8450 £170 ★★★★★ Reviewed April 05 www.hp.com/uk	HP's Photosmart 8450 is a bulky printer, but it's capable of producing stunning photo prints.
		Epson Stylus Photo R340 £149 ★★★★★ Reviewed February 06 www.epson.co.uk	Excellent-quality prints and the ability to function without a PC.
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.
		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.
LASER PRINTERS		HP Color Laserjet 2605dn £299 ★★★★★ Reviewed September 06 www.hp.com/uk	An affordable colour laser that would benefit any small business.
		Lexmark C500n £239 ★★★★★ Reviewed September 06 www.lexmark.co.uk	A good budget colour laser, but it comes with low starter cartridges.
		Dell Laser Printer 1100 £93 ★★★★★ Reviewed November 05 www.dell.co.uk	A cheap mono laser printer, but it comes with a relatively small starter toner cartridge.
		HP Laserjet 1020 £89 ★★★★★ Reviewed August 05 www.hp.com/uk	A great home laser printer that's fast, good quality and is one of the cheapest lasers available.

HOW TO BUY

If you don't need colour, consider a monochrome laser or LED printer. The latter tend to be cheaper and may last longer than a laser, but LED printers have a fixed resolution and can't take advantage of software-based resolution enhancements.

If you print hundreds of pages a week, a laser is the best option as they're cheaper and more reliable for high-volume printing. If you print a few pages a month, buy a cheap colour inkjet. If printing high-quality colour photos, buy a good photo printer.

Look for the manufacturer's quoted 'duty cycle' – this is how many pages a month the machine can handle. Choose a duty cycle three or four times larger than your expected average usage. Also check the printer's 'engine life' or 'total print volume' – after this expires, the printer's on borrowed time and uneconomical to repair.

Quoted printer speeds often refer to the speed the printer pushes a blank sheet of paper through the mechanism; for documents they tend to refer to lower quality settings. PCW's tests use real documents and photos, giving a better idea of print speed.

For serious inkjet photo printing, consider higher-end models that use six, seven or eight colour cartridges. Normal

inkjets use three colours (cyan, yellow and magenta) plus black, while specialised photo printers add extra shades to improve colour fidelity. Cheaper models often combine three colours in a single cartridge, which is not as economical as using separate cartridges for each colour.

Some 'convertible printers' use four separate black cartridges for longer-life mono printing and you can replace three of them with cyan, magenta and yellow cartridges for colour printing.

Laser models for business use often have a large number of paper-handling options. They're usually modular so you can add features as required. They also have a wider range of interface options and consumables.

You'll often find bundled software with a printer. Their quality varies, but there can be some useful programs.

The quality and usability of the driver software is vital, but it's difficult to assess before buying. Check PCW's reviews and online forums (www.pcw.co.uk/forums) and read the manufacturer's technical support site for any known problems.

Third-party or refurbished consumables generally work fine, but can cause problems with quality and reliability. Your warranty may not cover the use of non-approved consumables.

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.
		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.
		Twinhan Magic Box £69.99 ★★★★★ Reviewed August 05 www.twinhan.com	A stylish external USB2 tuner with good software and an attractive price.
		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.
		Kworld Dual TV Tuner DVB-T 220 £49.99 ★★★★★ Reviewed October 06 www.kworld.com.tw	This device provides one analogue and one digital tuner at a decent price.

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

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.
		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.
		Samsung Syncmaster SM940BW £226 ★★★★★ Review: www.pcw.co.uk/2159088 www.samsung.co.uk	A low-cost and stylish monitor for gaming and multimedia use.
		Iiyama ProLite E1900WS-B1 £175 ★★★★★ Reviewed October 06 www.iiyama.co.uk	A budget monitor with decent brightness, contrast and response times.
19IN			
17IN+		LG Flatron L1732P £239 ★★★★★ Reviewed February 06 www.lge.co.uk	Fast response times make this 17in panel a good choice for gamers.

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.

DIGITAL CAMERAS

DIGI SLR		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.
		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.
		Nikon Coolpix S6 £349 ★★★★★ Reviewed www.pcw.co.uk/2157327 www.nikon.co.uk	A decent compact camera with Wifi and a host of useful features.
		Casio Exilim Z1000 £379.99 ★★★★★ Reviewed www.pcw.co.uk/2159709 www.casio.co.uk	With 10megapixels, this is a good performer for its size, and it's easy to use.
		Pentax Optio T10 £349 ★★★★★ Reviewed September 06 www.pentax.co.uk	A good but pricey camera with a touch-screen interface.
PROSUMER			
COMPACT			

HOW TO BUY

In general, the higher the megapixel count of a digital camera's sensor – and the bigger the sensor's physical size – the more detailed the images. A small sensor and high megapixel count won't always produce better image quality. Four to 5megapixels is good for 8 x 10in or larger prints. The quoted 'effective' pixels number is the camera's true megapixel resolution.

Forget digital zoom and concentrate on the optical zoom, which zooms in on the subject and produces a better-quality image. Digital zooms simply crop

into the centre of the picture. 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.

ROUTERS

WIRELESS / MODEM		Netgear 108 ADSL router £159 ★★★★★ Reviewed April 05 www.netgear.co.uk	If you need a Super-G router with built-in ADSL modem, this offering from Netgear is great value.
		Ozenda 11g ADSL Router £70 ★★★★★ Reviewed November 04 www.ozenda.com	Ozenda has come up trumps – wireless ADSL doesn't get any easier than this.
WIRELESS		Linksys WAG54G (wireless) £76 ★★★★★ Reviewed August 05 www.linksys.com	This 802.11g wireless model offers advanced features for home and professional users.
		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.
VOIP		Intertex IX66+ ADSL Aircip 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

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	01 Communique I'm Oncall	Aug 06	4	Funcom	Dreamfall: The Longest Journey	Sept 06	3	PC Nextday	Zoostorm 2-5401 Versatile PC	Aug 06	4
Aastra	9112i (IP telephone)	Sept 06	2	★ Gainward	Bliss 6800GS GLH (graphics)	July 06	5	PC Nextday	Zoostorm 7-7401 (desktop PC)	Sept 06	4
Acer	Aspire AS9802 (notebook)	Sept 06	3	Gainward	Bliss 7800GT GLH (graphics)	July 06	4	Pentax	Optio T10 (digital camera)	Sept 06	4
Acer	d150 (sat nav)	Aug 06	3	Gecube	Radeon X1800GTO 256MB	July 06	4	★ Philips	Showline MCP9350i	July 06	4
★ Acer	Travelmate TM4202 (notebook)	July 06	4	Gendan	Engine Check 1.4	Sept 06	4	Pioneer	BDR-101A (removable storage)	Sept 06	4
★ Acksen	Timesheet Xpress 8	Aug 06	5	Gigabyte	GA-8N-SLI Quad Royal	Aug 06	4	★ Pioneer	DVR-111 (storage)	July 06	4
Adobe	Encore DVD 2.0 (DVD authoring)	July 06	3	Google	Google Mini (search appliance)	July 06	4	Plustek	Opticard 820 (scanner)	July 06	3
AJP	D900K (notebook)	Sept 06	3	★ Grandstream	Budgetone 101 (IP telephone)	Sept 06	4	Polycom	Communicator C100S	Sept 06	3
AMD	ATI Radeon Xpress 200	Aug 06		Grandstream	GXP-2000 (IP telephone)	Sept 06	4	Port Designs	Coolfan	Sept 06	3
AMD	Nforce 4 SLI (processor)	Aug 06		Grandstream	GXV-3000 (IP video phone)	Sept 06	3	Print Audit	Print Audit 5	Aug 06	4
AMD	Nforce 4 SLI X16	Aug 06		★ HP	Color Laserjet 2605dn (printer)	Sept 06	5	Raritan	Z-Series 24200U (KVM remote)	July 06	3
Aopen	G325 (PC case)	July 06	3	HP	Compaq nx9420 (notebook)	Sept 06	4	Rock	Pegasus 330 (laptop)	July 06	3
Aopen	i975a-YDG (m'board)	July 06	4	★ Hi-Grade	Ultinote D6000 (notebook)	Sept 06	4	★ Rock	Xtreme CTX T2500 (notebook)	Sept 06	5
Apple	Boot Camp (utility)	July 06	4	Hela	Lap Up 2340 (notebook stand)	July 06	3	Samsung	Samsung Q1 (handheld PC)	July 06	4
★ Apple	Macbook (notebook)	Aug 06	4	★ Hi-Touch	S400 (photo printer)	July 06	4	★ Samsung	Syncmaster 940BW (TFT)	Sept 06	4
Asus	N4L-VM DH (m'board)	July 06	4	Intel	975X (processor)	Aug 06		Samsung	YP-U2 Music Player	Sept 06	3
ATI	Radeon X1300	Aug 06		Intel	Nforce 4 SLI Intel Edition	Aug 06		★ Sandisk	Sansa e260 (media player)	Sept 06	5
ATI	Radeon X1300 Pro	Aug 06		Intel	Nforce 4 SLI X16 Intel Edition	Aug 06		Sandisk	Sansa m250 (media player)	July 06	3
ATI	Radeon X1600 Pro	Aug 06		Intel	Nforce 4 SLI XE (processor)	Aug 06		Sanyo	Xacti VPC-HD1E (camcorder)	Sept 06	4
ATI	Radeon X1600XT	Aug 06		Intellect	Prodesk X2 3800+S (PC)	Aug 06	4	Sapphire	Radeon X1600 XT Ultimate	Sept 06	4
ATI	Radeon X1800XT	Aug 06		★ Intuit	Quickbooks Pro 2006	July 06	5	Sapphire	Toxic X1900XTX 512MB	Aug 06	4
ATI	Radeon X1900XT	Aug 06		IPdialog	Siptone III (IP telephone)	Sept 06	3	Seagate	Barracuda ST3750640AS	Aug 06	4
ATI	Radeon X1900XTX	Aug 06		Jabra	BT620s (Bluetooth headset)	Aug 06	3	Sega	Condemned (game)	Aug 06	3
ATI	Radeon X850XT PE	Aug 06		JDPSoft	Digital Vault (encryption)	Sept 06	3	Seiko Instruments	Smart Label Printer 450	Sept 06	4
ATL	IP300S (IP telephone)	Sept 06	2	Kensington	SX2000 (speakers)	July 06	3	Serif	Movieplus 5 (video-editing)	Aug 06	3
Avanguest	Web Easy 6 Professional	July 06	3	Kiss	DP-600 (media player)	Sept 06	3	Shuttle	Shuttle XPC P 2500G (SFF PC)	July 06	4
Averatec	4155 (notebook)	July 06	3	★ Lenovo	Thinkpad X60 (notebook)	Aug 06	4	★ Sling Media	Slingbox (TV streaming)	Aug 06	4
★ Belinea	10 20 30W (TFT monitor)	July 06	4	Lexmark	C500n (colour laser printer)	Sept 06	4	Skylook	Skylook 1.5 (VoIP service)	July 06	3
★ Brother	HL-5280DW (printer)	Aug 06	5	Lexmark	X8350	July 06	4	Sony	Location Free (TV streaming)	Sept 06	3
★ Business Objects	Crystal Xcelsius	Sept 06	5	★ Linksys	SRW224P (switch)	July 06	5	Sony	MDR-NC50 (speakers)	July 06	4
★ Business Solve	Hotdesk Manager	Sept 06		Linksys	WTR54GS Travel Router	July 06	4	Sony	Storstation AIT-3Ex (backup)	Aug 06	3
CA	Business Protection Suite r2	July 06	2	Magix	Photos on CD & DVD 5.0	July 06	4	Sony	Vaio VGN-AR11M (notebook)	Sept 06	3
CA	Etrust Internet Security Suite	July 06	3	McAfee	Internet Security Suite 2006	July 06	3	Sony	Vaio VGN-SZ1M (notebook)	July 06	4
★ Canon	DC40 (DVD camcorder)	Aug 06	4	Mesh	Discovery D2400PCW (laptop)	July 06	4	Storvision	MiniVCR SV-1000	Sept 06	4
★ Canon	MV960 (camcorder)	July 06	4	Mesh	Matrix Vector 7600GT (PC)	Aug 06	4	★ Symantec	Norton Internet Security 2006	July 06	5
★ Canon	Pixma MP800R (MFD)	July 06	5	★ Mesh	Matrix X-treme FX AM2 (PC)	Aug 06	4	★ Terratec	Noxon 2 (audio-streaming)	Aug 06	4
Creative	I-Trigue L3800 (speakers)	July 06	3	Microsoft	SQL Server 2005 Express	July 06	4	Tesco	Internet Phone (VoIP service)	July 06	4
Cube	247 Epsilon ST6 (dual-core PC)	Aug 06	3	MSI	NX7950GX2 (quad-SLI graphics)	Sept 06	4	Tiscali	Netphone (VoIP service)	Sept 06	3
Cyberlink	PowerDVD 7 Deluxe	Aug 06	4	Nero	Photoshow Deluxe 4	Sept 06	3	Toshiba	Satellite P100 (notebook)	July 06	4
★ Dell	Dimension 9150 (dual-core PC)	Aug 06	5	Netgear	WG5606			Toshiba	TDP-FF1A (projector)	Aug 06	3
D-Link	Netdefend DFL-M510 (security)	July 06	4		(wireless print server)	Aug 06	4	Trendnet	Clearsky		
EA Games	The Godfather	July 06	4	Nortel	BCM 50 (telephony)	Sept 06	4		(Bluetooth VoIP phone)	Aug 06	3
EA Games	LOTR: Battle for Middle-Earth II	July 06	4	Novogo	V30 (sat nav)	July 06	3	Trend Micro	PC-cillin Internet Security 14	July 06	4
EA Games	The Sims 2: Open for Business	July 06	3	Nvidia	Geforce 6600 (graphics card)	Aug 06		Ubisoft	Blazing Angels	Aug 06	3
★ Eidos	Hitman Blood Money	Sept 06	4	Nvidia	Geforce 6600 GT (graphics card)	Aug 06		Ulead	Videostudio 10 Plus	Aug 06	4
★ Eidos	Tomb Raider Legend (game)	Aug 06	5	Nvidia	Geforce 6800 Ultra (graphics)	Aug 06		★ US Robotics	Professional Access Point	Aug 06	5
Elmeg	290 (IP telephone)	Sept 06	3	Nvidia	Geforce 6800GS (graphics card)	Aug 06		★ Valve	Half-Life 2: Episode One	Sept 06	4
Epson	Stylus Photo RX640 (MFD)	July 06	4	Nvidia	Geforce 6800GT (graphics card)	Aug 06		★ Viewsonic	VP2130b (TFT monitor)	Aug 06	4
Evesham	Axis GR76 (dual-core PC)	Aug 06	4	Nvidia	Geforce 7800GT (graphics card)	Aug 06		Viewsonic	VP2330wb (TFT monitor)	Sept 06	4
Evesham	Quest A230 (notebook)	Aug 06	4	Nvidia	Geforce 7800GTX (graphics card)	Aug 06		★ Yahoo	Mail Beta (webmail)	July 06	4
★ Evesham	Quest Nemesis (computer)	Sept 06	4	Olympus	E-330 (digital SLR)	July 06	4	★ Zalman	Fatal1ty case (PC case)	Aug 06	5
★ Evesham	Voyager C550 (notebook)	July 06	5	★ Optoma	EP747 (projector)	Sept 06	4	★ Zonelabs	Zonealarm ISS 6	July 06	5
★ Family Historian	Family Historian 3 (genealogy)	Aug 06	5	Panda Software	Platinum 2006 Internet Security	July 06	4	Zen Software	Mdaemon Pro v9.0	Aug 06	4
★ Fujitsu-Siemens	Scenicview P24-1W (TFT)	Sept 06	4	★ Panrix	Nitro 840D (dual-core PC)	Aug 06	4	★ Zybert Computing	Z1 Gem (network server)	Sept 06	5



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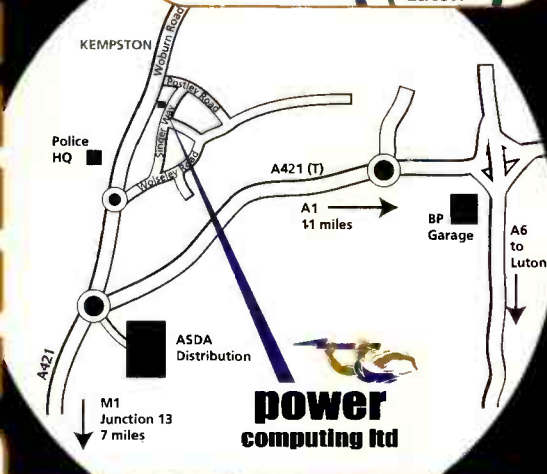
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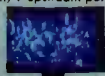
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- Refurbished, with balance of IBM warranty - until approx December 2006
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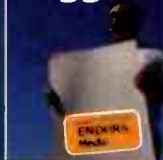
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Casio Exilim EX S600

October 25, 2005
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Casio just released yet another super-calm model in its Exilim line. The EX S600 is a 6 megapixel camera that features an anti-shake DSP that's reduce blurring. It also features a 3x optical zoom, a 2.2-inch LCD, increased battery life (about 300 shots per battery charge), and the ability to shoot VGA-quality MPEG-4 movies at 30fps. Each unit measures 80 x 58 x 18.1 mm and weighs 115 grams. There's also a unique "Reverse Shot" mode that's optimized for taking digital shots of old album photos (it sounds very "Waiting for the Undead." The EX S600 will be available in "Sparkle Silver," "Mistral Blue," and "Latin Orange"—what, no "Copsy Brown?"—in early 2006. Price is still being

worked out

Casio Exilim EX S600 [@leleodigital](#)

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Canon Optura 600. It's Dual-tastic!

October 25, 2005
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USING THE COVER DISC

The PCW cover disc uses a web-browser-style interface. To get full functionality, you'll need to use Microsoft Internet Explorer (version 5.5 or later). Unfortunately, Netscape doesn't properly support this software. However, we have also provided links to the featured programs so you can still copy them to your hard disk or install them manually (the standard download dialogue box will appear). Programs can be found in the \software\ folder on the disc.

STARTING THE DISC

The CD-Rom (or DVD) should auto-start. If it doesn't, double-click the CD-Rom/DVD icon in My Computer or open the terms.htm file on the root of the disc.

PROBLEMS?

Please note that we cannot give support on individual programs contained on this disc. If you have problems running the disc or any of its content, please note these guidelines:

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If the disc is physically damaged and will not load, return it to this address for a replacement: PCW October 2006, cover disc ABT, First floor, 13 Clifftown Road, Southend on Sea, Essex, SS1 1AB quoting reference: 'PCW Vol 29 No 10'.

PROBLEMS INSTALLING/ RUNNING THE SOFTWARE

Check the support page on the disc or check the manufacturer's site.

GENERAL DIFFICULTIES

Call 08700 885 995 (9.30am to 5pm Mon, Tues, Thurs & Fri; open until 8pm on Wed and 10am to 2pm Sat). Or go to www.vnuser.com or email us at pcw@vnuser.com.

For software requiring registration, PCW cannot guarantee that serial codes will be available later than three months from the on-sale date of the magazine. Please avoid disappointment by registering your software promptly.

SIX PAGES OF DISC INFO INCLUDING

- PRODUCT DESCRIPTIONS
- WORKSHOPS
- UPGRADE OFFERS
- KEY FEATURES
- CONTACT DETAILS
- NEED TO KNOW



INFORMATION

System requirements 128MB Ram,
Windows 98 or later, 40MB hard drive space

Contact www.conceptdraw.com

Registration Get your code from
www.conceptdraw.com/registration/mm4special.php

Concept Draw Mindmap 4.4 PE

Quickly create attractive project plans with this charting tool

Whether you're organising an event, planning a presentation or writing a report, finding inspiration to get started is the most difficult part. Concept Draw Mindmap is a graphical charting tool that helps you express and structure your ideas, then clearly present them to others.

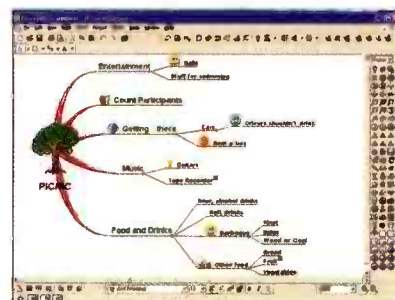
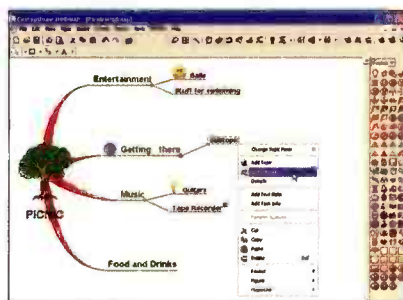
The heart of the program is based around the concept of mind mapping. This is a simple but effective way of visually organising ideas, generally in the form of a tree. The main topic, say a business plan for a restaurant, goes in the centre. Major sub-topics flow out from that: Location, Staff, Menu, and so on, each one splitting into others as the diagram extends.

The completed tree can become quite involved, but that doesn't mean it'll take long to

produce it. Concept Draw Mindmap gets you off to a flying start with its Assistant, a wizard that walks you through creating the initial design. It's easy to add new topics, then illustrate them with graphics, icons or symbols from the built-in libraries. And this isn't just for your benefit: when finished, you'll have a clear, detailed diagram that can be used to convey your ideas to others.

Mind map charts aren't just about attractive graphics. Each sub-topic in a mind map can be linked to a URL or local file, have a text note attached, or even simple task information (such as start date, end date, resources, per cent complete), turning the program into a basic project manager: very versatile, and well worth a look.

Create an attractive, detailed project plan in minutes with Mindmap



- 1 Click File > New > Assistant to launch a start-up wizard that'll walk you through setting up your first mind map. Start by entering the central theme of the diagram, then add whatever sub-topics come to mind. If you're organising a company day out, say, then transport, food, and entertainment might all be on the list.
- 2 Just adding one topic might immediately make you think of related sub-topics. For transport to the day out, say, will you hire a coach? Right-click any topic, select Add Sub-topic, then type a name for whatever this sub-topic is about. Use the right-click Add text note option for in-depth details.
- 3 Keep going and you'll soon have a substantial list of ideas and thoughts about the project. Dress these up with graphics, if you like (just click on a topic or sub-topic, then choose clipart or an icon from the library), save the results as an image, HTML or Rtf file, and share your work with others.

UPGRADE OFFER

- Import Outlook tasks
- Work with multi-page documents
- Create your own libraries
- Save templates and workspaces
- Export maps to Microsoft Project
- Save diagrams in Pdf format

50% OFF CONCEPTDRAW MINDMAP PRO

If you need even more project planning functionality than Mindmap can provide, take a look at the Professional version. It can base mind maps around imported Outlook tasks, and extend complex diagrams over several pages. You're able to speed up the creation process by designing your own map templates, and the finished results can be exported to Microsoft Project, or saved in Pdf format.

Mindmap Professional normally costs \$249 (£136), but you can upgrade for only \$99 (about £54). Visit www.conceptdraw.com/en/purchase/mindmap/upgrade.php to order.



Pocomail 3

Block spam and secure your inbox with this powerful email client

A good email client should be secure, packed with features, great at handling spam, and have an easy-to-use interface. So why are so many people still using Outlook Express? It's the no-effort option, but it's missing a lot. Pocomail offers more than you might think and takes only a couple of minutes to set up.

Various import options read the address book and email folders from many different applications. And, unlike Outlook Express, your choice of settings, account details and mailboxes can be backed up or restored in a couple of mouse clicks.

A well-designed interface means you'll be using the program right away. The Quick Guide tab is particularly helpful, offering instant links to

many common tasks. Anyone with a bulky inbox will appreciate email filters that let you show only the emails sent before a particular date, or emails that don't have an attachment.

Your Inbox shouldn't be packed with junk mail, anyway, because Pocomail has integrated spam filters. And you can add the program's versatile message filters, which are far more powerful than anything the Outlook Express message rules offer.

A Sanitise Message option strips out HTML from an email, leaving it in plain text. You also get password protection for emails and accounts; the ability to add custom text annotations to an email; a complete scripting language, and more. If you're tired of your current email client then give Pocomail a try.

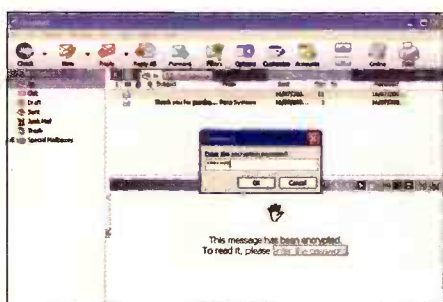
INFORMATION

System requirements Windows 98 or later, 12MB hard disk space

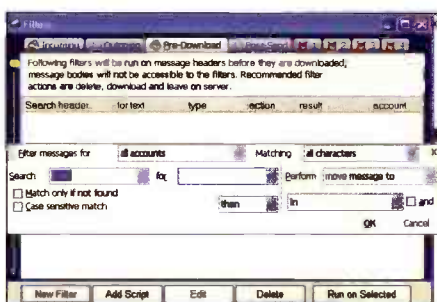
Contact www.bluesquad.co.uk

Registration Enter your details at www.bluesquad.co.uk/vnu/pocomail/register

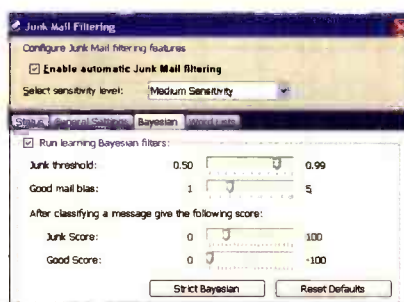
Stay secure and easily block spam with Pocomail 3



1 Tired of other users having complete access to your emails? It's easy to take back control. Click Tools > Options > Privacy and Security to password-protect access to Pocomail, or specific areas of it. Or password-protect sensitive emails individually by clicking Message > Privacy > Encrypt Message.



2 Click Filters if you'd like to keep your Inbox junk-mail free. The Pocomail system is particularly flexible, so for example you can test 31 different attributes of a message (including header fields like X-Mailer, Return-Path or X-UIDL), and optionally apply filters to message headers before the bodies are downloaded.



3 There's no need to create hundreds of filters just to block spam, though, because Pocomail can do that automatically. Click the Filters Incoming tab, check the top filter box, then click Edit and select 'Enable automatic Junk Mail filtering'. Explore the tabs for more spam filtering tweaks and options.

UPGRADE OFFER

Instant Reply option
Feeds and RSS support
SMTP support includes SSL/TLS
Search supports Boolean expressions
Many new Imap features
Quick search of any folder

SAVE £10 ON POCOMAIL 4

The latest version of Pocomail adds extras such as Instant Reply, sending a quick message without opening a Compose window. There's support for feeds and RSS, and sending secure (SSL/TLS) emails, while Imap support is better than ever (including multithreaded access to the Imap server via Online Folders). Search is much improved, too, with new indexing capabilities meaning even large folders can be searched in around a second.

Pocomail 4 normally costs £27.95, but as a PCW reader you can qualify for a £10 discount: just visit www.bluesquad.co.uk/vnu/pocomail/offer and enter the code POCOMAIL.



Paragon Partition Manager 2005

Create, resize, merge and move hard drive partitions

Partitioning your hard drive is an invaluable way to optimise the use of disk space, improve performance, or create a dual-boot PC so you can install another operating system. Just don't use Windows' own partitioning tools to do the job, as they're destructive, wiping the data from whatever drive you working on: you're much better off using a safe alternative such as Paragon Partition Manager 2005.

If your drive has a single partition, for instance, Partition Manager 2005 can resize it in a few mouse clicks. It's able to create primary or extended partitions, and can format them in a range of file systems: Fat16, Fat32, NTFS, Ext2FS, Ext3FS, ReiserFS and L-Swap2. And if you want to take full control, Partition Manager 2005 even lets you choose the cluster size for

the drive, and the number of sectors allocated to boot code.

It's then possible to create new partitions in the empty space, merge partitions, or move them around on the hard drive. And if you made one or more partitions a little too small and it's now short on disk capacity, use the Redistribute Free Space wizard to even things up.

Even if you couldn't care less about partitions, there may still be functions here that you'll find useful. There's a Copy Hard Disk option, for example, useful if you've bought a new drive. The program can convert your file system from NTFS to Fat32, and there's even an option to defragment the NTFS Master File Table (MFT), boosting performance in a way that can't be achieved by normal defragmentation tools.

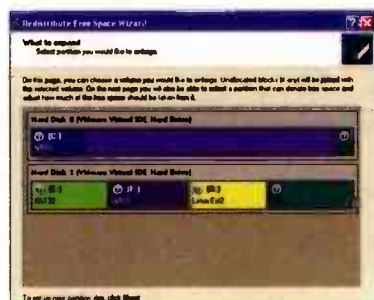
INFORMATION

System requirements Windows 98 or later, 12MB disk space

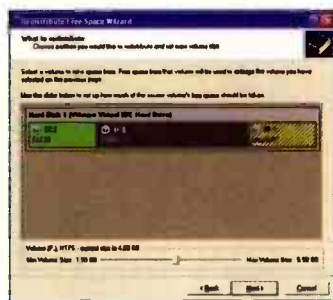
Contact www.paragon.ag

Registration Point your browser at <http://registration.paragon.ag/pm2005>

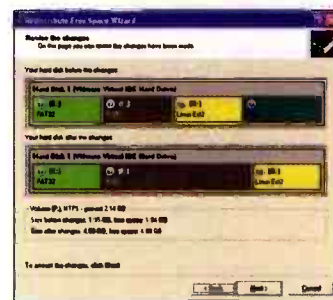
Quickly resize and rearrange hard drive partitions, without losing data



1 Partition Manager 2005 isn't just about letting you manually create and resize partitions: it has some intelligent wizards that can automate more complex tasks, too. If you're running short of space on one partition, click Wizards > Redistribute free space to begin fixing the problem.



2 Click Next, find the partition that needs a little more space, and click to select it. If the drive has any unallocated space it'll be added to that partition, but the chances are you'll need to donate some free space from another partition as well. Click Next to decide exactly how that's going to work.



3 Click the partition that has some spare capacity, then choose how much space it can offer with the slider at the bottom of the screen. Click Next to see a diagram of your partitions before and after the changes. If it looks OK click Next > Finish > Apply, and the program will automatically resize and rearrange both partitions.

UPGRADE OFFER

Real-time drive backup
Create CD/DVD images and virtual drives
Migrate your data online
Securely erase your data
Powerful hard drive partitioning
Enterprise imaging and deployment

GET 20% OFF A PARAGON PRODUCT

Partition Manager 2005 is only one of many drive-related Paragon products. The range also includes Drive Backup, a powerful disk imaging and cloning tool, that also supports differential backups to improve performance.

CD-Rom Emulator can create virtual CD and DVD drives, then mount them with disk images so you don't have to keep swapping (and perhaps damaging) the real disks.

Disk Wiper securely erases files so they can't be undeleted later.

Prices start at \$29.95 (around £16.50), and there's a 20 per cent discount available if you order within seven days of registering Partition Manager 2005. See your registration email for the promotional code.



LP Recorder 6

Easily convert your old vinyl records into digital format

INFORMATION

System requirements Windows 98/ME/2000/XP, 300MB disk space (for approx 30 minutes recording time), soundcard with line-in socket

Contact www.cfbsoftware.com

Registration Not required

In the age of the iPod, music is all about convenience, portability, having your favourite songs around whenever you want to hear them. Which isn't exactly easy if some of them are still on vinyl LPs, 7 and 12in singles and cassettes. Fortunately LP Recorder has the answer, providing an easy way to get all your old analogue recordings safely converted into an easier to handle digital Wav file format.

The process starts by connecting the line out of your amplifier to the line in connector of your soundcard. Check the Turntable Setup section in the LP Recorder Help file for advice on using the right cable.

Once connected, you could just leave LP Recorder to record any input, then play your records or tapes and enjoy the digital results. But

the program has other features that could help improve the finished file if used correctly.

If you click Record on LP Recorder first, for instance, then put the needle on your record, the Wav file will start with a moment of silence. Check Auto Start instead and LP Recorder will monitor the input, automatically starting to record at the moment the stylus is lowered onto the record.

Sometimes your amplifier might output too high a signal for the PC soundcard to handle, leaving a crackling sound on the Wav file. Check Auto Level and LP Recorder will limit the input volume and usually fix the problem.

If the automated features don't quite work as you expect, you can take manual control. Pause the recordings, tweak the volume and balance, to help get the best results.

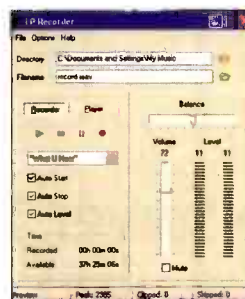
From irritating analogue to convenient digital music in three easy steps



1 Launch LP Recorder and you'll be asked to choose the Recording Device (the soundcard you'll be using to record the LP) and Playback Device (the one that will play back recorded Wav files). If these will always be the same option (and there's only one anyway) then clear 'Display when starting' to skip this next time.



2 Click Options > Preferences to confirm that the program is set up to suit your requirements. Check Auto Stop, for instance, and LP Recorder automatically stops recording when the LP is quiet for 10 seconds. If it stops prematurely because your LP contains longer quiet segments, extend the Auto Stop Delay here.



3 Connect the PC to your amplifier if you've not done it already, then check Auto Start, Auto Stop and Auto Level to let LP Recorder take care of all the hard work. Finally click the red Record button, place the needle on your LP, and leave LP Recorder to convert the analogue input into a convenient Wav file.

UPGRADE OFFER

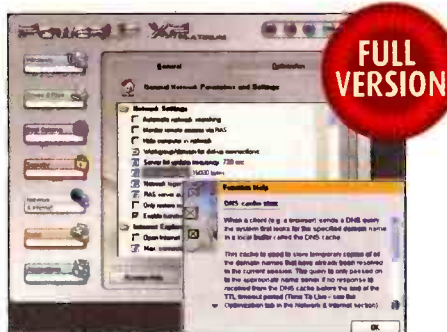
Four different menu styles
Enhanced sound device support
Simultaneous playback
Supports mono recording

20% OFF LP RECORDER 8

The latest LP Recorder comes with a visual style to match most systems (Windows 98, ME, XP, Office XP or Office 2003). There's support for recording from a wider range of devices, even if they're not strictly Soundblaster-compatible. PCs with two sound devices can use Simultaneous Playback to hear what's playing on one card, while they record on the other, while a new Mono option gets the best possible recording from non-stereo sources.

Upgrade for 20 per cent off the usual price - that's around £16 rather than £20 - at www.cfbsoftware.com/special64.htm.

Ashampoo Powerup XP Platinum



**FULL
VERSION**

INFORMATION

System requirements Windows 2000/XP,

20MB disk space

Contact www.ashampoo.com

Registration Click Get Full Version Key during installation, or from the Internet menu

Powerup XP Platinum explains even its most complex tweaks, so you'll know which setting is best for you

There are thousands of ways Windows can be tweaked to suit particular circumstances, but this isn't necessarily a good thing. Especially if you lose track of where an individual setting is located.

Powerup XP Platinum presents all the best Windows tweaks under a single interface. They're neatly categorised into common groups like Drives & Files, Boot Options and Security, making it easy to find the option you need. You can also explore and try out different settings and see what they can do for you.

The Security page, for instance, can help prevent MSN Messenger starting with Windows or Outlook Express. You can set all kinds of

restrictions for the current user, perhaps stopping them using the Registry Editor, adding or deleting printers.

Then there's the Boot Options dialogue. You could use this to have the Temp folder emptied, your cookies deleted and the My Recent Documents list cleared when Windows starts, say.

Explore the Windows section and you'll find options to change Explorer's thumbnail size and image quality. The Network & Internet button reveals many ways to optimise TCP/IP performance. The program is packed with useful options, and every one has detailed Help provided to ensure your PC will be set up correctly.

UPGRADE OFFER

**40% OFF
POWERUP XP
PLATINUM 2**

Move to the second version of Powerup XP Platinum, and you'll benefit from one-click tuning for Office, Gaming, Media Editing or Resource Optimisation. You can now create multiple desktops, running different programs on each one, and switching between them. And there are many new tweaks for the settings added in XP SP2. A 40 per cent discount on the regular price means you can upgrade for around £17: click Internet > Upgrade Infos to find out more.

VMware Server 1.0

**ON OUR
COVER
DVD**



**FULL
VERSION**

INFORMATION

System requirements Windows 2000 or

later (Server editions for full functionality),

130MB disk space

Contact www.vmware.com

Registration Click Help > Enter Serial Number > Get Serial Number

No need to partition your hard drive to try the Vista beta. VMware Server lets you run it in a window on your XP desktop

Installing a second operating system on your PC normally requires you to partition your hard drive. Run VMware Server instead and you can create a virtual machine, a software emulation of a PC. You could then install and run Linux, Dos, the beta of Windows Vista, or just about any other operating system.

Apart from the convenience of trying out other operating systems without messing up your hard drive, virtual machines also have big security advantages. If you're uncertain about a program you've downloaded, for instance, install it on a VMware Server virtual machine first. If it's buggy, infected with spyware, even viruses,

the worst that's likely to happen is it'll trash your virtual machine. Your real system is isolated from any programs running on the virtual system, and will remain safe from harm.

VMware Server can manage virtual machines on systems across your network. And you can deploy virtual machines around your network with little effort. To get the full benefit you need to be running a server version of Windows (that's Windows 2000 or 2003), with IIS running for remote management. The program will also install on standalone XP Home or Professional, and allow you to create and use as many virtual machines as your system can hold.

PCW OFFER

**VMWARE
WORKSTATION**

If you don't need the Server features of VMware Server, then take a look at VMware Workstation instead. This is smarter at memory optimisation, improving the performance of your virtual machines. It can also manage multi-tier configurations more efficiently, and can maintain multiple snapshots (records of a virtual machine state), while VMware Server is restricted to one. Workstation prices start from around £116, and you can read more, and download a trial version, at www.vmware.com.

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System requirements: Available USB 1.1 or 2.0 port. Windows 98SE/ME/2000/XP.

* An optional power adapter is available for the few laptops that limit port power.

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COMPETITION

WIN! Avanquest software, plus a 30GB iPod Video

Avanquest UK has launched a great range of iPod software and is giving PCW readers the chance to win copies of iExtend, Web Pod Studio, Pod Media Creator, DVD2Pod and Pod Presenter, as well as a stylish iPod Video to go with it!

iExtend lets PC users on the go review emails, notes, calendars and contacts, as well as back up important files. The software will locate and back up documents and file types for storage on an iPod. It keeps track of multiple file versions, and archives and restores these files once the iPod is reconnected to a computer.

Web Pod Studio helps you create quality podcasts. The program detects all audio and video devices on the computer, and a tutorial helps you through the podcasting process. A teleprompter ensures users will know what to say, and when to say it, for a flawless broadcast.

Recordings can be previewed before publishing to the web. Web Pod Studio comes with integrated RSS support, so users can download a show as soon as it is available.

Pod Media Creator lets you to compose and edit videos, touch up photos, create slideshows and mix mp3s before putting them on an iPod. You can personalise and edit movie files; cut, mix and add effects to mp3 files; edit and personalise images with photo effects; and create slideshows with text and music. Files will then be transferred to an iPod and the iTunes library will be updated.

To enjoy movies on the go, DVD2Pod lets you copy non-protected DVDs and import



create and edit slides. All files are saved to the iPod, so you always have the latest revisions, and you can even view them on your iPod.

Avanquest is giving three readers the chance to win these five software programs, along with a 30GB iPod Video to use them on. For your chance to win, answer the question below and enter online at www.pcw.co.uk/competition. The competition opens on 17 August and closes on 22 September 2006.

Which iPod title allows you to broadcast your own podcasts?

- a) Pod Media Creator
- b) DVD2Pod
- c) Web Pod Studio

This competition is open to readers of PCW, except for employees (and their families) of VNU Business Publications, and Avanquest. 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.

multiple movies onto an iPod. The software will automatically know the correct settings for your movies. Once created, simply open it with iTunes and treat it like an audio file.

Finally, Pod Presenter turns your iPod into a portable Powerpoint graphics system. You can create new presentations or edit existing slides by plugging your iPod into any computer. Pod Presenter is quickly installed from the iPod and operated from any Windows PC or Mac to



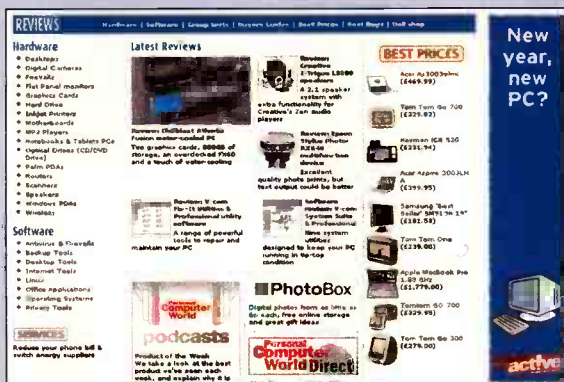
The winners of the August competition are Colin Price, who wins a Dell Dimension 9150 PC and a copy of Prey. CA Johnson, Jeff Biggs, Rachel Harding and William Rudd each win a copy of Prey.

ENTER ONLINE AT www.pcw.co.uk/competition

On the web

www.pcw.co.uk

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→ <http://labs.pcw.co.uk> → <http://www.reportlabs.com/testbed>

PCW Interactive

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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Printed and bound by St Ives (Roche) Ltd
Distributed by Marketforce (UK) Ltd, 5th Floor, Low Rise
Building, King's Reach Tower, Stamford Street, London SE1 9LS

ABC 76,020
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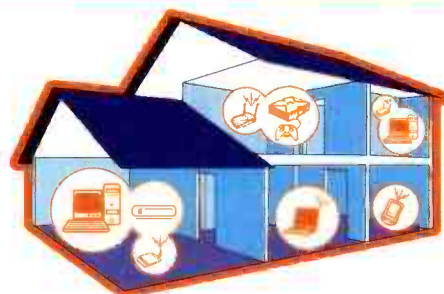
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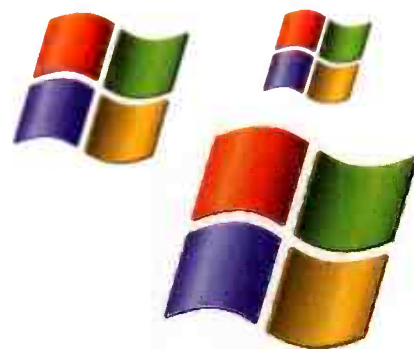


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Everyone's blogging these days – or so it seems. And when you consider how simple it is to get started, perhaps it's not surprising. We show you how to get your voice heard in the 'blogosphere'.

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Badly written drivers are among the most common causes of Windows crashes. Our experts give you some professional tips on how they work and offer advice on how to keep them under control.



There's lots more in November's PCW DON'T MISS IT...

OCTOBER 2001

The PC group test in our October 2001 issue was a testament to the recent price wars in the computing market – great news for consumers since it featured a lot of machine for the money.

The target was £799 ex Vat, and 10 manufacturers were up for the challenge. Our favourite was Atlas/Hi-Grade's Meridian A1400. It was one of only two 1.4GHz Athlon processors in this test, and it was fast.

The rest of the specification was equally impressive: a 40GB Western Digital hard drive, 8-speed CD-RW drive and a Videologic Vivid XS graphics card. It also supplied a webcam. We considered it a well-balanced system that performed well in our tests. ComputeIT's Infinity LT and the Axis 1.3 from Evesham.com won the Highly Commended awards.



We also investigated the tactics used by virus writers to trick computer users into infecting themselves. The epidemic of viruses in the late 1990s was blamed partly on the gullibility of those who received them. The Melissa virus, which spread worldwide in just 24 hours, was sent as an infected email that looked as if it came from a trusted source.

Designed to appeal to the user's sense of fun, viruses can be a game, screensaver, audio file or a web link, and are usually linked through to a malicious website, we explained. A technical expert advised all computer users to think about their online behaviour and take responsibility for their actions, urging: "Remember: you can catch a cold from a friend as well as a stranger!"

OCTOBER 1981

The Oki if800 adorned the cover of this issue of PCW, and Chris Sadler and Sue Eisenbach had the honour of putting this Japanese business microcomputer through its paces in our benchtest feature.

The fully integrated if800 combined classy desktop features, such as a colour screen and powerful key functions, with the flexibility expected of a micro system, including 64KB of Ram and a Z80a processor. However, it was a rather hefty package with a price tag

to match, weighing in at 40kg and costing an estimated £4,000.

Meanwhile, TRG Green and Gunnel Clarke investigated the development of microtechnology speech recognition. It was hoped that in future, machines would recognise carefully spoken utterances to be used for toys and military equipment.

Finally, Les Soloman of *Popular Electronics* contacted PCW about his latest invention – a robot he had trained to fetch him a beer from the fridge. However, it seemed that the android could only perform this solitary task... Ah, the simple things.



OCTOBER 1991

The Tandon DatapacII made its way on to the cover of our October 1991 issue. This portable hard drive was meant to be an alternative to carrying around a notebook, but PCW's Guy Swarbrick suspected this idea would not take off as users were already attached to their lighter, more powerful notebooks. However, he did commend the DatapacII on its ability to back up one drive to the other in just seven-and-a-half minutes.

Although an unlikely topic for PCW, the 1992

Olympic Games in Barcelona was the subject of the feature *Playing the Game* by Geof Wheelwright. Rank Xerox and IBM, major contributors to the event, became joint partners of the Olympics by supplying computer equipment and services valued at more than \$25m.

Finally, reading *Chipchat* proves that mobile phones have come a long way. It is rather amusing to read that PCW's features editor called the editor on his mobile just to say, "I just phoned so that everyone on the train would know you had a mobile phone and you're a poser."



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