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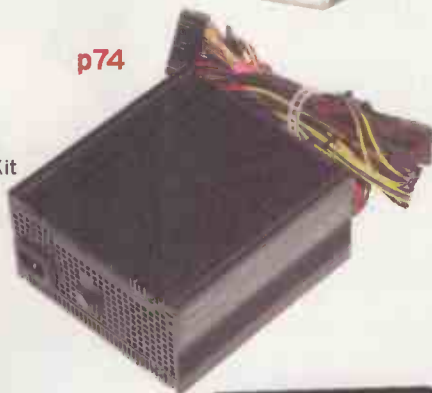
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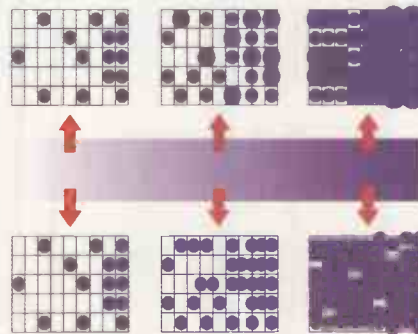
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Consumers need savvy sales staff

Rob Jones calls for PC retailers to improve training for staff selling new technologies



>> **Media Center PCs**
Take advantage of this entertainment software – see page 101



>> **Surfing selection**
If you're looking for an alternative web browser, turn to page 117

Media Center PCs feature heavily in this issue and, whatever your view on Microsoft's latest piece of software, they are beginning to attract the attention of the general public.

The last version suffered from some inbuilt weaknesses, was difficult to set up and several readers were left angry at the poor information they got from retailers. I tested it at home for about three months, struggled to get the TV to work properly with my Sky system, but once I'd finally sorted it out, was impressed with the software.

By coincidence, over Christmas a friend bought a Media Center PC for himself and his family. Although still boxed, he was proud of his purchase, if a little annoyed at the lack of knowledge displayed by the sales person in the shop he bought it from.

Come Christmas day, his kids unwrapped the family present, and there it sat until the 28 December, when he called and asked if I'd set up the system for him. A computer user at work, he is no expert and the appalling instructions in the box had left him flummoxed.

He'd bought an Advent system from PC World, where the display PC included a base unit, flat-screen monitor and speakers. All this, he was assured, came with the system. Except that they didn't, and his anger wasn't eased by the shoddy, unclear black and white quick setup instructions.

He took a trip back to PC World a few days later, hung around the same system and waited for a shop assistant to pounce, which they duly did. 'Does this PC come with those speakers?' he asked. 'Yes sir, they do,' said the assistant.

'Oh, only I bought that PC and there were no speakers in it,' he replied. The assistant checked and came back admitting he was wrong, the PC came without speakers, so he'd have to buy some, at a discount for his trouble. 'You wouldn't want those speakers anyway,' the assistant added, 'they're rubbish.'

Now Microsoft has pumped millions of dollars into marketing its whizzy operating system and PC World has spent plenty of its budget on advertising its tech-credibility, and if both really want to make money from Media Centers, this type of poor sales technique is not going to help.

Everyone makes mistakes in their jobs, but you sometimes wonder what training staff receive when selling a new technology to the public, and what Microsoft is doing to ensure PC companies and retailers know the software inside out. Because as ever, it's the paying consumers that suffer when the system won't work as expected.

Getting back to my friend and his Media Center, we still had trouble getting the TV to work and resorted to setting it up manually. But once set up, he was impressed with the capabilities of what is, in his opinion, a neat piece of kit.

The PCW office is split over whether Media Centers will be a success, but I think they will be. The prices are dropping and many people will be excited by the extra functions and capabilities that come with the software. I'm not convinced they will be the centre of the digital home, but as an all-round entertainment PC for the home, I can see them being a success. My friend's PC had inbuilt wireless, which flashed away merrily. I checked and yes, it was a secure connection, which is more than I can say about two of my neighbours. I started testing a Wanadoo Livebox wireless broadband router (a full review will appear in a later issue), and it was a timely reminder of the need for securing your wireless network. While seeking my network, the Livebox found two more unsecured wireless Lans. Finding these was too much to resist, and I tried both to see what the signal was like. Both worked fine, so two neighbours are potentially freely giving away their bandwidth – but not to me, I must add.

'You have to wonder what training staff receive when selling a new technology to the public'

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PCW uses the services of VNU Labs to perform all its hardware testing. VNU Labs' highly experienced staff use industry-standard benchmarks and methodologies to generate accurate, repeatable test results. Below you'll find the details of the most frequently used benchmarks that PCW publishes

SYSMARK 2004

Sysmark 2004 is a system productivity benchmark, designed to reflect system performance when running the most popular application software in real-world scenarios with real-world workloads.

Sysmark 2004 uses 15 applications, plus anti-virus and compression software, divided into two major categories: office productivity and Internet content creation. It runs through predefined scripts which include concurrent running of applications to test multiprocessing and multithreading capabilities.

In the office productivity scenario, the user creates a marketing presentation and supporting documents. This involves, among other tasks, receiving and detaching documents and email attachments, updating a personal calendar, querying a database, graphing up the results in a spreadsheet, making a slideshow and reviewing the results in a browser.

The Internet content creation scenario includes creating a website targeted at broadband and narrowband audiences. First, a 3D model is rendered into a bitmap while web pages are being prepared. A video movie is then edited from several audio and video clips and processed, while the rendered bitmap file is modified in Adobe Photoshop. Back in the 3D modelling software, the user exports a 3D model as a vector for later use. Once the movie is finished, the user adds special effects and image files before optimising it for faster animation. The final movie is then compressed for delivery over the Internet before the system is scanned for viruses.

Scores are calculated for each of these categories based on various sub-tasks, which are also given individual scores. Individual tasks are scored based on 'response time' – the time the system takes to complete a task initiated by the user. Responsiveness to the user is always scored more highly than the total time taken to complete a number of tasks.

These scores are based on a comparison between the test system and a reference PC with a 2GHz Pentium 4 processor, an Intel D845GBV-based motherboard, 512MB of DDR266 CL2.5 Ram, a 64MB ATI Radeon 9700 Pro graphics card, an 80GB IBM 2MB cache, 7,200rpm hard drive formatted with the NTFS file system and Windows XP SP1.

A score of 100 indicates that the system has a performance equal to the reference PC, 200 indicates twice the performance and so on. We run the benchmark at a resolution of 1,024 x 768 in 16bit colour. It is run three times, rebooting between each category.

When testing PCs and notebooks, we first configure them with standard desktop settings. This includes removing all start-up programs, automatic updates, desktop wallpaper, screensavers and proprietary system tray utilities. This is done in order to ensure the repeatability of tests.

The applications within each category of Sysmark 2004 are as follows:

Office productivity

Adobe Acrobat 5.0.5, Microsoft Access 2002 SP2, Microsoft Excel 2002 SP2, Microsoft Outlook 2002 SP2, Microsoft Powerpoint 2002 SP2, Microsoft Word 2002 SP2, Microsoft Internet Explorer 6.0 SP1, Scansoft Dragon Naturally Speaking 6 Preferred, Network Associates McAfee Virus Scan 7.0, Winzip Computing Winzip 8.1.

Internet content creation

Adobe After Effects 5.5, Adobe Photoshop 7.01, Adobe Premiere 6.5, Discreet 3ds Max, Macromedia Dreamweaver MX, Macromedia Flash MX, Microsoft Windows Media Encoder 9 Series, Network Associates McAfee Virus Scan 7.0, Winzip Computing Winzip 8.1.

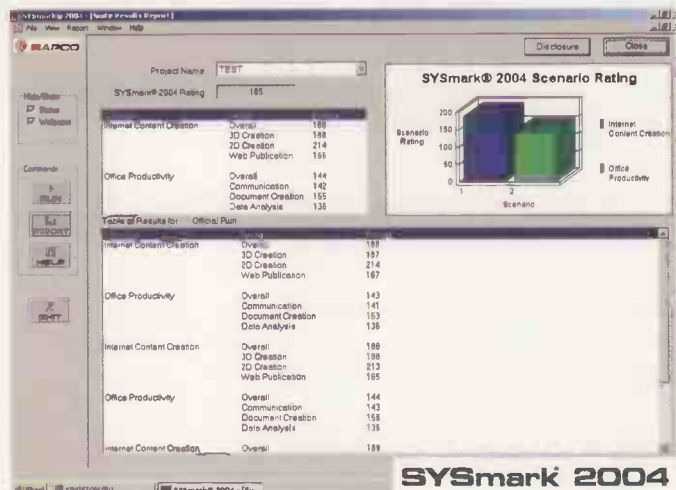
See www.bapco.com for pricing information and full details of testing strategies and methodologies.

3DMARK03

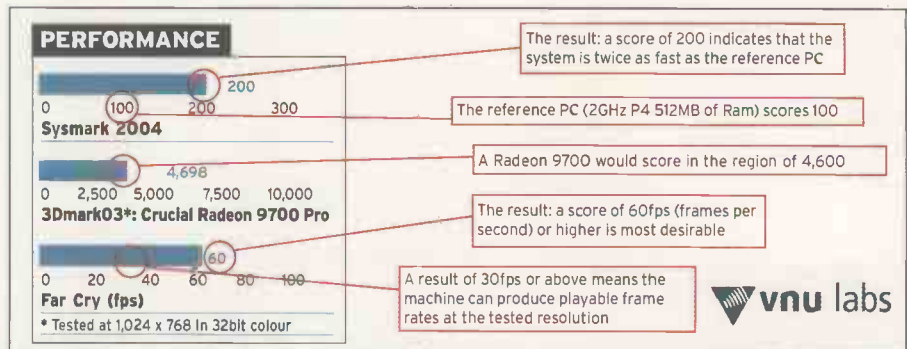
3Dmark03 consists of four tests. The first examines DirectX 7 performance; the following two are DirectX 8; and the final test is DirectX 9. While in theory this means that any DirectX 7 card could run at least part of the test and therefore achieve a score, none have the raw power to run at the speeds 3Dmark03 demands.

The result is calculated by taking an average of the frame rates from the first three tests. The results from the fourth test are included, but has a lesser bearing on the final score.

This version will only fully run on DirectX 9 compliant cards. 3Dmark03 is suitable for modern cards in the budget to mid-price ranges. For the latest cards, we use 3Dmark05. 3Dmark 2001 has now been officially retired by VNU Labs.



Sysmark 2004 tests system performance by running popular applications





Far Cry is a real challenge for modern graphics cards



PCmark04 measures memory, processor, graphics and hard drive performance

3DMARK05

3Dmark05 is the latest version of Futuremark's 3D graphics benchmark. It is a demanding test designed to stress the latest generation of DirectX 9-compliant cards, and will only work with models that support Pixel Shaders 2 and have DirectX 9c installed.

Using the same interface as 3Dmark03, the main benchmark consists of three simulated game tests. These are designed to load the graphics subsystem as much as possible, although the CPU and other components can have an effect on the overall score, which is why 128MB of video Ram and a 2GHz CPU are part of the minimum system requirements for running the tests. For systems using older graphics cards that don't meet the 3Dmark05 requirements, we will continue to use 3Dmark03.

Scene complexity has been increased to one million rendered polygons per frame on average, making this one of the toughest tests available for a modern 3D graphics card.

FAR CRY

We use the Far Cry game from Ubisoft for testing DirectX 9 gaming performance. The default demo we use is timedemo on the 'Fort'

level. Far Cry's game engine is very graphics-intensive, so it presents a real challenge to modern graphics cards. For PC and notebook testing we test at 1,024 x 768 pixels, 32bit colour, 75Hz refresh and default settings for both anti-aliasing (AA) and anisotropic filtering (AF).

When it comes to testing graphics cards, in addition to the standard test, the card is also tested at 1,024 x 768 with 4x AA and 4x AF; 1,600 x 1,200 with 4x AA and 4x AF and 1,600 x 1,200 with maximum quality settings.

PCMARK04

Part-way between application-based and entirely synthetic benchmarks, PCmark04 uses a hybrid technology, employing portions of real applications to produce realistic performance results without the overhead of installing complete software packages.

It contains four main suites of tests for measuring memory, processor, graphics and hard drive performance, as well as that of the overall system. It is also customisable, which allows user-specified tests to be configured. For more information on PCmark and 3Dmark, visit www.futuremark.com.

BATTERY TEST

To get a feeling for the length of time a notebook battery will last, we run a specific test. Based on a looping Excel Visual Basic application, the test opens worksheets, generates random numbers and pivot tables, then zooms, and adjusts the brightness and contrast of an image. The application also includes 2D animation and periodically halts to simulate natural human pauses. The running time is recorded to disk every 30 seconds until the battery power diminishes.

TEST BEDS

When testing graphics cards, motherboards, hard disks and optical drives, we use two test PCs. The first uses an Intel Pentium 4 3.2GHz Northwood C with an 800MHz front-side bus (FSB), the second has an AMD Athlon 3200XP+ using a 333MHz FSB. Each has two 512MB PC3200 modules of Corsair memory, a 120GB Western Digital hard drive with 8MB cache and a Crucial Radeon 9800XT Pro graphics card. Graphics and hard disk tests are primarily performed on the Intel system. A fresh image of the hard disk is applied to the PC before any tests begin, and the same image is then used each time for consistency.



3Dmark05 pushes modern graphics cards to their limits



3Dmark03 will be used to test older graphics cards

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The sale of IBM's PC division (see also page 19)

focused minds on the company's place in the history of computing.

A new book focuses instead on the time when British boffins had computers doing serious work five years before IBM.

All change on notebooks

A new Intel mobile platform is about to render notebooks bought at Christmas out of date. The next-generation Centrino architecture, codenamed Sonoma and originally slated to ship last year, uses a new 915GM chipset that brings the PCI Express bus to mobiles.

Sitting on this bus is the new Express Card slot, which is smaller and faster than the familiar PC Card slot and is expected to supersede it. PC Cards will not fit into the new slot and it is not yet clear whether notebooks will carry both versions.

One manufacturer was reported to be using an Express Card slot that could take legacy PC cards, but it is hard to see how this could be done simply.

The new chipset also offers Dolby-designed Azalia audio and, according to Intel mobile platforms marketing manager Andy Greenhalgh, brings a new level of onboard graphics to

notebooks. 'It is powerful enough to satisfy the needs of most notebook users, though of course some gamers will always want more,' he said.

A raft of new mobile chips will be launched with the Sonoma platform – watch our website for details. The new platform will not extend battery life though it does deliver more computing power for much the same time between charges. Intel is backing two new battery technologies that are expected to double the life between charges and should translate into products within two years.

Greenhalgh said Intel has been trying to encourage software developers to use power management facilities in hardware. 'They can actually do a lot by shutting down non-essential tasks during idle time,' he said. 'Microsoft has done quite a good job in this respect with Office 2003.'

Wifi will come as standard on the platform, as with current

Centrinos. One surprise is that tri-mode (supporting the 11a, 11b and 11g) is optional, which means that users can choose to stick with dual-mode (11b and 11g). Intel originally said tri-mode would be included as standard, which would have boosted use of 11a and helped relieve congestion in the 2.4GHz band used by the other two modes.

Wifi will be implemented on a mini PCI card and so will be easily upgradable.

On the horizon is a dual-core version of the platform, codenamed Napa. Putting two processors into one chip may sound like a recipe for pushing up power use and reducing battery life. But as Greenhalgh said: 'How often do you actually use the full power of a notebook when running off the battery? Very rarely. Dual core gives you the power when you need it and went you don't you just switch one core off.'

Clive Akass

● Dual-core roadmap – page 38

Latest from the greatest computing show in the US

Opening just as we went to press was the Consumer Electronics Show in Las Vegas, which has become the major computing event following the decline of Comdex – cancelled last year, possibly never to return. The shift reflects the growing convergence between IT and consumer electronics, though this was only one of the problems that hit Comdex.

There's some early CES news on pages 18 and 21, but Rob Jones reported directly from the show on our site at www.pcw.co.uk/ces.

We'll also print a round-up of the show next month.

Home networking and portable media players were a major theme of the show, where an entire stand was pushing the use of Ultra Wideband (UWB) as the next-generation wireless link for consumer devices. The idea is that TV sets, hifi and other devices will have low-cost UWB transceivers to swap content.



A smart microwave that reads cooking instructions

The stand was set up by the Intel-backed Multiband OFDM Alliance (MBOA); Motorola backs a rival standard and the IEEE standards body is deadlocked. Some believe the rift will mean emerging 802.11n Wifi will kill off UWB.

Wifi consumer products were also much in evidence, such as

Mio's networked Personal Video Recorder (right) that will pause TV and store programmes over a network to your PC's hard disk. It will also play DVDs, mp3 files and CDs, as well as screen digicam shots on your TV. Also at the show were a number



Mio networked PVR records TV to your PC's hard disk

of smart appliances, including an oven from TMIO (www.tmio.com) that you can control over the Internet or even from your mobile phone.

There was also a microwave oven (pictured left) that reads product barcodes, looks up the relevant cooking instructions and programs itself to follow them. You'll find more details at www.beyondconnectedhome.com.



Let us entertain you
Don't miss our group test
of Media Center PCs on
page 101



Stay cool
Keep the temperature of your
processor down with one of the
cooling devices on page 122



Windows barred to Player

Windows PCs and packaged versions of the XP operating system will be sold without Windows Media Player in Europe, following a recent court ruling. Microsoft will also have to open secret communications protocols to enable rival products to work more efficiently with systems running its software.

The decision, by a judge at the European Court of First Instance, upholds an EC ruling in March that Microsoft has breached competition rules. Microsoft has already paid a \$612m (£315m) fine imposed then – part of a total of \$5b (£2.57b) it has paid over the past two years to settle more than a score of cases against it.

Real Networks, which offers rival media players, has a private anti-trust suit still outstanding against Microsoft in the US.

Chris Parker, senior lawyer at Microsoft, said: 'We plan to



Bundle of trouble... the Media Player will no longer come with Windows

comply fully and promptly with Court's order... We have agreed with the Commission on a reasonable timetable to distribute this version of Windows [without the Media Player].

The EC version of Windows will be with PC vendors this month, and in shrinkwrapped versions by next month.

Bundling products with Windows has been a point of contention since Microsoft

tried to push its own online service as part of Windows 95. Its bundling of Windows Explorer, and packing early versions with free features, is widely seen as having killed off the first Netscape browser.

The EC ruling will make little initial difference to users: Media Player will remain available as a download and there will be no difference in the price of Windows products sold without it. This will put the Microsoft product on something like the same footing as rival players – not a trivial point at a time when the Windows desktop is becoming more important as a global marketplace selling digital content.

Ironically, this is best shown by Apple's phenomenal success in selling tracks via its iTunes player, which is bundled with Macs. And no-one is throwing anti-trust suits at Apple.

Movies coming to a phone near you

Full-length feature films for viewing on a mobile phone become available this month with the launch of a new technology from UK company Rok Entertainment.

They come on a £14.99 Multimedia Card (MMC), which is compatible with SD (Secure Digital) slots and includes a Rok media player that formats the film for the phone screen. Cards will come in 128MB and 64MB capacities and Rok marketing director Bruce Renny says there will be 'a little space left' for private use.

'The price is a little higher than a DVD but that reflects the cost of the Multimedia Card,' he said.



You will not be able to save money by swapping films on the card. 'Film companies want to be sure that their property is safe,' said Renny.

The cards will be available initially only for Symbian-based phones such as the Nokia 7710 or the Siemens SX1 (pictured) but other platforms will be supported shortly.

Deals announced by Rok reflect content light enough to be tolerable on a tiny phone

screen: it has signed up Aardman Studios, creators of *Wallace and Gromit*; Indestructible Studios, which owns *Captain Scarlet*; and hit TV shows such as *Red Dwarf*.

Rok faces competition from dedicated portable players that can play recorded content. And



Movies on the move... showing on a Siemens SX1 mobile phone

new affordable 1GB SD cards – Transcend has just announced one costing €113 (£78) – could also encourage viewing of recorded content on mobiles.

The question for device makers is whether video use will popularise products with larger screens, with tiny phones giving way to phone-enabled PDAs.

www.rokplayer.com

>> Talking phone

Samsung unveiled the p207 phone, that will convert speech into text for sending messages. Another model, the a890, allows you to write frequently used messages, such as 'call me', and then activate them simply by speaking the words.

'This new technology will significantly change how people interact with their wireless phones,' said Peter Skarzynski, senior vice-president at Samsung.

>> Good wheeze?

Negative advertising has finally got to the mobile-phone market, with the release of what is described as the most annoying ringtone in the world, which is saying something. It is the sound of someone coughing and you can get it at www.benylincough.co.uk. And you don't need to cough up any money for it.

>> Mips chips

AMD has launched a new Au1200 mobile processor designed for portable media players and based on the Mips architecture – unlike Intel chips in this market, which have ARM-based cores. A number of manufacturers have said they will use the Au1200, including PVR specialist Tivo, which is developing a range of portable media players.

>> PC piracy tax

PC buyers in Germany will have to pay around £8 more for a PC after a court ruling that a computer is like a video blank tape in that it can be used to pirate content and is therefore liable to a levy to recompense copyright owners.

>> Spycam alert

Thousands of security cameras are accessible through a simple Google search because their links have not been password protected, warns a search expert. For full story, see www.pcw.co.uk/news/1160289.

Gadgets galore
on show at CES

News of some exhibits at the Consumer Electronic Show (see page 16) was available before the show opened as we went to press. The DPP-TV (left)



from Imagebank is basically a portable CD-RW burner with a 12-format card reader that lets you transfer pictures from any digital camera direct to a CD. It also lets you view and edit the pictures on a TV. Details are at www.mymediagear.com.

Parrot (www.parrot.biz) showed its CK 3300 hands-free phone kit (below) for cars. It supports voice-activated calling and has a GPS receiver that works with any navigation



software and can link to any Bluetooth-equipped phone or PDA. Prices were not announced at press time.

A \$49 (£24) software package called Singing Coach is said to enable even the 'hopelessly tone deaf' to sing better. It tracks pitch and tempo to provide visual feedback to a singer and comes with a headset and a selection of songs. Details are at www.carryatune.com.

Play PC games to stay fit

A US company has come up with an answer to fears that computer games are encouraging unfitness and obesity. It has developed an exercise machine that doubles as a controller for games consoles.

The Kilowatt 'isometric trainer' replaces the joystick with what the manufacturer, Powergrid Fitness, calls a resistance rod. The device measures the force applied by the player rather than the motion of the rod.

The player sits semi upright, feet apart and tugs or pushes the rod which has a limited range of movement.

Designer Daniel Drury claims this 'recruits large



muscle groups to engage in an activity that requires fine motor co-ordination.'

Drury claims that the Kilowatt 'provides an innovative and efficient means for

Burn energy by the Kilowatt: using this device as a joystick is said to tone up the heart and muscles

stimulating muscle development. In addition, increases in heart rate, breathing rate and energy expenditure are similar to traditional cardiovascular exercise'.

The device, shown at the Consumer Electronics Show in Las Vegas, is said to support the Playstation 2, Gamecube and Xbox games requiring an analogue joystick.

There are two models, the Sport and the Pro, costing respectively \$1,200 and \$800. www.powergridfitness.com

Whatever happened to desktop video?

The oddest aspect of the hype around 3G is that it is plugging mobile video calls as the 'next big thing' when they have yet to take off big-time on fixed links.

Videoconferencing is routine in some companies, mostly using products from Polycom. Now Polycom is trying to spread its use with the release of a software codec called PVX that it says will bring enterprise-class video links to the desktop, either over the web or a local network.

Prices start at \$149 (£77 approx) per user, so is it worth it? Clearly your choice of hardware will have a big effect

on quality. We tried PVX using Plantronics DSP headsets and Creative Labs' Vista Pro webcams at each end.

Setup involves reconfiguring your router and it is not for the faint-hearted. We managed to set up a web link of sorts but only one-way. This proved to be the case even with Polycom's test site, though here at least we got good video with little jerkiness

The PVX interface is friendly – but setup could be easier



that could be viewed happily at full screen.

PVX supports video at up to 30 frames per second, rich document sharing, AES encryption and 14KHz audio. An additional module lets you videoconference using Microsoft Netmeeting.

To be fair, the software is intended to be sold through specialist installers who would know the problems. But desktop video will have to get a lot friendlier before it goes mainstream.

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China flexes IT's muscles

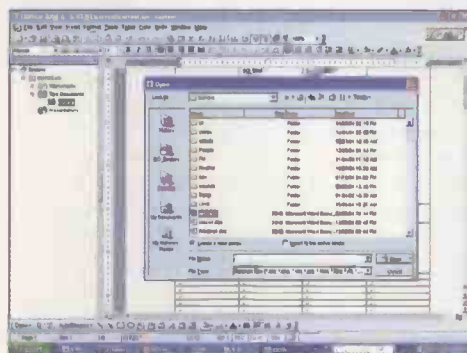
The sale late last year of IBM's PC division to Chinese giant Lenovo (see below) was not the only sign of an ominous shift of the IT industry's centre of gravity towards the emerging economic superpower and its neighbours.

Networking giant Cisco, blaming increasing competition from Far Eastern manufacturers, announced that it is to move from selling individual devices to becoming a systems provider – providing solutions rather than products. Ironically this will put it into direct competition with IBM, whose China deal reflects a similar shift.

The software industry, itself moving towards providing services rather than products, is also feeling the eastern wind of change. Palmsource, the software spin-off from Palm (now known as Palmone), announced that it is buying China Mobilesoft (CMS), a developer of software for mobile phones.

The deal gives Palmsource an entry into the Chinese market; but, perhaps more significantly from the West's point of view, the company also announced that it is to implement the PalmOS Interface, its biggest asset, on the Linux operating system (see story right).

China is already a big Linux user and may provide a critical



Evermore Office... adopted by government ministries

Linux and is said to be much more tightly integrated than the Microsoft product.

The spreadsheet, word processing, and business-graphics functions

mass of applications and users that could make open source a major player in the mobile and desktop markets.

Revenues remain relatively small even in the server markets in which open source holds a greater sway: IDC reckons money from Linux licences, predominantly for back-end systems, will grow to just \$68m (£36.1m) by 2008 in the Far East (minus Japan). But licence revenues are not a direct measure of how many people use nominally free open-source code.

Microsoft faces a separate threat from clones of its Office products. A Chinese company called Evermore launched what it called an advanced English-language edition of its Evermore Integrated Office (EIS) into the US, Japanese and Chinese markets. Written in Java, this runs under both Windows and

are accessible from a single module rather than being separate programs; and linked data is said to be more easily synchronised in EIS than Office – changes to a spreadsheet, say, can easily be reflected in a table in a word processor document.

EIS can also create pdf files natively, whereas in Microsoft Office they require a plug-in.

China is an opportunity as well as a threat, as the Palmsource deal shows, and there is no serious short-term challenge to Windows and Office.

But governments and other organisations worldwide are seeking ways to cut enormous annual maintenance payments to Microsoft. EIS has already been adopted by important Chinese ministries, which could be the thin end of a wedge. And wedges don't get much bigger than China.

Linux mobiles to get Palm front end

China Mobilesoft (CMS), the company acquired by Palmsource (see right), sells mobile-phone software based around mLinux, a version of the open-source operating system tailored for devices with low processing power.

Palmsource will be able to give this code a front end with the kind of loyal, even fanatical, user base enjoyed by Apple's MacOS. In fact Apple made a similar move with MacOSX, which gave the much-loved Mac look and feel to a Unix code base.

Linux mobiles have not been big in Europe, but they are popular in the Far East. The CMS deal will not only give Palmsource access to this market, with the chance of widening it, but also to that for basic mobiles, which far outsell smartphones.

Emulation code should allow legacy Palm apps to run on the new operating system. Palmsource chief executive Dave Nagel, said applications written for Cobalt, the latest version of the Palm OS, should require only a recompile to run natively. The Linux code will not supersede existing Palmsource operating systems but in the Far East it could stiffen competition for Symbian and Microsoft.

● Palmsource made a better-than-expected \$2.1m profit in the three months up to November, thanks to a \$2.6m settlement with licensee Acer.

IBM buyer Lenovo joins major league in PC sector

The £900m deal to sell IBM's PC hardware business to Lenovo will make the Chinese manufacturer the third biggest PC vendor in the world, behind Dell and HP. In one sense it will make little difference because, like many other big vendors, IBM already contracts out the making of many of its branded products to the Far East.

Even Taiwanese firms, which make many computer products sold under US and European brands, have exported much of their manufacturing to China.

The IBM deal also reflects the commoditisation of PCs, which will increasingly be mass

produced with relatively few versions and sold on a 'pile 'em high and sell 'em cheap' basis. IBM has been unable to make money on its PCs in this climate: its PC division has lost something like \$1b since 2001.

It remains to be seen if the deal will establish Lenovo, formerly known as Legend, as a major brand in the West. IBM will still sell machines under its well-known brands, such as Thinkpad, with Lenovo as a 'preferred supplier'.

But the deal has huge symbolic significance, with one of the bulwarks of US capitalism selling off its heritage to a



former bastion of communism (see page 38). Chuanzhi Liu, current chairman of Lenovo Group, says he's excited by this breakthrough in the company's journey towards becoming an

Motherboard production at QDI, a Shenzhen-based company owned by Lenovo

international player. 'Over the past 20 years, I've watched Lenovo develop into the leading IT company both in China and throughout Asia. Since the beginning, however, our unwavering goal has been to create a truly international enterprise,' he said.

IBM chief executive Samuel Palmisano said: 'In Lenovo we have a partner with powerful competitive capabilities in China and Asia and in consumer and desktop PCs.'

>> **Porn spotter**

A £9.95 browser plug-in is said to recognise downloaded porn pictures on a PC and replace them with a 'neutral image'. Ishield is designed to give parents and people who run public-access PCs control over what can be downloaded. It works with Explorer and will support other browsers shortly. There's a trial version at www.vivldfish.co.uk.

>> **Fair hypocrisy?**

People who are happy to pay a premium for Fair Trade produce, to ensure growers get paid a fair price, are not so ethical with regard to pirated goods, according to a survey commissioned by Microsoft.

Just over four in 10 (43 per cent) of those questioned owned goods they knew to be counterfeited. Nearly one in four (23 per cent) admitted using pirated software.

Yet three in four people agreed that they would hate their own ideas to be stolen – evidence of a double standard, Microsoft said.

>> **Linux aid**

A software tool that is said to ease migration from Windows to Linux PCs has been released by Alacos.

Linux Migration Agent Professional helps transfer documents, email and settings to the new environment. It costs from \$29.95 (£15.40) per user.

www.alacos.com

>> **Rich pickings**

You can translate multiple rich-text format files into web pages at the click of a button with the aid of RTF to XHTML Converter 1.15 for Windows. It costs \$34.50 (£18.50) from www.sautin.com.

>> **Web record**

Traffic per second through the London Internet Exchange (LinX), the world's biggest web exchange, hit a record 50Gbits on Boxing Day and 45Gbits on Christmas Day – more than double the figures for last year. Figures for the three previous weekends averaged at 62Gbits.

Anger over spam revenge

Web portal Lycos dropped a 'spam the spammers' scheme (see PCW February, page 16) shortly after launch following a barrage of criticism. Its free 'Make Love Not Spam' screensaver used PC slack time to bombard the sites of known spammers in a revenge Denial of Service attack.

Critics said the scheme was clogging the web and the clincher came when it was hijacked by a Trojan keystroke-logger that could be used to steal passwords and other sensitive information.

The Trojan was found in an email attachment labelled 'Lycos screensaver to fight spam.zip'. 'The file inside the attachment is not the famous Lycos "Make Love Not Spam" screensaver,' warned Katrin Tocheva at F-Secure's Laboratory. '...It is a RAR SFX archive that has an embedded key-logger inside.'

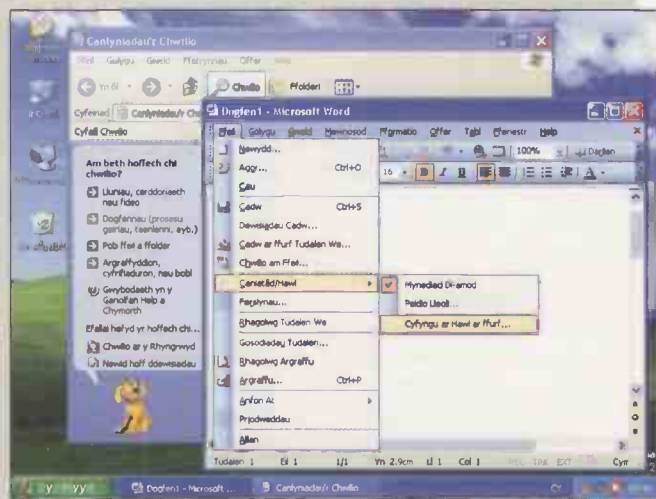
Lycos Europe claimed spammers designed the Trojan to deter people from using the screensaver. But it stopped distribution of the screensaver, saying that it made its point.

The plan was to take up 95 per cent of the bandwidth of spam sites, reducing them to a crawl but inflicting no real damage. More than 100,000 copies of the screensaver were downloaded.

But analysts Gartner produced a scathing report on the scheme. 'Companies can fight spammers in more effective ways. Legal action is commonplace. For example... Microsoft filed seven lawsuits against alleged spammers under the US Can-Spam Act for failing to label sexually explicit messages.'

Windows in Welsh

There'll be a welcome on the hillsides for Microsoft's latest venture, a Welsh implementation of Windows. Not being Welsh speakers ourselves, we were bemused to discover that the venerable language had words for every menu and option except, apparently, the word Help. Could those sturdy ancients have considered themselves beyond help – or were they too proud to ask for it? More likely Microsoft and their partners at the Welsh Language Board didn't want students to get too frustrated having to consult a dictionary to find instructions on how to *cadw* their *ffell*.



Alert issued as NT4 hits buffers

People using Windows NT are warned that free support for all versions ended on 1 January. Some help and 'critical' security patches will be available for two years, but only to companies paying an extra flat fee.

Support for NT4 Workstation ended in June but continued until 31 December for the server version.

Microsoft is advising people using the server software to upgrade to Windows Server 2003, which it says is inherently more secure and cheaper to run.

Peter Houston, senior director of Windows serviceability, says it runs 160 per cent faster than NT4 as a file server and 345 per cent faster as a domain server. 'Customers need to upgrade to newer Microsoft offerings to be as secure as possible from



Free support for Windows NT finally came to an end on 1 January

today's sophisticated Internet-based attacks.'

As many as eight in 10 UK companies still use NT and many are reluctant to migrate to an

operating system that might be better but could cause glitches in complex systems. But Robert May, managing director of IT consultancy Ramsac, warns that it is a bad idea to underpin an IT infrastructure with unsupported software. 'Not only are firms opening up their systems to possible attack, they are also in danger of contravening supplier guidelines, an increasing number of which require partner companies to operate robust and reliable IT systems.' Ramsac offers a free NT audit for concerned companies and Microsoft has a number of tools to aid migration.

NT (New Technology) ousted Novell Netware as the dominant force in the world's local networks after its launch in 1996 and helped break the dominance of Unix in enterprise systems.

Type with your trousers

A UK company has developed a fabric that could turn your trousers into a keyboard. The five-layer material, between 0.6mm and 1mm thick, has already been used in roll-up keyboards supplied to Logitech and Vodafone for use with specific devices.

But developer Eleksen, based at Pinewood Studios in Buckinghamshire, showed a version at the Consumer Electronics Show in Las Vegas that can be used with any Bluetooth-enabled device.

The fabric, impregnated with carbon, can register where and how hard it is being touched



Bluetooth fabric keyboard... could be built into clothing, such as trousers

and can provide sensitive surfaces between 2.5cm and 1.5metres along either edge.

One use under consideration is for wall coverings and posters

that control information displays. Chief technology officer Nigel Gilhespy says the washable fabric could also be used in clothing – in the upper part of the trouser leg for instance, so that you can literally use your laptop as a keyboard.

The fabric has also been used to cover a joystick, providing a smart surface that offers an extra layer of control. Gilhespy says the company has also been

approached by what he calls 'the sex industry', whose interest in the fabric is perhaps best left to the imagination.

www.eleksen.com

...but don't get too heated about it

While on the subject of trousers (see story above), you may have noted with some alarm a report last month alleging that prolonged notebook use appears to reduce male fertility. The problem stems from the fact that the machine tries to use your thighs as a heatsink, causing a phenomenon known in the industry as hot legs.

In fact male sperm counts have dropped by almost a third in a decade, according to a study done in Aberdeen. Nobody knows why but drug use, pesticides, chemicals and radioactive material are believed to be factors.

Where notebooks fit in is anyone's guess, but marketeers were not slow to spot an angle. Hardly was the news off the presses before we got a press release about a product called the Lapdesk (pictured below) that could 'save your family jewels from a roasting'.

It is a tray, designed for a laptop and, if you are really worried, you can find out more

at www.port-able.com. We already had a slightly more elaborate 'laptop desk' in the office, but no-one could work up the enthusiasm to try it. It costs \$30 (£15.50) and has a swivel base so you can turn the laptop round without moving your legs. You can find more details at www.laptopdesk.net.



HD-DVD and Blu-ray shape up for format war

The battle between Blu-ray and HD-DVD next-generation optical storage is becoming an all-out format war, with both sides claiming victories. No sooner had the Blu-ray camp, headed by Sony, announced the backing of Walt Disney Studios, when the rival HD camp cited support from Paramount, Universal and Warner Brothers studios.

Sony was reported to have been rebuffed by HD stalwart Toshiba in a bid to get a compromise deal that would avoid confronting consumers with yet another confusing choice of technologies.

Both systems use the shorter wavelength of blue-laser light to achieve high data densities.

Blu-ray will store 27GB per layer, and has multiple layers on its read map; but it will not be compatible with today's DVD format. A Blu-ray drive is expected to form part of Sony's Playstation 3 games platform when it launches in 2006.

HD-DVD drives store 20GB per layer but are backwards compatible with DVD. In December 2004 NEC announced that it had developed a drive with a single head able to read HD-DVD, DVD and CD discs. Toshiba and Memory Tech have developed discs capable of recording both DVD and HD-DVD; JVC has announced a similar disk for Blu-ray.



>> UK in depth

The Ordnance Survey used to boast that Britain was the best-mapped country in the world, though that was in the days before technology made things a little easier for cartographers. Now Intermap has produced what it claims is the most accurate digital contour map of Britain. It is derived from data produced by a specially equipped Learjet flying over the country at night, using radar to record every five-metre change of height in the land below. The data is sold under licence.

www.intermap.com

>> Worm turns

A British 16-year-old who released the Randex worm, turning infected machines into potential spam-generating 'zombies', has received a suspended six-month sentence at South Cheshire Juvenile Court in Crewe.

He was arrested, along with two Americans and a Canadian youngster, in a combined operation by Scotland Yard, the FBI and the Royal Canadian Mounted Police after attempts to sell networks of infected PCs to spammers and hackers seeking to attack websites.

>> £500 laptop

Evesham Technology has launched 15in notebook for £499.99 inc VAT. The Quest Explorer is built round an AMD Sempron mobile processor and Windows XP Home Edition and has 256MB of DDR Ram, a 40GB hard drive and a DVD/CD-RW drive.

www.evesham.com

>> Online boom

BT has signed up four million wholesale broadband customers and is connecting a new customer every 10 seconds, it announced last month.

Easy network setup

Three networking vendors have teamed up to produce a technology making it easy to set up secure wireless networks.

The Secure Easy Setup (SES) from HP, Linksys and chipmaker Broadcom means new devices can be set up instantly on a network by pressing a button on a router. This will establish a private conversation with the router, enabling Wireless Protected Access (WPA) security and passing on the Service Set Identifier (SSID – in effect, a password for network access).

It will be available in Linksys and HP routers, and other makes using Broadcom chips, but it may spread to other vendors. 'We'd like to see it standardised,' said Gordon Lindsay, Broadcom product manager in the UK.

An estimated eight in 10 wireless network users do not activate the security measures. SES was expected to be launched at the Consumer Electronics Show in January in Las Vegas.

Super Wifi hits 1Gbit/sec

Researchers have used an advanced form of the technology used in Wifi to achieve a record wireless throughput of 1Gbit/second.

The range was about 5m across a lab, but researchers say it could have reached further. It used orthogonal frequency division multiplexing (OFDM) modulation and multiple in multiple out (Mimo) technology.

Both are expected to be used in next-generation 802.11n Wifi, which should appear in products towards the summer of 2006 and will have data rates in excess of 100Mbps/sec.

Mimo uses multiple aerials at the transmitter and receiver ends. These transmit different data flows over the same frequencies, like different groups of people holding separate conversations

in one room. Clever processing at the receiver can separate the data from the different sources, increasing the throughput a lot.

The technology has only been possible since the availability of high-powered digital signal processing. One breakthrough made by the researchers – from the Fraunhofer Institute for Telecommunications (Heinrich Hertz Institute), working in collaboration with Siemens and Germany's Institute for Applied Radio Technology – was to identify time-critical steps in the signal processing and offload them to a logic array optimised for the task.

Volker Jungnickel of the Fraunhofer Institute said speeds in excess of 1Gbit/sec had been achieved wirelessly before but only using methods requiring

line of sight and directional aerials. These are easily blocked and less suitable for mobile links because the aerial must keep pointing in the right direction.

'Our link needs no line of sight or tracking... and so it allows for true mobility of the user. This is really novel at such high data rates.'

It shows that the technology underlying 11n Wifi is feasible and scalable to much higher data rates – although 11n works in bandwidths of 20 or 40MHz, whereas the experimental system used 100MHz.

Mimo technology is in use in 'pre-n' products that offer high bandwidth between compliant devices that don't conform to a standard, although they default to Wifi when talking to devices from other manufacturers.

Wimax debut

The first chip to comply with the IEEE 802.16-2004 Wimax standard has been launched by Wavesat, the smallest of the three main developers of Wimax integrated circuits.

According to Phillip Solis, senior analyst for wireless connectivity at ABI Research, the development marks a 'milestone' in the development of Wimax infrastructures. An ABI study noted that Wavesat had achieved its stated goal of beating rival Wimax firms Intel and Fujitsu to be first to market with IEEE-compliant silicon.

Web terminal hits the Dect

US Wifi vendor Westel is to launch this device in the UK in 2006. It is a combined Windows CE-based web terminal, 11g-plus Wifi access point, four-port 10/100 switch that can optionally be used as a DSL modem – cable users disable this if necessary.

It also acts as a Dect base station that can be used with a standard home wireless phone or a Voice-over-IP model. The built-in phone can be used in either mode. Westel expects it to be popular with service providers and users, as it lets them communicate with users even if the DSL link is down.

Prices have yet to be announced but are likely to be aggressive, as Westel, which is less known in the UK than it is in the US, is keen to establish a brand presence here.



This combined Windows CE-based web terminal also acts as a Dect base

Firefox email

The Mozilla Foundation has released the Thunderbird 1 email client, a companion to its Firefox 1 browser (see page 119). It includes adaptive junk mail controls, integrated RSS news and blog reader and email management tools. www.mozilla.org

Spam peak

Spam peaked at 95 per cent of email traffic in November, and the average was 83 per cent – more than eight out of 10 messages, according to Email Systems. www.emailsystems.com

3G successor triples data rates

Live tests of mobile calls delivering data at three times the speed of 3G networks have been completed by O2 and Nortel. They used a technology known as High Speed Downlink Packet Access (HSDPA), designed to offer services including DVD-quality film and video streaming, high-resolution interactive gaming, multimedia music tracks, 'push-to-watch' services and access to large email attachments.

HSDPA is being pitched as a successor to today's 3G, the

Universal Mobile Telecoms System (UMTS) wireless standard used across Europe, Japan and North America.

In the test calls, a 5MB music file was downloaded in less than 15 seconds, and a 45MB mpeg video file was downloaded in approximately three minutes.

The test calls were completed as a first phase of planned Nortel deployments across portions of O2's European UMTS network.

'We are looking forward to deploying this broadband technology in Europe, and to delivering a newer and better experience to our business and consumer customers,' said Dave Williams, group chief technology officer at O2.

Commercial field trials of the Nortel HSDPA system will begin in the second quarter of 2005 and are expected to include an integrated, commercial data card product.

Robert Jaques

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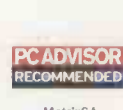
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| • 128MB FX 6600 to 128MB FX 6800GT | £50 EX VAT | £58.75 INC. |
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Mighty performance... MESH wins hands down

PC Pro -
November 2004



Matrix M 3000+ AGP



Direct e1025

Great Value AMD Athlon™ 64 Powered PC

- AMD Athlon™ 64 Processor 3000+ with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
- ASUS K8V-MX Mainboard, 1600MHz System Bus, SATA
- 512MB DDR 400 Memory
- **Now with 160GB Serial ATA (150mbps) Ultra Fast Hard Drive**
- Direct 2D/3D onboard graphics (SMA*)
- 17" TFT Analogue Flat Panel Monitor
- Sony 52x CD Re-Writer & 16x DVD-ROM Drive (combo)
- 5.1 Surround Sound 6 Channel Audio
- Creative Sound Blaster SBS260 Speakers
- Microsoft Works 8.0 Plus 60 Day Microsoft Office Trial
- Software: Pinnacle Instant CD/DVD Player and Studio 9 SE
- Plus M Series Additional Features (see left column)



Matrix M 3200+ AGP



Direct e1030

AMD Athlon™ 64 Powered PC for Home/Office

- AMD Athlon™ 64 Processor 3200+ with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
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- 512MB DDR 400 Memory
- 250GB Serial ATA Ultra Fast HDD (150mbps, 16MB buffer)
- Direct 2D/3D onboard graphics (SMA*)
- 17" TFT Analogue Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- 5.1 Surround Sound 6 Channel Audio
- Creative Sound Blaster SBS260 Speakers
- Logitech Cordless Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 Plus 60 Day Microsoft Office Trial
- Software: Pinnacle Instant CD/DVD Player and Studio 9 SE
- Plus M Series Additional Features (see left column)

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INC. VAT

£509.79

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GREAT VALUE UPGRADES

- | | | |
|---|------------|-------------|
| • Athlon™ 64 3000+ to Athlon™ 64 3200 Processor | £30 EX VAT | £35.25 INC. |
| • 160GB to 250GB SATA Ultra Fast Hard Drive | £50 EX VAT | £58.75 INC. |
| • Combo Drive to Sony Multi-Format 16x DVD burner | £30 EX VAT | £35.25 INC. |
| • Upgrade to Cordless Keyboard & Mouse | £19 EX VAT | £22.33 INC. |

£699

INC. VAT

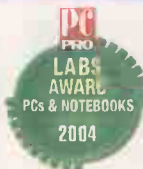
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EX. VAT

GREAT VALUE UPGRADES

- | | | |
|---|-------------|--------------|
| • Athlon™ 64 3200+ to Athlon™ 64 3400 Processor | £30 EX VAT | £35.25 INC. |
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Matrix Series PCs

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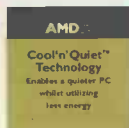
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Issue 03.05



Matrix A PCX Series Additional Features

The latest Athlon based systems featuring PCI Express 939 pin technology

- > Midi Tower Case & 350W PSU > Network Ready
- > Internet Ready V.92 56Kbps data/fax/voice modem
- > 3 Year B-to-B, Parts & Labour Warranty (see terms)

On-Board features include

- > DDR 400 > 10/100/1000 Ethernet LAN
- > 6 USB 2.0 ports > FireWire
- > 1x Serial ATA connectors supports Raid 0/1
- > 1 Serial port > 1 Parallel port
- > 1 Audio I/O & 1 RJ-45 jack
- > Slots Include 3x PCI
- > Slot PCIEX16 x1



The Next Generation of Matrix PCs

MESH launch their new range of AMD PCI Express PCs

Matrix A PCX Series.

PCI EXPRESS™



Looking to take your new PC to the next level in performance? The Matrix A PCX series has it all.

Features such as the NVIDIA nForce4 Ultra chipset and the latest PCI-Express™ bus technology, deliver top performance, feature-rich multimedia computing, and security protection for the most demanding PC users.

Incorporating the much heralded Asus A8N-E motherboard, the Matrix A PCX Series enhances the MESH range of AMD Athlon 64 PCs meeting tomorrows 3D gaming and multimedia applications.

Finally PCI Express has come to the MESH Matrix Series - The ultimate 64-bit platform for single-GPU desktop PCs.

nForce4 Ultra features include

- PCI Express Support
- SATA Support
- Support 3 Gb/s
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- NVIDIA ActiveArmor
- NVIDIA Gigabit Ethernet

4 NEW Matrix PCX Series PCs

SOFTWARE INCLUDED

FREE 60 Day Trial - Microsoft® Office

All MESH PCs are now shipping with a FREE 60-Day trial Version of Microsoft® Office - Student & Teacher Edition, with the latest fully-functional versions of Microsoft® Office Word, Excel, Powerpoint & Outlook 2003.

The following software comes with featured Matrix & Elite PCs (excludes special offers & reviewed PCs)

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- >> Pinnacle Studio 9 SE Video Editing Software
- >> Pinnacle Instant CD/DVD + Inter Video WinDVD
- >> eTrust Antivirus v.7 - 90-day trial

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Games Bundle 4 Includes Nostromo Speedpad, Joystick and 3 cutting-edge games:

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- > Colin McRae Rally '04

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MESH Matrix A PCX Series | PCs ideal for the Home/Office/Power User



Matrix A 3200+ PCX

Direct e1040

Best Buy AMD Athlon™ 64 PCI-Express Powered PC

- AMD Athlon™ 64 Processor 3200+ with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
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- 512MB DDR 400 Memory
- 200GB Serial ATA Ultra Fast HDD (150mbps, 16MB buffer)
- 128MB ATI X600 Pro PCI Express with TV out and DVI
- 17" TFT Analogue Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- 5.1 Surround Sound 6 Channel Audio
- Creative Sound Blaster SBS260 Speakers
- Logitech Cordless Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 Plus 60 Day Microsoft Office Trial
- Software: Pinnacle Instant CD/DVD Player and Studio 9 SE
- Plus Matrix A PCX Series Additional Features (see left)



Matrix A 3500+ PCX

Direct e1045

Special Offer AMD Athlon™ 64 PCI Express PC

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- Microsoft® Windows® XP Home Edition
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- 512MB DDR 400 Memory
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- Now with 128MB NVIDIA 6600GT PCI Express with TV out and DVI
- 19" TFT DVI Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- 5.1 Surround Sound 6 Channel Audio
- Creative Labs Inspire 5.1 - P5800 Speakers + Subwoofer
- Logitech Cordless Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 Plus 60 Day Microsoft Office Trial
- Software: Pinnacle Instant CD/DVD Player and Studio 9 SE
- Plus Matrix A Series Additional Features (see left column)



£749 INC. VAT £637.45 EX. VAT

GREAT VALUE UPGRADES

- | | | |
|---|-------------|--------------|
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£999 INC. VAT £850.21 EX. VAT

GREAT VALUE UPGRADES

- | | | |
|--|-------------|--------------|
| • Athlon™ 64 3500+ to A64 4000+ Processor | £250 EX VAT | £293.75 INC. |
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- **Now with 2x 256MB NVIDIA FX 6600GT (SLI Technology Dual VGA)**
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- Sony Multi-Format 16x Dual Layer DVD Writer**
- Creative Labs Sound Blaster Audigy 2 ZS
- Creative Labs Inspire 7.1 - T7900 Speakers + Subwoofer
- Logitech Cordless Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 Plus 60 Day Microsoft Office Trial
- Software: Pinnacle Instant CD/DVD Player and Studio 9 SE
- Midi case, Plus Matrix A Series Additional Features (see right column)



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The platform for high performance NVIDIA® SLI™ multi-GPU solutions. Supports two NVIDIA SLI-ready graphics cards. High-performance PCI Express design for increased 3D graphics performance. Single x16 graphics slot supports all PCI Express graphics cards.

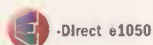


Mighty performance... MESH wins hands down

PC Pro - November 2004

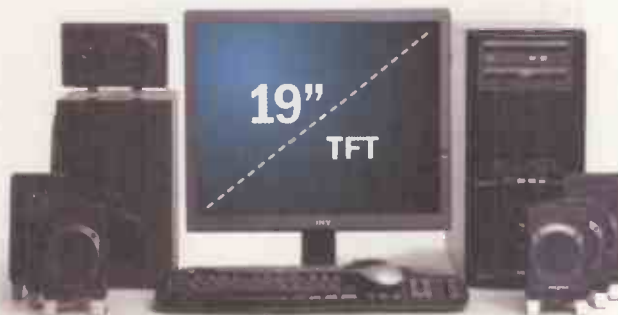


Matrix A 4000+ PCX



Leading Edge Power PC with PCI Express Technology

- AMD Athlon™ 64 Processor 4000+ with HyperTransport™ Technology
- Microsoft® Windows® XP Home Edition
- **New ASUS A8N-E PCI Express 939 Mainboard**
- 1GB DDR 400 Memory (2x 512MB)
- 300GB Serial ATA Ultra Fast HDD (150mbps, 16MB buffer)
- **Now with 128MB NVIDIA 6600GT PCI Express with TV out and DVI**
- 19" TFT DVI Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- 5.1 Surround Sound 6 Channel Audio
- Creative Labs Inspire 7.1 - T7900 Speakers + Subwoofer
- Logitech Cordless Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 Plus 60 Day Microsoft Office Trial
- Software: Pinnacle Instant CD/DVD Player and Studio 9 SE
- Midi case, Plus Matrix A Series Additional Features (see left column)



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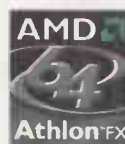
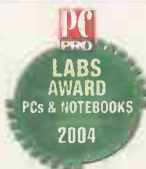
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| • Athlon™ 64 4000+ to FX 55 Processor | £100 EX VAT | £117.50 INC. |
| • 128MB 6600GT to 128MB ATI X800 PF | £160 EX VAT | £188.00 INC. |
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Only Microsoft® DirectX® 9.0 Shader Model 3.0 and PCI Express GPU in its class - PCI Express support delivers 8GB/sec of raw graphics bandwidth



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PCI Express 939 pin SLI technology

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- > 3 Year B-to-B, Parts & Labour Warranty (see terms)

ABN-SLI Deluxe On-Board features include
> SATA 3Gb/s > Dual RAID > Dual Gigabit LAN
& AI NET2 > NV Firewall > Memory - support max.
4GB DDR400 > Expansion Slots - 2 x PCI Express x16
slot > SLI mode : x8, x8 - Default (Single VGA) mode:
x16, x1 - 2 x PCI Express x1, - 3 x PCI > 1 x Parallel
> 2 x RJ45 > 1 x 1394 > 6 x USB 2.0/1.1
> 8-Channel Audio I/O > 2x FireWire
> 8x Serial ATA connectors supports Raid 0/1
> 1 Serial port > 1 Audio I/O & 1 RJ-45 jack

Optical Storage Technology by Sony

NEW Matrix PCX Series PCs

5

IYAMA 17" LCD TV/Monitor

17" ProLite C171WT LCD TV

- Combines TV and PC use
- Response time : 25ms
- Fast Videotext
- Picture-In-Picture



£399 INC VAT

IYAMA 19" LCD TV/Monitor

19" ProLite C480T LCD TV

- Combines TV and PC use
- Response time : 16ms
- Contrast Ratio of 600:1
- Picture-in-Picture
- 2x 5W high quality stereo

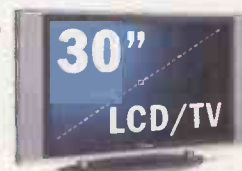


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- 2x 10W high quality stereo
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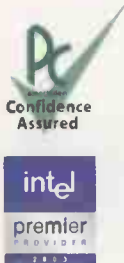
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- > 3 Year B-to-B, Parts & Labour Warranty (see terms)

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- > 2x PCI & 1x PCI Express slots > HT Technology

6 Elite Series PCs

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802.11g Wireless Desktop Network Card, makes wireless file transfers and downloads faster.

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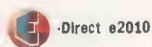
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**Sony Multi-burners R/W all standard formats Except DVD-RAM

Elite M 530 PCX

Amazing Value Intel® PCI Express based PC



- Intel® Pentium® 4 Processor 530 with HT Technology (3.0GHz Prescott 1MB L2 Cache, 800 FSB) Intel Hyperthreading Technology
- Microsoft® Windows® XP Home Edition
- ASUS P5G01-VM 775 Socket Mainboard HT Ready
- 256MB DDR 400 Memory
- 80GB Serial ATA Ultra Fast HDD (150mbps, 8MB buffer)
- Intel® Graphics Media Accelerator 900 224MB Max (SMA*)
- 17" TFT Analogue Flat Panel Monitor
- Sony 52x CD Re-Writer & 16x DVD-ROM Drive (combo)
- 5.1 Surround Sound 6 Channel Audio
- Logitech Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 Plus 60 Day Microsoft Office Trial
- Software: Pinnacle Instant CD/DVD Player and Studio 9 SE
- Plus Elite Series Features (see left column)

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- Microsoft® Windows® XP Home Edition
- ASUS P5GD1-VM 775 Socket Mainboard HT Ready
- 512MB DDR 400 Memory
- 200GB Serial ATA Ultra Fast Hard Drive (150mbps, plus 8MB buffer)
- Intel® Graphics Media Accelerator 900 224MB Max (SMA*)
- 17" TFT Analogue Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- 5.1 Surround Sound 6 Channel Audio
- Logitech Cordless Desktop Keyboard and Optical Mouse
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- Software: Pinnacle Instant CD/DVD Player and Studio 9 SE
- Plus Elite Series Features (see left column)

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| • Intel® Pentium® 4 Processor 540 to 550 | £50 EX VAT | £58.75 INC. |
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Elite M 550 PCX

High Performance Elite PCI Express 915G PC



- Intel® Pentium® 4 Processor 550 with HT Technology (3.4GHz Prescott 1MB L2 Cache, 800 FSB) Intel Hyperthreading Technology
- Microsoft® Windows® XP Home Edition
- ASUS P5GD1-VM 775 Socket Mainboard HT Ready
- 1GB DDR 400 Memory (2x512MB)
- 250GB Serial ATA Ultra Fast Hard Drive (150mbps, plus 16MB buffer)
- Intel® Graphics Media Accelerator 900 224MB Max (SMA*)
- 19" TFT DVI Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- 5.1 Surround Sound 6 Channel Audio
- Logitech Cordless Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 Plus 60 Day Microsoft Office Trial
- Software: Pinnacle Instant CD/DVD Player and Studio 9 SE
- Plus Elite Series Features (see left column)

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Elite A 550 PCX



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Featuring the GeForce PCX 6600GT VGA, delivering better graphics and vibrant digital media to PC consumers through additional bandwidth and features by Intel's new PCI Express bus architecture.



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- ASUS P5GDC Deluxe PCI Express Mainboard, Audio, GB LAN, 2x FireWire
- 1GB DDR 400 Memory (2x512MB)
- 250GB Serial ATA Ultra Fast HDD (150mbps, 16MB buffer)
- 128MB NVIDIA GeForce FX 6600GT, TV out & DVI PCI Express Graphics
- 19" TFT DVI Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Creative Labs Sound Blaster Audigy 2 ZS Sound Card
- Creative Labs Inspire 5.1 - P5800 Speakers + Subwoofer
- Logitech Cordless Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 Plus 60 Day Microsoft Office Trial
- Software: Pinnacle Instant CD/DVD Player and Studio 9 SE
- Plus Elite A Series Features (see right column)



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GREAT VALUE UPGRADES

- | | | |
|---|-------------|--------------|
| • Pentium® 4 550 to Pentium® 560 | £100 EX VAT | £117.50 INC. |
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| • NVIDIA 6600GT to ATI X800 XT PCI Graphics | £200 EX VAT | £235.00 INC. |
| • Add a separate CDRW/Combo Drive | £30 EX VAT | £35.25 INC. |

Graphics by NVIDIA GeForce 6600 technology

PCI Express is the latest I/O Interconnect technology. With a bus bandwidth 4 times higher than that of AGP 8X interface, PCI



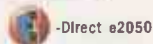
Express x16 bus performs much better than AGP 8X in applications such as 3D gaming. PCI Express x1 also outperforms PCI Interface with its exceptional high bandwidth up to 500MB/s.

A PCI Express system that packs a solid punch

PCW - November 2004



Elite A 560 PCX

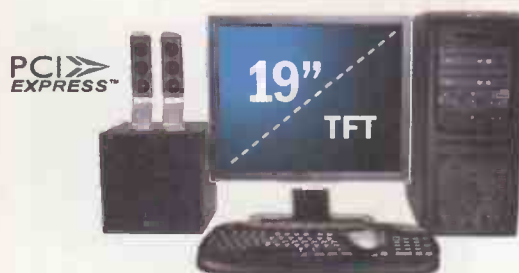


High-End PCI Express Intel® based PC

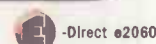
- Intel® Pentium® 4 Processor 560 with HT (3.6GHz Prescott 1MB L2 Cache, 800 FSB) Intel Hyperthreading Technology
- Microsoft® Windows® XP Professional
- ASUS P5GDC Deluxe PCI Express Mainboard, Audio, GB LAN, 2x FireWire
- 1GB DDR 400 Memory (2x512MB)
- 300GB Serial ATA Ultra Fast HDD (150mbps, 16MB buffer)
- 256MB ATI Radeon X800 Pro, TV out & DVI PCI Express Graphics
- 19" TFT DVI Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Sony 52x CD Re-Writer & 16x DVD-ROM Drive (combo)
- Creative Labs Sound Blaster Audigy 2 ZS Sound Card
- Creative Labs 2.1 - I-Trigue 3200 Speakers + Subwoofer
- Logitech Cordless Desktop Keyboard and Optical Mouse
- Microsoft Works 8.0 Plus 60 Day Microsoft Office Trial
- Software: Pinnacle Instant CD/DVD Player and Studio 9 SE
- Plus Elite A Series Features (see right column)



£1499 INC. VAT **£1275.32** EX. VAT



Elite A 570 PCX



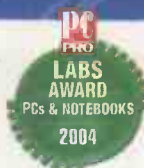
Leading Edge Elite PCI Express 915P PC

- Intel® Pentium® 4 Processor 570 with HT (3.8GHz Prescott 1MB L2 Cache, 800 FSB) Intel Hyperthreading Technology
- Microsoft® Windows® XP Professional
- ASUS P5GDC Deluxe PCI Express Mainboard, Audio, GB LAN, 2x FireWire
- 2GB DDR 400 Memory (2x1GB)
- 600GB Serial ATA Ultra Fast HDD (2x300GB, 150mbps, 16MB buffer)
- 256MB ATI Radeon X800 XT, TV out & DVI PCI Express Graphics
- 19" TFT DVI Flat Panel Monitor
- Sony Multi-Format 16x Dual Layer DVD Writer**
- Sony 52x CD Re-Writer & 16x DVD-ROM Drive (combo)
- Creative Labs Sound Blaster Audigy 2 ZS Sound Card
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- Plus Elite A Series Features (see right column)



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Elite Series PCs

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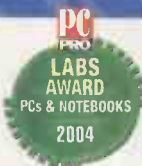
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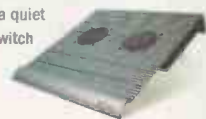


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Octan 6800cs
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AMD *		No Monitor	Inc.VAT	17" TFT	Inc.VAT
Sempron	2800	£394	£462.95	£593	£696.78
Sempron	3100	£405	£475.88	£604	£709.70
Athlon	3200 XP	£411	£482.93	£610	£716.75
Athlon	64 3000	£425	£499.38	£624	£733.20
Athlon	64 3200	£452	£531.10	£651	£764.93
Athlon	64 3400	£499	£586.33	£698	£820.15
Athlon	64 3700	£629	£739.08	£828	£972.90

Intel[®]	No Monitor	Inc.VAT	17" TFT	Inc.VAT
Intel (330) 2.6Ghz	£378	\$444.15	\$577	\$677.98
P4 (520) 2.8Ghz	£431	\$506.43	\$630	\$740.25
P4 (530) 3.0Ghz	£441	\$518.18	\$640	\$752.00
P4 (540) 3.2Ghz	£465	\$546.38	\$664	\$780.20
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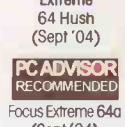
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- 512Mb Corsair DDR 400 Memory
- 320Gb Serial ATA Hard Drive (2x 160Gb SATA)
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- Creative Inspire 7900 Speakers
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MONITORS	Price	Inc. VAT
17" Carrera SVGA Monitor (Black)	£58	£68.15
19" Carrera SVGA Monitor (Black)	£99	£116.33
19" NEC/Mitsubishi 930SB (Black)	£199	£233.83
22" NEC/Mitsubishi 230SB (Black)	£313	£367.78

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15" TFT Sharp LLT 15G4 (DVI)	£168	£197.40
17" TFT Carrera	£155	£182.13
17" TFT Sharp LLT 172a	£189	£222.08
17" TFT Sharp LLT 172a (DVI)	£199	£233.83
17" TFT Ilvama E434s	£224	£263.20
17" Wide TFT + TV Sharp LL 171-me	£358	£420.65
19" TFT Sharp 191a	£267	£313.73
19" TFT Sharp 191D1 (DVI)	£290	£340.75
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Athlon 64 3000	£663	£779.03	£862	£1012.85
Athlon 64 3200	£690	£810.75	£889	£1044.58
Athlon 64 3400	£737	£865.98	£936	£1099.80
Athlon 64 3700	£867	£1018.73	£1066	£1252.55
Athlon 64 3800	£949	£1115.08	£1148	£1348.90

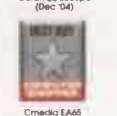
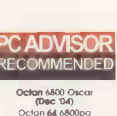
AMD®	No Monitor	Inc. VAT	19" TFT dvi	Inc. VAT
Athlon 64 3500	£1166	£1370.05	£1485	£1744.88
Athlon 64 3800	£1324	£1555.70	£1643	£1930.53
Athlon 64 FX53	£1437	£1688.48	£1756	£2063.30

Intel®	No Monitor	Inc. VAT	17" TFT Sharp	Inc. VAT
P4 (530) 3.0Ghz	£682	£801.35	£881	£1035.18
P4 (540) 3.2Ghz	£708	£831.90	£907	£1065.73
P4 (550) 3.4Ghz	£747	£877.73	£946	£1111.55
P4 (560) 3.6Ghz	£837	£983.48	£1036	£1217.30

Intel®	No Monitor	Inc. VAT	19" TFT dvi	Inc. VAT
P4 (520) 3.0Ghz	£1057	£1241.98	£1376	£1616.80
P4 (530) 3.2Ghz	£1083	£1272.53	£1402	£1647.35
P4 (550) 3.4Ghz	£1121	£1317.18	£1440	£1692.00
P4 (560) 3.6Ghz	£1211	£1422.93	£1530	£1797.75

★★★★★

THE SUNDAY TIMES



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Carrera



PERSONAL
COMPUTER
WORLD
Octan 64/6800
(Oct '04)



PERSONAL
COMPUTER
WORLD
Octan 3000pcw
(Dec '04)



PERSONAL
COMPUTER
WORLD
Demonite Graduate 64
(Sept '04)



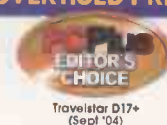
Octan 6800 Oscar
(Dec '04)



Octan 64 6800pa
(Dec '04)



COMPUTER
SHOPPER
Cmedia EA65
(Dec '04)



Travelstar D17+
(Sept '04)

octan 64/6800 special

- AMD® Athlon® 64 3000 Processor with Hypertransport Technology
- 512Mb DDR RAM (PC3200) 400Mhz
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- 19" TFT Sharp LL191 Monitor**
(all monitor options available on this model)
- NVIDIA Geforce 6800 128Mb Extreme Graphics**
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- Subwoofer Speakers (+£15)
- Broadband (10/100) internet ready
- High Quality Keyboard & Mouse
- Microsoft Windows XP Home & WorkSuite 2005 (MS Word/Encarta 2005/Autoroute 2005/MS Money/Works v8/Photo)**
- Carrera High Quality Case (435h x 200w x 470d)
- 6x USB 2.0 (2x Front Mounted)

- 5 Year Warranty, 3 Years On-site + 2 Years RTB Labour
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£799 +vat £938.83 or £33.15 per month @ 0%*

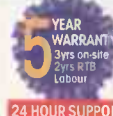
*Just pay £33.15 per month over 11 months + Initial deposit £93.88 & final payment £480.30.
Total amount payable £938.83. Total charge for credit £0. Payment Protection Insurance £5.30 per month.



Octan 6800
(Dec '04)
Octan 64 6800pa
(Dec '04)



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Carrera



octan 64/6800 DVD rw

£699 +vat £821.33 or
£29.00 per month @ 0%*

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- 512Mb DDR RAM (PC3200) 400Mhz
- 80Gb 7200rpm UDMA 100 Hard Drive
- 17" TFT Sharp LL172a Monitor**
- NVIDIA Geforce 6800 128Mb Extreme Graphics**
- DVD Writer NEC 3500a (16x +/- DL)
- 5.1 Surround Sound 6 Channel Audio Subwoofer Speakers
- Broadband (10/100) internet ready
- High Quality Keyboard & Mouse
- Microsoft Windows XP Home
- Office Suite (MS Works v7/ Word processor/ Spreadsheet/Database)
- Carrera High Quality Case (435h x 200w x 470d)
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- 5 Year Warranty, 3 Years On-site + 2 Years RTB Labour
- 24 Hour Initial Setup and installation support



Octan 6800CS
(Sept '04)



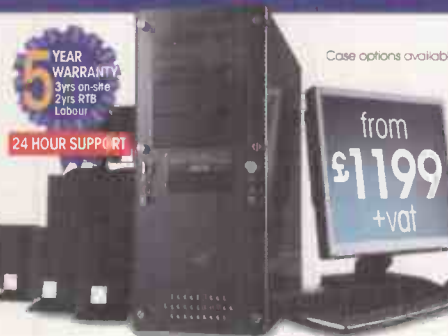
octan 550xt PCI Express

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- 17" TFT Sharp LL172g (DVI) Monitor**
- ATI Radeon X600XT 256Mb PCI Express Graphics**
- 16x DVD ROM • DVD Writer NEC 3500a (16x +/- DL)
- 8 Channel Audio & Creative 6700 Speakers • Broadband (10/100) internet ready • Gigabit Lan 1000/100/10
- High Quality Keyboard & Mouse
- Microsoft Windows XP Home & WorkSuite 2005 (MS Word/Encarta 2005/Autoroute 2005/MS Money/Works v8/ Photo)**
- Carrera High Quality Case (435h x 200w x 470d)
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- 24 Hour Initial Setup and installation support



Octan 540CB
(Dec '04)



focus extreme 3.6 PCI Express

£1199 +vat £1408.83 or
£49.78 per month @ 0%*

- Intel® Pentium® 4 (3.6Ghz) 560 Processor supporting Hyperthreading Technology (LGA775)
- Asus P5GDC Deluxe PCI Express Motherboard
- 512Mb DDR RAM (PC3200) 400Mhz • 200Gb Serial ATA 7200rpm Hard Drive
- 17" TFT Sharp LL172g (DVI) Monitor**
- ATI Radeon X800Pro VIVO 256Mb PCI Express Graphics**
- 16x DVD ROM • DVD Writer NEC 3500a (16x +/- DL)
- 8 Channel Sound • Creative Inspire 6700 Speakers
- Gigabit Lan 1000/100/10 • High Quality Keyboard & Mouse
- Microsoft Windows XP Home
- Microsoft WorkSuite 2005 (MS Word/Encarta 2005/Autoroute 2005/MS Money/Works v8/Photo)**
- Carrera High Quality Case (435h x 200w x 470d)
- Microsoft Windows XP Home • 6x USB 2.0 (2x Front Mounted)
- 5 Year Warranty, 3 Years On-site + 2 Years RTB Labour
- 24 Hour Initial Setup and installation support



Focus Extreme
(Nov '04)



Focus Extreme
(2004)

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*Just pay £49.78 per month over 11 months + Initial deposit £140.00 & final payment £721.26. Total amount payable £1408.83. Total charge for credit £0. Payment Protection Insurance £7.96 per month.



>> Wifi projectors

NEC has launched two projectors equipped with 11g Wifi, allowing them to be linked wirelessly to a PC at speeds of up to 30Mbps/sec. www.nec.co.uk

>> Dual Matrox

Matrox has released what it says is the first single graphics card to support both dual-display and high-definition television. The PCI-Express-based Parhelia APvE features dual 400MHz Ramdacs with independent lookup tables for fully symmetric Dualhead resolutions up to 1,920 x 1,440. It will be available early this year for £193 ex VAT. <http://shopmatrox.com>

>> Fast memory

Samsung claims a breakthrough with the fastest-yet graphics memory chip with the highest data density available. The 512MB GDDR3 synchronous D-Ram module is already shipping to graphics-card and console manufacturers.

>> Hush puppy

Silent-PC specialist Hush Technologies has added a dual-TV option to its Hush Media Center PC range, allowing you to record one analogue TV program while watching another. www.hushtechnologies.net

>> G-whizz

ADS Tech has launched a new Wifi 11g-enabled version of its me² Media-Link box that allows you to deliver digital entertainment from a PC to a TV. It costs £199.99 and can be used with a wired network link. www.adstech.com

>> Trojan force

Wintasks 5 Pro monitors which applications PCs are running to identify trojans and spyware. It also tracks why PCs start running slow. Features include a process library with virus data. It costs \$49.95 (£26) from www.liutilties.com.

New chips take the strain

A new way of making silicon processors will boost performance by up to 24 per cent for a given power drain – or give the same performance using less power, according to joint developers IBM and AMD.

The basis of the technique has been known for some time: that you can ease current flow in the transistors by 'straining' semiconductors like germanium or silicon so that their molecules are infinitesimally further apart – or (depending the polarity of the transistor) closer together.

Most work has been done on strained silicon, but the performance is much better with germanium. The new technique uses strained germanium to form the tiny conducting channel

within each transistor that is switched on and off by the gate voltage. The bulk of the device is still silicon based and the major breakthrough lies in the ability to make the new transistors using well-established Cmos manufacturing processes.

IBM says the technique will be practicable with feature sizes as low as down to 32nanometres – compared with 90nm on today's mainstream fast processors. The massive performance increases of the past few years have been largely due to miniaturisation; but IBM fellow TC Chen said: 'Chip performance... will increasingly depend on new materials and design techniques rather than simple scaling.'

Strained germanium will be combined with another IBM-pioneered technology called Silicon-on-Insulator, which reduces leakage current and performance-reducing capacitance. Dirk Meyer, executive vice-president of AMD's Computation Products Group, said AMD already delivers the best performance per watt on today's processors and the new technique would extend that leadership.

It will be introduced into all AMD's 90nm processors; first 90nm AMD64 processors using it will ship in the first half of the year. IBM will implement it on 'multiple 90nm processor platforms' including its Power Architecture-based chips.

HP drops out

HP has ended its partnership with Intel over development of the Itanium processor in the latest blow to the decade-long project to build a next-generation platform for enterprise systems.

The Itanium, which uses a completely new instruction set, has hardly taken the world by storm, though Intel insists that sales have been respectable for the demanding niche markets at which it is targeted.

HP says it will still spend \$1b a year for the next three years designing Itanium 2-based HP Integrity servers.

Intel has taken over HP's 300-strong Itanium development team, based in Colorado.



Lacie drives bypass the server

Lacie, which has been pushing a series of aggressively priced external drives with capacities up to 1.6TB (see review page 71), has launched a series of network-enabled models.

The 800GB Lacie Ethernet Drive, which includes an embedded version of XP, will allow up to 25 people to access it off a local network without recourse to a central server.

The 800GB version costs £949 inc VAT; there are also 160GB, 250GB and 500GB versions costing £345, £385 and £629 inc VAT respectively.

Upright bits increase disk capacities

Toshiba has claimed a breakthrough in commercial application of a technique called perpendicular recording to produce disks packing 206Mbits into a square millimetre – equivalent to 133Gbits per square inch.

Several companies have been experimenting with perpendicular recording, in which the magnetic dipoles storing information are aligned vertically instead

of longitudinally, as in conventional hard disks, allowing them to be packed more tightly.

The technology will be used in two 1.8in drives, the 40GB MK4007GAL and the 80GB MK8007GAH, which are due to ship in the middle of 2005. The 80GB drive has the largest capacity yet in the 1.8in form factor, claims Toshiba.

Kazuyoshi Yamamori, vice-president of the storage device

division at Toshiba's Digital Media Network Company, said: 'Our research confirmed the superior potential of perpendicular recording technology, and we have now achieved the core head and disk technologies required for reliable, high-density recording.'

The 1.8in drive will be followed by 0.85in versions with a capacity of 8GB per platter.

SATELLITE PRO SERIES

Satellite Pro range

Desktop performance unleashed at a price you can afford

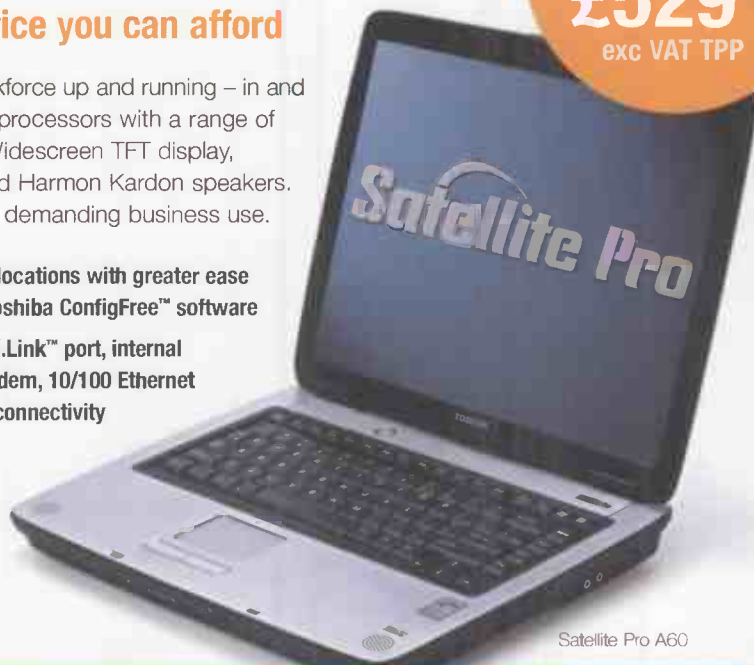
Our Satellite Pro range contains all you need to get your workforce up and running – in and out of the office. The robust, A60 combines Intel® Celeron® processors with a range of flexible connectivity options. And the M30 boasts a 15.4" Widescreen TFT display, class-leading nVIDIA GeForce FX Go5200 graphics card and Harmon Kardon speakers. It's an ideal combination for big presentations and the most demanding business use.

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Satellite Pro M30

- Move between work locations with greater ease using pre-installed Toshiba ConfigFree™ software
- Built-in fast infrared i.Link™ port, internal international v.90 modem, 10/100 Ethernet port – for maximum connectivity



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	1 Year	1 Year	1 Year	1 Year
Intel® Technology	Mobile Intel® Celeron® D Processor 335 (2.80GHz, 533MHz FSB, 256KB)	Mobile Intel® Celeron® D Processor 335 (2.80GHz, 533MHz FSB, 256KB)	Mobile Intel® Celeron® D Processor 335 (2.80GHz, 533MHz FSB, 256KB)	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 725 (1.60GHz, 400MHz FSB, 2MB)
Operating System	Microsoft® Windows® XP Pro Home	Microsoft® Windows® XP Pro	Microsoft® Windows® XP Pro	Microsoft® Windows® XP Pro
Memory	256MB	256MB	256MB	512MB
Hard Disk	40GB	40GB	60GB	60GB
Weight	3.50kg	3.50kg	3.50kg	2.78kg
Drive	DVD-CDRW	DVD-CDRW	DVD-RW	DVD-CDRW
Display	14.1" XGA TFT	15.0" TFT	15.0" XGA TFT	15.4" Widescreen TFT Display
Graphics	ATI Radeon® Mobility 7000 IGP	ATI Radeon® Mobility 7000 IGP	ATI Radeon® Mobility 7000 IGP	nVIDIA GeForce FX Go5200 64MB
Part Number	PSA65E-01G02D8K	PSA65E-01H00U8K	PSA65E-01U03KEN	PSM35E-0042X-EN
Peace of Mind Pack	From £129	From £129	From £129	From £139

Business Kit

If you were to buy each item separately it would cost £179 exc VAT. Together as part of this bundle it's now **HALF PRICE** at just £89 exc VAT. Part Number: TPUPR-1BDL

- Entry level carry case
- USB Floppy Disk Drive
- USB Port Replicator
- Optical USB Mouse

All this for only **£89** exc VAT £105 inc VAT

Satellite Pro recommended upgrade:

Toshiba Peace of Mind



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(AFTER 36) TI

Pick-up & Return Warranty*

Each Toshiba Satellite Pro and Tecra notebook comes with a 1 year warranty.

*Pick-up & Return means that in case of repair under warranty your Toshiba notebook will be collected from you and returned to you at the earliest opportunity.

KEY:

New Product



Warranty



Price Down



WiFi™ and/or Bluetooth™

Tecra M2

Lightweight, heavy specification

The Tecra M2's combination of reliability and stability makes it perfect for those working remotely for extended periods. Its long battery life, robust platform and Intel® Centrino™ Mobile Technology means it delivers performance you can rely on time after time after time. It also features secure WiFi™ 802.11b/g connectivity, DVD multi-drive for rapid data back-up and easy sharing of common accessories and peripherals. All of these heavyweight features are housed in a tough, lightweight magnesium alloy casing.

Reliable performance wherever you need it

- Supports the Advanced Port Replicator III docking solution
- A minimum 12 month life-cycle
- Optional high capacity 11 hour battery for heavy mobile use
- SD™ Card slot for extra storage
- AcuPoint and TouchPoint navigation for user flexibility
- Weight – just 2.26kg



Tecra M2s
from
£949
exc VAT TPP

| Stylishly thin & light | Stable platform | Extended battery life |

36 Months Leasing Business Plan is available on all models.

	£949 exc VAT TPP £1116 inc VAT	£999 exc VAT TPP £1174 inc VAT	£1099 exc VAT TPP £1291 inc VAT	£1499 exc VAT TPP £1761 inc VAT
Tecra M2	1 Year	1 Year	1 Year	1 Year
Intel® Technology	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 715 (1.50GHz, 400MHz FSB, 2MB)	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 725 (1.60GHz, 400MHz FSB, 2MB)	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 735 (1.70GHz, 400MHz FSB, 2MB)	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 755 (1.80GHz, 400MHz FSB, 2MB)
Operating System	Microsoft® Windows® XP Pro	Microsoft® Windows® XP Pro	Microsoft® Windows® XP Pro	Microsoft® Windows® XP Pro
Memory	256MB	256MB	512MB	512MB
Hard Disk	40GB	40GB	40GB	80GB
Weight	2.26kg	2.26kg	2.26kg	2.26kg
Drive	DVD	DVD-CDRW	DVD-CDRW	DVD SuperMulti
Display	14.1" XGA TFT	14.1" XGA TFT	14.1" XGA TFT	14.1" XGA TFT
Graphics	nVIDIA GeForce FX Go5200	nVIDIA GeForce FX Go5200	nVIDIA GeForce FX Go5200	nVIDIA GeForce FX Go5200
Part Number	PTM20E-4MP1D	PTM20E-4MP19-EN	PTM20E-0R1X3-EN	PTM20E-4MP1F-EN
Peace of Mind Pack	From £139	From £139	From £159	From £159

Tecra recommended upgrades:**USB Floppy Disk Drive**

Use to transfer large or small data files

£59 exc VAT £69 inc VAT
Part number: PA3109U-1FDD**High Capacity Battery Pack**

Provides up to 8 hours of battery life

£98 exc VAT £115 inc VAT
Part number: PA3357U-1BRL

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T2

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Design led, lightweight and power packed

Lightweight and powerful, the Portégé range offers top-end performance for serious business users. Every machine is packed with the latest features including Intel® Centrino™ Mobile Technology, WiFi™ and Bluetooth™ connectivity. The slim, stylish R100 weighs in at just 1.09kg; the M100 offers true desktop performance, while the M200's touch-sensitive screen and tablet design provides a new level of versatility. The A200 combines lightweight design with a sleek, pearlescent casing.



Portégé A200



Portégé M200

| Lightweight | Compact and stylish design | Exceptional portability |

- Unprecedented wireless connectivity – WLAN & Bluetooth™
- Optional drives enable tailoring to your needs
- Purpose-built for demanding business travel
- Full range of options for straightforward expansion
- Compact and lightweight design

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Portégé range

	Portege A200	Portégé R100	Portégé M100	Portégé M200
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	NEW! 1 Year	3 Year	3 Year	3 Year
Intel® Technology	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor ULV 725 (1.60GHz, 400MHz, FSB, 2MB)	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor ULV 733 (1.10GHz, 400MHz, FSB, 2MB)	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor LV 738 (1.40GHz, 400MHz, 2MB)	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 745 (1.80GHz, 400MHz, 2MB)
Operating System	Microsoft® Windows® XP Pro	Microsoft® Windows® XP Pro	Microsoft® Windows® XP Pro	Microsoft® Windows® XP Pro
Memory	256MB	512MB	512MB	512MB
Hard Disk	40GB	40GB	60GB	60GB
Weight	2.0kg	1.09kg	2.0kg	2.0kg
Drive	DVD-CDRW	N/A	DVD-CDRW	N/A
Display	12.1" TFT CSV	12.1" TFT	12.1" TFT	12.1" TFT SXGA
Graphics	Intel® AGM 855GM Graphics	Trident XP4™ M32	Trident XP4™ M32	nVIDIA GeForce FX Go5200
Part Number	PP415E-00J005EN	PPR10E-213M5-EN	PPM10E-0L7F3-EN	PPM21E-0260z-EN
Peace of Mind Pack	From £349	From £349	From £349	From £399

Portégé recommended upgrades:

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512MB Memory



Maximise your notebook performance for greater productivity

WAS £199 NOW ONLY £129 exc VAT
Part number: PA3312U-1MS1



MOBILE
TECHNOLOGY

T3

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TECRA SERIES

Tecra A2

**Cost-effectiveness,
performance and reliability**

Tough and powerful but also lightweight and portable, the Tecra A2 is ideal for intensive mobile working. With built-in combo drives and onboard networking capabilities, including secure, high-speed WiFi™ 802.11b/g connectivity, it provides true versatility. And the inclusion of Intel® Centrino™ Mobile Technology ensures there's no shortage of power either. All of this is available at an unbeatable entry-level price.

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- Robust, lightweight casing for easy mobility
- WiFi™ capability for anytime communication
- Intel® Centrino™ Mobile Technology processing power from just £759 exc VAT
- A minimum 12 month life-cycle guaranteed

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	£659 exc VAT TPP £775 inc VAT	£759 exc VAT TPP £892 inc VAT	£949 exc VAT TPP £1115 inc VAT	£1049 exc VAT TPP £1233 inc VAT
Tecra A2	 1 Year	 1 Year	 1 Year	 1 Year
Intel® Technology	Intel® Celeron® M Processor 340 (1.50GHz, 400MHz FSB, 512KB)	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 725 (1.60GHz, 400MHz FSB, 2MB)	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 735 (1.70GHz, 400MHz FSB, 2MB)	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 745 (1.80GHz, 400MHz FSB, 2MB)
Operating System	Microsoft® Windows® XP Pro	Microsoft® Windows® XP Pro	Microsoft® Windows® XP Pro	Microsoft® Windows® XP Pro
Memory	256MB	256MB	512MB	512MB
Hard Disk	40GB	40GB	60GB	80GB
Weight	2.60kg	2.60kg	2.60kg	2.60kg
Drive	DVD-CDRW	DVD-CDRW	DVD SuperMulti	DVD SuperMulti
Display	14.1" XGA TFT	15.0" XGA TFT	15.0" XGA TFT	15.0" XGA TFT
Graphics	UMA Intel® graphics	UMA Intel® graphics	UMA Intel® graphics	UMA Intel® graphics
Part Number	PTA20E-4KC01QEN	PTA20E-07801QEN	PTA20E-01F029EN	PTA20E-4M3029EN
Peace of Mind Pack	From £129	From £139	From £139	From £139

Tecra recommended upgrades:

Notebook Starter Kit II



The ideal start to getting more from your notebook

£38 exc VAT £45 inc VAT
Part number: PX1175E-1NSK

Advanced Port Replicator III



Dock your Tecra A2 easily to your desktop devices

£145 exc VAT £170 inc VAT
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TOSHIBA

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Buyers Guide

For you and your Business January 2005



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featuring Intel® Centrino™ Mobile Technology



Product shown is Portégé A200

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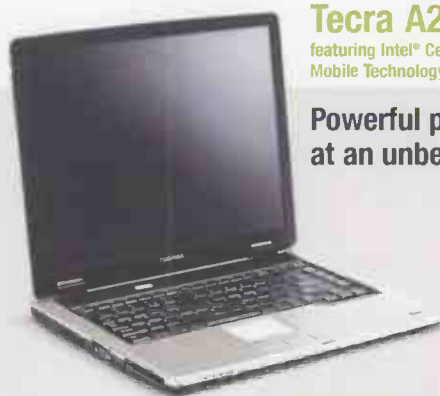
Satellite Pro A60

containing Mobile Intel® Celeron® D
Processor 335

**Mobility at a price
you can afford**

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Mobile Technology

**Powerful performance
at an unbeatable price**

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£775 inc VAT

T5

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The Qosmio series offers the cool-conscious consumer with a "4-in-1" experience – TV, Audio, DVD recorder and PC – simplifying the home entertainment experience. Featuring an ultra-bright screen, superior surround sound, Intel® Centrino™ Mobile Technology and a new video engine.



- Qosmio Player – Instant On TV & DVD facility
- Harmon Kardon speakers with SRS Surround Sound
- Qosmio Engine – dedicated video processor to enhance DVD Playback

Qosmio G10-100

Intel® Technology	Intel® Centrino™ Mobile Technology with Intel® Pentium® M Processor 735 (1.70GHz, 400MHz FSB, 2MB)
Operating System	Microsoft® Windows® Media Center Edition 2005
Memory	512MB
Hard Disk	80GB
Weight	4.40kg
Drive	DVD SuperMulti
Display	17.0" Widescreen Trubrite™ TFT
Graphics	nVIDIA GeForce FX Go5700 128MB
Part Number	PQG10E-01H00REN
Peace of Mind Pack	From £159

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£1530 exc VAT
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Dual core coming soon

Dual-core processors based on today's Prescott generation of the Pentium architecture will be available by the middle of 2005, Intel has confirmed.

The new chips, codenamed Smithfield, are effectively two processors in one. They will be made initially using a 90-nanometre process but 65nm versions will ship in 2006, said Steve Smith, vice-president of Intel's desktop platform group. He predicted that by 2008 processors will be 10 times more powerful than the original P4.

Software will need to be optimised for the processors to take full advantage of their power; but this has already started to happen since the introduction of Hyperthreading, which treats a single processor as two virtual ones. Hyperthreading already delivers a performance gain of up to 25 per cent on single-core desktop processors and up to 30 per cent on servers, Smith told a press briefing. By next year more than seven in 10 Intel desktop and mobile processors shipped are expected to be dual core (see below) and 85 per cent of server chips will have two or more cores. Dual-



core Itaniums, codenamed Montecito, will ship in late 2005, and dual-core Xeons will follow in early 2006.

Smith would not specify speeds for the new chips but said the fastest Smithfield would clock at a rate approaching that of today's fastest Prescott, which is 3.8GHz.

One advantage of dual-core is that it can deliver more processing power without pushing up clock speeds; this means voltages can be kept down, reducing the electrical drain and heat dissipation and thus the need for noisy fans. The downside is that you are running more transistors, which pushes up the power drain.

Intel is coy about how this power equation balances out. Smith said only that Smithfields were designed to deliver more processing power within the electrical 'power envelope' of today's Prescotts,

Intel is about to release the Smithfield – two processors in one

which implies that they are more power efficient.

In the longer term desktop processors will have as many as 10 cores, though no timescale was given. Still further out are processors with tens or even hundreds of satellite cores optimised for particular tasks; these processors could include complete systems on a chip.

Satellite modules could include multiple processors designed to perform massively parallel floating-point operations, and signal processors optimised for tasks such as speech input.

The basic structure of a central controlling core surrounded by specialist modules is already common in processors in handheld devices. Smith said the power of early dual-core devices would enable multiple background tasks to be performed without slowing down the machine. 'Most users don't realise how much work the machine is doing behind the scenes,' Smith said.

This unseen load is going to grow over the next few years, he added.

Newbee Zigbee rivals Bluetooth

A specification for yet another wireless data technology was approved at the end of 2004. Zigbee transmits at only 250Kbits/sec, barely a tenth the data rate of the latest Bluetooth spec, but it can reach further with a range of more than 100m.

Zigbee is designed primarily for device-to-device communication, such as meshes of sensors monitoring conditions in large installations and campus sites. It could also be used for controlling lights and appliances in the home.

The big question is whether it can hold its own against Bluetooth, which has been going longer and is better established. But there is as yet no Bluetooth profiles for home and industrial control applications.

One company, Freescale Semiconductor, says it will offer Zigbee chips for about £1.50 each if bought in very large quantities; this is about the same as Bluetooth chips.

Notebooks take Napa to save power

Notebook processors will also go dual-core in 2005 with the launch of a design codenamed Yonah later in the year. It will be made using a next-generation 65nm process and will include power management resources.

But battery life is unlikely to be extended much for a couple

of years because, as with desktop processors (above) and the latest Sonoma platform (see page 16), Yonah will be designed to fit the 'thermal envelope' of current notebooks, boosting processing while drawing much the same electrical power.

The Yonah processor will be launched as part of a platform call Napa, with enhanced power-management and up to six PCI-Express ports. It will offer improved integrated graphics, codenamed Calistoga, and multi-mode wireless links codenamed Golan.



Showshifter 3.10 boosts listings

The latest version of Showshifter, the major rival in the UK to Microsoft's Media Center software, has a revamped showguide that populates itself with programme information obtained from the web or the TV signal.

Showshifter 3.10 also has a simplified interface (pictured above), enhanced mpeg2 and support for DVB cable and satellite standards. Like XP Media Center Edition, it lets you record and timeshift TV, and play DVDs and CDs.

Evaluation versions can be downloaded from www.showshifter.com.

£24,000 home PC

This system, on sale at Harrods, could qualify as the most expensive consumer system ever. The Vivadi Saturn is at heart a Media Center PC and comes with a 46in plasma screen, a 200GB hard disk and a DVD recorder. The base unit costs £15,999, and the 600w speakers will set you back an extra £7,999. 'This is the first time that anyone has produced such a future-proof integrated TV and hi-fi that combines the full range of home cinema and PC functions,' said Paul Roberts, managing director of the UK-based company.



When UK computing led the world

The sale of IBM's PC division to a Chinese company seemed like a transfer of IT heritage. Yet, as a new book relates, Britain had a computer working five years before the first IBM

The impact of last year's sale of IBM's PC division to the Chinese

manufacturer Lenovo owed much to the US company's peculiar position in computing history. The machine that rules desktops today began life as the IBM PC and big IBM boxes dominated computing for a quarter-century before that.

Yet in both eras IBM came late to the game, and for a brief heady period after the Second World War Britain led the world in computing – with a little help from the US.

The story is told in a new book, *Electronic Brains: Stories from the Dawn of the Computer Age*, by Mike Hally (Granta, on sale in April, for £14.99).

No single person invented the computer. The Victorian Charles Babbage, grasped the fundamentals but failed in his attempts to build a mechanical one. This failure seems to have stemmed more from Babbage's personality than from the limitations of Victorian engineering and more than one computer pioneer had similar problems.

There was John Atanasoff, a maths professor from Iowa State University, who Hally says 'loved fast cars and whisky and did not mind mixing the two'. During one drunken drive in the late 1930s, Atanasoff conceived the idea of an electronic computer using binary arithmetic.

He teamed up with an inspired electronic engineer called Clifford Berry to build a simple model in 1940 that could add and subtract. For memory they used a rotating drum of capacitors that could store charge to represent data but needed regular refreshes – an astonishing precursor of today's clocked dynamic Ram.

The Atanasoff Berry Computer, inevitably called the ABC, used 300 valves and was as big as a fridge. It worked, but Atanasoff got no further with it.



Tom Kilburn, pictured for a PCW interview on the 50th anniversary of his 'baby'. He died in 2001. For links to this interview, and one with Sir Maurice Wilkes, go to www.pcw.co.uk/specials/1131917

He got sidetracked into war work and, with no Berry to help him, made little headway with a post-war computer project.

Similarly Britain's Alan Turing, who wrote some of the seminal papers on computing, was by common consent hopeless at running a team and made little contribution to building actual computers.

Atanasoff's major impact was indirect: in 1941 he described the ABC to a professor called John Mauchly, who was using mathematics for weather forecasting. How much Mauchly gleaned is a subject of debate but, with electronics expert Prosper Eckert, he went on to build the famous Eniac decimal computer, which was completed just as the war ended.

These ideas did not come out of nowhere. In fact computing seems to have been bursting for realisation. Mechanical calculators had become increasingly refined and advanced models used electrical relays. From relays, it was a short step to electronic valves and programming.

The fact that Britain was using valve computers at Bletchley Park to crack German codes was kept secret until long after the war. They were restricted to a small set of tasks, and they were not general-purpose machines, but they were a start. Peace brought the demobilisation of ex-service

people schooled in electronics, who were able to apply to computing the pulsed circuits used in wartime radar.

In Manchester University, Tom Kilburn built a small computer in 1948 to demonstrate the use of a cathode-ray tube as memory; this was the first stored program computer. Shortly afterwards Maurice Wilkes at Cambridge University ran the first program on Edsac, which can claim to be the first modern computer to be used in earnest (see photo above).

Wilkes had attended a famous computing course in 1946 at Philadelphia's Moore School run by Mauchly and Eckert, and generously admits learning much from them. He had Edsac up and running a year before their first effort because, as he points out, he was building a tool for the university, not a commercial product. Moreover, his US mentors were hampered by an unfortunate choice of memory technology: an unreliable specialised valve called a Selectron.

Edsac inspired the 1951 Leo computer, built and used by Britain's Lyons eating-house chain. It was the first dedicated business computer and later models and applications were the most advanced of their kind.

But as early as 1943, Hally recalls, Loring Crossman in the

US had begun work on a business computer which became the Rand 409. There were also little-remembered projects in Australia and Russia.

Hally is good at depicting the excitement of those days: men and women in the prime of their lives, released from the stress of war, high on their collaboration in what they knew was something momentous – though few, perhaps, realised quite how much computing would change the world. It seems to have been similar to the buzz a generation later when microprocessors democratised computing and every user became a pioneer.

So where did IBM fit into all this? It turned down the chance to buy Mauchly and Eckert's company and did not deliver its own computer, the 701, until May 1953. But it had been selling enterprise data-processing aids for decades and was ruthlessly professional in both marketing and technology. It was soon outselling all its competitors put together.

Hally's book stops at the 1960s but long-time PCW readers will know the rest. When desktop computers began to appear in the late 1970s, IBM persuaded itself they were of no account. By the time it did launch a PC, in 1981, developers were desperate to avoid having to tailor software for each new model that came out.

IBM's name was big enough to make its unremarkable design a de facto standard – particularly because the architecture was open and easily cloned and improved by rivals.

Famously, too, it gave a tiny company called Microsoft the job of writing the operating system. But don't imagine that the tables are turned. IBM still has far greater revenues (if not profits) than Microsoft; and cashflow like that earns clout on the scale of China.

Clive Akass

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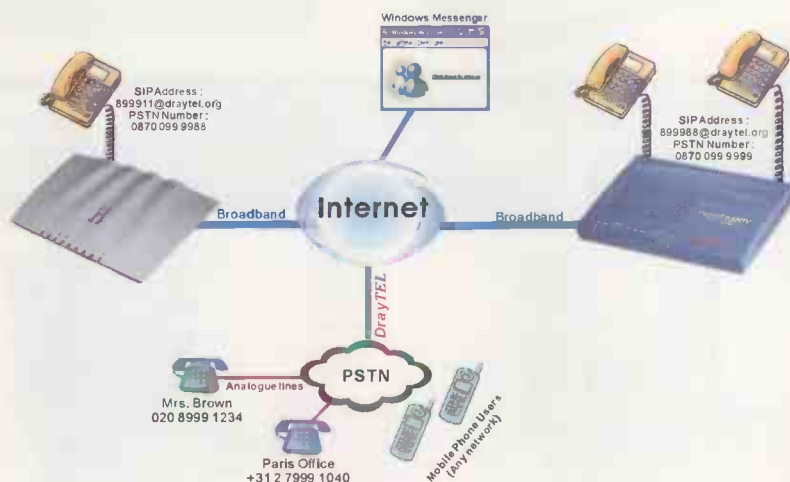
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Letters

Near expert user >

I read with interest Tim Nott's article in January's issue on how he struggled to rebuild his PC. Perhaps he should read articles such as the one by Craig Paterson in PCW April 2004. It beggars belief that you the experts don't take basic steps to protect your systems. What hope is there for the rest of us?

Roy Houghton

Kelvyn Taylor replies > At least you now know we're as human as the rest of you.

Warranty terms >

I was reading with interest the laptop group test in the February 2005 edition.

I feel one of the factors that ought to be considered is the warranty. I've tried one of your recommended systems' collect-and-return warranty and found it to be a complete nightmare, taking nearly two weeks to get everything sorted out. A three-year next-day on-site warranty is a good option especially when buying a laptop. It means cost of ownership will be very low for three years. Then there's the supplied software and operating system, which should be factored into the overall score.



Consider warranties carefully before buying a laptop

While I might sound like an advert for one of the manufacturers, it is true that all of them will have bad technical support stories, but I think it is wrong not to consider the entire package.

Martin Hodder

Kelvyn Taylor replies > We do rate the terms and length of warranty plus the bundled software in our assessment of the product's features. We obviously can't review how good the promised warranty service is, but we do listen to readers' feedback on problems they've encountered and feed these back to manufacturers.

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Letter of the month

Is enough enough? >

Are we the consumer being conned by manufacturers into believing we really must have the latest technological wizardry they place before us, or is it as I believe, just another way to maintain the profit margins? Advancement in technology is of course vital, but there comes a 'saturation stage' after which it's merely academic.

For example I've just upgraded from a 1.8GHz all-singing all-dancing system to a 2.8GHz all-singing all-dancing system and, despite there being 1,000MHz extra, as far as my computer needs are concerned I cannot tell the difference. If I had upgraded from a 333MHz Pentium I would probably have noticed a massive improvement. So can it be said that a 1.8GHz system is more than adequate for the majority of users. To exceed this serves no purpose other than to relieve the consumer of more cash and give the feel-good factor.

The same applies to digital cameras – can the average user really tell the difference between a 3megapixel model at £200 and a 6megapixel one at £450? More to the point, would 3megapixels be more than adequate for the holiday snaps and nights down the pub with the girls? Yet the manufacturers know the public in general

will go for the 6megapixel model because it's advertised as bigger and better.

A friend of mine has just bought an mp3 player with a mind-blowing 5,000-song capacity for £350. Now who on earth can afford to pay to legally download this huge amount (250 albums) never mind spend time listening to them? This is nothing more than manufacturers going over the top, knowing that music lovers will see this as a must-have accessory, regardless of the fact that a player with a capacity of 300 songs for £60 would in reality be more than enough for most people's needs.

So where do we draw the line between adequate and overkill and return to some kind of financial sense?

Jane Peart



If progress was only driven by consumers, we'd all still be using Wordstar in Dos 3

Kelvyn Taylor replies > Rarely is technological progress driven purely by customer needs, otherwise we'd probably all still be using Wordstar in Dos 3. And what's 'good enough' for one person isn't necessarily so for another – for example, I recently upgraded from a 1.9GHz system to a 3GHz one and found a remarkable improvement. What's more important is ascertaining exactly what you need and then finding a suitable product, and that's exactly what PCW aims to help you discover.

Pulling power >

As I read Gordon Laing's column in January's *PCW* (Don't let megapixel envy distract you), I got a distinct feeling of déjà vu as just recently I wrote a letter on the same basic theme to *Amateur Photographer*, which was published just a few days before *PCW* arrived.

The problem is that a lot of professional photographers need very high resolutions for images for high-quality publications. Us mere mortals don't really need these resolutions, but the camera companies obviously need to generate income to fund the necessary research and development. A friend of mine who supplies images to the RSPB and image banks, and still hasn't 'gone digital', tells me some agencies are now no longer accepting slides and stating a minimum file size of 48MB for digital images.

They are also advising all photographers to use nothing less than the Canon 1DS, worth £5,000, if they want images accepted. At the same time many pros are dumping their 1DS cameras in favour of the new 1D, which has the new 8megapixel chip and 1.3x focal length multiplier (this is the diagonal of a 35mm film frame divided by the diagonal of the camera's sensor). Hence they can use smaller, lighter, faster, and cheaper lenses, with equal 'pulling' power thanks to the multiplier.

Bob Isgar

DAB is BAD backwards >

In your review of the Evesham Ebox (*PCW* January 2005) you say 'You can also listen to digital radio, although this isn't DAB'. What is this supposed to mean? My understanding of the situation in the UK is that, as seems to be usual with the authorities that regulate our airways, we have gone for quantity over quality and tried to squeeze in as many DAB stations as possible to available bandwidth.

Digital radio over Freeview tends to be of higher quality (using higher mpeg2 bit rates) than DAB. A good FM signal is still better than either digital formats, not because of inherent problems with the technology but because of the decisions made in how to implement it in the UK. The best one can say for DAB in the UK is that it is good enough to replace AM and for use in noisy environments such as cars.

I am a musician and teacher. It saddens me to see how the word 'quality' is so misused when it comes to recorded music. Lack of hiss/scratches/pops, while welcome, does not mean the sound is of high quality.

Rob Priestley

Kelvyn Taylor replies >

In the review we made the same point – that DVB radio isn't the same as DAB – although admittedly we could have made it clearer.

The penguin fights back >

In reply to Paul Bickmore's letter 'Watch out Linux' in the January issue, I'd say that a personal firewall is next to useless as it runs



Evesham Ebox – what kind of digital radio does it provide?

as a standard application on the same machine it is protecting. As such it's susceptible to the same vulnerabilities as it's supposed to protect against. For instance, an exploit could switch off AV protection or open ports. What is needed is a real firewall running on dedicated hardware that sits between the local network and the Internet.

Why should we have to spend time and money on fixing a problem that can be laid squarely at the door of Microsoft?

Anti-virus software running on a Linux desktop is totally unnecessary as any damage is restricted to the user's home directory. To get a hostile script to even run a user would have to download the script to the home directory, log in as root, from a text console make the script executable and finally type something like './run.trojan'.

Linux and OSX run by default in a safe state where the users are restricted in what they can do. If you did want to protect your system what you would do is run one of the various intrusion detection systems such as Snort. Using the information so gleaned you can then take steps to close up any vulnerabilities identified. Sure, Linux needs patching. But even on an unpatched system when a breach occurs the damage is trivial compared to the Microsoft equivalent.

Remember Linux, FreeBSD and other variants on Unix have been running the Internet infrastructure for decades, getting a hammering from every would-be hacker on the planet. And as for SP2 being the cure-all. I'll wager that in December 2005 we'll still be talking about Windows viruses.

James Cook

Is Guy Kewney an alien? >

In the January 2005 edition Guy Kewney wrote that cameras, radios and other electronic items would merge to become all-purpose devices with their media content being constantly downloaded from the net. It seems to me that Guy didn't go far enough in his speculation.

Today the electromagnetic spectrum is packed with broadcast signals, sending gigawatts of energy round the world and out into space. If we get to Guy's connected world all these broadcasts will disappear to

become signals in copper wires and fibre-optic cables. At each end there will be a low-power unit to get the signal in or out of the network. The airwaves will fall silent except for signals with no alternative but the broadcast route.

This will be good news for those who bemoan the crowded ether. It is not such good news for the multitude using their Seti@Home screensavers looking for just that blaze of radio waves from out there.

On the other hand, the little green men may already have caught our blaze of signals and come to have a look. As for me – sorry, but I've abandoned my Seti@Home installation.

Colin Slater

Self improvement? >

Barry Fox's article in January's *PCW* struck a chord for me. I've had a piece of 'follow-me' driver software which I use for a bit of hardware critical to my business (a PIC IC programmer). This is an extremely simple driver which dumps a data file out through the parallel port, and I've used it successfully on different computers as I migrated from 95 to 98, SE to ME. I held off getting an XP machine for ages due to early adopters' horror stories about compatibility, but eventually – after I'd checked the software on someone else's XP machine – I took the plunge and bought a new PC with XP. Initially, all was well, once I'd got used to the 'improved' user interface and the ghastly search function. I continued using my little PIC programmer without incident.

Then along came XP SP2 and my world turned upside down. Suddenly the programmer can't find the LPT port it's been using for ages and I can't program the ICs which are critical to my business. And there's no way I can find out what's blocking access, let alone how to remove it. My only alternative is to cobble together a last-generation machine out of spare bits and pieces and install a copy of Windows 98.

Self-updating is great in theory, but it brings with it the nightmare of going to bed with your system working perfectly but waking up to a computer which refuses to do the things it did yesterday for my 'protection'.

So what are we to do? Turn off automatic updating and risk our machines not being compatible with later software (or worse still, being wide open to attacks)? Or do we simply put up with the risk that mission-critical software which runs today might refuse to operate tomorrow, due to the computer's own self-improvement programme? Answers on the back of a postcard, please.

Giles Read

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guyk@pcw.co.uk

Who cares about technical specs?

Consumers put notebook style above specs, says Guy Kewney; something IBM's new owners should consider

Watching a performance of *The Princess Bride* in widescreen DVD format on my brand new NEC I-Select notebook on holiday last year, a visitor asked what had happened to my faithful Thinkpad X31.

This is the test. Now that IBM isn't IBM any more, will I still want a Thinkpad? Or will I fall for the exciting technical specs of products from less established rivals? In a nutshell, do I buy Thinkpads because they are the best on the market or because they're IBM?

When the news broke that IBM had sold its PC business, there was an enthusiastic response from those rivals. I chatted with their marketing people and almost all of them were bravely excited – or at least they said they were. But secretly, they will be looking over their shoulders at Dell.

The battle for the PC desktop is almost one of 'who cares?' – what matters these days is the portable market. And in portables, you get extra marks for style and grace.

If you were to ask most people in my profession – technical writers – what they felt was the most stylish notebook you can get, you would find a surprisingly high percentage of them saying either Thinkpad or Sony Vaio. Ask who comes next, and I doubt you'd get the same answer from more than five per cent of them; The rest of the field all have their good points, but I doubt you'd hear any huge majority saying that beauty and design were their prime reasons for picking the machine they like best.

The question facing IBM, and its new owner, is whether the three letters, I, B and M, are actually a key feature of that beauty and design, or whether the word Thinkpad is the magic icon which inspires envy and a lust to own. Is it the shape and colour of the notebook or is it the fact that it comes from the oldest existing computer icon?

Hard questions. But heck, does beauty and design actually matter in personal computing?

The easy answer is 'No, not a bit – if you have a genuine technical advantage.' If you produce a notebook PC which is half the weight of all its rivals, or runs twice as fast, has a screen with twice the pixel count or produces cinema-realistic animation when everybody else has stick-men then you can put it in a tin can or a yellow plastic box with flowers on. And if you could make the same machine for half the price, then you'd take the market by storm, too.

Who, though, has a technical lead? In this industry, nobody. As with the motor industry, where you can buy a

Jaguar and a Ford with a virtually identical chassis, the engineering inside a notebook case is mostly dictated by Intel. The choice left to NEC or Hitachi or Toshiba or Dell is really what colour the buttons are – how many USB sockets to provide, whether to put them on the back or the side, whether to use a Type 2 PC Card or a couple of Secure Digital readers and, of course, whether to make the display fashionably wide.

And why is it fashionable to make the display of a portable machine wide? Nothing to do with PCs, is it? It's two things: wide-screen cinema and Apple.

Technically, if you get the widescreen (16:9) DVD of your favourite movie, then the normal aspect ratio of a PC screen (4:3) isn't ideal and an over-wide display makes sense. But the first widescreen notebooks to sell well were from Apple, and Apple has focused almost primarily on aesthetics – style and grace.

We've had a good year, in terms of PC sales – personal computer sales, that is, not just PC-compatible computers. But watching the stream of new hardware

pour through our Labs, the thing that has struck me more forcibly is how little innovation there is. 'Haven't you got an SD slot on your old Thinkpad?' asks a sympathetic colleague when I pull out a USB cable and plug my camera's memory card into the end of it. No I haven't, because when I bought this one, cameras used Compact Flash memory cards, not Secure Digital. 'Oh, what a shame.'

I'm reminded of a friend who got himself more enthusiastic about the drinks-cup holder in his new Saab than he did about the performance. I asked him whether he had the turbo engine (he did, of course) and he said, no, he didn't think so. But he giggled like a teenager when he pushed the button in and the little mechanism went through its 'surprise and delight' routine, producing a full table-top, it seemed, from a tiny slot in the dashboard.

So, if the new IBM, owned by the Chinese, continues to be an icon of design and desirability, and has the computer equivalent of the ideal drinks holder, then I guess it will be a serious competitor to Dell. And if it actually depends on truly being IBM, to be magically desirable, then the future of the notebook PC will switch to Apple – until someone else, perhaps Sony, perhaps a newcomer – comes up with a new design talisman.

But technical specifications? Who cares? Frankly, they're all the same, aren't they? Now, the important question: should we start using walnut veneer on the bezel?

'Does beauty and design actually matter in personal computing? The easy answer: 'No, not a bit'

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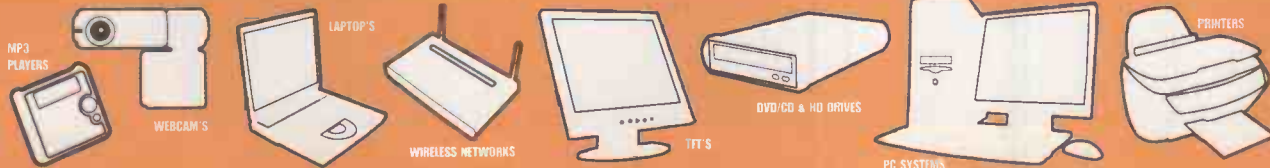
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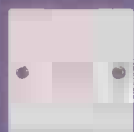
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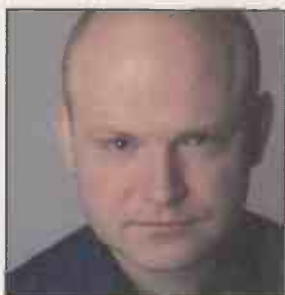
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It's intricate but worth the effort

Gordon Laing grasps the opportunity to install Media Center on his own PC, but finds it's not an easy task

I've spent the last fortnight struggling to install Windows XP Media Center 2005 on my own PC. To be fair, Microsoft never said it was going to be easy – indeed Media Center was never intended for end-user installations. As a tricky beast to get going, Microsoft only ever meant for it to be pre-installed by manufacturers on brand new systems.

But when Microsoft's extended licensing for Media Center 2005 allowed system builders to theoretically sell the OEM installation discs to end users, I couldn't resist. It was a red rag to this bull who'd always envied its slick user interface and free two-week electronic programming guide (EPG), but was never prepared to buy a new PC just to have it. The joy of the challenge aside, are there any compelling reasons to install Media Center on your own PC rather than installing rivals that are designed for end-user installations?

For starters, the value of Media Center's programming guide can't be underestimated. Most packages require a subscription or a complex process to harvest and reformat free scheduling data available on the Internet; others exploit the seven-day EPG delivered by Freeview for terrestrial digital TV broadcasts, but this can be slow to gather. In contrast, Media Center gives you free access to a two-week EPG that automatically downloads from the Internet every day. You just press the Guide button and it's there without delay, configuration or subscription. I'd say it's worth having just for this alone.

Media Center 2005's ability to use twin TV tuners is also useful. I rarely want to record shows that are on at the same time, but I do like to pad recordings by a few minutes either end. Problems come if you're recording shows on different channels that immediately follow each other. With two tuners, the second show can start recording while the first one's finishing off. Once you've used it, you'll wonder how you ever coped with a single tuner.

It's no secret that I like Media Center, but I'm not prepared to buy a new PC just to have it. I have a perfectly good one it could run on, hence the attraction of attempting a manual installation. But despite the warnings, I had no idea how tricky it would turn out to be.

The initial Media Center installation itself presents no problem at all. The OEM packet consists of two CDs (costing around £70 ex VAT) that include a new version of Windows XP, requiring a fresh installation – so it will wipe your system clean. The version of XP that MCE comes with is essentially XP Professional with a few features disabled.

One contentious issue is its inability to connect to network domains, although this option is presented during

initial installation. It's the only chance you'll get to join a domain without reinstalling the OS, but at least it's possible for those installing Media Center on their own machines.

So, apart from a slight panic when you're asked for a non-existent Windows XP Service Pack 2 CD (solved by simply re-inserting disc one), the initial leg of getting Media Center to work is essentially no different from a standard XP installation. The hard part is trying to get it to work with your TV tuner, graphics card and DVD software.

Microsoft makes no attempt to hide the fact Media Center is fussy over what it will work with. After wasting hours, I gave up trying to get existing parts to play ball and just decided to replace them with those absolutely known to work. Sadly, it's not just the hardware which has to be right – you may also need specific Media Center drivers, which aren't always available to end users.

Luckily there are exceptions and I'd advise you go for them. Hauppauge's latest TV tuners seem to work fine in MCE with their supplied drivers, and GDI even offers WHQL-certified Media Center software for its Black Gold

tuners on its main website. You'll need a recent graphics card with the right drivers, but Nvidia's standard XP software should work, and ATI has made its specific Media Center drivers available on its website.

Even with the right graphics and TV tuner you're not in the clear. Media Center records video content in mpeg2, which is used to view DVD movies and live digital TV broadcasts. You'll need DVD decoding software to see these, but not just any version – you should use

Nvidia's DVD decoder or Cyberlink's PowerDVD 6.

Should you meet all these conditions, Media Center should work without a hitch. Even if you have to buy a new graphics card, TV tuner and DVD software, along with the Media Center discs and Microsoft's remote control (the latter pair available from www.ebuyer.co.uk), you could theoretically upgrade a PC for less than £250. You may even own some of the required parts.

The secret behind installing Media Center is not to try and get around incompatibilities – just give it exactly what it wants. If it's something you fancy trying on your own computer, check out this and next month's Hands on Hardware columns, which detail the entire process, including getting the difficult silent-suspend mode to work.

Ultimately Windows XP Media Center Edition is not meant to be installed by end users and I suspect the discs may never be sold alone as a retail option. But if you know which parts to use and where to get them, it really can be installed on your own PC. It's not for the fainthearted, but now it's running I'd say it was worth the effort.

'It's no secret that I like Media Center, but I'm not prepared to buy a new PC just to have it'



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A patently tricky source of concern

Barry Fox explains why Europe's proposed new patent laws are worrying computer programmers

If you had walked down Victoria Street in London in mid-December you might have spotted Alan Cox, author of much of the code inside the Linux kernel, loitering outside the DTI building.

Inside, our Minister for Science and Innovation, Lord Sainsbury, and a team of suits from the British Patent Office in Wales were trying to reassure 100 or so computer programmers that Europe's plan to pass new patent laws does not mean Europe is going to follow America and Japan in allowing patents on more or less anything, including computer code and business schemes.

'They say they weren't excluding me, they just forgot to invite me,' said Cox, while handing out leaflets that challenged most of what was being said inside.

Almost certainly the Cox exclusion was a cock-up rather than conspiracy. The DTI suits were near desperate to get their message across, if only because they have spent the past five years under a barrage of letters from the open-source community and their MPs.

The DTI's problem, which is also the problem for the law-makers in Brussels, is that the original draft for a new European patent law was an apparently well-intentioned mess, which was further confused by clumsy amendments.

The law-making process in Europe, which creates directives all European countries must follow by enacting changes in local law, is bewildering. Patent law is complicated anyway, and no-one trusts anything that politicians, Brussels lawyers or big businesses tell us. 'They want to build bridges as long as everyone goes across their bridge', said Cox, typifying the them-and-us distrust.

Inside, Peter Lawrence, director of policy at the British Patent Office, said: 'When people don't understand they are frightened – so they oppose. For instance, people don't distinguish between a patent that has been published while pending and one that has been accepted and granted. Only 50 per cent of published patents are granted. The rest are refused.'

He added that when people talk about 30,000 software patents being granted in Europe, these are published applications or patents on computer-implemented inventions. 'You don't get a patent on a mobile phone, or the software code in a phone, you get patents for the hundreds of "computer-implemented" systems inside the phone that depend on software.'

Some people are ideologically anti-Microsoft and anti-patent. 'Realistically,' Lawrence said, 'we don't expect to win these objectors over. But we can remind them that

Europe has very powerful competition laws on abuse, and that the laws are being used against Microsoft. We asked for concrete examples of cases where European software patents had been used against open-source software – where someone had said "you're not big enough to take us on – back off". No-one could point to one. Something would surely have come out of the woodwork by now.'

He went on to say that some small businesses have been scared into thinking they need to employ a patent lawyer. 'We have more hope of explaining the situation to them.'

'For something to be patentable it should make a "technical contribution",' explained Peter Hayward, policy maker at the UK Patent Office. 'The first draft tried to define that in terms of "forces of nature", the definition that is used in Japan and came from an old German court case. But that phrase has now been dropped. Source code is not patentable and will not be patentable. Business schemes will not be patentable either.'

Hayward said that even IBM has revealed it does not want the American situation in Europe. 'American law

only changed because a judge in his nineties said everything had always been patentable, and then died a couple of weeks later. This opened the floodgates. What's happened there is extraordinary. There's been a land grab – or a patents arms race. The directive is intended to pin things down and stop any drift towards the situation in the US and Japan. We are confident the new draft will not open any floodgates.'

I once worked as a patent agent, patenting inventions. I gave it up to be a journalist, largely because I was tired of helping inventors waste their money trying to patent stupid ideas. But I have kept on scanning newly published patents to find out what companies are doing but will not tell me as a journalist.

So I know first hand that many patents coming out of the US are not worth reading because large companies can now patent almost anything, including vague business schemes and Internet ideas. The US Patent Office in Washington grants these daft patents and the large companies can use them to batter small companies into submission.

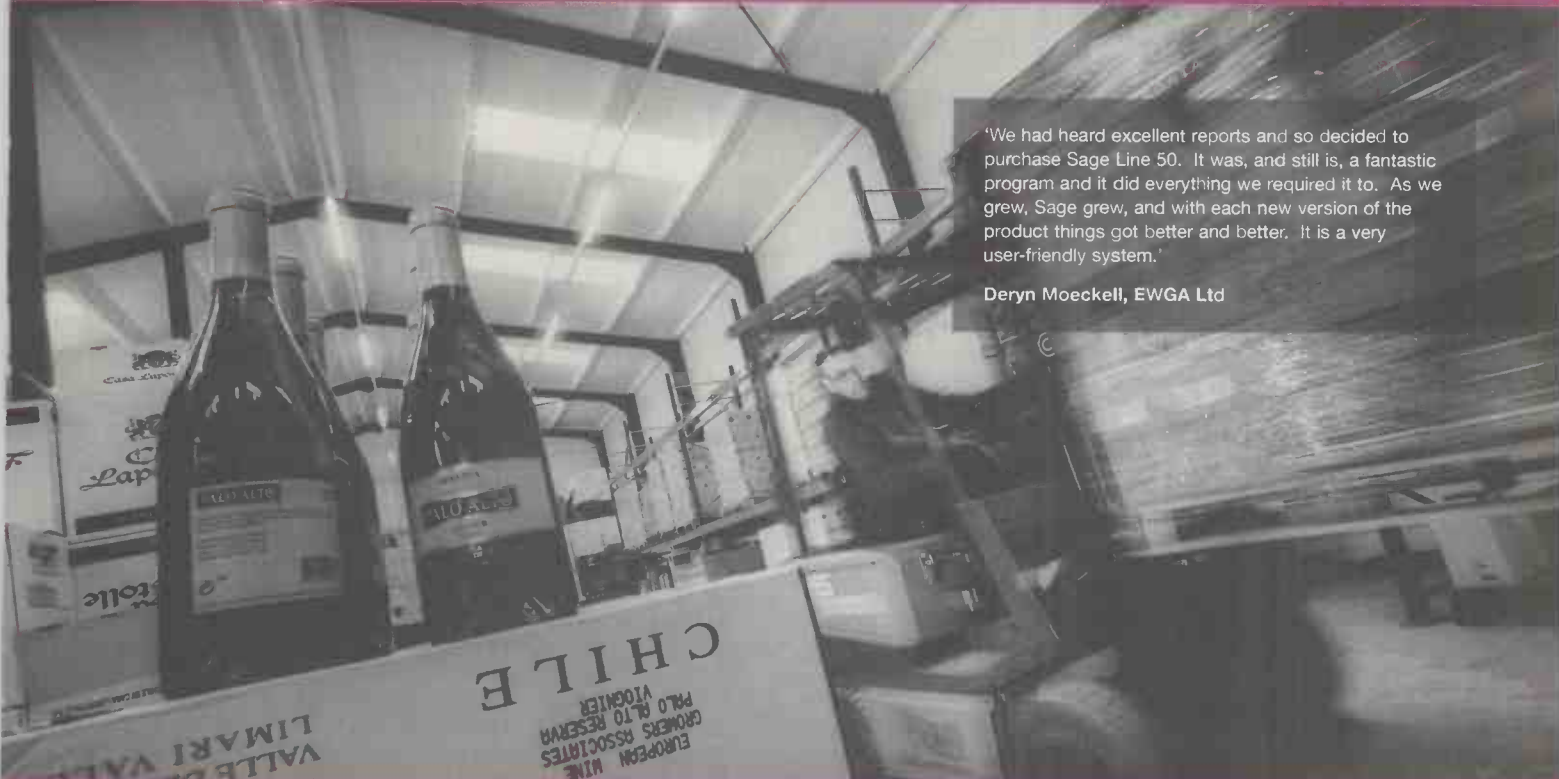
That's what will happen in Europe if the law isn't clarified to outlaw business schemes. The draft directive looks like an attempt at doing this.

But even if it's not, let me remind the open sourcers about the legal trick known as 'prophylactic disclosure'. Once an invention has been disclosed, it can never be patented by anyone. So if you don't want to be held to ransom, just publish your ideas on the Internet and keep dated proof of the posting.

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Don't fall through a security loophole

Technology needs to become more secure and consumers more educated, thinks Alex Arias

The news is riddled with stories of phishing scams, premium-rate diallers and exploited security holes in Windows PCs. But to what extent is this a result of users' ignorance, lack of concentration, inherently insecure technology or simply bad luck when someone falls victim to one of these attacks?

Let's take the scenario of leaving a window open in your home. It's something that's easily spotted and rectified, but if you're burgled the insurance company is unlikely to pay out. It's not quite as simple to spot an open port on a firewall or notice your system's infected with a key-logging trojan. So to what extent should we expect everyone to understand such technical matters?

At the risk of stretching a metaphor, we're now at a point where many people have two homes: a physical one of bricks and mortar and an electronic one in the form of home PCs and network. And the electronic 'home' conceivably holds information of more value than the contents of your physical home. Just as it's your responsibility to close the living room windows, should it also be your responsibility to maintain a secure home network?

Unfortunately it's not quite that black and white, as not only do users have to repel brute-force attacks, but also a psychological onslaught in the form of tempting offers via email and rogue websites. Firewalls, anti-virus, anti-spyware, anti-everything software all provide barriers against the first type of threat, but it's the cunning psychological tricks that can catch out even the most security-aware users. Whether it's an exploitation of an operating system security hole via a legitimate-looking website or emails requesting personal information at 3.30pm on a Friday afternoon when people's guards are down – all are tactics of the cyber-criminals.

Part of the answer is that everyone should understand the inherent vulnerabilities of the technology they're using – everyone knows a padlock can be picked or a phone can be tapped. Although you should keep these things in perspective: for example, credit card fraud (often a result of careless disposal of receipts or rogue retail employees) has reportedly affected one in three of all British cardholders.

Companies should, in theory, be responsible for the consequences of security loopholes, although trying to sue Microsoft for a bug in IE which caused someone to empty your current account might not be practical at the moment. But there could be changes on the horizon, not necessarily in favour of users.

The financial industry body Apacs suggests that around 2,000 British online account holders were taken in by scams in the past year, losing approximately £4.5m between them, and the banks are starting to feel the pinch. And while they usually refund stolen money at the moment, they're making noises about shifting some of the liability to the consumer, as they themselves are can't get insurance against certain types of online fraud.

In particular, the banks may become stricter in defining 'grossly negligent' in their terms and conditions. For example, sending your account details in response to a request that appeared to come from your bank might, quite justifiably, be regarded as negligent. Of course knowledge and education are key to resolving many of these problems and the financial sector has been shouting about the problem for a while, setting up information sites such as www.banksafeonline.org.uk. But what is clear is that financial institutions don't want to continue to shoulder the burden of what they view as consumer ignorance.

So what of the future? Perhaps there'll be a move to

make people use 'authorised' software and hardware, reminiscent of the early days of online banking. Perhaps the cost of running a PC is set to soar with subscriptions to all sorts of companies promising to keep your system safe. Could there be a whole new division of the insurance market – insure yourself against electronic intrusion or fraud, with discounts for those who can pass a security awareness test?

I believe that as broadband becomes the most popular way of accessing the web, we'll reach a crossroads. Either site logins will get so complicated that people will no longer bother using them, or every PC will require a smartcard/biometric reader – something already being trialled by some American banks.

Security is a real problem for the industry as a whole, and many of the possibilities offered by new technologies and services will be stillborn. The 'digital home' concept, pleasing as it sounds, I believe is fraught with danger. Imagine your Internet-connected home entertainment system going berserk after being infected by a virus it picked up from your Bluetooth phone. Suddenly one night it decides to order Sony's entire back catalogue of online video content. Today's diallers would seem trivial by comparison and unfortunately there's no real solution on the horizon.

Being a victim of online fraud makes life that little bit harder as your identity becomes 'questionable' for some time after the event. Just remember no technology is infallible and, even if you're an expert, never forget to engage your brain before acting.

'Companies should, in theory, be responsible for the consequences of security loopholes'



**They are one of a kind
so is their XC Cube**



XC Cube AV

Now you can experience the perfect fusion of home theatre and personal computer in a space saving, beautiful modern design with the XC Cube AV. The possibilities are truly unprecedented. With the Instant On function, you have access to audio and video files within eight seconds. The uniquely designed VFD display and the accompanying remote control easily enable you to play DVD/CD/MP3/VCD files. Moreover, the AV's 7-in-1 card reader also reads the most common memory cards. And the SilentTek technology and the heat evacuating design, means the AV is silently cooled.

• XC Cube AV EA65 and EA65-II: Intel socket 478 / Intel 865G+ICH5.
For more detailed specifications, please visit our website:
www.solution.aopen.com.tw/products/XC/

Together with the accompanying TFT screen, speakers, keyboard and mouse (optional), the AV ensures optimal digital viewing and listening pleasure to your specifications.

AOpen®

Reviews

EDITED BY CHRIS CAIN

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

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Oxford Dictionary of Quotations



PAGE 57

With its silver case and wide screen, Dell's Inspiron 9200 is stylish, but can it perform?



PAGE 58

If you're in the market for a new PDA, check out the latest Palm Tungsten upgrade



PAGE 88

Suse Linux 9.2 is a powerful operating system – find out whether it can rival Windows

At PCW we've always applauded companies that go the extra mile when naming products. Until recently, it looked as if the days of such greats as the Apple Macintosh, Commodore Amiga and Hercules Terminator Beast were long gone. This month, our faith has been restored.

Arguably the best-named PC in a long time, Evesham's Decimator lived up to its moniker. Sporting Intel's fastest Pentium 4, 1GB of 533MHz DDR memory and ATI's brand new X850XT Platinum Edition graphics card, it put in a truly blistering performance. The only downside to the Decimator is the price – you won't get much change from a cool £2,500.

Advent's T9420 offers 3.8GHz power without the price. It's not as cutting edge as the Decimator, and the name is awful, but it does come in at around £1,000 cheaper. Mesh scored on both the name and performance fronts this month with its Fireblade SLI – the first system we've seen to offer Nvidia's latest graphics technology.

Peripheral reviews kick off with the T5, Palmone's sexy next-generation PDA. Combining the build and the styling of the E and T3 models, it's lightweight with much improved battery life. Creative's latest gadget was notable for the same reasons. Available in a range of 10 colours, the Zen Micro is a 5GB mp3 player designed to compete directly with Apple's iPod mini.

Other products on test include new digital cameras from Canon and Contax, a PVR (personal video recorder) system for notebooks from Terratec, and 3G phones from Sony and Motorola. Meanwhile, if you fancy the idea of a Media Center but don't want to splash out on a new PC, Pinnacle's PCTV Mediastudio 300i provides analogue and digital tuners, with software to let you watch and record TV, play DVD movies, rip CDs and listen to music.

We've seen some interesting new releases on the software front, too. Quark Xpress 6.5, Adobe Acrobat 7, Dragon Naturally Speaking 8, Ulead PhotoImpact 10 and CyberLink PowerDVD 6 are just some of the packages under scrutiny. Elsewhere, McAfee has finally updated its best-selling Internet Security Suite with 2005 versions of Virus Scan, Personal Firewall Plus, Privacy Service and Spamkiller.

Finally, we take Suse Linux 9.2 for a spin. It's easily the best version of the open-source OS yet, but does it offer enough to make anyone switch from Windows?





Creative Zen Micro

The first real challenge to the Ipod Mini, this mp3 player beats its rival in several areas – see page 63



Quark Xpress 6.5 for Windows

This latest version of the desktop publishing package is still the market leader – see page 79



MEDIA CENTER PC

Evesham Decimator

An impressive, but expensive, system that lives up to its name



First things first: the Evesham Decimator has the best name we've heard in quite a while. It also has the looks to match. A bit bigger than the average tower, it sports an all-over brushed-metal finish with a stylish swing-out door covering the front panel. The door itself houses a circular cut-away with an LCD panel, showing the date and time, temperature of various sensors in the case, and the (many) fan

speeds. It's certainly a step away from Evesham's standard look and feel, and we like it.

The Decimator is built around some of the fastest components available. There's a top-of-the-line 3.8GHz Pentium 4, mounted on an MSI 925X motherboard, 1GB of 533MHz memory and an ATI Radeon X850XT-based video card in a 16x PCI Express slot.

A pair of 250GB Sata drives provides 500GB of hard disk storage, chained together in a

Raid 0 array. This makes performance faster than a standard configuration, especially when reading and writing large files, but the downside is that you could end up losing the majority of your data should one of the units fail.

Two spare Sata connectors on the motherboard allow for additional drives, and the case has three empty external 5.25in bays. Both external 3.5in bays are taken – one with a 10-in-1 card reader and the other with a floppy drive. You also get a Sony DVD-Rom and a 16-speed dual-layer DVD writer.

Two free PCI slots allow for extra expansion and two huge fans, acting as general system coolers as well as specifically cooling the video and PCI cards, cover the whole slot-section of the board. The memory takes up two DDR slots, leaving another two for future expansion.

Considering how much is inside the case – making full use of the 420w power supply – it's all well packed away, and good use has been made of the clips on the case to tidy the cabling. The case is spacious and quieter in use than you might expect.

Instead of burdening the front of the case (and obstructing the door) with more sockets, the top holds a plastic housing that conceals a pair of USB connectors, headphone and microphone sockets and a

Firewire port, as well as another fan. There are four more USB sockets on the back, along with another Firewire port, surround-sound outputs and an optical S/PDIF port, plus keyboard, mouse, parallel, serial modem and network connectors. The Radeon includes DVI and S-video outputs as well as VGA.

Given the name and specification, we expected top performance, and the system scored a Sysmark rating of 229 – one of the highest we've seen. It would also make a great gaming PC, and its 3Dmark05 score of 6,035 sets a new standard.

Bizarrely, given the specification and full tower configuration, the system comes with Windows XP Media Center 2005. It's useful to have the extra facilities, but the Evesham Ebox featured in our group test on page 101 seems more in tune with the idea of a living room-friendly consumer device. We'd also expect a TV tuner, although technically this isn't required.

The only downside to the system is the price. You won't get much change from £2,500, a lot even for a PC with as much packed into its case as this one.

Anthony Dhanendran

DETAILS

RRP £2,474 (£2,105.53 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Evesham Computers

0870 160 9500 www.evesham.com

SPECIFICATIONS

Windows XP Media Center Edition 2005 • P4 3.8GHz • 1GB memory • 500GB hard disk • Sony DVD 16x, Sony dual-layer DVD rewriter • ATI X850XT PE graphics card • Viewsonic VP2015 20in TFT monitor • Microsoft Works 8, Pinnacle Instant CD/DVD SE, Studio 9 SE and DVD player, Etrust E-Z Antivirus • 2yr OSM warranty, 1yr RTB

PROS Speed; great specification

CONS Price tag to match

VERDICT

A spectacular system, but only for those with deep pockets

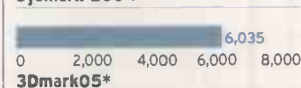
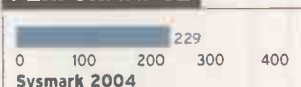
FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

PERFORMANCE



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

MEDIA CENTER PC

Mini Computers Theatrino

Plenty of features packed into a tiny case

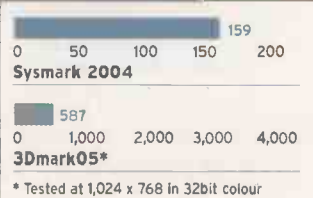


Just missing our group test of Media Centers on page 101 by a whisker, the Theatrino is certainly a small PC. It's designed to sit under your television and take care of your viewing and listening needs, as well as being a proper computer. And the brushed metal finish, slot-loading DVD rewriter and blue front LED make it look more like a piece of home cinema gear than a PC.

Mini Computers has stuffed a lot into the box, considering its size – there's a Pentium M 745 1.8GHz, 512MB of Ram, 400GB of hard disk space, and a slimline DVD rewriter. Two PCI slots are taken up by a digital TV tuner card and a riser board for the DVI and TV-out ports. These are wedged in tightly and there is little room for manoeuvre – the hard disk is screwed to the case and would be hard to replace.

The system has four USB sockets, parallel and serial ports and optical and normal sound outputs. A Bluetooth Logitech Dinovo keyboard and mouse are useful additions.

PERFORMANCE



Graphics come courtesy of a Mobility Radeon M10 card, which makes this PC fine for pictures and video but poor for games. The chip scored just 587 in 3Dmark05. Media Centers really aren't designed with games in mind, but we like a well-rounded PC. A Sysmark score of 159 does it more justice.

For a machine without a monitor, £1,600 is a lot to pay, although it is fairly powerful. However, other Theatrino configurations are available.

Anthony Dhanendran

DETAILS

RRP £1,599.18 (Uno package 3) (£1,361.00 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Mini Computers

www.minicomputers.co.uk

SPECIFICATIONS

Windows XP Media Center 2005 • 1.8GHz Intel P4 • Intel 855GME chipset • 512MB DDR Ram • Digital TV tuner (Freeview) • 400GB UltraATA hard disk • DVD+/-R/RW/CD-R/RW drive • CF adapter • ATI Mobility Radeon M10 AGP graphics • 1yr mainland on-site warranty

PROS

Decent performance

CONS

Expensive for what you get

VERDICT

A huge amount in a tiny case, but it comes at a price

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

AMD ATHLON 64 PC

Mesh Fireblade SLI

The latest Nvidia chipset and graphics

FIRST UK REVIEW



Look inside Mesh's latest PC and you'll find two Leadtek Geforce 6600GT graphics cards. The Fireblade is the first system we've seen to employ Nvidia's Nforce4 chipset and SLI (scalable link interface) technology, allowing a matched pair of graphics adapters to be linked for increased performance.

The rest of this Athlon64 3800+ PC is quite conventional. Mesh has chosen an Asus A8N-SLI Deluxe motherboard, and there's a decent array of ports on the backplate (four USB2, two Firewire, optical and coaxial S/PDIF), and two more USB on the front of the case. However, gamers won't like the lack of a dedicated soundcard.

The inside of the case is neat, thanks in part to a Maxtor Sata hard disk with its slender cable and 300GB capacity. There's room for upgrades and we doubt anyone will feel restricted by the seven unused Sata connectors, arranged in two blocks of four on two separate controllers.

In tests the twin cards proved comparable to a high-end

Geforce 6800GT card and the system handled games such as Doom3 superbly – knocking out over 80fps (frames per second) at high quality settings. We can't help thinking Mesh missed a trick as it could have fitted a single 6800GT, which would leave an upgrade path for gamers to install a second card at a later date.

The Logitech desktop set and Creative 7.1 speakers work well, but pride of place goes to the 19in Viewsonic TFT display.

Leo Waldoock

DETAILS

RRP £1,499 (£1,275.75 ex VAT)

Delivery costs £45.82 (£39 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Mesh 0870 046 4747

www.meshcomputers.com

SPECIFICATIONS

Windows XP Home • AMD Athlon 64 3800+ • 1GB PC3200 DDR • 300GB hard disk • 16x dual-layer DVD writer, 16x DVD-Rom • Dual 128MB FX-6600GT graphics cards • 19in Viewsonic VX912 TFT display • 3yrs on-site warranty

PROS

Good value; performance

CONS

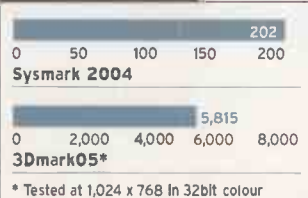
Integrated audio; no 6800GT SLI available at present

VERDICT

An insight into the way PCs will develop over the coming months

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

PERFORMANCE





Windows Mobile

Smartphone masterclass

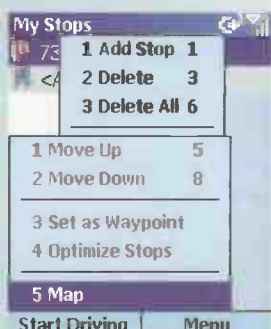


You need never get lost again if you've got a Smartphone running the Windows Mobile operating system. Using the latest Co-Pilot Live software from ALK, your Smartphone can be transformed into an ultra-portable, in-car satellite navigation system. When Co-Pilot Live is combined with your Smartphone's colour screen and in-built speakers, the result is a powerful, hands-free GPS system, and the 'Live' element of Co-Pilot comes into its own when tapping into the Smartphone's wireless ability to connect to the Internet. To unlock the potential of sat nav on your Smartphone, read the tutorials below

How to navigate home in a car

Follow these steps on a Windows Mobile-based Smartphone with Co-Pilot Live for a hassle-free journey.

- 1 Click Start and choose Co-Pilot from the menu.
- 2 Switch on Co-Pilot Bluetooth GPS Satellite receiver. This will automatically activate Bluetooth on your phone and connect to the receiver.
- 3 Select 'Going To' from the



welcome screen. The 'my stops' screen will be displayed. Click 'add a stop'.

- 4 Key-in an address and click 'Done'.
- 5 A selection of matches will appear. Highlight the correct location and click 'Select'.
- 6 The address will be added to



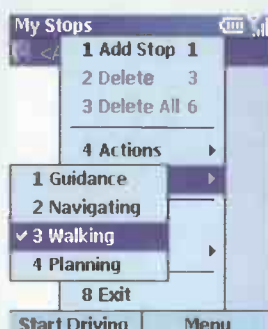
your itinerary.

- 7 Click 'Start Driving' and your Co-Pilot-enabled Smartphone will guide you there, with turn by turn voice directions all the way to the door.

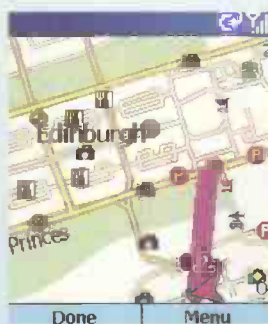
Using Co-Pilot Live to get around Edinburgh

There's a lot more to Edinburgh than the castle. However, if you're new to the city it can take while to find your way around. Save yourself the expense of a guidebook and let your Smartphone help you.

- 1 Click 'Going to' from the Co-Pilot welcome screen.
- 2 Click on menu, then toggle down to 'mode' and select 'walking'.



- 3 Now click on 'Add a Stop' and enter in an address or simply pinpoint a place on the map displayed.
- 4 Co-Pilot will now maintain a straight 'as the crow flies' line against a detailed map. Just follow the line to get from wherever you



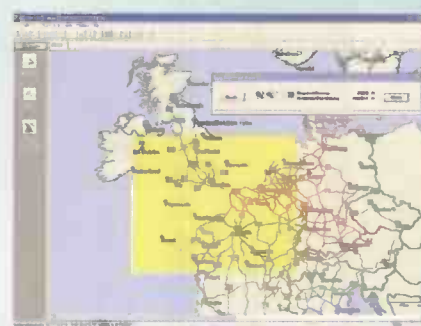
are to your destination.

- 5 You can zoom in and out of the map either by pressing buttons one and two, or pressing in the phones' navigation button and toggling up and down.

Installing a new map onto your Smartphone

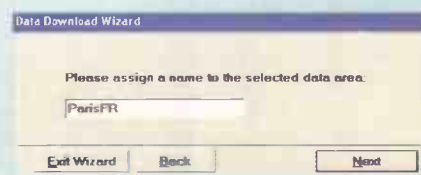
Once you know where you are going, ALK can provide you with the maps you need on CD.

- 1 On your PC, launch the Co-Pilot Live Desktop software and select Data download wizard.
- 2 Select the drive letter of your device storage card.
- 3 Select 'map area'
- 4 Enter in a city with the map area



you want to download and click next.

- 5 Zoom in or out to fit the required map area on screen.
- 6 Using the mouse, drag a box to select the map area required. You will see the required and available memory displayed on-screen.
- 7 Click next, give the map area a



name and click next.

- 8 Click on the download icon to download maps to the storage card
- 9 Once complete, insert the card into your Smartphone and your map will be available.

Conclusion...

Over the past five months, this popular series of tutorials covered many of the key Windows Mobile-based Smartphone features. These have included including web surfing, email, instant messaging, streaming live radio from the Internet and transferring MP3s from your PC. We also showed you an array for handy travel software applications, how to improve your golf game and how to download games from the web to your Smartphone while on the move. Add in GPS, and the Smartphone's ability to take photos and video, and you have more than enough reasons to ditch the clutter of devices you already have. Make 2005 the year you opt for single tool for all your entertainment and communications needs: Windows Mobile Smartphone – one device to rule them all!

PENTIUM 4 PC

Advent T9420

A great performer with plenty of storage options



The Advent T9420 is one of two PCs this month to feature a 3.8GHz Pentium 4. Here Intel's flagship processor has been twinned with its own Grantsdale 915 chipset and a substantial 1GB of fast DDR400 memory.

Given its specification the T9420 is likely to appeal to a broad group of potential users, and the inclusion of a TV/FM tuner will be of particular interest to multimedia fans. It isn't a digital tuner, so you won't be able to access Freeview channels, but it does include a remote control.

As well as allowing you to watch terrestrial programmes, the T9420 comes with a pair of 250GB Maxtor SATA hard drives that, in theory, should be enough to store around 500 hours of high-quality video or a vast stockpile of digital images. Prized recordings and other data can be burned to disc using the supplied 16-speed dual-layer/dual-format DVD writer.

The T9420's multimedia features are extended with a versatile front panel mounted in one of its 3.25in drive bays. This

has a number of sockets including S-video and coaxial video inputs, handy if you want to transfer your old VHS tapes to a digital format or capture footage from a camcorder. The AV front panel also includes a 9-in-1 memory card reader, compatible with the storage media used by just about every digital camera.

The audio department is well stocked with eight-channel sound, S/PDIF input and output ports and a set of Philips A3.610 speakers. The latter provide convincing surround sound through a set of five flat-panel units that measure little more than 3cm in thickness. They can also be wall mounted, provided you don't overreach the 5m of cabling. Overall these give a wide field of audio, and the wooden subwoofer should provide more than enough bass to annoy the neighbours.

Unusually for a desktop PC, the T9420 includes both Ethernet and 802.11g wireless networking. If you've got a notebook or PDA with wireless support, you can share files or an Internet connection without too

much fuss. The wireless theme is extended to keyboard and mouse, avoiding cable clutter.

On paper, the T9420 looks like a top performer. In reality the system's benchmark results backed this up. A Sysmark 2002 score of 214 is very impressive, though this is slightly slower than the Evesham Decimator reviewed on page 53.

Given the strong all-round specification, we were slightly surprised by Advent's choice of graphics card. The Radeon X700 Pro is an excellent solution and it's PCI Express. However, while the 3.8GHz Pentium 4 is top of its class, the X700 is outperformed by a number of other cards in the Radeon range. This said, a 3Dmark05 score of 2,941 means you'll still be able to play any of today's most demanding

titles at high resolution, with all the graphics effects turned up to the maximum.

Advent has chosen a 19in TFT screen to accompany the T9420. This is a good display on the whole and, as with most 19in flat panels, it's designed to run at a resolution of 1,280 x 1,024 – the same as most 17in models. Some would argue the extra budget reserved for a 19in screen would have been better spent reducing the price or upgrading another component.

In terms of software, the system comes with Windows XP Home and Microsoft Works 8, which provides for basic productivity needs. It would have been good to see more, though.

The Advent offers a high specification and at £1,599 it's great value for money. If you're after a PC with a strong multimedia focus that can also handle the latest games and run rings around office applications, it is difficult to beat.

Rory Reid

DETAILS

RRP £1,599 (£1,460 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

PC World 08705 464 464

www.pcworld.co.uk

SPECIFICATIONS

3.8GHz Intel Pentium 4 (Socket 775 Prescott) • 1GB DDR400 Ram • 256MB ATI Radeon X700 Pro • 2 250GB SATA hard disks • TV tuner, AV panel • 16x Dual-layer DVD writer drive • 16x DVD-Rom drive • 8-channel audio • Philips A3.610 speakers • 802.11g Wireless • 56K modem • Ethernet • Windows XP Home • Microsoft Works 8

PROS Price; AV panel; fast processor; speakers

CONS Graphics could be faster

VERDICT

Ideal for even the most demanding users

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL

★★★★★
★★★★★
★★★★★
★★★★★

PERFORMANCE



DESKTOP REPLACEMENT

Dell Inspiron 9200

A large and stylish notebook that's comfortable to use



Dell's Inspiron 9200 is the follow-up to the 9100 desktop replacement notebook reviewed last month. The most obvious change is a new look – the system is housed in an eye-catching silver chassis, complemented by a black keyboard and white trim.

While its external appearance is an improvement, the 9200 seems to have taken a step backwards inside. Our review sample was equipped with 1GB of Ram, but instead of the 3.4GHz desktop Pentium 4 processor seen in some versions of the 9100, this machine has a 2GHz mobile Pentium M.

Understandably, this gives it slightly slower performance than many of the desktop replacement notebooks we've seen in previous issues. The machine delivered a Sysmark 2004 rating of 158, on a par with what we'd expect given its specification, but this isn't a patch on the scores achieved in our desktop replacement group test in the February issue.

The Inspiron 9200 makes up for its average core performance

with an ATI Mobility Radeon 9700 in the graphics department. This isn't as fast as the top-end graphics cards available in full-sized PCs, but it is more than capable of running the latest games without much compromise in detail or speed. As a result, it came in with a 3Dmark05 score of 785.

The mobile processor does help to deliver a long battery life in comparison to some of the other systems we looked at. The Inspiron 9200 lasted just over two hours in our intensive Labs tests, but should last even longer with everyday office tasks such as word processing.

One of the 9200's most compelling features is its 17in widescreen display. Its native 1,920 x 1,200 resolution is ideal for viewing multiple documents side by side in the accompanying Microsoft Works 7 or for watching DVD movies. That said, while the screen is clear and bright, our early review sample had noticeable speckling on images with sections of light

tones that looked like noise distortion. The system includes both analogue VGA and DVI outputs to connect it to an external monitor.

The Inspiron was one of the most comfortable notebooks we've used for a while. The keyboard is outstanding with an excellent tactile response. The mouse touchpad is less impressive, lacking a dedicated scrolling function, but the keyboard's cursor buttons are a fairly good size and well positioned for use when scrolling through a document.

The Inspiron 9200 also surprised us by remaining cool, even during prolonged use. Desktop replacement notebooks normally generate a considerable amount of heat, but you're unlikely to notice

much heat dissipation when running standard applications.

Our review sample was equipped with a Secure Digital (SD) card reader on the right side of the unit, along with a mini Firewire port and audio sockets for a mic and headphones. Unfortunately the 9200 doesn't support any other form of memory card as standard, so if your digital camera or mobile phone doesn't use this format, you'll have to rely on one of the four USB2 ports to transfer your data. The integrated DVD-rewriter supports plus and minus disc formats but can't write to dual-layer media.

On the whole, the Inspiron 9200 is an attractive and well-specified system that seems to be lost somewhere between being a desktop replacement and an ultraportable. It's not small enough for easy transportation, but it can't compete with similarly sized rivals when it comes to raw power. If you don't need extreme performance but still want a notebook that can comfortably run most applications, the Inspiron is worth a look.

Rory Reid

DETAILS

RRP £1,649 (£1,403.40 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Dell www.dell.co.uk

SPECIFICATIONS

Windows XP Pro • Pentium M 2GHz • 1GB of DDR 400 Ram • 60GB hard drive • ATI Mobility Radeon 9700, 128MB Ram • 8x DVD+/- rewriter • 17in WXGA LCD • 3yr warranty • 802.11b/g wireless Lan • Works 7 • 3.5kg

PROS High-resolution widescreen display; comfortable to use

CONS Performance; single-layer DVD writer

VERDICT

Large and stylish, but lacking in some areas

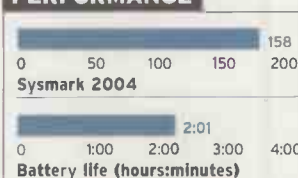
FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL

★★★★★
★★★★★
★★★★★
★★★★★

PERFORMANCE



Yakumo Hypersound XR

- Plays MP3 / WMA
- 256MB / USB 2.0 full speed
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Apacer RS-MMC 256MB.....	£19.95
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PDA

Palm Tungsten T5

A great-looking device to spice up the range



If you've played with previous Palm Tungsten PDAs, the T5 will seem familiar. Physically, it combines the build and looks of the E and T3 models and offers a 320 x 480 Transfective TFT colour screen. The T5 doesn't have the stretched display feature of the T3, but it does come with Palm OS 5.4, which includes 'alpha channel-blended graphics' that allows effects such as transparent icons. There's also a handy 'Rotate Screen' icon to switch between portrait and landscape modes.

At 146g, the T5 is lighter and more compact than other models. Nevertheless, the Intel 416MHz XScale processor and 256MB of memory make the T5 one of the most powerful PDAs we've seen. Only 215MB of the memory is available to the user. There's 55MB for programs and data, while the other 160MB is used as an internal flash drive. An SD memory card slot allows for further expansion.

A new Favorites tool allows you to have up to eight application icons, documents or preferred URLs on the home screen. Another new application, Files, works much like Windows Explorer, displaying a list of stored folders and files. Palm's File Transfer application has also had a makeover, and lets you easily move files and folders back and forth between the T5 and a PC or Mac. When it's connected

to your system, you can use the T5 as a USB drive. It also comes with Graffiti 2 handwriting recognition and you can write anywhere on screen, however a pop-up area is still available.

Battery life is much better than previous models, lasting around four hours with the backlight on maximum. GPRS fans will also appreciate the intuitive wizard that makes the connection process simpler. In fact, the only real downside to this otherwise excellent PDA is the lack of integrated Wifi, although you do get Bluetooth.

Luke Peters

DETAILS

RRP £279 (£237.44 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Palmone 0118 974 2700

www.palmone.com/uk

SPECIFICATIONS

Palm OS 5.4 • Intel XScale 416MHz ARM processor • 256MB memory (215 available); 55MB programs and data, 160MB flash drive • 320 x 480 TFT screen • SD/SDIO/MMC • Bluetooth • 146g • 7.8 x 1.5 x 12.1cm

PROS Excellent screen; memory

CONS No Wifi; expensive

VERDICT

Another sterling Tungsten upgrade with great new features

FEATURES

★★★★★

PERFORMANCE

★★★★★

VALUE FOR MONEY

★★★★★

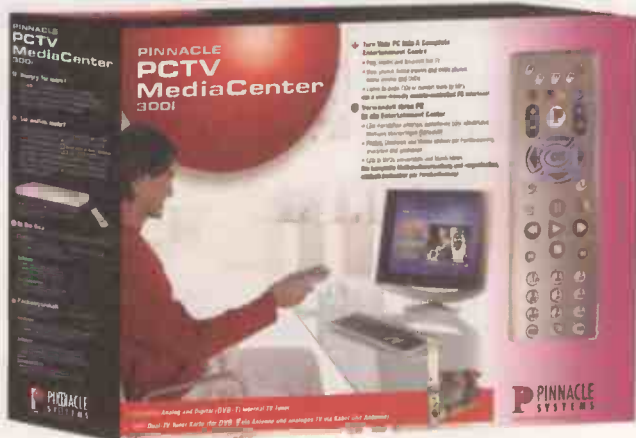
OVERALL

★★★★★

PC TV/PVR

Pinnacle Mediacyenter 300i

A good-value all-in-one PVR



If you like the look of Microsoft Media Center (see our group test on p101) but don't fancy shelling out for a new PC, there are some alternatives. Pinnacle's latest offering is the PCTV MediaCenter 300i and consists of a PCI TV tuner, remote control and Pinnacle's own Mediacyenter software.

The setup process is simple and well designed; it took us just 10 minutes to get things up and running. A neat feature of the 300i's TV capture card is that it's capable of picking up both analogue and digital TV (Freeview) signals, but it won't allow you to receive both at the same time.

As with most PVR (personal video recorder) software, the 300i's interface is strikingly similar to that of Microsoft Media Center 2005. At first it responded extremely slowly, but after upgrading to the latest version (which entailed a tiresome 127MB download) things improved dramatically. However, switching between channels remained slow.

Overall, TV image quality was impressive. Viewed from a distance it looks good, though close up it couldn't quite match that of a standard TV set. Scrolling text was also a little stuttered and the audio was occasionally out of synch, though a restart of the

Mediacyenter would often remedy the latter.

Unlike with Microsoft Media Center PCs, Pinnacle's version won't interact with a set-top box. You can use the S-video input to hook it up to another source, such as a Sky box, but the 300i won't be able to change channels automatically.

It's a shame you can't use the analogue and digital tuners at the same time, but on the whole this is a good alternative to Microsoft Media Center.

Will Stapley

DETAILS

RRP £79.99 (£68.08 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Pinnacle 01895 442 003

www.pinnaclesys.com

SPECIFICATIONS

Digital and analogue tuner • S-video, Composite video input • Remote control • Mpeg1/2/3, Xvid, wmv, asf, DV-avi video support • mp3, wma, wav audio support • Jpeg, gif, bmp Image support

PROS

Easy to set up; cheap

CONS

Digital or analogue, not both; occasional syncing problems

VERDICT

The 300i is good value for money, but it lacks the functionality of Microsoft Media Center

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL

★★★★★

★★★★★

★★★★★

★★★★★

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Adtec 512Mb 3200 DDR	£50.20	£58.98
PNY 512Mb 2700 SODIMM	£65.50	£76.96
Corsair Value Select 256Mb 2700 SODIMM	£29.24	£34.36

NETWORKING



PRODUCT	EX. VAT	INC. VAT
Canyon 802.11g Wireless USB Adaptor	£15.65	£18.39
Belkin High Speed Wireless G Router	£50.60	£59.46
Dynamode Mini 1 Port Wireless USB Print Server	£160.85	£189.00
Dynamode 802.11g Wireless Router with 4 Port 10/100 Switch	£45.96	£54.00
Canyon 802.11g Wireless PCMCIA Card	£12.80	£15.04
MINI5 54G Wireless Access Point	£44.78	£52.62

GRAPHICS CARDS



PRODUCT	EX. VAT	INC. VAT
PNY GeForce 6600 GT 128Mb AGP8X	£122.52	£143.96
Sapphire Radeon X800 Pro 256Mb TV Out - Vivo	£236.33	£277.69
Leadtek WinFast A180B T 128Mb 8XAGP	£25.79	£30.30
Connect 3D Radeon X800 XT Platinum E	£292.49	£343.68
XFX GeForce FX 5700LE 256Mb DDR TV	£65.04	£76.42
ABIT 9600 XT 256Mb DDR	£88.30	£103.75

MODDING



PRODUCT	EX. VAT	INC. VAT
Akasa AK FC-03 - System Fan Speed Controller	£28.56	£33.56
Coolermaster Dual Storm DDF-S81-U1 Case Fan	£11.70	£13.75
Speeze Hard Disk Drive Cooler	£4.95	£5.82
StarTech.com - Round Orb - Chipset Cooler - Copper	£4.23	£4.97
Coolermaster Aerogate II Thermal Control	£18.72	£22.00
StarTech.com - Mutant Mods Lion 80mm Laser Cut Fan Grill	£2.36	£2.77

OPTICAL DRIVES



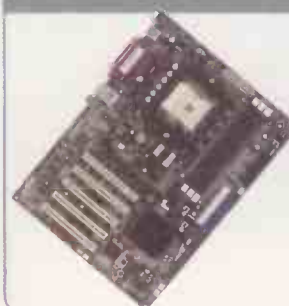
PRODUCT	EX. VAT	INC. VAT
Samsung TS-H552B/WB1H 16x Dual Layer DVD±RW Drive	£35.98	£42.28
Artec 52x32x52 CD-RW	£16.11	£18.93
Lite-On External 12x Dual Format DVD±R/DVD±RW Drive	£61.45	£72.20
A open combo Drive 52x32x52/16x DVD±R/DVD±RW Drive	£21.46	£25.22
Samsung SD 616 - DVD-ROM - Black	£57.02	£67.00
Lite-On 16x Dual Format DVD±R/DVD±RW Drive	£45.80	£53.81

PROCESSORS



PRODUCT	EX. VAT	INC. VAT
Intel® Pentium® 4 3.2GHz	£134.49	£158.02
AMD Sempron 2400+	£36.79	£43.23
Intel® Pentium® 4 HT 3.2GHz	£135.56	£159.28
AMD Athlon 64 3000+	£89.83	£105.55
Intel® Pentium® 4 HT 2.8GHz	£101.13	£118.83
AMD Athlon 64 2800+	£78.00	£91.65

MOTHERBOARDS



PRODUCT	EX. VAT	INC. VAT
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AOpen AX45F-4DN	£23.97	£28.17
Supermicro P4SPE, Intel® 800FSB 865PE Chipset	£87.01	£102.24
DFI Lanparty NFII Ultra B - Mainboard - ATX - nForce2 Ultra	£45.90	£53.93
DFI 865PE Infinity - Mainboard - ATX - i865PE - Socket 478	£53.07	£62.36

SYSTEM CASES



PRODUCT	EX. VAT	INC. VAT
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AOpen XC Cube EY65	£132.13	£155.25
Silverstone TJ03 Silver Case	£177.70	£208.80
Jeantech Cyclops ATX Midi	£11.86	£13.94
Q-TEC L-MD02 350W Black Case	£20.12	£23.64
Jeantech Silver and Black Butterfly ATX Midi	£31.51	£37.03

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£293.26 £344.58



BFG GeForce 6800 OC

128Mb DDR Memory, 350MHz Core Clock Speed, 700MHz Memory Clock, Nvidia CineFX 3.0 Engine, 64-bit Texture Filtering and Blending

(ex. VAT) (inc. VAT)
£153.86 £180.79



BFG GeForce 6600GT OC AGP

128Mb GDDR3 Memory, 525MHz Core Clock Speed, 1050MHz Memory Clock, Nvidia CineFX 3.0 Engine, 64-bit Texture Filtering and Blending

(ex. VAT) (inc. VAT)
£123.40 £145.00



BFG GeForce 6600GT OC PCI-E

128Mb GDDR3 Memory, 525MHz Core Clock Speed, 1050MHz Memory Clock, Nvidia CineFX 3.0 Engine, 64-bit Texture Filtering and Blending

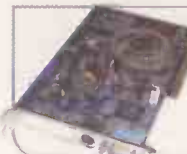
(ex. VAT) (inc. VAT)
£119.15 £140.00



BFG GeForce FX 5700 OC 256Mb

256Mb DDR Memory, 465MHz Core Clock Speed, Nvidia CineFX 2.0 Engine, Nvidia Ultrashadow Technology

(ex. VAT) (inc. VAT)
£90.29 £106.09



BFG GeForce FX 5500 OC 256Mb

256Mb DDR Memory, 290MHz Core Clock Speed, Nvidia CineFX 2.0 Engine, 2 Dual-rendering Pipelines

(ex. VAT) (inc. VAT)
£54.02 £63.47



BFG GeForce FX 5200 OC 256Mb AGP

256Mb DDR Memory, 280MHz Core Clock Speed, Z-correct Bump Mapping

(ex. VAT) (inc. VAT)
£50.15 £58.93



BFG GeForce FX 5200 OC 256Mb PCI

256Mb DDR Memory, 280MHz Core Clock Speed, Z-correct Bump Mapping

(ex. VAT) (inc. VAT)
£50.15 £58.93



BFG GeForce MX 4000 64Mb AGP

64Mb DDR Memory, 275MHz Core Clock Speed, Nvidia Lightspeed Memory Architecture II, 2 Dual-rendering Pipelines

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DIGITAL CAMERA

Contax U4R

Interesting design, but the price is high



Contax is renowned for developing stylish cameras and the new 4megapixel U4R, with its Carl Zeiss lens, is no different. Sporting a brushed magnesium and aluminium casing along with a tanned leather pad on the front, which is available in either black, indigo or 'camel', the U4R has a retro feel that might not suit all tastes.

The camera's swivel design makes it easy to shoot photos at just about any angle. The lack of an optical viewfinder isn't a huge blow, but it does mean the LCD screen needs to be used more often, resulting in quicker discharge of the battery. The menu system features a number of preset shooting modes and takes a while to get used to, as do the ridiculously small four-way joystick and buttons.

Chromatic aberrations hampered some shots during our tests and, in low light conditions, image noise was a little too apparent but, on the whole, picture quality was good and what we'd expect from a 4megapixel compact. The U4R's burst mode is also impressive and will take up to three shots per second at all quality settings; as expected, the flash doesn't fire in burst mode.

Accessories in the box include a USB docking station, which also charges the camera, and a small adapter for the lens that

allows for the use of 28mm filters. It's a little disappointing that Contax couldn't stretch to including a Secure Digital (SD) memory card to get you started, especially considering the price.

Cameras such as this always carry a style premium and, at just under £400, the U4R is a little overpriced. If you like the design it's worth considering, but you can get similar quality for much less with the Pentax Optio S40 (£150) and Canon Powershot A85 (£170).

Will Stapley

DETAILS

RRP £399 (£339.58 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Contax 01189 337 000

www.contaxcameras.co.uk

SPECIFICATIONS

4megapixel • 2,272 x 1,704 max resolution • 3x optical zoom • 38-115mm focal length (35mm equivalent) • 20cm macro • ISO 50-400 • 2in LCD monitor • SD/MMC cards (not included) • Lithium-ion battery • 102 x 63.5 x 19mm (w x h x d) • 140g
PROS Fast burst mode; stylish
CONS Too expensive; no bundled memory card

VERDICT

There are cheaper options, but if you don't mind paying more the U4R performs adequately

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL

★★★★★
★★★★★
★★★★★
★★★★★

DIGITAL CAMERA

Canon Ixus 30

Not cheap, but still an excellent choice



Over the past few years, digital cameras have become increasingly compact and portable, while the number of features they offer has continued to grow. The Ixus 30 from Canon is no exception. It weighs just 115g and is about the same size as a pack of playing cards, yet still squeezes 3.2megapixels of snapping power into its compact, brushed aluminium body, with a 3x optical zoom.

A 2in LCD screen sits at the back of the unit, displaying images clearly and responding well to movement. Above this is an optical viewfinder, and to the right are buttons giving quick access to various camera settings. The Menu button takes you into the camera settings menu, while the Function/Set button in the middle of the circular cursor key lets you change image dimension and quality settings, and switch between different automated shooting modes.

Modes include settings optimised for shooting portraits, night scenes, subjects that are likely to move mid-shot, indoor snaps and underwater shots. This last mode reduces bluish tones and is ideal if you're going to buy the All Weather case, (£99 inc VAT), which lets you use the Ixus underwater. Some photographers may want to experiment with the manual settings and light-metering feature.

The zoom control on top of the unit gives smooth movement and, using the macro mode, we took images at just 3cm from our subject. Overall image quality was impressive – outlines were crisp right into the corners of photos, and colours and tricky textures such as transparent surfaces were well reproduced.

There are cheaper 3megapixel cameras on the market, but few that will match this (available exclusively from Jessops) in terms of image quality.

Emilie Martin

DETAILS

RRP £249 (£211.91 ex VAT)

PRODUCT INFORMATION

Canon 08705 143 723

www.jessops.com

SPECIFICATIONS

3.2megapixel resolution • 3x optical, 3.2x digital zoom • 35-105mm focal length (35mm film equivalent) • on, off, auto, red-eye reduction, slow sync flash modes • 2in LCD screen; 16MB SD memory card • 115g • 86 x 53 x 21mm (w x d x h) • USB interface

PROS Image quality; size; range of features

CONS You can pick up cheaper 3megapixel cameras

VERDICT

Versatile and covetable, the Canon is worth every penny of its price tag

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL

★★★★★
★★★★★
★★★★★
★★★★★

MP3 PLAYER

Creative Zen Micro

First serious challenger to the Ipod Mini



Having failed to completely knock Apple's Ipod off the top slot, Creative is gunning for its younger sibling with the launch of the 5GB Zen Micro. The product is a direct competitor to the Ipod mini – it's even available in a range of 10 colours.

The Zen Micro certainly oozes style. The small compact design looks great, while the pulsating blue light when it's charging gives an extra touch of class.

Creative has removed all the buttons you'd expect at the front of the unit, following Apple's lead with a completely touch-sensitive design. Although it's an attention grabber, trying to skip tracks with the player still in your pocket is almost impossible. We also found the vertical scroll pad in the middle too fiddly – unlike the circular scroll wheel on the Ipod, you have to stroke the pad numerous times when scrolling through tracks. Even on its lowest sensitivity setting, accidental button presses were frequent.

As well as playing mp3 and wma tracks, the Zen Micro houses an FM radio. You can record broadcasts directly to the hard disk, but the lack of a line-in socket means you can't record from any other source.

Creative claims a battery life of 12 hours, but in tests we struggled to reach much more than six. Thankfully, it's easy to

replace the battery and Creative is including a spare with the first 40,000 units to hit the country – this will then be replaced by a wired remote. Don't ask us why.

The Zen Micro has a lot going for it and beats the Apple Ipod Mini in a variety of categories. The hard drive is 1GB larger, it has an FM radio and the battery can be swapped out easily.

The Zen Micro is, at present, the biggest threat to the Ipod Mini.

Will Stapley

DETAILS

RRP £189.90 (£161.62 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Creative

<http://europe.creative.com>

SPECIFICATIONS

5GB hard disk • mp3/wma • Voice recorder • FM radio (including recorder) • Organiser • USB2 • Li-ion battery (removable) • 84 x 51 x 19mm (h x w x d) • 108g

PROS Stylish; features

CONS Fiddly control system; no line-in

VERDICT

With a stylish design, good range of features and reasonable price tag, the Zen Micro gives the Ipod Mini some much needed competition

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

TV TUNER/VIDEO CAPTURE

Terratec Cinergy 400 TV

Great range of features including WinDVR



Terratec's Cinergy 400 TV Mobile turns your notebook into a portable TV and digital video recorder, complete with a timeshifting option that lets you 'pause' live broadcasts. Setup is easy – put the card in to a PC Card slot, hook it up to a portable or wall-mounted aerial and install the software that is on the accompanying disc.

The Cinergy software bundled with the TV tuner will do the rest of the work for you, with an automatic channel-scanning function to locate all available stations. You can then add channels to a 'Favourites' menu, edit their names and sort the list into an order that suits you.

The Cinergy software control panel is fairly easy to navigate, with buttons giving fast access to the Teletext and EPG (electronic programming guide) functions, station selection and input options, display settings (you can view multiple channels as thumbnails) and recording/playback controls. To take advantage of timeshifting functions, though, you'll need to use the bundled copy of Intervideo's WinDVR software, which means going through a second autoscanner process.

Along with the TV antenna-in socket, the card is supplied with a multi-connector cable with composite-in, stereo audio-in and S-video-in sockets. You can use the card to record video directly

from a digital video camera, video recorder or satellite receiver with compatible sockets.

All common file standards are supported, and you'll need to select a compression setting before you begin capturing video, as around 11 minutes of uncompressed footage recorded in 4:3 QVGA format will eat up about 4.5GB of hard disk space. It's important to do this as there's no limit on the amount of footage you can capture in one go.

Emilie Martin

DETAILS

RRP £89.99 (£76.59 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Terratec 01252 870 726

<http://en.terratec.net>

SPECIFICATIONS

PC Card Type 1 and 2 compatible • TV antenna-in, composite-in, stereo audio-in, S-video connectors • Pal B/G(H), Pal D/K, Pal I TV tuner • Cinergy control software and Intervideo WinDVR bundled

PROS Easy to set up and use; WinDVR bundled

CONS Timeshifting function only available in WinDVR

VERDICT

Easy to use with a good range of features and bundled software, this TV tuner card is a great buy

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

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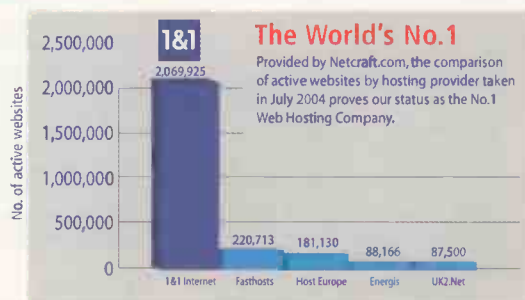
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■ FTP Access Accounts	75	75	
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■ Protected by up-to-date Firewall	✓	✓	
■ Daily backups	✓	✓	
■ Shared SSL or optional own SSL Certificate	✓	✓	
■ SSH Access	✓	–	
■ Password protection	✓	✓	
APPLICATIONS			
■ WebsiteCreator	25 pgs	25 pgs	
■ Full Version Software worth £400	✓	✓	
■ New 1&1 Control Panel	✓	✓	
E-MAIL			
■ IMAP/POP3 e-mail accounts	1,500	1,500	
■ Autoresponders included	✓	✓	
■ Unlimited e-mail aliases	✓	✓	
■ New 1&1 Webmail	✓	✓	
■ Virus Scanning for Accounts	20 Acc.	20 Acc.	
■ Spam Filtering	✓	✓	
■ Newsletter Tool	✓	✓	
WEBSITE FEATURES			
■ Access Database supported	–	✓	
■ My SQL Database	5x100Mb	–	
■ MS SQL Database	–	1x100Mb	
■ SQL Import	–	✓	
■ Ready-to-run CGI Library	✓	✓	
■ PHP3/4/5, Perl & Free CGIs	✓	–	
■ ASP Scripting Supported	–	✓	
■ ASP.NET & .NET Framework	–	✓	
■ FrontPage extensions supported	✓	✓	
■ Password Protection	✓	✓	
■ Raw Logfiles	✓	✓	
■ SSI	✓	✓	
CRM/E-COMMERCE			
■ In2Site Dialogue	✓	✓	
■ 1&1 WebStatistics	✓	✓	
■ 1&1 WebElements	✓	✓	
■ 1&1 WebDatabase	✓	✓	
■ Chat Channels	10	10	
■ Customisable Forums	✓	✓	
■ Cron Jobs/Scheduled Tasks	✓	✓	
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■ Server Priority	✓	✓	
■ Password protection	✓	✓	
APPLICATIONS			
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■ Full Version Software worth £400	✓	✓	
■ New 1&1 Control Panel	✓	✓	
E-MAIL			
■ IMAP/POP3 e-mail accounts	3,000	3,000	
■ Autoresponders included	✓	✓	
■ Unlimited e-mail aliases	✓	✓	
■ New 1&1 Webmail	✓	✓	
■ Virus Scanning for Accounts	100 Acc.	100 Acc.	
■ Spam Filtering	✓	✓	
■ Newsletter Tool	✓	✓	
WEBSITE FEATURES			
■ Access Database supported	–	✓	
■ My SQL Database	10x100Mb	–	
■ MS SQL Database	–	2xMS SQL	
■ SQL Import	–	✓	
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MINI ROUND-UP

Voice over IP routers

Six devices on test that let you use VoIP with your phone handset



The Billion 7100SV was easy to use, produced good call quality and is a good low-cost solution

Draytek's Vigor 2500V is easy to configure and there's lots of documentation to help

Aimed mainly at small-business users, the Draytek Vigor 2600VG has an integrated VPN

This season's must-have technology is Voice over IP (VoIP), the system that lets you make phone calls for free using spare broadband capacity. Admittedly you can only make them to similarly equipped VoIP users, but you can also save on calls to standard phones on the plain old public switched network (PSTN) by subscribing to a gateway service linking old and new technologies together.

That said, making and receiving calls via your PC and a softphone isn't always convenient and most of us prefer to use a proper handset. For VoIP, this means investing in extra hardware. One solution is a custom IP phone, but these can be expensive, so here we look at a range of ADSL routers equipped with one or more phone ports that allow you to connect an ordinary phone handset.

A fairly recent innovation, the VoIP-enabled routers featured here all use the Session Initiation Protocol (SIP) to locate and connect calls and promise other benefits beyond the ability to use existing telephone hardware. One benefit is the ability to sidestep problems with network address translation (NAT) and firewall settings, which can be encountered when using

softphones and IP phone alternatives. Most also provide emergency access to the phone line in the event of a power failure – important for calling the emergency services of if you've opted to give up on ordinary handsets and go totally IP.

But what else can you expect from such devices? We review six of the leading home and small-business products and tell you what they provide, how easy they are to configure and just how they measure up in our increasingly IP-centred world.

Billion 7100SV

UK distributor Solwise sent us a Billion 7100SV; a low-cost VoIP router aimed mostly at home users that can be used with a range of public SIP services.

As well as the router, AC adapter, and a cable to connect the built-in ADSL modem, there is a UTP lead for use with the single Ethernet port. You also get a cable to attach a telephone handset to the router – Solwise is adding an adapter for use with the plug on the end of most UK phones.

Web-based setup is done via a menu-driven interface that features separate quick-start pages for ADSL and VoIP setups. Voice configuration is further simplified with a preconfigured

setting to use the Freeworld Dialup service (www.freeworlddialup.com). You just register via the website to get an account and associated SIP number.

A gateway isn't available via Freeworld Dialup, which means using a different service if you want to get PSTN connectivity. This is easy enough to do, but you will have to poke around in the router interface to change the associated connection settings. Still, the GUI isn't that difficult and Solwise has its own support line to help with such problems.

We had no real trouble using the Billion to make and receive SIP calls and call quality was excellent, with a choice of G.711 and G.729 codecs (the software used to encode/decode voice calls). You also get emergency failover to the PSTN line in the event of power cuts, plus you can choose to make calls over the ordinary network.

Other more basic router services, such as firewall and support for NAT, UPnP and Dynamic DNS, are included. You don't get a VPN server but, despite this, the Billion 7100SV is a good, low-cost solution.

Draytek Vigor 2500V and V2600VG

Draytek's UK distributor (SEG Communications) sent in two

routers, the Vigor 2600VG, first introduced a couple of years back, accompanied by a newer and much cheaper Vigor 2500V.

Both routers have built-in ADSL modems and similar firewall facilities, but the 2600VG is aimed primarily at small-business users with an integrated VPN server, and is able to handle up to 16 encrypted tunnels. There's no VPN server on the consumer-oriented 2500V, but it does have VPN pass-through facilities. Likewise, although both have four-port Ethernet switches, the 2600VG comes with 54Mbps/sec wireless support as standard.

There are other differences in the VoIP facilities. Both models allow ordinary phone handsets to be used to make and receive SIP calls, but the 2500V only has one phone port, while the 2600VG has two. Calls can be made and received from either phone on the 2600VG and calls between the two ports are also possible. Users of both routers can make calls via the local analogue phone connection, but PSTN lifeline facilities are only provided on the 2500V.

The management interface on the 2600VG has been around for a couple of years, so isn't as slick as on the 2500V, although neither is that difficult to

configure. Quick setup wizards and lots of documentation help, and the UK distributor preconfigures the routers for use with BT lines, as well as bundling a subscription to Draytel's public SIP service – Draytel (www.draytel.org).

This subscription lets you locate and call other SIP users as well as make and receive calls via the public phone network, with a choice of 0870 or 0845 numbers for incoming PSTN calls, if required. Registration via the Internet is straightforward and you get £2 of calling credit to get you started.

We were able to get both routers up and running and making VoIP calls in a matter of minutes, both to other SIP users and out to the public phone network. Call quality in both instances was excellent using the default codecs. The 2600VG supports more options here, allowing further scope for fine-tuning. For cable users there's the Vigor 2100V, which is much like the 2500V but with a second Ethernet port for connection to a cable modem rather than the built-in ADSL interface.

Both Vigor routers have features to recommend them and with good support from manufacturer and distributor they're well worth looking at.

Intertex IX66+ ADSL Airsip GW

The smallest of all the routers here, the IX66 from Intertex, is one of the longest established and is big on functionality. When it comes to VoIP, the IX66+ has more to offer than most of its rivals.

To start with you can attach an ordinary phone or headset to make and receive SIP calls, just as with the others. In addition the IX66+ has a built-in SIP server, making it possible to host your own domain and employ custom SIP addresses rather than subscribe to a public service.

The SIP server can also be used by other VoIP users with the hardware and is able to handle up to 15 simultaneous calls from a mix of softphones and IP phone hardware. By installing optional SIP Switch software (£330 ex VAT), the router can act as a small-business PBX (private branch exchange), to route outbound calls to the PSTN, forward incoming calls to local extension numbers, provide voicemail services and so on; a remarkable option on a device of this type and price.

One downside to all this functionality is a more complex management interface. However, Intertex has made its web GUI understandable and initial deployment was no harder than any of the others. All the cables and adapters needed to get started are inside the box, including a useful headset.

The router specification is pretty good too, with a built-in firewall, Nat, UPnP and Dynamic DNS support. A VPN server upgrade is another optional extra, plus you can add wireless connectivity by plugging a suitable adapter into the SD slot.

We used the IX66+ to make and receive calls with both the built-in SIP server and via Freeworld Dialup with impressive results. However, the IX66+ doesn't come with a

subscription to any particular SIP service, although resellers do provide such bundles along with help on setup and other support services.

Zoom Zoomtel X5v

The Zoomtel X5v is a complete package for consumers and teleworkers looking for single-line VoIP capabilities. The Zoom router can be connected to either a single PC using the built-in USB port or to a network via the integrated four-port 10/100 Ethernet switch. Cables for both are supplied along with an RJ-11 lead for an ADSL connection, plus a converter to attach an ordinary telephone handset to the second RJ-11 port. This port also features passive pass-through to the phone line involved, allowing emergency calls in the event of a power failure.

Setup was no problem at all. Point a browser at the default IP address and all you need is a username and password to connect to your ISP and, in our case, the static IP address assigned to the broadband link. Some users may then have to tweak the firewall to, for example, support a local mail server, but for most everything is taken care of, including the SIP phone service.

This is all thanks to Zoom's own SIP service Global Village (www.globalvillage.com), which the X5v is preconfigured to use. All a new user has to do is create an account to match the pre-assigned SIP phone number by clicking a link in the management GUI and filling in the on-screen forms.

Calls to other SIP subscribers are then free (even those subscribing to other SIP services) with 10 minutes of credit for PSTN calls included as part of the package. Voice quality is on a par with ordinary phone calls with support for both G.711 and G.729 codecs.

Compared to some other services, however, functionality is a little disappointing, as is the lack of support for either UPnP or Dynamic DNS services. Configuring the router to work with other VoIP services could be a problem, but overall the Zoom X5v impressed as a good solution for the home user looking for no-fuss VoIP connectivity.

Zyxel Prestige 2602HWL

Like other members of its popular Prestige ADSL router family, Zyxel's 2602HWL is a robust device with both an integrated four-port Ethernet switch and a 54Mbps/sec wireless interface as standard. The Zyxel router also has a VPN server capable of handling up to 20 simultaneous IPsec (IP security protocol) remote access tunnels and, on the VoIP front, a pair of ports into which ordinary telephone handsets can be plugged to make and receive SIP calls.

As well as direct dialling of IP addresses, each port can be assigned its own SIP number or a single number used on both. You also get emergency lifeline facilities plus the ability to choose between IP calls and dialling over the PSTN connection. However, there's no built-in SIP server and no PBX



It may be the smallest here, but the Intertex IX66+ has loads of functions

For a no-fuss Voice over IP solution at home, the Zoom Zoomtel X5v is worth considering

ZyXel's Prestige 2602HWL offers ease of configuration and good call quality





facilities like those available on the Intertex IX66+.

The management GUI employed by Zyxel isn't as intuitive as some, but it gets the job done and is easy to navigate once you get used to it. There's also a wizard to take you through the initial setup of both the router and the SIP functionality. On the downside there's no bundled subscription to a public SIP service, as with the Draytek and Zoom products, although such services can be subscribed to independently. Indeed we used Freeworld Dialup (www.freeworlddialup.com) for our tests and were able to configure the Prestige 2602HWL for use with this with very little difficulty.

Neither did we have any qualms about call quality with a

choice of G.711 and G.729 codecs, both of which gave excellent results. The necessary adapters to allow phones to plug into the RJ-11 ports are also included in the box along with an ADSL microfilter and a cable for use with the local management port.

Prestige routers are popular with service providers that may well bundle a SIP service with the product and Zyxel too is looking to add this option.

Our verdict

Although a well-established technology in the world of big business, VoIP, and SIP in particular, are recent innovations for home and small-business use. Despite this, there are already several VoIP-enabled routers available to

address this market, with more expected in the next few months from the likes of D-Link and Netgear.

Of the six we looked at for this round-up the Draytek and Zoom products were the easiest to configure and use, largely because the vendors included a subscription to their own public gateway service as part of the deal. This is all most home users need and, of the two, the Draytek Vigor 2500V is the one we'd recommend since, although slightly more expensive than the Zoomtel X5v, the latter lacks Dynamic DNS and UPnP support; important for broadband services with dynamically assigned IP addresses.

On the downside you only get basic firewall facilities with these consumer-oriented

products and, for a small business needing VPN support, the Draytek Vigor 2600VG or Zyxel Prestige 2602HWL are better choices. Both also have wireless facilities and support for two SIP users although the Vigor once again has the edge in terms of its bundled Draytel subscription.

For the ultimate in small-business routers, however, the Intertex IX66+ is hard to beat. It may not come with a bundled gateway but it does have its own SIP server and optional software to create your own mini switchboard using VoIP technology. We've given a Recommended award to the Intertex IX66+ router, for small businesses looking for multi-user VoIP support.

Alan Stevens

MANUFACTURER	BILLION	DRAYTEK	DRAYTEK	INTERTEX	ZOOM	ZYXEL
MODEL NAME	7100SV	VIGOR 2500V	VIGOR 2600VG	IX66+ ADSL AIRSIP GW	ZOOMTEL X5V	PRESTIGE 2602HWL
Price inc VAT (ex VAT)	£94.59 (£80.50)	£139.83 (£119)	£210.33 (£179)	£269.08 (£229)	£99.99 (£85.09)	£217.38 (£185)
Supplier	Solwise	SEG Communications	SEG Communications	Intertex	Zoom	Zyxel UK
Telephone	0845 458 4558	020 8381 5500	020 8381 5500	+46 8 628 28 28	01276 704 400	08702 909 090
URL	www.solwise.co.uk	www.draytek.co.uk	www.draytek.co.uk	www.intertextdata.com	www.zoom.com	www.zyxel.co.uk
PHYSICAL SPECIFICATIONS						
Integrated ADSL modem	✓	✓	✓	✓	✓	✓
Ethernet ports	1 x 10/100	4 x 10/100	4 x 10/100	1 x 10/100	4 x 10/100	4 x 10/100
Wireless Ethernet support	x	x	Integrated 802.11g	Optional (CF card)	x	Integrated 802.11g
FXS (phone) ports	1	1	2	1	1	2
Phone adapter included	✓	✓	✓	✓	✓	x
Other	N/A	N/A	USB port	USB port	USB port	Console port
ROUTER OPTIONS						
Nat/Firewall/Port forwarding	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓	✓/✓/✓
DHCP/VPN (number of tunnels)/Print server	✓/x/x	✓/x/x	✓/✓(16)/✓	✓/optional/x	✓/x/x	✓/✓(20)/x
UPnP compliance/Dynamic DNS support	✓/✓	✓/✓	✓/✓	✓/✓	x/x	✓/✓
VOIP OPTIONS						
PSTN lifeline/pass-through	✓/✓	✓/✓	x/✓	✓/✓	✓/✓	✓/✓
Supported VoIP protocol	SIP	SIP	SIP	SIP	SIP	SIP
Integrated SIP server	x	x	x	✓ (5 user)	x	x
PBX facilities	x	x	Between attached phones	Option	x	x
Default SIP registrar	Freeworld Dialup	Draytel	Draytel	None	Globalvillage	None
Preconfigured PSTN gateway	x	✓	✓	x	✓	x
PSTN credit included	None	£2	£2	None	10 mins	None
CODECS SUPPORTED						
G.711/G.723/G.276/G.729	✓/x/x/✓	✓/x/x/✓	✓/✓/✓/✓	✓/x/x/✓	✓/x/x/✓	✓/option/option/✓
SERVICE AND SUPPORT						
Standard warranty (years)	1	3	3	2	2	2
SCORES						
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★



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3G PHONES

Motorola A1000 v Sony Ericsson V800

Find out how two of the latest 3G phones compare as we put them head to head



With Vodafone and Three spending huge sums promoting their new 3G phone services, handset manufacturers are responding with new models designed to take full advantage of the facilities. Two of the latest to hit the stores are Motorola's A1000 and the Sony Ericsson V800.

Motorola A1000

Currently only available on the Three network, Motorola's latest device looks more like a PDA than a mobile phone, thanks to a touch-sensitive display that occupies around 80 per cent of its front panel. There are very few standard buttons, as most operations can be performed via the stylus, hidden in the lower right-hand side of the phone.

The A1000 has a central rocker button, so you can navigate up, down, left and right through menus, but we found it useless. It's so small that, regardless of which direction you push it in, you are likely to push it downwards and inadvertently select the wrong menu item.

Using the stylus is more effective – especially when entering text. The A1000 has fairly good handwriting

recognition and you can enter words in your own scrawl and have them translated into recognisable entries – useful for notes and reminders.

The A1000 uses Symbian OS V7, with a UIQ 2.1 user interface. Unfortunately the UIQ menu structure isn't very user friendly, so finding the section of the phone you want can involve a lot of trial and error. Thankfully there are dedicated buttons for the most common functions such as dialling and accessing online content services.

To its credit, the A1000 has some interesting features, such as a 1.2megapixel camera with lenses facing towards and away from the screen, so you can take pictures of your friends or self-portraits without having to turn the display away from you.

It also has an impressive 200-hour standby time and 225-minute voice talktime. There's Bluetooth wireless support and, with tri-band compatibility, you can use it in most countries.

Sony Ericsson V800

The Sony Ericsson V800 looks far more like a traditional mobile handset than the A1000. It has attractive retro styling and

a flip-open clamshell design (complete with small exterior screen) that will be familiar to most users. At the moment it is only available with Vodafone.

The inside looks fairly ordinary. As well as the 12 standard keys, Sony has added a central menu key with dedicated video call and multimedia buttons to the left and right. The latter provides instant access to your movies and videos. The V800 uses Sony Memory Stick as its storage format, which may cause compatibility issues with other devices.

Navigating through the phone is fairly easy thanks to a four-way direction pad and clearly labelled icons. The screen isn't as large as the Motorola A1000, but it is clear, and the menu system is straightforward.

One of the phone's best features is its rotating camera, which can be positioned towards or away from the user. It has a 1.3megapixel resolution with better than average image quality and clicks satisfyingly into either position. It also has a

set of lights to the left and right, designed to help take pictures at night or in dark environments.

The external speaker faces away from the user on the top flap of the phone. If you make video calls without the in-ear hands-free kit, most of the caller's voice is directed away from the user, making it hard to hear.

We were very impressed with some of the phone's software. It comes with a number of very good Java games, some of which show off the handset's good 3D abilities. The V800 also has strong organiser functions that were easy to get to grips with.

Verdict

Both the V800 and the Motorola A1000 have their strong points. The latter should appeal to business users with its PDA-like functionality, but the V800 has similar features, is more portable and easier to use. We're still not convinced of the reliability of 3G networks, but if you're an early adopter after a next-generation phone, the V800 has the edge.

Rory Reid

DETAILS

MOTOROLA A1000

RRP From £49 with contract
BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Motorola www.motorola.com

SPECIFICATIONS

Symbian OS v7 • 65,000 colours, TFT touchscreen, 208 x 320 pixels • 24MB built-in memory, supports removable memory (Triflash-R) • GSM/GPRS/3G • 900/1,800/1,900MHz • WCDMA 2,100MHz • 1.2megapixel camera • 200-hour standby time and 225-minute talktime

PROS Handwriting recognition; good screen

CONS Unintuitive interface; bulky

VERDICT

A smartphone likely to appeal to business users given its PDA-like functionality

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

DETAILS

SONY ERICSSON V800

RRP From £49 with contract
BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Sony Ericsson 08705 237 237

www.sonyericsson.com

SPECIFICATIONS

Multitasking • 260,000-colour TFT, 128 x 160pixels • 32MB Memory Stick Duo • Network: GSM/GPRS/3G • 900/1,800/1,900MHz • 1.3megapixel camera • 280-hour standby time and 180-minute talktime

PROS Easy to use; stylish

CONS Rear-facing speaker; only supports Sony Memory Stick

VERDICT

Light, easy to use and boasting a 260,000-colour screen, the V800 offers a great way to explore the benefits of 3G

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

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▲ Lacie 1TB Bigger Disk Extreme

The Lacie Bigger Disk Extreme external drive has the once almost unimaginable capacity of 1TB (1,000GB) – enough to store at least 200 DVD movies, or more than 1,500 hours of VHS-quality video with CD-standard stereo sound. That means more than 60 days of continuous television can be stored in a 5kg box the size of two paperbacks (17.3 x 8.8 x 26.8cm) with a near consumer-level price tag.

It supports USB2 and 400Mbps/sec and 800Mbps/sec Firewire links giving sustained data transfer rates of up to a claimed 85Mbytes/sec. But its capacity is what sets it apart. This class of storage, which will be common soon, will do for video what mp3 did for audio: make entire collections available at the click of a mouse. It will make months of surveillance video instantly accessible. And, as with mp3, it's likely to have a big knock-on effect on the entertainment industry.

Clive Akass

RRP £685 (£582.98 ex VAT); 1.6TB version costs £1,319 (£1,122.55 ex VAT)

PRODUCT INFORMATION Lacie 020 7233 8338

www.lacie.com

PROS A lot of space to play with

CONS You'll need another drive as big to back up your data

★★★★★



▲ Fingerprint Recognition Memory Stick

USB keys have made it much easier to move large files between PCs on a day-to-day basis, cutting down on the need to email documents back and forth or move data across a network. The latest from Cables and Stuff offers an added security bonus.

Available in sizes up to 1GB, this plug-and-play device includes fingerprint recognition for up to five people – one administrator and up to four others. Only authorised users can access and edit files, and fingerprints are easily added or deleted once a user has been verified. There's also the option of encryption for particularly sensitive data.

The USB1 Fingerprint Recognition Memory Stick is a handy tool and is compatible with Windows 98, ME, XP and 2000. We'd have liked USB2, though, especially for the larger capacity keys.

Anna Lagerkvist

RRP £63.45 (£54 ex VAT)

PRODUCT INFORMATION Cables and Stuff 0845 351 0030

www.cablesandstuff.com

PROS Easy to use; comes in a handy pouch

CONS Sometimes slow in reading fingerprints

★★★★★



▲ Creative Inspire T5900

Creative's latest Inspire speaker set is a reasonably priced 5.1 system designed to add an extra dimension to movies, music and games. The subwoofer is encased in wood, so there's no rattling plastic, and the five satellite speakers are sturdy enough to hang on a wall or rest on a desk. The centre speaker is louder than the others, which allows for clearer speech when watching DVD movies or playing games with spoken dialogue.

Although you need a 5.1 soundcard (or decoder) for true surround sound, you can activate Creative's CMSS function, which provides a simulated 5.1 experience for four-channel soundcards.

Overall sound quality is good for the price, but we'd go for Logitech's X-530 and save ourselves £10. However, if you're in the market for a new 5.1 system, the T5900s are a worthy consideration.

Luke Peters

RRP £59 (£51 ex VAT)

PRODUCT INFORMATION Creative

www.europe.creative.com

PROS Good treble, bass and mid-range

CONS Not quite as good as Logitech's X-530 speakers

★★★★★



▲ Matias Tactile Pro keyboard

Modern keyboards are, by and large, rubbish. Spongy affairs with membrane keys, they don't feel as positive as the original IBM or Apple keyboards. Step forward the Matias Tactilepro, based on the mechanical switches used for Apple's old Extended Keyboard. It works via USB and has keycaps labelled with the special symbols (copyright, yen, omega and so on) that Mac users access via the Option key. And it's a joy to type on, responsive with a clattery noise.

There's a two-port hub built in, so you can plug in a mouse or digital camera easily at either end, plus power, volume control and eject keys for Mac users. It works on the PC, too, though you'll find the keycap information pointless and the Windows and Alt keys reversed.

We've quoted the price for the UK distributor, but you can buy it cheaper at www.macintoy.com and other sites.

Nigel Whitfield

RRP £81.78 (£69.60 ex VAT)

PRODUCT INFORMATION UK Supplier: 3E

www.3elimited.com

PROS Excellent build quality

CONS Expensive from UK distributor

★★★★★

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0870 907 4587

► Gainward Powerpack Ultra 2400 256MB

Gainward's Golden Sample graphics cards always promise something special, and the Ultra 2400 doesn't disappoint. Based around a Geforce 6800GT, the card uses an Nvidia reference design but Gainward has gone for its own cooling system to allow for overclocking.

Instead of a single fan placed near the GPU, the Ultra 2004 sports a pair of red LED-lit fans mounted on a large anodised aluminium plate that covers both the graphics core and the memory. The size of all this makes it a two-slot cooling solution.

By default the core runs at 350MHz DDR (700MHz), while the memory is set at 1GHz. However, installing the supplied Expertool overclocking software takes things to 800MHz and 1.1GHz respectively. We then managed to run the card just fine at 824MHz core and 1.25GHz memory speeds, without even adjusting the voltage settings.

As well as Expertool, the Ultra 2400 comes with Intervideo WinDVD 5 and Muvee Autoproducer 3.

RRP £367.60 (£312.85 ex VAT)

PRODUCT INFORMATION www.tekheads.co.uk

★★★★★



◀ Antec Phantom 350w

With the ever-increasing demand for quiet components, the choice of fanless power supplies is growing on a daily basis. The 350w Phantom is the latest from Antec.

As with all Antec products, build quality is second to none. Solidly constructed with large aluminium heatsinks, the Phantom is no lightweight and comes complete with the obligatory blue LED and gold-plated connectors for better conductivity. Fanless units do have a tendency to get hot, but Antec claims an impressive 85 per cent efficiency for the unit; the greater the efficiency, the less heat the PSU produces.

While 350w isn't really suitable for the latest high-performance PCs, the Phantom is fully ATX12V v2.0 compliant and would be ideal for a home theatre PC. Superb.

RRP £117.44 (£99 ex VAT)

PRODUCT INFORMATION www.overclockers.co.uk

★★★★★



► Aerocool Aeropower II +SE 450w

Aerocool's Aeropower II +SE is the perfect power supply for PCs with a transparent side panel. Finished with blue LED-lit fans, blue acrylic windows and polished titanium, it certainly stands out from the crowd.

Underneath all of the glitz is a first-class power supply, which, despite two cooling fans, operates at a quoted 19dBA – even at full load.

The Aeropower II +SE is available in three versions; 350w, 450w and a whopping 550w.

All cabling is enclosed in nylon mesh and kept tidy by heat-shrunk tubing. You get two Sata (Serial ATA) power connectors, but there's no PCI-Express (PCX) connector.

RRP £55.52 (£47.25 ex VAT) 450w

PRODUCT INFORMATION www.overclock.co.uk

★★★★★



► Vantec UV Cable Braid Sleeving Kit

Another product that's great for PCs with a clear side panel, Vantec's UV Braid Cable Sleeve Kit is designed to hide any messy leads. It comes in a range of ultraviolet reactive colours and consists of the sleeving, heatshrink tubing for making a neat job of the sleeve ends and some tie wraps – all you need after that is the patience to sit there and wrap up all the offending cables.

RRP £6.99 (£5.95 ex VAT)

PRODUCT INFORMATION www.casetechnology.co.uk

★★★★★



◀ Aeroengine (Black)

Aerocool's Aeroengine case is definitely for those who want a PC that stands out from the crowd, and it's immediately obvious where the name comes from. Dominating the front of this steel case is a 12cm fan housed inside a silver cowling, looking every inch like the blades of a turbofan engine.

Both the front fan and the 8cm fan in the clear window side panel are lit by four blue LEDs.

For a midi tower the Aeroengine has a lot of room to move around inside the case, with enough drive bays for even the most power-hungry users. There are four 5.25in and two 3.5in bays with external access and six 3.5in internal bays.

Due to the location of the front fan, all of the external ports – two USB2, two audio and a single Firewire port – are housed at the side of the front bezel, along with a thumb wheel to control fan speed.

Unfortunately, this is one case you'll have to use a screwdriver with as there are no tool-free components and even the motherboard backplate is fixed.

RRP £41.03 (£34.92 ex VAT)

PRODUCT INFORMATION

www.overclock.co.uk

★★★★★



► Nexus Prolong

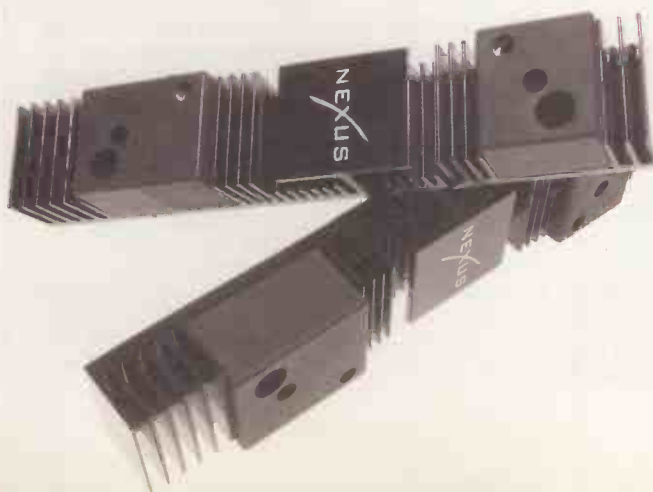
The latest high-end power supplies come with thermal sensors that keep the system fans spinning after you've switched off the machine, until the inside of the case reaches a safe temperature. This helps to extend the lifespan of individual components. Nexus' Prolong adds this feature to older PSUs.

The device will keep the fans running for around five minutes after shutdown, with the added advantage of dropping the fan power usage from 12v to 5v ensuring they spin as quietly as possible.

RRP £12 (£10.21 ex VAT)

PRODUCT INFORMATION www.kustompcs.co.uk

★★★★★



◀ Nexus Disktwin

It's all very well fitting a quiet case and silent cooling fans, but you may still find your PC is noisy thanks to a rattling hard drive. How do you solve this problem? Well, apart from replacing the drive with a quieter model (but even then you may be unlucky enough to get a noisy 'quiet' drive), you could always try a damping kit such as the Disktwin from Nexus.

The Disktwin comprises a pair of solid aluminium frames, each with two high-quality rubber mounting blocks to absorb vibration and hard disk seek noise. The only drawback is that once you have fitted the kit you will have to install your drive in a 5.25in drive bay.

RRP £10.58 (£9 ex VAT)

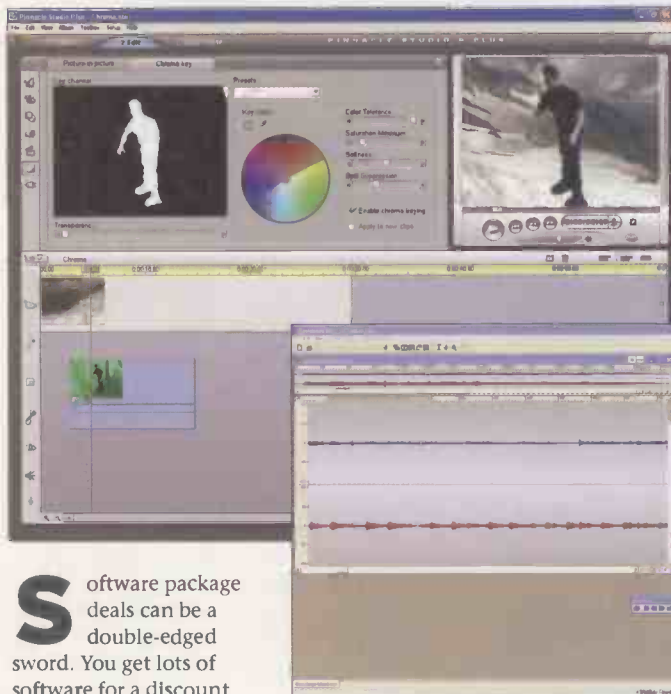
PRODUCT INFORMATION www.kustompcs.co.uk

★★★★★

MEDIA-EDITING SUITE

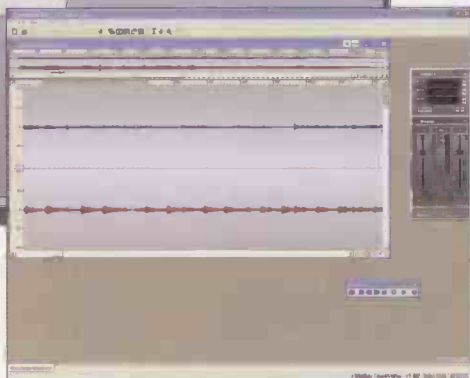
Pinnacle Studio Media Suite

An overwhelming amount of software for your money, but it's not all useful



Left: Pinnacle Studio Plus 9's chroma keying capabilities are particularly well served by the green sheet included in the Media Suite package

Below: The capable Steinberg Wavelab Lite is included for treating your audio files and adding effects



Software package deals can be a double-edged sword. You get lots of software for a discount price, but you may end up with loads of stuff you don't need. Pinnacle's Studio Media Suite is different. Aside from an array of applications, there's one component that isn't software at all. You get a sheet of green material intended as a background for video chroma keying. You could always use a single-colour bed sheet, but this one is specifically designed to be much more effective.

The primary beneficiary of this sheet is Media Suite's headline act – Pinnacle Studio Plus 9. This updated version of Studio 9 adds powerful features, including chroma keying. But for the extra £25 over the standalone version of Studio Plus you get Coreldraw Essentials 2 and Steinberg Wavelab Lite, plus Pinnacle's own InstantCD/DVD and Media Manager. This all amounts to a huge install. Pinnacle recommends 1GB of free space, but with the Studio Bonus Content DVD you could need as much as 3GB, plus free space for your video-editing files.

The standard version of Studio is just about the easiest

entry-level video-editing software to use. But it has its limitations, primarily the lack of a second layer of video. The Plus edition solves this problem, adding both chroma keying and picture-in-picture. The keying includes some detailed control over colour tolerance and spills suppression, which allow you to fine-tune how the background colour is removed. However, we found Studio's keyer automatically sensed appropriate settings when applied to footage shot with the green sheet. The picture-in-picture is 2D only, but offers borders and cropping or zooming.

Studio Plus includes animated pan and zoom capabilities for still images, although you can only create start and finish points. The already excellent DVD authoring capabilities of Studio have been enhanced by support for Dolby Digital audio encoding. With the existing 5.1 surround-sound mixing, this makes Studio Plus a very capable app if you just want to use it for authoring and burning DVDs, particularly as dual-layer

DVD+Rs can now be burnt as well.

Coreldraw Essentials 2 includes a cut-down version of Coreldraw plus Corel Photobook and Photo Album. The Essentials version of Coreldraw still includes many of the same vector-drawing tools of its bigger brethren. Photobook and Photo Album are less impressive. The former is a fairly limited image-

editing app, good for simplified photo correction but not much else. Photo Album is yet another image-management package, but it does have a few useful features. It can turn a group of images into an HTML or presentation slideshow, burn them to CD or even create a screensaver.

The rest of the applications read like a roll call of companies Pinnacle has purchased. Steinberg's Wavelab Lite is a handy audio file editor, with normalisation, compressor/expander/limiter/noise gate tools, and the ability to add harmonised chorus voices. You get a host of tools from Instant CD/DVD, which was acquired with the purchase of VOB. Instant DVD Recorder allows you to record video from your capture device direct to DVD, either using a wizard or according to an advanced settings dialogue. There's a full complement of CD-burning, copying and backup applets, plus Instant Cinema for watching DVD videos and listening to audio CDs.

The final bundled app, Media Manager, bears more than a

passing resemblance to the software included with Pinnacle's Showcenter. It can scan for media and help you organise your files, although you might wonder why you need yet another media management tool. We also had trouble getting it to import anything at all.

Anyone interested in Studio Plus 9 for its new keying abilities should consider Media Suite instead. The green sheet is effective. However, you can't help but feel overwhelmed by the overall package deal, and if you don't want the drawing tools in Coreldraw Essentials 2, Wavelab's sound editing, or Instant CD/DVD's disc facilities, it's not worth the extra money. Also, although Studio Plus 9 has a full manual, the paper assistance for the other apps is minimal, with just the briefest introduction to some of them. So even though you get a huge amount for your money, you might fail to notice some of it's there.

James Morris

DETAILS

RRP £89.99 (£76.59 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Pinnacle Systems

01895 442 003

www.pinnaclesys.com

SYSTEM REQUIREMENTS

Windows 2000 or XP • 800MHz Pentium III or higher • 256MB Ram, 1GB for program data plus at least 1GB for video-editing files • DirectX 9 graphics • CD or DVD writer

PROS Lots of apps for the money and green screen works well

CONS Huge install, and you may not want many of the apps

VERDICT

An overwhelming amount of software for the money. Pinnacle Studio Plus 9 is an excellent video editor, but you may not find the rest so useful

FEATURES

★★★★★

EASE OF USE

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★

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SATA II IEEE 1394b Dual LAN USB 2.0 DualBIOS

EasyTune™ 4 8-Channel Audio with UAA



GA-K8NF-9

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- Integrated T.I. IEEE 1394b FireWire interface
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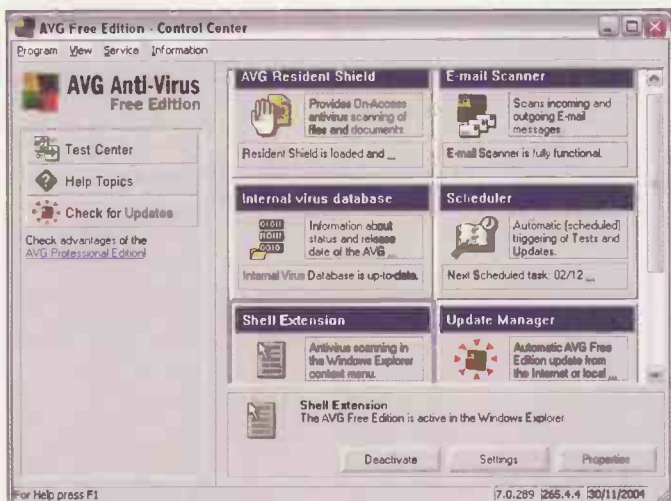
GIGABYTE™

TECHNOLOGY

ANTI-VIRUS

AVG Free Edition

Protect your PC from viruses for free



The AVG Control Centre provides you with access to all the main features within the software

Grisoft lets you download a free version of its AVG anti-virus software, a fully functional, if limited, package. While it's quick to point out how much better the paid-for version is, this still offers good protection.

The latest free version is based on AVG Professional 7 and provides the basics to protect your PC from infection. It has an improved scanning engine with faster detection techniques, and can check that your hard drive, emails and removable media are virus free. The AVG Personal Email Scanner supports both SMTP and Pop3 email clients, and can be set up automatically during installation.

The program includes updates via the Internet to ensure virus definitions are up to date, and classifies updates by their level of importance. A Virus Vault quarantines bugs it can't fix, and the software supports scanning within Windows Explorer, so you can check individual files by right-clicking them. It also includes On Access scanning, examining documents and files when you open them.

Given that AVG is free, it stands to reason there has to be something missing. The most

glaring omission is technical support. The only support for the free edition is via a discussion forum, which you gain access to after registering the product.

Customisation options are limited, as you can't create your own schedules for scans. You don't get access to the fastest download servers for updates, and the program lacks the multiple language support found in the Professional edition.

Laura Jones

DETAILS

RRP Free
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Grisoft 01636 700 496
www.avguk.com

SYSTEM REQUIREMENTS
Windows 98/ME/2000/XP • Windows 95 or NT with IE 5.01 or higher

PROS Price; features
CONS No tech support; lack of configuration options

VERDICT
AVG Free Edition may not be the most sophisticated anti-virus software, but it's free and it does the job, although the lack of tech support could pose problems

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

VOICE RECOGNITION

Dragon Naturally Speaking 8

A viable alternative to keyboard input

Scansoft claims Dragon Naturally Speaking 8 makes 20 per cent fewer errors than version 7, and can be up to 99 per cent accurate, which is better than most typists.

DNS8 can make as few as one mistake in 100 words, but you'd be hard put to get that accuracy consistently. By voice, corrections can be tricky, but a pop-up box giving other interpretations helps. Even with correction time, DNS8 can be as quick or quicker than a keyboard on a fast PC.

We tried it on a Motion Computing Tablet PC, using its twin built-in noise-cancellation microphones rather than the Scansoft-provided headset, which was surprisingly effective. Correcting voice transcription by the tablet's handwriting recognition was quicker than using the soft keyboard: the greater input speed outweighs the chance of secondary errors.

This is getting back to the convenience of the writing pad and makes tablets of all sizes – even ultra-personal PCs (UPCs) the size of PDAs – more useful as working platforms.

New features in version 8 include a scan of your documents and contacts files to pick up names and specialist vocabulary,

while smart formatting allows you to specify how acronyms and dates are spelled out.

The DNS8 Preferred edition will transcribe dictation taken from recommended PDAs or digital voice recorders. We used a Philips 9350 recorder but had to phone the company to discover how to get it to deliver the required wav format.

Clive Akass

DETAILS

RRP Standard £79.99 (£68.08 ex VAT); Preferred £149.99 (£127.65 ex VAT); Professional (with customisation tools) £548.72 (£467 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Scansoft 0871 872 0150

www.scansoft.com

SYSTEM REQUIREMENTS

500MHz PIII or better, 512MB Ram (256MB free), 300MB disk space, Windows 2000, XP and ME (Standard and Preferred editions only)

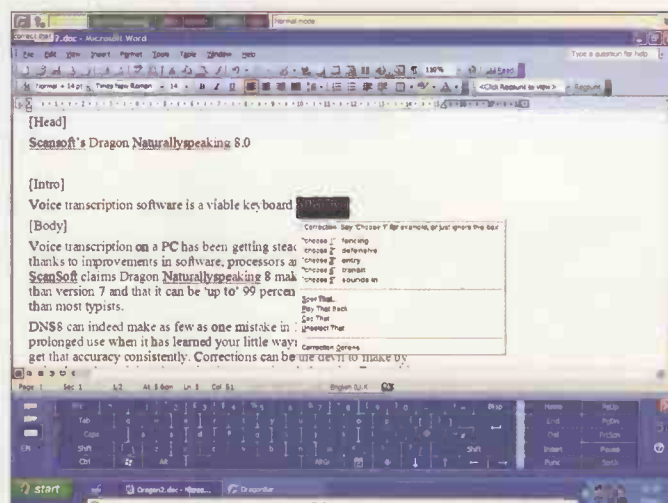
PROS Accuracy; ergonomics

CONS Training script too small for poorly sighted

VERDICT

Shows that voice input can be a viable alternative to keyboards

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



DNS8 in action: the Dragon toolbar is at the top of the screen, and a correction box offers alternative translations

DESKTOP PUBLISHING

Quark Xpress 6.5 for Windows

This is still the market leader, but for how much longer?



Left: Quarkvista is a new **Xtensions** module for image manipulation. It extends the capabilities of Quark Xpress to include image editing within the context of the layout

It's rare for a software package to completely dominate its market, but for the past decade or so, professional desktop publishing has been entirely synonymous with Quark Xpress. Go back to 1990 and the nascent DTP market was dominated by a package called Pagemaker, then along came Quark. It proved a revelation to designers and journalists alike with its simple approach and, within a few years, you'd be hard pressed to find anyone in publishing with experience of anything but Quark.

But IT and printing have moved on. The increased reliance on producing printer-ready pages in pdf format (Quark doesn't include it) and demands for more sophisticated picture manipulation within the package (Quark couldn't do it) has seen Xpress looking creaky for a few years now. There were silly anachronisms too: Windows users, accustomed to using multiple undo to correct their typing errors, discovered with horror that Quark would only let you undo your last mistake.

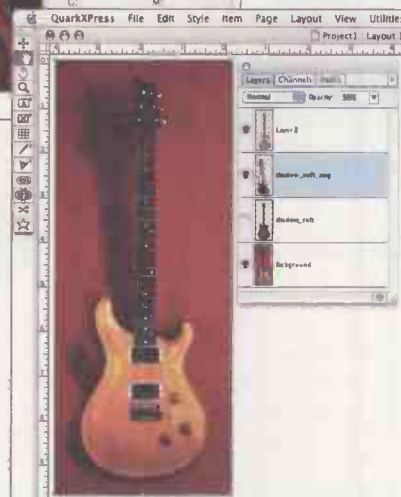
Now the cracks are really beginning to show, and Adobe has been perfecting its own DTP package, Indesign. It is also bundled with Acrobat, and Indesign works well with Photoshop. And then there's the price tag – under £700 compared to Quark's £1,000-plus. Little

Right: Import native Photoshop files: Change layer, channel and path settings directly using Quark Xpress

surprise that the trickle of newspapers and magazines moving to the Adobe software has recently become a flood. Not a great position for Quark then, as it sees a new generation of designers emerging trained in rival software. So at this Alamo in its product history, can Quark do enough with 6.5 to hold its patch of ground?

This new version builds on new features introduced in version 6 – the use of layers, synchronised text and multiple undo. But it's more than a tweak. Several features slated for version 7 have been pulled forward and the package goes out free to users of 6 and for £163 for users of 3 and later.

Quark uses Xtensions to augment the basic package, and the most impressive here is Vista, which lets you tweak, enhance and apply effects to the pictures on your page instead of having to go out to Photoshop. This is a long-overdue attempt to build a comprehensive DTP image-manipulation suite. Click into the Picture Effects palette and you can apply emboss, diffuse, despeckle, unsharp mask –



everything designers are likely to need to enhance pictures for print. The PSD Import Xtension, meanwhile, allows you to import Photoshop images, maintaining the layers used by Photoshop though annoyingly not allowing you to manipulate them.

The Xclusive Xtension lets you create print layouts direct from Xpress for output to HP Indigo digital presses. With the Print Styles now allowing you to specify bleed settings and enhanced support for pdf creation via more effective picture compression, Quark has partly addressed its isolation from the print medium. You can even click in the Missing Fonts window to quickly go online and buy font sets missing from your system (useful when somebody sends you documents created with arcane typefaces). But it doesn't incorporate Adobe Writer, and all the print options in the world don't make up for that.

A success? It has to be a qualified yes, with Quark addressing the two big failings in the existing Xpress over the courses of versions 6 and 6.5. For its work on pictures we'd give it an A+, for the print features a B. As such this could see many Quark diehards keeping the faith, especially as the upgrade is free.

The sad irony (apart from the fact that Adobe now owns Pagemaker and might see Indesign as revenge) is that if Quark had come up with these leaps forward three or four years ago, it would still be dominating the market. As it is, this could be an impressive last hurrah.

But we really have to ask. Has Quark given up on new users? Indesign costs around £675, which isn't cheap but a snip compared to the £1,095 Quark is asking. So the chances of new users electing for Quark, let alone anyone swapping back from Adobe's package are roughly on a par with Betamax making a comeback next Christmas.

John Rennie

DETAILS

RRP £1,095 (£931.91 ex VAT); **Passport** £1,365 (£1,161.70 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Quark 00800 1787 8275

www.quark.co.uk

SYSTEM REQUIREMENTS

Microsoft Windows 2000 or XP • 128MB of Ram • 190MB available hard disk space • CD-Rom drive • TCP/IP network for site licence (using Quark License Administrator)

PROS Simple interface; designers now have a reason to stick with it
CONS Absurdly expensive

VERDICT

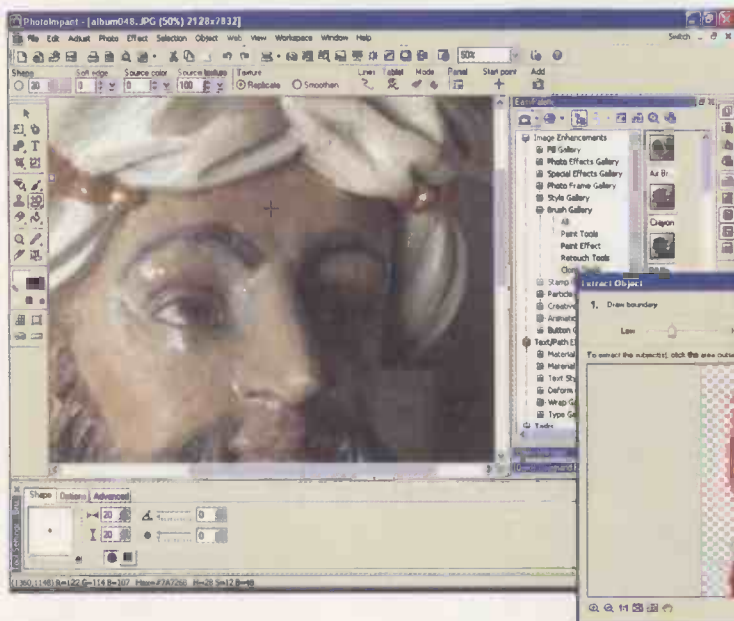
While there are still areas to improve, Quark remains the number one package in professional DTP. However, we have to wonder for how long

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

IMAGE EDITING

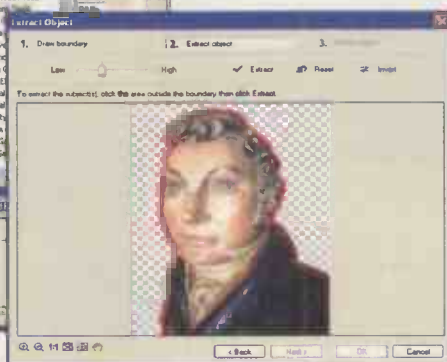
Ulead Photoimpact 10

Borrowing some features from Photoshop, Ulead's latest image editor is great value



Left: The new touch-up tool works a treat on problem areas such as skin blemishes

Below: Painless extraction with the new Extract object wizard



Following a diversion from sequential numbering with PhotoImpact XL, Ulead has made a return to convention with the release of PhotoImpact 10.

Ulead's package has been criticised in the past for its unwieldy interface. PhotoImpact has never been short on features, but ease of use has never been a strong point. With this new release, Ulead has attempted to make everything novice-friendly as well as adding new features aimed at digital camera users.

A new welcome screen offers a choice of common photo-editing tasks including scanning images, fixing photos, getting photos from a digital camera and browsing image collections, and provides appropriate tools and guidance for the task in hand. Meanwhile, the workspace is less intimidating with the introduction of a Basic work mode. This hides the Easypalettes and replaces the standard toolbars with fewer bigger, bolder buttons. You can configure the application to start in either mode and easily toggle between them.

Improvements have also been made to what's now called the Standard mode workspace, with

a reorganised menu bar and updated Layer Manager. But the biggest improvement is the inclusion of dockable panels that let you group frequently used panels and toolbars together at the screen edge.

PhotoImpact's High Dynamic Range feature provides a unique method for tackling the age-old photographic problem of capturing detail in subjects with both dark shadows and bright highlights. One way to deal with this problem is to take several 'bracketed' images with different exposure settings and combine the correctly exposed bits.

To do this manually requires not only skill but a lot of time, but PhotoImpact automates much of the process. The High Dynamic Range dialogue box is split into three tabs which allow you to compose, optimise and adjust the combined images. The trickiest task in dealing with multiple images is getting them in exact register and this is handled automatically. We tested this feature using three bracketed images shot using a tripod, but Ulead claims it also works with photos taken with a handheld camera.

The High Dynamic Range feature isn't new, but it has been

enhanced to enable the removal of conflicting image areas caused by camera or subject movement between exposures. You can ask the software to take care of this automatically, or manually paint out the offending detail using brush tools.

Making selections and cutouts is now that much easier thanks to an enhanced lasso tool and a new Extract object wizard. The smart lasso hugs the edges of an object which it identifies by a big jump in contrast and you can set the detection scope in the attribute toolbar.

The Extract object wizard works in a very similar fashion to Photoshop's Extract filter, only with a little more guidance. Draw a thick outline around the object you want to extract and PhotoImpact does the rest. You can adjust the sensitivity of the extractor using a slider and touch up the results using an eraser. On the whole it works well.

Extract isn't the only Photoshop feature that PhotoImpact has assimilated. The new touch-up tool bears more than a passing resemblance to Photoshop's healing brush and is used to correct facial blemishes or for

other retouching tasks. Vector drawing tools have been improved to include multiple node editing and you can now add outlines to text as well as vector shapes. Other improvements and additions include a raft of new painting and artistic effects, split view in image adjustment and dialogue boxes, a noise reduction filter and display of Exif data in the Browse manager.

PhotoImpact is great value for money. Also in the box are the Explorer 8.5 media management application, Photo Album 10, Gif Animator 5.05 and Ulead's excellent and easy-to-use panorama software, Cool 360.

All this makes the package a great choice for enthusiastic digital photographers who already possess some digital image-editing experience or don't mind spending time learning the ropes. PhotoImpact has a lot in common with Paint Shop Pro in this respect – it's inexpensive, but well equipped. However, Ulead hasn't gone far enough with ease-of-use enhancements to make PhotoImpact a viable option for beginners, who'd do far better with Adobe Photoshop Elements 3.

Ken McMahon

DETAILS

RRP £59.99 (£51.06 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices
PRODUCT INFORMATION Ulead
01327 844 880 www.ulead.co.uk

SYSTEM REQUIREMENTS

Windows 98SE/2000/ME/XP • PIII processor • CD-Rom drive • 128MB Ram • 600MB hard disk space • 600 x 800 24bit graphics

PROS Better organised workspace; new selection tools

CONS Not for novices

VERDICT

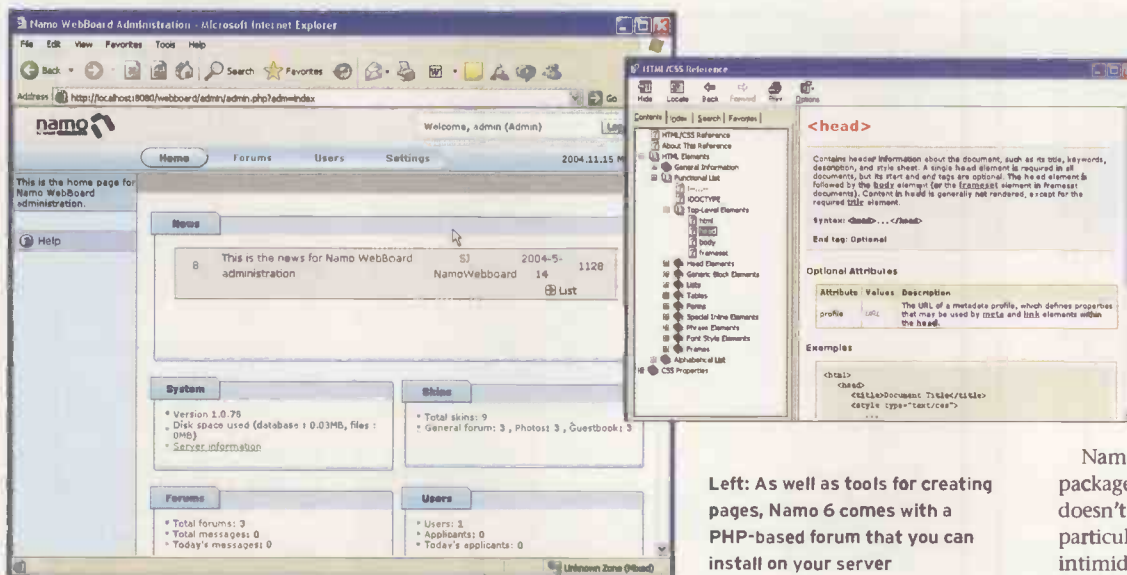
Well-suited to ambitious amateur photographers and those with time to learn

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

WEB DESIGN

SJ Namo Web Editor 6 Suite

A fully featured package at a good price that will help you set up your website



An online reference to HTML and CSS is included

When it comes to uploading your site, the site management tool has presets for hosting services, and there's proper version management, which is good for those working on complicated pages.

Namo 6 is a pretty decent package; unlike Frontpage it doesn't tie you too much to a particular platform, and it's less intimidating than Dreamweaver for the novice designer. There's enough in the package to ensure you can come up with some great sites without breaking the bank – but we do wish there was better documentation, especially when it comes to issues like databases and the web forum. Nevertheless, at just under £70, it's still remarkable value for money.

Nigel Whitfield

SJ Namo has been around for a while, and this version packs in a lot for your money. There's the web editor itself, a vector graphics program for creating custom graphics from templates, a program designed to split large images into more digestible tiled chunks, image-capture software and a gif animator. The package even ships with a web discussion forum that you can install on your server.

Installation is straightforward, though you have to install the various components separately, and we weren't too thrilled after installing the Web Board software to discover that, as well as an admin tool, our test PC was now also host to Apache, MySQL and a full PHP installation; all good software, but best kept on a remote server.

The main package uses an interface that will be familiar to many people, and it's not that far removed from Macromedia Dreamweaver. The main web design area is in the centre, with tabs to show code only, code plus layout, layout only or a proper preview. To the left is a selection of shortcut buttons to add things such as media clips, photo galleries, or launch a new site wizard. Below are inspectors

where you can set properties of the element you've highlighted and, optionally, a timeline for dynamic pages. To the right you'll find things like styles, with the main menus at the top. As with Dreamweaver, there's a detailed HTML and CSS reference, stored in a Windows help file here, rather than viewable within Namo itself.

Creating a site is easy and, a little like Net Objects Fusion, you can use styles and templates to set up the basic layout, complete with buttons and links automatically. Shared blocks of boilerplate make it easy to add such things as email addresses or navigation footers to each page, and there's a good range of script items you can add to your pages. Thankfully, the selection box also indicates if particular effects only work in certain browsers, making it easier to create a universal site. That's also helped by a validation tool, which can check your HTML and report on compatibility with major browsers.

As with Dreamweaver, building sites based on open-source systems such as PHP and MySQL is straightforward, though the code view lacks the PHP help in Macromedia's software. Unfortunately,

Left: As well as tools for creating pages, Namo 6 comes with a PHP-based forum that you can install on your server

although it's manageable enough when you get going, this is where some sloppiness creeps in. If you want to do a PHP/MySQL-based page, you can write that easily enough, but you can't get through the wizard without creating a wholly unnecessary ODBC link to the database for the preview function to work. The manual suggests searching the web for a MySQL ODBC driver; since Namo installs a copy of the database on your PC with the Web Board, surely adding the freely downloadable ODBC driver isn't impossible? Or how about writing code that doesn't need it?

There's a little sloppiness like this when it comes to installing the Web Board software, which looks like a pretty decent forum for those who want interactivity on their pages. The full Apache/MySQL/PHP setup on your PC will let you run a forum there, and if you have the necessary software on your web server, the admin tool will install the forum there too. But you still have to create the database, which can be tricky for the novice. We can't help feeling proper instructions would have been good here, rather than another link to the official MySQL website's documentation.

DETAILS

RRP £69.99 (£59.57 ex VAT)
BEST PRICE

www.pcw.co.uk/bestprices
PRODUCT INFORMATION

Phoenix Global Software
www.phoenixglobalsoftware.co.uk
0870 240 4494

SYSTEM REQUIREMENTS

Windows 98 and above • Pentium 166MHz processor • 64MB Ram • 358MB disk space for full installation • Web Board requires Apache 1.3, PHP4.1, MySQL 3.23

PROS Full featured; very attractive price; HTML validation tools built in
CONS Database connections fiddly; documentation

VERDICT

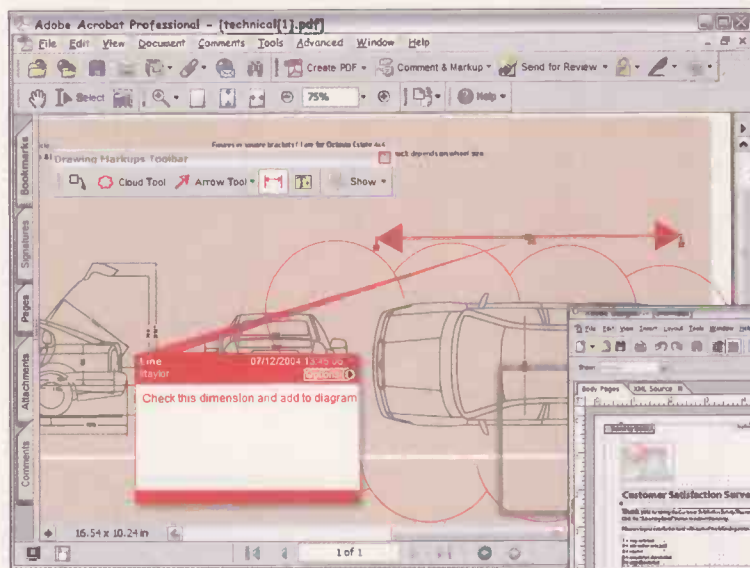
A comprehensive package that's less intimidating than Dreamweaver, but awkward in some areas; some features lack good documentation

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

PDF CREATION

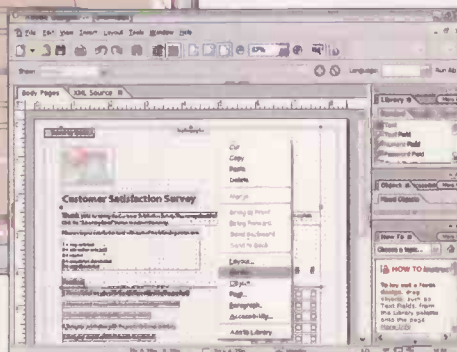
Adobe Acrobat 7

An impressive upgrade aimed at corporate users



Left: New markup tools are just one of the features in Acrobat 7 intended to broaden its appeal

Below: Lifecycle Designer is a great new bundled tool for designing interactive pdf forms



this lets you design interactive XML-based forms in a Wysiwyg editor. With this powerful tool you can create interactive surveys for return via email, with the results returned in XML format for automatic collation in a csv spreadsheet.

Finally, security has been augmented by the introduction of 'E-envelopes' and support for company-wide security policies using Adobe's Lifecycle Policy Server. E-envelopes are encrypted wrappers for pdf files that let you send files securely via email. There's also the ability to create a self-signed digital ID for use in certified documents.

It's an impressive package, although many of the features won't appeal to casual users. For them, Acrobat Standard would be a more sensible choice. But for those who use the pdf platform on a daily basis, it's a must-have. The addition of the form creation tools alone is worth the price if you've always wanted to create interactive pdf forms but couldn't justify the expense of Designer.

Kelvyn Taylor

Acrobat 6, despite its strengths, always gave the feeling of being a transitional product, intended to get users accustomed to the radically different interface, the concepts of secure pdfs and the whole collaboration idea. With the launch of Acrobat 7, that feeling has been pretty much confirmed. Without a doubt, we've now got the real thing.

Touted by Adobe as a key part of its Intelligent Document Platform, Acrobat 7 adds many new features and capabilities to an already comprehensive product. The Professional version reviewed here is aimed squarely at power users, be they corporate people or creative professionals. The Standard edition is slightly cheaper and loses a few of the workgroup-oriented and enterprise features. There's also a new version of the free Acrobat Reader software.

It's difficult to know where to start, but the good news is, those familiar with version 6 will be instantly at home with the task-oriented interface. Existing users will also be happy to know that the program load time has been reduced noticeably and web-based pdfs seem to load faster too.

One feature that might not be so popular is the new activation

procedure, finally implemented in Acrobat 7 after appearing in other Adobe products. You must activate the product via the Internet or phone within 30 days of purchase, and you can install the program on two separate computers. But Adobe has added a bit of a novel twist: if you install it on a third machine, you must deactivate one copy and transfer the activation via a simple menu command. The effect is immediate if it's done via the Internet.

There's no limit to how many times you can activate and deactivate a copy. Adobe says that activation is moderately insensitive to hardware changes, but a full system rebuild or low-level drive format could force a re-activation. The transfer activation feature will be welcomed by users with multiple computers at home and work, and we believe it's a good compromise between anti-piracy and user convenience.

PDF version 1.6 is the default file format, meaning the full features might not be viewable in Acrobat 6 or below, but Distiller lets you save in any previous version for compatibility purposes. Distiller itself has had

a makeover, with a more friendly user interface. For archival work, support for the draft pdf/A standard has been added.

At long last, Adobe has added an Organizer for managing your pdfs. This separate window gives you multi-page thumbnails of each document and you can browse your file opening history and add files to a Favourites list. Collections are created by dragging pdfs from any location into the relevant collection. You can quickly merge a series of pdfs into a single file or send them for review. The workgroup collaboration features have been expanded to include those who don't have the full Acrobat package – a menu option allows those with Acrobat Reader 7 to participate in document reviews, using the commenting toolbar added to the new Reader 7. The review Tracker is now a separate window that can accept RSS feeds, making it a handy RSS reader as well as keeping track of the reviewing process.

A welcome feature for power users is the inclusion of Acrobat Lifecycle Designer (although only with the Windows product). Previously a separate application,

DETAILS

RRP £464.13 (£395 ex VAT); upgrade from versions 4, 5 or 6 £158.63 (£135 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION Adobe

0870 606 0325 www.adobe.com

SYSTEM REQUIREMENTS

Pentium processor • Windows 2000 SP2/XP/XP Tablet PC • 128MB of Ram, 460MB hard disk space • 1,024 x 768 display • CD-Rom drive • Internet Explorer 5.5

PROS New form design tools; file management improvements

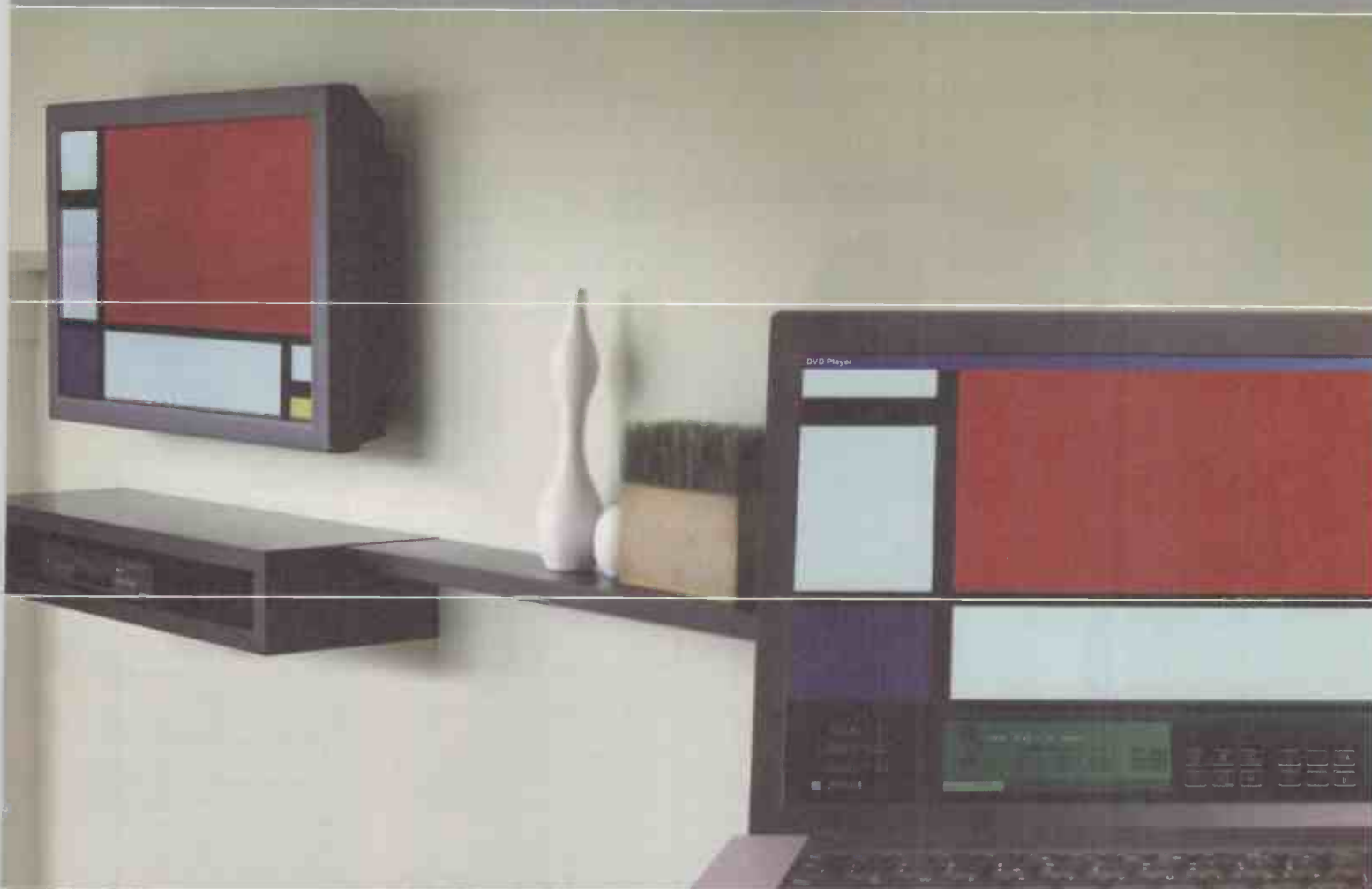
CONS Some features not available on Macs; no pre-Windows 2000 support

VERDICT

There are some worthwhile additions, but some will only be of interest to corporate users

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

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- > MS Windows® XP Professional

> W1743N-UP

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UTILITY

Cyberlink PowerDVD 6 Deluxe

Fully featured DVD player package



Adding surround-sound information to stereo sources is just one of the new features in this upgrade

PowerDVD 6 Deluxe from Cyberlink adds some great new abilities to what was already one of the best featured DVD player packages.

The most notable new addition is a Meridian Lossless Packing (MLP) audio decoder, allowing full-resolution playback of DVD-audio titles. You'll need a 24bit soundcard to take full advantage of the 24bit/96KHz six-channel surround or 24bit/192KHz stereo formats on DVD-audio titles.

A lot of the features introduced in version 5 have been tweaked and enhanced, but not always successfully. For example, Cyberlink Eagle Vision (CLEV), which automatically enhances the visual appearance of dark DVDs, has become CLEV-2 and now adjusts luminance as well as other picture values – we preferred the old version. Fortunately, you can still use a range of colour presets or create your own custom profiles.

Audio features have also been extended. You can now add surround information to stereo sources and get virtual surround playback on speakers or headphones using either Cyberlink or Dolby options.

Support for DivX Pro and Microsoft's WMV-HD content has been added in the Deluxe

version reviewed here, but we found that some of our WMV-HD files wouldn't play back with the correct aspect ratio.

PowerDVD remains one of the best DVD players for Windows, although version 5 was a hard act to beat. But if you have a lot of DivX or DVD-audio content, it's definitely a worthwhile upgrade.

Kelvyn Taylor

DETAILS

RRP £44.83 (£38.15 ex VAT) download; £48.98 (£41.69 ex VAT) boxed version

BEST PRICE

www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Cyberlink www.gocyberlink.com (download); www.dabs.com (boxed)

SYSTEM REQUIREMENTS

Windows 98SE/ME/2000/XP • P4 1GHz/Pentium-M 1GHz/Athlon 1.2GHz or above • 128MB of Ram • 60MB hard disk space • AGP/PCX graphics card
PROS DVD-audio and DivX Pro support

CONS Some video enhancements overdone

VERDICT

Still one of the best choices
If you're looking for a fully featured media player

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

REMOTE ACCESS

Sproqit Personal Edition

Access your inbox remotely

Sproqit Technologies' mobile platform lets you access your email, contacts and calendar remotely via a wireless device. But instead of forwarding information from a corporate server, Sproqit provides a remote view of your Outlook inbox and local files as long as your PC is switched on and connected to the net. We looked at the single-user edition, but a workgroup release for up to 25 users is due soon.

The Sproqit system comprises a Desktop Agent on the PC and a thin-client companion on the mobile device. This first release provides access to the email, calendar, contacts and other functions of Microsoft Outlook, plus a Desktop Explorer to access files and folders.

Installation required updates to our test system. These downloaded automatically, but we had to manually configure the Desktop Agent with our email settings.

In tests we managed to use a Palmone Treo 600 handheld to remotely access emails in Outlook Express running on a Windows 2000 PC. We could read and reply to incoming emails as they arrived in the PC's inbox, view attachments and browse and transfer files.

This said, we found there was often a delay when we tried to access information not on screen. It also lost its connection with the Desktop Agent frequently. Fortunately, it works asynchronously, so you can carry on working if the connection is lost. Any actions are then enacted by the Desktop Agent once the connection is re-established.

Daniel Robinson

DETAILS

RRP £8 per month for a single user

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Sproqit 01892 891 521

www.sproqit.com

SYSTEM REQUIREMENTS

Sproqit Desktop Agent: Windows 98/ME/2000/XP/NT 4 SP3 • 20MB of Ram • 128MB disk space

Mail server support: Microsoft Exchange 5.5 or 2000, Corporate Pop3 server • Internet Pop3 server

Sproqit Companion: Palm OS 4.1 • 5.2.1 or Pocket PC 2000, 2002, 2003

PROS Live remote access to Outlook from mobile device

CONS Sluggish performance

VERDICT

An appealing idea, but similar to many mobile email solutions

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

Inbox

	From	Subject	Date
	Chad Sc...	RE: Hi John!	7/24...
	'John W...	RE: trying m...	7/24...
	'John W...	RE: trying m...	7/24...
	'john.wa...	trying multi...	7/24...
	'xander...	hds	11/2...
	Chad Sc...	RE: Here's a b...	11/2...
	SproQit ...		11/1...
	'peter@...	success	11/1...
	Greg Alt...	install Wizard	10/2...

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- > IEEE 1394 Firewire on board
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- > Dimension and weight: 354 x 273 x 22-34 mm - 2.7 Kg
- > MS Windows® Professional

> M6747NE-UP

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ONLINE SECURITY

McAfee Security Suite 2005

Online tools get an update



McAfee's graphical interface shows you just how well your system is protected, and everything is managed centrally from this window

Hot on the heels of Symantec and Steganos, McAfee has released the 2005 version of its integrated online security suite. The package includes the latest Virus Scan (reviewed PCW January), Firewall Plus, an updated Privacy Service and Spamkiller.

Installation is straightforward and everything can be managed centrally from the main McAfee Security Center window. Most options are in plain English and these are combined with a gauge showing how well your system is protected. Naturally, you'll score 10 in each category with the Internet Suite, but rival products are recognised. This also serves as an information window, complete with online alerts to warn you of impending threats.

Improvements in Firewall Plus include enhanced intrusion detection to counter common hacker probes and a quick setup wizard for fast configuration. However, although setting up access rights for new and existing applications is simple, options are limited compared to rival packages. Spamkiller has now been tweaked to spot any suspect images, intentional misspellings and 'invisible code' in the same colour as the email's background, while the Privacy

Service now comes with a secure file shredder along with content filtering and advert blocking. However, it's also annoying as it requires you to log into it every time you start your PC. Finally, the anti-virus side is now more efficient when scanning large files and offers spyware detection. The scanner also integrates with all popular clients and instant messaging services.

Chris Cain

DETAILS

RRP £49.99 (£42.54 ex VAT)
BEST PRICE

www.pcw.co.uk/bestprices
PRODUCT INFORMATION

McAfee 01753 217 500

<http://uk.mcafee.com>

SYSTEM REQUIREMENTS

Pentium 100MHz • Windows XP

Home/Pro/2000 Pro/ME/98 •

Internet Explorer 5.5 or higher •

32MB of Ram • 71MB of free hard disk

space • CD-Rom drive

PROS 4-in-1 protection; most

options in plain English

CONS Logon for Privacy Service

VERDICT

Feature packed and easy to

use, with clear icons and

step-by-step instructions

FEATURES

EASE OF USE

VALUE FOR MONEY

OVERALL

★★★★★

★★★★★

★★★★★

★★★★★

BUSINESS PLANNING

Business Plan Pro 2005

Help in getting a company off the ground

As any bank would be keen to point out, an effective business plan can mean the difference between success and failure when starting up a new venture. But building a genuinely useful document that will help you keep track of your goals and finances can be complex.

Business Plan Pro aims to take the fear out of creating such a document, guiding you through the entire process from start to finish. The program is designed to help those setting up a new company, launching new products or seeking funding or partners, and it requires very little expertise to write an impressive plan.

You can either use one of the 400 samples or create your own from scratch using a built-in wizard. This method is perfect for the complete novice and walks you through writing a plan in great detail. It helps you build in essential financial information as well as guiding you through setting out exactly what it is you have to offer and hope to gain in your new enterprise.

The package is geared for everyone from individual self-employed traders through to someone running a small

business. All you need to know are the details of your own current financial situation, though it can take some time to get this information together.

New features in this version include the ability to import financial information from Sage Line 50, and this can now be exported into Quickbooks Pro. Key charts, tables and graphs can also be imported into Powerpoint to help create presentations.

Laura Jones

DETAILS

RRP £99.99 (£85.05 ex VAT)
BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Palo Alto 0845 351 9924

www.paloalto.co.uk

SYSTEM REQUIREMENTS

Windows 98/ME/2000/XP •

Pentium processor • 100MB hard

disk space

PROS Covers wide range of

business types; easy to follow

CONS Lots of steps to complete;

requires lots of preparation

VERDICT

Takes most of the pain out of

creating a professional plan

FEATURES

EASE OF USE

VALUE FOR MONEY

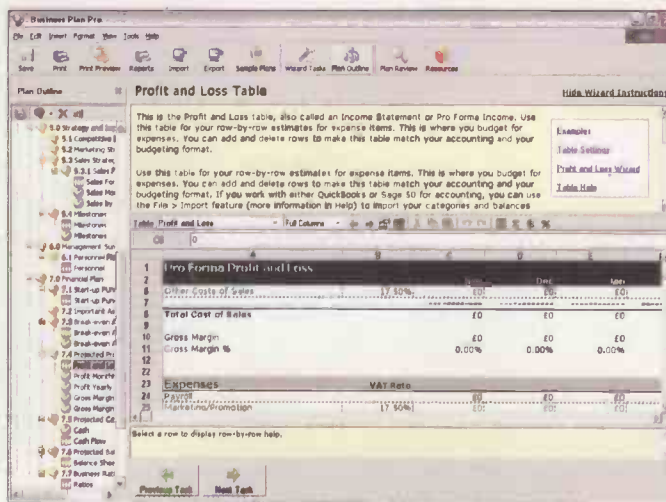
OVERALL

★★★★★

★★★★★

★★★★★

★★★★★



The wizard-based interface eases the process of creating a professional plan and helping you make your business a success

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- > Dimension and weight: 356 x 286 x 42 mm – 3.5 Kg
- > MS Windows® XP Home / Professional

> A4744G-UH

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OPERATING SYSTEM

Novell Suse Linux 9.2 Professional

Does Novell's latest version of Suse Linux offer enough to rival Windows?



Left: You can choose between Gnome or KDE

Below: Just about everything can be configured using the Control Center

Irda and Wifi, although hardware support is still not quite up to Windows standards, while owners of Palm or Psion PDAs can now sync their devices with Outlook equivalents in Gnome or KDE, including Novell Evolution, and install software on them. There's no support for Pocket PC, but given the Microsoft connection it's not that surprising.

Being a commercial version of Linux, Suse 9.2 Professional comes complete with printed documentation. Not only are the manuals helpful for finding out how to use Suse, they're also great for working out exactly what's included with version 9.2. With so much software bundled, it's quite easy to miss entire packages inadvertently.

Finally, if you fancy trying out Suse Linux 9.2 without splashing out, you can download a free evaluation from www.suse.com/en/private/download/suse_linux/index.html. Now you can't do that with Windows.

Tim Smith

While Windows looks set to rule the PC desktop for the foreseeable future, Linux continues to gain ground as a viable alternative – especially for those who aren't tied to Microsoft's applications. Now easier to use with improved hardware compatibility, Novell's Suse Linux 9.2 is its most complete version yet.

Featuring support for 32bit and 64bit processors, Suse 9.2 Professional can be installed from either five CDs or a single DVD – you also get a DVD containing all the source files of the supplied applications. Installation is straightforward and the software identified all the main components in our Dell notebook. However, we did encounter problems with wireless networking, and the modem refused to work despite being correctly identified. Standard Ethernet support seems much more reliable, and connecting to our office Windows network gave instant access to the Internet and other computers.

Suse 9.2 will happily co-exist with Windows and the installer offers the option to create a

dual-boot system. However, while the OS can read hard drives formatted with NTFS on the same PC, it won't have permission to write to them. If you want to share files between Windows and Suse on the same drive you'll need to create a Fat32 partition that both can read and write to.

This version comes with both the KDE 3.3 and Gnome 2.6 graphical interfaces, allowing users to choose the look and feel that suits them. However, some Linux software is tied to a specific front end. Similarly, there are several Internet browsers installed, including Mozilla Firefox and the KDE browser, Konqueror, which supports mouse gestures in the same way as Opera.

The amount of software bundled with Suse 9.2 is impressive and covers most areas. The star of the show is undoubtedly Openoffice 1.1.3, providing a complete Microsoft Office-style suite for free, but you also get a number of multimedia utilities for editing music and video and burning

CDs, including Realplayer. There's also the highly regarded Gimp 2 for image editing, which is considerably more useful than Windows Paint, plus Apache, FTP, DNS, DHCP, Samba, NFS, SLP and NIS servers.

Just about everything in Suse can be configured via the Control Center, which includes the Yast (Yet another setup tool) modules, and controls and options are clearly laid out. There's also a backup utility that can split files across floppies or CDs. DVD support would be preferable for reducing time and media, but this is still better than Windows manages out of the box.

Updates, including security and kernel patches, are available over the Internet and should be checked regularly to keep your system up to speed. Changes to the kernel are handled automatically and shouldn't require anything more than a reboot. The days of having to recompile the kernel manually are now, thankfully, over.

Other new features in 9.2 include support for Bluetooth,

DETAILS

RRP £64.99 (£55.31 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION Novell 01428 751 481 www.novell.com/uk

SYSTEM REQUIREMENTS

Intel Pentium or AMD Athlon, Athlon XP, Athlon MP, Athlon64-based computer • 128MB Ram • 500MB hard disk space (2.5GB recommended for standard install)

PROS Much improved hardware support; huge software bundle

CONS Still not as easy to use as Windows

VERDICT

A powerful operating system with a wealth of software and much improved hardware support. If you're looking for a Windows alternative it's definitely worth trying

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



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HEART OF TECHNOLOGY



▲ PC Tracker

PC Tracker is a security system designed to help the police retrieve stolen laptops. It comprises software and a metal plate with a unique ID number that's glued to the system's casing. Both the software and plate can be bought separately, but without the former your hardware can't be tracked. Once we'd set everything up, the tracking company was able to tell us where and when we had used our notebook whenever we went online. Although an extra deterrent, the downside to PC Tracker is that it relies on the thief going online – if they don't, there's no way of finding your stolen machine. Equally, a tech-savvy thief can easily disable the software by reformatting the hard disk, although the tracker will survive a simple re-installation of the operating system.

Rob Jones

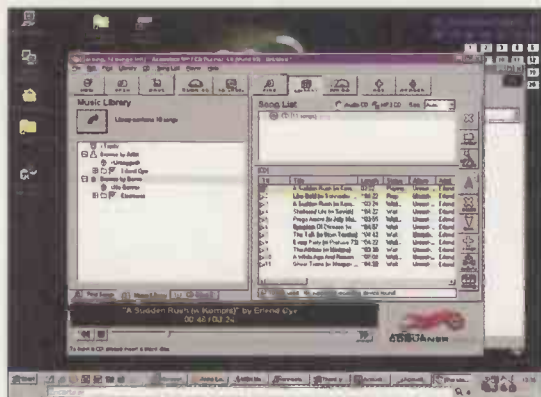
RRP £49.90 (£42.46 ex VAT)

PRODUCT INFORMATION Cotswold Computer Supplies 01773 828 181
www.cotswoldcomputers.net

PROS Three-year licence; tracked our test machine's address

CONS Too easy to disable

★★★★★



▲ Acoustica mp3 Music Suite

Acoustica's mp3 Music Suite is a collection of four programs that aim to help you make the most of your digital tunes. You can create your own mixes, adjusting the pan, volume and playback rate of each sound, convert and burn mp3s to CD-compatible wav files to play on your hifi, and even design and print the labels to go on the discs. You can even squeeze 200 songs on a normal CD-Rom or 1,000 onto a DVD.

Each component is easy to use and features such as the option to add tag information to tracks make your favourite tunes easier to find – simply key in information such as artist name, album, genre and so on, and then browse through the various categories. There are also wizards to help you choose optimum settings.

Anna Lagerkvist

RRP £39.99 (£32.99 ex VAT)

PRODUCT INFORMATION Koch Media 0870 027 0972
www.kochmedia.com

PROS Wide range of functions; logical interface

CONS Doesn't work with Apple iTunes' aac files

★★★★★



▲ PrevX Home 2

Designed to work alongside your existing anti-virus software, PrevX Home is free to download and works in a similar way to Panda's Trueprevention (reviewed PCW December 2004). Instead of trying to detect intruders already on your system by comparing data against locally stored signature files, it aims to prevent them getting in by looking for suspicious behaviour. PrevX can be annoying at first, regularly throwing up alerts during legitimate net and file access. However, it can be trained – we got things under control in a few days.

Updates are also free and the company makes its money by analysing and selling threat data sent anonymously from your PC to other organisations. If you haven't got a problem with that, it's definitely worth checking out.

Chris Cain

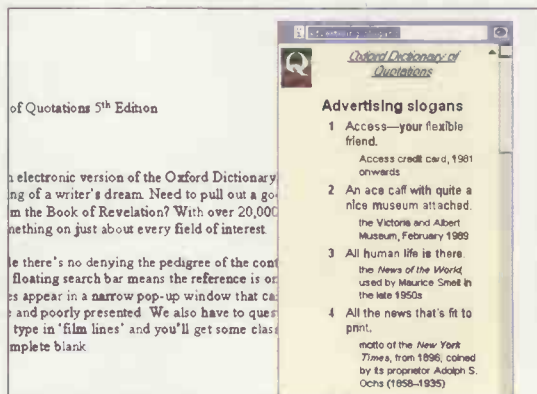
RRP Free

PRODUCT INFORMATION www.prevx.com

PROS Free; works with existing virus software

CONS Threat data must be shared

RATING ★★★★★



▲ Oxford Dictionary of Quotations 5th Ed

On the face of it, an electronic version of the *Oxford Dictionary of Quotations* would seem to be something of a writer's dream. Need to pull out a good line from Shakespeare or find a phrase from the Book of Revelation? With over 20,000 quotations from 3,000 authors, there's something on just about every field of interest.

Unfortunately, while there's no denying the pedigree of the content, its delivery leaves a lot to be desired. A floating search bar means the reference is on hand when you need it, but entries appear in a narrow pop-up window that can't be resized. They're difficult to navigate and are poorly presented. We also have to question the intelligence of the search engine.

Chris Cain

RRP £9.99 (£8.50 ex VAT)

PRODUCT INFORMATION Multimedia 01889 570 156
www.focusmm.co.uk

PROS Excellent range of content; price

CONS Presentation and search engine

★★★★★



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£56 + VAT

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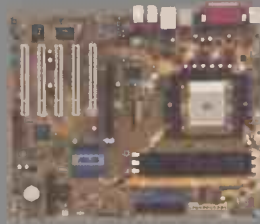
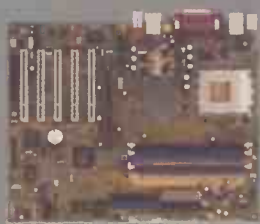
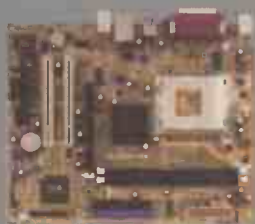
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- > Hyper Transport MHz FSB
- > 3DDRAM 400/333/266 ECC
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- > RAID 0, 1, 0+1, RAID 5
- > 1 x Agp, 5 x PCI
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HIGH-END PC

Advent T9420

REVIEW March 2005, p56 RRP £1,599

(£1,460 ex VAT) **PRODUCT INFORMATION**

PC World 08705 464 464 www.pcw.co.uk



This system offers a high specification and, at £1,599, it's great value. If you're after a PC with a multimedia focus that can also handle the latest games and run rings around office applications, it is difficult to beat.

SLI PC

Mesh Fireblade SLI

REVIEW March 2005, p54 RRP £1,499

(£1,275.75 ex VAT) **PRODUCT INFORMATION**

Mesh 0870 046 4747 www.meshcomputers.com



Featuring Scalable Link Interface (SLI) technology, this houses two Geforce 6600GT graphics cards. Combined with an Athlon64 3800+ and a 300GB storage capacity, this is a powerful PC at a good price.

MEDIA CENTER PC

Evesham E-box S

REVIEW March 2005, p103 RRP £999

(£850.21 ex VAT) **PRODUCT INFORMATION**

Evesham 0870 160 9500 www.evesham.com



A refined version of the previous Evesham E-box, this features dual digital TV tuners, a quieter cooling system and a stylish design. At under £1,000, it's one of the best Media Center PCs currently available.

FULLY FEATURED NOTEBOOK

Asus M6B00N

REVIEW September 2004, p48 RRP £1,996

(£1,699 ex VAT) **PRODUCT INFORMATION**

Asus www.asus.com.tw



Asus returns to the notebook market with this powerful 2GHz Intel Dothan processor driven model. With 1GB of Ram, 15.4in screen and a large 80GB hard drive, it's no wonder the price is high.

DESKTOP REPLACEMENT

Rock Quaddra Ti

REVIEW February 2005, p118 RRP £1,865.90

(£1,588 ex VAT) **PRODUCT INFORMATION**

Rock 08709 90 90 90 www.rockdirect.com



On the whole, the Quaddra Ti is an excellent notebook that outclasses many full-sized desktops in terms of performance and features. It's fairly costly, but as a desktop replacement this effort from Rock is a winner.

TABLET PC

AJP T200C

REVIEW August 2004, p48 RRP £1,173.82

(£999 ex VAT) **PRODUCT INFORMATION**

AJP 020 8208 9700 www.ajp.co.uk



The T200C is a convertible notebook combining the features of a traditional laptop with the flexibility of a tablet PC. It includes a digital camera, DVD rewriter and costs just £999 ex VAT.

PROJECTOR

Infocus X2

REVIEW September 2004, p51 RRP £799

(£680 ex VAT) **PRODUCT INFORMATION**

Infocus 08000 286 470 www.infocus.com



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

17IN LCD TV

Dell W1700

REVIEW January 2005, p70 RRP £451

(£383.83 ex VAT) **PRODUCT INFORMATION**

Dell 0870 152 4649 www.dell.co.uk



With a native resolution of 1,280 x 768, this 17in widescreen LCD TV is perfect for use as both a TV and a monitor. It features DVI, component, composite and S-video inputs and a remote control.

17IN FLAT-PANEL MONITOR

Samsung Syncmaster 173P

REVIEW November 2004, p117 RRP £389

(£331 ex VAT) **PRODUCT INFORMATION**

Samsung 01932 455 000 www.samsung.co.uk



If you're after a stylish flat-panel monitor that's capable of delivering stunning images, the Samsung Syncmaster 173P delivers the goods. It's one of the more expensive 17in TFTs, but it's worth the extra money.

PDA

Palmone Zire 72

REVIEW September 2004, p106 RRP £199

(£170 ex VAT) **PRODUCT INFORMATION**

Palmone 0118 974 2700 www.palmone.com/uk



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

MP3 PLAYER

Apple iPod

REVIEW January 2005, p129 RRP £207.99

(£176.17 ex VAT) **PRODUCT INFORMATION**

Apple 0800 039 1010 www.apple.com



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

SPEAKERS

Altec Lansing FX6021

REVIEW September 2004, p54 RRP £199.95

(£170.17 ex VAT) **PRODUCT INFORMATION**

Euro Tech 0870 460 6060 www.alteclansing.co.uk



If you don't have room for a full set of 5.1 speakers, this 2.1 set delivers surprisingly good results. Thanks to the six 1in micro drivers in the two satellites, sound is incredibly crisp.

ATHLON MOTHERBOARD

Biostar K8VHA-Pro

REVIEW July 2004, p131 RRP £61.49

(£52.34 ex VAT) **PRODUCT INFORMATION**

Biostar 01952 461141 www.biostar.com.tw



It might lack the bells and whistles of the more expensive Athlon 64 boards, but if you're building a powerful AMD system on a budget, it represents great value for money and gets the job done.

POCKET PC

HP Ipaq rx3715

REVIEW November 2004, p67 RRP £369

(£314.05 ex VAT) **PRODUCT INFORMATION**

HP 0845 270 4222 www.hp.co.uk



The Ipaq rx3715 crams a wealth of features into its diminutive slimline case. Along with all the usual Pocket PC functions, you get a built-in camera, and both Bluetooth and Wifi capabilities.

LASER PRINTER

HP Laserjet 1320nw

REVIEW January 2005, p66 RRP £368.95

(£314 ex VAT) **PRODUCT INFORMATION**

HP 0845 270 4222 www.hp.com



There are cheaper personal printers, but with excellent build quality, top performance and wireless support, the 1320nw impressed us a great deal. It comes with a duplex feature as standard.

HIGH-END SPEAKERS

Creative Gigaworks S750

REVIEW April 2004, p48 RRP £330

(£280.77 ex VAT) **PRODUCT INFORMATION**

Creative www.creative.com



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

POWER SUPPLY

Antec Phantom 350w

REVIEW March 2004, p74 RRP £117.44

(£99 ex VAT) **PRODUCT INFORMATION** Overclockers

www.overclockers.co.uk



The Phantom 350w's build quality is second to none. Constructed with aluminium heatsinks and not a single fan in sight, this 350w power supply would be ideal for a home theatre PC.

MULTIFUNCTION DEVICE

Brother DCP-310CN

REVIEW February 2005, p54 RRP £119.99

(£102.12 ex VAT) **PRODUCT INFORMATION**

Brother 0870 830 4037 www.brother.co.uk



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

INKJET PRINTER

Canon Bubblejet I990

REVIEW August 2004, p118 RRP £299

(£254.47 ex VAT) **PRODUCT INFORMATION**

Canon 0800 616 417 www.canon.co.uk



The I990's print head houses 5,376 nozzles, allowing it to fire more ink at the page in one go. It's still not the fastest inkjet we've seen, but it delivers excellent results.

SOUND CARD

Creative Audigy 2 Platinum EX

REVIEW May 2003, p76 RRP £89.90

(£76.51 ex VAT) **PRODUCT INFORMATION**

Creative <http://europe.creative.com>



This feature-filled card and external unit provides 24/96 recording, 6.1 sound and loads of software, including Cubasis VST 4.0 CE for music makers, and Ulead Videostudio SE DV for movie buffs.

GRAPHICS CARD

HIS Excalibur X800 XT IceQ II

REVIEW October 2004, p77 RRP £365

(£310 ex VAT) **PRODUCT INFORMATION**

Ebuyer 0870 467 0753 www.ebuyer.com



If you're addicted to speed, this latest effort from HIS is the fastest graphics card we've seen in terms of real-world performance. Featuring ATI's Radeon 420 core, it's a real scorcher.

DIGITAL VIDEO CAMERA

Sony Handycam DCR-HC1000E

REVIEW November 2004, p68 RRP £1,300

(£1,106.38 ex VAT) **PRODUCT INFORMATION**

Sony 08705 111999 www.sony.co.uk



If your budget can stretch to £1,300, this is a great camcorder. Not only are its three CCD sensors capable of capturing stunning footage, but it's also very easy to use. Expensive, but well worth the money.

DIGITAL CAMERA

Canon Powershot A85

REVIEW December 2004, p64 RRP £239

(£203.40 ex VAT) **PRODUCT INFORMATION**

Canon 0870 514 3723 www.canon.co.uk



Not only can the Powershot A85 take decent 4megapixel images, but it also comes with a wealth of manual controls, as well as a 3x optical zoom and a 32MB Compact Flash card to get you started.

HIGH-END DIGITAL CAMERA

Canon Powershot Pro1

REVIEW July 2004, p62 RRP £799

(£680 ex VAT) **PRODUCT INFORMATION**

Canon 08705 143 723 www.canon.co.uk



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

DVD-RW

NEC ND-2510A

REVIEW November 2004, p75 RRP £49.93

(£41.91 ex VAT) **PRODUCT INFORMATION**

NEC 020 8752 3665 www.nec.co.uk



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

MEDIA CREATION SOFTWARE

Roxio Creator 7

REVIEW June 2004, p73 RRP £69.99

(£59.57 ex VAT) **PRODUCT INFORMATION**

Roxio www.roxio.co.uk



With the ability to edit photos, create home movies and burn CDs, Roxio Creator 7 houses a wealth of features and is also very easy to use. What's more, it comes at a very competitive price.

PC SECURITY SOFTWARE

Norton Internet Security 2005

REVIEW February 2005, p80 RRP £54.99

(£46.80 ex VAT) **PRODUCT INFORMATION**

Symantec 01628 592 222 www.symantec.co.uk



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

OFFICE SOFTWARE

Microsoft Office Professional 2003

REVIEW May 2004, p150 RRP £459 (£390.64 ex VAT)

PRODUCT INFORMATION Microsoft 0870 501 0100

www.microsoft.com



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

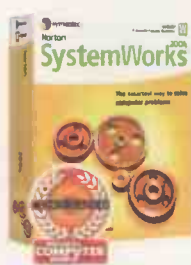
PC MAINTENANCE SOFTWARE

Norton Systemworks 2004

REVIEW March 2004, p68 RRP £64.99

(£55.31 ex VAT) **PRODUCT INFORMATION**

Symantec 01628 592 222 www.symantec.co.uk



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

ECOMMERCE SOFTWARE

Actinic Business 7

REVIEW July 2004, p81 RRP £938.83

(£799 ex VAT) **PRODUCT INFORMATION**

Actinic 0845 129 4800 www.actinic.co.uk



If you're looking to set up an e-commerce site, Actinic Business is definitely worth a look. With a wide range of advanced features and an easy-to-understand interface, its high price tag is justified.

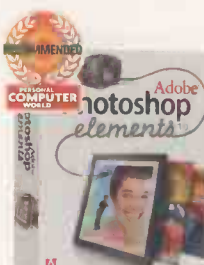
IMAGE-EDITING SOFTWARE

Adobe Photoshop Elements 3

REVIEW January 2005, p83 RRP £69.33

(£59 ex VAT) **PRODUCT INFORMATION**

Adobe 020 8606 4001 www.adobe.co.uk



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

VIDEO-EDITING SOFTWARE

Adobe Premiere Elements

REVIEW January 2005, p148 RRP £69.33

(£59.00 ex VAT) **PRODUCT INFORMATION**

Adobe 020 8606 4001 www.adobe.co.uk



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

MUSIC CREATION SOFTWARE

Steinberg Cubasis VST 5

REVIEW March 2004, p67 PRICE £59.95

(£51.02 ex VAT) **PRODUCT INFORMATION**

Pinnacle Systems www.pinnaclesys.com



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

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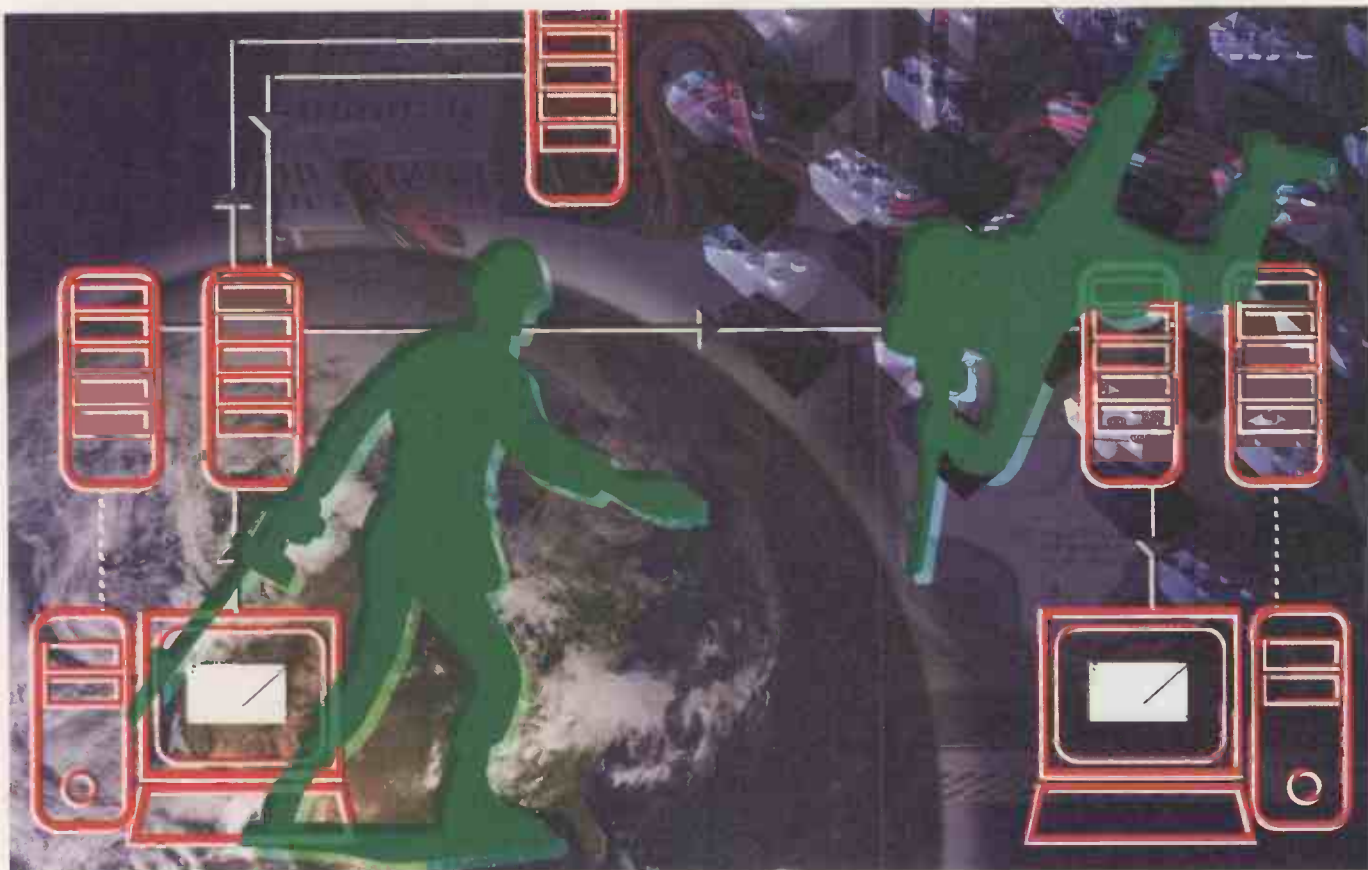
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Tisc 1562



WORDS: NIGEL WHITFIELD

Take control of your inbox

Setting up an email server is easier than you think. In the first of a two-part feature, our step-by-step guide will help you configure and build a system

Viruses and spam are the scourge of the Internet, making up a huge proportion of the emails received every day. There are, of course, tools that can deal with them when you collect your email from the server, but in many situations it's best if you can reject them before they even reach you. There are commercial companies, such as Messagelabs, that will do the job for you, as well as many server-based spam and virus solutions.

All too often, however, you'll have to pay subscriptions to keep up to date and as you add more users, that can quickly start to become expensive.

With a little effort you can, however, combine open source tools to set up a mail server that doesn't need

costly subscriptions, can be set up in a few hours and filters out both junk mail and viruses before they reach anyone's inbox.

Whether you want to provide a mail gateway for a small office or a central mail server to put on the end of an ADSL connection for a home network, it's a lot simpler – and cheaper – than you might think. You can put together a powerful mail scanning system for around £500; in fact, our tests suggest there'll still be plenty of horsepower left over if you want to use the same system for other tasks too.

Over the next few pages, we'll show you how to configure and build a server based on the OpenBSD operating system and next month we'll explain how to configure the email scanning and filtering.

What you'll need

Spam used to be the main problem affecting Internet mail servers. But over the past couple of years, viruses have become a great threat too, thanks to some that have been particularly fast and prolific in their spread, making it near-essential for any mail system to check for them, along with rejecting junk.

There are many ways that you can check for spam; one of the best-known open-source tools is called Spamassassin; it's powerful and can be configured to apply its own rules, to check messages against a Bayes database to determine the likelihood of them being spam and to check other online resources, for example email from known spam hosts, or message 'fingerprints' to see if other people have reported spam.

A couple of years ago, finding a free anti-virus system wasn't easy. But now there's a tool called ClamAV (www.clamav.net), which is open source and has regular updates to its virus database; it's even caught some viruses before commercial alternatives and can intercept phishing attacks too.

So, there are tools available, but what's the best way to implement them? In this project, we're creating a mail server that's capable of hosting several domains, with messages delivered both to mailboxes on the server, and to other machines, when spam and virus checks have been carried out. We'd naturally like it to be as secure as possible.

For some, Linux is the obvious choice for this type of project. Here, though, we've opted for OpenBSD 3.6 (www.openbsd.org), a Unix-like operating system that is secure by default; when you install it, you won't find things like mail, web and FTP servers running automatically. Instead, those things will only be running – and potentially vulnerable – if you explicitly enable

'With little effort, you can combine open-source tools to set up a mail server in just a few hours'

them. It has a very good track record in security and there's a wide range of precompiled packages available, making it easy to get up and running.

Besides the operating system, we need to decide on an email system; and in this we were guided by experience and two excellent pieces of documentation from Scott Vintinner and Kris Nosack; without their How-to documents (www.flakshack.com/anti-spam/wiki), this project would have been much harder. The email system they used is Postfix and that's what we're going to use too. It's much easier to configure than Sendmail and can be set up in a fairly secure way – more of which next month.

Another key choice is the hardware to use; if you've decided on an operating system, that will to a large extent determine what you can buy, since you need to be sure the drivers are available; the hardware section of the OpenBSD web site at www.openbsd.org/i386.html is invaluable here, for checking that things such as Ethernet cards and disk controllers will work.

We wanted a compact system, to fit in a rackmounting case, and that led us to the Mini-ITX



Top: The Mini-ITX store might have what you are looking for

Bottom: OpenBSD 3.6 has a great security record

store (www.mini-itx.com), where we opted for a Via Epia PD6000E motherboard. At only 600MHz, that might not sound like much power, but in fact it's plenty for this type of mail server – with around 1,500 messages a day going through it, our server spends most of its time with only a few per cent of the CPU being used, ramping up to around 70 per cent if several large

messages arrive simultaneously.

Memory is important, so we opted for 512MB, though again the system isn't using it all, leaving plenty of headroom for adding other services. A hard disk with 40GB of space is sufficient, though if you anticipate users having large mailboxes on the server, you might want more.

We partitioned our disk with around 20GB for user files (/home), and 10GB for spool files in /var, which includes mailboxes. The root partition (/) will fit in 1GB, and 5GB for /usr leaves plenty of space for applications and source code. We have a temporary (/tmp) partition of 1GB, enough to hold a full CD image for burning.

The motherboard incorporates two Ethernet ports, along with graphics, USB and PCI expansion. You may need to check manufacturers' data sheets for your motherboard choice, to find out the chipset used, then check those against the compatibility list.

Two items pushed up the cost – the rackmounting case, at around £149 ex VAT – and a slimline combo drive. The rack case needs a slimline laptop-style drive, and we opted to spend £69 ex VAT on a Panasonic slot-loading combo drive, so we can read DVDs and write to CD-R or CD-RW, enabling us to back up configuration files easily. These drives also need an IDE adapter at £9.50 ex VAT. Even so, including VAT and delivery, the system cost just £522.29.

If you have the DVD edition of PCW, you'll find two ISO disk images, which can be burnt to CDs. The first, cd36.iso, is a bootable installer for OpenBSD 3.6, while the second, PCWOpenBSD3.6.iso, contains the files needed by the installer.

They were too big for the CD, so if you have that edition, you can download the cd36.iso image from the OpenBSD site (www.openbsd.org/36.html) and install over the Internet, or support OpenBSD by buying a full set of official CDs.

When you've got your installation media ready, it's time to put your server together – see the workshops overleaf.

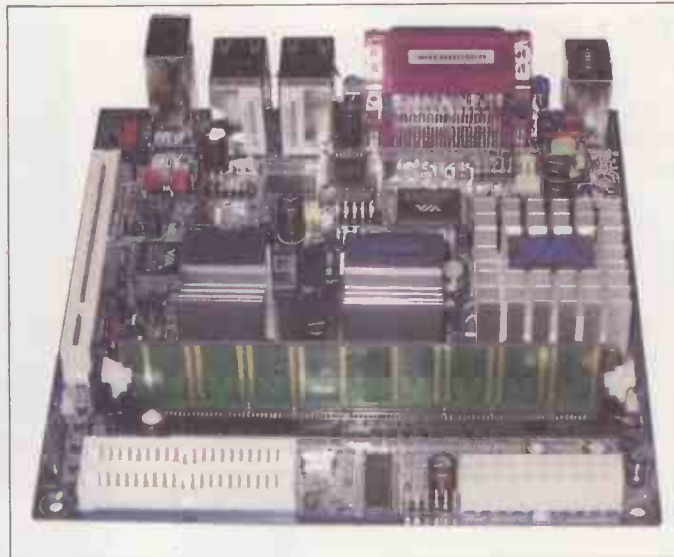


>



Step 1

This is the inside of our 1U Travia C146 rackmount case, with the drive mounting bays removed, along with the optical bay, which is beneath the left-hand drive mount. We've fitted the backplate with the cutouts for the motherboard ports and the PCI riser; there's space in this case for two PCI cards, but if you don't anticipate expansion, you can leave it out. Low-profile cases like this tend to have quite small power supplies – in this case 180w – so don't go overboard with your graphics controllers. There are cooling fans in the box at the right of the case, which blow over the motherboard. You'll also need the power extension cable, to reach from the PSU on the left to the motherboard on the right.



Step 2

Now, make sure you're grounded and remove the motherboard from its protective packaging. There's only one memory slot on the board, so it's best to go for a decent size to start with – we've installed a 512MB PC2100 module; if you're using a low-profile case like this, make sure the memory will fit. You can see the two IDE connectors at the bottom left of the motherboard, with the single PCI slot on the side. This board also includes graphics, sound, two Ethernet ports, four USB and a serial port on the rear panel, with headers for two more USB and three more serial connections. Line the board up on the mounting posts built into the case and fix it with one of the mounting screws at each corner.



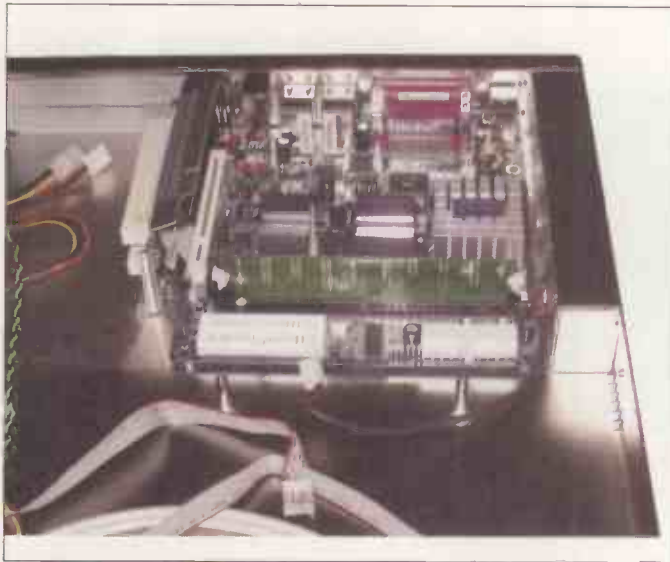
Step 5

Now, take the optical drive and mount it in its carrier. It's held in place by three small screws, two on one side and one on another. For a slimline drive such as this, you'll also need an adapter to connect it to the standard cabling inside the case. You must screw the adapter onto the back of the drive, otherwise it's liable to work loose. Connect one of the small floppy-disk-style power connectors from the PSU to the back of the adapter and then connect one end of a second IDE cable. It's a bit of a tight squeeze on the adapter, but don't worry – you're unlikely to break anything.



Step 6

Once you've mounted the optical drive in its carrier, screw the carrier back onto the base of the case and then replace the left-hand drive mounting bracket above it. You should end up with something that looks like the photo above. We've folded the IDE cable onto the top of the mounting platform, so we can route it neatly; it's worth considering the type of drive you use here; we could have saved some money by opting for a tray-loading design, but this slot-loader doesn't have anything that can stick out and get damaged. As you can see here, the red and green power and LED cables from the front panel pass under the drive platform, before going round to the side of the motherboard.



Step 3

Here you can see the motherboard mounted in the case, with the PCI riser ready to be plugged in; it's a bit fiddly, but it will go in eventually. The black cable on the right is for the case fans. Make sure it isn't snagged as you slot the motherboard into the case and then connect it to the appropriate header on the motherboard. You should also make sure that when you route other cables, you don't obstruct those fans, especially with a fanless motherboard such as ours. There are three two-wire cables from the front of the case, for the power switch, hard drive LED and power LED. They're fairly flexible, so connect them now. On each one, the black cable connects to the appropriate HDD connector. We'll leave most of the other connectors until later.



Step 7

Next, replace the right-hand drive platform, with the hard drive already installed on it. Plug the IDE cable from the hard drive into the IDE1 socket, furthest from the edge of the main board, and connect a power cable from the PSU. Then plug the IDE cable from the optical drive into the IDE2 socket and indulge in some origami to tidy up the cables. You'll also need to route the cable for the two front-panel USB sockets and the front-panel serial port to the appropriate headers on the motherboard. The gap below the USB ports on the front panel is for an optional Compact Flash reader. When you've routed all the other cables tidily, plug the power connector into the motherboard; this is the bulkiest cable, so you'll have to squeeze it in around everything else.



Step 4

Now you need to set the jumpers on your hard drive as Master and mount it on one of the drive platforms. The case is supplied with a range of screws for mounting the drive; make sure you pick the right ones, as there are some that look very similar, but with a different thread pitch. We've mounted ours immediately in front of the motherboard, but bear in mind that in this position, it can be quite fiddly to get at the connectors without first unscrewing the drive platform again. Connect one end of the IDE cable to the drive, and then set it aside.



Step 8

This is the finished result; we're almost ready to get started. First, though, connect a monitor and a keyboard with a PS/2 connector to the back panel sockets. Power up the system and go into the Bios by pressing Del. Check that both drives are detected, though with a new drive you won't be able to boot yet. Now make a few changes to the settings. First, in the standard Cmos features section, set the Halt option to All except keyboard, so the system will boot keyboardless. In Advanced Bios settings, set the boot order to CD first, then hard drive. Under Integrated Peripherals, turn on USB keyboard support, so you can plug a keyboard into the front panel, and finally under ACPI set the Power button so that it has to be held down before switching the system off, preventing accidental shutdowns.



INSTALLING OPEN BSD

```
Terminal type? [vt220]
Do you wish to select a keyboard encoding table? [no]

IS YOUR DATA BACKED UP? As with anything that modifies disk contents, this
program can cause SIGNIFICANT data loss.

It is often helpful to have the installation notes handy. For complex disk
configurations, relevant disk hardware manuals and a calculator are useful.

Proceed with install? [no] y
Cool! Let's get to it...

You will now initialize the disk(s) that Open BSD will use. To enable all
available security features you should configure the disk(s) to allow the
creation of separate filesystems for /, /tmp, /var, /usr, and /home.

Available disks are: wd0.
Which one is the root disk? (or 'done') [wd0]
Do you want to use 'all' of wd0 for OpenBSD? [no] y
```

Step 1

Boot the server from the cd36.iso CD. You should see the OpenBSD/i386 boot prompt; if the system doesn't continue after a few seconds, press Enter. You'll see a list of hardware detected scroll past, then at the next prompt, press I followed by Enter. Press Enter to accept default terminal and keyboard types, confirm you really want to install and use the whole disk for OpenBSD.

```
System hostname? (short form, e.g. 'foo') gateway
Configure the network? [yes]
Available interfaces are: vr0 vrl
Which one do you wish to initialize? (or 'done') [vr0]
Symbolic (host) name for vr0? [gateway]
The media options for vr0 are currently
  media: Ethernet autoselect (100baseTX full-duplex)
Do you want to change the media options? [no]
IPv4 address for vr0? (or 'none' or 'dhcp') 192.168.1.1
Netmask? [255.255.255.0]
Available interfaces are: vrl
Which one do you wish to initialize? (or 'done') [vrl] done
DNS domain name? (e.g. 'bar.com') [my.domain] nigel.whitfield.com
DNS nameserver? (IP address or 'none') [none]
```

Step 3

When you've confirmed the previous stage, the disk will be formatted, then you'll see these prompts, where you set the host name, domain and network details. If you're going to install over the network via FTP or HTTP, you need to choose yes when you're asked if you want to use DNS now. Note that since this will be a mail server, you should give it a fixed IP address, rather than using DHCP.

```
The following sets are available. Enter a filename, 'all' to
all the sets, or 'done'. You may de-select a set by prepending a '-'
to its name.

[X] bad
[X] base36.tgz
[X] etc36.tgz
[X] misc36.tgz
[X] comp36.tgz
[X] man36.tgz
[X] game36.tgz
[ ] xbase36.tgz
[ ] xetc36.tgz
[ ] xshare36.tgz
[ ] xfont36.tgz
[ ] xserv36.tgz

File name? (or 'done') [xbase36.tgz] done
```

Step 5

You'll see a list of install sets, like this. The default should be fine – we're not going to add X-Windows, since it's not really necessary on a mail server and consumes more CPU. Type done when you're sure the selection is OK and the files will be installed on the hard disk; it's very quick.

```
Initial label editor (enter '?' for help at any prompt)
> d a
> a
partition: [a]
offset: [63]
size: [156360582] 1g
Rounding to nearest cylinder: 2097585
FS type: [4.2BSD]
Mount point: [none] /
> a
partition: [b]
```

Step 2

When the Disk label editor starts, type d a then Enter to delete the initial whole disk partition. Press a and create a new partition for the root filesystem – 1GB is fine. Add partition b, of type swap (1GB) then repeat to add d (mount point /usr), e (/tmp), f (/home) and g (/var); there's no partition 'c'. We allocated 1GB to / and /tmp, 5GB to /usr, 20GB to /home and the remainder to /var. Press q to save the new disk label, confirm with y and type done at the next prompt.

```
Password for root account? (will not echo)
Password for root account? (again)

You will now specify the location and names of the install sets you want to
load. You will be able to repeat this step until all your sets have been
successfully loaded. If you are not sure what sets to install, refer to the
installation notes for details on the contents of each.

Sets can be located on a (m)ounted filesystem; a (c)drom, (d)isk or (t)ape
device; or a (f)tp, (n)fs or (h)ttp server.
Where are the install sets? (or 'done') c
Available CD-ROMS are: cd0
Which one contains the install media? (or 'done') [cd0]
Pathname to the sets? (or 'done') [3.6/i386] x86install
```

Step 4

Now enter a password for the root user twice and pick the location for the install – it's quickest from a CD, so eject the boot CD and insert the next one. The suggested path is for the official OpenBSD discs. If you're using the PCW OpenBSD disc, type x86install and press Enter.

```
Sets can be located on a (m)ounted filesystem; a (c)drom, (d)isk or (t)ape
device; or a (f)tp, (n)fs or (h)ttp server.
Where are the install sets? (or 'done') done
Start sshd(8) by default? [yes]
Do you expect to run the X Window System? [yes] no
Change the default console to com0? [no]
Saving configuration files... done.
Generating initial host.random file done.
Which timezone are you in? ('?' for list) [Canada/Mountain] GR
Setting local timezone to 'GR' ...done.
Making all device nodes...done.
Installing boot block...
```

Step 6

When you're asked for the location of install sets again, type done, and then choose to have sshd started by default; this allows you to make a secure connection to the server for admin. Answer no to questions about X-Windows and console, then enter your time zone. Shortly afterwards you'll see a congratulation message. Type halt, wait for the system to say it's shutdown, remove the CD and reboot – you're ready to configure your mail system; details next month.



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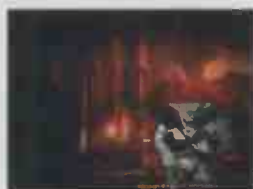
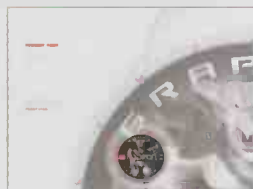
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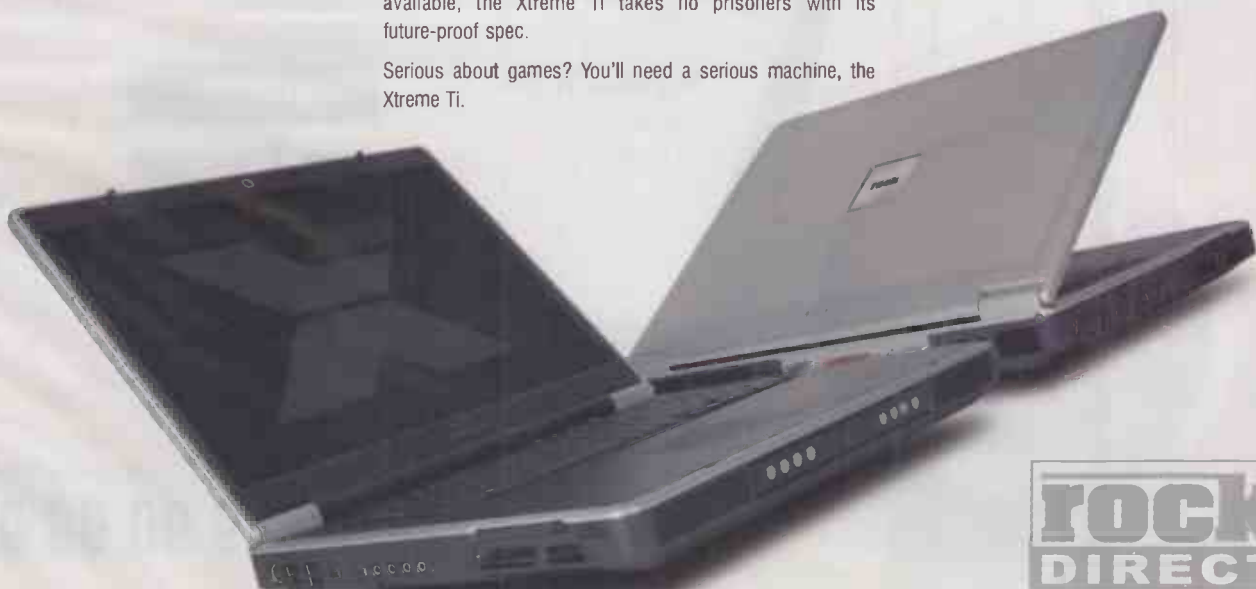
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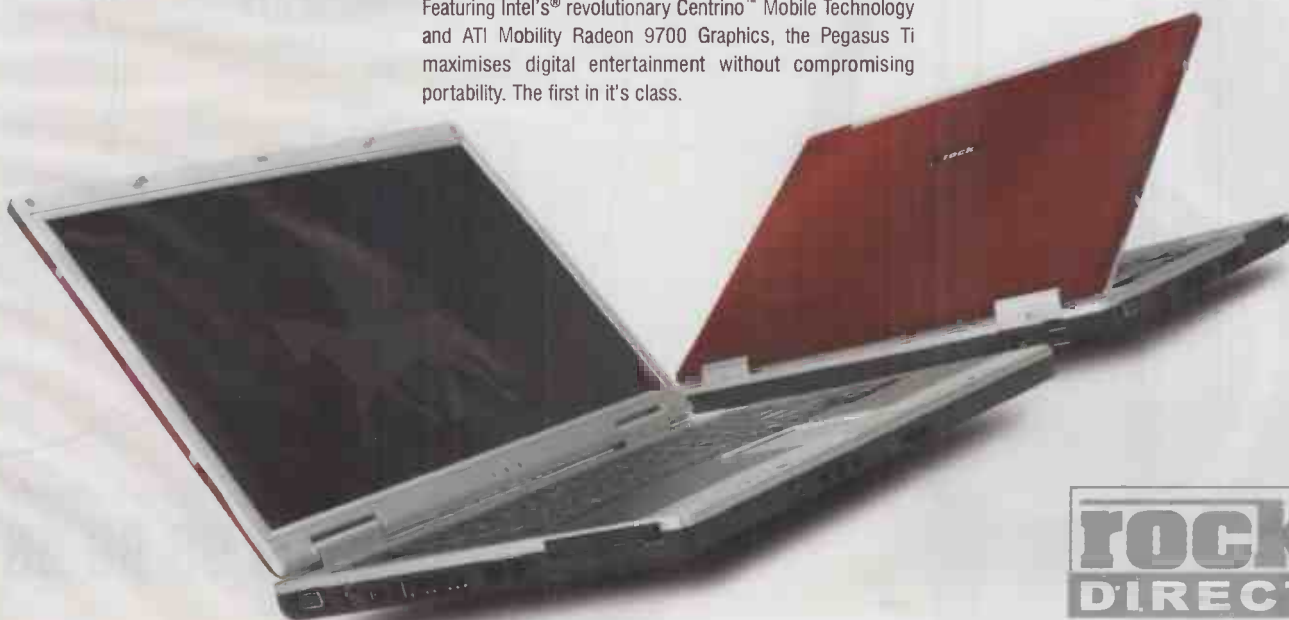
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Quaddra Ti Introducing the new Rock Quaddra Ti. Feature rich, this outstanding notebook is the ultimate workstation. Whether used as a Powerful Presentation Tool or as a Digital Entertainment Centre, the new Quaddra Ti has all and more to offer the most demanding of notebook users.

The Quaddra Ti features a RAID hard disk drive controller. With a 2nd hard drive you can take advantage of either RAID-0 or RAID-1 technology, making it the ideal powerhouse.



**rock
DIRECT**

RD9

Quaddra 64 MAIN FEATURES

Up to AMD Mobile Athlon™ 64 3700+

- Featuring PowerNow! Technology

Microsoft® Windows® XP Home

128Mb ATI Mobility Radeon 9700 Graphics

17.0" WXGA+ TFT Screen (1440 x 1050 Res)

Built-in Digital Video Camera

8x DVD DUAL Layer (-/+) Writer

Firewire™ and 3 x USB 2.0 Ports

4-in-1 Card Reader

Gigabit LAN & 56k Modem

3yr Collect & Return Warranty

Full specification online

MODEL: Q64-3.4

- AMD Athlon 64 3400+
- 17" WXGA+ TFT Screen
- 512MB DDR 400 RAM
- 60Gb 7200rpm HDD
- 8x Dual Layer DVD Writer

£999 Ex VAT
1173.83 Inc VAT

MODEL: Q64-3.7

- AMD Athlon 64 3700+
- 17" WXGA+ TFT Screen
- 1Gb DDR 400 RAM
- 60Gb 7200rpm HDD
- 8x Dual Layer DVD Writer

£1199 Ex VAT
1408.83 Inc VAT

Quaddra 64 UPGRADES

- Bluetooth Option

- WiFi

- XP Pro

Quaddra XT Pro MAIN FEATURES

Intel® Pentium® 4 Processor

- Featuring HyperThreading™ Technology

Microsoft® Windows® XP Home

128Mb ATI Mobility Radeon 9700 Graphics

15.0" SXGA+ TFT Screen (1400 x 1050 Res)

Built-in Digital Video Camera

8x DVD DUAL Layer (-/+) Writer

Firewire™ and 2 x USB 2.0 Ports

6-in-1 Card Reader

Gigabit LAN & 56k Modem

Full specification online

MODEL: QXTP-3.2

- Intel Pentium 4 3.2GHz HT
- 15" SXGA+ TFT Screen
- 1GB DDR 400 RAM
- 80Gb 5400rpm HDD
- 8x Dual Layer DVD Writer

£899 Ex VAT
1056.33 Inc VAT

Quaddra XT Pro UPGRADES

- Bluetooth Option

- WiFi

- XP Pro

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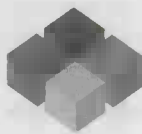
RD10

"...the Quaddra flew through our benchmarks, achieving 1.42 overall..."

QUADDRA XT PRO | PC PRO



QUADDRA



Enjoy exceptional performance and true mobility with the Mobile AMD Athlon™ 64 processor for notebook computing.

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The revolutionary architecture of the AMD Athlon 64 processor enables industry-leading performance to help maximize productivity and deliver a true-to-life digital entertainment experience. Designed to enhance mobility, the AMD Athlon 64 processor also incorporates AMD PowerNow! technology to deliver performance on demand while helping to extend system battery life.

Quaddra XT Pro strikes the optimum balance between portability and performance and makes no compromise on specification. A true mobile powerhouse.

Featuring an Intel® Pentium® 4 processor with HyperThreading™ technology, the Quaddra XT Pro will you give you all the performance you could need.



**rock
DIRECT**

RD 11

ROCKDIRECT

Founded in June 1992, notebook manufacturer rockdirect (formally known as Rock Computers) is one of the largest and most respected manufacturers of leading edge mobile notebook technology in the UK.

At its manufacturing facility in Warwick, rockdirect design and support a complete range of inspiring notebook computers to Consumers, Businesses and Education Establishments.

Twelve years ago Rock entered the notebook market with the launch of their NP-101 notebook, featuring a 16MHz 386SX CPU, 1Mb RAM, 20Mb HDD and an 8.5" mono LCD. It was to be the first of many milestones in Rock's history with their inspiration driving many of the major advances in notebook technology. Rock has grown rapidly since its beginning and in 2003 was ranked by Deloitte Touche as one of the UK's fastest growing companies.

In addition to continued technological innovation in the portable computing market, rockdirect is the only notebook manufacturer to supply a 3 year (insurance backed) collect and return warranty on its entire notebook range as standard, ensuring it offers the most comprehensive after sales service of any notebook manufacturer.

For further information, including full specifications on our notebooks please call

08709 909090

Or visit our website at

www.rockdirect.com

Alternatively, you can visit our showroom at

1 Collins Road, Heathcote Estate, Warwick, Warwickshire CV34 6TF

Opening hours 9am-5.30pm Mon-Fri and 10am-2pm Sat

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We will be closed at 1pm on Friday 24th December till 9am Tuesday 4th January.

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RD12



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Editor's Choice

If you want to take advantage of what Microsoft's Media Center 2005 has to offer, then you may need a new PC. We take a closer look at nine systems currently available

Center of attention

WORDS: WILL STAPLEY TESTING: VNU LABS PHOTOS: BRUCE MACKIE

With the recent release of Microsoft's Windows XP Media Center Edition 2005 (we'll refer to it as Media Center 2005 for brevity), we decided to investigate exactly how the major manufacturers are incorporating it into their PCs. As with previous versions, Microsoft has taken the decision not to sell Media Center 2005 as a standalone operating system. If you want to take advantage of what Media Center 2005 has to offer you'll have to buy it as an OEM or shell out for a new PC.

In order to get a variety of Media Center PCs, we didn't set a price for this group test. We also left it up to the manufacturers to decide whether to supply a monitor. If the

PC you like doesn't include a monitor, speak to the vendor in question as they may be able to give you a new quote. As well as examining what PC manufacturers are selling in the way of Media Centers, we also took a closer look at the Media Center operating system itself and what DIY alternatives are on offer.

Before we move on to the reviews it's worth noting that some manufacturers have supplied digital TV (DVB-T) tuner cards with their systems. Although this is no problem if you live in a Freeview area, you should speak to the manufacturer about swapping them for analogue versions if you prefer. Also, as with all Media Centers, each PC in this group test comes with a Media Center remote control.





Carrera C-Box T2-P Deluxe

Carrera has housed the C-Box T2-P Deluxe in the same Asus T2 micro ATX case that appeared with its entry in our January 2005 group test. It doesn't look as stylish as some of the other small form factor Media Centers on test, but it's nowhere near as cumbersome as a standard tower and offers some room for upgrade.

An Intel P4 processor clocked at 3GHz sits alongside an Nvidia Geforce FX 5900XT graphics card. Carrera has decided not to opt for 1GB of Ram, instead choosing 512MB. It's not something that should concern you, but you may want to consider upgrading to 1GB at some point.

Storage is provided by a 160GB hard drive. Although this is by no means small, storage is important in Media Center PCs so it would have been good to see a larger model. That said, two 5.25in bays are free so adding another drive is a possibility.

Our benchmarks returned mixed scores for the C-Box T2-P Deluxe. In PCmark04 it did extremely well and topped the table, but in the Sysmark 2004 and 3Dmark05 tests it only managed to clock up mid-range scores.

Carrera ships the C-Box T2-P Deluxe without a monitor as standard, hence the low price. At just over £800 it's very competitively priced.

DETAILS

RRP £821.33 (£699 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Carrera 0871 222 3456 www.carreras.co.uk

PROS Good price; upgradeable

CONS Storage could be larger

VERDICT

A solid, good value-for-money entry, but upgrading the memory and increasing storage capacity should be considered

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL

★★★★★

★★★★★

★★★★★

★★★★★



CFL Excite Mediacenter

The Excite Mediacenter is CFL's debut PC in a PCW group test; for those who have never heard of CFL, it's based in Wales and has been in business since 1989.

Thanks to the MSI Mega 865 small form factor case, the Excite Mediacenter doesn't disappoint in terms of style. With the eye-catching mirrored effect on the front of the case, it's a model that will no doubt be the centre of attention in any lounge.

CFL has included an impressive 250GB hard drive with this system; a large storage capacity is something that Media Center PCs cry out for. The processor is a 3GHz P4 while memory stands at a respectable 1GB, which is an impressive pairing. A Geforce FX 5700 LE graphics card delivers acceptable 3D performance, but it won't set the world on fire when it comes to playing the latest games.

Like many of the other entries this month, a monitor isn't included with the Excite Mediacenter. This has a positive effect on the price tag and, at just under £900, it's certainly good value for money. The one-year collect and return warranty could certainly be improved upon, but all in all this is an impressive first submission from CFL at a good price.

DETAILS

RRP £899 (£765.11 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

CFL 01446 775 985 www.cfl-systems.com

PROS 250GB hard drive; good case

CONS Poor standard warranty

VERDICT

Plenty of storage, fast processor and 1GB of Ram make this a very capable PC, but the one-year warranty is disappointing

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL

★★★★★

★★★★★

★★★★★

★★★★★



Elonex Extentia Gold 2005

Whether or not you like the smooth, round edges of the Extentia from Elonex is a matter of personal taste, but what you can't deny is that it's a real space saver. Featuring a 17in widescreen display, this all-in-one Media Center is perfect for those who want to limit the impact on desk space. Just as impressive is the built-in wireless receiver for the keyboard and mouse, removing the need for an external receiver box. Flip open the door on the left side of the Extentia and you'll find a multi-format card reader, while the DVD-RW drive sits on the right.

Despite everything being housed in what seems like a very cramped environment, Elonex has done a stunning job in keeping the cooling system quiet. It is possible to hear the fans whirring away, but if you're watching a movie you're unlikely to notice.

Factor in all the components, and the fact that this is an all-in-one unit, and the price seems fair enough. One problem with such systems is if things start going wrong inside it's hard to fix the problem yourself and upgrade opportunities are limited. Having said that, the three-year collect and return warranty is on hand should you experience technical problems. So if you're after a complete Media Center, the Extentia is a compact and well-designed option.

DETAILS

RRP £1,499 (£1,275.74 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Elonex 020 8452 2444 www.elonex.co.uk

PROS Good compact design; quiet

CONS Difficult to upgrade or repair

VERDICT

One of the best all-in-one PCs we've seen, but those interested in upgrading will find it limiting

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL

★★★★★

★★★★★

★★★★★

★★★★★



Evesham E-box S

If you caught our standalone review of the E-box in the January issue of PCW, you'll notice this model looks similar. The similarities extend much further than just looks and this E-box has an almost identical specification. Evesham has made two alterations, namely to the internal fans and the price. The good news is that on both counts it's a change for the better. The cooling system has been adjusted to reduce noise, while Evesham has also given the price a knock in the right direction.

The E-box S has a 3GHz P4 processor and 512MB of Ram, while a 160GB hard drive provides adequate storage space – a slightly larger model would have been preferable. The Radeon X300 graphics card will cope with most games, but hardened gamers might want to consider upgrading.

Evesham is one of two manufacturers in this group test to have supplied two TV tuner cards, both of which are digital. Using these cards, Media Center 2005 is able to record live TV and play or record another live channel at the same time.

The price drop of the E-box S to £999 makes it even more attractive than when we first reviewed it. With dual digital tuners and a neat, if chunky design, it's one of the best Media Centers available, scooping our Editor's Choice award.

DETAILS

RRP £999 (£850.21 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Evesham 0870 760 9500 www.evesham.com

PROS Dual tuners; quiet

CONS Hard drive is a little small

VERDICT

Dual digital TV tuners and a neat design make this E-box S one of the more attractive Media Centers

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



Hi-Grade DMS 3000

The silver VCR-style case from Hi-Grade doesn't complicate things in terms of buttons and controls. Just the power button and audio and Firewire/USB ports sit on the front.

The opposite is true on the back of the unit and connections are in abundance. You get two Scart outputs, one of which can be converted to an input and both in and out options for S-video and composite video, leaving you with plenty of choices when it comes to hooking it up to your TV and set-top box.

Hi-Grade has gone for a modest specification with the 3GHz P4 leading the way. This is backed up by 512MB of Ram and an Nvidia Geforce 5200 graphics card, which will struggle to play the latest games at the highest quality levels. Our benchmarks showed Hi-Grade falling behind in all of the tests, but what's more of a concern is the 120GB hard drive. Although you'll be able to record a fair amount of TV before having to delete programmes, it falls below the storage space offered by most of the systems this month.

The price of the DMS 3000 is a little on the high side too, especially considering the slow graphics card, but the huge array of connections makes it a versatile Media Center.

DETAILS

RRP £1,056 (£899 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Hi-Grade 020 8532 6111 www.hlgrade.com

PROS Huge variety of connection options

CONS 120GB hard drive

VERDICT

The price is a little high considering the spec, but the wide range of connections options is impressive

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



Jal Poseidon

Jal has submitted its Media Center 2005 PC in Aopen's XC Cube small form factor case. Although the XC Cube doesn't sport the same flashy design as Shuttle's XPC or MSI's Mega 865, it's still a compact and well-designed model. Unlike most other cases of this kind, there's no built-in memory card reader as standard.

A 2.8GHz P4 from Intel sits at the heart of the Poseidon alongside 1GB of Ram and a 160GB hard drive. Sparkle's Geforce 6600 GT provides ample 3D performance for gamers and, as our benchmark results show, fared extremely well during testing.

As we've stated with other systems featuring a 160GB hard drive, more storage would have been good but it's an acceptable size. Along with the base unit, Jal has supplied a Viewsonic VG712s 17in monitor. The silver bezel sits well with the XC Cube case and we can't fault this monitor in terms of performance.

The Jal performed very well in the majority of our benchmarks. This kind of performance isn't required for Media Center applications, but it does allow you to use the Poseidon as a high-powered standard PC as well. It might not be able to match some of the other entries in terms of style, but overall we feel it's a good value for money and definitely worth considering.

DETAILS

RRP £1,056.33 (£899 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Jal 08707 525 810 www.jal.co.uk

PROS Good performance; quality monitor

CONS More storage might be required

VERDICT

If you're after a high-power Media Center that doesn't cost a fortune, the Jal would be a good choice

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

Winner
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AJP are the proud winners of What Laptops UK BEST SERVICE Award - December 2004

With over 18 years experience in the IT business and specialists in Notebooks and portable products, AJP have something that will more than satisfy any budget, requirement and specification. With AJP's wealth of experience, expertise and commitment to launching the latest in mobile technology at the best value, let us help you make the right choice. Our philosophy is "Making IT Happen" at "Best Value for Money".

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AJP G220

The Traveller with a 12.1" Widescreen, built in 1.3 Mega Pixel Camera and durable Magnesium Alloy casing, the AJP G220 is slim, light and truly portable.

- 12.1" TFT WXGA (1280x800) Glare Type
- Magnesium Alloy top & bottom case
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- Processor speed 1.5GHz
- 512K Level 2 Cache
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- Intel Integrated Wireless LAN (802.11b/g) card
- 256MB DDR333 RAM (up to 1GB)
- 40GB HDD (up to 100GB)
- Built in DVD/CDRW Combo Drive (Optional DVD-RW/CD-RW)
- Built in 56K fax/modem & 10/100 Ethernet Adapter
- 64MB Shared Video Memory
- Ports: 3xUSB 2.0, IEEE Firewire, Monitor
- Built in 4-in-1 Card Reader (Supports SD/SDIO/MS/MS-PRO)
- Up to 4 Hours Battery Life
- Built in 1.3 Mega Pixel Camera (180° Rotation)
- 320(W)x242(D)x22-28mm (H) / Weight: 2.1Kg
- 3 Year RTB Warranty***
- Windows XP Home with CD & Manual
- PANDA Platinum Internet Security
- Virgin.net - Internet access, NO 12mth contract

Other Features: Built in 3D Sound & Speakers, 1x PC Card Slot, 6 Cell Smart Li-Ion Battery**, 4 Application Key, External USB FDD (Optional)

12.1" TFT	Celeron 1.5GHz	256MB RAM	40GB HDD	Combo Drive
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£595 ex. VAT
£699.13 inc VAT

1.3 Mega Pixel Camera
180° Rotation



ECode: e014

AJP D410EV

Mid-Range Notebook with a good screen, great graphics, perfect for making presentations, writing or watching DVD's and game playing at an affordable price.

- 15" TFT SXGA+ (1400x1050)
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- 512MB DDR400 RAM (up to 2GB)
- 60GB HDD (up to 100GB)
- DVD-RW/CD-RW Dual Format (+/-) & Dual Layer (+)
- Built in 56K fax/modem
- Built in 10/100/1000-Giga LAN Ethernet Adapter
- ATI Mobility Radeon M11 with Integrated AGP 8x
- 128MB DDR Video RAM & DirectX 9 support
- Ports: 2xUSB 2.0, IEEE Firewire, IrDA, TV-Out, Parallel, Serial, Monitor, PS/2, S/P DIF output
- Built in Video Camera
- Built in 6-in-1 Smart Card Reader
- Built in Bluetooth Support & Built in Wireless antenna**
- 329(W)x275(D)x36mm (H) / Weight: 3.3Kg
- Carry Case, 3 Years RTB Warranty***
- Windows XP Home with CD & Manual
- PANDA Platinum Internet Security
- Virgin.net - Internet access, NO 12mth contract

Other Features: Built in 3D Sound & Speakers with 5.1 channel output, Smart Li-Ion Battery**, 3 Hot Keys (Email, Web Browser, Application), External USB FDD (Optional), Wireless LAN module (Optional)**, Bluetooth module (Optional)**, External USB TV Tuner (Optional)

15" TFT	Pentium 4 3.2GHz	512MB RAM	60GB HDD	DVD-RW/CD-RW	ATI M11
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£799 ex. VAT
£938.83 inc VAT

Built in Video Camera



ECode: e040

AJP M6000NE

Power Centrino for the dedicated road warrior. Great battery life, high resolution screen, slim and light with a DVD-RW included as standard for backing up work and playing DVDs.

- 15.4" TFT WSXGA+ (1680x1050) Widescreen
- DOTHAN - Intel Pentium M Processor 735
- Processor speed 1.7GHz (up to 2.0GHz)
- 2MB Level 2 Cache
- Intel Integrated Wireless LAN (802.11b/g) card
- 512MB DDR400 RAM (up to 2GB)
- 60GB HDD (up to 100GB)
- DVD-RW/CD-RW Dual Format (+/-) & Dual Layer (+)
- (HotSwappable with 2nd HDD or 2nd Battery)
- Built in 56K fax/modem & 10/100/1000-Giga LAN
- ATI Mobility Radeon M11 with Integrated AGP 8x
- 64MB DDR Video RAM & DirectX 9 support
- Ports: 4xUSB 2.0, IEEE Firewire, IrDA, TV-Out, Parallel, Monitor, PortBar (Docking Station)
- Built in 4-in-1 Card Reader (Supports MMC/SD/MS/MS-Pro)
- Up to 5 Hours Battery Life (up to 8 Hours with 2nd Battery option)
- 354(W)x273(D)x22-34mm (H) / Weight: 2.6Kg
- Carry Case, 3 Years RTB Warranty***
- Windows XP Home with CD & Manual
- PANDA Platinum Internet Security
- Virgin.net - Internet access, NO 12mth contract

Other Features: Built in 3D Sound & Speakers, 1x PC Card Slot, Smart Li-Ion Battery**, 5 Application Key, (Optional) External USB FDD

15.4" TFT	Centrino 1.7GHz	512MB RAM	60GB HDD	DVD-RW/CD-RW	ATI M11
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£899 ex. VAT
£1056.33 inc VAT



ECode: e090

Contact Us

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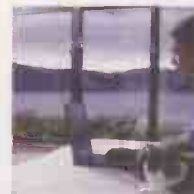
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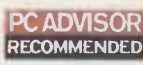
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Winner
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Awards for D870P



"Great all-round performance and spec"

PC Format June 2004 (D870P)

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"The only thing AJP hasn't included with the D870P is the Kitchen Sink!"

Computer Buyer Dec 2004 (D870P)

AJP D870P

Power Notebook Plus featuring a 17" widescreen with 256MB video memory, RAID 0 or RAID 1 technology (available by adding a 2nd hard disk) and an optional higher resolution screen with wide angle viewing. This is a perfect desktop replacement, fantastic for presentations, home cinema experience and any other task you wish to perform.

- 17" TFT WXGA (1440x900) Widescreen or Optional WSXGA+ (1680x1050) with Wide Angle Viewing
- 3.2GHz Intel® Pentium 4 (up to 3.4GHz) with 800MHz FSB, Hyper-Threading & 1MB Cache
- 1GB DDR400 RAM (up to 2GB)
- 80GB HDD (Additional bay for 2nd HDD option with RAID 0 & RAID 1 support, up to 100GB)
- DVD-RW/CD-RW Dual Format (+/-) & Dual Layer(+)
- 4x Built in Speakers & Sub Woofer Module
- Built in TV Tuner and Remote Control (Optional)
- Built in 56K fax/modem & 10/100/1000-Giga LAN
- ATI Mobility Radeon M11 with Integrated AGP 8x
- 256MB DDR Video RAM & DirectX 9 support
- Ports: 3xUSB 2.0, IEEE Firewire, IrDA,TV-Out, Video In (with TV Tuner only), Parallel, Serial, DVI out, PS/2, S/P DIF output
- Built in Video Camera
- 7-in-1 Smart Card Reader
- Built in Wireless LAN 802.11b/g card
- Built in Bluetooth Support**
- Full Size Keyboard & Separate Numeric Keypad
- 393(W)x275(D)x37.5mm(H) / Weight: 3.8Kg
- Carry Case, 3 Year RTB Warranty***
- Windows XP Home with CD & Manual
- PANDA Platinum Internet Security
- Virgin.net - Internet access, NO 12mth contract

Other Features: Built in 3D Sound with virtual 6 channel output, 1x PC Card Slot, Smart Li-Ion Battery**, 3 Hot Keys (Email, Web Browser, Application), External USB FDD (Optional), Bluetooth module (Optional)**

17" Widescreen	Pentium 4 3.2GHz	1GB RAM	80GB HDD	DVD-RW/CD-RW	ATI M11	256MB VRAM	Optional 2ND HDD	RAID 0 RAID 1 SUPPORT
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£1149 ex. VAT

£1350.08 inc VAT

ECODE: e010



Built in Video Camera

AJP D900T

An unprecedented addition to AJP, is the D900T series, a five-spindle notebook of 'firsts' incorporating the latest advances in mobile technology. Including DDR2 dual channel RAM, a revolutionary memory breakthrough, plus the option for the user to select between the fastest mobile graphics cards, nVidia Geforce Go 6800 or the ATI Mobility Radeon X800, both with PCI Express and 256MB VRAM.

Teamed with a superior 17" widescreen, fast copy facility, when you add a second optical drive, built in Audio DJ with MP3 player, Intel Azalia high definition enhanced sound, support for S-ATA hard disk drives, RAID 0 or RAID 1 technology (available by adding a 2nd hard disk), the AJP D900T is unrivalled as the supreme desktop replacement, matching the most powerful desktop performance in a versatile solution.

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- Processor speed 3.4GHz (up to 3.6GHz) with 800MHz FSB, Hyper-Threading & 1MB Cache
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- 80GB HDD (Additional bay for 2nd HDD option with RAID 0 & RAID 1 support, upgradeable to 200GB) Optional S-ATA HDD
- DVD-RW/CD-RW Dual Format (+/-) & Dual Layer (+)
- Additional bay for optional 2nd Optical Drive (fast copy facility)
- Built in 7-in-1 Smart Card Reader
- PCI Express nVidia GeForce Go 6800
- Optional PCI Express ATI Mobility Radeon X800
- 256MB DDR Video RAM & DirectX 9 support
- Intel Azalia High Definition Sound with Virtual 8 Channel output
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- Built in Wireless LAN 802.11b/g card
- Built in Bluetooth
- Built in TV Tuner and Remote Control (Optional)
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- Built in 10/100/1000-Giga LAN Ethernet Adapter
- 2x IEEE 1394 Firewire 400Mbps port
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- Built in Video Camera
- Full Size Keyboard & Separate Numeric Keypad
- 397(W)x298(D)x49.5mm(H) / Weight: 5.2Kg
- Carry Case, 36 months RTB Warranty***
- Windows XP Home with CD & Manual
- PANDA Platinum Internet Security
- Virgin.net - Internet access, NO 12mth contract

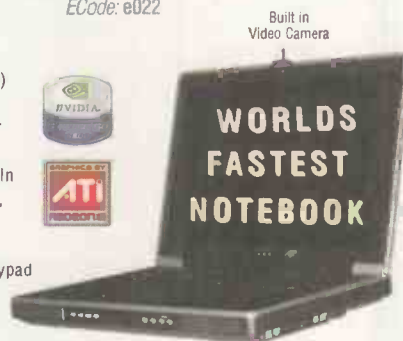
Other Features: 1x PC Card Slot, Smart Li-Ion Battery**, 3 Hot Keys (Email, Web Browser, Applications), External USB FDD (Optional),

17" Widescreen	Pentium 4 3.4GHz	1GB DDR2 RAM	80GB HDD	PCI Express	nVidia 6800	ATI X800	256MB VRAM	Azalia Audio
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December 2004

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- 2004 - Computer Shopper Awards 2004 Notebooks Shortlist
- 2002 - The Best SubNotebook of the Year, PC Advisor
- 2000 - Ranked in the top 10% of Computer Companies, Dunn & Bradstreet
- 1999 - One of the Fastest Fifty growing IT Companies in London, Deloitte & Touche
- 1999 - The Best Notebook of the Year, PC Advisor
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Mesh Media+ Cubex64 939 MCE

Mesh has decided to go for Shuttle's XPC small form factor case this month and with its stylish black design it will appeal to those who are interested in aesthetics.

Although we're not hugely concerned with raw performance in this group test, it should be noted that this Mesh monster clocked in some highly impressive benchmark scores. Topping the Sysmark 2004 and 3Dmark05 and coming second in the PCmark05, the Athlon 64 3500+, 1GB of Ram and Radeon 9800 Pro graphics card combine to create a powerful PC. As if that wasn't enough, Mesh has also found room for a total of 300GB of hard disk space – when it comes to Media Center PCs, you can never have enough storage.

Mesh has supplied this system with a 19in Iiyama C480T LCD TV which is an impressive monitor. However, with Media Center handling your viewing we can't see a huge need for an LCD TV except as a backup or if you want to watch a channel while recording another using Media Center.

Considering all the quality components, this Mesh system is extremely good value for money but if, like us, you feel you won't put the LCD TV to use, you might want to go for a cheaper option.

DETAILS

RRP £1,599 (£1,360.85 ex VAT)
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION Mesh
 08700 464 747 www.meshcomputers.com
PROS Good value for money; high spec
CONS LCD TV isn't really necessary
VERDICT
 Impressive price considering the components, but Media Center reduces the need for an LCD TV

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



Tiny MMC E10252

Tiny was the only manufacturer this month to submit a model based around a standard tower case.

Although this obviously has no effect on overall performance, the cumbersome and rather unattractive design means it won't look particularly great next to the TV in your living room. However, if you're only going to be hooking up Media Center to your monitor it's not so much of an issue.

The MMC E10252 is based around an Athlon 64 3000+ and 512MB of Ram. It houses two digital TV tuners. A 200GB hard drive also sits inside the case and provides a suitable amount of storage space for recorded TV shows. Gamers will be concerned about the inclusion of a Geforce FX 5200 graphics card, but for Media Center purposes this isn't a problem.

The other systems have just one optical drive, but Tiny has installed two, and with the amount of space inside the huge case it's really not that surprising. Along with the impressive NEC 3500AG DVD-RW, you get a run-of-the-mill unbranded DVD-Rom.

As is the norm with Tiny machines, the price is rock bottom. You don't get a monitor included in the deal and the ungainly tower case will be enough to dissuade more than a few buyers, but the MMC E10252 has a decent specification for the price.

DETAILS

RRP £668.99 (£569.35 ex VAT)
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION
 Tiny 08708 303 156 www.tiny.com
PROS Low price; room for upgrade
CONS Poor performance; large case
VERDICT
 The tower case is unusual for a Media Center PC and performance isn't great, but it's a good budget option

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



Watford Aries Media Experience+

Housed in a slim black DVD-style casing, the Aries Media Experience+ has obviously been designed to sit directly under your television. The retro design might not suit all tastes, but in terms of size it's a very compact device.

As far as performance goes, this Watford Media Center simply couldn't match the speed of the other entries this month. The reason for its poor showing in the benchmark graphs isn't hard to spot. The budget AMD Sempron processor has been paired up with 512MB of Ram, but with the onboard Nvidia Geforce4 graphics using 128MB of the main system memory it's only left with 384MB to play with.

Our review unit came with a single analogue TV tuner, however Watford has told us it will be shipping the Aries Media Experience+ with a dual analogue tuner.

Watford only offers a one-year return-to-base warranty for this system – compared to the other systems this month it's a little lacking. While the Aries Media Experience+ will struggle to play games, its poor specification does mean that the price is kept low. So if the onboard graphics and relatively slow processor don't bother you it's worth considering.

DETAILS

RRP £734.99 (£625.52 ex VAT)
BEST PRICE www.pcw.co.uk/bestprices
PRODUCT INFORMATION
 Watford 0870 027 0900 www.savastore.com
PROS Cheap; slim case
CONS Poor spec; relatively small hard disk
VERDICT
 At this price it's tempting, but make no mistake, the specification is well below what the other entries offer

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



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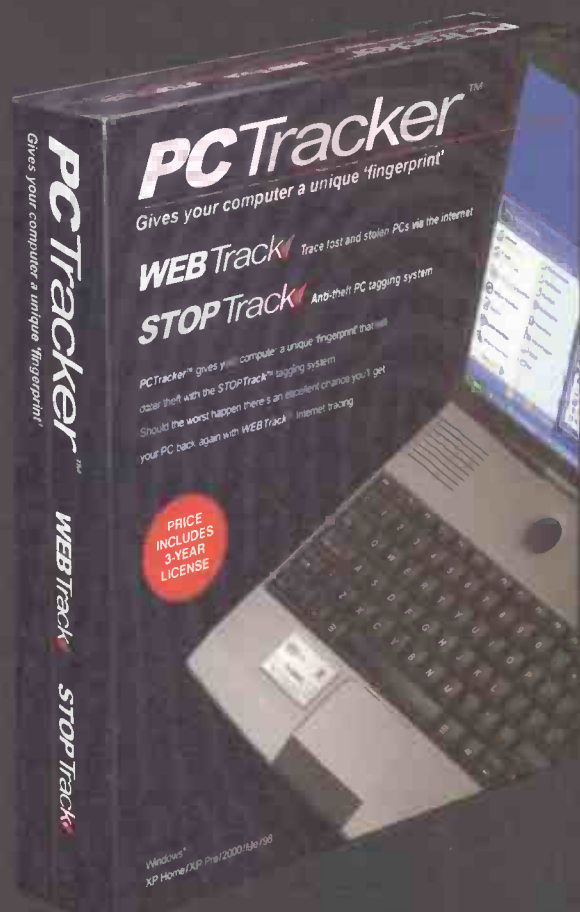
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WebTrack & **StopTrack** are also available separately. "WebTrack Only" is £29.90. plus p&tp for a 3-YEAR LICENSE and "StopTrack Only" £14.00 plus p&tp.



Windows XP Media Center Edition 2005

As all the systems this month feature Microsoft's Media Center 2005, here's a closer look at what this entertainment software offers

Media Center 2005, which comes pre-installed on all the PCs in this group test, is the third version of Microsoft's all-in-one entertainment software. Based on the Windows XP operating system, the 2005 edition is instantly recognisable to those who have used the previous version, but there are plenty of new features and enhancements lurking within.

A number of aesthetic alterations were inevitable and the most noticeable is the new font. It's not a massive change, but it looks good and is easy to read. The simple menu system was easy to navigate through in the last version of Media Center and the new shortcuts, such as one-click access to live or recorded TV programmes, make it even easier to work your way around. Using the Media Center remote control, you can access all the features without going anywhere near your PC.

Installation improvements

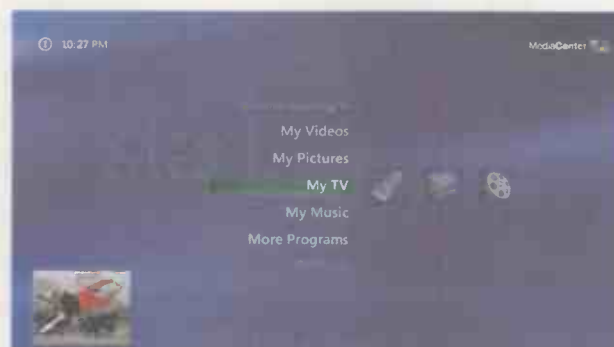
Microsoft is fully aware that the ease of installation and setup process of Media Center 2005 is critical to its success. This new version has refined the setup wizard still further and guides you through the process of first identifying your set-top box and then moving on to the other hardware and software settings. It's now possible to enhance the display to suit your output device (TV or monitor) as well as sort out your surround-sound speaker system.

Additional programs have been included in Media Center 2005, such as a CD creator and Microsoft's popular Messenger service. Although the thought of having contacts flash up instant messages while you're watching TV might sound like more of an irritation, it's a feature that will appeal to some. HDTV (High-Definition Television) support has also been added, but since HDTV broadcasts are very limited in Europe this is more of a future-proofing move by Microsoft.

TV features

A big improvement with Media Center 2005 is its ability to handle two TV tuners enabling you to watch a channel while recording another, or record two channels at the same time. Anyone with Sky+ will know how handy this can be.

Although Media Center 2005 sports a highly intuitive menu system and a wealth of interesting and useful features,



we still feel it falls down in one area. Unfortunately, especially for Microsoft, the quality of the video in machines we've seen is still not up to the standard we're after. Playback on a PC monitor is acceptable, and indeed better than previous version, but sit it next to your widescreen TV and you'll notice the difference. Hook up your Media Center PC to your TV and you'll still be left with a picture that isn't quite up to scratch. The picture quality isn't terrible – indeed some may well find it perfectly acceptable – but if Media Center 2005 is going to take over the living room it needs to produce picture quality that is at least on a par with what we already experience using standard TVs.

A lot of the problem is not inherent in the Microsoft software, but is a result of poor configuration and testing by the manufacturers. Factors that can affect the viewing quality include the quality of the aerial connection, mpeg video codec and graphics card drivers. Microsoft recognises the problem and offers guidelines on testing and optimising video quality at www.microsoft.com/whdc/device/stream/MCEvid.msp.

If vendors want to ensure a good user experience, they must get these configuration issues right, otherwise the Media Center concept will die.

Despite these issues, picking holes in the interface and features of Media Center 2005 isn't easy. Advanced users might find it a bit limiting, but in terms of ease of use we feel it's way ahead of anything else currently available.

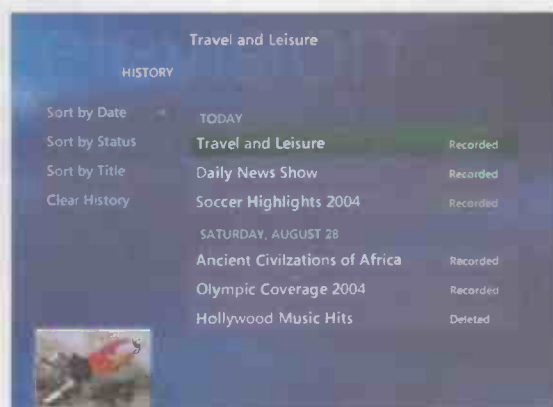
Setting up and operating Media Center can pose a few problems. If you're having trouble,

head to www.pcw.co.uk/mediacenter where you'll find a list of common problems and information on how to resolve them.

Getting a TV signal

The most common way to supply Media Center with a TV signal is to hook it up to your set-top cable or satellite box. The set-top box will normally connect to your Media Center PC via either a standard coax aerial cable or an S-video cable. During the installation process, Media Center will attempt to identify the make and model of your set-top box. If it can't identify it, you'll be asked to help manually configure it. To allow Media Center to change channels on the set-top box, a small transmitter needs to be placed directly on the infra-red receiver of your set-top box.

If you don't have a set-top box, you can simply attach an aerial to the TV card on your Media Center PC and it will receive either analogue or digital channels, depending on your TV tuner card. You can watch TV on your PC's monitor, but it's also possible feed the signal out to your television set, usually via an S-video cable.



DETAILS

RRP £79 (£67.99 ex VAT) from Ebuyer
BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Microsoft www.microsoft.com/mce

PROS Intuitive menus; works well

CONS TV quality is still an issue

VERDICT

It has its faults, but Microsoft is leading the way with Media Center 2005

FEATURES

PERFORMANCE

EASE OF USE

OVERALL

★★★★★

★★★★★

★★★★★

★★★★★

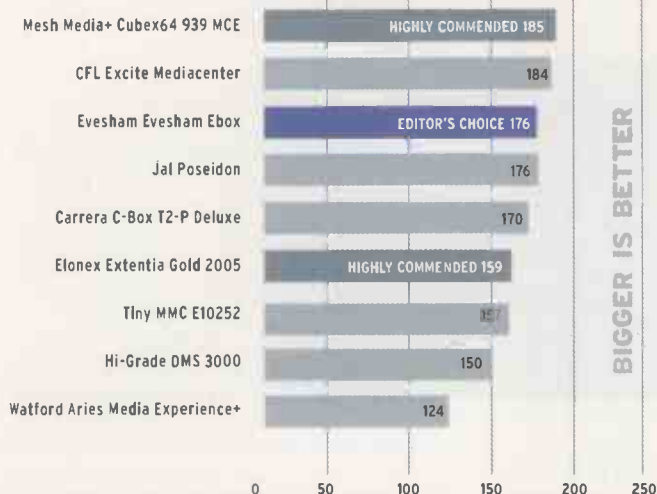




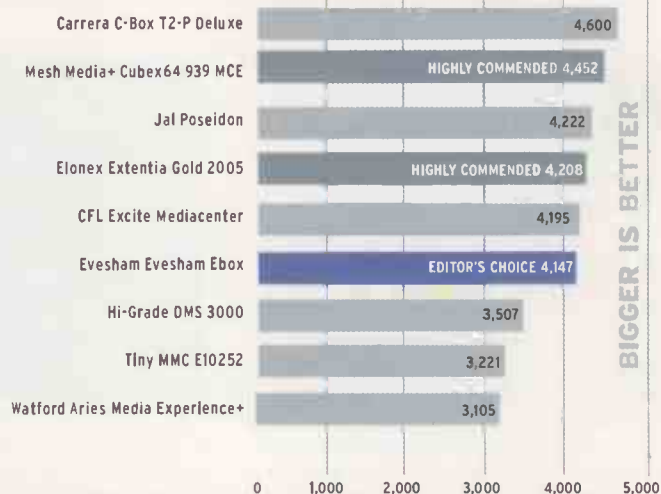
Lab results



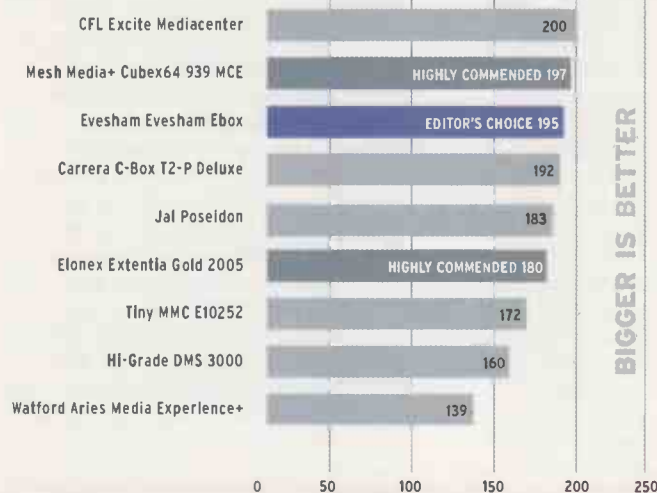
Sysmark 2004



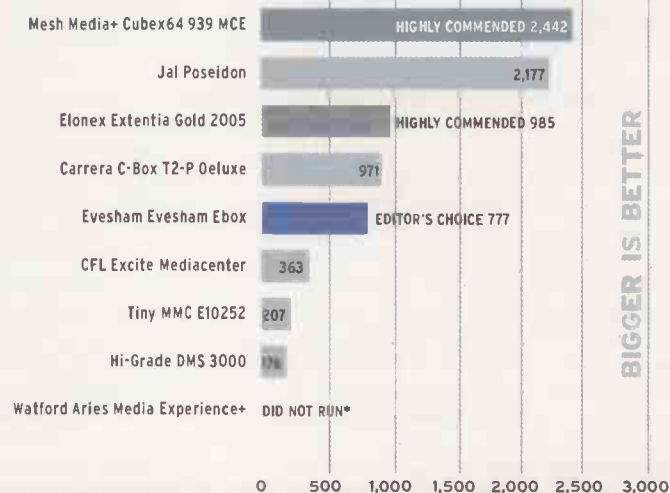
PCmark 2004



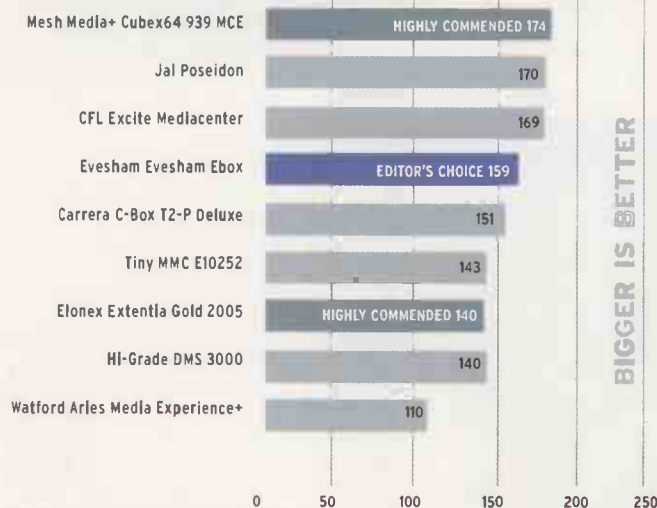
Sysmark 2004 Internet content creation



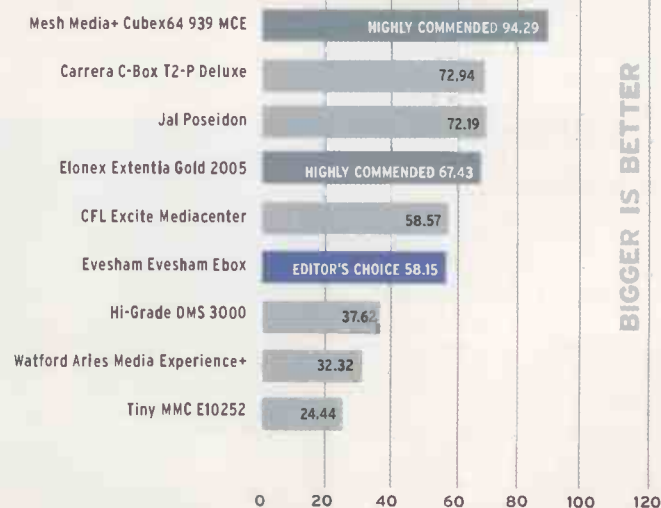
3DMark05 (1,024 x 768 at 32bit)



Sysmark 2004 office productivity



Unreal Tournament 2003 (1,024 x 768)



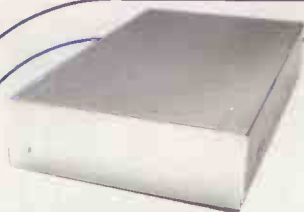
*3Dmark05 requires 512MB of dedicated system memory

Please see page 12 for an explanation of how we tested the PCs

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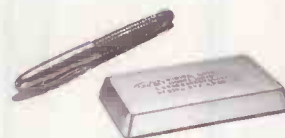


LaCie USB/FireWire 2.5" Mobile Drives

- Ultra-portable - only 7.6 x 12.9 x 1.7cm & 200g
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- AC adapter-free, powered by USB or FireWire
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- Sleek, robust enclosure - design by F.A. Porsche
- Compatible with Windows® backup utility
- 2 years manufacturer's warranty as standard

Available Models:

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FireWire & USB2.0 - 40GB, 60GB, 80GB, 100GB



LaCie DataBank 1.8" Hard Drives

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- Ideal for notebook/laptop users as mobile storage
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Available Models:

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- Compatible with Windows® backup utility
- 2 years manufacturer's warranty as standard

Available Models:

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500GB, 1000GB, 1600GB



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Available Models:

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- Ships with remote control, power unit and all cables
- Store 20,000 MP3's, 15 MPEG-2 or 80 DivX movies, 1,000,000 photo's in VGA, or up to 80GB of data

Available Models:

USB2.0 - 40GB, 80GB

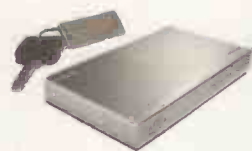


LaCie Photon LCD Monitors

- DVI and VGA connectors
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- Photon 20 - response time 16ms
- Photon 20 - dot pitch 0.25
- Photon 20 - 176 degrees viewing angle (IPS)
- 3-year advance replacement warranty

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Electron Blue CRT 19", Electron Blue CRT 22"
NEW 300 Series - LCD/TFT 321 - 21.3"



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- A new portable concept for computing with easy Linux

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- 2 years manufacturer's warranty as standard

Available Models:

'd2' Mini NAS & USB2.0 160GB, 200GB, 250GB
NAS XP - 400GB, 500GB, 800GB, 1000GB





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E&OE Feb 05

Group test» Media Center PCs

Table of features

				
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MODEL NAME	C-BOX T2-P DELUXE	EXCITE MEDIACENTER	EXTENTIA GOLD 2005	E-BOX S
Price inc VAT (ex VAT)	£821.33 (£699)	£899 (£765.11)	£1,499 (£1,275.74)	£999 (£850.21)
Sales telephone	0871 222 3456	01446 775 985	020 8452 2444	0870 160 9500
URL	www.carreras.co.uk	www.cfl-systems.com	www.elonex.co.uk	www.evesham.com
HARDWARE SPECS				
Processor	Intel Pentium 4HT, 3GHz	Intel Pentium 4E, 3GHz	Intel Pentium 4HT, 3GHz	Intel Pentium 4E, 3GHz
Memory quantity and type	512MB DDR400	1GB PC3200	512MB PC2700	512MB PC3200
Occupied/spare memory (Ram slots)	2/0	2/0	2/0	2/0
Max memory in this configuration	512MB	1GB	512MB	512MB
Hard disk manufacturer and model	Maxtor 6B160MO ATA/133	Maxtor 7Y250P0 7,200rpm, UltraATA/100	Western Digital WDC WD2000JB-00FUA0	Maxtor 6Y160MO 7,200rpm, Serial ATA/150
Hard disk size	160GB	250GB	200GB	160GB
Motherboard manufacturer/model	Asus P4P8T	MSI MS-6797	Elonex	MSI MS-7066
Chipset manufacturer/model	Intel Springdale-G i865G	Intel Springdale-G i865G	Intel Springdale-G i865G	Intel Grantsdale i915
EXPANSION AND I/O				
No of 3.5/5.25in bays	1/2	2/1	0/0	1/1
No of free 3.5/5.25in bays	0/1	1/0	0/0	0/0
No of PCI/shared ports	1/0	1/0	1/0	3/0
No of free PCI/shared ports	0/0	0/0	0/0	0/0
No of USB2/Firewire ports	6/0	4/2	5/1	6/1
No of serial/parallel/PS/2 ports	1/1/2	1/1/2	0/0/0	1/1/2
MULTIMEDIA				
Primary optical drive	NEC ND-3500AG	NEC ND-3500AG	HL-DT-ST GWA-4040N	Matshita UJ-825S
Drive speed	DVD-R/-RW: 16x/4x, DVD+R/-RW: 16x/4x, DVD-Rom: 16x, CD-R/RW: 48x/24x, CD-Rom: 48x	DVD-R/-RW: 16x/4x, DVD+R/-RW: 16x/4x, DVD-Rom: 16x, CD-R/RW: 48x/24x, CD-Rom: 48x	DVD+RW: 4x/2.4x, DVD-RW: 2x/2x, DVD-Rom: 8x, CD: 16x/10x/24x DVD+RW/DVD-RW	DVD-Ram: 2x, DVD-R/-RW: 4x/2x, DVD+R/-RW: 2.4x/2.4x, DVD-Rom: 8x, CD-R/RW: 16x/8x, CD-Rom: 24x
Secondary optical drive	N/A	N/A	N/A	N/A
Drive speed	N/A	N/A	N/A	N/A
Soundcard manufacturer and model	Intel 82801EB ICH5 AC97	Intel 82801EB ICH5 AC97	Intel 82801EB ICH5 AC97	Intel 82801FB ICH6
Speakers manufacturer and model	N/A	N/A	Built-in 2.1 speakers	N/A
Graphics card manufacturer and model	Nvidia Geforce FX 5900XT	Nvidia Geforce FX 5700 LE	Radeon 9600 Series - Secondary	ATI Radeon X300 Series
Chipset	Nvidia Geforce FX 5900XT	Nvidia Geforce FX 5700 LE	Radeon 9600 Series - Secondary	ATI Radeon X300 Series
Memory	128MB	128MB	128MB	128MB
Analogue/digital TV tuners	0/1	0/1	1/0	0/2
Monitor manufacturer and model	N/A	N/A	Samsung flat panel	N/A
Monitor max viewable diagonal	N/A	N/A	17in	N/A
Maximum resolution at Vesa refresh	N/A	N/A	1,280 x 768	N/A
OTHER INFORMATION				
Bundled peripherals and software	Microsoft Wireless Optical Desktop, FM antenna, card reader, S-video cable, Windows XP MCE 2005, Cyberlink PowerDVD	Logitech Cordless Desktop Optical, FM antenna, IR receiver extension (x2), MSI remote control, card reader, Windows XP MCE 2005	Elonex wireless keyboard and mouse, card reader, Microsoft Works 7, Windows XP MCE 2005	Microsoft Wireless Optical Desktop, Profigold 2m coax-coax cable (x2), two-way coax splitter, Slx2 aerial amp, Windows XP MCE 2005
Standard warranty*	3yrs on-site	1yr C&R	3yrs C&R	2yrs on-site, 1yr RTB
SCORES				
Features	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★
Overall score	★★★★★	★★★★★	★★★★★	★★★★★

* RTB = return to base, C&R = collect and return

Media Center PCs <<Group test

For the best Media Center PC prices go to www.pcw.co.uk/bestprices



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TINY

WATFORD

DMS 3000

POSEIDON

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MMC E10252

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£1,056.33 (£899)

£1,599 (£1,360.85)

£668.99 (£569.35)

£734.99 (£625.52)

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08707 525 810

08700 464 747

08708 303 156

0870 027 0900

www.higrade.com

www.jal.co.uk

www.meshcomputers.co.uk

www.tiny.com

www.savastore.com

Intel Pentium 4HT, 3GHz

Intel Pentium 4E, 2.8GHz

AMD Althon 64 3500+, 2.2GHz

AMD Althon 64 3000+ 2GHz

AMD Sempron 2800+ 2GHz

512MB PC3200

1GB PC3200

1GB PC3200

512MB PC2700

512MB PC2700

1/3

2/0

2/0

1/1

2/0

2.5GB

1GB

1GB

1.5GB

512MB

Hitachi HDS722512VLAT20
7,200rpm, UltraATA/100

Maxtor 6Y160M0 7,200rpm,
Serial ATA/150

Maxtor 6B300S0 7,200rpm,
Serial ATA/150

Seagate ST320082 2AS 7,200rpm,
Serial ATA/150

Hitachi IC35L120AVV207-0
7,200rpm, UltraATA/100

120GB

160GB

300GB

200GB

120GB

Asus P4P800

Aopen UX915G

Shuttle FN95

MSI MS-6741M

MSI MS-7051

Intel Springdale-G i865G

Intel Grantsdale i915

Nvidia nforce3 250, AMD Hammer

Via K8M400, AMD Hammer

Nvidia nforce2 IGP

1/1

1/1

2/1

4/3

1/1

0/0

0/0

0/0

1/1

0/0

3/0

1/0

1/0

3/0

1/0

0/0

0/0

0/0

0/0

0/0

3/1

4/3

4/2

6/1

8/2

0/0/0

1/1/2

1/0/2

1/1/2

1/1/2

Matshita DVD-Ram UJ-815A

NEC ND-3500AG

Sony DW-D22A

NEC ND-3500AG

Matshita UJ-825-B

DVD-RW:1x/1x, DVD-Ram:2x,
DVD-Rom:8x, CD:16x/8x/24x,
DVD-RW/DVD-Ram

DVD-R/-RW: 16x/4x,
DVD+R/-RW: 16x/4x, DVD-Rom: 16x,
CD-R/RW: 48x/24x, CD-Rom: 48x

DVD-R/RW: 8x/4x, DVD+R/RW: 16x/4x,
DVD-Rom: 16x, CD-R/RW: 48x/24x,
CD-Rom: 48x

DVD-R/-RW: 16x/4x,
DVD+R/-RW: 16x/4x, DVD-Rom: 16x,
CD-R/RW: 48x/24x, CD-Rom: 48x

DVD-Ram: 2x, DVD-R/-RW: 4x/2x,
DVD+R/-RW: 2.4x/2.4x, DVD-Rom: 8x,
CD-R/RW: 16x/8x, CD-Rom: 24x

N/A

N/A

N/A

OEM DVD-Rom 16X

N/A

N/A

N/A

N/A

16x DVD-Rom

N/A

Intel 82801EB ICH5 AC97

Intel 82801FB ICH6 - AC97

Nvidia MCP2-S

Via AC97

Nvidia MCP2-S

N/A

Altec Lansing VS315R

Creative I-Trigue 3200

N/A

N/A

Nvidia Geforce
FX 5200

Sparkle Geforce
6600 GT

ATI Radeon
9800 Pro

Nvidia Geforce
FX 5200

Nvidia Geforce4
MX Integrated GPU

Nvidia Geforce FX 5200

Nvidia Geforce 6600 GT

Radeon 9800 Pro

Nvidia Geforce FX 5200

Nvidia Geforce4 MX Integrated GPU

128MB

128MB

128MB

128MB

128MB

1/0

0/1

0/1

0/2

1/0

N/A

Viewsonic VG712s

Iiyama ProLite C480T

N/A

N/A

N/A

17in

19in

N/A

N/A

N/A

1,280 x 1,024

1,280 x 1,024

N/A

N/A

Sejin wireless keyboard with
trackball, S-video cable,
composite cable, Ability Office,
Windows XP MCE 2005

Gyratation keyboard and mouse,
FM antenna, Intervideo Wincinema,
Cyberlink PowerDVD, Nero Suite,
Counterstrike, Windows XP
MCE 2005

Logitech Cordless Desktop Optical,
USB modem, Microsoft Works 8,
Pinnacle Studio 9SE,
Windows XP MCE 2005

Tiny wireless keyboard and
mouse, S-video to RCA converter,
card reader, Microsoft Works 7,
Windows XP MCE 2005

Logitech Cordless Internet Pro
Desktop, IR extender, Ability Office,
Panda Titanium Antivirus 2004,
Windows XP MCE 2005

2yrs C&R

2yrs on-site

3yrs on-site

3yrs RTB

1yr RTB

★★★★★

★★★★★

★★★★★

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★★★★★

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★★★★★

★★★★★

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.

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Alternatives

Not being able to get Media Center as a standalone product without buying hardware is a pain, but there are alternatives.

Cyberlink PowerCinema TV Plus Sporting a very similar interface to Microsoft Media Center, PowerCinema TV Plus comes with a TV tuner card. Channel surfing is speeded up thanks to the 12-screen preview, while electronic programme guides are downloaded direct from the Internet.



PRICE \$99.95 (approx £51)

CONTACT www.gocyberlink.com

REVIEW www.pcw.co.uk/products/software/1154840 (non TV Plus version)

Intervideo Home Theater Gold Edition

A direct competitor to PowerCinema, Home Theater Gold Edition houses the same range of features. A TV tuner card doesn't come as standard, hence the lower



price, but it allows you to watch, pause and record live TV as well as view photos and listen to music.

PRICE \$49.95 (approx £26)

CONTACT www.intervideo.com

REVIEW www.pcw.co.uk/products/software/1152355

Pinnacle Mediacer 300i

The Mediacer 300i from Pinnacle includes a single TV tuner card that's able to receive both analogue and digital broadcasts.

Pinnacle's Mediamanager software lets you take control of your audio and video while a fully featured remote control is also thrown in.

PRICE £79.99 (£68.08 ex VAT)

CONTACT www.pinnaclesys.com

REVIEW For a review of this product, go to page 59.



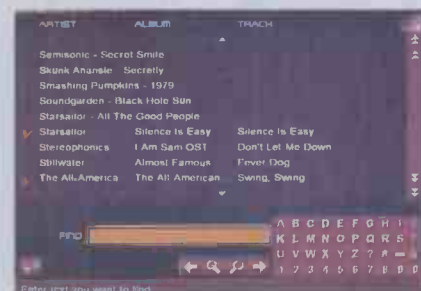
Showshifter

Showshifter is now on its third revision. It doesn't have the same ease of use as Media Center, but it's cheap, loaded with features and you can get a free demo from the website and we have a version on our cover disc.

PRICE \$59.99 (approx £31)

CONTACT www.showshifter.com

REVIEW www.pcw.co.uk/products/software/1153771



Editor's Choice

Choosing the right Media Center PC depends entirely on what you're planning to do with it. Will you be using it solely as a Media Center or will it also be used as your main PC? Do you want to hook your TV up to it or will you be using a PC monitor? Then, of course, you have to decide how much you are willing to spend. Before you decide to part with your cash, read our reviews of Media Center 2005 on page 109 and the other DIY options available (above), plus see our Hands on Hardware column on page 150.

The winners

There were a few systems that stood out and, if you're after an all-in-one Media Center, you can't go far wrong with the **Elonex Extentia Gold**. Featuring a 17in widescreen display with built-in stereo speakers, it's a real space saver. All-in-one systems such as this do have disadvantages. Upgrading is very tricky; you're limited to just memory upgrades, and if something goes wrong it's hard to fix the problem yourself. Despite this, we feel the Extentia



Evesham E-box S



Elonex Extentia Gold 2005



Mesh Media+ CubeX64 939 MCE



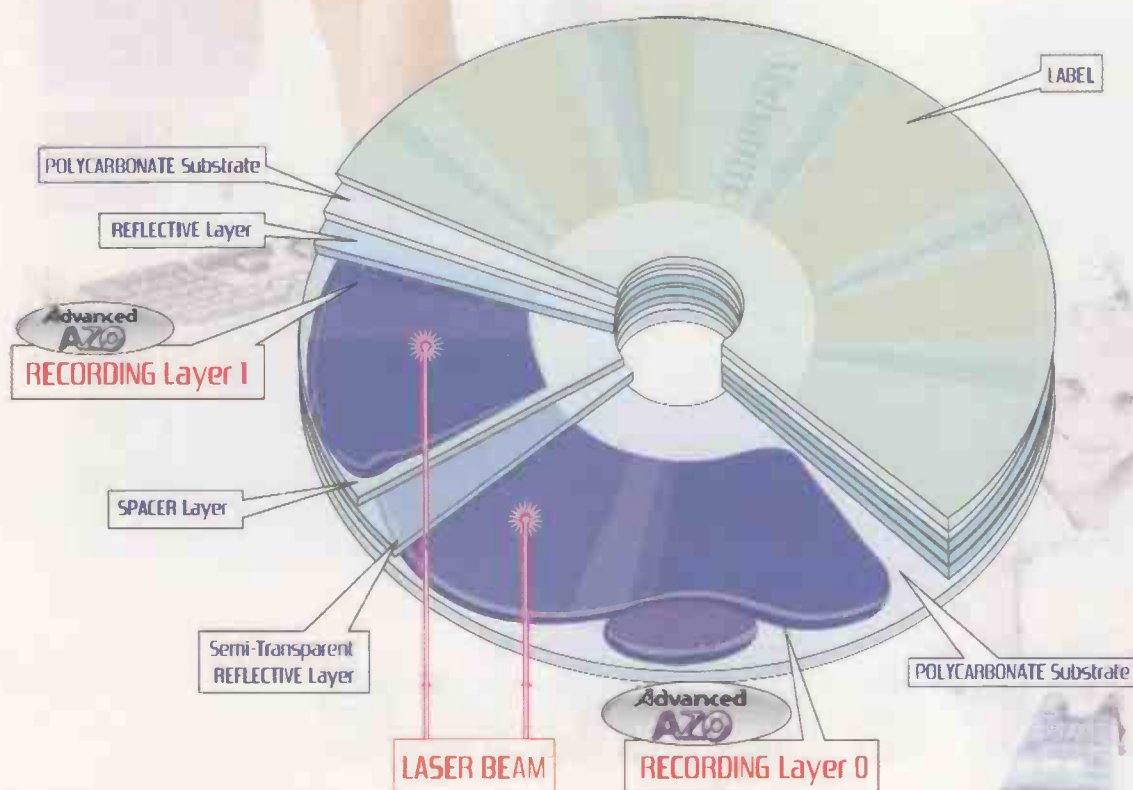
Gold is a well-designed Media Center PC and wins a **Highly Commended** award.

The **Media+ Cubex64** from Mesh picks up the second **Highly Commended** award. We were impressed to see a massive 300GB hard drive included, which is exactly what Media Center systems require. The high specification continues with a fast processor and a 19in Iiyama LCD TV. All things considered, Mesh has done extremely well for a price of £1,599. We do question exactly how useful an LCD TV will be when you're using Media Center, but it can be used to watch one channel while recording another.

After much deliberating, we decided the **Evesham E-box S** was worthy of the **Editor's Choice** award. The dual digital tuners, which can be swapped out for analogue models if you're not in a Freeview area, let you record two channels at once, and the whole unit manages to stay just under the £1,000 mark. We'd have liked to see a bigger hard drive than the 160GB model included, but we feel the Ebox is deserving of the Editor's Choice award.

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CONTENTS

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Deepnet Explorer 1.3
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- 119** Mozilla Firefox 1.0
Netscape Navigator 7.2
Opera 7.54
- 121** Table of features
Editor's Choice

Surfing selection

WORDS: RORY REID

All roads do not lead
to Internet Explorer
and many web browsers
are easier to use and
less susceptible to
attacks from hackers
and other threats

It can be easy to forget there are a number of web browsers you can use instead of Internet Explorer (IE), which is bundled with Windows. Many provide more features, greater ease of use and can make web surfing safer.

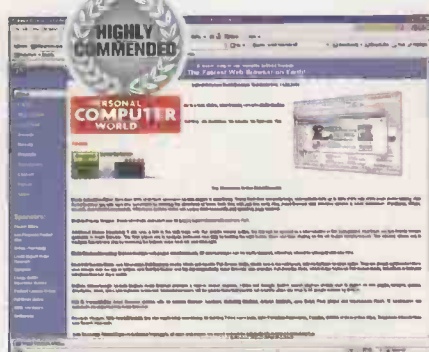
If you make heavy use of the Internet, you're right to be concerned about the threat from hackers, most of whom will target IE, as it is the most popular web browser. Many PCs have become infected with spyware, malicious programs that can surreptitiously send information from your computer to unscrupulous organisations, or even lead you to websites that have lewd content.

IE has long been superseded by the competition in terms of ease of use. Many third-party browsers include advanced

navigation options that make it easier to find your way round websites. Most have integrated search facilities, superior document handling, and even allow you to check your email without using an external application.

There are numerous considerations that have to be taken into account before switching to a new browser. Many website designers create their pages specifically for use with IE, with the result that other browsers can't display them correctly.

We've taken a look at some of the best web browsers and examined how they compare with IE and each other. In order to find the best for your needs, we examined their ease of use, website compatibility, security and how they affect your overall browsing experience.



Avant Browser 10

This uses the same underlying architecture as Internet Explorer (IE), but has a number of additions designed to improve functionality.

Like most non-IE browsers, it supports tabbed browsing, and can tile several browser windows in horizontal or vertical arrangements. Unlike Deepnet Explorer, though, new websites can be loaded into existing tabs, but there is no support for multiple instances of the browser.

One of our main gripes with Avant Browser 10 is its rather cluttered interface. It has 10 entries along its file menu, and dozens of tiny navigation icons that can make it difficult to find particular ones.

This makes the browser difficult for visually impaired users, although you can zoom in on HTML documents by up to 500 per cent. Address aliasing is included, whereby user-definable phrases can be entered into the address bar instead of a full URL. For example typing 'gg' will take you to www.google.com.

Advanced users can specify whether to allow ActiveX components, scripts, or Java Applets. This provides added security, although the browser is still vulnerable to the same security issues as IE.

This browser can be recommended above IE since it has a number of good features. Many readers will not use some of its more advanced options, but in spite of its busy interface Avant is a powerful and versatile browser.

DETAILS

RRP Free

PRODUCT INFORMATION

Avant www.avantbrowser.com

SYSTEM REQUIREMENTS

166MHz Pentium or higher • Windows 98 • 32MB of Ram • 12MB of free hard disk space

PROS URL aliasing

CONS Busy interface; attack vulnerability

VERDICT

A good alternative to IE, but some users may find it difficult to use the advanced features

FEATURES

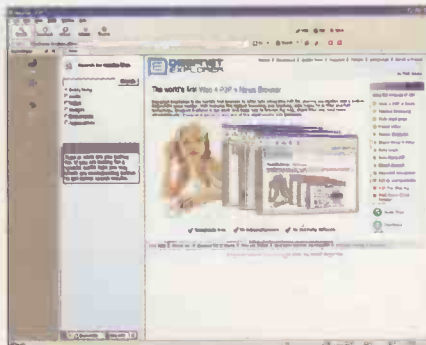
★★★★★

EASE OF USE

★★★★★

OVERALL

★★★★★



Deepnet Explorer 1.3

Deepnet Explorer incorporates web browsing, peer-to-peer file downloads and an RSS/Atom newsreader. Like Avant Browser 10, it is based on IE, so its interface should be familiar to most users. Its most obvious differences are the tabbed window structure and support for vertical and horizontal tiling of browser windows. However, the implementation isn't sophisticated. Typing in a web address, for example, will always generate a new tab, which eventually forces you to close old unwanted tabs rather than loading new content into them.

The most unusual feature of Deepnet Explorer is its peer-to-peer download capabilities. It uses the Gnutella network, so has a relatively large base of users and a good range of files to choose from without any annoying adware/spyware.

The RSS/Atom newsreader allows you to sign up to news feeds from websites and have them sent to the browser, so you don't have to trawl the web for new stories.

For all its additions, this browser is prone to the same problems as IE. Its identical architecture gives it broad compatibility with most websites, but it has numerous security vulnerabilities so you'll need to download updates from the Microsoft website to keep it and your PC safe.

The help features are also minimal, but if you can put up with its flaws, Deepnet Explorer is a strong alternative to the standard Microsoft offering.

DETAILS

RRP Free

PRODUCT INFORMATION

Deepnet www.deepnetexplorer.com

SYSTEM REQUIREMENTS

166MHz Pentium or higher • Windows 98 • 32MB of Ram • 12MB of free hard disk space

PROS Peer-to-peer downloads; RSS newsreader

CONS Limited tab functionality

VERDICT

If you make use of peer-to-peer downloads while browsing, this is the obvious choice

FEATURES

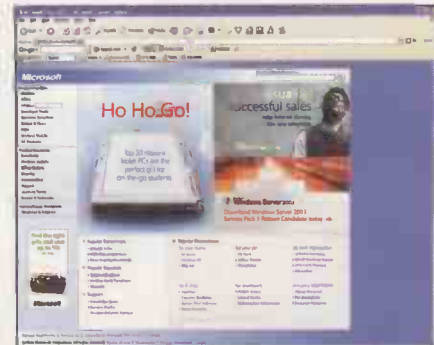
★★★★★

EASE OF USE

★★★★★

OVERALL

★★★★★



Microsoft Internet Explorer 6 (SP1)

Most of us have used IE without problems, thanks to its high compatibility with websites. Version 6 for Service Pack 1 includes all security updates delivered over the past year, plus some useful additions. We tested IE for SP1 because this will also work on Windows XP with SP2.

The new pop-up blocker works better than those supplied with the other browsers. Whereas others ably block most automatic pop-ups, IE differentiates between unwanted pop-ups and those activated deliberately. By default, pop-up sensitivity is set to Medium, but this can be increased if you visit sites with aggressive advertising.

Security is improved by limiting ActiveX controls. If a site tries to load potentially harmful content or download a file to your PC, an information bar appears below the address bar giving you the option to continue or get further information.

Despite these additions IE lacks features. It does not support tab browsing as standard, so you'll need to open multiple instances of the program. There's also no support for RSS feeds, and is the most likely browser in the group to be targeted by spyware and other malicious programs.

The user interface is very easy to use, and you'll be hard pressed to find a website that won't display, but with so many advanced alternatives available, it is hard to recommend IE except when websites you regularly visit will not load in other browsers.

DETAILS

RRP Free

PRODUCT INFORMATION

Microsoft www.microsoft.com

SYSTEM REQUIREMENTS

486/66MHz or higher processor • Windows XP • 32MB of Ram • 12MB of free hard disk space

PROS Good pop-up blocking

CONS Lacks features; vulnerable to attack

VERDICT

Compatible with the vast majority of websites but lacks features

FEATURES

★★★★★

EASE OF USE

★★★★★

OVERALL

★★★★★



Mozilla Firefox 1.0

At first glance, Mozilla Firefox 1.0 seems to be the most basic browser here. It has the obligatory File menu, but by default it only displays the most crucial navigation icons: back, forward, reload, stop and home.

Look closer though and you'll find some useful features, including a built-in search bar. Google is the default search engine, but others include Yahoo, Amazon, IMDB, and Dictionary.com. To improve flexibility, more search engines can be added to the list via Mozilla's website.

Firefox features tabbed browsing. Unlike in Deepnet Explorer, existing tabs can be diverted to new sites, although there is no facility to view two pages side by side, as you can in Opera 7.54.

Firefox 1.0 is far less vulnerable to malicious attacks than IE. This is largely because hackers and virus writers mainly target the most commonly used software, but also because Firefox lacks support for VBScript and ActiveX controls. As a result this browser may display some pages incorrectly. Worse still, music video sites such as Launch.com, and online mail clients such as Inotes or Outlook Web Access may not display some content at all.

The upshot is that your PC is far less likely to become infested with spyware. This, combined with Firefox's excellent list of features, means it is a far better choice for everyday surfing than many browsers in the group.

DETAILS

RRP Free

PRODUCT INFORMATION

Mozilla www.mozilla.org

SYSTEM REQUIREMENTS

Pentium 233MHz • Windows XP • 64MB of Ram • 52MB of free hard disk space

PROS Flexible searching

CONS Less vulnerable to spyware than IE

VERDICT

A sophisticated yet easy-to-use browser that should appeal to most users

FEATURES

EASE OF USE

OVERALL



Netscape Navigator 7.2

Navigator 7.2 is based on Mozilla software, but its rather dull interface is far removed from the elegant front end used by Firefox.

The longwinded installation process can also cause problems. The installer file is just 288KB, but the files it downloads subsequently can total over 27MB, which can take over an hour on a dial-up modem.

You can customise installation to exclude superfluous additions such as the desktop weather software, integrated mail client, and AOL Instant Messenger. This takes the size down to a more manageable 12MB.

Even without these inclusions, Navigator 7.2 is well featured. It has good pop-up blocking and allows tabbed browsing. It also renders web pages much quicker than its predecessors, and has a new Password Manager feature that allows you to view a list of passwords you've saved while browsing.

You can set a Master Password to prevent access to this list, but during tests we were still able to access all login details without providing any authentication. This could be dangerous if more than one person has access to your PC, since users can not only log in with your details, but also see the passwords you use to gain access.

On the whole, Navigator 7.2 is a welcome update to the series. It lacks some of the bells and whistles of the more advanced browsers on the market but, thanks to its Mozilla backbone, it stands out as good alternative to IE.

DETAILS

RRP Free

PRODUCT INFORMATION

Netscape www.netscape.com

SYSTEM REQUIREMENTS

233MHz Pentium or higher • Windows 98 • 64MB of Ram • 64MB of free hard disk space

PROS Pop-up blocking; speed

CONS Questionable multi-user security

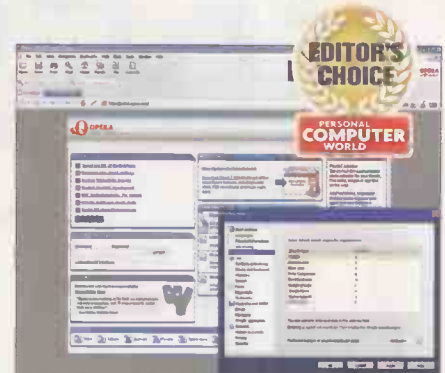
VERDICT

Has a good number of features, but is not as impressive as some browsers here

FEATURES

EASE OF USE

OVERALL



Opera 7.54

Opera 7.54 has some features that no other browser here offers. One of the most unusual is the rewind and fast-forward buttons. The former takes you back to the home page of any website you've wandered into too deeply, while the latter tries to guess the next page you're likely to visit on that particular site.

This works surprisingly well and accurately mimics the 'next' button on web-based image slideshows. Opera also includes mouse gestures, so you can wave your input device in various patterns that correspond to navigation or browser actions. Holding the right mouse button and moving the mouse to the left, for instance, will take you to the previous page.

This is one of just two browsers here to allow multiple documents in a single window, and include horizontal and vertical tiling. It also has a context-sensitive menu so when you double-click on any text on a web page it is passed through a language translator, dictionary or search engine.

A spoofing mode allows Opera to identify itself as an IE or Mozilla browser, but this isn't always reliable.

The full version of Opera requires a £24 registration fee, but most users will opt for the free edition, which is supported by (easy to ignore) adverts.

Some users may find a few of Opera's features a little superfluous, but for advanced surfing, few of its rivals can match our Editor's Choice award winner.

DETAILS

RRP Free (ad supported); £24 for ad-free version

PRODUCT INFORMATION

Opera www.opera.com

SYSTEM REQUIREMENTS

486MHz or higher processor • Windows 98 • 64MB of Ram • 25MB of free hard disk space

PROS Mouse gestures; advanced navigation

CONS Adverts in free edition

VERDICT

Opera is easy to use and has a larger number of standard features than its rivals

FEATURES

EASE OF USE

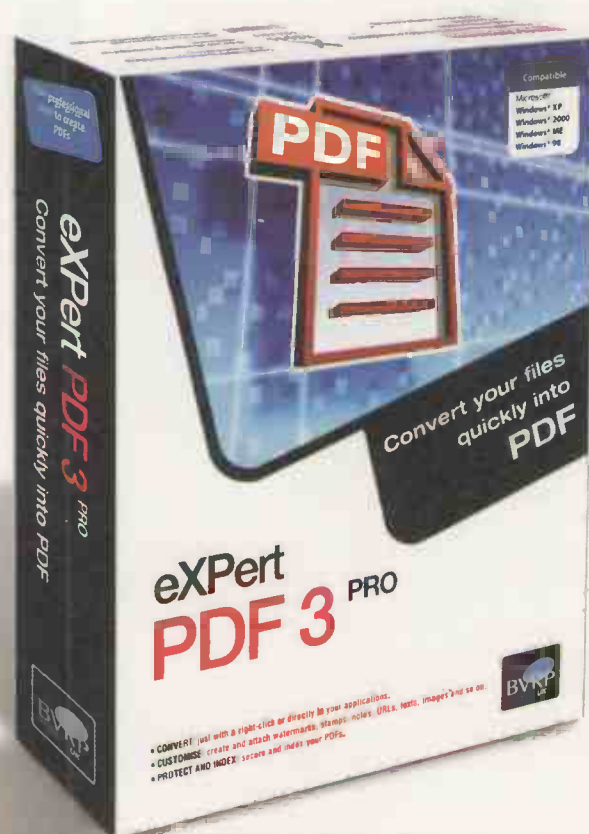
OVERALL



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- **Convert to PDF** from any application
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Table of features

MANUFACTURER	AVANT	DEEPNET	MICROSOFT	MOZILLA	NETSCAPE	OPERA
BROWSER NAME	AVANT BROWSER 10	DEEPNET EXPLORER 1.3	INTERNET EXPLORER 6 (SP1)	FIREFOX 1.0	NAVIGATOR 7.2	OPERA 7.54
Price inc VAT (ex VAT)	Free	Free	Free	Free	Free (£16.07 inc VAT full version)	Free (£24 inc VAT full version)
URL	www.avantbrowser.com	www.deepnetexplorer.com	www.microsoft.com/windows/ie/	www.mozilla.org	www.stilessoft.com	www.opera.com
PLATFORMS/STANDARDS SUPPORTED						
Windows 95/98/ME/NT/2000/XP	x/v/v/v/v/v	x/v/v/v/v/v	v/v/v/v/v/v	x/v/v/v/v/v	v/v/v/v/v/v	v/v/v/v/v/v
Linux/Mac OS X	x/x	x/x	x/x	v/v	x/x	v/v
Java/PNG/Flash	v/v/v	v/v/v	v/v/v	v/v/v	v/v/v	v/v/v
CSS 2.1/XHTML/DOM Lvl2	v/v/v	v/v/v	v/v/v	v/v/v	v/v/v	v/v/v
FEATURES						
Mail client	x	x	x	x	x	v
Multiple documents/Tabs/Single docs	v/v/v	v/v/v	x/x/v	x/v/v	x/x/v	v/v/v
Settings import	v	v	x	v	v	v
Mouse gestures	x	v	x	x	v	v
Browser spoofing/Sessions support	v/x	x/x	x/x	x/v	x/x	v/v
Download manager	x	x	x	v	x	v
Pop-up blocking	v	v	v	v	v	v
SECURITY						
SSL2/SSL3	v/v	v/v	v/v	v/v	v/v	v/v
TLS/Certificates/Proxy servers	v/v/v	v/v/v	v/v/v	v/v/v	v/v/v	v/v/v
SCORES						
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Ease of use	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

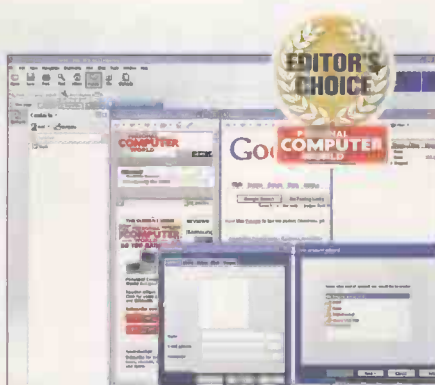
Editor's Choice

Before the release of Service Packs 1 and 2, Internet Explorer was a poorly equipped and vulnerable web browser. Even with these additions, it still lags a long way behind its rivals, as illustrated in this group test.

Deciding which browser is right for you depends largely on which sites you visit. Many web developers lazily create websites that are only compatible with Internet Explorer. As a result, you may be better off using a browser based on IE, such as Deepnet Explorer or our first **Highly Commended** award winner, **Avant Browser 10**.

The latter offers broad compatibility, but also provides some useful extras that aid navigation, such as tabbed browsing. Visiting websites with long URLs is made easier thanks to the very useful addition of address aliasing, which allows you to substitute unwieldy URLs for short memorable keywords.

Unfortunately, like Deepnet Explorer, Avant Browser inherits the same security shortcomings as IE, and will need regular security updates. As a result, security-



Opera 7.54

conscious users may prefer to opt for our second **Highly Commended** award winner, **Mozilla Firefox 1.0**.

Firefox 1.0 has a number of great features including pop-up and pop-under blocking, tabbed browsing, and a download manager that organises downloads in a single window instead of launching separate windows for each file transfer.

Unfortunately Firefox 1.0 does not support ActiveX controls or VBScript. This may limit

its use in a corporate environment since you may not be able to load web interfaces for an email client such as Inotes or Outlook Web Access.

Our **Editor's Choice** is **Opera 7.54**. This is the most fully featured browser of the group. It incorporates some useful functionality such as multiple document support, which allows you to arrange several browser pages in a single window.

It is also the only browser in the group that supports mouse gestures without the need for a software plug-in. This, in conjunction with the fast-forward and rewind buttons, makes controlling the browser and navigating web pages far easier.

Opera 7.54 inherits the same weaknesses as any browser that isn't based on Internet Explorer, but it has a handy browser mode that can sometimes fool websites into thinking it is an IE or Mozilla browser.

There are times when only Microsoft's offering will do, so you shouldn't turn your back on IE completely, but for everyday browsing we're sure you'll find one of the alternatives provide significant benefits. ■



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Editor's Choice

We're havin' a heatwave

WORDS: NICOLE OTT TESTING: VNU LABS

The latest processors push out more than 100w of heat, putting a major strain on CPU coolers. Only a few models can keep up, and you can find out which over the next few pages

Intel has not made the cooler manufacturers' job any easier with its latest processors. Up to 110w of heat is created by the current 3.6GHz Pentium 4 chips – more than that produced by a 100w lightbulb.

Making an effective cooling system which ensures low operating temperatures, without producing as much noise as a vacuum cleaner, is not easy.

Our tests bear this out: the CPU coolers can only just fulfil the cooling needs of the Intel processors. On average, the published CPU operating temperatures are 10°C higher than they were a year or so ago. At temperatures just below 80°C, there's no margin for hot summer days or overclocking.

Cooler means louder

Powerful and effective cooling is possible, as shown by the results from the Coolermaster Hyper 6 for AMD processors and Thermaltake Jungle 512 for Intel chips (see page 126). Both, however, produce a noise level of well over 50dBA (A-weighted decibels), which makes them very loud. At this sort of level, the coolers can be heard clearly, even with a closed casing, over normal background noise. Silence enthusiasts won't be very impressed by any of the Intel coolers we tested. At 42dBA the Gigabyte PCU22-VC may generate the least noise, but it still isn't exactly quiet. For sensitive ears, an AMD-based system might be a better bet: the winning cooler for AMD processors, the

BTX coolers

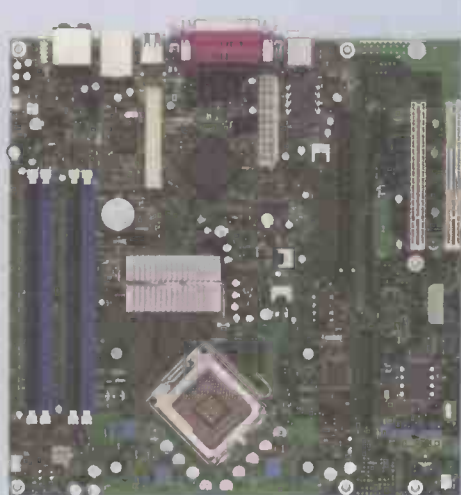
Intel's new BTX form factor is just about ready to hit the market, and it brings with it a whole new approach to cooling.

The problem with the ATX format is that it was designed over 10 years ago, when there wasn't really a vast amount of heat generated from components apart from the CPU. These days, powerful graphics cards and even north- and southbridge chips can get extremely hot and require their own heatsinks and/or fans.

BTX attempts to improve the airflow inside a PC by adopting a straight-through airflow approach: cool air comes in from the front of a PC and hot air is exhausted out the back. As you can see from the photo of Intel's D915GHM motherboard (above), all the major board components are arranged in more or less a straight line.

The key to the cooling is the new Thermal Interface Module (TIM), which is a shrouded heatsink and 90mm fan assembly that doubles up as both the system fan and CPU cooler. It doesn't just send air over the top of the motherboard, but underneath it as well, giving even more cooling.

It's a massive assembly – the specs allow for up to 900g for the larger Type I design (pictured above right), which is double the present 450g physical limit for ATX motherboards. Type II TIMs are low profile with a 70mm fan for use in smaller form factor systems.



The TIM is solidly mounted through the motherboard, but we still have reservations about moving a PC around with this sort of weight strapped to your precious motherboard and processor.

What it also means for upgraders is that there will be no more flashy copper or aluminium heatsinks on display – the plastic shroud around the heatsink is integral to the cooling performance. The single fan uses an advanced downstream stator to twist around the airstream before it enters the heatsink, but you'll be able to plaster lots of LEDs and UV-sensitive tape around the shroud, so maybe not all is lost. And we bet it won't be long before clear or illuminated shrouds appear.

Kelvyn Taylor

Verax Polargate 64FX Cu is hardly audible at 34dBA. Here even the latest AMD processors, with a maximum power consumption of 70w, are not as demanding on the cooling system. Intel processors with speeds of below 3.7GHz are easier to look after, as they are rated at 84w, and didn't cause problems for any of the tested coolers.

Cool trickery

Intel is trying various tricks to get the cooling problem under control. To make life easier for the cooler manufacturers, Intel has changed the specification for

temperature inside the PC casing to allow a maximum of 38° instead of the previous 40°. The temperature inside the casing is an important factor in the efficient operation of CPU coolers: an air temperature one degree lower near the cooler can result in a CPU temperature that is two or three degrees lower. This is really the only reason a large number of cooler models can even be considered for use with the latest Intel CPUs.

Towards radial construction

The Intel coolers are clearly recognisable by their new method of attachment, as Socket 755 processors need a new fitting for the cooler. Taking the Gigabyte PCU22-VG as an example, the use of brackets and frames is over as far as Intel is concerned: almost all models are inserted directly into pre-made holes on the motherboard using four springloaded plugs. A metal plate on the reverse of the motherboard ensures the necessary stiffness to prevent the board from bending. AMD, on the other hand, sticks to the old methods, even with the new Socket 939 processors: fixing with retaining frames and clamps on the cooler has been standard since Socket 754 models.

Noticeable on more than half the coolers here is the symmetrical radial construction (see picture left). This shape serves to direct the air flow from the CPU cooler onto the surrounding motherboard electronic

components, giving a bonus cooling effect on them as well.

The power supply and voltage regulation circuitry on the motherboard, which provides up to 90amps of current to the processor, become very hot when the latest processors are in use – 100°C is not uncommon in poorly designed PC cases. As a result, according to the CPU manufacturers' current design guides, the CPU cooler should also contribute to motherboard component cooling. If there's no cooling you run the risk of the motherboard failing prematurely because of overheating. If the installed CPU cooler doesn't provide enough air flow, then you should, at the least, install an extra fan near the CPU socket.

Not in the test

Global Win was excluded from this test because its products did not meet our requirements. Only coolers specifically for AMD Socket 939 were included – even if older models, which use the same mountings, would fit. Only one product from each manufacturer is included in each category.

Further information

You'll find audio samples for all the models in this group test on this month's cover disc.



The radial construction (shown here by the Intel fan) provides extra cooling for the motherboard components (see arrows)

Group test>> CPU coolers

Table of features – AMD coolers

				
MANUFACTURER	A CONTO NOISE MAGIC	AMD	ARCTIC COOLING	
PRODUCT	SILENT-BOOST K8 NMT	RETAIL BOXED	FREEZER 64	
Manufacturer's URL	www.thermaltake.com	www.amd.com	www.arctic-cooling.com	
Sales URL	www.noisecontrol.de	N/A	www.pcsilent.de/en/	
Price inc VAT (ex VAT)	€55 (€47.41)	Supplied with retail CPUs	€25.90 (€22.04)	
TECHNICAL SPECIFICATIONS				
Dimensions (w x d x h)	80 x 25 x 80mm	70 x 60 x 76mm	120 x 133 x 92mm	
Weight	590g	351g	476g	
Fan type and diameter	Papst, 80mm	AMD, 70mm	Arctic Cooling, 74mm	
Fan speed (12v)	2,050rpm	3,900 to 4,860rpm	2,200rpm	
Heatsink material	Copper	Aluminium	Aluminium	
CPU contact plate material	Copper	Aluminium	Copper	
Attachment method	3 clips	1 clip	3 clips	
Cooling of motherboard components	x	x	x	
Fan speed control (manual/automatic)	x/v	x/v	x/x	
Heat-resistant foil/Thermal paste supplied	x/v	v/x	x/v	
Warranty	2 years	3 years	6 years	
SCORES				
Performance	★★★★★	★★★★★	★★★★★	
Features	★★★★★	★★★★★	★★★★★	
Value for money	★★★★★	★★★★★	★★★★★	
Overall	★★★★★	★★★★★	★★★★★	

Table of features – Intel coolers

				
MANUFACTURER	A CONTO NOISE MAGIC	ARCTIC COOLING	COOLERMASTER	
PRODUCT	NM 8412N/2G 775 COOLER	FREEZER 7	C15-9HDP-A-0L	
Manufacturer's URL	www.noisemagic.de	www.arctic-cooling.com	www.cooler-master-europe.com/	
Sales URL	www.noisecontrol.de	www.pcsilent.de/en/	www.beigeboxes.co.uk	
Price inc VAT (ex VAT)	€55 (€47.41)	€29.95 (€23.65)	£11.74 (€9.99)	
TECHNICAL SPECIFICATIONS				
Dimensions (w x d x h)	90 x 105 x 90mm	120 x 133 x 92mm	110 x 80 x 110mm	
Weight	500g	525g	480g	
Fan type and diameter	Papst, 80mm	Arctic Cooling, 74mm	CoolerMaster, 92mm	
Fan speed (12v)	2,100 to 3,200rpm	250 to 2,700rpm	2,200 to 3,000rpm	
Heatsink material	Aluminium	Aluminium	Aluminium	
CPU contact plate material	Copper	Copper	Copper	
Attachment method	Snap-in	Snap-in	Snap-in	
Cooling of motherboard components	✓	x	✓	
Fan speed control (manual/automatic)	x/v	x/v	x/v	
Warranty	2 years	6 years	2 years	
SCORES				
Performance	★★★★★	★★★★★	★★★★★	
Features	★★★★★	★★★★★	★★★★★	
Value for money	★★★★★	★★★★★	★★★★★	
Overall	★★★★★	★★★★★	★★★★★	

For the best CPU cooler prices go to www.pcw.co.uk/bestprices

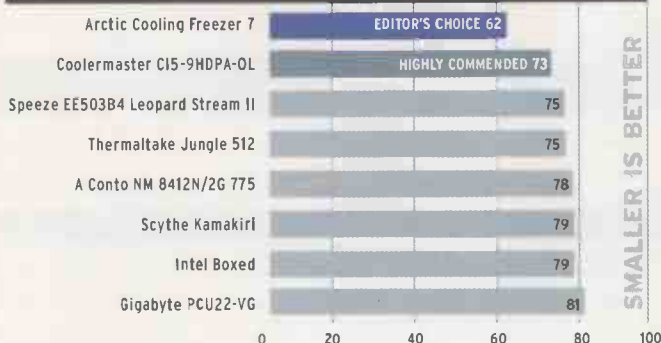
				
COOLERMASTER	SCYTHE	SILENTMAXX	VERAX	ZALMAN
HYPER 6	FCS-50	COOLFLOW ATHLON 64 REV 1.0	POLARGATE 64FX CU	CNPS7000B-CU
www.cooler-master.co.uk	www.scythe.co.jp/en	www.silentmaxx.de	www.verax.de	www.zalman.co.kr
www.pcwcomponentcentre.co.uk	www.quietpc.com	www.quietpc.com	www.pcsilent.de/en/	www.quietpc.com
£35.82 (£30.48)	£45.83 (£39)	€64.95 (€54.58)	€119 (€101)	£37.60 (£32)
94 x 115 x 105mm	130 x 110 x 100mm	80 x 72 x 80mm	92 x 107 x 100mm	110 x 62 x 110mm
1,050g	726g	702g	990g	750g
CoolerMaster, 80mm	Scythe, 80mm	Papst, 80mm	2 x Verax, 80mm	Zalman, 80mm
1,860 to 3,060rpm	Max 4,600rpm	Max 3,100rpm	3,280rpm	1,350 to 2,400rpm
Copper	Aluminium	Copper	Aluminium/copper	Copper
Copper	Copper	Copper	Copper	Copper
4 screws/2 clips	2 screws	2 screws	2 screws/3 clips	2 screws
x	x	✓	x	✓
✓ (stepless)/✓	✓ (stepless)/✓	✓ (stepless)/✓	✓ (6 steps)/✓	✓ (stepless)/✓
x/✓	x/✓	x/✓	x/✓	x/✓
2 years	2 years	2 years	2 years	2 years
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

				
GIGABYTE	INTEL	SCYTHE	SPEEZE	THERMALTAKE
PCU22-VG	RETAIL BOXED	KAMAKIRI	EE503B4 LEOPARD STREAM II	JUNGLE 512
http://uk.giga-byte.com	www.intel.com	www.scythe.co.jp/en	www.speeze.co.uk	www.thermaltake.com
www.overclock.co.uk	N/A	www.quietpc.com	www.pcwcomponentcentre.co.uk	www.thecoolingshop.com
£28.20 (£24)	Bundled with retail CPUs	£41.13 (£35)	Call Speeze 0239 258 1111	£21.14 (£17.99)
112 x 120 x 112mm	92 x 80 x 92mm	80 x 110 x 100mm	115 x 115 x 70mm	92 x 92 x 92mm
500g	455g	645g	510g	635g
Gigabyte, 80mm	AVC, 80mm	Scythe, 80mm	Speeze, 92mm	Thermaltake, 92mm
2,500 to 4,000rpm	Max 3,600rpm	Max 4,600rpm	2,500 to 3,500rpm	3,960rpm
Copper	Aluminium/copper	Aluminium	Aluminium/copper	Aluminium
Copper	Copper	Copper	Copper	Copper
Frame and 2 clips	Snap-in	2 screws	4 screws	Snap-in
x	✓	x	✓	✓
✓ (stepless)/✓	x/✓	✓ (stepless)/✓	x/x	x/x
2 years	3 years	2 years	5 years	2 years
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

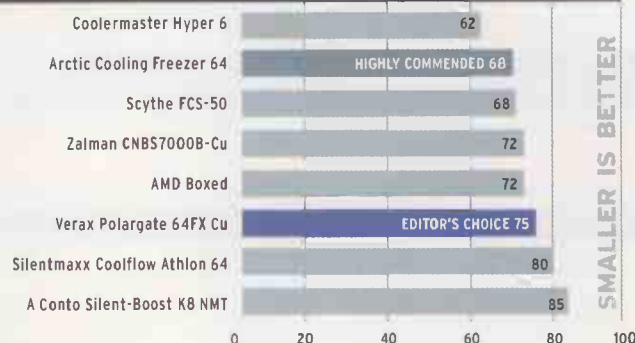
Lab results



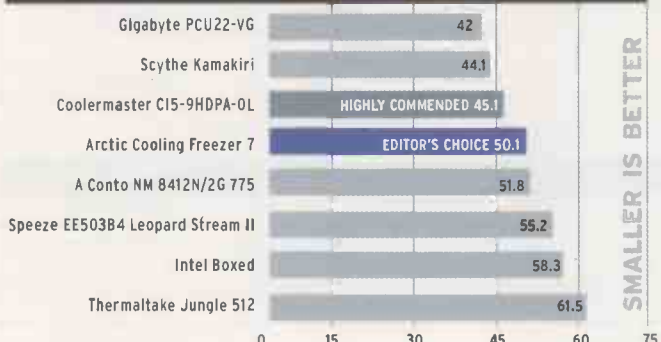
Intel Pentium 4 560 coolers: Temperature °C



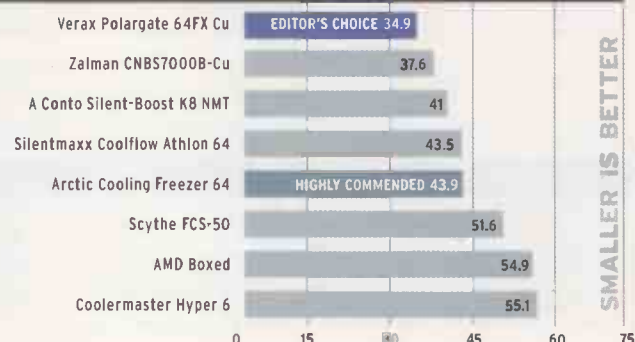
AMD Athlon 64 3800+ coolers: Temp °C



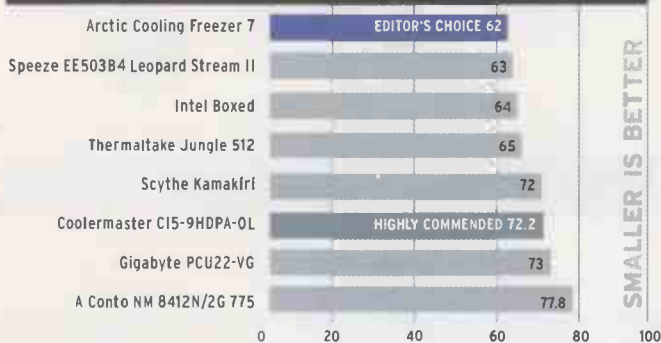
Intel Pentium 4 560 coolers: Noise dBA



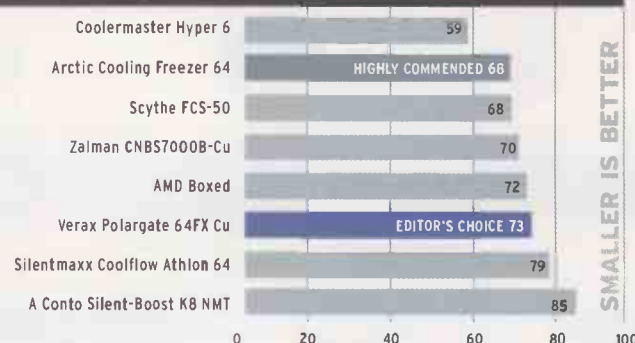
AMD Athlon 64 3800+ coolers: Noise dBA



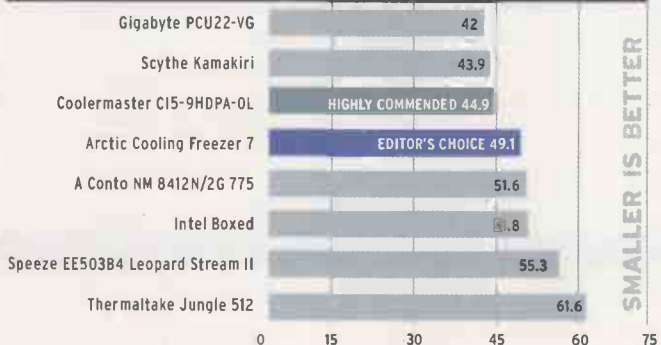
Intel Pentium 4 520 coolers: Temperature °C



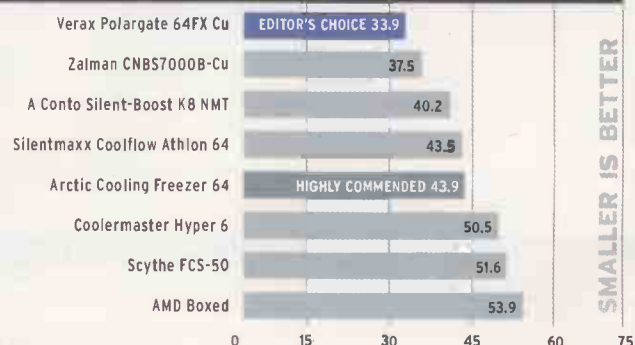
AMD Athlon 64 3500+ coolers: Temp °C



Intel Pentium 4 520 coolers: Noise dBA



AMD Athlon 64 3500+ coolers: Noise dBA



Note: We have used a linear scale in these graphs purely for representation purposes, however dBA uses a logarithmic scale

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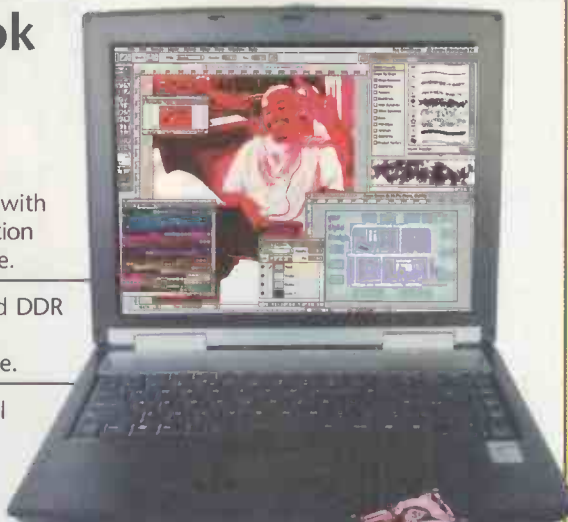
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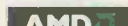
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Editor's Choice

In making our choices, we've tried to balance all the factors including price, features, noise and cooling power. But in the end, if a cooler can't keep your CPU cool then it's no use whatsoever.

Choosing the right cooler will depend on your needs – whether you want something that's purely functional or you'd like a bit of style to put on display. And don't forget noise – the CPU fan is usually the hardest-working fan in your PC, and can contribute a lot to the overall noise level. Listen to the recordings on our cover CD to see what the models on test sound like before you make your final decision.

We've decided to award separate Editor's Choice awards in the AMD and Intel cooler categories, as most coolers don't come with universal mounts and there are different thermal design requirements for the two families of processor.

If you're an AMD aficionado, we can't recommend any better solution than the **Verax Polargate 64FX Cu**, which gets our first **Editor's Choice** award. It's a very unusual twin-fan design that is the best compromise between high cooling efficiency and low noise, plus it's got a bit of style. It's also very expensive, but we reckon it's worth it if you're serious about getting the best cooling performance for your PC.

For those on a tighter budget, the **Arctic Cooling Freezer 64**, gets our **Highly**

'The Verax is the best compromise between cooling and low noise'

Commended award. Costing only €25.90 (about £17), it's an unusual looking cooler with its 'hanging' fan design, but does a great job for the money.

For Pentium 4 CPUs, the **Arctic Cooling Freezer 7** keeps even the fastest models well within a safe range of temperatures, while not generating a vast amount of noise, and so gets our **Editor's Choice** award.

Although our Intel Editor's Choice isn't particularly expensive, we feel that our **Highly Commended** award should go to the **Coolermaster C15-9HDPA-OL**. It's a product that you can't ignore – for only £11.74 inc VAT you get perfectly acceptable cooling at noise levels that you'd expect from much more expensive models.

AMD COOLERS



Verax Polargate 64FX Cu

INTEL COOLERS



Arctic Cooling Freezer 7



Arctic Cooling Freezer 64



Coolermaster C15-9HDPA-OL

How we tested

We measured cooling performance in a real-world setup, using an Abit AA8 motherboard and Athlon 64 3800+ and 3500+ processors for the AMD coolers. For the Intel products we used a Pentium 4 560 and 520 in an Abit AV8 motherboard. Ambient air temperature was a constant 31°C. The CPU temperature was measured using a digital thermometer and probe. During the test we ran processor-intensive applications (Cinebench 3D xCPU test and the Mainconcept mpeg2 encoder running simultaneously) and measured temperatures after five, 10 and 15 minutes.

Audio measurements were taken with the cooler mounted inside a Studiobox acoustic measurement booth (www.studiobox.de) at a stable ambient temperature of 40°C. The recordings we made (in wav format) can be found on our cover disc – all recordings were done using the same fixed recording gain, and the wav files have not been normalised. A-weighted decibel (dBA) noise levels were measured inside the box using a sound meter. A-weighting refers to the weighting of different frequencies in the sound spectrum in order to simulate the average frequency response of the human ear.

Note that decibels are logarithmic values – an increase of 3dBA corresponds approximately to a doubling of the perceived noise level. For comparison, the noise level in an open-plan office with normal conversation is around 60dBA. A very quiet office should be about 50-55dBA, and a whisper at 1.5m is about 20dBA.

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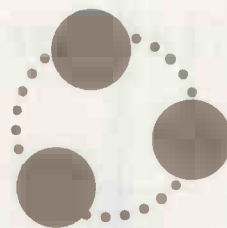
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Speed hike for broadband at home

Regulator Ofcom is relaxing restrictions on the use of wireless radio frequencies and allowing service providers to offer high-bandwidth, cost-effective fixed wireless broadband voice and data services to UK firms. It also plans to expand the range of licence-exempt wavebands, delivering enough bandwidth to support a 10Mbps/sec broadband connection to every UK resident. Restrictions governing the 3.4GHz spectrum were relaxed in December 2004, and the 5.8GHz waveband could be expanded to accommodate Wimax.

Sonic improves AV

Sonicwall's SonicOS v3 is a major upgrade and adds a realtime gateway anti-virus service to the intrusion prevention system. Sonicwall claimed it can scan many files of any size as well as email and all network transfers. The new system does not require new hardware and appliances can be upgraded easily.

Use mobile potential

Firms must work closer with mobile operators and developers to integrate mobile systems into their infrastructure, according research analysts IDC. Speaking at the company's Mobility Conference, IDC research manager Lars Vestergaard said firms should start with email, as messaging is an easy application to implement for mobile staff, while other applications take more time to develop.

Eight entry-level servers are on test this month, and we delve into the search for a combined power and data infrastructure

Tools speed applications to mobiles

Blackberry maker Research in Motion (Rim) and Good Technology are adding support for over-the-air provisioning of wireless clients, making it easier for organisations to use mobile email and other handheld applications.

Rim has released Blackberry Enterprise Server 4, which can link to a firm's Microsoft Exchange or Lotus Domino server to give mobile access to email, calendar and contacts information.

Version 4 of Good Technology's Goodlink is also now available, although it only supports Microsoft Exchange at the server end. But it can be accessed from a range of client devices including Symbian smartphones, Pocket PC devices and Palmone's Treo 600 and 650.

The major new feature of both releases is the ability to provision the client device remotely via a wireless connection.

So while neither product needs cradle synchronisation, now client devices can be set up from a website. Staff log in with their user name and they can then access their corporate email straight away.

The technology also lets IT managers piggyback other applications onto the download, so that users get, for example, Symantec Antivirus for Handhelds installed at the same time. Both applications can be tailored to deliver

different packages to users depending on their profile.

Both firms have also added other improvements to their products, such as interface enhancements and support for AES communication encryption. Good Technology said its software client is more responsive, and now uses less power on the wireless device than earlier versions. Rim said it had improved handling of attached documents in email messages. Goodlink 4 is available now and existing customers can download an upgrade for no extra charge. The availability of Blackberry Enterprise Server 4 and cost of an upgrade to customers is dictated by carriers, Rim said.

Daniel Robinson



BT promises firms mobile savings

BT is working with Vodafone to offer a mobile virtual network operation (MVNO) service to companies. Called Business Circle, the move follows the end of BT's contract with spin-off O2 in late 2004, under which mobile connectivity was provided for BT's corporate customers.

BT has started to migrate businesses to the new services, which are not significantly different to those previously available. Customer management operations, including marketing, branding, billing and customer service, will be solely BT's responsibility. Network airtime

and services will be provided by Vodafone UK.

BT said the new services will help to reduce companies' mobile phone bills and prepare the ground for an integrated service to meet firms' needs for fixed and mobile communications.

Business Circle aims to reduce a company's communications costs, by letting an employee's mobile device become an extension of the switchboard and mobile calls across this VPN will cost less.

BT is also offering a Conference on Demand facility, allowing conference calls to be managed via a mobile handset, and will shortly announce an

offer for its BT Mobile business customers to access BT Openzone Wireless Broadband for a reduced monthly fee.

In conjunction with Business Circle, BT is launching its Bluephone service, based on a dual-mode GSM/Wifi handset able to roam both cellular networks and private wireless Lans.

'BT Mobile will ultimately offer a fully converged fixed-mobile service, bringing together advanced technologies and networks, whether that's broadband, wireless broadband or 3G,' commented Steven Evans, chief executive of BT Mobile.

Dave Bailey



alan_stevens@vnu.co.uk

Getting more power to your Ethernet

Work on a Power over Ethernet Plus standard will pave the way for a single combined power and data infrastructure

'It's important to deliver the right amount of power to devices plugged into the same Lan'

Power over Ethernet (PoE) is one of those technologies you don't really appreciate until you start to use it. Then it becomes indispensable, especially if you work for a large firm and need to deploy hundreds, if not thousands, of electronic devices.

To start with it does away with all those unsightly AC adapters on the wall, while at the same time allowing far simpler deployment of all kinds of network hardware.

No longer do you have to hunt down an outlet for every bit of kit or run in additional cables to power each new webcam, IP phone or wireless access point. Instead, power is simply pumped out over the same wires used to carry data and, as soon as it's attached, the hardware is ready to use. Of course, there are limits, with an absolute ceiling of just 13w per port, set by the 802.3af PoE standard. In practice, that's rarely achieved, so all kinds of device you'd like to be able to power via your Lan can't be powered this way. At least not at present, although there are moves afoot to increase the current limit. A new IEEE study group was established last month to extend the 802.3af spec.

The leading light behind the move is PoE pioneer Powersine which, as a major vendor of the supporting technology, clearly has a vested interest in extending the standard. However, the new study group was voted in by some 22 IEEE members, indicating a lot of interest among networking firms in general.

The purpose of the new group is to come up with a new standard, backwards compatible with existing 802.3af technology, to let devices draw a lot more than 13w.

Dubbed PoE Plus, the new system should enable things such as PDAs, notebooks, and even desktop PCs to draw current from the Lan. How much power exactly is a major talking point, but some group members suggest 40w or more. However, that won't be easy as twisted-pair cabling was never intended to carry large power loads and there are issues of interference and safety to resolve. One of the biggest concerns has to be heat build-up. And it's important to be able to deliver the right amount of power to different devices plugged into the same Lan. Important, for example, to make sure power-hungry devices get what they need while making sure that those able to exist on a lighter diet aren't inadvertently fried.

Still, given the rapid growth of wireless and Voice over IP technologies together with a insatiable appetite for mobile devices in general, it can't be long before such problems are resolved and a standard for PoE Plus is agreed.

At the same time, however, it's worth noting a parallel resurgence of interest in the use of power lines to carry data, and in particular to deliver consumer broadband connectivity. So much so, that I'm starting to wonder if we're not at the dawn of a new era of convergence, the result of which might be calls for a single combined power and data infrastructure any day now.

Pointsec suite guards Linux clients

Security specialist Pointsec Mobile Technologies has extended its suite of client-side security tools to cover Linux-based laptops and desktops, offering a complete hard disk encryption system for the open-source platform.

Pointsec for Linux, available from early 2005, will let firms deploy Linux laptops to mobile staff with the same security afforded to Windows laptops under the existing Pointsec for PC product. The move demonstrates the growing importance of Linux as a platform for business clients.

Pointsec for Linux enforces password access to the laptop and encrypts all files on the hard disk, including the operating system and temporary files, plus documents written to removable storage media.

It will not allow the operating system to start unless the user is properly authenticated, either via a password or by a smartcard. Because encryption and decryption is automatic, it is

transparent to users and does not impede performance or productivity, according to Pointsec. The company said it runs under desktop distributions from Red Hat and Novell's Suse.

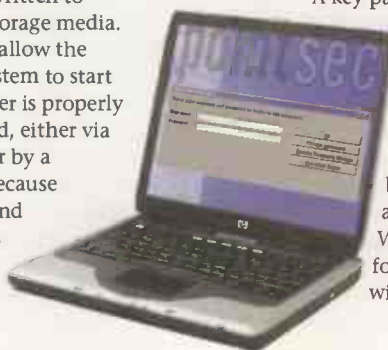
A key part of Pointsec's security products is that they can be centrally managed and controlled by an IT administrator. With Pointsec for Linux, as with Pointsec for

PC, administrators can centrally create, deploy and manage security policies across their client systems.

Pointsec also offers similar security protection for wireless client devices running Palm OS, Symbian OS and Microsoft's Pocket PC.

Pointsec for Linux will be available only under volume licensing, priced from £8,500 ex VAT for 100 users. Customers will be able to move users from a Windows to a Linux licence for no extra charge, the company said.

Daniel Robinson



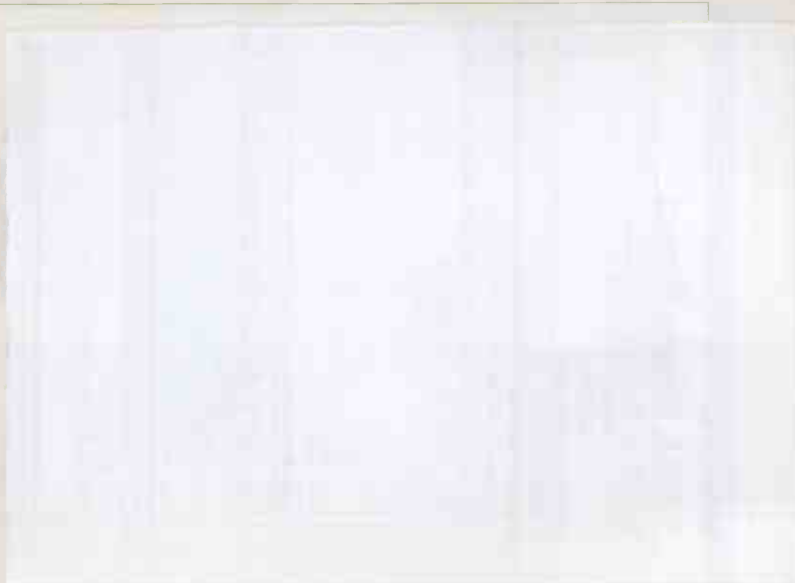
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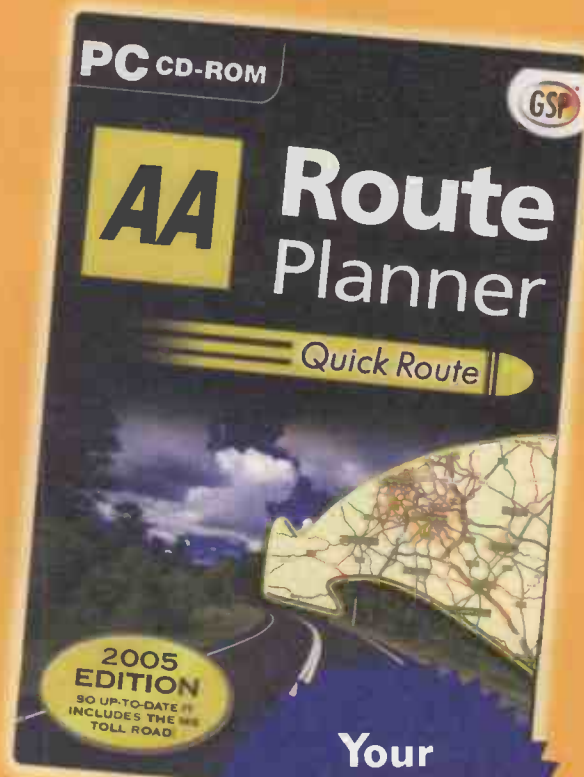
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WIRELESS ROUTER

Belkin Pre-N Wireless Router

A possible solution if you're having coverage problems with your wireless network



Current Wifi networks in real-world environments often suffer from poor range due to reflection scattering of the radio signals by solid objects – a phenomenon known as multipath. Belkin's Pre-N wireless router uses technology designed to exploit this phenomenon and give better range with no increase in transmission power.

The technology is known as Mimo (multiple input, multiple output) and Belkin's implementation uses Airgo Networks' 'True Mimo' AGN100 chip. Multiple transmit and receive antennas are used (in Belkin's case, three on the access point and two in the PC Card adapter), with the data stream being split equally between the transmitting antennas. The complex multipath signals generated in this way are stitched back together at the receiving end using sophisticated signal processing algorithms.

The 'Pre-N' name refers to the fact that Airgo's True Mimo technology is a contender to form the basis of the upcoming 802.11n wireless 108Mbps/sec standard, due to be ratified in late 2005 or 2006. But 802.11n will undoubtedly be a lot

different to True Mimo, so there's no guarantee whatsoever that Pre-N equipment will work with 11n devices. Belkin's Pre-N router does have full Wifi certification for 802.11b/g operation.

The claimed benefits of True Mimo are increased range and less degradation of throughput in difficult radio environments. Belkin's claim on the box that it gives '600 per cent faster' speeds than 802.11g are disingenuous, however – it's advertised as a 108Mbps/sec device, and Belkin's published test data shows a maximum real throughput of 45Mbps/sec, which we couldn't achieve in our tests, although our environment was affected by interference from other 802.11g access points. We still managed 30-35Mbps/sec real data transfers at 10m distances. The range improvement of '800 per cent wider' on the box is referring to areal coverage – the claimed linear range improvement in the manual is twice that of standard 802.11g.

These gripes aside, the unit impressed us – in a home networking environment known to have severe range problems with 802.11b products and with an 802.11g access point nearby, the Pre-N router and PC Card

performed well, giving a range of about 40m through brick walls and trees where we'd never managed more than about 10m with 802.11b. One other trick up the Pre-N's sleeve is that in mixed b/g environments it doesn't fall back to the lower speed – a fact we verified by using 802.11g and b clients simultaneously, with both maintaining their full normal link speeds. You can also set the wireless to run in b/g mode or g only.

So what about the physical product? It's housed in Belkin's familiar low-profile silver-grey box which can be wall mounted. The intuitive CD setup wizard and clear 'Start here' poster make installation simple. MAC address cloning isn't part of the setup, though – this has to be done manually. It's a nuisance that could catch out those with connections that require a registered MAC address, and adding this step to the setup procedure would be an easy and sensible improvement.

In terms of features, the Pre-N router has a good complement. There's a four-port 10/100Base-T switch, but no uplink port for chaining another hub or switch. The built-in firewall is of the full NAT/SPI (stateful packet

inspection) variety, meaning it's a lot more secure than a basic NAT firewall. IPsec passthrough support means you can also use it to set up a secure VPN (virtual private network) connection.

The web-based interface is admirably clear and easy to navigate, with password protection for important settings. For home users, there's a large list of preconfigured game and application virtual server profiles to choose from in the port forwarding section, and a DMZ is supported. A six-month free subscription to Belkin's Parental Control content filtering service is included.

Wireless configuration includes 802.11e QoS support for multimedia data, auto channel selection and Wep support. To prevent casual snoopers you can also turn off the SSID broadcast. It's more expensive than a standard 802.11g solution, and to get the maximum benefit you'll need to equip clients with the matching Pre-N PC Card adapter or upcoming PCI desktop adapter. But if you're having problems with coverage or 802.11b interference it's a peek into the future that's worth trying out.

Kelvyn Taylor

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VERDICT

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SURVEILLANCE SYSTEM**Axis 206M**

Simple surveillance for small businesses



Supporting an impressive 1.3megapixel sensor, the Axis 206M network camera is aimed at businesses requiring a simple yet effective remote surveillance system.

Once the camera has been set up, which took us less than five minutes, the 206M's built-in web server allows you to view live footage and manage the camera's settings from any web browser.

The 1.3megapixel Cmos sensor means the 206M is capable of capturing much more detailed images than traditional webcams. A maximum resolution of 1,280 x 1,024 gives you the power to zoom in to a greater depth without losing quality. This high resolution does affect refresh rates, however, and you're unlikely to get more than 12fps (frames per second). Even dropping the recorded resolution won't change this.

The 206M comes with the Axis Camera Explorer software. This utility allows you to monitor and manage multiple Axis network cameras from a remote PC or even a PDA. To limit the impact on hard disk space, video footage can be recorded at a specified frame rate, for example 3fps or one frame per hour, but you won't get audio because there's no built-in microphone.

Aside from handling manual recording and displaying up to four camera feeds in one screen, the software itself is fairly limited. If you want greater functionality, you'll need to purchase additional Axis software.

The RRP of £279 ex VAT might seem a little steep for a network camera but, when you consider the quality of the image and ease of use, the Axis 206M is good value for money.

Will Stapley

DETAILS**PRICE** £327.83 (£279 ex VAT)**CONTACT** Axis 0870 162 0047**www.axis.com****SPECIFICATIONS**

1.3megapixel Cmos sensor • 1,280 x 1,024 • Motion jpeg • Illumination 10-10,000 lux • RJ-45 Ethernet port • Axis Camera Explorer software • Adjustable stand • 85 x 55 x 34mm (h x w x d) • 177g

PROS 1.3megapixel; simple to use**CONS** Limited software package; no audio**VERDICT**

Excellent high-quality surveillance system that's easy to set up and operate

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

NAS APPLIANCE**Tiko Classic 340**

A low-cost and well-featured device



NAS appliances have been around for some time now and are generally designed for medium-sized companies looking to add storage to department networks or back up critical data on their servers. The Tiko Classic 340 is well suited to either role.

Based around a 2.8GHz Intel Pentium 4 processor, the Classic is a 1U rackmount server offering a total storage capacity of 1TB via four 250GB hot-swappable Sata (Serial ATA) drives. The drives are easily accessible and there's software support for Raid 0, 1, 3, 5, 10 and Jbod, though hardware Raid is available as an option. Meanwhile, dual Ethernet ports provide the network connection and allow bandwidth aggregation (trunking), but not load balancing. There's also a single PCI slot for adding items such as a SCSI controller card and a list of approved devices is available from Tiko.

The system comes with Tikonas NAS OS, a custom Linux-based operating system. While this may lack some of the flexibility found in Windows, it boots from a 64MB Flash memory module and things can be operational in less than 50 seconds. This also has the added bonus of freeing up valuable

disk space. Once running, however, this appliance is particularly noisy.

The Tiko can be managed using a secure web-based interface, and features such as drive snapshots, backup using NDMP (Network Data Management Protocol), dynamic volume expansion, clustering and automatic failover can all be easily configured. It also supports iSCSI data transfers and can be managed via SNMP.

Alex Arias

DETAILS**PRICE** £2,226.62 (£1,895 ex VAT)**CONTACT** Tiko www.tikocorp.com**SPECIFICATIONS**

1U rackmount • Intel P4 2.8GHz • 512MB Ram • 64MB Flashdisk • 4 Sata drives • 2 Gigabit Ethernet interfaces, • Raid 0, 1, 3, 5, 10 and Jbod support • CIFS/SMB3.0, Appletalk, NFS3.0, HTTP1.x • Three-year warranty

PROS Low cost; fast startup**CONS** Noisy**VERDICT**

The Tiko Classic 340 is a well-featured appliance at a competitive price, and as such is definitely worthy of investigation

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



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Resilience and power

WORDS: DAVE MITCHELL TESTING: VNU LABS

Small offices looking for an entry-level server could be faced with a variety of specs and capabilities. We explain what you should expect from one of these devices and outline the features of eight servers that cost less than £1,199

E ntry-level servers tend to be designed with the needs of smaller businesses in mind, although they can also appeal to larger enterprises, sometimes as low-cost platforms for testing new applications and services.

In this group test we have evaluated entry-level systems from eight leading server manufacturers. We asked each vendor to submit what they considered to be a suitable network server for a small office. We limited them to a maximum cost of £1,199 ex VAT and left them to decide what hardware specification they could provide for the price.

The line between entry-level server and PC is often a thin one, but one of the most

obvious differentiators is build quality. Servers must be able to run 24-7 for many years, so resilience is key.

We found that all eight systems demonstrated good overall build quality, but Acer's Altos G510 and Evesham's Silveredge 500SP Sata (Serial ATA) were particularly impressive. The Altos G510's extremely sturdy chassis, solid side panels and good internal construction looked capable of surviving rough treatment, while the Silveredge showed how Intel's chassis offerings have improved considerably over earlier designs.

Good air flow, both through the case and across critical components, is essential to ensure longevity, but we found that the design of some of the systems failed to



fully take this into account. Both Fujitsu Siemens and NEC have focused so much on venting heat from the processors that their ducting designs tend to reduce air flow over the hard disks. A lack of secondary fans also means the disks are likely to suffer from higher running temperatures, reducing their lifespan.

It is clear that SCSI hard drives are now being overtaken by SATA devices, primarily because SCSI devices simply cannot compete in terms of capacity or price. Five of the review systems came with SATA drives installed and the total capacities ranged from 160GB offered by NEC right up to Systemax's generous 400GB. These make the SCSI-based 36.4GB hard disk capacity offered by the servers from HP, IBM and Acer look stingy in comparison.

Performance is not an issue at this level, as SATA interfaces can easily match the throughput of Ultra320 SCSI when running small-business applications. In fact, we believe that now there is nothing to be gained from using SCSI subsystems in an entry-level server, as it is simply too expensive. SATA can also support RAID, which has traditionally been one of SCSI's strong points.

Raid capabilities

All the SATA-based systems came with some form of RAID capabilities. Dell's Poweredge 700 comes with three hard disks configured in a RAID 5 array, while the Systemax Mission 3512 and Fujitsu Siemens' Primergy TX150 S2 have dual- and quad-port PCI SATA controller cards respectively, both of which are capable of supporting RAID 0 and 1 striped and mirrored arrays. The NEC TM700 and Evesham Silveredge motherboards have

embedded dual-port SATA controllers, both supporting RAID 0 and 1.

Evesham also gets a pat on the back for fitting all six cables to the Silveredge's hard disk backplane so they are ready to be used once an extra controller card has been fitted.

The systems from Acer, Evesham, Fujitsu Siemens and IBM also offer hard disk hot-swap capabilities. These were largely academic in the SCSI-equipped systems, though, as no RAID controllers were supplied and the price only included a single drive. While Dell offers the best storage fault tolerance, we found the drives quite tricky to remove as you need to unplug the lot and remove the entire cage from the front.

In terms of general performance, all the systems reviewed have more than enough horsepower to handle typical small-business applications such as file and print, Internet access, email, content filtering and anti-virus services.

Those delivering the most processing power were Acer's dual-Xeon Altos G510 and the dual-Opteron Mission 3512 from Systemax, with the latter also offering the most memory and RAID-protected SATA of the group.

Most of the vendors plumped for single-processor systems based on Intel's Pentium 4 chip. However, Evesham's Silveredge included Intel's latest processor and chipset combination. Codenamed Nocona, this EM64T architecture supports both 32bit and 64bit processing.

Nocona is available to manufacturers with a choice of three new Intel chipsets. The Silveredge features the E7320 Lindenhurst-VS, which, being aimed at

entry-level systems, has a fairly narrow feature set. For example, PCI Express (PCX) support is limited to a single configurable 8x PCI Express interface, which is split into two 4x PCI Express interfaces supporting dual Gigabit Ethernet, a pair of PCX segments and a single 4x PCX slot.

Most of the specifications on offer stuck to the components that are essential for basic LAN tasks, such as file serving, and eschewed PC-oriented features such as powerful graphics cards and audio ports. The only exception was NEC's TM700, which features a PC-based motherboard that boasts audio capabilities most firms would find superfluous.

Good management and monitoring facilities are essential in any server, especially if it is to be used in a branch office. The systems from Acer, Fujitsu Siemens, Dell, Evesham and IBM were all strong in this area. These vendors all provided good software packages that allow administrators to remotely monitor the server, keep an eye on areas such as temperatures, voltages and fan speeds, and send out warnings via email in the event of a failure or a threshold being breached.

Dell's Openmanage and IBM's Director packages are designed to provide a complete management umbrella for workstations and laptops as well as servers, although we thought Director's interface looked a little dated. Not only did Evesham deliver the very latest Intel hardware, it also included the new Intel Server Manager 8.1 software, which brings some useful improvements.

Companies requiring the best remote-management package need look no further than Fujitsu Siemens' Primergy TX150 S2,



Acer's Altos G510 offers plenty of scope for future expansion



The Poweredge from Dell has excellent remote management capabilities



IBM's Xseries 206 is a well-built system, with a tool-free case for easy upgrades



HP's Proliant ML110 comes at a low price, it's well built and has room inside for four hard disks. Its disadvantages include the fact that it has no management capabilities and only 512MB of Ram



NEC offers a well-priced product with a dual-port Sata controller embedded in the motherboard. It is quiet in operation, but the internal cooling arrangement is a tad fussy



Systemax's Mission 3512 includes a generous 400GB of Sata storage and RAID fault tolerance. It has poor server management tools, however, and its build quality is not the best

which was supplied with a Remoteview Server Board. This PCI card has its own processor and memory, and the Lan and serial ports at the rear allow the server to be accessed over the network or via a dial-in modem connection.

The card comes with an optional independent power supply that allows it to provide full control over the server regardless of the latter's condition. It

supports encrypted SSL connections, and the Remoteview web interface provides a wealth of operational information about the motherboard, power supply and environment. Alerts, which are recorded in a detailed log, are sent out as emails.

All the other systems had fairly weak management features. HP's Proliant ML110 is designed to be managed within an environment already running HP's Insight

Manager and so only comes with the agent software. NEC takes a similar approach, delivering an agent that allows the TM700 to slot into a network already running its ESMPro application.

Systemax's server comes with MSI's Iconsole, which offers remote management over the Lan but provides only basic operational information.

The features table is overleaf.

Editor's Choice

We were generally impressed with all the servers on review, making it all the harder to decide which deserved an award. While the Editor's Choice was not such a tough decision, the Highly Commended award was far more difficult to decide, simply because most of the products were pretty good. In the end we chose the Fujitsu Siemens' Primergy TX150 S2 for a Highly Commended award, as it delivered an excellent range of features and came with the best remote management and monitoring package. Customer support is a major issue at any level of the server market, and Fujitsu Siemens scores highly in this area, too.

Whereas many vendors excelled in specific areas – Acer's build quality or Fujitsu Siemens' remote management, for example – Evesham's Silveredge 500SP Sata delivered the best combination of features and so earned our top award, the Editor's Choice. It provides good build quality, plenty of potential for system expansion, full hot-swap RAID-protected Sata storage, and better than average remote management and monitoring facilities. The icing on the cake, however, was the inclusion of Intel's brand new Nocona processor and Lindenhurst-VS.



Evesham's Silveredge 500SP Sata impressed us with its combination of features



The Primergy TX150 S2 from Fujitsu Siemens had the best remote management package



Table of features

MANUFACTURER	ACER	DELL	EVESHAM
MODEL	ALTOS G510	POWEREDGE 700	SILVEREDGE 500SP SATA
Price inc VAT (ex VAT)	£1,404 (£1,195)	£1,265 (£1,077)	£1,408 (£1,199)
Sales contact	01753 699 317	0870 907 4156	0870 160 9700
URL	www.acer.co.uk	www.dell.co.uk	www.evesham.com
CHASSIS, MOTHERBOARD, MEMORY & HARD DISK			
Chassis dimensions mm (w x h x d)	217 x 440 x 596	98 x 440 x 1,498	235 x 450 x 485
PSU rating (watts)	450	330	600
Motherboard manufacturer/chipset	Acer/Serverworks GC-SL	Dell/Intel E7210	Intel/Intel E7320
Processor type/speed/processors installed/maximum	Intel Xeon/2.8GHz/2/2	Intel Pentium 4/3.2GHz/1/1	Intel Xeon (Nocona)/3GHz/1/1
Type of Ram/amount fitted/maximum	PC2100/512MB/4GB	PC3200/1.5GB/4GB	PC2700/1GB/8GB
Free/total sockets	3/4	0/4	2/4
Hard drives: number/manufacturer/model/capacity (unformatted)	1/Hitachi/Ultrastar/36.4GB	3/Maxtor/Sata/150/240GB	2/WD1200/Sata/150/240GB
Controller type	LSI 1020 Ultra320	Adaptec 2610SA Raid	LSI Megaraid
Controller location	Motherboard	PCI card	Motherboard
Other controllers	2 IDE	2 embedded Sata, 1 IDE	2 IDE
Network interface manufacturer/model	Broadcom Gigabit	Intel Pro/1000	Intel Pro/1000
EXPANSION SLOTS & PERIPHERALS			
64bit PCI slots free/total	4/4	2/3	2/2
32bit PCI slots free/total	2/2	2/2	2/2
Front 5.25in drive bays free/total	1/2	1/2	1/2
Front 3.25in drive bays free/total	5/6	4/5	4/7
Internal 3.25in drive bays free/total	x	x	x
CD-Rom or DVD-Rom/other peripherals	CD-Rom/x	CD-Rom/x	CD-Rom/x
GRAPHICS ADAPTER			
Manufacturer/model	ATI Rage XL	ATI Rage XL	ATI Rage XL
Location/video memory	Motherboard/8MB	Motherboard/8MB	Motherboard/8MB
Software supplied	Acer Server Manager	Dell Openmanage	Intel Server Manager 8.1
Basic warranty	3yrs on site	3yrs on site	3yrs on site
PRODUCT OVERVIEW			
Overview	Although better known as a supplier of desktop and notebook PCs, Acer delivered an impressive entry-level server that was the only system in this group test to offer dual Xeon processors	The Poweredge 700 is the entry-level system in Dell's server range. It features excellent remote management capabilities and is available with a choice of either SCSI or Sata storage	Evesham's use of Intel's latest 64bit Nocona Xeon processor helped to ensure this server has an impressive chassis and motherboard combination with plenty of room to expand
Pros	Dual Xeon processors; excellent build quality and internal design; good expansion potential; six-drive hot-swap bay; useful server management utilities; good overall value	Good construction; quiet operation; six-channel Raid controller; triple disk Raid 5 array; 1.5GB of Ram; Openmanage software bundle	Latest Intel 32/64bit processor; E7320 chipset; very good build quality; hot-swap Sata drives; quiet operation; good management features
Cons	SCSI storage capacity is small; limited PC2100 memory	No spare memory sockets; hard disks awkward to remove; no hot-swap capabilities	Extra Sata controller card required to use remaining drive bays
Verdict	The Altos G510 from Acer may be overly large for a basic server, but it is built like a tank and boasts a very good specification, with plenty of room for future expansion	Dell's six-port Sata Raid controller delivers the best storage fault tolerance in this group. The system also offers scope to expand, and good remote management tools	The 500SP Sata steals a march on the competition by combining Intel's latest Lindenhurst-VS chipset and the Nocona 32/64bit Xeon processor
SCORES			
Features	★★★★★	★★★★★	★★★★★
Build quality	★★★★★	★★★★★	★★★★★
Enterprise value	★★★★★	★★★★★	★★★★★
Management software	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★



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FUJITSU SIEMENS	HEWLETT-PACKARD	IBM	NEC	SYSTEMAX
PRIMERGY TX150M S2	PROLIANT ML110	ESERVER XSERIES 206	EXPRESS5800TM700	MISSION 3512
£1,360 (£1,158)	£1,138 (£969)	£1,254 (£1,068)	£1,173 (£999)	£1,408 (£1,199)
0800 004 003	0845 270 4114	0870 010 2508	0870 010 6322	0870 720 8720
www.fujitsu-siemens.com	www.hp.com	www.ibm.com/uk	www.nec.co.uk	www.systemax.com
205 x 444 x 605	200 x 430 x 550	162 x 465 x 485	173 x 446 x 450	175 x 450 x 615
400	330	340	280	450
Fujitsu Siemens/Intel E7210	HP/Intel E7210	IBM/Intel E7210	Asus/Intel 875P	MSIAMD 8131
Intel Pentium 4/3.2GHz/1/2	Intel Pentium 4/2.8GHz/1/1	Intel Pentium 4/3GHz/1/1	Intel Pentium 4/2.8GHz/1/1	AMD Opteron 242/1.6GHz/2/2
PC3200/1GB/4GB	PC3200/512MB/4GB	PC2700/1GB/4GB	PC3200/512MB/4GB	PC2700/1GB/12GB
2/4	2/4	2/4	3/4	4/6
3/Maxtor/Sata/150/240GB	1/HP/Ultra320/36.4GB	1/IBM/Ultra320/36.4GB	2/Maxtor/Sata/150/160GB	2/Maxtor/Sata/150/400GB
Promise Fasttrak S150 TX4 Raid	LSI 1030 Ultra320	Adaptec 7901X Ultra320	Adaptec Hostraid	Adaptec 1210SA Raid
PCI card	PCI card	Daughtercard	Motherboard	PCI Card
Embedded LSI 1020, 2 IDE	2 IDE	2 Sata/150, 1 IDE	2 IDE	2 IDE
Intel Pro/1000	Broadcom Gigabit	Intel Pro/1000	3Com Gigabit	2 Broadcom Gigabit
2/2	2/3	2/2	X	3/3
2/3	2/2	3/3	4/5	1/2
2/3	2/3	1/2	1/2	2/3
1/5	X	3/5	1/2	4/7
X	3/4	X	1/3	X
CD-Rom/Remoteview Server Board	CD-Rom/X	CD-Rom/X	DVD-Rom/X	DVD-Rom/X
ATI Rage XL	ATI Rage XL	ATI Radeon 7000M	ATI Rage XL	ATI Rage XL
Motherboard/8MB	PCI Card/8MB	Motherboard/16MB	PCI card/8MB	Motherboard/8MB
Serverstart	HP Diagnostics Insight Manager Agent	IBM Director	ESMPro Agent	MSI Iconsole
3yrs on site	1yr on site	1yr on site	1yr on site	3yrs on site
The trademark metal grille on the front panel of the Primergy TX150 S2 can be used to secure access to the device bays and the hard disks underneath	HP's Proliant ML110 costs less than its rivals and is a good candidate for small businesses that are willing to overlook the sacrifices that have been made in storage capacity and memory	A clever, tool-free case makes the Xseries 206 easy to upgrade. It comes with IBM's Director software, which provides a remote management umbrella for all IBM client and server systems	The TM700 is competitively priced but this is reflected in the rather basic spec. It uses an odd internal cooling system that restricts all air movement to components other than the processor, increasing the risk of hard disk failures	With the Mission 3512, Systemax has put together a good-value, dual-processing package based on AMD Opteron processors and two 200GB hard drives
Well built; good expansion potential; embedded Sata controller with Raid capabilities; remote server board and Remote View web application	Low price; well built; internal room for four hard disks; simple	Good build quality and design; optional SO-Dimm SCSI controller card; extensive server management features; embedded Sata controllers; hot-swap disk support	Low cost; tidy interior; quiet operation; Raid-protected Sata storage; costs £69 to upgrade warranty to three years on site	Dual Opteron processors; high-capacity Sata hard disk storage; Raid controller; good expansion potential; tidy interior
Takes up a lot of space; hard disk cooling system is poorly designed; three Sata drives but only striped and mirrored Raid arrays supported	Single low-capacity SCSI hard disk; only 512MB Ram; no management capabilities; only ATA interfaces embedded on the motherboard	Low-capacity SCSI storage; untidy interior; hard disk cage could be better secured	PC-class motherboard; fussy internal cooling arrangement; can only be managed by a remote ESMPro server	Poor server management tools; oversized chassis; average build quality
No system could match the TX150 S2's remote management features	ML110 is a reasonable server package that offers good expansion potential for the price. The more expensive Sata variant may offer better value as an entry-level server	The Xseries 206 is a well-built system with extensive remote management and monitoring facilities, but storage capacity is limited	It may be well priced, but we felt some of its components should have been of a higher spec, and we were concerned by its cooling capabilities	Management features are minimal but the Mission 3512 delivers a good spec that includes a healthy 400GB of Sata storage and Raid fault tolerance
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
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★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

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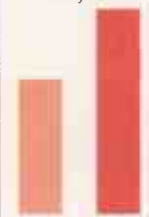
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EDITED BY NIGEL WHITFIELD

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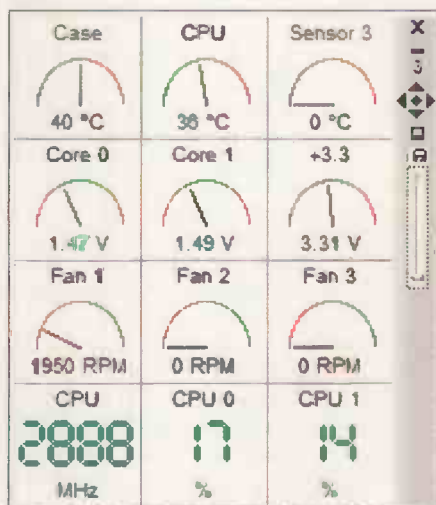
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If you are looking to install XP Media Center Edition 2005, then our guide in Hardware could help



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Paint Shop Pro 9 comes under the spotlight in Digital imaging and video



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Let Motherboard Monitor help you keep an eye on your heat levels in Overclocking

There's an air of futurism abounding

in the Hands on section this month, with several of our contributors casting their eyes over new and improved versions of some of their favourite tools.

Digital photographers can take a look at the new features of Paint Shop Pro 9, courtesy of Ken McMahon, including some areas where it manages to beat Adobe's mighty Photoshop.

In Databases, Mark Whitehorn ponders the future for Access and finds out just what Microsoft has planned for the venerable database. And if you've still got a pile of unwatched video tapes left over from the Christmas holiday, you might well be wondering if there's a better way to store your memories. Gordon Laing thinks so, and in this month's Hardware column, he takes a look at the 2005 edition of Microsoft's Windows Media Center, and finds out what hardware you'll need to put together if you want to run it, but can't afford to splash out on a brand new PC.

Visual programming takes a look at what's new in Java 5 and Tim Anderson also revisits the Swing versus SWT debate and finds out more about Subversion.

Five is also the magic number when it comes to PHP, and in Web development you can find out how the new version of the language will affect some of the scripts you've written for your site. And for newcomers, we start looking at how Cascading Style Sheets work.

Tim Nott is on hand this month for Windows users, with tips on how to use the Briefcase, while in the world of word processing he looks at watermarking and how to tidy up your fonts folder. Stephen Wells takes a look at how to persuade Excel to dial telephone numbers for you.

Back under the hood, Barry Shilliday explains how you can resize an NTFS partition on your PC to squeeze Linux onto the hard drive alongside Windows, Gordon Laing shows overclockers how to take their system's temperature and Alan Stevens explains the mysteries of direct cable connections in Networks.

In our features this month, you can find out how to add extra capabilities to Windows Explorer, making it easier to manage your files and we take a look at inkjet technology, plus of course, your queries are answered by the team in Question time.



Nigel Whitfield



Advice from our experts

Our Hands on experts answer your questions and solve your problems

Spreadsheets

Q When making a list of today's invoices it would be useful to be able to enter today's date in a range of cells, say A2:A20. Does Excel offer a fast way to do that?

Nick Wiszowaty

A Highlight the range. Press **Ctrl & ;** to enter today's date. Then press **Ctrl & Enter** – this shortcut makes an entry into a range of cells.

Q I work in public transport and am responsible for staff rotas. I am using Works 2000 with Windows 98SE, but am unable to make it count in hours and minutes. Our normal working day is seven hours, 48 minutes in length, making 39 hours over five days. If I put 07:48 into five cells on a spreadsheet and total them it gives the answer 15:00. Can you suggest a way around this problem?

B Les Jackson

A Microsoft Works has limited formatting facilities compared with Excel but one solution is to keep your hours and minutes apart. Format the ranges B2:B6 and C2:C7 as General. Format B7 as Number with zero decimals. Enter the digit 7 in the cells B2:B6. Enter 48 in the cells in the range C2:C6. In B7 enter: `=SUM(B2:B6)+SUM(C2:C6)/60`. In cell C7 enter: `=(B7-INT(B7))*60`.

This way if someone should work seven hours, 53 minutes on one of the days you'll see a total of 39 hours in B7 and 5 minutes in C7 (see screenshot 1).

Q One of my contacts sends me files in which six-digit reference numbers are created out of dates. For example the number might be 350106 which started as 6/1/1935 or 040404 coming from 4/4/2004. How can I convert these numbers back to dates?

Tania Fallon

A If the original number as you've described it is in cell A2, formatted as text, enter in B2: `=VALUE(RIGHT(A2,2)&" / "&MID(A2,3,2)&" / "&LEFT(A2,2))`

(Key: ✓ code string continues)

and give B2 the Custom format, d/m/yyyy.

The screenshot shows a spreadsheet titled 'adding times.xlsx'. The formula bar displays `=SUM(B2:B6)+SUM(C2:C6)/60`. The spreadsheet has columns A through F and rows 1 through 8. The data is as follows:

	A	B	C	D	E	F
1		Hours	Mins.			
2	Mon	7	53			
3	Tue	7	48			
4	Wed	7	48			
5	Thu	7	48			
6	Fri	7	48			
7	Total	39	5			
8						

How to total hours and minutes in Works

Q I seem to recall that Excel has a fast way of entering the months of the year. Can you remind me how to do it?

Eve Tomlinson

A If you enter Jan or January in a cell you can left-click the cross at the bottom right of the cell and drag it down as far as Dec or December. These are built-in Custom Lists. See Options, Custom Lists on the Tools menu. Once entered in a column, you can also click on the next cell down, press **Alt & Down Arrow** and you'll see a mini-menu of the months (see screenshot 2).

Q Is it possible for Excel to automatically highlight the cells on a worksheet that have formulas which relate to a selected cell?

Alban Leigh

A You could choose Toolbars on the View menu, then Formula Auditing. On this toolbar, hover over the tools until you find Trace Dependents. This tool will display blue arrows from your selected cell to the cells with formulas which refer to it. Another way is to press **Ctrl & [** or **Ctrl &]** (opening or closing square brackets) to go to or highlight related cells (see screenshot 3).

Q How can I calculate a deceased person's age at date of death in Excel when their dates of birth and death were before 1900?

Hugh Dinwoodie

A To find an age at death, enter the date of birth say, May 30, 1900 in cell A2; and the date of death, say May 29, 1985 in B2; and: `=DATEDIF(A2,B2,"y")`

in C2. I've used a decease date that is a day short of the birthday to show the DATEDIF function doesn't mistakenly round up the year. Excel starts counting dates from Jan 1, 1900 but you can download the XDATE custom functions from www.j-walk.com/ss/excel/files/xdate.htm which are accurate back to 1752.

Q For a timesheet in Excel, how can I calculate the hours worked for someone who clocks on at 11:30pm and off at 6:45am?

Nina Beck

A Format A2 and B2 as h:mm AM/PM and C2 as a number with 2 decimals. Enter 23:30 in cell A2; 6:45 in B2; and `=(B2-A2+(B2<A2))*24` in C2. This will show your answer, 7.25 hours.

Windows

Q Some while ago I noticed that I had lost all the custom icons on my IE favourites. They have all been replaced by the generic IE icon. Do you know of a Registry entry (or anything else) which can turn these back on? It makes looking through the various entries much more difficult when they all look the same!

Guy MacMullen

A These 'favicons' can be fragile – they are deleted, for example, when you delete 'offline content' from Internet Options. What you need is a utility called FavOrg which manages and backs up these 'favicons'. We found the free version at www.mercury.org.uk/dnlds6.htm (see screenshot 4).

Q At regular intervals my Windows XP Home system prompts me to tidy up my desktop by removing unused desktop shortcuts. Invariably it offers to delete all my shortcuts even though I use many of them regularly. I had hoped that SP2 would also have a fix for this, but it does not. Is there a tweak that will make the system recognise that I do use my shortcuts?

Richard Davies

A You don't need a tweak – it's just a well-hidden Windows setting. Go to Display Properties, Desktop and click the Customise

Desktop button. Clear the 'Run... every 60 days' box.

Q I am planning to create a slipstream CD with Windows 2000 SP4. I want to add post-SP4 critical updates to the slipstream CD but am experiencing some difficulty in determining the relevant updates. The post-SP4 update list displayed in Windows Update Catalog on Windows Update bears no relation to the list of updates installed on my PC by the Automatic Updates service.

Graham Thorne

A For a job like this, Windows Catalog is virtually useless. The Critical Update set that its Search function returns is not specific to your computer, and includes updates that have been superseded as well as some service packs that Automatic Updates does not install. To add to the confusion, the Windows Catalog naming scheme is not consistent with that of Automatic Updates or the online WindowsUpdate scan, and the Catalog lists all versions of each and every critical update and service pack. This also explains why you see multiple versions of updates for Internet Explorer, DirectX and so forth.

It is probably best to identify the relevant individual updates and download each in turn. One approach would be to select each 'More info' link in turn from the dynamic Windows Update critical update list. Or you could use the Security Bulletin Search on Microsoft Technet www.microsoft.com/technet/security/CurrentDL.aspx (see screenshot 5). This list is more accurate than Windows Catalog and the search options allow superseded updates to be excluded.

Whichever list you choose, do consider double-checking with Microsoft Baseline Security Analyzer www.microsoft.com/technet/security/tools/mbsahome.mspx, as this tool will red-flag installed critical updates that have been superseded. Although MBSA is a general security tool which reports a variety of security issues in addition to missing critical updates, it is recommended as its scanning of components such as MDAC and MSXML is more accurate than Windows Update.

Word processing

Q Is it possible to change the available watermark text so that, if I don't want any of Microsoft's default wording but wish to have my own, I don't have to type it in every time? I send bills to my clients with a copy watermarked 'Remittance

Advice' for them to send back with their cheque and I find I have to type in the words 'Remittance Advice' on each invoice. I am using Word 2002 from Office XP.

Tim Lawrence

A As far as we can tell, the list you get when you go to Format, Background, Printed Watermark and select the Text Watermark option, is not editable – it's hard-coded into Word's innards somewhere. Any text you type into the box will, however, remain in the list of watermarks for that document. A better way would be to have a specific template for, say, Remittance Advice and insert the custom watermark into that, so it will appear ready-made in every document based on the template (see screenshot 6). Have a look at this month's Hands on word processing column on page 162 for more about watermarks in general.

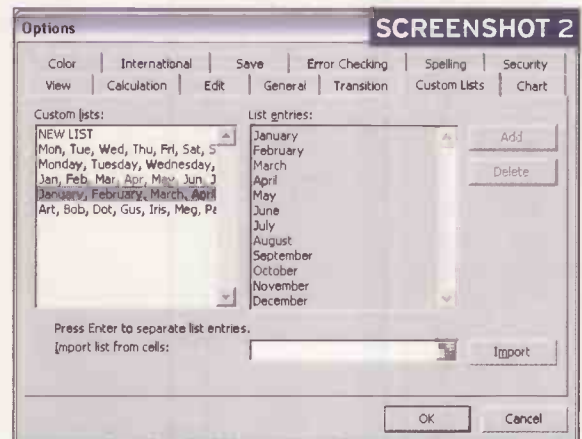
Q I have recently installed Windows XP Home on my PC but Wordpad does not operate. I get an error window announcing, 'Cannot load Word for Windows 6.0 files' which is very frustrating because Wordpad is the ideal compromise between the very useful, but simple, Notepad and the cumbersome Word. I hope you can advise.

Mike Goodearl

A This can happen when the XP version of Wordpad tries to open a document created in the Windows 98 version. The problem is that Wordpad is unable to convert the document to Rich Text Format. Fortunately a little Registry editing solves the problem. Start, Run, Regedit, and go to HKEY_CURRENT_USER \Software \Microsoft \Windows \CurrentVersion \Applets \Wordpad. Right-click in the right-hand pane and choose New, DWORD Value. Rename this to EnableLegacyConverters. Double-click on the new value and change its Value data to 1. Close the Registry Editor and all should be well. Microsoft has documented this problem in Knowledgebase article 870883, but curiously only in relation to problems in opening the 'What's New' file from Quicken 2003 and 2004. Which leaves one wondering why they created those files in 98?

Q Is it possible to create a Word document from a template that is in a location other than the default templates folder?

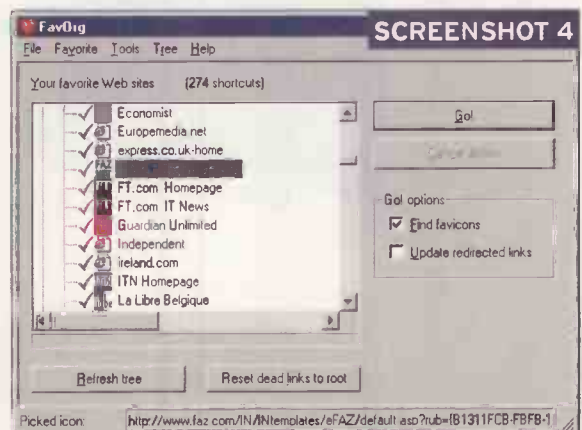
Mick Gunn



Custom Lists enable you to drag out the months of the year

	A	B	C
6 Stock		1,234	919
7 Pre-Paid Expenses			
8 Other Current Assets		59	54
Formula Auditing		539	£1,143
		976	£1,421
14 Accounts Payable		£657	£463
15 Other Current Liabilities		252	166
16 Current Liabilities		939	629
20 Total Liabilities & Equity		£1,976	£1,421
21			
22 Net Sales		£7,233	£6,021
Beginning Stock		919	727
24 Purchases		4,995	4,210
25 Total Goods for Sale		5,914	4,937
26 Ending Stock		1,234	919
27 Cost of Goods Sold		4,680	4,018
28 Gross Profit		£2,553	£2,003
30 Net Income		£233	£190
34			
35 Working Capital		650	514
36 Net Worth		920	696
37 Average Stock		1,077	823

How to find cells on a worksheet with related formulas



Look after your favicons so you don't lose them again



Get accurate information on critical updates from the Technet Security Bulletin site



The standard Microsoft text watermark list



Check before buying a digital TV card for your PC – it may not be possible to record subtitles

SCREENSHOT 5

A Yes – the easiest way is to open the containing folder in Windows Explorer, right-click on the template and choose 'New'. This should be the default (bold) action, so you can also just double-click on the .dot file. Word will launch (if not already open) and your new document, with all its template content, will appear.

Digital imaging

Q My wife has hearing impairment and relies on TV subtitles. We would like to record programmes with the ability to replay them with subtitles. I gather that there is a device called a Telemole which enables this, but it is rather expensive (about £250). I was wondering if it might be possible to get round the problem with a TV card fitted in my PC. A number claim to be Teletext capable, but this does not necessarily imply subtitling. If it did, it might be possible to feed the monitor output of my PC into a DVD recorder, or record on my built-in PC DVD recorder. I don't want to make a purchase only to find out that the one thing I want to do isn't achievable.

Tony & Maureen Ward

A Teletext subtitles are overlaid on the TV picture, so you'll have the same problems recording them with an analogue TV tuner card as you would with a Teletext TV. Teletext-capable TV tuner cards may display the subtitles but, as far as we are aware, none will allow you to record them.

Digital TV transmits subtitles in DVB format which are recordable, so an alternative to the Telemole TAD 150, which costs £229 ex VAT (and requires a Scart socket) would be to buy a Freeview box, or subscribe to a digital satellite or cable service. With a Freeview box you'll be able to record programmes with subtitles to an ordinary VCR or DVD recorder. Go to www.connevens.com to find a Freeview box that's been tested for subtitle recording.

An alternative would be to buy a digital TV card, such as the one pictured left, for your PC which you can get for around £50. This would be a bit of a risk though as, unlike Freeview boxes, we weren't able to find any that guaranteed the ability to record DVB subtitles.

Q I have video clips taken by a digital camera but it was rotated by 90°. After searching for a program that could correct this issue, I found that Virtualdub did the trick. The corrected files play fine as avi files. I am now looking for software that

would enable me to convert the files into another format, wmv for example. I have tried many programs, but none appears to work correctly – the converted images appear with the incorrect aspect ratio. Images appear short and fat, like the other software I tried before finding Virtualdub's correct rotation correction. Is there any software that will convert my files while retaining the present aspect?

J Kathawick

A You're on the right track with Virtualdub, see Hands on Digital imaging and video in PCW August 2003 for more on how to rotate digital camera movies using this excellent open-source video utility.

The best option for encoding movies into wmv format is Microsoft's own Windows Media Encoder 9 Series, which you can download from www.microsoft.com/windows/windowmedia/9series/encoder.

This application provides a huge amount of control over all aspects of the encoding process, including bit rate, single and two-pass encoding, cropping and size. To maintain the aspect ratio, enter the same width and height values as the original in the Video size tab of the Session Properties panel. If you want to reduce the size of the video, make sure you reduce both dimensions by the same amount to maintain the aspect ratio. The info panel tells you the input and output sizes, aspect ratios and the change – which should be 1:1 (see screenshot 7).

Databases

Q I am currently using Access 2000 and I am still learning about building databases. I build a table and create lots of forms based on that table. Then I discover I need to change some property of a field in the table. This is easy, but then I have to go to every form and update the field in each one. How can I get the change to propagate into every form?

Matthew Ellison

A The answer couldn't be simpler – upgrade to the most recent version (Access 2003). Here, if you modify an inherited field property in Table design view, Access will display a new option. This option allows you to select how the update of the property is propagated to some or all of the controls that are bound to that field. In screenshot 8, we have modified the Description of the field. A Property Update Options button has appeared and offers various options.



Hardware

Q I have a Dell Inspiron 2650 laptop with a built-in CD rewriter. I'd like to read and write DVDs, but am unsure whether an internal replacement or an external model is the best bet.

Alan Cranston

A There's no official internal upgrade for the 2650's optical drive from Dell, but like most laptops it uses a slimline optical drive which could be unscrewed and swapped for a slimline DVD writer. In line with most laptop components though, slimline DVD writers are slower and more expensive than their desktop counterparts. The store at www.mini-ltx.com sells a Panasonic UJ-825-B Slotload DVD-Multi drive for £119 ex VAT. You may find that the bezel won't match your case though, so some DIY work could be required. The alternative is to go for an external DVD writer, which would be faster and cost around £75 ex VAT, but require either USB2 or Firewire ports. Since your 2650 only has USB1.1 ports, you'll either have to put up with slow reads and writes, or buy a USB2 PC Card interface; Belkin's FSU222uk USB2 PC Card costs £25 ex VAT.

Q The instructions for my Thomson Freeview hard disk PVR describe an archiving mode where a recording can be transferred to a VHS or 'other devices'. Could a recording be sent to a laptop this way and, if so, would it be in digital or analogue format?

Bob Isgar

A PVRs such as your Thomson may record the streams broadcast by Freeview in digital format, but their standard video outputs are analogue only. Consequently, unless you're willing to invest in modifications, you'll need to capture and re-digitise the analogue signals output from your unit's Scart plug. This is what Thomson's instructions are referring to. The so-called archive modes of this and other PVRs including the Sky+, play the desired programme through one of the Scart plugs which should be connected to a recorder. This recorder could be a VHS, DVD recorder or a PC or notebook with analogue video capture facilities. If you have USB2 ports on your laptop you could use an external capture box such as Pinnacle's Dazzle DVC90, otherwise get the Dazzle DVC120 designed for older USB ports. See www.pinnaclesys.com for more details.

Q I recently upgraded the Via Unichrome integrated graphics on my motherboard with a 128MB Radeon 9200 graphics card. The original integrated graphics had 64MB of memory, is it possible for the Radeon card to make use of it?

Craig Pullman

A Sadly not. Like many integrated graphics solutions, the Via Unichrome chipset borrows its memory from your main system Ram – so that 64MB was deducted from your total Ram. In contrast, graphics cards have their own dedicated memory and are normally unable to exploit Ram from other parts of your system. If you're exclusively using your Radeon, it's advisable to disable the integrated graphics from your motherboard's Bios settings to help prevent conflicts and ensure all your Ram is available for use.

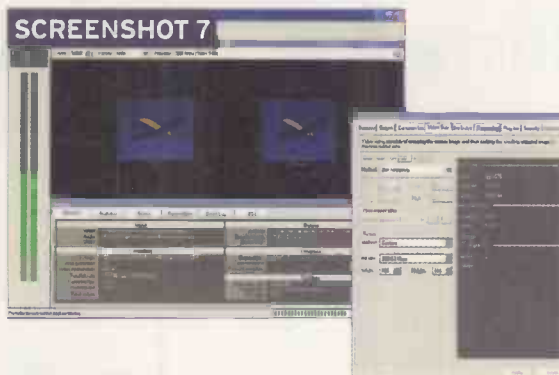
Q During a trip to the US, I bought a notebook running Windows XP Media Center Edition 2005. While the notebook runs fine, the MCE part won't receive TV signals or work when I attach an external set-top box. It also still shows the US TV schedules. Is there any way I can get the MCE portion of it working over here?

James Irwin

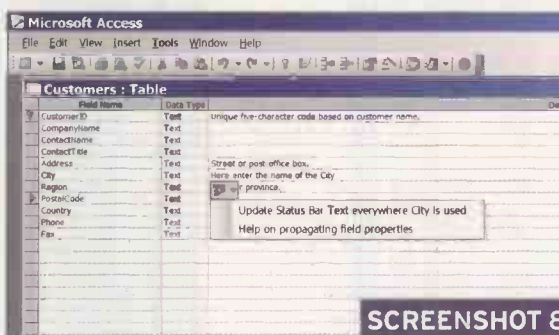
A The TV tuner in your notebook is designed to receive American NTSC TV signals and the software is configured for the American region. In theory you'll need to fit a Pal TV tuner and reconfigure the MCE software so it knows it's in the UK. If you're lucky your existing tuner may be able to receive Pal TV signals by changing a setting in its control panel or driver software. More likely though you'll need to disable or remove it and replace it with a new Pal TV tuner.

The trouble with MCE, though, is that it's very fussy – contact your notebook manufacturer to see which tuners it uses on UK MCE notebooks or find one of the OEM products by Aver Media.

After the Pal tuner is fitted and its specific MCE drivers installed, you should open Windows' Regional and Language control panel to set your location and language to the UK. MCE checks this in order to set up which electronic programming guide to download. Next, start MCE, go to the TV section of the Settings menu and select the option to Set Up TV Signal. In theory it should detect your new hardware, tune it, then download the guide. If you run into problems, visit the Community pages of www.thegreenbutton.com.



SCREENSHOT 7
You can change the size of a movie while you're encoding it to wmv format



SCREENSHOT 8
Access 2003 allows the propagation of changes from fields in a table down to forms

CONTACTS

All of our experts welcome your queries, simply respond to the appropriate address below:

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Hardware:	hardware@pcw.co.uk
Linux/Unix:	linux@pcw.co.uk
Networks:	networks@pcw.co.uk
Overclocking:	overclock@pcw.co.uk
Sound:	sound@pcw.co.uk
Spreadsheets:	spreadsheets@pcw.co.uk
Visual programming:	visual@pcw.co.uk
Web development:	webdev@pcw.co.uk
Windows:	win@pcw.co.uk
Word processing:	wp@pcw.co.uk

Please do not send unsolicited file attachments.

**Gordon Laing**

has been a hardware enthusiast ever since his first Sinclair ZX80 and, as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing

Installing XP Media Center Edition 2005

Getting this onto a PC is a challenge. We show you how in the first of a two-part guide

With the launch of Windows XP Media Center Edition 2005, Microsoft has finally made it possible for end users to get their hands on the software and install it for themselves. This is great news for anyone who's envied the slick MCE user interface and free guide, but hasn't wanted to buy an entirely new PC just to enjoy it.

The only trouble is that installing MCE 2005 is far from a retail, user-friendly experience. The MCE 2005 software that's on sale is designed for OEMs, and comes with no official support or help. You're expected to know what hardware works with it and how to install it. And it's important not to underestimate the fussiness of MCE 2005: it really will only work with a handful of cards and, even then, only if you additionally download specific drivers designed for it.

All in all, installing MCE 2005 on your own machine is quite a challenge, but one that's not insurmountable if you know exactly what steps to follow. And that's where Hands on Hardware comes in: over the next two columns I'll explain the issues behind an MCE 2005 installation and how to smoothly work through its various idiosyncrasies.

Beyond the software installation and subsequent tweaking, I'll also look at the different hardware options available, and considerations behind building a successful media PC. Post-installation, there are lots of neat third-party utilities and tweaks which can extend MCE 2005's functionality.

Why MCE 2005?

So what's so special about MCE 2005 anyway? Microsoft's official spin can be found at www.microsoft.com/windowsxp/mediacenter, but as far as I'm concerned, it really boils down to three main things: a free two-week electronic programming guide (EPG) which works out-of-the-box (see screenshot 1), an easy built-in way to author DVDs, and the best-looking user interface of all the media manager programs. Ultimately, you can match many of MCE's features with alternative packages but, to my eyes, it looks and

The software for Windows XP MCE 2005 can now be bought and installed by end users, but it remains a no-frills OEM package

feels more like a consumer product than any of its competitors.

A quick note to people who connect to network domains. MCE 2005 may be based on Windows XP Professional, but the ability to connect to network domains has been removed. There appears to be no way round this for copies of MCE that have already been installed.

If you're installing MCE 2005 yourself, though, the option to connect to a domain still appears during the Windows installation as if you were loading XP Pro. According to those who use domains, it would appear you can enter the required details here and allow MCE 2005 to connect to domains, but you won't be able to subsequently change the details without a reinstallation. This may

sound inflexible, but it's some improvement over the original assumption that domains were 100 per cent out of the question for MCE 2005.

Before launching into MCE 2005's requirements and installation, it's worth briefly mentioning the alternatives that offer similar media-handling and TV recording facilities. These include Showshifter (www.showshifter.com), Snapstream's BeyondTV (www.snapstream.com) and, for Linux users, MythTV (www.mythtv.org).

Since all are designed to be installed by end users, they're much easier to get working than MCE 2005,

and most are compatible with a wider range of hardware, too. The Hardware column has regularly covered these alternatives and will continue to do so in the future, but for this and next month, it's over to MCE 2005.

What you need

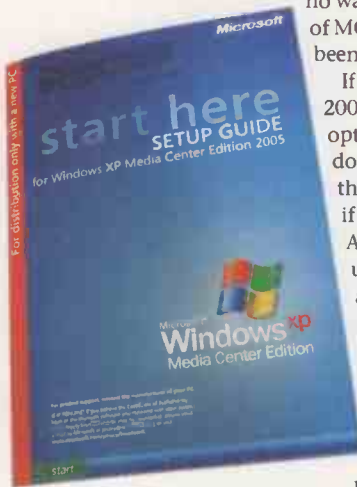
The basic hardware requirements of Windows XP MCE 2005 are fairly standard. Microsoft suggests running it on a minimum of a 1.6GHz processor with 256MB of Ram and 4GB of free disk space. For smooth running, though, you should really be looking at 2.4GHz with 512MB of Ram or higher, especially if you're using dual tuners or intend to stream content to optional Media Center Extender devices.

MCE's legendary reputation for fussiness refers to the choice of graphics and TV tuner cards, both of which it is very strict about. It also only works with one type of remote control and a couple of software DVD decoders. That said, even if you have to buy a new TV tuner, graphics card and remote control, you could still upgrade an existing PC for around £250 including software. Here's what you'll need for a basic configuration.

Starting with the software itself, the OEM Windows XP MCE 2005 package consists of two CDs sandwiched with a thin booklet in no-frills cellophane wrapping. While MCE 2005 appears to work like a separate Windows application in practice, it's delivered and installed as part of an entirely new Windows XP installation.

Consequently, when you buy MCE 2005, you get a brand new licensed copy of Windows XP complete with Service Pack 2. As mentioned earlier, XP MCE 2005 is based on XP Professional, but with a few features taken out, such as the ability to connect to new domains. You will need to do a fresh installation of XP for MCE 2005; it won't work as an upgrade to existing XP systems. If you currently own MCE 2004, contact your supplier for upgrade details.

Microsoft's new licensing for MCE 2005 allows the OEM package to be sold by pretty much any component supplier, although to comply with the OEM licence, you'll have to buy a piece of hardware at the same time. Ebuyer is one of several websites



One of the best aspects of MCE is its free two-week electronic programming guide, automatically updated over the Internet

GUIDE				14:32
	19 Nov	21:00	21:30	22:00
1	BBC ONE	Children In Need		BBC News
2	BBC TWO	Empire Warriors		QI
3	ITV1	A Touch of Frost		William: the Ma
4	Channel 4	The Simpsons	Max and Paddy	Peep Show
5	five	House Doctor: Designs for Living		Trapped
6	ITV2	Get Me Out of Here! I'm Tuffers		The Xtra Facto
7	BBC THRI	Mind, Body and	Mind, Body and	New Little Brita

	<p>Max and Paddy's Road to Nowhere</p> <p>Six-part comedy drama. Peter Kay's spin-off from his award-winning Phoenix Nights series stars Max and...</p> <p>21:30 - 22:00 Shows/Comedy</p>
--	--

SCREENSHOT 1



selling the OEM MCE 2005 discs; it charges £67.99 ex VAT, which isn't bad when you consider the OEM version of XP Professional costs £78.86 ex VAT from the same site. See www.ebuyer.co.uk.

Graphics cards

In terms of graphics cards, the Microsoft website recommends a minimum of 64MB of Ram, although in practice 128MB is more sensible. More crucially, though, the card must support DirectX-9 in hardware and have specific drivers to support MCE 2005.

On the ATI side, Microsoft has officially certified Radeon 9800, X700 and X800 series cards; specific MCE drivers for these ATI chipsets (and a handful of others) can be downloaded from the ATI website at www.ati.com. As for Nvidia, Microsoft has certified the Geforce 6600, 6800, FX5200, FX5700 or FX5750 series; Nvidia's unified Windows XP drivers should work with MCE but, like ATI, its website claims slightly broader chipset support beyond Microsoft's official list.

If you're putting together a new system and aren't bothered about the very best games performance, consider one of the slower of the supported cards, as many are available with silent, fanless cooling.

TV tuners

MCE 2005 is equally fussy about TV tuner cards, again demanding specific models, dedicated drivers and, in some cases, even particular chipsets. If you have an older card, there's a good chance it's using an unsupported chipset. Some enthusiasts on various MCE forums have got older cards to work, but in general it's best to go with those verified to be OK.

For analogue TV tuners, officially supported products include the Hauppauge WinTV PVR-150 and Avermedia's M113 / M150 – see www.hauppauge.co.uk and www.avermedia.co.uk for more details. Nvidia's NTVTV P179 and 200 are also compatible, although sadly as yet none of the UK ATI All-In-Wonders is officially supported.

Compatible digital terrestrial DVB-T tuners include the Hauppauge WinTV Nova-T (pictured above), so long as it's the current Conexant 90002 chipset version, not the older Philips one – the Avermedia A16A and the Black Gold by Genesis Digital Innovations (GDI) see www.gdinnovations.com.



MCE is very strict about which TV tuners cards it will work with. The Hauppauge WinTV Nova-T DVB tuner card will work, so long as it's the most recent version

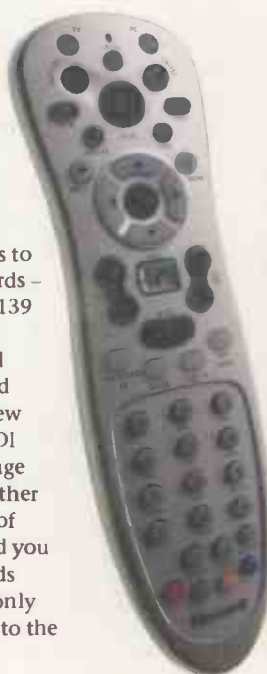
Whichever tuner you go for, make sure you download the specific MCE 2005 drivers from the manufacturer's website, as standard XP drivers rarely work. Avermedia's MCE-compatible cards are currently only available as OEM products, which may not be easily available through normal retail channels.

One of the most exciting new features in MCE 2005 is support for dual tuners. This allows you to change channels while recording another, or to record two different channels simultaneously. For this to work, both tuners must receive exactly the same channel list. This means you can use two analogue or two digital tuners, but not a mixture.

Every system integrator we've spoken to has recommended using identical tuner models, and if you're buying from scratch this certainly makes sense. Even better, you may want to consider one of the new dual-tuner cards, designed especially for use with MCE 2005. These include the Hauppauge WinTV PVR-500MCE and Avermedia A169, although at the moment, all dual-tuner models are for receiving analogue broadcasts only, and again they may only be available in OEM packages.

If you'd like twin digital DVB-T tuners, your best bet is to go for a pair of Black Gold cards – GDI sells a double-pack for £139 from its website and offers a direct link to WHQL-certified drivers. While I'd recommend buying matching cards for new installations, I've had one GDI Black Gold and one Hauppauge WinTV Nova-T working together without a hitch. At the time of writing, Hauppauge reckoned you couldn't run two Nova-T cards simultaneously, leaving the only official route for twin-digital to the Black Gold cards.

While MCE can be operated entirely by mouse, a remote control is much easier. Here's the official Microsoft remote control for MCE – note the green start button in the middle



Remote control

MCE is designed to work with dedicated infra-red remote control models, employing an external USB receiver and a controller with a green Start button in the middle. Several alternative designs have been demonstrated, but the classic Microsoft model (pictured below) can be bought for £25.57 ex VAT, again from www.ebuyer.co.uk.

DVD decoder software

The final requirement is DVD decoding software. MCE 2005 employs the mpeg2 format for encoding analogue TV recordings, and the format is also the standard for Digital TV broadcasts. Consequently if you want to watch any of your TV recordings or view live TV from a digital tuner, not to mention watch DVD movies, you'll need mpeg2 decoding software.

In theory any DVD software decoder should work, but at the time of writing, Microsoft only officially certified two. First is Nvidia's DVD Decoder, costing around £14 from www.nvidia.com/object/dvd_decoder. If you've bought an Nvidia card in a retail package, it may already come with the DVD decoder software. Nvidia's software should also work with ATI Radeon cards. Alternatively, go for Cyberlink's PowerDVD 6, costing from £30 at www.gocyperlink.com; Cyberlink also offers a free trial.

Programming guide

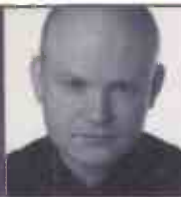
One of the best aspects of MCE is its free EPG. This allows you to browse upcoming shows on any channel up to two weeks in advance and select the ones you'd like to record. MCE's EPG is automatically delivered over the Internet, so obviously you'll also need a connection to access it.

The basics covered

So those are the basic requirements behind building an MCE 2005 system. Next month I'll look at the installation process, along with a number of tweaks and extras to enhance your system beyond the norm. If you're chomping at the bit to continue but still have unresolved issues, I can highly recommend browsing the MCE forums at www.thegreenbutton.com.

CONTACTS

Gordon Laing welcomes your comments on the Hardware column. Email him at: hardware@pcw.co.uk. Please do not send unsolicited file attachments.

**Gordon Laing**

has been a hardware enthusiast ever since his first Sinclair ZX80 and, as a former editor of *PCW* and contributor for over 10 years, what he doesn't know about technology isn't worth knowing

Temperature tracker

Keep an eye on the heat levels in your system with Motherboard Monitor

Temperature monitoring is one of the most important aspects of long-term overclocking, yet one which is often neglected in the heat of the moment, if you'll pardon the pun. It's easy to get carried away with performance boosts when you're increasing bus speeds and core voltages, only to forget to keep an eye on the temperature of your components. Under the hood, though, various parts could well be running much hotter than they're supposed to, which in turn could result in stability issues or even reduce their lifespan.

It's not just overclockers who should monitor temperatures, either. Anyone who's built or upgraded their PC should check the temperatures of key PC components from time to time, in case clogged fans or incorrectly mounted heatsinks are failing to do their job. Even poorly routed cables can obstruct airflow and cause overheating.

Similarly, anyone who leaves their PC powered up for very long periods of time, such as servers, media recorders, or number-crunchers, should take temperatures very seriously – after all, you don't want to come back after a few hours or days to find your machine has hung or even been damaged by overheating.

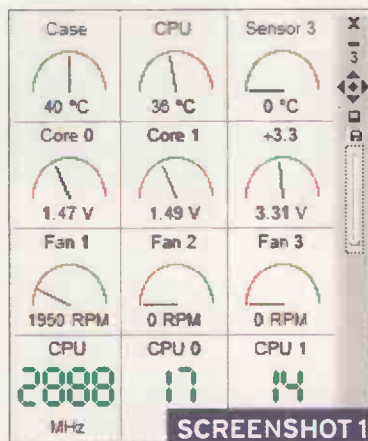
Luckily, various sensors in modern PCs and components can monitor temperatures and report back to the user. Limits can often be set and alarms activated or the system shut down automatically. Normally, though, most temperature controls and feedback are delivered through the Bios interface – hardly convenient if you want to monitor temperatures while doing anything useful.

Fortunately, a number of utilities can read the temperature values delivered by various motherboard sensors and let you keep an eye on them under standard operating systems. One of the most popular for Windows users is Motherboard Monitor. It's long been a stalwart of PC enthusiasts, but is well worth mentioning again for anyone who's not come across it.

Motherboard Monitor

Motherboard Monitor is a small utility that runs under Windows and can be downloaded free of charge

Motherboard Monitor displays case and core temperature



from <http://mbm.livewiredev.com>.

The original author may have halted development during mid-2004, but many third-party plug-ins are still being written, and it remains the de facto standard for enthusiasts who wish to keep an eye on temperatures and fan speeds.

During installation and setup, Motherboard Monitor needs to know what motherboard you're using. While there are standards for reporting temperatures and fan speeds, many motherboards implement them differently, so it's important to know the right model, or at least the closest to it.

Once running, Motherboard Monitor displays your case and core CPU temperatures in the system tray, along with the temperature of any additional sensors supported by your motherboard. These – along with other details including fan speeds and system voltages – can also be presented in a dashboard view, either as analogue RPM-style gauges or digital readouts.

Safe temperatures

Of course, monitoring temperatures is only one half of the story. It's clearly important to know the maximum operating temperature of your CPU if you're to ensure it's running safely. To find this information, you'll normally have to browse the thermal sections of a processor's data or specification sheet, although both Intel and AMD make these available on their websites.

The specification to look out for is the Tcase maximum. This refers to the temperature at the hottest average point on the CPU package – technically speaking, at the geometric centre of the component's mold cap. For modern Pentium 4 and Athlon 64

processors, the Tcase maximum is typically quoted as 70°C. This is the highest temperature at which the processor should run and still perform within specification.

According to Intel, should the Tcase temperature be exceeded for even a short time, the following could happen: product performance may be unpredictable; power consumption may exceed specifications; voltage thresholds may not be met; product life span may be shortened; the processor may stop functioning due to logic errors; and, in the worst cases, the processor may be damaged.

However, this doesn't mean you should sit back and relax if your P4 core temperature happens to be 68°C. First of all, the temperature will vary depending on the load on the processor, so you should be checking this during heavy gaming or number-crunching rather than casual web browsing or office work.

Second, modern cooling systems should keep a processor running at a temperature considerably lower than its maximum – for example, I have a 2.4 P4C processor overclocked to 2.88GHz in the cramped conditions of a Shuttle SB75G2 and, even with an ambient case temperature of 40°C (thanks to a fast Radeon card and a passively cooled chipset), the CPU happily registers 34°C under normal use and less than 40° under heavy load. Temperatures hotter than these are unusual for this type of CPU, so indicate a problem with its cooling.

Peace of mind

In everyday use, manually monitoring temperatures inside your PC shouldn't be necessary, but if you build or upgrade your system, leave it running all day, enjoy overclocking, or simply suspect all's not well, it can become a valuable practice. Temperature readings are not always 100 per cent perfect, but they give an indication of what's going on inside and whether you're heading for trouble. It's worth checking for peace of mind, whether you're overclocking to the max or just fitting a new heatsink and fan.

CONTACTS

Gordon Laing welcomes your comments on the Overclocking column. Email him at: overclock@pcw.co.uk. Please do not send unsolicited file attachments.

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**Tim Nott**

is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family

The wandering Knowledgebase

Searching with Microsoft, the Windows briefcase and a couple of Opera lessons

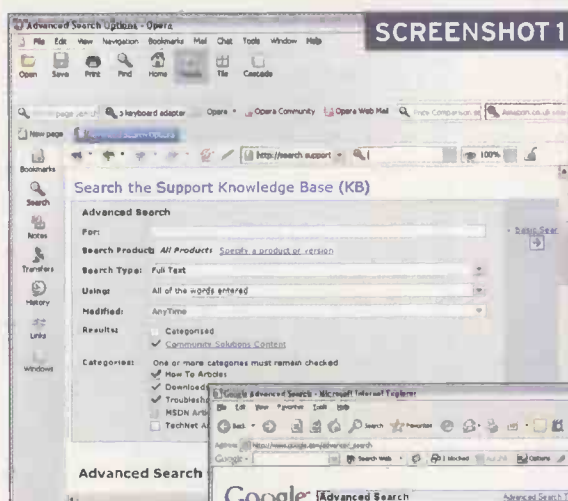
Microsoft seems to move the goalposts of its support knowledgebase at irregular intervals. As

I write this, I'm getting messages that the page at <http://support.microsoft.com/search/c.asp>, which has served me well in the past, is 'currently not available'. However, there's a redesigned search engine at <http://search.support.microsoft.com/search/?adv=1>. It's a little more complicated, as you can no longer choose a product from a dropdown list, but there are more options for tuning your search (see screenshot 1).

Alternatively you can use Google. There are two options here – you can either go straight to the purpose-made Google Microsoft search page at www.google.com/microsoft.html, or you can be a little more canny and DIY from the Google home page. Choose Advanced Search (you can also get there from the Google, Google Links menu on the Google IE toolbar) and you'll be brought to the page shown in screenshot 2. In the Domain section, opt to 'Only return results from the site or domain' and put 'microsoft.com' in the box. Make sure that 'KB' is in the 'All the words' section and fill in the rest according to your query. It will come as no surprise that it's much faster than the Microsoft version.

Key issues

For the past two months this column has been commuting. The PC in town has all the past Hands on columns, a huge database of readers' queries, various other resources and an ADSL connection. The PC at the house we've just moved to has the great advantage of being a few steps away, but the disadvantage of a slow Internet connection. So, after a few journeys back and forth with floppy disks I thought it was time to embrace new technology and buy a USB2 memory key. This thing cost around £20, holds the equivalent of 300 floppy disks, is very fast and small enough to slip into the smallest pocket – or, indeed, lose. For versions of Windows later than 98 it needs no drivers – by the wonders of plug and play it 'just works'. So, when I plugged it into a USB port on my home PC via the supplied cable, I was surprised to see that Windows XP had encountered a problem with an



Above: The redesigned Microsoft Knowledge Base search page

Right: Searching the MSKB from Google



Two-way stretch – the Briefcase updates in both directions



As a further experiment, back at the home PC, I plugged the key directly into one of the front ports. Bingo, or rather bong-bing, as Windows joyfully recognised the device instantly. But it still wouldn't via a cable. It seems that the Serial Bus is not as Universal as one might hope.

Brief encounter

The commuting – and the USB key – also prompted me to try out something I've been meaning to investigate for the past nine years, namely the Windows Briefcase, which is a special kind of folder designed for synchronising files on two or more PCs. Now, I'm sure this was always somewhere on the Start menu, and I'm pretty sure I'd seen it sitting on the Desktop in Windows 95 and 98, but a lengthy trawl through the XP Start menus failed to unearth it. So

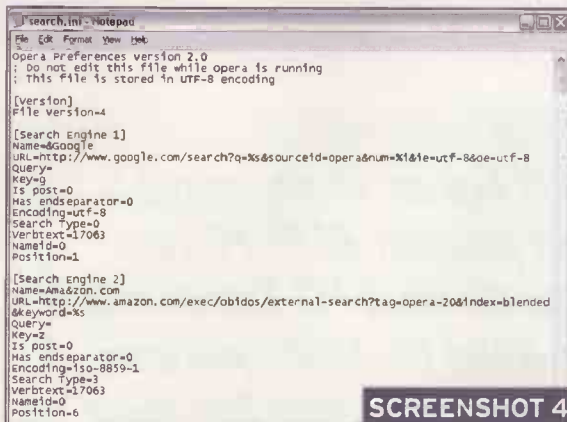
maybe it wasn't installed, but an even lengthier trawl through the XP Add/Remove Windows Components also drew a blank. So I took the coward's way out and looked in the Help Centre.

I might add at this point it was all slightly complicated by the fact that the home PC I was in front of has the French version of XP, and familiar items such as 'My Computer and Recycle Bin have unfamiliar, but rather less fanciful, names such as *Poste de travail* (workstation) and *Corbeille* (wastepaper bin).

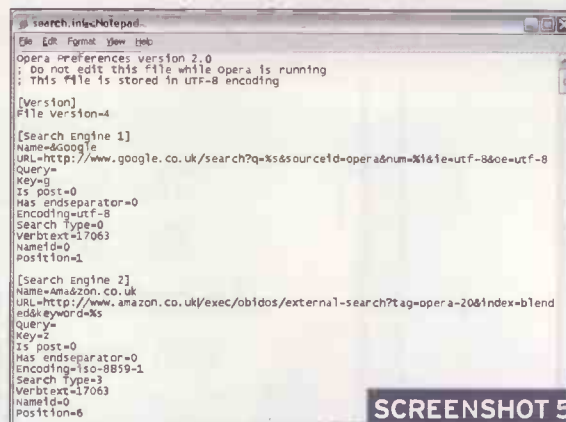
Anyway, I found that the way to access the *Porte-documents* (you guess) is from a right-click, New in any folder or the Desktop. I wonder what the French for D'oh is? In fact, the same method applies to previous versions of Windows – the Desktop Briefcase is just a ready-made sample.

Having created a Briefcase, and getting back to English, using it is fairly straightforward. Let's take scenario one, where you have a laptop which you connect to your desktop PC via a network adapter, wireless connection or, increasingly rarely as pretty well everything now comes with built-in networking, direct cable connection.

First drag the files you want from their folders on the desktop machine



SCREENSHOT 4



SCREENSHOT 5

Far left: Editing the Opera Search file

Left: The modified file

to the briefcase on the laptop – you should close the files first if you've been working on them, and the source folders need to be shared over the network. You can now disconnect the PCs, and take your laptop home, or better still to a pub with a riverside view, where you can open the briefcase and work on your files in tranquillity.

When you next have the two computers connected, open the briefcase on the portable machine and 'Update all' from the Briefcase menu, the toolbar or, in the case of XP, the task pane. Windows will then replace the files on the desktop machine with their modified versions in the briefcase or, if the desktop versions have been saved more recently, vice versa. In either case you get the chance to confirm or change the behaviour for each file (see screenshot 3).

If you want to carry your briefcase around on removable media seeking, as I was, to work on two unconnected desktop PCs, then the procedure is slightly different. The Microsoft documentation then makes reference to a floppy disk – what century are these guys living in? In this case you first create a Briefcase on desktop one, then drag the files into it as before. Next, close the Briefcase and drag the whole thing onto the removable media.

Wait until the copying is complete, then remove the media. Clutching the latter in your hot little hand, scurry off to the second computer. Insert the media, open the Briefcase stored on it, then Update All (you can also update individual items). The files on the second computer will then be updated – again it works both ways.

Don't, by the way, work directly on files stored (in or out of a Briefcase) on removable media: this can cause a lot of problems with temporary and autosaved files, particularly in Microsoft Word.

Operatics

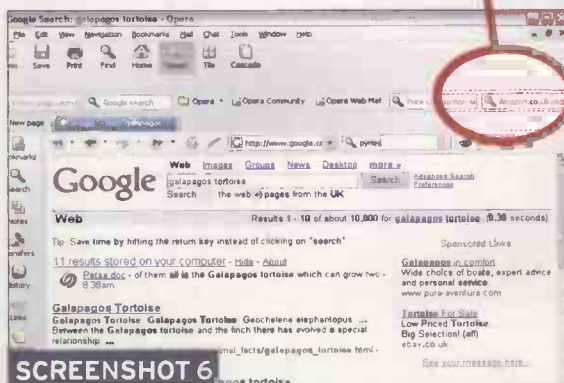
As you may have seen already in this issue's web browsers group test (see page 117), we've awarded Opera 7.54 our Editor's Choice award. I much prefer using Opera to using Internet Explorer for web browsing as it just has so much more going for it and is much better integrated. I'm not going to go on at length about its advantages, but will just mention that the tabbed page interface is so much better than the messy collection of separate windows you get in IE.

Another advantage is the profusion of built-in search boxes – you can search Google, Amazon, Ebay, Opera help, the current page, and much more straight from the toolbars. There is only one snag – most of these sites lead to the US versions, and there seems to be no way to customise these from the user interface. So, if you want to replace some of these sites with their regional equivalents, here's how to do it.

The data is stored in a good old-fashioned ini file, so first close Opera and then search your computer for Search.ini. You may find more than one copy in an Opera-related folder – the one you want will be under your user profile.

For example, in Windows XP this will be at C:\Documents and Settings\<username>\Application Data\Opera\Opera\profile. Open

The Amazon and Google searches now point to the UK sites



SCREENSHOT 6

the file in Notepad (see screenshot 4). Although it all looks rather complicated, the changes you need to make are quite simple. Taking, for example, the first item in the screenshot, change the first part of the URL from www.google.com to www.google.co.uk. Repeat for Amazon – here you might also want to change the name as well, but this is purely cosmetic (see screenshot 5). Repeat for any other entries you want to regionalise, then save and close Search.ini.

Not all entries will work just by changing com to co.uk – you may have to find the exact spelling for the URL from the relevant site. Restart Opera, and you should then find that the Amazon and Google search boxes point to the relevant UK sites (see screenshot 6).

Keyboard disaster

Further to January's item on disaster recovery, reader Duncan McGowan points out an interesting gotcha. You may find that, although a USB keyboard lets you get into the Bios, it fails to produce anything at the Recovery Console. You may be able to cure this by enabling 'legacy' USB in the Bios, but some have found that this stops the PC booting. In this case, turn off the computer and reconnect the keyboard and mouse to the specific corresponding sockets on the back of the PC – the keyboard and mouse manufacturer should have provided a suitable adapter, and usually the keyboard goes in the mauve socket and the mouse in the green. Restart the PC and you should find keyboard functionality restored. If you don't have the adapter, then one can be bought for a few pounds.

CONTACTS

Tim Nott welcomes your comments on the Windows column. Email him at: win@pcw.co.uk. Please do not send unsolicited file attachments.

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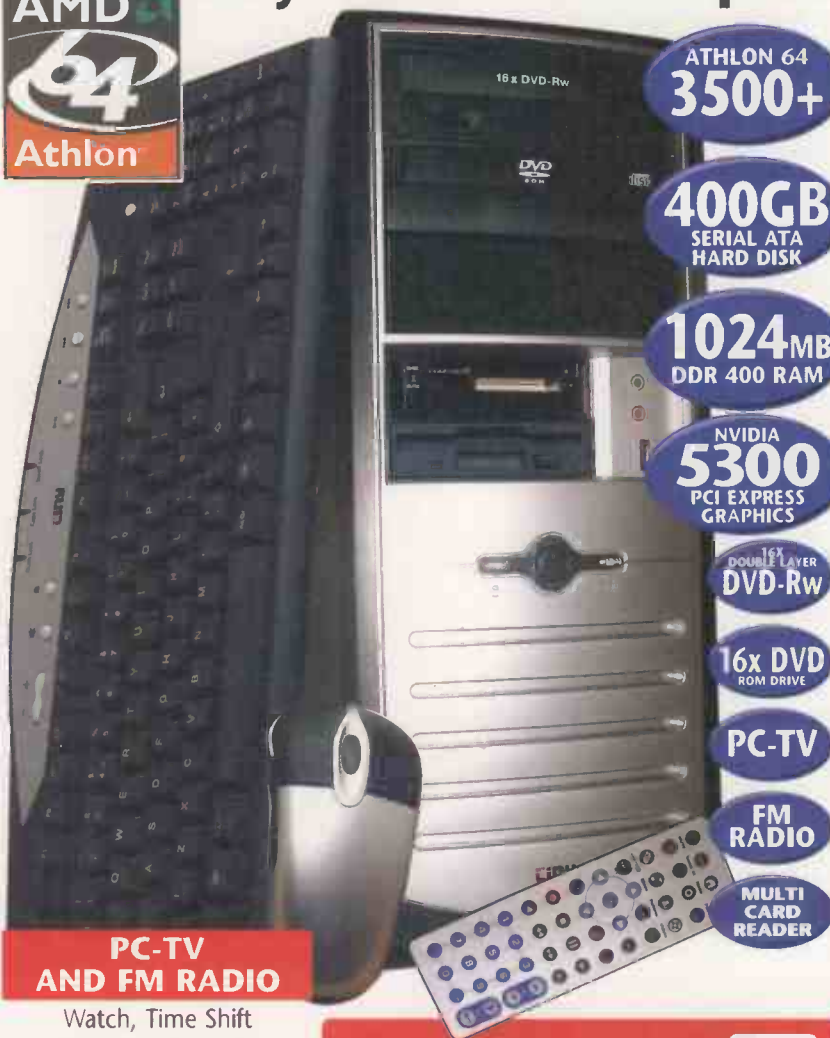
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**Barry Shilliday**

has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time prefers to travel the world – and snap it with his camera

Control your speed

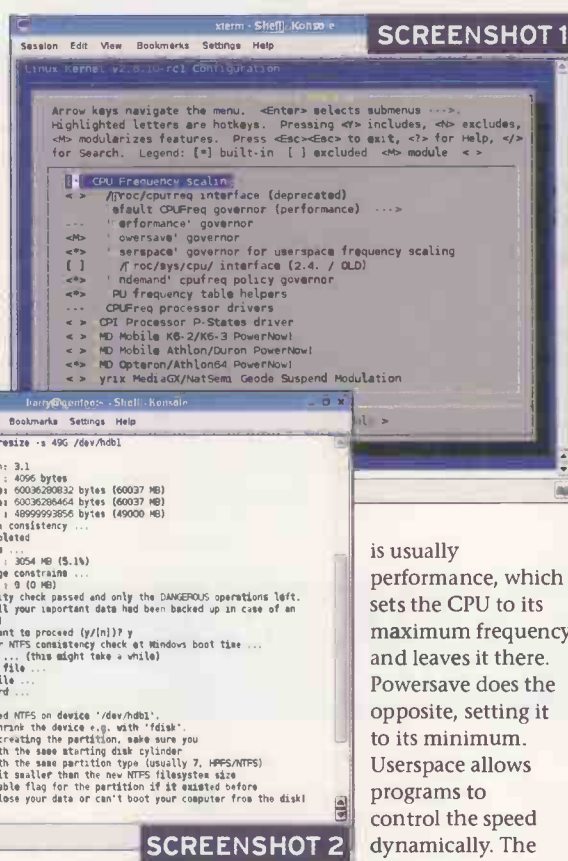
How to introduce frequency scaling under Linux to regulate CPU power usage

David Fensom has written asking about the AMD64; he wants to know if the 'Cool 'n' Quiet' feature works under Linux. The good news is that it does but, as ever, this depends on the distribution or, more accurately, the kernel in use. Recent 2.6 kernels fully support this feature, which is commonly known as 'frequency scaling'.

A modern CPU runs at extraordinary speeds, but most of the time it sits there idle. When you're typing a document in Open Office or browsing the web, the CPU requires only the tiniest fraction of its potential power to get the job done. Without frequency scaling, the CPU runs at a constant speed and consumes the same power as when it is encoding an Ogg Vorbis file or recompiling the kernel. Most laptop CPUs, and the standard AMD64, support frequency scaling to give more control over how the processor runs. This makes sense for a battery-powered laptop – if the CPU isn't busy, then switching to lower power means a longer battery duration. For desktops, too, it comes in handy, since lower power means less heat generated, more potential to overclock, and possibly a longer life for your system components.

To support this feature on Linux, frequency scaling must be enabled in the kernel. This is found under 'Power management' in the configuration. It works with a 'CPUFreq' driver (one for the AMD64, another for Intel P4 and so on), and various frequency governors. The governor is the way in which you can control the processor's speed. Enable all the possible governors in the kernel configuration together with the necessary CPU driver (see screenshot 1). If you don't want to get your hands quite so dirty with kernel building, you can check to see if the feature is already present in your running kernel by checking the 'dmesg' output (see screenshot 2).

There are three longstanding governors available: performance, powersave and userspace. The default



Top: A 60GB hard drive configured with a single 60GB NTFS partition

Bottom: The NTFS partition is deleted, and then re-created at a smaller size, leaving around 10GB of free space

kernels, from 2.6.9 onwards, also have the 'ondemand' governor. When using this, the kernel dynamically adjusts the processor's speed, depending on the system load. It's this governor you're most likely to use.

To configure frequency scaling, use the files in `/sys/devices/system/cpu/cpu0/cpufreq/`. This is a virtual filesystem (like `/proc`), and inside you will find several files. For example,

the `scaling_available_governors` file tells you which governors you can choose, while `scaling_governor` tells you which one is currently in use:

```
# cat scaling_available_governors
ondemand userspace
performance
# cat scaling_governor
performance
```

(Key: ✓ code string continues)

Change the governor simply by 'echoing' the new name into this file. You can access information as a standard user, but you must be logged in as root to make any changes:

```
# echo ondemand
> scaling_governor
# cat scaling_governor
ondemand
```

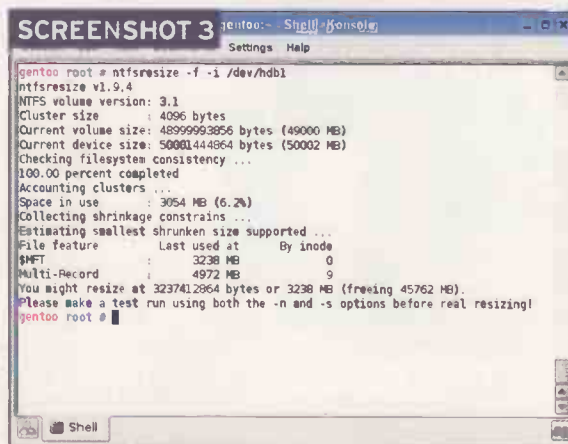
Check the files `'scaling_available_frequencies'` and `'scaling_cur_freq'`. The available frequencies will depend on the CPU type. For the example here, look back at screenshot 2. The driver shows that the CPU can run at 2.2, 2, 1.8 and 1GHz, with voltages from 1.5v to 1.1v respectively. If you've switched to the on-demand governor and the system is idle, you should find that the current frequency is at its minimum setting. For the userspace governor, you can manually set the speed by echoing it to the `scaling_cur_freq` file, as with the governor selection above.

For kernels older than 2.6.9, if you want the system to manage the frequency for you, you'll need a userspace program to do it. One such program is `powernowd` (www.deater.net/john/powernowd.html). Despite its name, it will work with any CPU, since the governor mechanism is hardware-independent. This program does more or less the same as the on-demand governor, except it operates as a running daemon, as opposed to being part of the kernel. Expect new features in the kernel governors with the latest releases.

NTFS resizing

Almost all new PCs come pre-installed with Windows XP, whether you want to use it or not – the so-called Microsoft tax, since you pay for it as part of the PC's price.

The re-created partition needs its type and bootable flag changed. Now everything looks good



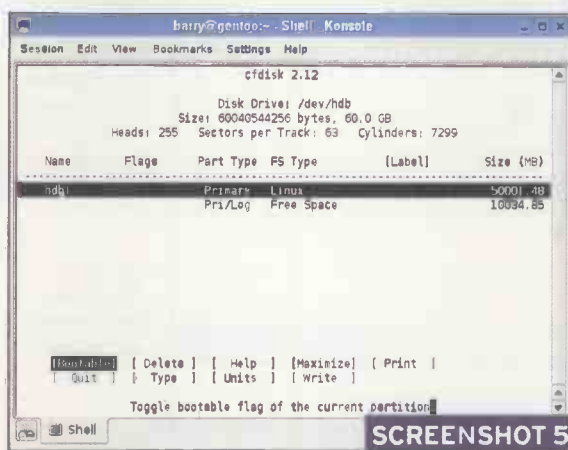
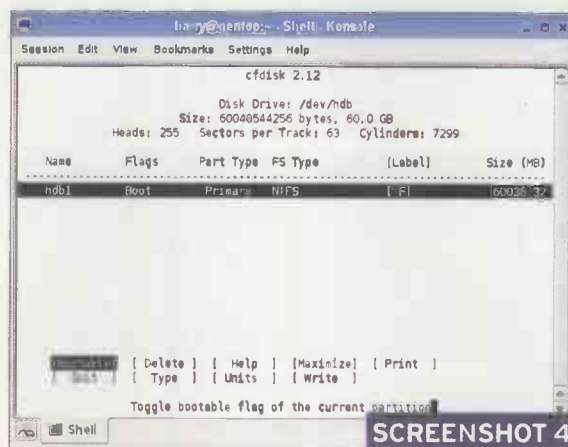


Manufacturers will build the PC for you, configuring the hard disk as required. That's great news for the majority of people (at least at the moment), but for us enlightened Linux users, it's quite a pain. If you don't want to use XP at all, there's no problem – just erase the disk. But since you've already paid for it, and will therefore want the option to use it, that's not what you're likely to do. Quite often, XP isn't provided as anything but a rescue disc, which will automatically set up your disk as it was originally supplied. That makes reinstallation impossible if you want to run Linux alongside XP.

Alternatively, you may already be using XP and want to experiment with Linux, but have all your disk taken up with XP, making reinstallation an unattractive solution.

The best solution is to change your disk configuration to free up some space. XP has no resizing tools supplied. You can pay for a commercial utility to do it, but we're not going to do that. It's worth mentioning that some Linux distributions, including Suse 9.2, come with installation programs that can resize your NTFS and Fat partitions. An open-source project called 'Linux-NTFS' (<http://linux-ntfs.sf.net>) exists to provide, unsurprisingly, NTFS-related tools for Linux. These include a kernel driver that enables you to mount NTFS partitions, and a set of tools for manipulating NTFS partitions. It's these tools we're going to look at.

Usually, your hard disk is set up in one of two ways: the disk is made up of one large partition which fills the entire drive, or it consists of a main



The question you're probably asking is how to run Linux commands when you don't have Linux installed. You could boot with a Knoppix CD (www.knoppix.com) although, unfortunately, Knoppix has a very out-of-date version of the ntfsprogs included. See below on how to get around that. Alternatively, you can try 'SystemRescueCD'

'dmesg' shows that CPU frequency scaling is enabled in the kernel

The options to support CPU frequency scaling in the 2.6 kernel

```
# tar xfvz ntfsresize-  
static-1.9.4.tgz  
# cd ntfsresize-static-  
1.9.4  
# ./ntfsresize -h  
Alternatively, build the entire set  
of programs. The following is an  
example for Knoppix:  
# su -  
# cd ~knoppix  
# tar xfvz ntfsprogs-  
1.9.4.tar.gz  
# cd ntfsprogs-1.9.4  
# ./configure --prefix=  
ramdisk/ntfsprogs  
# make install
```

These commands build and install the programs to /ramdisk/ntfsprogs, with the binaries in the bin and bin sub-directories (see screenshot 3).

Before starting

The ntfsresize program resizes the filesystem, but does not change the size of the partition. These are two distinct steps. A partition is just an arbitrary chunk of disk space, and the filesystem is laid over that space. To grow an NTFS filesystem, you must first increase the size of the partition – it's impossible for a filesystem to be bigger than a partition. For the same reason, to reduce a partition's size, you must first shrink the filesystem.

Let's look at a real example (see screenshot 4). Here's a 60GB disk on device /dev/hdb – the command 'cfdisk /dev/hdb' is used to get this screen. As you can see, there's a single 60GB NTFS partition which fills the drive, and this has the device /dev/hdb1. Any free space on the drive would be listed here, so it's clear the drive is fully used. We're going to reduce the size of the partition to give us enough space for a Linux installation. Right now we don't know what's available, but we'll aim at around 10GB of space, if possible.

'The question you're probably asking is how to run Linux commands when you don't have Linux installed'

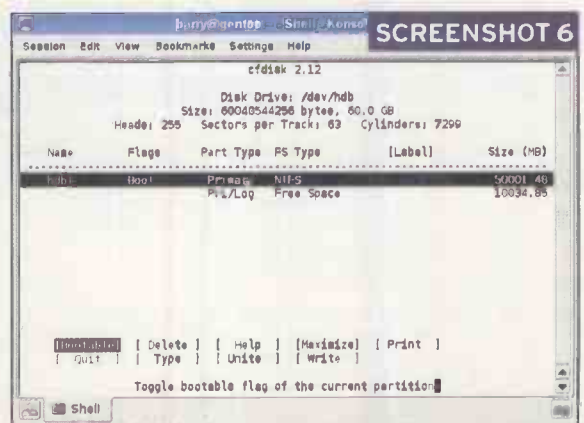
system partition and one or more extra partitions. In the latter case, one option is to delete one of the partitions, but its suitability will depend on its size and whether you're already using it for data. In the former case, the only option is to resize the partition.

The NTFS tools include a utility called 'ntfsresize'. No prizes for guessing what this does: it can work on any NTFS partition, be it with Windows NT, XP or current beta releases. The tools are part of the 'ntfsprogs' package, which is available from the project's website. We've included the source code for version 1.9.4 on the cover DVD.

(www.sysresccd.org), which is another CD-based Linux system (though designed really only for rescue) and comes with a more recent version (1.9.2 at the time of writing).

We've included a binary version of ntfsresize on the cover DVD. You can also download it from <http://mlf.linux.rulez.org/mlf/ezaz/ntfsresize-static-1.9.4.tgz>. With this, you can run ntfsresize from Knoppix, or any other bootable Linux CD. If you want to use the copy on the cover DVD, you'll need to copy the package to a floppy disk, USB pen or hard drive partition if you don't have a second CD/DVD drive. Extract the binary with tar:

If using Knoppix, use the static ntfsresize program or compile the latest source code





You can find out some useful information about an NTFS partition with `ntfsresize`. The information includes the amount of space used by files, thus giving us the amount of disk space we can free up by reducing the filesystem's size. Run `'ntfsresize -i'` on the partition, as shown in screenshot 5. The command output here shows that both the device (partition) and filesystem sizes are equal at about 60GB. It also shows that only 5.1 per cent of the filesystem is in use, so there will be no problem in getting the job done. The program says we can free up around 56GB of space – we don't need all that, so we'll stick at the original idea of 10GB. With all recent versions of `ntfsresize`, there's no need to defragment the NTFS filesystem. So long as space is available, `ntfsresize` will take care of all the steps.

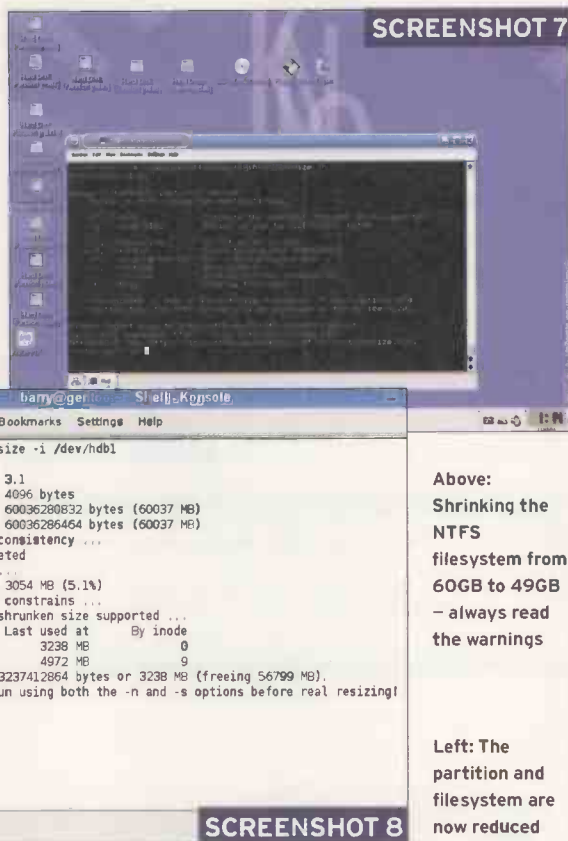
Before making any changes, ensure you've made a backup of your files. There have been no reported problems with using `ntfsresize`, but caution is always to be recommended. A hardware or power failure during the resizing could be disastrous. You may also want to make a backup of your boot sector – this is a good idea even at the best of times. Create a copy using `dd`:

```
# dd if=/dev/hdb \
of=/tmp/hdb.mbr bs=512 \
count=1
```

This command reads the first 512 bytes (the boot sector) from the disk and saves it as `/tmp/hdb.mbr`. Keep this file on a separate hard disk or removable storage, such as a floppy disk. If the worst happens and you need to restore the boot sector, run the following:

```
# dd if=/tmp/hdb.mbr \
of=/dev/hdb bs=512 count=1
```

Check to see how much space on the filesystem is free with `ntfsresize`



SCREENSHOT 7

Above: Shrinking the NTFS filesystem from 60GB to 49GB – always read the warnings

Left: The partition and filesystem are now reduced

Doing the deed

As above, the filesystem size must be reduced before the partition. It's a good idea to make the filesystem deliberately a little smaller than the intended partition size to avoid having a larger partition. For our example, we'll make the filesystem 49GB in size. Run `ntfsresize` with the `-n` option first. This attempts the resize without changing the disk. If successful you'll see the message 'The read-only test run ended successfully'. It's then safe to run the command properly (see screenshot 6).

The partition size must now be reduced, so load `cfdisk` again. Delete the partition by pressing 'd'. Don't worry – no data is lost by doing this, you're just altering the partition table. `Cfdisk` now reports the disk as having 60GB free. We

need to re-create the partition at the smaller size, so press 'n' for new, and 'p' for primary (as in screenshot 4). `Cfdisk` suggests a size of 60GB – change it to 50GB (50,000MB) and select 'Beginning' to add the partition at the beginning of the free space; the replacement partition

must start at exactly the same point as the old one. The screen should now look like screenshot 7. The default filesystem type of 'Linux' is incorrect for the NTFS partition, so change it with 't' and enter '7' for the correct type. If the partition had the boot flag set (as it did in our example, see screenshot 4), add this back by pressing 'b'. By following these steps, you will re-create the partition identically, except for a smaller size.

Finally, select 'Write' to make all these changes to the disk. Do not write the changes unless you have something on screen similar to screenshot 8. You may have to reboot after making these changes; although not always necessary, it's a good idea anyway. Do not boot into Windows just yet.

Finishing up

In our example, the disk now has about 10GB free. Check that everything looks normal by running `'ntfsresize -i'` again on the partition. You'll need the `-f` (force) option this time because `ntfsresize` sets the filesystem as 'dirty', which schedules a check when Windows boots up (see screenshot 9). Everything looks good – the partition size is now at 50GB, while the filesystem is at 49GB. If you've made a mistake and the filesystem size exceeds the device size, it's essential to increase the partition with `cfdisk` immediately. Do not boot Windows before correcting it or you may lose all data.

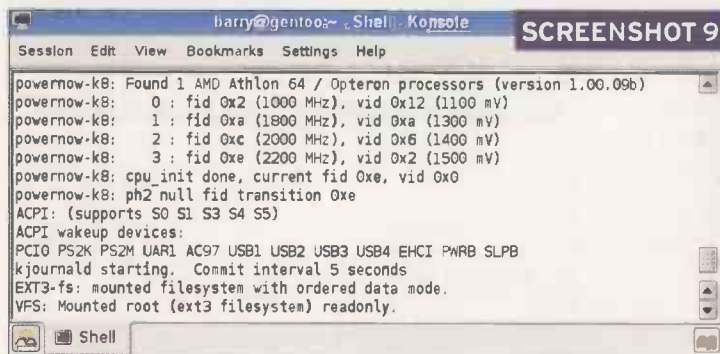
As things stand, we're wasting 1GB of data – the difference between the filesystem size and the partition. It's easy to fix this and make them equal – just run `ntfsresize` again. Without a '`s`' option to specify the size, the utility automatically resizes the filesystem to fit the partition exactly:

```
# ntfsresize -f \
/dev/hdb1
```

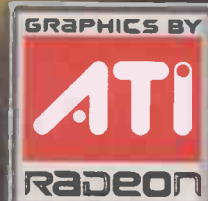
A final check with `'ntfsresize -i'` should now show the sizes equal, similar to the initial check before the resize (see screenshot 5). The last thing to do is boot into Windows. A filesystem check will automatically start. Don't worry about this, it will only happen once. You now have free disk space to go ahead and install Linux.

CONTACTS

Barry Shilliday welcomes your comments on the Linux/Unix column. Email him at: linux@pcw.co.uk. Please do not send unsolicited file attachments.



SCREENSHOT 9



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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

Pruning fonts

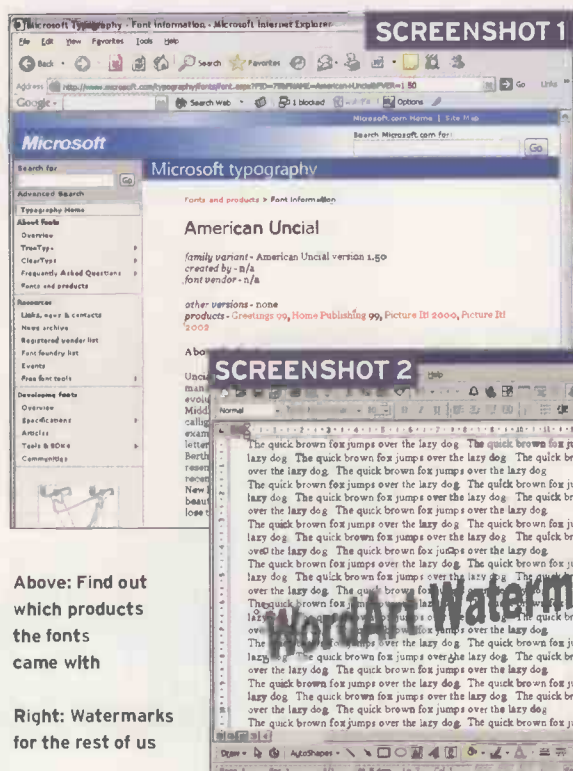
Tidy up and identify fonts, and some useful information to help you use Watermarks

Regular correspondent Pádraig McCarthy has thrown several challenges at us over the years, ranging from creating a list of available fonts to getting Word to automatically insert next month's date in a newsletter. This time he wanted to tidy up his fonts folder, which contains 298 fonts, not counting variations.

It's well known that fonts accumulate and may even breed in the warm environment of a PC. Trial versions of software often come with a selection of fonts. When you remove the program, very often the fonts stay put. I've lost count of the times I've uninstalled review software and then had to go and weed out the accompanying fonts – Serif, Lotus and Corel are serial offenders here. These 'free' fonts are either not of the best quality or are not needed by other applications. For example, both Wordperfect and Wordpro use special fonts for mathematical symbols and non-western character sets such as Greek or Cyrillic. This is frankly a bodge. Word, and some other word processors such as Star Office, Open Office and Thinkfree, make use of Unicode, a standard that has been available for several years. Each character occupies two bytes, instead of the one in the Ansi standard. Hence there is room in a font for 256 x 256 characters – over 65,000 – which is enough for all the alphabets and common symbols known to man.

Although you will find few, if any, fonts containing all these symbols, the fonts supplied with Windows and Microsoft Office should contain all you need, including Eastern European accents, Cyrillic, Greek, Hebrew, Arabic, maths and currency symbols, eighth and third fractions and more. This has two great advantages over the special 'pi' fonts used by Wordperfect and Wordpro. First, if a document is being transmitted digitally, rather than in printed form, then either the recipient must also have the pi fonts installed or the sender will need to embed them in the file, which will bloat the file as well as being a chore. Second, if you choose, say, a one-third fraction from Unicode Times New Roman, it will be properly set in that font: the pi fonts are 'one shape fits all'.

But getting back to Pádraig's problem, although Windows 2000



Above: Find out which products the fonts came with

Right: Watermarks for the rest of us

and XP don't have a limit on the number of fonts you can install (for 95, 98 and ME it is around 1,000), it doesn't make sense to keep fonts you never use – they take up disk space, slow down booting and make it difficult to find the font you want from your word processor's list. The problem with spring-cleaning is knowing which fonts are safe to delete. Anything with an A against it in the fonts folder should be left in place – as should marlett.ttf. These are all system fonts. It's also not a good idea to delete fonts that are shipped with Windows. As for the rest of the TrueType or OpenType fonts, it's really up to you to decide.

You're probably now thinking 'all very well, but how do I know which fonts shipped with my version of Windows?' Fortunately Microsoft has the answer to this. If you go to www.microsoft.com/typography/fonts you can choose from a list of Microsoft products and find out which fonts were shipped with that product. Alternatively, you can select a font, and find out which products it came with (see screenshot 1).

While we are on the subject, if you're trying to identify a font from a printed or on-screen sample, then there's a wonderful resource at

www.identifont.com. It takes you through a series of questions, narrowing down the possibilities each time and is surprisingly accurate.

In this month's Question time we promised you more on watermarks in Word. A watermark is a faint image or piece of text which appears on the background of the page, as in screenshot 2. This is easy to do in Word 11, aka 2003, as explained in the answer to Tim Lawrence's

question, and you have a ready-made choice in the dialogue for a picture or text, with options to 'washout' the former or make the latter semitransparent.

In earlier versions of Word it's a little more challenging. If you want a picture, then go to Insert, Picture. Having inserted the picture, right-click and Format Picture. On the Layout tab of the dialogue, choose 'Behind text': you'll then be able to move the picture about and resize it.

On the Picture tab, increase the brightness and decrease the contrast to get the washout effect. If you want a text watermark, you can either do this with a text box or if you want slanting text, a Wordart object. Once again, right-click and format to send the object behind the text. You can fade a Wordart object from the Colours and Lines tab of the dialogue, setting the fill colour and transparency appropriately. For a text box you need to select the text, then format that to a suitably light colour.

If you want the watermark to appear on every page of the document, go to View, Headers and Footers and insert it into the header. After you've followed the steps above you'll find that the image or object overflows the header area to appear behind the body of the page. In Word 2003 the watermark appears on every page automatically – if you don't want this to happen use the manual method described above to put it in the page body.

CONTACTS

Tim Nott welcomes your comments on the Word processing column. Email him at: wp@pcw.co.uk. Please do not send unsolicited file attachments.



Click and phone

How to add a dialling tool to an Excel workbook

There are facilities in Outlook and the Windows Address Book for dialling the telephone number of any of the contacts listed. Reader William Jennings wondered if it was possible to make that happen in Excel. I didn't know of a way. But, finding a solution from an alternate source, William shared the basics with me, which I have expanded on here.

In your C:\Windows\System32 directory you will doubtless have a file called, Tapi32.dll. This is the Telephony Application Programming Interface (Tapi). It was developed jointly by Microsoft and Intel in 1993 for connecting a PC running Windows to telephone services. VBA for Excel lets you take advantage of it by including a function, `tapiRequestMakeCall`.

To try this out, start by entering a list of names on a blank Excel worksheet with their phone numbers in the adjacent column. In screenshot 1 we've used columns A and B. Press Alt & F11 to open the VBA editor, choose Insert Module, and carefully enter the following, all in one line, as shown in screenshot 2:

```
Declare Function tapiRequestMakeCall Lib "TAPI32.DLL" (ByVal lpszDestAddress As String, ByVal lpszAppName As String, ByVal lpszCalledParty As String, ByVal lpszComment As String) As Long
```

(Key: ✓ code string continues)

That is all that is needed to make the dialler available. Under that, to link it to your particular Excel worksheet, enter the following macro:

```
Sub CallTool()  
Dim x As Long  
Dim cPhone As String  
Dim cName As String  
cName = ActiveCell  
cPhone = ActiveCell.Offset(0, 1)
```

SCREENSHOT 1

	A	B	C
1			
2	British Gas	08456091122	
3	Employer Direct	08456012001	
4	National Rail Enquiries	08457484950	Call
5	NHS Direct	08454647	
6	The National Trust	08704584000	

```
Offset(0, 1)  
x = tapiRequestMakeCall(  
cPhone, "", cName, "")  
End Sub
```

Excel can dial numbers on a phone list

Unlike in Excel, the OFFSET function in VBA doesn't require a range reference. Obviously, you could change the row and column arguments (currently 0,1) but here it works for names in one column and phone numbers in the next. Both pieces of code are on this month's cover DVD.

Ways to run the macro

Excel offers a wide choice of ways to run the activating macro. I'll describe three of them here. Screenshot 1 illustrates them: a tool on the Standard Toolbar; a keyboard shortcut and a button on the worksheet. Whichever method you use, all you have to do is select a name in column A, run the macro and the adjacent phone number in column B will be dialled.

It's easy to add a tool to a toolbar. Click the toolbar Options down arrow at the end of any toolbar. Choose Add or Remove Buttons, Customize. Whenever this Customize dialogue box is displayed you are in editing mode. You can add, modify, or remove your own tools. Click the Commands tab. Under Categories, choose Macros and drag Custom Button to the Standard Toolbar. Right-click on the new tool and modify to suit. Change the Name to Phone. If you put an ampersand in

The two short listings needed for dialling numbers

front (&Phone) this will kill two birds with one stone: you will create the keyboard shortcut Alt & P as well as have the Phone tool. Go to Change Button Image and you can pick another icon. With Edit Button Image you can change the colours in the design. Choose Assign Macro and pick your new macro, CallTool. Close the Customize dialogue box and you've created the first two methods.

A third way to run a macro is via a button on your worksheet. Click the Drawing tool to display the Drawing toolbar. Click the Rectangle tool. A cross appears and you can drag this out to draw the shape of a button. Right-click on this, choose Add Text and type Call, Ring, Phone or whatever word you wish to appear. Select the word and you can use any of the tools on the regular Formatting Toolbar to centre the word, change its font and font colour. On the right-click menu you can click Assign Macro and choose your new macro, CallTool. That's it.

Adding contacts

Many of you will want to add names and phone numbers from an Outlook Contacts file. Excel won't import an Outlook .pst file but there are facilities in Outlook to export it. In the more recent versions of Outlook, you open the Contacts file; on the File menu choose New and then Folder. Enter a name for the new folder, such as Short List. In the 'Folder contains' list choose, Contacts. In the 'Select where to place the folder' list choose, Contacts. Click OK.

A pop-up box offers to put a shortcut to this folder on the Outlook Bar. To copy the contacts you want listed in Excel, drag the names from your existing list into the new folder. Choose the new folder, then Import and Export on the File menu. Choose Export to Excel and follow the Export Wizard. This permits you to edit out the fields you don't want and put the new file in the directory you choose. Open the new file, highlight the letters of the used columns, press Shift and click after the last letter. The column widths will adjust appropriately.

CONTACTS

Stephen Wells welcomes your comments on the Spreadsheets column. Email him at: spreadsheets@pcw.co.uk. Please do not send unsolicited file attachments.

SCREENSHOT 2

```
Declare Function tapiRequestMakeCall Lib "TAPI32.DLL" (ByVal lpszDestAddress As String, ByVal lpszAppName As String, ByVal lpszCalledParty As String, ByVal lpszComment As String) As Long  
Sub CallTool()  
Dim x As Long  
Dim cPhone As String  
Dim cName As String  
cName = ActiveCell  
cPhone = ActiveCell.Offset(0, 1)  
x = tapiRequestMakeCall(cPhone, "", cName, "")  
End Sub
```

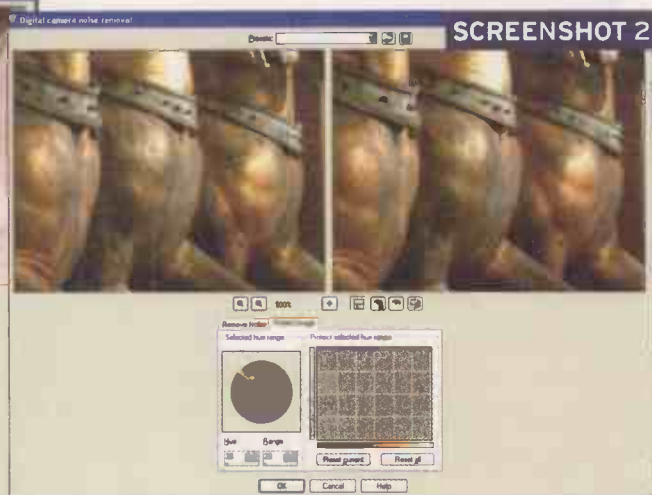


Ken McMahon

is a freelance journalist and graphic designer. His involvement with digital graphics began with a Commodore 64. He graduated to Macs and now works mostly with PCs. Draw your own conclusions

What's hot in Paint Shop Pro 9

Noise removal and displacement maps can be extremely useful – here's how



In last December's PCW (page 75) I reviewed Jasc's Paint Shop Pro 9 (PSP). This is a good upgrade and PSP users should be pleased with the new features and improvements. Nonetheless, I concluded that PSP was still no match for Photoshop. It must irritate the pants off Jasc that PSP continues to be compared with an application costing five times as much, but it's also quite flattering, particularly when the cheaper product comes out on top.

More often than not it's the other way around, though. PSP 9's new Fill Flash and Backlighting filters aren't a patch on Photoshop's Shadows/Highlights and if you want to rescue shadow detail in PSP without bleaching the highlights you'll need to resort to the kind of techniques I described in November's Digital imaging column (page 202).

On the other hand, there are some areas in which PSP scores over Photoshop, and there are two features in the new release where Jasc has succeeded in gaining an edge – the Digital Camera Noise Removal filter and the Displacement Map effect.

These two features fall at opposite ends of the usability spectrum; the first is for everyone with a digital camera, as noise is something you'll find in all of your images. The second has a bit more of an esoteric flavour. Even people who've heard of displacement maps often don't know what they're for. If you're the kind of person who piles back copies of PCW from floor to ceiling, check

Above left: Paint Shop Pro 9's new Digital Camera Noise Removal filter in action. Set sampling regions in the left window

Above right: You can use the Protect Image tab to hold back specified colour ranges – but it isn't very intuitive

Below: A better option is to duplicate the layer, reduce its transparency and use a layer mask

out the March 2003 Hands on section for the lowdown on Photoshop displacement maps. Alternatively you can buy it for 99p from www.pcw.co.uk. Better still, find out how to do it the PSP way right here.

Noise removal

Removing noise is a subject I've looked at before. In that article I assessed a variety of noise reduction plug-ins. Now that PSP includes its own noise-reduction feature, you don't need plug-ins, so how exactly does it work?

To open PSP 9's Digital Camera Noise Removal filter select Adjust> Photo Fix> Digital Camera Noise Removal or click the DCNR button on the Photo Toolbar. I take issue with word 'removal'. You can't entirely remove noise from a digital image, but you can make it less visible. The DCNR dialogue box features the usual

before and after preview windows with zoom buttons below the before thumbnail and proofing buttons which apply the preview to the main image window below the after thumbnail. I prefer to ignore the proofing controls and expand the dialogue box to fill the screen (see screenshot 1). To get a look at what's happening to noisy pixels you need to select 100 per cent magnification. You can move the image about by dragging in the right-hand thumbnail.

Below the preview windows there are two tabs – Remove Noise and Protect Image (see screenshot 2). The Remove Noise tab has a Sampling regions thumbnail which has three crosshairs positioned on it. If you drag in the right-hand preview thumbnail to part of the image that contains one of the crosshairs, you'll see a corresponding rectangular marquee in the left-hand preview window. This is a Sampling region, which the filter analyses to determine which pixels are noise and which are genuine image data.

The sampling regions can be resized by dragging the corner handles and you can add new ones by left-click-dragging in the left-hand preview window. Flat areas of colour containing noisy pixels make the best sampling regions. Try to avoid detailed parts of the image and anything containing edge detail. To delete a sampling region you have to drag one of the corner handles and resize it until it disappears.





In the noise correction pane there are three input boxes with sliders that can be dragged from zero to 100 per cent to reduce noise occurring in small, medium and large groups of pixels. Most of the noise you'll be dealing with occurs in individual pixels or very small groups. While the large slider does a good job of eliminating noisy pixels, it also destroys all the fine image detail. My advice is to leave this one set to zero.

You also need to exercise a fair degree of caution with the medium slider and, although a lot depends on the individual image, I wouldn't recommend sliding this one past 30. There's a Link detail sizes checkbox which maintains the relationship between these three sliders, but as you're unlikely ever to use the large one it's probably best left unchecked.

Below the three noise correction sliders are two more, for Correction blending and Sharpening. The first of these blends the noise-corrected image with the original, providing a means of reducing the overall effect slightly and re-introducing some image detail. The second appears to apply the Unsharp mask filter, but with less control, lacking a radius or clipping input. I'd suggest you set Correction blend to 100 per cent and Sharpening to zero and apply any blending and sharpening outside of the DCNR dialogue.

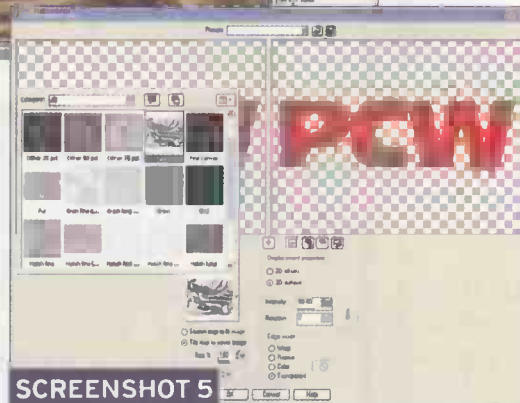
If you duplicate the layer prior to de-noising you can use the layer transparency controls to blend with the original (see screenshot 3). You get a better view of what's going on and have access to blend modes. If you apply a mask layer you can then paint the mask to restrict the noise reduction to specific areas.

There is another way to ensure parts of the image unaffected by noise are ignored by the DCNR filter. Click the Protect Image tab and Ctrl-drag in the left-hand preview window to sample the region you want to exclude from noise reduction. The selected Hue and Range settings correspond to the colours in the sampled region, you can adjust the range using the colour wheel and graphic equaliser style controls, but it isn't the most intuitive process.

Despite recent advances in sensor technology, noise is still a problem in low-light situations and PSP 9's new DCNR filter provides a very workable solution to the problem.

Displacement maps

Displacement maps aren't for everyone, but if you want to place text or a graphic over a photographic image and make it look like it's part



of the textured surface, rather than sitting on top in a detached digital layer sort of a way, a displacement map is what you need.

You can use a displacement map to make text look like it's part of an object – as if it was sprayed on a wall for example. Displacement maps can also be used to put a logo on a flag or other crumpled fabric and to add water distortions to type and graphics.

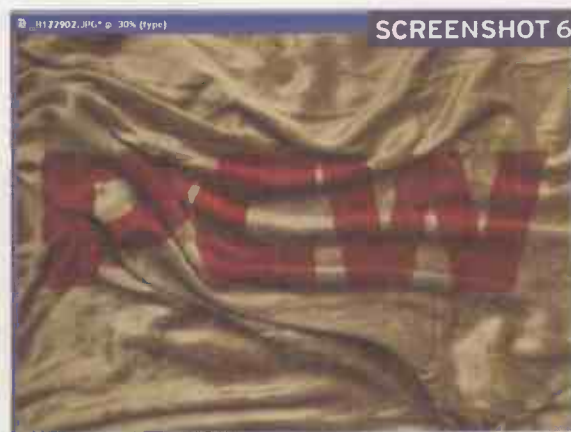
PSP's Displacement Map effect is first rate. It comes with a whole host of texture samples which you can easily apply to any image. Better still, it allows you to apply an image as its own displacement map.

In Photoshop, you need to create an alpha channel from a selection and save it as a separate image, then apply it to the original. In PSP this isn't necessary as you can apply the current image as a displacement map. The

Top: Nice fabric, but how do you add text and make it look realistic?

Bottom: By using Paint Shop Pro's new Displacement Map effect to distort

Then use the colour blend mode so the fabric texture shows through



Displacement Map dialogue box also provides a blur slider. Displacement maps work by moving pixels in the target image according to the greyscale values of pixels in the displacement map. Too much contrasting detail in the displacement map image can cause the target image to distort and break up, but you can avoid this by blurring the displacement map.

Here's a recipe for applying the Displacement Map effect to make type adopt the contours of folded fabric;

you can adapt it to suit. First, open the target image in Paint Shop Pro 9, duplicate the background layer and rename it 'map'. Next, add the type layer and duplicate that. Select the duplicated type layer and choose Convert to Raster Layer from the Layers menu. Double-click the rasterised type layer in the Layers palette and rename it 'type' (see screenshot 4). Turn

off all of the layers, except the map layer by clicking their layer visibility buttons (the eye icons) in the Layers palette and make the (invisible) type layer active by single-clicking it. Choose Effects, Distortion Effects, Displacement map and, in the displacement dialogue box, click the Displacement map button under the before preview thumbnail and select the current image. Adjust the blur and intensity sliders until the type in the right-hand preview is distorted, but not breaking up (see screenshot 5). You won't be able to proof it in the main image window as the type layer is turned off. Ignore the stretch and tile radio buttons as the map and target image are the same size.

Click OK to apply the effect, make the type layer visible and change the blend mode to colour, hard light or multiply (see screenshot 6).

If you have trouble getting the distortion to follow the target image contours, try splitting the image to channels, pick the most contrasty one, increase the contrast using Levels and save it to C:\Program Files\Jasc Software Inc\Paint Shop Pro 9\Displacement Maps\mymap. Then select mymap from the menu in the Displacement Map dialogue box.

CONTACTS

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What's new in PHP5?

Find out if you should upgrade and make use of this programming tool's new features

Regular readers of the column who've followed the series on PHP programming may have noticed that version 5 of PHP is now available. But do you need to upgrade and what should you watch out for?

It's important to remember that, while it's always good practice to keep software on your web server up to date, there's not an urgent need to move to PHP5; PHP4 is still being revised and updated and the next release will be version 4.3.10. If you have a large or important website using PHP, you may be better off evaluating PHP5 on a test server and making sure that everything works properly before making the switch.

As the PHP website says, most code should be fine. There are new features including a better optimised engine, improved handling of XML and objects. If you've followed some of our example code regarding objects, you'll discover some changes in PHP5. First, if you've got two objects, \$object_a and \$object_b, and you say:

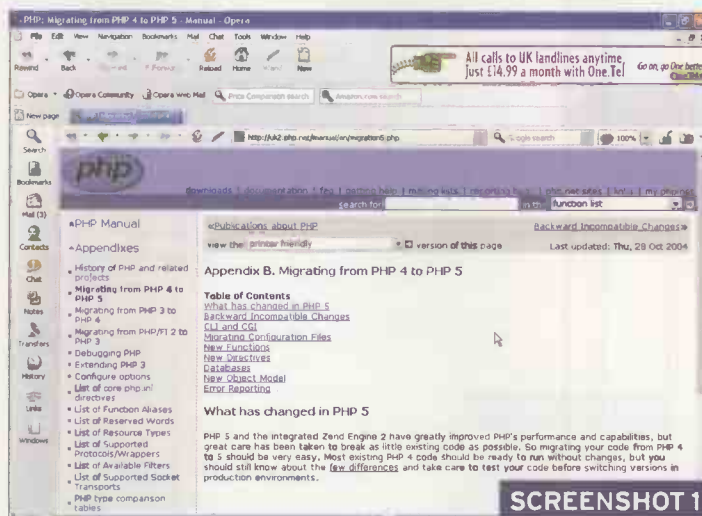
```
$object_b = $object_a
```

then in PHP4 you now have two objects, which are identical, but separate, as we explained back in June 2003. Some of you might well have made use of this behaviour in your own scripts. If you have, then you need to think again, since in PHP5 what happens is that these variables are really references to objects, rather than the objects themselves. The result of the code fragment above is that \$object_b will be a reference to the same data as \$object_a, rather than a copy of the object.

That means, whereas in version 4, changing \$object_b would leave \$object_a unaltered, in PHP5 making a change to either \$object_a or \$object_b will affect the same underlying data. Long-time programmers may be used to this way of doing things, but it can be a surprise to many newcomers; think of it as a little like making \$object_a an alias of \$object_b.

If you really do want to make a separate copy of the object, there's a new function called clone, so to behave like PHP4, the code in PHP5 you need is

```
$object_b = clone $object_a
```



SCREENSHOT 1

\$object_a ;

(Key: ✓ code string continues)

You can add a corresponding __clone method to your object class if you want anything special to happen when the copy is done.

Another change in objects is the way they're constructed; again, back in June 2003, we explained how you can write a constructor function that's called when you say, for example, \$image = new Photo ; where you have an object class called Photo, and PHP looks for a method with the same name as the class. This will still work in PHP5, so you can use it if you want your scripts to work on both versions, but there's also a new notation, where a function called __construct will be used (that's two underscores). So you could change functions that have the same name as the class containing them into __construct; if there's no such function, PHP5 looks for the old way of doing it.

Database changes

Other major changes are in database access, where the combination of PHP and MySQL has long been a popular way of creating data-driven websites.

PHP5 includes the SQLite library, which is a built-in SQL database, so you don't necessarily need to worry about installing MySQL on the server and, of course, since SQLite uses files on your disk, rather than a server connected via the network, there's one less application to worry about patching against network attacks.

If you use objects or MySQL databases in your website's code, check carefully to see what's affected by changes in PHP version 5

You can still use MySQL and for large projects, that is probably a sensible idea – especially if you may want to move the database server to another system later. However, simply by sticking with MySQL you won't be immune from the need to go over your code. MySQL support was not included in PHP5 as there were some issues with the licence, hence the use of SQLite instead, but there is still a library available that will let you use MySQL, as long as you compile PHP with it.

To use the library, which is called MySQLi (for improved), you need MySQL 4.1.3 or above on your server. And while the basic functions to connect to the database, send a query and fetch results are still there, so you won't need to fiddle with your code too much, they do have slightly different names, beginning with mysqli instead of just mysql. So, instead of code saying:

```
$db = mysql_connect(
    'localhost', 'myname',
    'mypassword');
mysql_select_db(
    'databasename', $db);
```

you need to say:

```
$db = mysqli_connect(
    ('localhost', 'myname',
    'mypassword',
    'databasename'));
```

As in that example, you can combine the database name with the other parameters here, something you couldn't do with the old MySQL connect function; there's still a mysqli_select_db function, which you might think would make changing code more straightforward, but the parameters are reversed, so you'd need to replace the mysql_select_db function above with this alternative:

```
mysqli_select_db($db,
    'databasename');
```

So, proceed with caution and check the documentation on the PHP website (www.php.net) carefully, to make sure you don't fall prey to any other gotchas. Remember too that even if you're relying on Dreamweaver or a similar tool to create the PHP code that underlies database-driven pages that you've



built, you could still run up against this sort of problem if your web host switches to PHP5 or decides that MySQLi is a better bet for database sites. In fact, it's possible to have both the MySQL and MySQLi extensions enabled in PHP, which will aid transition. Obviously, it's not a good idea to mix and match in the same project.

The best advice regarding PHP5, then, is probably for web developers to take things slowly. Ensure – if it's your job – that you keep your existing PHP4 installation up to date, and perhaps begin to plan a change to MySQLi for your database functions; set up a test server with PHP5 and make sure everything works as you expect – especially if you're using object-based code (see screenshot 1). PHP4 is far from dead, so you don't need to rush to change over.

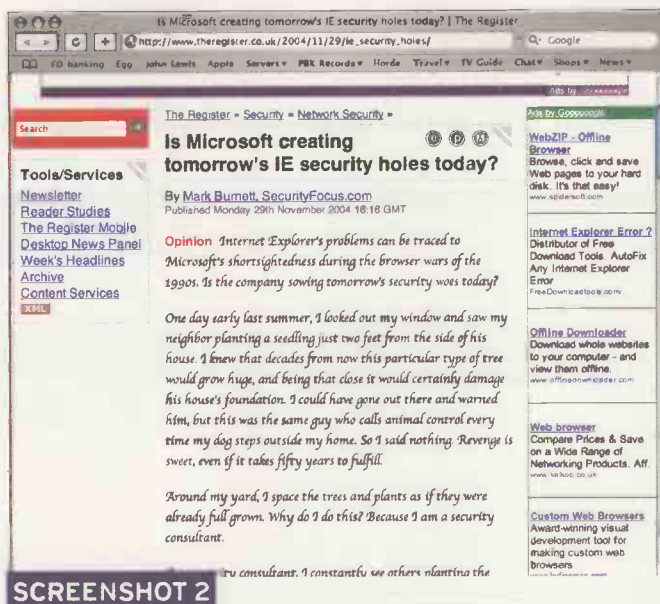
Image queries

Reader David Newman had a question regarding image manipulation: 'I like to complete the title, subject, author and comments properties of my jpeg images as this ensures a handy way of remembering them. However, I should also like to be able to extract this data to a table against the file name for manipulation with MySQL, but I cannot find a PHP function on the website.'

The answer lies in Exif, which is the standard for adding metadata of this type to an image. PHP versions 4.2.0 and above, when compiled with the Exif support (add the --enable-exif flag) can make use of the information, via the `exif_read_data` function. If you search the PHP site for the function, you'll find examples.

Also, since you may not be in a position to change the compiled-in options for the PHP installation on your server, you may find it helpful to follow some of the user-contributed links on that page, which provide alternative solutions that can be used without the need to recompile PHP.

Once you can read the data, you could then use it in something like the PHP photo album project we created in August and September 2003, to populate a web form with basic info, before prompting you for some additions or alterations.



SCREENSHOT 2

Just because you can choose a cursive font in a stylesheet, doesn't mean you should

Styling with CSS

Stylesheets are a useful tool for creating layouts on web pages, as many readers will doubtless know. Most web editors provide a means to create them and, to all intents and purposes, you can regard many of them as a simple way of applying formats very much like the styles you're used to in your word processor.

Of course, CSS (cascading stylesheets) can do much more than that, including detailed layout without the need to use tables or frames and again you can do much of this work in a point and click way with modern web editors. But since

'Stylesheets are a useful tool for creating layouts on web pages, as many readers will doubtless know'

we're always keen to know how things work, this being Hands on, we're going to take a look at the basic elements of CSS and how you can use it.

Modern browsers allow you to specify your own style sheet to override any specified on the web page, which is something that can be useful for those with visual difficulties, ensuring certain colours and font sizes are used. And, of course, as we saw with Firefox a couple of months ago, you can load a stylesheet on the fly, to see how it will affect the page you're presently viewing.

First, though, what is a stylesheet? Well, they can come in two forms, either as information embedded within your web page or linked via a separate file. The latter is more

useful, since it will allow you to change just one file and affect the appearance of your whole site.

Within a web page, you can include a stylesheet with code like this, which sets the page to black text on a white background:

```
<style type="text/css">
body { color: #000000;
background: #FFFFFF; }
</style>
```

The style sheet is simply the name of an HTML tag, with the attributes that will be applied to that tag following, in curly brackets. Each attribute has a name followed by a colon and a value and ending with a semicolon. If you want the style information to be included from a separate file, `mystyles.css`, you would instead have this code in your document's head:

```
<link type="text/css"
rel="stylesheet"
href="mystyles.css">
```

Of course, setting text and background colour is trivial; where CSS starts to be useful is in providing much better control over layout, allowing you to specify attributes such as margin-top, margin-bottom, margin-left and margin-right, which can be given as percentages of the window width or height, pixels or ems, which is the size of a letter m in the current font.

So, if you want to have a margin the width of five letters either side of a paragraph, you could say:

```
p { margin-left: 5em;
margin-right: 5em }
```

You can also specify an indent for the first line, with the text-indent attribute. And it's CSS that allows us to specify the fonts that we'd like to see on a web page, giving either a specific name, or classes of font, such as serif, sans-serif, monospace or even cursive. So, if you really want text to use a swirly handwriting font, you can say:

```
p { font-family:
cursive ; }
```

and instantly render your pages next to impossible to read, as you can see from screenshot 2.

We'll look some more at the basics of CSS in the May issue, and how you can use it to create pages with columns and other features, without the need to use tables or frames.

CONTACTS

Hands on Web development will return in May issue. Nigel Whitfield welcomes your comments on the Web development column. Email him at: webdev@pcw.co.uk. Please do not send unsolicited file attachments.



Use your connections

How to tackle the problems of networking PCs using technologies other than Ethernet

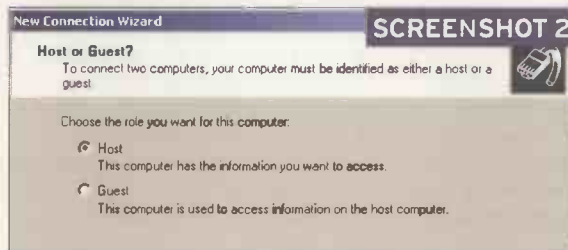
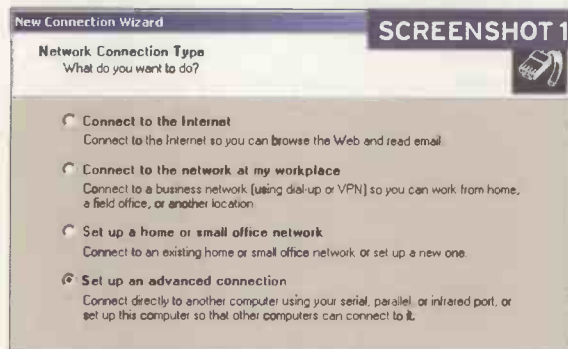
I've had a number of emails from readers trying to network PCs using technologies other than Ethernet. Most commonly that means a parallel, serial or USB cable, but infra-red can also be used, along with the Firewire interfaces built as standard into a lot of notebooks. In their favour it's not that difficult to use most of these technologies to create a small network, with much of the software required built into both Home and Professional versions of Windows XP. However, there are limits to what you can achieve and common problems that need to be addressed – so much so that I will go through some of the issues in this month's Networks Hands on.

Direct cable connection

I'm concentrating here on what Windows refers to as a direct cable connection (DCC) using the kind of parallel, serial or USB cables more normally associated with printers and other peripherals. However, you can't just use a printer lead; you need to buy a cable specially manufactured to provide the right kind of connector at each end and to cross over some of the wires for the signals to be transferred correctly. If you want to use USB, it's important to stress that you shouldn't try using a cable by itself.

Unfortunately it is possible to get USB leads with the same connector at each end (so called A-to-A cables), but if you use one of these you're likely to short out the power connectors built into the USB interfaces with potentially disastrous consequences. Instead, you need a USB bridge, either built into the cable or as a separate device into which the cables are plugged. You'll need additional software to set up a network using USB, and the information that follows only applies to serial, parallel or infra-red links. In fact, USB really isn't any easier or cheaper than Ethernet and probably best avoided unless you're really determined.

There are other more general considerations too. A DCC link, for instance, is limited in terms of the number of systems that can be networked (usually just two) and they can't, typically, be more than a couple of metres apart. Bandwidth is restricted too, with DCC a lot slower than Ethernet, making large file transfers very tedious. However, with



the necessary interfaces built in, a direct parallel, serial or infra-red link is a cheap and easy alternative if, for example, all you want to do is copy the occasional file from one PC to another or to share a printer.

Getting started

The first thing you'll need is a suitable DCC-compatible cable. These can be purchased from most online and catalogue suppliers for just a few pounds. Belkin resellers, for example, offer products of varying length and quality. Most Laplink cables can also be used with Windows DCC.

Next, you need to call up the Windows XP New Connection Wizard, by going to the Control Panel and selecting Network Connections. Click on Create a new connection in the list of tasks in the side panel and the wizard will start, as shown in screenshot 1.

The New Connection Wizard is used for a lot of things but, for a direct cable or an infra-red connection, choose the option marked 'Set up an advanced connection' followed by 'Connect directly to another computer'. You'll then be asked whether you want to configure a host or a client – an important choice as, unlike Ethernet networking, the PCs at either end of a

When configuring a host PC, you may need to create new user accounts to control access to its resources

Top: As well as Ethernet networks the XP New Connection Wizard can be used to configure a direct cable connection

Bottom: On an Ethernet network all PCs are equal, but with a direct cable connection you have a host at one end of the link and a guest at the other

DCC link aren't equal. The host is the PC containing data that you want to be able to access from the guest machine, and you need administrator rights in order to configure it. The guest is the PC that will be used to access the information on the host system. Guest connections can be configured without administrator rights (see screenshot 2).

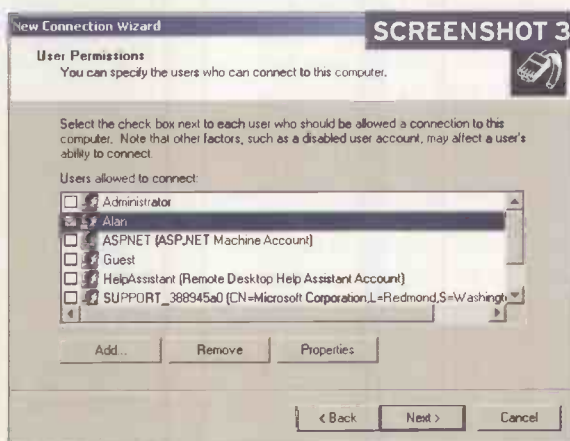
When creating a host, you're first asked for the type of connection to use, with a choice of parallel, serial and, if available, infra-red ports. That done, you need to specify the users to be allowed access to the host. Users already defined will be listed, with options to add new ones and to change their passwords and permissions (see screenshot 3).

A new connection labelled Incoming Connections will be added to the Network Connections folder on the host PC. This never needs to be selected or run directly; it just waits until a guest connection is detected, then starts up using the settings defined via the wizard.

At the guest end

The procedure on the guest PC is much the same, except the first thing the wizard will ask for is the name of the host computer. This isn't really used, so you can specify anything you want, but it's worth typing in something meaningful such as 'Desktop host', for example, to remind you what you're connecting to.

The wizard then asks for the type of connection – again, that's a parallel port, serial port or infra-red – before creating a new connection with the name specified in step one. You may need to reboot at this stage. Microsoft says you shouldn't have to, but with





nearly every direct connection I try, I get protocol errors until I do.

You're then ready to connect the guest to the host PC, both physically and then logically, by double-clicking the newly created Network Connection icon on the guest PC. A dialogue box will pop up and ask you for a suitable user name and password on the host with the option of saving these for the current user of the guest system, and any others if the PC is shared (see screenshot 4).

And that's about it as far as the basic connection is concerned. Speed, as always, is dependent on a number of factors including the type of cable and the specification of the PCs. It's never going to be as fast as wired Ethernet, but with most parallel cables you can expect around 4Mbps/sec, which is roughly the same as an 802.11b wireless link.

Although the example here is for Windows XP, direct cable connections can be created using earlier implementations of Windows, including 98 and 2000. The procedure involved is somewhat different, depending on the versions of software used, but the end result should be much the same and you can mix hosts and guests running different versions of Windows.

Using the connection

Once your DCC is working, resources on the host can be accessed by the guest in much the same way as on a standard Ethernet network. While a guest will be able to see and access resources shared on the host PC, the latter can't access anything defined as shared on its guest. You may have to make other changes to use your DCC just as you would on an Ethernet Lan.

If you don't see the host PC listed in the My network places folder on the guest PC, click on View workgroup computers in the task list to make the guest PC look for other systems on the network. If no systems are found, it's possible that the two PCs are in the wrong workgroup, which is easy to fix. From the Control Panel (Classic

To initiate a DCC connection, double-click the newly created Network Connection icon on the guest PC and enter a valid username and password

You can change the workgroup name from the System applet in the Windows Control Panel

View), select the System applet and choose the tab marked Computer Name. Here you can see the name of the PC and the workgroup or domain to which it belongs. By default, Windows will assume a workgroup called 'Workgroup', but you can use anything you like as long as each PC (host and guest) has the same setting. However, if you're using a PC that normally connects to a domain, it's better not to switch from using a domain to a workgroup; just make sure the PCs at home are members of a workgroup with the same name as the domain to which the notebook normally connects (see screenshot 5).

Sharing resources

Accessing the resources on a host PC should be a matter of double-clicking its icon in the My Network Places folder and browsing to what you want. Depending on how the target system has been configured, however, you may need to define one or more network shares. It's not always necessary; for example, if

you've run the XP Network Setup Wizard, you'll find the Shared Documents folder is already available on the Lan. However, if it isn't accessible you can share it, or any other folder on the host system, simply by right-clicking the folder and choosing Sharing and Security. Put a tick in the box marked Share this folder on the network, optionally changing the default share name, and you're done. You can also set user access rights, although on a direct cable connection network you really don't need to (see screenshot 6).

If you try to create a share for the built-in Shared Documents folder (usually used to share documents between local users), XP will suggest running its Network Setup Wizard. However, this changes other things, such as the workgroup name and Internet connection settings. If you've already set these, the wizard could set some of the parameters back to the defaults, in which case it's preferable to create the share manually, as already described.

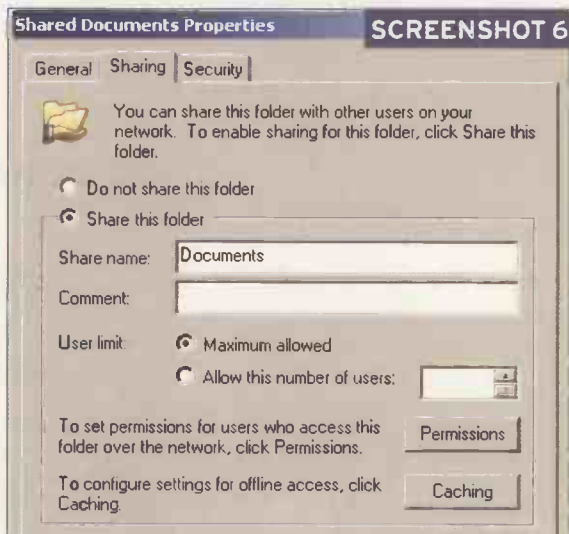
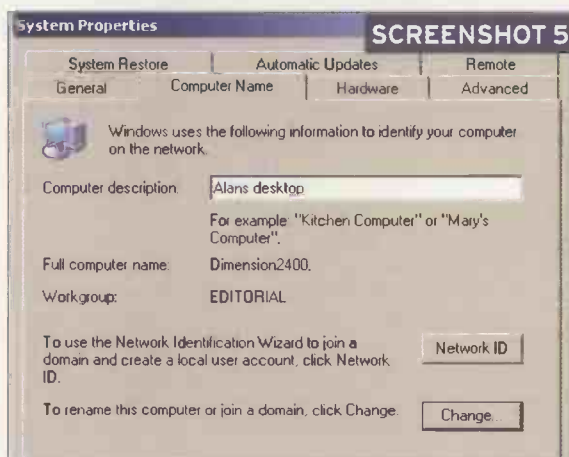
Printers can be shared in several ways, the easiest of which is to let the XP wizard do it for you during initial printer setup. Otherwise, open the Printers and faxes window on the host, right-click the required icon and choose Sharing. For guests running Windows 2000 or XP the necessary printer driver will be copied across and installed automatically when they use the shared printer. If you want this to happen for guests running other versions of Windows, click Additional Drivers and follow the on-screen instructions to prepare the necessary files.

Not quite networking

Setting up a direct cable or infra-red connection between two computers is relatively straightforward and doesn't have to cost much. However, the fact that you're using a technology not really intended for networking should be kept in mind. Simple file and printer sharing is easy enough, but if you want to share an Internet connection or run network-oriented applications, things get a deal more complicated. Indeed, if Internet sharing is your main goal, then a conventional Ethernet network is likely to be easier and yield better results – and it needn't be much more expensive to configure.

CONTACTS

Alan Stevens welcomes your comments on the Networks column. Email him at: networks@pcw.co.uk. Please do not send unsolicited file attachments.



If the Shared Documents folder isn't available on the network, you can share it or create other network shares yourself

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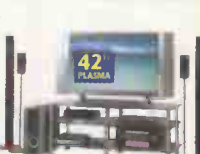
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Access to the future

Discover what lies in store for Access, as Microsoft reveals its plans for the database

This is a database column, not an Access column. However, it is clear from the email I receive that by far the majority of readers are using Access. So, with apologies to users of other databases, this month we'll focus entirely on Access because, for the first time, Microsoft has provided a roadmap for the future of the product. Clint Covington, lead program manager for Access, gave a talk at the National Seminar of the Access User Group about where Microsoft sees the product going.

Not in its twilight years

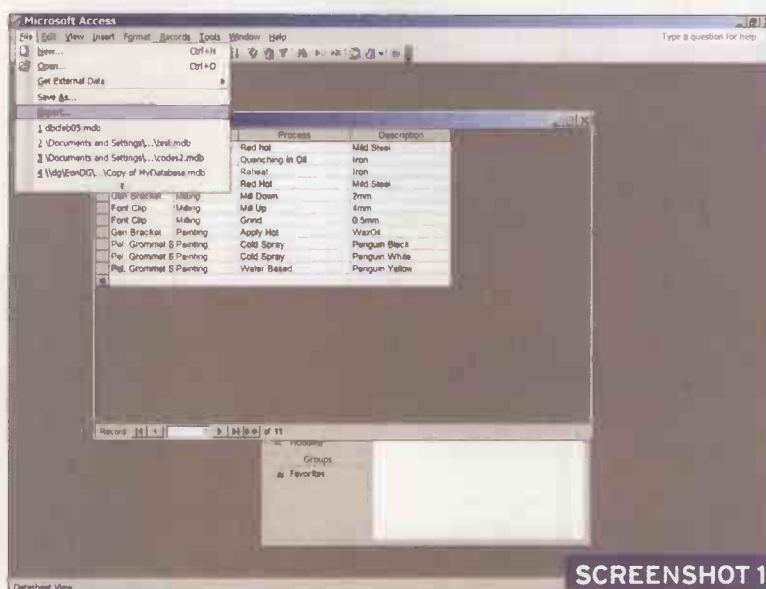
In the past couple of years, Microsoft has taken a long, hard look at Access. People within the company felt that the product had come to a crossroads. Either it needed to be given the database equivalent of a makeover or it was to be, in Microsoft parlance, 'twilighted'. (This is, I think, one of the better examples of 'noun verbalisation' I have come across in a long time.)

To save you the anguish of anticipation, twilighting is no longer an option. Covington gave us our first preview of what the daylight at the end of the tunnel might look like. He made it quite clear from the start that he wasn't there to talk about Office 12 (the next version of Office), nor was he there to talk in detail about the feature set of the next version of Access which may, or may not, be a standard part of Office 12.

What he was there to do was to give a flavour of where, in general, Microsoft sees the product going in the next five years, to give a feel for the level of commitment that Microsoft is putting into the program, and to cover the markets at which the product will be aimed.

Who uses Access?

Microsoft started the assessment process by trying to find out who was currently using Access and what they do with the product. Of the people who use Access, about half of them use databases that other people have created; the other half spend part of their time creating databases. Of the 50 per cent who create databases, about 24 per cent write code in Access. Microsoft was surprised that so many of the current users are



SCREENSHOT 1

actively using the product to create what are clearly moderately complex databases.

Where and how?

Access is used by SMEs (small to medium-sized enterprises). During a host of customer visits, Microsoft found that many people said 'You can't remove Access, we use it to run our business.' (This was one of the killer arguments against the dreaded twilighting).

'Microsoft was surprised so many are using Access to create what are moderately complex databases'

In addition, Access turns out to be a sweet spot for power users, departmental and professional developers. It is widely used at the departmental level for the creation of, for example, small, cost-effective, information-tracking solutions.

Microsoft now sees Access as being about building workgroup solutions. It also found that the most widely used database on the planet is not Access, but Excel. Microsoft wants to move people using Excel as a database over to Access.

Commitment

Having discovered that the product was viable and had a place in the market, Microsoft has elected to

Exporting data
from Access

the rest of the product range? Surprisingly, the product that has come under the greatest scrutiny for integration with Access is Sharepoint.

Think about it this way. Access is now seen as a departmental-level database solution. People at the department level often want to be able to share data within a workgroup of perhaps one to 15 people. They love the data validation that Access offers, and they love the reports, but are desperate to make their data available on the web.

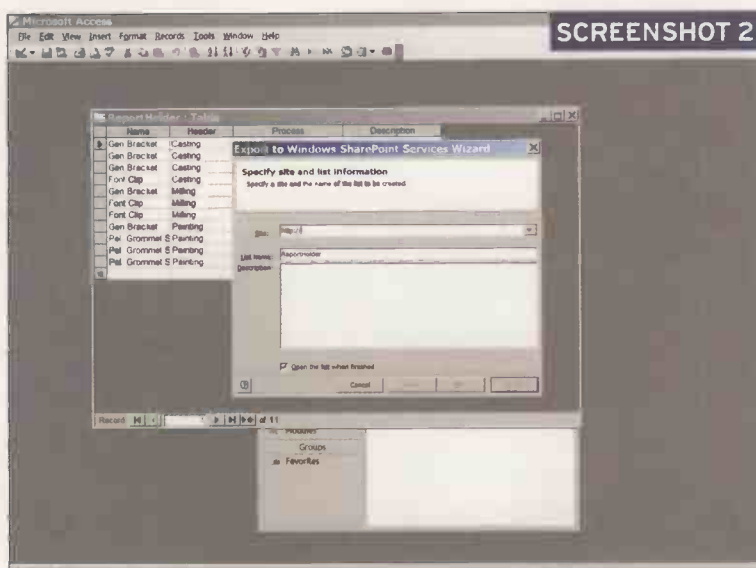
In Microsoft's view of the world, workgroups are now centred around Sharepoint, so the two products are going to have to work more closely together. Indeed, work started some time ago on this kind of co-operation. Some of the Access development team have been working on Sharepoint to ensure that the building blocks are in place, as Covington demonstrated using the current versions of Access 2003 and Sharepoint.

It is possible, within Access, to choose Export to Sharepoint, which will send a table of data to Sharepoint (see screenshots 1 and 2). From within Sharepoint, you can then filter, sort and display the data and have it appear as, say, a web report.

In other words, you can create views in Sharepoint that sub-set and present the data in an attractive way. Remember that the data is now being held and managed by Sharepoint. From Access you can then produce a



SCREENSHOT 2



link to the data in Sharepoint. Once that is done, you can base Access forms on that data.

This is already possible with today's products, but there are restrictions. For example, Microsoft recommends that we should keep the number of rows in Sharepoint to fewer than 10,000. In addition, Sharepoint has no notion of joins between tables so you have to keep the data in Sharepoint flat and small.

Microsoft has sold about 40 million licences for Sharepoint, so the company is making serious bets that this is going to become the hub for workgroups. In turn, that means we can expect to see much better integration between these two products in future.

Access pages and ADP

This use of Sharepoint to make data available across the web prompted a question from the audience about ADPs (Access Database Projects) and data access pages. The reply was that Microsoft has found people still love Jet and MDBs. The uptake of access pages and ADPs has not been great, so the team is not focusing on developing these areas. However, ADPs will continue to run. Covington said that if ADPs didn't run in the future, that would be considered an upgrade blocker – and that upgrade blockers were considered to be bad for the careers of lead program managers.

Types of customers

Microsoft feels that Access has already captured the power users and so it wants to significantly expand the user base. So, while he wouldn't be drawn on details, Covington said that one of the goals of the next version will be to make the product much easier to use and more

The current version of Access comes ready configured to export to Sharepoint

attractive. He proceeded to give us a demo of what was explicitly not a version of the new product, but something that demonstrated some of the ideas the development team are considering.

For example, the data sheets can be made more attractive by using features such as gradient colour fills and rich text (bold, italics and so on). Controls could resize on forms as

the form is resized and there could be much better support for images. The team would also like, for example, to supply default date pickers that appear automatically for date fields. It has also looked at synchronising data sheet and form views.

There is talk of replacing the switchboard manager with a navigation pane on the left-hand side of the screen, finally ending the excessive wear of the F11 key that is associated with Access developers.

'One of the goals of the next version will be to make the product much easier to use and more attractive'

Features such as the ability to edit lookups and value lists without losing context (no need to flip to design view), and fill down and auto-complete in the datasheet, are also being considered. Other desirables include the ability to email a form to people so they can complete it within the email. When they email it back, the underlying data table is automatically updated using the data in the form.

Another area that will be scrutinised is reporting. Currently, reports are images in Access; this will have to change. The team wants to add the ability to, for example:

- Find data in reports
- Copy and paste from reports
- Expand and collapse the reports on-screen
- Provide document outline and drill through to the original data
- Design while looking at data
- Grouping, add/delete fields, resize controls, changing formatting, and so on.

On broader issues, the team intends to:

- Continue to make the linking to external data easier
- Improve scalability and stability
- Support complex data in Sharepoint and SQL Server
- Improve upsize data to Sharepoint and SQL Server
- Work on an integrated security model.

Is Jet dead?

One subject Covington refused to be drawn on was what lies in store for Jet: 'I can't talk in detail about the future of Jet. I can say that Jet is alive and well at Microsoft. No-one at Microsoft has ever said that Jet is dead. In order to achieve the stuff described above we will do whatever is necessary. I will say that we used to see MSDE on everyone's desktop, but we don't see that happening any more.'

All of which sounds positive for Jet, so why not simply say that Jet will continue to be used to underpin Access? One might suspect that this has a great deal to do with Sharepoint (which in turn is underpinned by SQL Server), but time alone will tell because Microsoft clearly isn't going to say much for a while.

Infopath v Access?

Covington was also asked about Access and Infopath. He said that Access does a great job of importing XML data from Infopath and that Access can be a great reporting tool for the product. He sees Infopath more as an enterprise tool and Access more as a workgroup tool.

Finally, in clear praise of the original developers of Microsoft (including the famed Bill Marklyn), he said: 'The Access query processor is still one of the best features of the product. Many people have tried to improve on what those people did – none of them has ever been successful.'

Long live Access

For those of us who love Access, this is clearly great news. For the foreseeable future, Access will continue to be around in some form or another. We can continue to play with it, make money from it and generally have fun with it. Sounds good to me.

CONTACTS

Mark Whitehorn welcomes your comments on the Databases column. Email him at: database@pcw.co.uk. Please do not send unsolicited file attachments.

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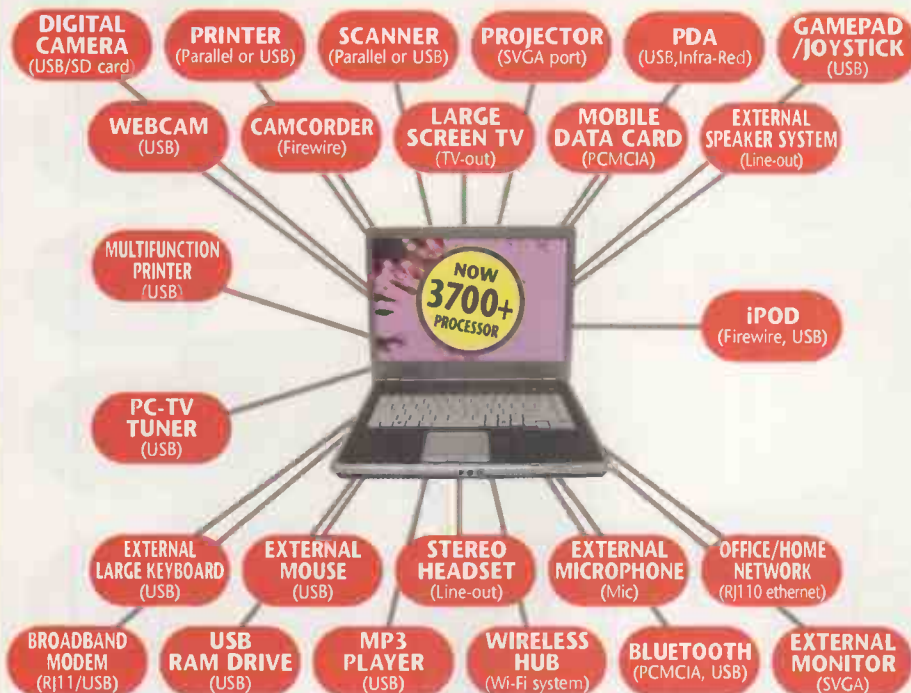
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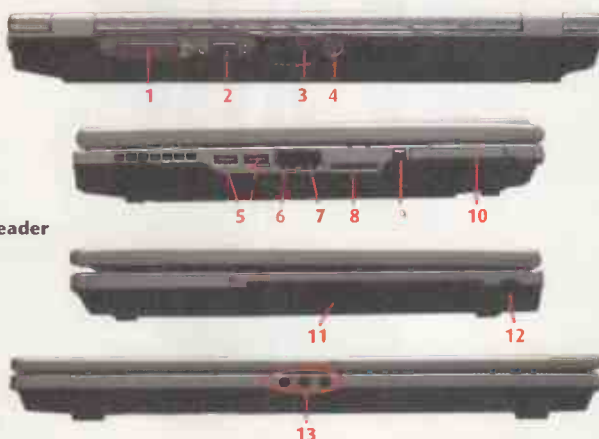
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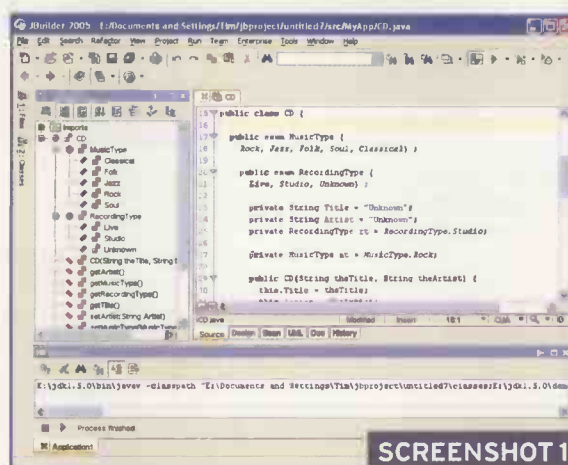
Here are some tips on using Sun's platform to make coding simpler and more robust

Sun's Java is a great way to code cross-platform applications or dynamic websites. Version 5, released last year, introduced some significant language enhancements that make Java coding easier and cleaner. Incidentally, Java version numbering is confusing. According to Sun, we are at version 5 of the Java 2 platform. However, internally the version is 1.5, and that is what Java itself reports in the java.version system property. Therefore, developers tend to think of it as 1.5. Another intriguing feature of Java 5 is how it picks up features that Microsoft implemented in C#, its Java-like language for .Net. Examples are automatic boxing of primitive types, enum types, for ... each iteration through collections, and generics (all of which are explained below). In the case of generics, Microsoft has long indicated that they would be implemented in .Net, but they are only arriving in .Net 2 which is still in beta. Sun is therefore a step ahead, except that .Net generics are implemented in the runtime rather than being a compiler feature, enabling better performance.

From the developer's perspective, having these two vendors play catch-up with each other is no bad thing. Apart from anything else, it makes porting between .Net and Java relatively easy. In fact, non-visual code is already easily converted between C# or Visual Basic .Net and Java. The class libraries are another matter. There are large differences between the .Net Framework library and the Java class libraries, so porting code is still a challenge, but at least the language issues are now minor.

Understanding generics

Generics are easier to use than to explain. The short description is that they allow you to pass a type as a parameter. This means you can get the best of two worlds: strong typing combined with highly re-usable generic classes. The most common use of generics is for collections. In Java, the ArrayList is a handy class for storing collections of any object type. In your code, you usually only want to store one type of object in any particular ArrayList, but up until Java 5 you could not enforce that without creating your own collection class.



SCREENSHOT 1

Imagine you are creating an application to manage your CD library. Probably the first thing you would do is to create a CD class to represent a CD. You might then add some CD objects to an ArrayList, like this:

```
CD aCD;
theCDs = new ArrayList();
aCD = new CD();
aCD.setArtist("Radiohead");
aCD.setTitle("Kid A");
theCDs.add(aCD);
```

(Key: ✓ code string continues)

Later on, you can read a CD back as follows:

```
CD aCD = (CD)theCDs.get(0);
```

However, you might carelessly add a string to the collection, like this:

```
theCDs.add("Amnesiac");
```

This will happily compile, but at runtime you will get a ClassCastException when retrieving the object, as Java attempts to cast a string to a CD.

The solution is to tell the ArrayList what type of object it can accept. You do this with the following declaration, which includes the type as a parameter to ArrayList:

```
ArrayList<CD> theCDs;
```

enabling code as follows:

```
CD aCD;
theCDs = new ArrayList<CD>();
aCD = new CD();
...
theCDs.add(aCD);
...
CD aCD = theCDs.get(0);
```

Now the compiler will catch any attempt to add the wrong type of

JBuilder 2005 has strong support for Java 5

object to the collection, and you no longer need a cast to retrieve it. The code is also a little more concise. It is worth using generics wherever they fit.

Enumerated types

Like generics, enumerated types are a handy feature that you will use all the time. They accomplish two things. First, they enable you to limit a variable to one of a range of values. Second, they combine efficiency with readability. For example, you might want to assign each CD a MusicType, indicating what style of music it contains. You could make this a string, which is inefficient and error-prone, or more likely an integer with one of several predefined constant values. That still does not prevent assigning an invalid value. In Java 5 you can define this as an enumerated type, like this:

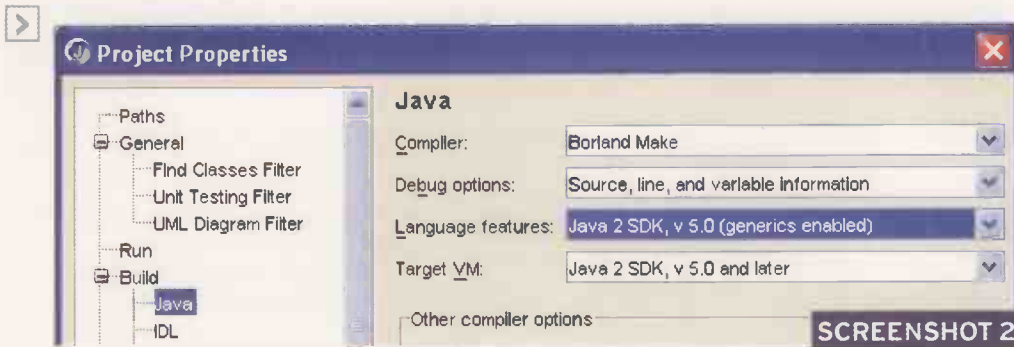
```
public enum MusicType {
    Rock, Jazz, Folk, Soul, Classical;
```

Now you can give your CD class a MusicType field with getters and setters. A useful feature is that toString() will return the text used to define the value, so you can do:

```
this.jLabel1.setText(aCD.getMusicType().toString());
```

Boxing

Object orientation is generally a good thing, but if every data type is a class, there is an overhead. For example, if you have an algorithm that simply crunches numbers, you need the efficiency of primitive types such as int and float. To give you the choice, Java has both primitive types and classes that wrap them. All the primitive types begin with a lower-case character, whereas the wrapper classes have initial capitals. You can easily convert from one to the other. For example, Double.valueOf(double) returns an object from a primitive type, while Double.doubleValue() returns the primitive type. In Java 5, this distinction is somewhat hidden. You can simply assign a Double to a double, and vice versa, and you can pass a primitive type to a collection that expects an object. It is not quite as seamless as in C#, where you call object methods on primitive types, but nearly. For example, the following pointless code



demonstrates autoboxing:

```
Double D = ✓
Double.valueOf(54.8798);
double d = D; //assign ✓
Double to double
ArrayList<Double> al = ✓
new ArrayList<Double>();
al.add(d); //add the ✓
primitive type to a ✓
collection
```

Autoboxing is convenient, but not a major benefit. It makes for slightly more concise code, but some developers dislike this kind of hidden conversion. It is also important to avoid using objects rather than primitive types within performance-critical loops.

Easy to iterate

It's easier to iterate through collections in Java 5, with the enhanced for statement. For example, the following adds the title of all your CDs to a JList, where theCDs is a typed ArrayList and lm is the DefaultListModel of a JList:

```
for(CD cd : theCDs) {
    lm.addElement(✓
    cd.getTitle());
}
```

This is really Java's version of the for ... each statement that you find in other languages such as Visual Basic. You can also use the enhanced for statement to iterate through an array without needing a counter variable.

Working with Java 5

The J2SE Development Kit remains a free download, but it comes without any IDE. However, the major Java IDEs have been adding Java 5 support. JBuilder 2005 understands the new features, although by default it targets Java 1.4 (see screenshot 1). You have to install JDK 1.5, add it to JBuilder using the Tools - Configure - JDKs dialogue, set Project - Properties - Paths to the location of JDK 1.5, and finally set Project - Properties - Build - Java to support version 5 features (see screenshot 2).

Eclipse users need at least version 3.1. Go to Project - Properties - Compiler and select 1.5 compiler compliance level, along with using a

Configure JBuilder to recognise Java 5 features

1.5 JDK. At the time of writing, Eclipse 3.1 is still in beta, and Java 5 support in the latest milestone release is good but not yet complete. Netbeans is the Sun-supported open-source IDE for Java, and for Java 5 support you need version 4 or higher, again in beta at the time of writing. IntelliJ IDEA has Java 5 support in version 4.5, which is a finished release, so credit is due to Borland and IntelliJ for good early support.

Swing versus SWT

In PCW December 2004 (page 183) I wrote about using the SWT library for a Java GUI. This prompted an email from Steve Crook, who comments: 'Swing is not more complex than SWT, it's just different. The separation of data from UI is important, and allows all sorts of things to be done that would be a real struggle without a design based on MVC [Model-View-Controller]. There

'Swing is not more complex than SWT, it's just different. The separation of data from UI is important'

is a little sacrifice to be made in complexity, but the programming benefits far outweigh the costs the moment a UI needs to do anything other than have a few edit controls or lists in a dialogue. My main regret is that Sun and Eclipse couldn't have got their heads together and perhaps handed control of Swing to the

Eclipse developers, so that the undoubted talent and effort that went into SWT could have been directed into getting Swing to be what we would all have liked it to be. We really don't need two GUI toolkits for



Behlendorf: 'A lot of people are not seeing any upside to Berkeley DB. It doesn't look like it's faster and it's not more reliable'

Java. I'm going to continue to program in Swing partly because that's where my code is and partly because I prefer it to SWT. I don't use Eclipse either. I prefer IntelliJ IDEA which, despite having to pay for it, I consider to be superior to Eclipse.'

I agree with much of what Steve says and did not intend the feature to be interpreted as advocating SWT over Swing. Merging them is a step too far, though; they represent different cross-platform philosophies and both have value. It's worth noting that you can do MVC with SWT, using the JFace wrapper. I also second the comments about IDEA, which is a delight to use.

More on Subversion

Subversion is an open-source version control system, featured in last month's column. When you create a Subversion repository with version 1.1 or higher, you will notice that you get a choice between two repository types. One uses Berkeley DB, and was originally the only option. The other uses the file system without the services of a relational database manager. This type is called FSFS, and has several advantages. Permissions are simplified, repositories are smaller and, most important, it will not lock up if there is a problem.

According to Brian Behlendorf, the CTO of Collabnet - the company that sponsors Subversion - FSFS is likely to become the recommended repository format. He told me that: 'A lot of people are not seeing any upside to Berkeley DB. It doesn't look like it's faster in any way, and it's not more reliable. I think we'll continue to support it since there are a lot of people with existing Berkeley DB installations, but I think FSFS is going to be the recommended route.'

The suggestion, then, is to use FSFS for your new repositories. If you want to convert old ones, this can be done by dumping the old one to a backup file, creating a new one and then restoring.

For Java 5 information and downloads, visit www.java.com/en/developers. For JBuilder 2005 information, see www.borland.com/jbuilder. The home page for Subversion is <http://subversion.tigris.org>.

CONTACTS

Tim Anderson welcomes your comments on the Visual programming column. Email him at: visual@pcw.co.uk. Please do not send unsolicited file attachments.

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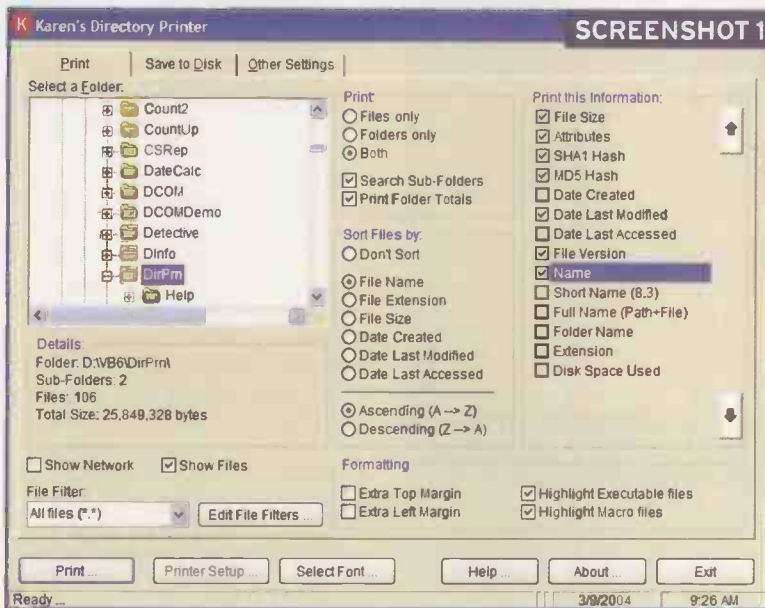


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Limited additions

A few add-ons can turn the Windows Explorer into a useful file management tool



You can use Directory Printer to print out directory contents or send them to a text file

Attribute Changer 5.23 (freeware, <http://webplaza.pt.lu/~rpetges>) removes or changes file attributes such as System, Hidden and Write-protected. It can only be accessed from the Windows Explorer context menu. After selecting one or more files or folders, the program can be started with the right-click menu entry Change Attributes. On the same tab, you can activate or remove file attributes. The Compressed and Index attributes are only available under Windows NT/2000 and XP. You can also change the created on, altered and last accessed dates. Subdirectories can be included in date changes, and filter functions, which you can define yourself, are very useful for global actions.

To start Jdisk Report 1.21 (freeware, www.jgoodies.com), click on a directory or drive via the Windows Explorer context menu. This utility displays usage graphically. The Top WO tab lists the 10 largest files and can be sorted according to oldest and newest. The Modified tab evaluates files according to their modification dates, and Types shows the space required sorted by file type.

Gipo Move on Boot 1.95 (freeware, www.gibinsoft.net) copies, moves or deletes files and folders on the next system boot. The utility is very useful when you need to replace or delete files that are locked by other applications, loaded into the memory or just cannot be changed until the next system boot.

Shell Picture (www.baxbex.com, shareware, €115) appears in the Explorer context menu as soon as you select an image file and right-click. A preview of the image then appears in the context menu. Shell Picture also has a print preview and format converter function, and

Irritation about weaknesses in Windows Explorer's functions and usability can be a thing of the past: we've collected the best utilities and plug-ins to add those missing functions and make full use of the Windows Explorer context menu. We'll show you how to configure Explorer, and explain which extra features you really need.

Programs that integrate well into the Windows Explorer shell include Winamp (www.winamp.com) for playing sound files, the virus scanner Antivir Personal Edition (www.freeav.de) and the Ewido Security Suite to scan for trojans and malware (www.ewido.net).

A first step towards making Windows Explorer easier to use when working with files is to install the freeware program Folderbox 1.20 (www.baxbex.com). This adds another directory display to Windows Explorer and makes file operations and other functions available in a second window.

The same firm makes New Folder 1, which adds a quick button for creating a new directory to Windows Explorer. You can also do this with the F12 key.

User-friendly extras

Under Windows, all files are associated with a particular application. In practice, however, that is not always very helpful. For example, you can associate jpeg files with an image viewer or an

image editor, but Windows Explorer does not allow you to swap between the two, unless you use the awkward 'Open with' context menu option to select which program to use. Open Expert 1.40 (www.baxbex.com) provides a way around this. Instead of double-clicking on the file always

'Under Windows, all files are associated with a particular application. In practice, that is not always very helpful'

opening it with the same application, you can choose which program to use. The last-used application is listed in the context menu, under Open Expert - Program.

Directory Printer (freeware, from www.karenware.com) prints file lists showing directory contents or saves them to hard disk as text files. You can choose whether the listing should include information such as the files' sizes, attributes and last modified dates as well as their names, and use Edit File Filters to list only specified file types. In addition, you can sort the output by various criteria such as file name, type, extension and size. Directory Printer can also include the contents of subdirectories (Search Sub-Folders) and is called from the Windows Explorer context menu via the Print with DirPn entry.

At a glance

Added convenience

Freeware tools help add functionality to Windows Explorer, for example: customise program startups; print out directory listings; change file attributes in one pass; copy and move files flexibly.

Integrate extra functions

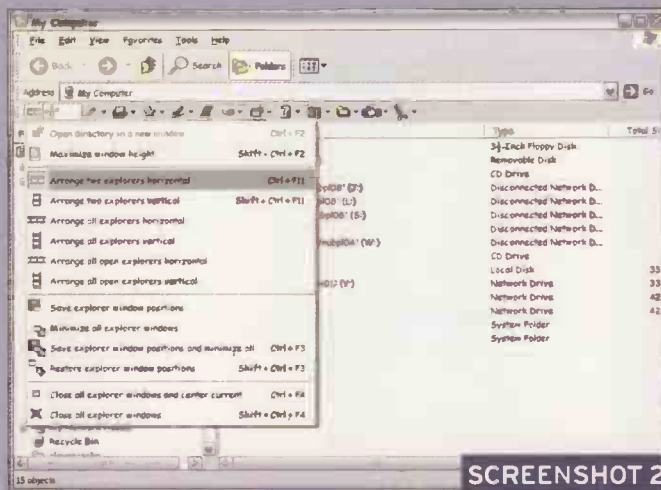
More extras to make your everyday work easier include: a Windows Explorer toolbar with lots of new options; file compressors; encryption; secure erasing of files; and audio conversion.





Dmex Bar7

This free program (www.simtel.net/product.php?id=59298) extends the functionality of the toolbar in Windows Explorer with several useful functions. If it is not visible after restarting Explorer, then use View – Toolbars – Dmex Toolbar to activate it. As an example of the added functionality, you can arrange multiple Explorer windows under or next to each other. 'Select icon' selects files in an open folder using a filter. The Expand and Collapse buttons expand or collapse the folder tree. You can also make favourites lists of frequently used folders. Further functions include the renaming of files and altering of file attributes, a program quick-starter and the ability to copy the file path to the clipboard.



SCREENSHOT 2

allows you to open the file in your preferred image editor as well as its own viewer.

Properly erased

The Windows delete function only removes the markers in the Fat (file allocation table), which means that deleted files can be recovered with special tools if the data has not been overwritten. Sensitive files ought to be made irretrievable by writing over the space they occupied. The freeware program Eraser 5.7 (www.heidi.ie/eraser) overwrites the relevant area on the hard disk up to 35 times using the Gutmann method, which is generally regarded as being secure. After it's been installed, an entry called Erase appears in the Explorer context menu. Choosing this entry after selecting the files and folders to be erased opens a dialogue to confirm your choice by clicking on Yes. You can select which deletion method is used from the Options section.

Integration with the context menu is the norm for compression programs. The free program Tugzip 3 (www.tugzip.com) is worth a look. It can handle, among others, files in zip, 7-zip, ace, cab, rar and tar formats. You can activate Tugzip Explorer context menus from the

Use Kill Copy to copy and move files with extra functions

Options tab. In the Extras section you'll find more useful functions, such as archive repair, extraction from several archives at once, encryption functions, the creation of self-extracting exe files, and a quick way to send archives by email.

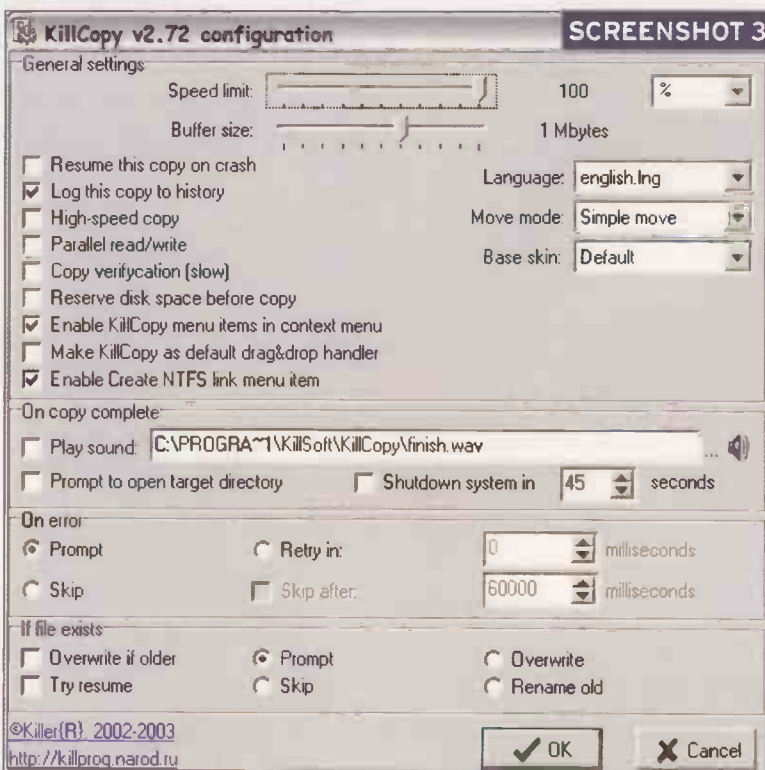
Safe Guard Private Crypto 2.01.0.3 (www.utimaco.com) uses the AES encryption algorithm. Select a file or folder to encrypt in Explorer and choose Private Crypto – Encrypt from the context menu. After entering a password, the

archive can be further compressed and the source file deleted. If you need to distribute the file, it's a good idea to create a self-extracting archive so the recipient only needs to know the password to extract the contents. You can encrypt files up to 2GB in size with the free version for personal use.

Copy, move and rename

The Windows functions for copying and moving files have one huge weak point: if the process is interrupted, for example by a read error or because the file's write protect attribute is set, it fails and has to be restarted. The freeware program Killcopy 2.82 (<http://killprog.narod.ru/killcopye.html>) makes the commands Killcopy and Killmove available via the Explorer context menu. These give you extra options; for example, you can specify the target directory, control the copying speed and pause the process. If an error message appears, you can acknowledge it and continue the operation, even if you have to restart Windows.

Piky Basket 2 (freeware, www.conceptworld.com) bypasses the tiresome Windows Explorer file copy and move procedure and allows the simultaneous copying or pasting of files from multiple directories. After installation, the program can be called by choosing Piky Basket from the Windows Explorer context menu.



SCREENSHOT 3

'Piky Basket 2 bypasses the tiresome Windows Explorer file copy and move procedure'



Wild Rename 2 (freeware, www.cylog.org) can rename multiple files within a folder or subfolders in a single step. Enter wildcards in the Match field to rename all files of one type. Other functions include upper-case/lower-case conversion and consecutive file numbering.

Conversion at a click

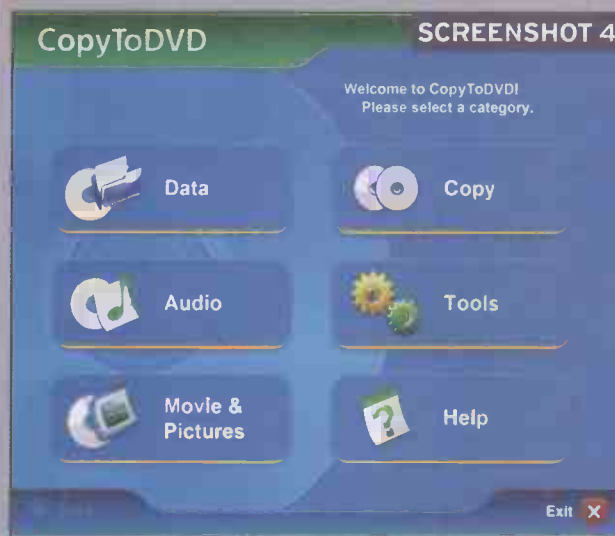
If you need to save graphics files to a different format via a Windows Explorer context menu shortcut, the freeware program Irfan View 3.91 (www.irfanview.de), with the Irfan-View Shell Extension 1.02 (www.baxbex.com/products.html) can be recommended.

The free program dbpower AMP Music Converter 10.1 (www.dbpoweramp.com/dmc.htm) allows wav and mp3 files to be converted using the context menu entry Convert to. After choosing the target format – in the case of mp3, the Lamedll encoder (<http://mitlok.cjb.net>) must be installed – the target directory and the new file's name can be specified. Clicking on Convert completes the process.

Text Imp (freeware, www.gth-media.de) converts text files from Unix to Windows format. You need to do this if text-based files such as HTML documents or CGI scripts have been saved in Unix format and do not display correctly in Windows editors such as Notepad.

Copy to DVD

You can burn CDs and DVDs directly from Windows Explorer under Windows XP via File/Send to... but this is not always satisfactory, as there are no configurable options available. A better alternative is offered by Copy to DVD (www.vso-software.fr/copytodvd_english.htm, €30), which



Three clicks starts file writing from Explorer

can be used as a standalone application or started from Explorer's context menu. Multiple files or directories can be selected and then copied to DVD/CD using the context menu's CopyToDVD command. You can specify a name for the disk and, after inserting a blank disk, you can write or burn an ISO image file. Or you can use CopyToDVD Depot to add files to a collection for burning later. Apart from data CDs/DVDs, you can make audio CDs from mp3, wma, ogg and ape audio files as well as video DVDs from vob files and even timed data backups. Copy To DVD includes Blindwrite for making quick copies of CDs or burning CD image files.

Mounting virtual drives

CD/DVD emulators are used to mount CD images. A free alternative for use with Windows Explorer is the combination of Daemon-Tools 3.47 and awxd-Tools 1.04 (www.daemon-tools.cc). Using these tools, you can mount files in various formats including iso, cue/bin, nrg (Nero), btw (Blindwrite) and ccd (Clone CD) as virtual drives using the entry

Daemon-Tools – Mount to in the Explorer context menu.

You can use Vsubst 1.7 (freeware, <http://home.tiscalinet.ch/t.bigler/utlis.html>) to mount a local folder as a virtual drive.

CONTACTS

PCW welcomes your comments on this column. Email us at: letters@pcw.co.uk. Please do not send unsolicited file attachments.

PROGRAM NAME	QUICK DESCRIPTION	LICENCE	WEBSITE
Folderbox 1.20	Adds an extra view to Windows Explorer	Freeware	www.baxbex.de
bx New Folder 1.0	Allows you to create a folder using a button or a hotkey	Freeware	www.baxbex.de
Open Expert 1.40	Opens files with the program of your choice	Freeware	www.baxbex.de
Directory Printer 4.3	Prints directory listings or saves them to a text file	Freeware	www.karenware.com
Attribute Changer 5.23	Changes file or directory attributes	Freeware	http://Webplaza.pt.lu/public/rpetges
JDisk Report 1.21	Shows the amount of space actually required by files and folders	Freeware	www.jgoodies.com
Gipo Move on Boot 1.95	Carries out file operations after the next reboot	Freeware	www.gibinsoft.de/gipoutils
Shell Picture	Displays an image preview in the Explorer context menu	Shareware	www.baxbex.de
Eraser5.7	Deletes files and directories using the Gutmann method	Freeware	www.heidi.ie/eraser
Tugzip3.0	Easy-to-use and fully featured file compressor	Freeware	www.tugzip.com
Safe Guard Private Crypto 2.01	Locks files and directories with a password	Freeware	www.utimaco.de
Killcopy 2.82	Copies and moves files and folders, has additional functionality	Freeware	http://killprog.narod.ru/indexe.html
Piky Basket 2.0	Collects files and copies them to a single folder	Freeware	www.conceptworld.com
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The magic of inkjets

Inkjet printers produce images using ink droplets just a billionth of a litre in size. Here's how

Allegedly it all began with a coffee machine. An HP engineer saw how hot water dripped into the jug from the spout. This gave him the idea that it ought to be possible to get ink onto paper not just using a ribbon or pins but also through a nozzle using heat.

It took almost 10 years to develop the idea into what is now the most widely used printer technology in the world: the thermal inkjet. In 1984 the first thermal inkjet, the HP Thinkjet, became commercially available. Other manufacturers were developing their own ink printing systems at the same time. Almost simultaneously, Canon got its BJ-80 Bubble Jet on to the shelves. In 1992 Lexmark, previously the IBM printer division, sold its first inkjet. These three manufacturers all have one thing in common: their inkjet printers all use heated droplets of ink – the thermal inkjet process.

Only the fourth big inkjet manufacturer, Japan's Epson, settled on the more expensive piezoelectric technology, which uses ceramics to fire the ink from the nozzle mechanically. In 1985 Epson joined the race with the SQ-2550. The four big players were now all represented.

Working together

Twenty years of development and numerous detailed improvements later, inkjet printers still use the same basic principle.

Mechanically, an inkjet printer is fairly simple, but it must work with high precision: a stepping motor drives rollers which pull the paper through the printer. The print head is driven by a second electric motor and moves horizontally over the paper. While moving, the print head sprays ink onto the paper through tiny nozzles. The difficulty is that the ink tanks are also mounted on the print head runners, so the motor has to accelerate and slow down a relatively large weight very accurately for each part of the printing process – that's one of the reasons printers only have small ink tanks. To get round this problem, Brother, for example, came up with capillary technology printers, where the ink tanks are not mounted on the print head but are fixed in the housing. The ink gets to the print head through hoses – one



The original: the HP Thinkjet was the first printer to use inkjet technology

hose for each colour. Because of the hoses' small diameter the ink is drawn into the print head by capillary action. However, this has the disadvantage that if the printer is not used for a while the hoses can become blocked with dried-up ink.

The nozzle itself is another challenge for the engineers and designers. The nozzle opening has to be finished very accurately and cleanly or the ink will drip out in an uncontrolled manner. As the cross-section of each nozzle is smaller than

a hair, drilling is out of the question. For this reason, the manufacturers have for many years relied on production methods from the microchip industry.

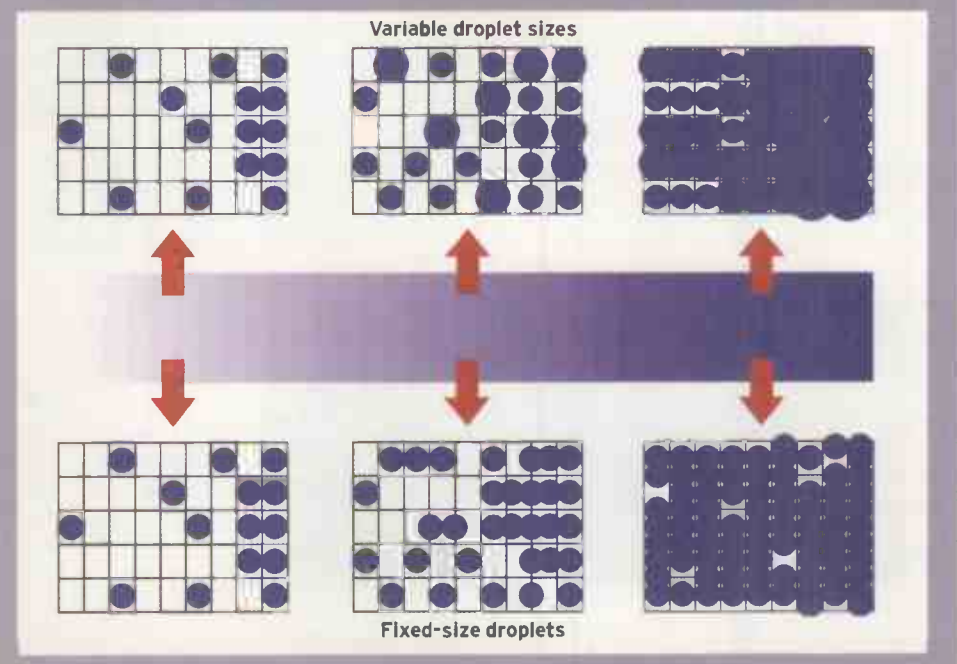
Thermal ink printing

Thermal inkjet print heads are made using silicon wafers and photolithography in a process similar to chip manufacture. The printer manufacturers' facilities are not unlike Intel or AMD processor fabrication plants. HP, for example, produces its print heads in Ireland, in a facility that boasts Europe's largest cleanroom area.

Canon uses photolithography to manufacture its print heads. The conductive tracks and heating elements are fixed on a carrier material and a light-sensitive mask is applied. Canon then exposes and develops the layout. The nozzles and their feed channels are made using chemical etching. Lexmark and HP use a laser to burn their pressure jets onto foil or small metal leaves, but

Varying droplet size

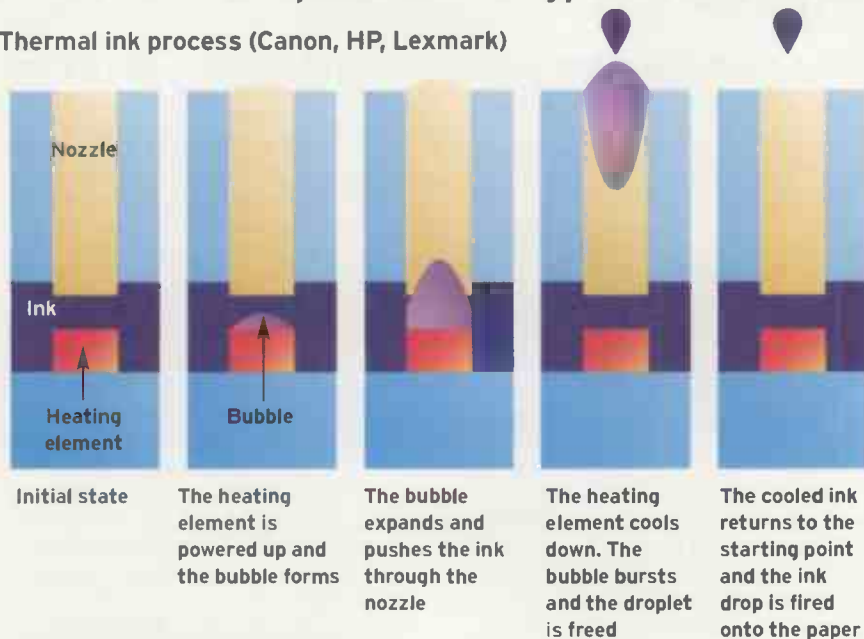
In order to optimise print speed, current photo printers use variable droplet sizes. Larger droplets – up to 10 picolitres – are used for areas with higher colour coverage. Fine details are printed using droplets as small as one picolitre. The diagram below shows how shades of colour are printed using variable and fixed-size droplets. The top three grids show how a variable droplet printer would cope with the colours in the centre; the higher the colour coverage, the larger the droplets. With fixed-size droplets (the bottom three grids) more ink droplets are needed to cover the same area – leading to a drastic reduction in printing speed.



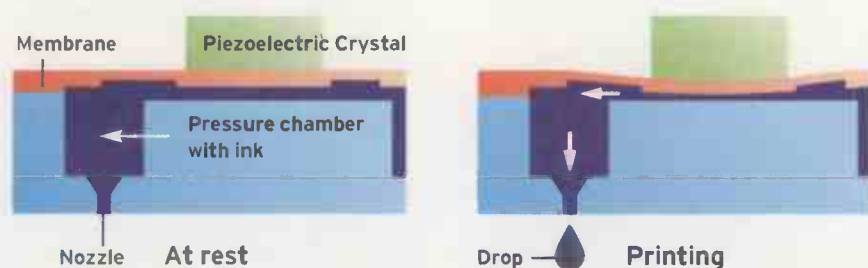


How thermal and piezo technology work

Thermal ink process (Canon, HP, Lexmark)



Piezoelectric process (Epson)



Epson makes the holes in metal using a pressing process.

HP's 1984 thermal inkjet printer, the Thinkjet, used 12 nozzles and 180picolitre droplets to create a relatively crude picture (1 picolitre = one billionth of a litre or one millilith of a cubic centimetre). Current HP printers use droplets as small as three picolitres and have up to 600 jets per cartridge. Lexmark and Epson also use three picolitre ink droplets, but Canon takes the prize for the smallest droplet: the Pixma

iP5000 can manage one picolitre miniature droplets. All the current photo printers use variable size droplets. Thanks to its piezoelectric technology, Epson can control droplet size precisely without the need for different nozzle sizes. HP, Lexmark and Canon use a mixture of different nozzle sizes and multiple heating elements to control the strength of the puff of vapour and therefore the droplet size.

The nozzles are connected to the Ink tanks via channels. There is a

separate heating element in each channel on a thermal inkjet print head. The heating elements are tiny – over 800,000 from an HP print head would fit onto a £1 coin.

To heat the ink an electric current is applied to the heating element and the ink heats in a fraction of a second to around 340°C. The liquid ink vapourises in a flash and a puff of vapour is created inside the channel leading to the nozzle. The ink expands because of the vapourisation and an ink droplet shoots out of the print nozzle, without detaching itself completely. When the heating element is turned off, the vapour cloud shrinks. At this point the ink droplet detaches itself from the nozzle and shoots, at a speed of about 50km/hour, onto the paper. As the ink is not being heated any longer, it cools off and creates lower pressure in the channel leading to the nozzle, preventing more ink from the ink reservoir from flowing in afterwards.

On the best printers, the process from applying current to the heating element, to the droplet being released and fresh ink flowing into the channel lasts less than three microseconds.

The speed at which the droplets form and can be fired is not the only factor determining print speed. The number of nozzles which can fire at the same time also decides how fast a photo can be printed. The fastest printer at present is the Canon Pixma iP8500. In theory it can output up to 147 million ink droplets per second and it can get a photo onto paper almost twice as fast as its competitors.

The nozzles in the print head on all inkjet printers are controlled by the electronics and the software driver, firing droplets of ink in quick succession onto the paper. An inkjet printer's intelligence lies in the drivers. Most inkjets use the Windows GDI (Graphics Device Interface). Some can only be controlled via Windows, to the annoyance of Linux and Mac users. GDI printer drivers use the PC's processing power to analyse and



A compact arrangement allows 6,144 print nozzles to fit on the Canon i9950 print head – the printer achieves a resolution of 1,200dpi

The HP print head and ink tank are an integrated unit. This means that the print head is changed whenever the ink runs out





rasterise the image, rather than the printer controller and Risc processor found in many laser printers. This leads to a decrease in printing speed if you print a very large file – say a 100MB pdf – using a GDI printer and a slow PC with less than 256MB of Ram.

Piezoelectric printers

Although today Epson is the best-known manufacturer of piezoelectric printers, the first model came from Germany, not Japan: in 1977 Siemens developed the PT 80i which used the then revolutionary piezo technology. The term piezo comes from the ancient Greek piezein, meaning 'to press'. The Siemens engineers used the piezoelectric effect from a ceramic crystal. Apply an electric current to a piezoelectric crystal and its atomic structure changes in milliseconds. The movement of electrically charged ions causes the crystal matrix to expand. It only returns to its original shape when the charge is removed. Because of the crystal's expansion a pressure is created and in a few milliseconds the ink droplets are fired at the paper. The Siemens printers had a big drawback: they were much more expensive to make than thermal inkjets and as a result, they were withdrawn.

Epson uses piezoelectric 'leaves' instead of tubes. These are easier to manufacture and are more compact. Epson gives each nozzle in the print head its own piezoelectric disk. According to the applied charge's polarity, the disk deforms in one or

the other direction. The crystal's movement pushes ink into the nozzle tube via a permeable membrane. It takes about five milliseconds for the deformation process – the exact rate varies according to the printer model and job being printed but is about 30,000 drops per second. Epson's print heads are still more expensive to make than thermal inkjet print heads produced in huge numbers using silicon wafers and photolithography. A further disadvantage is that the ceramic piezoelectric leaves need to have a certain area in order to move enough ink – the print head can't be made smaller indefinitely. On the other hand, it does mean that they are fairly robust and show no signs of degradation even after 50 sets of cartridges have been used. HP and Lexmark thermal print heads by contrast go wrong after three to five refills and are replaced every time you change the cartridge. Canon's print head can be changed, but according to the manufacturer they should last for the printer's lifetime.

The future

All the manufacturers' printers now produce such high-quality printouts you need a magnifying glass to see even small improvements in detail.

Ten years ago, a good-quality inkjet printer such as the HP Deskjet 850C cost around £550. Ten A4 pages of text took almost three minutes to print at a resolution of 300dpi. Today, even a cheap low-end printer like the

sub-£35 Lexmark P707 prints twice as fast, at a resolution (in theory) of 4,800 x 1,200dpi. Ink costs for a colour page at five per cent coverage were an average of 10p per page then and the comparative figure now is about 7.9p.

The emphasis in future is likely to be on print speed. This is where people such as the CEO of Lexmark, Paul J Curlander, see the greatest potential for development. The aim is to develop an inkjet printer which competes in terms of print speed and cost of consumables with a laser printer, while maintaining the high-quality output of current inkjets.

Canon has got a clear advance on the speed front. The compact construction of its print heads means they can fit more nozzle openings onto the same area than the competition – this means that the Canon Pixma IP4000 can print photos almost three times as fast as the competing models from Epson, Lexmark and HP. Even if you continually get better print quality for your money, printing with an inkjet will never be cheap, as manufacturers subsidise the low price of the printers by charging high prices for the ink cartridges.

Oliver Jendro

CONTACTS

PCW welcomes your comments on this column. Email us at: letters@pcw.co.uk. Please do not send unsolicited file attachments.

Four-colour game

Inkjet printers have and always have had one basic problem: they can only print the primary and secondary colours, that is cyan, magenta, yellow and black (CMYK), plus the secondary colours red, green and blue (RGB). A photograph, say a landscape, has millions of colour tones – so the printer has to play some tricks.

To represent them, inkjet printers spray the coloured droplets adjacent to or overlapping one another to create the impression of a particular colour shade. In general, the smaller and closer together the coloured droplets are, the more natural and homogeneous the final colouring of the printout appears.

However the ink droplets can't simply be reduced in size to improve the colour and brilliance, as the inks contain colour particles and pigments. Because of this, the manufacturers often use special extra colours in their photo printers. Canon's Pixma IP8500 uses eight colours: the usual CMYK plus Photo-cyan, Photo-magenta, Photo-red and Photo-green. Epson also uses eight colours, but has Photo-blue instead of green. HP and Lexmark produce photo printers which use six coloured inks.

The manufacturers also try to use driver software to improve the colour representation. HP has developed its own colour enhancement process: Photo Ret (Resolution Enhancement Technology). In Version IV, it can print up to 32 drops on top of one another, which, according to the manufacturer, allows 1.2 million colours to be reproduced.

However, in the real world most people would be hard pressed to see the difference between a normal and an optimised picture; the time taken to print in optimised mode can increase by up to 50 per cent. Other manufacturers, such as Epson, use interpolated resolutions. This means that additional pixels are calculated and inserted between the originals. It should be noted that resolution enhancement software like Photo Enhance (Epson) or Image Optimizer (Canon) doesn't often result in a better-looking picture.



Canon 1990: on high-quality photo printers the colours are smooth and even



Lexmark P707: with entry-level printers the colours are visibly banded



Xerox 8400: colour laser printers give visibly grainier results than inkjets

Leisure

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LOADING...



Signs of the Zodiac

The latest addition to the portable gaming device market is the Zodiac from Tapware. The company was founded by ex-engineering and marketing employees from Palm, and is essentially a PDA geared towards gaming.

It has a powerful ARM processor, a 320 x 480 screen, integrated Bluetooth wireless technology, an analogue controller, and two SDIO slots for future upgrades.

Currently there isn't a vast amount of software available for the machine, but it comes with Acid Solitaire. Other games announced so far include Duke Nukem, Doom II, Spyhunter, Stunt Car Extreme, and Madden 2005.

While it suffers from having little dedicated software, the Zodiac excels thanks to its compatibility with various emulators.

The Zodiac is set to retail for around £300, which may hamper its chances of success in an increasingly competitive market. It is well-priced compared to top-of-the-range PDAs, so those who are after a Palm-based device may see value in it. We'll reserve judgement until we review the product in a future issue of PCW.

Prince of Persia: Warrior Within

Epic settings, stunning visuals and adventure – the Prince is back



Despite the modest commercial success of Prince of Persia: The Sands of Time, Ubi Soft has tenaciously released its sequel, Warrior Within. This time around it's a tougher Prince that inhabits a much darker world.

Several years have passed since the last game and in that time the Prince has been tirelessly pursued by a Dahaka, an immortal incarnation of Fate that seeks revenge for our hero's disruption of time. This has turned the Prince into a moody, care-worn killing machine.

The most obvious difference between the two games is the visual approach. The graphics still look amazing and the epic gothic settings still boast clever level design, but a gloomy palette of blacks and browns has replaced the bright colours of the original. This harder, grittier edge takes the shine off what made the first game so appealing, but it may be more attractive to an older audience.

The puzzle and fighting elements remain intact, although the latter is given greater prominence. New moves have been added to the Prince's arsenal including leaps, swings and the

most balletic decapitations we've seen in a game.

Camera angles can obscure your view, but on the whole the visuals are a joy to behold. Animations seem flawless, and belie the fact that you're stabbing at buttons to execute them. The dexterity required by some moves means this game is best played with a gamepad.

Prince of Persia's unusual time manipulation makes a welcome return. Its potential is limited, but the Prince can rewind or slow down time, so you can have another go at mistimed jumps or dodge blows inflicting damage.

This feature alleviates the frustration of reloading the game

from your last save point. It encourages experimentation and leads to more variation in your style of play, since there is less fear of having to restart.

The game relies on some tried and trusted elements such as scantily clad women, but the grating nu-rock guitar riffs do little to build an authentic atmosphere, although these elements should appeal to much of the game's target audience.

Despite a few minor flaws, the epic visuals, acrobatic fighting system and cunning puzzles create a compelling adventure. The Prince's new 'maturity' may deter fans of the Prince of Persia: Sands of Time, but these are merely cosmetic changes beneath which lies a worthy sequel.

Andy Stewart

DETAILS

PRICE £34.99 inc VAT

CONTACT

Ubi Soft

www.ubi.com/uk

SYSTEM REQUIREMENTS

Windows 98SE, 2000, XP • Pentium III 1GHz or equivalent • 256MB of Ram • 2GB free hard drive space

VERDICT

This is a visually stunning action game with some unusual and satisfying additions

OVERALL

★★★★★





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Vampire: The Masquerade

Suck your way to the top



Vampire: The Masquerade – Bloodlines is based on a pen-and-paper role-playing game from White Wolf. This outing (the sequel to Activision's critically successful PC hit) picks up where the original left off – thrusting players into the shoes of a bloodsucking night crawler.

The game takes place across four major sections of modern-day Los Angeles. Players start out in Santa Monica, carrying out missions for a vampire lord. As you progress you'll learn more about the various vampire factions' battle for supremacy, and ultimately decide which one deserves your loyalty.

The bulk of the game is taken up by quests. Most of these are fairly traditional fetch-and-retrieve missions (where you must find an object and return it to a given character), but Bloodlines features a number of interesting stealth-based quests that require you to pick locks, hack computers, and sneak past guards and security cameras to achieve your objective.

Aside from the legendary Half-Life 2, Vampire: The Masquerade – Bloodlines is the only game to use the Source engine from developers Valve. This means its graphics are very well done, but the combat

elements in the game aren't a patch on those in Half-Life 2.

There is heavy reliance on building character statistics. For instance, the game involves a lot of shooting, but your aim will veer wildly depending on your skill points for that discipline. The lack of believable enemy artificial intelligence means using mêlée attacks is usually more effective, but this is hardly a desirable quality.

Bloodlines is highly enjoyable, and we liked the fact that players can get different endings based on choices made throughout the game. It doesn't do as much for role-playing games as Half-Life 2 did for 3D shooters, but it is atmospheric and entertaining.

Rory Reid

DETAILS

PRICE £39.99 inc VAT

CONTACT Activision
www.activision.co.uk

SYSTEM REQUIREMENTS

Windows 98, ME, 2000, XP • Pentium III or AMD Athlon processor • 1.2GHz • 384MB Ram • 3.3GB hard drive space • 64MB 3D DirectX 9-compatible video card • 16bit DirectX 9-compatible sound card • four-speed CD-Rom

VERDICT

A fun and action-packed role-playing game that is only let down in a few areas

OVERALL



Everquest II

Lose yourself, and your friends



Like its predecessor, Everquest II is an online-only MMORPG

(massively multiplayer online role-playing game) that takes place in the fictional world of Norrath. A cataclysmic event has led to the collapse of civilisation, leaving only two cities: Quenos, home of the forces of good, and Freeport, a stronghold of evil.

As with most games of this type, the basic premise involves creating a character, choosing their specialist skills and trade, and battling hundreds of computer-generated opponents to raise your level of experience.

All of Everquest's character races are included in the sequel, including gnomes, dwarves, ogres, dragons, and a new race of bipedal rodent-like creatures called the Ratonga. Once you have selected the race and gender of your character, you can perform limited modifications to their appearance.

You can then select a profession. Only four character classes are available at the start of the game (fighter, scout, mage, and priest), but you can unlock up to around two dozen as you progress. Unlike in the original game, any combination of races and classes can be used, which can make for some unusual results.

Taking part in quests will help you gain experience and evolve your character. For instance, a fighter can evolve into a warrior, crusader, and later a monk. The game doesn't explain the difference, but it becomes apparent after experimentation.

You can't battle other human opponents, but you can join guilds, and there is some satisfaction to be gained from going on quests with six or more like-minded people.

If you're one of the millions of online gamers out there who finds solace in playing a game with no real ending (that is, living your life through an online alter ego), Everquest II is one of the better MMORPGs available.

Rory Reid

DETAILS

PRICE £22.49 inc VAT
(plus a subscription of £17.31 per month)

CONTACT Ubi Soft
www.ubi.com/uk

SYSTEM REQUIREMENTS

Windows 98, 2000, ME, XP • Intel 1GHz or equivalent processor • 512MB of Ram • 64MB DirectX 9-compatible graphics card • Directsound-compatible audio hardware

VERDICT

A solid MMORPG, but will only appeal to fans of the genre

OVERALL



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Tiny Home 3200 TFT Special
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Tiny Home Power 3200
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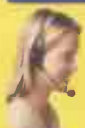
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Enterprise

Even great previews and an impressive specification doesn't guarantee success for a PC

The Elan team had a problem. After designing arguably one of the most powerful 8bit computers, delays in producing its custom chips had put the project 18 months behind schedule. Then to add insult to injury, they'd just lost a legal battle to use the name Elan – and this was after they'd already gone through a previous name change. Time was running out.

The computer that was finally launched as the Enterprise started life at IS (Intelligent Software), a company founded by David Levy in 1981. Levy was chairman, with partners Robert Madge and Kevin O'Connell working as head of technology and MD. Levy's experience as a chess International Master saw IS develop a number of chess games and computers.

IS was introduced to a family who wanted to get into the consumer electronics business. Levy's team developed a personal organiser for them which was launched as the Biztek PAD. Then in 1982, as Sinclair launched the ZX Spectrum, the family approached IS with additional investment from a friend: they wanted IS to develop a home computer and agreed to fund it.

Madge headed up the team, taking overall responsibility for management and specification. The key designers included David Woodfield, Nick Toop and Rob Stubbs on the hardware, and Martin Lea, Mark Richer and Bruce Stubbs on the software. The project was shrouded in secrecy, codenamed DPC, short for damp proof course in case the plans were leaked.

Madge had been impressed by the Spectrum and thought of producing something similar but with a better keyboard and greater variety of interfaces. But he rejected the idea feeling it would be an outdated specification by the time it came out. So the team started from scratch and devised their dream specification. Their goal was to make the machine the best at every function while remaining affordable, so they designed everything from the chips to the operating system.

Toop, who'd worked at Acorn, designed an impressive custom graphics chip capable of displaying resolutions up to 672 x 512 pixels or lower resolutions in up to 256 colours. Woodfield designed the audio chip, with stereo as standard. The resulting graphics and sound capabilities were beyond anything available at the time,

and in recognition of the designer's work, the chips were named Nick and Dave. A Z80 running at 4MHz was used as the main processor, accompanied by 64KB of Ram.

Three external companies were approached to pitch a case design. The job went to Geoff Hollington who, with associate Nick Oakley, wanted to get away from existing designs. The final design was very thin and resembled an artist's palette. A small joystick was fitted in the lower right corner, and shortly before release the original two-tone grey finish was tarted up with coloured keys.

In the run-up to launch, the DPC machine went through several name changes. It was originally going to be called the Samurai, but Hitachi started to use the name for its own machines. After toying with the name Oscar, Elan was chosen, for the machine and the company.

The name was checked out by a trademark agent who found a company called Elan Electronics, but he assured them that their business was sufficiently different not to cause problems. He was wrong. Elan Computers was sued for using the name and lost both the case and appeal. However, it sued the trademark agent for negligence and won.

By this time the Elan name had been widely used in marketing and would prove costly to change. The name Flan was half-seriously considered for the ease with which it could be implemented, but in the end they bought the name Enterprise from Data General.

Name changes weren't the only problem facing the Enterprise: delays producing its custom chips saw the project fall 18 months behind schedule. Despite announcing the machine in late-1983, the Enterprise didn't make it out until the end of 1984. A 128KB version was produced, but it was too late.

While still impressive, the Enterprise specification had lost its edge and Amstrad had beaten it to market with the lesser but cheaper CPC-464.

Had the Enterprise shipped on time it could have been very different. An impressive hardware and software specification saw positive previews, and 8,000 people registered as users based on reputation alone. But poor marketing and production delays saw Enterprise Computers go bust. The machine did enjoy great popularity in Eastern Europe, though, where 20,000 units were shipped and promptly sold out.

Gordon Laing



Evesham Ebox

You voted Evesham the PC maker of the year in PCW's Innovation awards. Now, the company is giving away one of its award-winning PCs. The Evesham Ebox won a Best Buy award in our January 2005 issue, as it was one of the best Media Center computers PCW has reviewed.

The Ebox comes in a sleek, flat, DVD-style case and has some powerful components designed to give exceptional multimedia performance. At its heart is a 3GHz Pentium 4 processor and 512MB of fast DDR400 Ram.

Evesham has made the most of the Windows XP Media Center Edition

operating system by installing a pair of Black Gold digital TV receivers that let you watch digital Freeview broadcasts. What's more, you can watch one digital channel and record another at the same time.

The Ebox is compatible with most monitors, TVs and projectors, but make sure you live in a Freeview area by checking www.freeview.co.uk. Evesham has included a booster to help strengthen the signal of digital television broadcasts, so you're less likely to miss the programs you want to see.

Inside the Ebox is a 160GB hard drive, so you can store around 50 hours of high-

quality video or thousands of digital images, and you can even back up your recordings onto a tri-format DVD drive that records to plus, minus and Ram disc formats.

For your chance to win an Ebox, answer the question below and follow the instructions on how to enter.

How many digital TV receivers does the Evesham Ebox have?

- a) 1
- b) 2
- c) 37

PCW MARCH 2005 EVESHAM COMPETITION ENTRY FORM

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This competition is open to readers of PCW, except for employees (and their families) of VNU Business Publications, Evesham and Gigabyte. PCW is the sole judge of the competition and the Editor's choice is final. 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. Prizes will be dispatched direct 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.

January winners

The winner of the Toshiba notebook is Michael Stephenson from Dorset. And the two wireless Belkin bundles and Ferrari Driving Days go to Stephen Salmon from Essex and Mrs VU Rossiter from Hampshire.



Gigabyte upgrade bundles

If your PC is struggling to keep up with demanding new software, it may be time to upgrade. Gigabyte is giving four readers the chance to win an upgrade bundle consisting of its very latest motherboards, graphics cards and 3D CPU coolers.

One winner will receive a first prize upgrade bundle consisting of a PCU22-SE CPU cooler, the 8GPNXP Duo motherboard, and a 128MB Nvidia Geforce 5700 graphics card (NX57128D). This uses the PCI Express (PCX) interface and gives you excellent performance in video-editing and gaming applications.

The first runner-up will receive a PCU22-VG CPU cooler, a 256MB Geforce 5700 graphics card (N57256V), and an 8I865GVM-775 motherboard. The latter supports socket 775 Pentium 4s, up to 4GB of DDR400 memory, and has a Gigabit Ethernet controller, which allows you to send files at 10 times the rate of a standard 10/100 network port.

The second runner-up will receive a K8NS Pro motherboard, an ATI X300 SE graphics card (RX30S128D) and a PCU31-SD CPU cooler. The final runner-up will receive a K8NS motherboard and a PCU31-VH CPU cooler. Gigabyte's 3D coolers have a central

blower and help reduce the temperature of the CPU and its surrounding components.

For more information on these fantastic prizes, or the rest of Gigabyte's range, visit www.giga-byte.com. For your chance to win, answer the question below and follow the instructions on how to enter.

What type of CPU does the 8GPNXP Duo support?

- a) Socket 757
- b) Socket 577
- c) Socket 775

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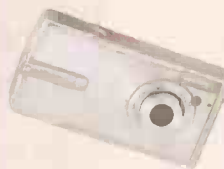


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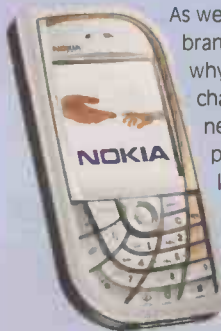
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• 48 bit scanning up to 2400dpi (opt)
• Capture up to A4+ Images with inc. stitch software

£129.99
(£110.63 ex VAT)

quicklink: 3JXD PW

EPSON

The Epson range - built to combine quality, ease of use and great value. Ideal for the home/office and photo enthusiast.



Stylus Photo R200
The R200 provides realistic 6-colour photos and a wealth of features like direct CD/DVD printing, making printing your own photos quick, easy & affordable too.

£75.20
(£64.00 ex VAT)

quicklink: 300MPW



Stylus CX3600
Aimed at the home user, it offers a complete printing and copying solution for all the family. Ideal for school projects, web printing, occasional photos & more.

£81.07
(£69.00 ex VAT)

quicklink: 3DWXPW



Perfection 2480 Photo
The ideal scanner for home users & amateur photographers who want to restore & archive precious photos. Class leading quality, ease of use & 35mm film scanning

£76.98
(£65.52 ex VAT)

quicklink: 38NCPW



Stylus C86 Photo Edition
A no compromise solution to home and small business printing. Delivering class leading with the quality and efficiency of EPSON DURABrite™ Inks

£76.37
(£65.00 ex VAT)

quicklink: 393PPW



Stylus photo RX420
Provides and all-in-one solution that offers photo quality printing, copying and scanning - allowing users to quickly enlarge and reduce their favorite images.

£86.95
(£74.00 ex VAT)

quicklink: 3DWYPW



PictureMate
Print directly from compatible digital cameras, from just about any memory card and even compatible camera phones.

£129.25
(£110.00 ex VAT)

quicklink: 356JPW



Canon's inkjet, all-in-one and scanner range providing excellent quality and performance.



Pixma IP1500
The Canon PIXMA IP1500 is the perfect all-purpose home printer - printing high quality colour photos, web pages and documents with speed, ease & efficiency.

£47.98
(£40.84 ex VAT)

quicklink: 3F16PW



Pixma IP3000
A great value fully featured printer for home & small office, offering outstanding performance and Canon's transparent Single Ink system that cuts running costs.

£78.00
(£66.39 ex VAT)

quicklink: 3F18PW



Lide 35
Ultra-sleek, the LIDE 35 flatbed scanner delivers 1200 x 2400 resolution in a body only 38mm thick. Draws all power required from a USB 2.0 Hi-Speed interface

£52.99
(£45.10 ex VAT)

quicklink: 38NCPW



Pixma IP4000R Inkjet Printer
The stylish and innovative PIXMA IP4000R. It combines outstanding photo quality and advanced features with convenient WIFI connectivity.

£190.98
(£162.54 ex VAT)

quicklink: 3GW5PW



Pixma IP8500 Inkjet Printer
Featuring Canon's exclusive 8-ink ChromaPLUS photo system - puts unprecedented colour, image quality and speed in the hands of photographic professionals.

£305.50
(£260.00 ex VAT)

quicklink: 3GW7PW



CanoScan 5200F
Advanced features and powerful performance in a value-for-money film & document scanner, including a 6 frame Film Adapter Unit & FARE level 2 technology.

£116.32
(£99.00 ex VAT)

quicklink: 36THPW

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OLYMPUS Explore your creative potential...



- C-370**
- 3.2 Megapixels
 - 3 x Optical Zoom
 - 1.5" LCD
 - 12Mb Internal Memory

£95.98
(£81.69 ex VAT)

quicklink > 3GY6PW



- Mju Mini Blue**
- Ultra-compact, vibrant styling
 - 4.0 Megapixels
 - 2 x Optical Zoom
 - 1.8" LCD
 - Six Colour Variations

£189.90
(£161.20 ex VAT)

quicklink > 3FV8PW



- Mju 500**
- 5 Megapixels
 - 3 x Optical Zoom
 - 2.5" LCD
 - 32MB x-d picture card Inc.

£231.99
(£197.44 ex VAT)

quicklink > 3KH6PW

PENTAX A model to suit every need



- Optio S50**
- 5 Megapixels
 - 3x Optical Zoom
 - 1.8" TFT Colour LCD Screen
 - 13 shooting modes

£177.99
(£151.48 ex VAT)

quicklink > 3FJ6PW



- Optio S51**
- 5 MegaPixel
 - 3x Optical Zoom
 - 1.8" TFT Colour LCD Screen
 - A stylish, ultra-compact aluminium alloy body

£248.99
(£211.90 ex VAT)

quicklink > 3FJ7PW



- Optio 750z**
- 7 MegaPixel
 - 5x Optical Zoom
 - 8x Digital Zoom
 - 1.8" TFT Colour LCD Screen
 - Easy-to-use

£427.99
(£364.24 ex VAT)

quicklink > 3FJCPW

SONY Movies Made Easy!...



DCR-HC30 MiniDV

- DV-In
- Memory Stick Duo Slot
- Carl Zeiss Lens
- 10x Optical/120x Digital Zoom
- Colour viewfinder
- Super nightshot plus

£419.99
(£357.04 ex VAT)

quicklink > 31X0PW



DCR-DVD201E DVD

- Advanced Megapixel HAD CCD
- Carl Zeiss Lens
- True Widescreen 16:9 Recording
- Super SteadyShot
- 10x Optical/120x Digital Zoom
- Nightshot plus

£549.99
(£468.08 ex VAT)

quicklink > 34YVPW

SONY Point-and-Shoot Cyber-shot...



- Sony DSC-T3 Cyber-shot**
- 5.1 Megapixel Super HAD CCD
 - 3 x optical zoom
 - Carl Zeiss Vario Tessar Lens
 - 2.5" clear photo LCD screen
 - docking station supplied

£324.99
(£276.59 ex VAT)

quicklink > 3FPMPW



- Sony DSC-V3 Cyber-shot**
- 7.2 Megapixel Super HAD CCD
 - 4x optical zoom
 - Carl Zeiss Vario Sonnar lens
 - Compact Flash & Memory Stick slots
 - Full manual controls

£455.99
(£388.08 ex VAT)

quicklink > 3FPMPW



- Sony DSC-L1 Cyber-shot**
- 4.1 Megapixel Super HAD CCD
 - 3 x optical zoom
 - Carl Zeiss Vario Tessar lens
 - Stamina InfoLITHIUM battery
 - PictBridge

£199.99
(£170.20 ex VAT)

quicklink > 3FPLPW

Digital Cameras

quicklink	CANON	inc VAT	ex VAT
31M8PW	Powershot A75	135.71	115.50
3F4SPW	Powershot A95	233.23	198.49
3GKHWP	ixus 40	244.98	208.50
31MDPW	ixus 500	249.99	212.76
	FUJIFILM		
39J1PW	Finepix S3500	182.99	155.74
39J2PW	Finepix S5500	239.00	203.40
2SRHPW	Finepix S7000	327.81	278.99
39J5PW	Finepix F440	194.99	165.35
145QPW	Finepix A330	109.80	93.45
	HP		
2G98PW	Photosmart 735 Camera 3.2 MP	115.98	98.71
32XSPW	Photosmart R707	178.98	152.33
3574PW	Photosmart R707 with Dock	211.99	180.42
2PTJPW	Photosmart 945	218.98	186.57
37WYWP	Photosmart R507	162.99	138.72
37WXWP	Photosmart R507 with Dock	205.98	175.31
	KODAK		
37LMPW	Easysmart CX7330	118.49	100.84
393MPW	Easysmart LS753	193.49	164.67
39R4PW	Easysmart DX7440	202.10	172.00
	OLYMPUS		
3GY5PW	C-470	156.80	133.45
3GY3PW	C-70	336.99	286.80
	SONY		
3453PW	DSC-P43 Cyber-shot 4MP	139.82	119.00
3454PW	DSC-P73 Cyber-shot 4MP	150.99	128.51
3455PW	DSC-P93 cyber-shot 5MP	209.99	178.72
3FPLPW	DSC-L1 Cyber-shot 4MP	199.99	170.21
3FPMPW	DSC-T3 Cyber-shot 5.1MP	324.99	276.59
3FPMPW	DSC-V3 Cyber-shot 7.2MP	455.99	388.08
3458PW	DSC-W12 Cyber-shot 5MP	226.99	193.19
393XPW	DSC-P150 Cyber-shot 7.2MP	289.99	246.80
2QL2PW	DSC-F828 Cyber-shot 8MP	599.99	510.63



EOS 300D & EF-S 18-55
6.3 Megapixel,
EF-S 18-55mm Lens,
plus £100 cash back
- offer ends 31/01/05

£627.99 (£534.46 ex VAT)

www.dabs.com/canon

quicklink > 2QJ1PW

Digital Camcorders

quicklink	CANON	inc VAT	ex VAT
3163PW	MV700	252.51	214.90
3164PW	MV700	289.99	246.80
3165PW	MV750	359.98	306.37
34J5PW	MVX200	399.99	340.41
34J6PW	MVX250	439.49	419.99
2QDLPW	MVX3i	839.98	714.88
12QDNPW	MVX10i	749.97	638.28
	SONY		
317YPW	DCR-TRV255 Handycam D8	222.99	189.78
2CP7PW	DCR-TRV265 handycam D8	239.99	204.25
31WYPW	DCR-HC14E Compact MiniDV	279.99	238.29
31WXPW	DCR-HC18E Super-Compact MiniDV	319.98	272.33
31X3PW	DCR-PC106E PC Style MiniDV	359.99	306.38
31X0PW	DCR-HC30E Super Compact MiniDV	399.99	340.42
34YRWP	DCR-DV91E DVD Handycam	482.99	411.06
31X1PW	DCR-HC40E Super compact MiniDV	479.99	408.51
2CVFPW	DCR-PC109 PC Style MiniDV Handycam	512.46	436.14
34YVPW	DCR-DVD201E DVD Handycam	529.98	451.05
31X2PW	DCR-HC85E 2Megapixel MiniDV	715.98	609.35

Memory

quicklink	LEXAR	inc VAT	ex VAT
28DSPW	256Mb Compact Flash Bx	30.98	26.37
2VGDWP	512Mb Compact Flash Bx	42.99	36.59
28FXPW	128Mb Smartmedia	23.99	20.42
2P5GPW	256Mb Secure Digital 32x	28.98	24.67
2P5HPW	512Mb Secure Digital 32x	43.99	37.44
2P51PW	256Mb Memory Stick Pro	48.17	41.00
2P54PW	1GB Memory Stick Pro	136.99	116.59
2F24PW	256MB XD Card	39.96	34.03
2VH4PW	512MB XD Card	77.55	66.00
	SONY		
34PFPW	128MB Memory Stick	28.99	24.68
34PHPW	128MBx2 Memory Stick	59.99	51.06
2TB2PW	128MB Memory Stick Duo	38.99	33.19
2HDPPW	256MB Memory Stick Pro	39.99	34.04
3CFPPW	512MB Memory Stick Pro	52.99	45.10
3CFJPW	1GB Memory Stick Pro High Speed	159.99	136.17

you can Canon Make more of every shot...



- Powershot A400**
- 3.2 Megapixels
 - 2.2 x optical, 3.2 x Digital Zoom
 - 1.5" LCD Screen
 - 16MB SD Memory Card

£108.81
(£92.61 ex VAT)

quicklink > 3F4MPW



- IXUS 40**
- 4 Megapixel
 - 3x Optical Zoom
 - 2" High Resolution Colour Display
 - SD Memory Card Compatible

£244.98
(£208.50 ex VAT)

quicklink > 3GKHWP



- IXUS iS Blue**
- 5 Megapixels
 - 6.5 x Digital Zoom
 - 1.5" LCD Screen
 - 32MB SD Memory Card

£229.99
(£195.74 ex VAT)

quicklink > 3CKMPW

you can Canon Make more of every shot...



- MV700 Digital Camcorder**
- 18x Optical Zoom
 - 360x Digital Zoom
 - DV Output
 - 2.5" Colour TFT LCD Display

£252.50
(£214.90 ex VAT)

quicklink > 3163PW



- MVX200 Digital Camcorder**
- 1.33 Megapixel
 - 14 x Optical Zoom
 - PictBridge compatible

£399.98
(£340.41 ex VAT)

quicklink > 34J5PW



- MVX25i Digital Camcorder**
- 14x Optical Zoom
 - 2.2 Megapixel
 - DV & USB
 - PictBridge Compatible

£649.99
(£555.18 ex VAT)

quicklink > 3F7KPW



HP Photosmart cameras produce outstanding quality images with ease



- Photosmart R507**
- Ideal for individuals and families looking for a durable, pocket-sized & easy-to-use camera
 - 4.1 Megapixel
 - 21x zoom (3x optical, 7x digital)
 - 3.8cm (1.5") Colour LCD
 - 32MB internal memory

£162.99
(£138.72 ex VAT)

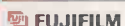
quicklink > 37WYWP



- Photosmart R707**
- Stylish on both the inside & outside with its stainless steel, sleek sculpted body
 - 5.1 Megapixel
 - 4cm (1.5") Colour LCD Display
 - 24x Zoom (3x Optical, 8x Digital)
 - 32MB internal Memory

£179.99
(£155.19 ex VAT)

quicklink > 32XSPW



FinePix - Compact, durable and lightweight...



- Finepix A120**
- 3.1 Megapixels
 - 1.5" LCD Screen
 - 16MB x-D included

£86.98
(£74.05 ex VAT)

quicklink > 345PPW



- Finepix F440**
- 5.2 Megapixels
 - 3.4 x Optical, 4 x Digital Zoom
 - Picture Cradle included
 - 2" LCD Screen
 - 16MB x-D Card included

£238.99
(£203.00 ex VAT)

quicklink > 39Z5PW



- Finepix E550**
- 6.3 Megapixels
 - 4 x Optical Zoom
 - 2" LCD Screen
 - 16MB x-D Card included

£240.99
(£205.10 ex VAT)

quicklink > 39J3PW

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iPod photo 40GB

quicklink > 3JVPW Go

£350.98
(£298.71 ex VAT)



iPod photo delivers a one-two sensory punch. Letting you carry not only an entire library of your favourite music — up to 15,000 songs — but enough photos — as many as 25,000.

Apple iPod Mini

quicklink > 31V6PW Go

£178.99
(£152.34 ex VAT)



Everything you love about iPod just got tinier. iPod mini lets you bring along enough music (up to 1000 songs) for a three-day weekend getaway in a package so small you'll forget you're carrying it. The Click Wheel takes best advantage of miniscule space and lets you scroll single-handedly through 1,000 songs from your iTunes music collection. For Mac & Windows



quicklink	APPLE	inc VAT	ex VAT
31V6PW	iPod Mini - Silver	178.99	152.34
31V7PW	iPod Mini - Gold	178.99	152.34
31V8PW	iPod Mini - Blue	178.99	152.34
31V9PW	iPod Mini - Pink	178.99	152.34
31VBPW	iPod Mini - Green	178.99	152.34

DVD & HDD Recorder

quicklink > 3HFVPW Go

£699.99
(£595.74 ex VAT)



Sony RDR-HX1000 250GB Hard drive High speed dubbing from HDD to DVD HQ+ Recording. DV Input for camcorder editing, simultaneous playback and recording.

NW-HD3 20GB HDD Network MP3 Walkman

quicklink > 3KFJPW Go

£227.99
(£194.03 ex VAT)



World's smallest, lightest, thinnest 1.8-inch HDD Audio Player* The NW-HD3 features a 1.8 inch HDD with 20GB capacity which can store up to 900 CDs, or the equivalent of 13,000 songs. The NW-HD3 can provide a marathon 30 hours* of continuous playback with just one battery charge. This Network WALKMAN features G-Sensor* to protect your music on the hard drive if it is dropped. Furthermore, 25 minutes of on-board memory ensures skip-free playback even in demanding situations. (Available in red, pink, black and silver)

*At time of going to press.

SONY

SONY

MuVo N200 - White

quicklink > 3JVPW Go

£73.98
(£62.97 ex VAT)



The MuVo™ Micro N200. Creative's smallest digital audio player, delivers big audio performance! weighing just 34g (1.2oz.) with its AAA battery.

CREATIVE

Zen Micro - Black

quicklink > 3HJXPW Go

£169.99
(£145.68 ex VAT)



It fits naturally into the hand, for perfect one finger navigation. The Zen Micro stores up to 2,500 songs in WMA or 1,250 in MP3 on its 5GB hard disk, and its easy-to-remove rechargeable battery delivers up to 12hrs of high-quality digital audio. FM radio & voice recording further extend its versatility. Ideal for use with on-line music services and Windows PCs, supporting downloads at up to a song per second via its USB 2.0 port.

quicklink	CREATIVE	inc VAT	ex VAT
3HJM3PW	Zen Micro - White	169.99	144.88
3HJL3PW	Zen Micro - Silver	169.99	144.68
3HJM3PW	Zen Micro - Dark Blue	169.99	144.68
3HJM1PW	Zen Micro - Pink	169.99	144.68

TravelSound i300

quicklink > 3HJXPW Go

£49.98
(£42.54 ex VAT)



Creative® TravelSound i300 is the palm-sized, fold-away, single-unit stereo sound stage for people on the move.

CREATIVE

I-Trigue 2200

quicklink > 3HJ7PW Go

NEW

£41.99
(£35.74 ex VAT)



Creative I-Trigue® 2200 stereo 2.0 speakers are built using dual titanium micro-drivers for advanced audio clarity with MP3 music. Their sleek, silver/black design with integral bass ports allows convenient positioning around the home. Extensive connectivity enables them to be used with portable audio players as well as alongside LCD screens and notebook PCs.

quicklink	CREATIVE	inc VAT	ex VAT
3HJ8PW	I-Trigue 3400	64.98	55.31
3HJ9PW	I-Trigue 3600	87.99	74.89
3HJBPW	I-Trigue 5600	127.99	108.93

AV480 Video Recorder

quicklink > 39CQPW Go

£499.97
(£425.00 ex VAT)



- Record from TV with easy cradle connection;
- Schedule multiple recordings;
- Watch movies on LCD or TV
- Listen to and record music;
- Transfer data from a PC

ARCHOS

Gmini 400 Digital Music Player

quicklink > 3FW1PW Go

£249.00
(£211.92 ex VAT)



The Gmini400 goes way beyond music featuring a colour LCD for viewing photos & videos, a built-in CompactFlash™ reader for storing photos & data, and the ability to play games

- Play MP3, WMA, and WAV music files and record in stereo
- Store up to 300 hours* of music
- View album cover art on color LCD
- Transfer and store up to 200,000* JPEG Images using built-in CompactFlash™ reader
- View photos on color LCD or TV

ARCHOS

Flashtrax 20GB

quicklink > 3FC4PW Go

£252.98
(£215.81 ex VAT)



FlashTrax is an innovative handheld device that allows you to expand the use of your digital camera and multimedia files. FlashTrax allows you to store, view, and play all sorts of media files.

SMARTDISK
Simplifying The Digital Lifestyle

H320 (20GB)

quicklink > 3FC4PW Go

£272.60
(£232.00 ex VAT)



- Plays over 600 hrs of digital music
- 20GB of storage
- Large, vivid colour display
- View JPEG or BMP Images
- Supports MP3, WMA, ASF, WAV • OGG music files
- USB 2.0

iRiver

Beatman Flash - 512MB

quicklink > 35CFPW Go

£170.98
(£145.52 ex VAT)



- Super small MP3 Player & Recorder
- Records directly into MP3
- Records music directly from CD Player or other audio equipment (HIFI set / TV set / built-in FM Radio)
- Up to 16hrs music

FREECOM TECHNOLOGIES



SONY

VTX-D800U Freeview Set-top Box

Upto 30 TV Channels and upto 16 radio stations subscription free!!

£81.99 (£69.78 ex VAT)

www.dabs.com/sony

quicklink : 258CPW



SONY

NW-E99 1GB MP3 Walkman

Up to 45 CDs
70 hours playback
Ultra compact only 40g
MP3, WMA, ATRAC, WAV

£139.98 (£119.14 ex VAT)

www.dabs.com/sony

quicklink : 3K0HPW



LITEON

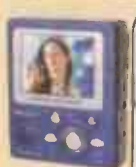
LVW-5006 DVD Recorder

Pictorialised title search, Space Saving, Life time preservation, DVD+R/RW, DVD-R/RW, CD-R/RW discs supported

£175.00 (£148.94 ex VAT)

www.dabs.com/liteon

quicklink : 3HLSPW



MUSTEK

PVR-A1 Media Player

Listen to music, watch movies, view your photos or even watch TV recordings on one simple recordable device!

£99.99 (£85.10 ex VAT)

www.dabs.com/toshiba

quicklink : 3HVPW



HAUPPAUGE

Dec-1100t

Digital TV on your television set, Digital radio, Electronic Programme Guide (EPG) Receive over 30 FREE digital channels

£49.99 (£42.55 ex VAT)

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quicklink : 360CPW

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Wireless ADSL Modem & Router

quicklink > 2VCDPW Go

£69.32
(£59.00 ex VAT)



WiFi
The Standard for
Wireless Fidelity.

Equipped with a built-in ADSL modem, it gets you connected to the Internet at top speed. You don't need a separate modem because it plugs right into your ADSL line. The built-in 802.11b wireless access point gives you the untethered freedom of wireless roaming connectivity to network resources and the Internet.

- Wireless ADSL modem and firewall router
- Built-in 4-port 10/100Mbps switch
- Share Internet connection for upto 253 users, Inc. up to 32 users

NETGEAR

Wireless-G PCI Card

quicklink > 2D13PW Go

£40.99
(£34.89 ex VAT)



WiFi
The Standard for
Wireless Fidelity.

The Wireless-G PCI Card connects you with Wireless-G networks at an incredible 54Mbps! And for added versatility, it can also interoperate with all the 11Mbps Wireless-B (802.11b) products.

LINKSYS

Wireless ADSL Modem

quicklink > 2Z9MPW Go

£81.07
(£69.00 ex VAT)



The Linksys Wireless-G ADSL Gateway is the all-in-one solution for Internet connectivity in your home. Giving you fast connection to the Internet, far faster than a dial-up, and without tying up your phone line.

LINKSYS

ADSL Modem & Router

quicklink > 33WDPW Go

£84.98
(£72.33 ex VAT)



WiFi
The Standard for
Wireless Fidelity.

The PSL-G6047 Remote Router is a versatile all-in-one networking device that provides high speed broadband Internet connection, wireless user access and dedicated LAN bandwidth server connection.

D-Link
Building Networks for People

OfficeConnect Wireless Modem/Router & PC Card

quicklink > 311VPW Go

£79.98
(£68.07 ex VAT)



3COM

The 3Com® ADSL Wireless 11g Firewall Router combines an ADSL modem, router, 802.11g wireless access point, four-port switch with a Wireless PC Card.

ADSL Modem with Built-In 802.11g Wireless Router

quicklink > 3K24PW Go

£70.50
(£60.00 ex VAT)



BELKIN.

Network your computers with this simple all-in-one solution that connects and shares your ADSL Internet access

- Connect to ADSL Internet access and share your high-speed connection, data files, and network peripherals wirelessly
- Protects your network from outside intrusions by hackers using NAT and SPI firewalls
- Transfers data at speeds up to 54Mbps, using the 802.11g wireless standard
- Backward-compatible with all 802.11b 2.4GHz wireless devices

Bluetooth USB Adaptor

quicklink > 25MGPW Go

£36.98
(£31.48 ex VAT)



BELKIN.

The Bluetooth USB Adaptor from Belkin lets you create cable-free connections between your USB desktop PC and devices using Bluetooth wireless technology

Optical Desktop with Fingerprint Reader

quicklink > 3FKHPW Go

£60.99
(£51.91 ex VAT)



Microsoft

Tired of trying to remember all your user names and passwords? Now there's a convenient way of replacing them - with a simple fingerprint! The new Microsoft Fingerprint Reader puts an end to password fatigue, enabling you to log on to your PC and access your favourite websites simply by touching your finger on the sensor.

- Fast access to websites - when you come to a web page that requires a user name and password, just place your finger on the fingerprint reader to log in.

Optical Mouse by S+arck

quicklink > 37XSPW Go

£24.08
(£20.50 ex VAT)



Microsoft

Created by world famous designer Philippe Starck, this mouse makes your desktop more fun, more interesting, and more you!

LX700 Cordless Desktop

quicklink > 3H7VPW Go

£61.98
(£52.78 ex VAT)



Logitech

The Logitech® Cordless Desktop® LX 700 is a premium blend of form and function, with a rechargeable, cordless, optical mouse.

MediaLife™ software presents your media library in a single, easily navigated interface. Includes sleek one-touch controls for media, communication, and frequent applications. Plus keyboard-based navigation controls that complement mouse.

Media Play Mouse

quicklink > 3HJFPW Go

£33.99
(£28.91 ex VAT)



Logitech

The Logitech MediaPlay™ Cordless Mouse is a powerful mouse that also works like a remote control for music, video and pictures on your PC. USB or PS/2 connections. 3-year guarantee.

OC Communicate Plus

quicklink > 3HJCPW Go

£42.99
(£36.59 ex VAT)



Logitech

Logitech QuickCam Communicate PLUS is quick to set up and makes it easy for you to communicate online with your family and friends, using video and audio

Webcam Instant

quicklink > 3HJCPW Go

£25.99
(£22.12 ex VAT)



CREATIVE

The perfect way to add imaging to communications. It captures 352x288 video at full 30fps, and stills at up to 640x480 (VGA) by interpolation. It's quick & easy to install via USB.

Spcaecam 150 Portable

quicklink > 2FJ9PW Go

£15.99
(£13.61 ex VAT)



Trust

- Compact design PC & notebook webcam
- For Internet applications like messenger, chatting & video conferencing
- Snapshot button with compact built-in viewfinder



BUFFALO 125Mbps Wireless Notebook Adapter

Sleek and convenient way to add Wireless Networking to your laptop or desktop PC

£40.99 (£34.89 ex VAT)

www.dabs.com/buffalo

quicklink > 3CWZPW



ACTIONTEC USB Starter Kit

USB Solution Provides Mobility, Transfer Network Data Upto 11Mbps, Simple Interface & Installation

£44.99 (£38.29 ex VAT)

www.dabs.com/actiontec

quicklink > 178MPW



BELKIN. Nostromo N52 Speedpad

Keyboard and gamepad functionality in one small and easy-to-use device

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2RXWFW	All-in-Wonder 9800 Pro 128MB	201.99	171.91
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37TGPW	Radeon X800Pro AGP 256MB	288.99	245.95
37THPW	Radeon X800Pro AGP 256MB D/VVO	272.99	232.33
39THPW	Radeon X800XT Platinum 256MB	349.99	297.86
39TJFW	Radeon X800XT 256MB PCI-E	321.99	274.03
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359KFW	ATI 9800Pro DVO 128MB	146.99	125.10
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2VKGPW	GeForce FX5200 Pers. Cinema 128MB	87.00	74.04
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34DBPW	GeForce FX5700LE 128MB DVI VO	62.99	53.61
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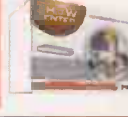
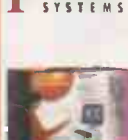
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3G70PW	PSIM DVD+-RW 8x USB2 Port 8.5GB	127.99	108.93
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36NVPW	DVD-ROM 16x IDE	17.99	15.31
351RPW	CD-RW 52x 52w 32rw Ext USB2	28.99	24.67
344CPW	CD-RW 52w 32rw 52r IDE Quiet	19.99	17.01
36NRPW	CD-RW 52r 52w 32rw IDE Black	18.99	16.16
344OPW	DVD+-R/RW 16x Int IDE DL OEM	47.00	40.00
3CNPW	DVD+-R/RW 16x IDE Black	52.99	45.10
3HSDPW	DVD+-R/RW 16x DL USB2 Black	84.99	72.33
3JVPW	DVD+-R/RW 16x USB2	82.99	70.63
BENQ			
39NFPW	CD-ROM 56x Retail Kit	10.99	9.35
3H17PW	CD-RW 52r 52w 32rw IDE Beige RP	17.99	15.31
38NOPW	DVD+-RW 16x Dual Layer Kit RP	43.99	37.44
3JTBPW	DVD+-RW 16x Dual Layer IDE Beige	42.99	36.59
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372HPW	FS-5 Combo CD-RW 24x DVDROM 8x	120.99	102.97
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2RVS5PW	FX-5 52r 52w 24rw Ext USB2	70.99	60.42
IOMEGA			
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3470PW	Combo 7 in 1 16x DVD 52r 52w 32rw	69.99	59.57
3471PW	Combo USB2 16x DVD 52r 52w 24rw	57.99	49.35
3FFQPW	12x DVD+-R/RW USB2 Dual Layer	121.99	103.82
3FFRPW	12x QuickTouch DVD+-R/RW USB2	212.99	181.27
LITEON			
3407PW	52x Internal IDE Retail	10.99	9.35
3J5KPW	16x DVDROM 48x CD IDE Retail	17.99	15.31
2PF9PW	CD-RW 52r 52w 32rw Int IDE RP	19.99	17.01
30M7PW	16x DVD 52r 52w 32rw IDE	29.00	24.68
223PPW	DVD+-R/RW 8x Int IDE Retail	53.99	45.95
39XBPW	DVD+-R/RW 16x Dual Layer RP	46.49	39.57
3K82PW	DVD+-R/RW 16x 12x IDE Black OEM	46.99	39.99
3HRKPW	DVD+-R/RW 8x 8x USB2	34.99	30.84
39KCPW	DVD+-R/RW 12x Dual Layer USB2	66.99	57.01
3G2SPW	DVD+-R/RW 16x 8x USB2 Black	84.99	72.33
LG			
3667PW	16x DVD 52x CD Int IDE OEM	15.50	13.19
3K5XPW	CD-RW 52r 52w 32rw IDE RP	17.99	15.31
2T21PW	CD-RW 52r 52w 32rw Int IDE RP	17.99	15.31
35YRPW	16x DVD 52r 52w 32rw Int IDE RP	32.00	27.23
35YSPW	16x DVD 52r 52w 32rw Int IDE OEM	29.99	25.52
36GCPW	16x DVD 52r 52w 32rw Int IDE OEM	32.00	27.23
3937PW	DVD+-R/RW/RAM 12x Int IDE OEM	47.99	40.84
3H17PW	DVD+-R/RW 12x DL Int IDE OEM Black	44.50	37.87
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33WVPW	16x DVD 52r 52w 32rw Int IDE RP	28.99	24.67
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39NCPW	DVD+-R/RW 16x Dual Layer OEM	42.99	36.59
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37JQPW	DVD+-R/RW 12x SATA	68.98	58.71
3FY1PW	DVD+-R/RW 12x USB2/Firewire	158.99	136.29
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3480PW	16x DVD 52r 52w 32rw Int IDE Black	26.99	22.97
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213DPW	CD-RW 52x32x52x Int IDE OEM	19.99	17.02
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33K7PW	CD-RW/DVD 52x32x52x16x OEM	29.99	25.53
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33J3PW	CD-RW 52x32x52 Silver OEM	18.38	15.65
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3G77PW	DRU-710A Dual Layer DVD+-RW Retail	74.98	63.82
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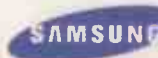


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22DNPW	80GB SATA150 8MB 7200rpm	44.99	38.29
250TPW	120GB UDMA133 2MB 7200rpm	52.99	45.10
22DPW	120GB UDMA133 8MB 7200rpm	54.99	46.80
22DPW	120GB SATA150 8MB 7200rpm	57.99	49.35
256SPW	160GB UDMA133 2MB 7200rpm	60.00	51.06
22DRPW	160GB UDMA133 8MB 7200rpm	61.50	52.34
22DPW	160GB SATA150 8MB 7200rpm	65.99	56.16
WESTERN DIGITAL			
18HFPW	Caviar 120GB UDMA100 8MB 7200rpm	55.99	47.65
2N5BPW	Caviar 160GB SATA150 8MB 7200rpm	57.99	49.35
12NMPW	Caviar 160GB UDMA100 2MB 7200rpm	56.99	48.50
2J72PW	Caviar 250GB UDMA100 8MB 7200rpm	61.99	52.76
25T3PW	Caviar 200GB UDMA100 2MB 7200rpm	67.49	57.44
25T5PW	Caviar 200GB UDMA100 8MB 7200rpm	72.99	62.12
2N7DPW	Caviar 250GB SATA150 8MB 7200rpm	112.49	95.74
2K2PW	Raptor 36GB SATA150 8MB 10000rpm	72.99	62.12

External Hard Disks

quicklink	MAXTOR	INC VAT	ex VAT
2VDGPW	One Touch 120GB USB2 2MB 7200rpm	83.50	71.06
2VDHPW	One Touch 200GB U2/FW 8MB 7200rpm	125.00	106.38
2VDKPW	One Touch 250GB U2/FW 8MB 7200rpm	144.49	122.97
2VDLPW	MAC 250GB Ext 8MB 7200rpm	138.99	118.29
2VDMPW	One Touch 300GB U2/FW 2MB 5400rpm	166.99	142.12
LACIE			
2SDJPW	P3 80GB Ext USB2 HDD & Cbl	64.50	54.89
2SDLPW	P3 80GB Ext Firewire HDD & Cbl	74.99	63.82
2SDKPW	P3 160GB Ext USB2 HDD & Cbl	85.00	72.34
2SDMPW	P3 160GB Ext Firewire HDD & Cbl	91.99	78.29
31PLPW	P3 250GB Ext USB2 HDD & Cbl	113.99	97.01
2SDNPW	P3 250GB Ext Firewire HDD	126.00	107.23
3JG1PW	200GB Extreme FW 400/800 USB2	137.99	117.44
22D9PW	d2 250GB Ext FW 400/800 USB2	149.99	127.65
22DKPW	d2 320GB Ext FW 400/800 USB2	192.99	164.25
22DMPW	d2 500GB Ext FW 400/800 USB2	299.99	255.31
81PJPW	d2 500GB Extreme Ext FW 400/800	279.99	238.29
31PKPW	d2 1000GB FW 400/800 USB2 HDD	618.99	526.80
3KHPW	d2 400GB SATA 7200rpm 8MB	342.99	291.91
2LS4PW	160GB Ethernet Disk 10/100 NAS	335.99	285.95
2KQWPW	500GB Ethernet Disk 10/100 NAS	680.99	579.57
XIMETA			
36FPWP	Portable NetDisk 80GB USB2	81.99	69.78
36FRPW	Portable NetDisk 160GB USB2	141.99	120.84
36FSPW	Portable NetDisk 250GB USB2	206.99	176.16
36FXPW	Mini NetDisk 40GB USB2	149.99	127.65
3OW3PW	250GB NetDisk Office USB2	256.99	218.71
SONY			
226KPW	GigaVault 80GB Hard Drive USB	236.99	201.69
226LPW	GigaVault 80GB i-Link	242.99	206.80

Media

quicklink	DABSVUE	INC VAT	ex VAT
398PPW	Datavite CD-R 52x 90min 100pk	13.00	11.06
38GRPW	Ridata DVD-R Dual Layer 8.4Gb	7.99	6.80
3F83PW	DVD-R 4.7GB 8x in 50pk	10.99	9.35
3GGBPW	Bulkpack DVD-R 8x Orange 25pk	7.99	6.80
32T5PW	Datavite DVD-R 4x Ritek (Q04) 25pk	10.99	9.35
32T6PW	Datavite DVD-R 4x Yellow 25pk	6.99	5.95
3H89PW	DVD-R 4.7GB 8x in 50pk	11.99	10.20
3H88PW	Ridisc CD-R 52x 90min in 100pk	13.99	11.91
3J7NPW	Ridisc DVD-R 8x Printable 25pk	6.99	5.95
SONY			
1Y1CPW	CD-R 700MB 20 Pack Colour Discs	8.99	7.65
2F0CPW	CD-R 700MB 80min 30 Pack	8.99	7.65
302ZPW	CD-RW 700MB High Speed 10 Pack	10.99	9.35
1Y2NPW	CD-R 700MB 25 Pack	13.00	11.06
2G2RPW	CD-R 80min 700MB 50 Pack Spindle	11.00	9.36
2CM2PW	DVD-R Video Box 3 Pack	7.99	6.80
2CMBPW	DVD-R Jewel Case 5 Pack	4.99	4.25
2CMBPW	DVD-R Jewel Case 5 Pack	5.99	5.10
380CPW	DVD-R 4.7GB 25 Spindle Pack	11.99	10.20
380HPW	DVD-R 4.7GB 25 Spindle Pack	11.99	10.20

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quicklink	CRUCIAL MEMORY	INC VAT	ex VAT
WWLPW	256MB 184Pin DIMM PC2100	32.00	27.23
SHWPW	256MB 168Pin DIMM PC133	31.00	26.38
SHWPW	128MB 168Pin DIMM PC133	35.99	30.63
17BJPW	512MB 184Pin DIMM PC2100	44.99	38.29
SGTPW	128MB 168Pin DIMM PC100	51.99	44.25
SHWPW	256MB 168Pin DIMM PC133	55.99	47.65
	DDR RAM Non-Parity	60.00	51.06
	SDRAM Non-Parity	60.00	51.06
	DDR RAM Non-Parity	71.99	61.27
	SDRAM Non-Parity	79.99	68.08

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Iomega Desktop 120MB External Hard Drive

quicklink > 38KSPW Go

£100.99
(£85.95 ex VAT)



The 160GB drive is both USB 2.0 1.1 compatible and includes Iomega Automatic Backup and Symantec Norton Ghost disaster recovery software.



quicklink	IOMEGA	INC VAT	ex VAT
30BPWP	Host Powered 40 U2	98.00	83.40
336APW	Host Powered 60 U2	118.99	101.27
30PCPW	Desktop 80 U2	81.99	69.78
37D2PW	Desktop 120GB USB2 7200rpm	94.99	80.84
38KSPW	Desktop 160GB USB2 7200rpm	100.99	85.95

DiamondMax Plus9 80.0 SATA150 8MB 7200rpm

quicklink > 259KPW Go

£38.49
(£32.76 ex VAT)



Expand your computer's storage capacity with the high performance DiamondMax Plus 9 hard drive.



quicklink	MAXTOR	INC VAT	ex VAT
24YHPW	DiamondMax Plus9 80GB UDMA133	33.50	28.51
259YPW	DiamondMax Plus9 120GB UDMA133	43.99	37.44
2580PW	DiamondMax Plus9 120GB SATA150	53.99	45.95
2582PW	DiamondMax Plus9 160GB UDMA133	53.99	45.95
2583PW	DiamondMax Plus9 160GB SATA150	60.99	51.91
3HVPW	DiamondMax Plus10 200GB UDMA133	67.00	57.02
39NKPW	DiamondMax Plus10 250GB S150	109.50	93.19
39NLPW	DiamondMax Plus10 300GB S150	129.99	110.63
39NSPW	SATA Ultra 16 250GB SATA150	126.00	107.23
39NTPW	SATA Ultra 16 300GB SATA150	155.99	132.76
39NQPW	Maxline III 300GB SATA150 7200rpm	141.99	120.84

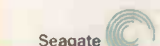
Barracuda 7200.7 160GB UDMA100 7200rpm

quicklink > 2FZYPW Go

£54.99
(£46.80 ex VAT)



- 2MB Cache/Buffer Size
- Interface Type Serial ATA-100



quicklink	SEAGATE	INC VAT	ex VAT
2GZAPW	Barracuda 5400.1 40GB UDMA100	32.00	27.23
2FZNPW	Barracuda 7200.7 40GB UDMA100	31.00	26.38
2FZQPW	Barracuda 7200.7 80GB UDMA100	35.99	30.63
2FZRPW	Barracuda 7200.7 80GB SATA150	44.99	38.29
2FZSPW	Barracuda 7200.7 120GB UDMA100	51.99	44.25
2FZVPW	Barracuda 7200.7+ 120GB UDMA100	55.99	47.65
2FZWPW	Barracuda 7200.7 120GB SATA150	60.00	51.06
2FZXPW	Barracuda 7200.7 160GB UDMA100	60.00	51.06
2G0CPW	Barracuda 7200.7+ 160GB UDMA100	60.00	51.06
32YKPW	Barracuda 7200.7+ 200GB ATA100	71.99	61.27
32YLPW	Barracuda 7200.7 200GB SATA150	79.99	68.08

Iomega Zip 750MB USB 2.0 External Drive

quicklink > 240JPW Go

£90.99
(£77.44 ex VAT)



The Zip 750MB drive is the fast and durable portable storage solution to back up your important data.



- Connects to any USB port
- Uses durable Zip 750MB disks
- Includes Automatic Backup software
- Backup and move your files at 7MB/sec

FreeCom FHD-XS 40GB USB 2.0

quicklink > 33RXPW Go

£143.98
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Maximum performance, storage capacity and reliability.

quicklink	FREECOM U Series X/Barracuda	INC VAT	ex VAT
24LDPW	FHD-1 40GB 18017 USB2	79.00	67.23
24LFPW	FHD-1 80GB 18018 USB2	88.99	75.74
2N01PW	FHD-2 20GB 20686 U2/Fire	99.99	85.10
2N02PW	FHD-2 40GB 20688 U2/Fire	108.99	92.76
30X2PW	FHD-2 PRO 20GB 21841 U2/Fire	79.00	67.23
30X3PW	FHD-2 PRO 40GB 21842 U2/Fire	94.99	80.84
30X4PW	FHD-2 PRO 80GB 21844 U2/Fire	141.99	120.84
30X5PW	FHD XS 20GB 20404 USB2	101.99	86.80
389JPW	FHD-3 160GB USB2 Ext HDD	117.99	100.42
389QPW	FHD-3 250GB USB2 Ext HDD	157.99	134.46
389LPW	FHD-3 160GB USB2/Firewire	127.99	108.93
389MPW	FHD-3 250GB USB2/Firewire	179.99	153.18



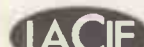
LaCie Mobile Hard Drive 40GB USB2

quicklink > 2SCYPW Go

£74.98
(£63.82 ex VAT)



At only 7.6 x 12.9 x 1.7cm and 200g, this bus-powered hard drive is small enough to fit in your shirt pocket and ideal for laptops, personal backup or carrying around your MP3's or photos. Now also available as dual USB2 & FireWire up to 100GB



quicklink	LACIE	INC VAT	ex VAT
2SCYPW	Mobile HDD 40GB USB2	75.99	64.67
3FTQPW	Mobile HDD 40GB FW/USB2	91.99	78.29
3FTPPW	Mobile HDD 60GB FW/USB2	123.99	105.52
2SC2PW	Mobile HDD 80GB USB2	119.50	101.70
3FTSPW	Mobile HDD 100GB FW/USB2	220.00	187.23

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Intel® Pentium® 4 processor is designed to deliver performance across applications & usages where end users can truly appreciate it.

quicklinx	INTEL	inc VAT	ex VAT
3145PW	P4E 3.0 1MB S478 800FSB Box	116.99	99.57
3146PW	P4E 3.2 1MB S478 800FSB Box	141.25	120.21
3141PW	P4EE 3.4 2MB S478 800FSB	645.99	549.78
365WPW	P4 520 1MB S775 800FSB Box	106.49	90.63
365XWPW	P4 530 1MB S775 800FSB Box	117.99	100.42
365YWPW	P4 540 1MB S775 800FSB Box	143.00	121.70
365ZWPW	P4 550 1MB S775 800FSB Box	181.00	154.04
367OPW	P4 560 1MB S775 800FSB Box	267.99	228.08

intel.

£137.49
(£117.02 ex VAT)

AMD Athlon™ 64 3400+ Processor

quicklinx > 36T2PW Go



The AMD Athlon™ 64 Processor with Enhanced Virus Protection for Windows SP2 runs today's 32-bit & tomorrow's 64-bit software.

quicklinx	AMD Athlon™ XP	inc VAT	ex VAT
36LDPW	Athlon 64 2800+ S754 512KB Box	91.99	78.29
36T1PW	Athlon 64 3000+ S754 512KB Box	98.99	84.25
36T2PW	Athlon 64 3200+ S754 512KB Box	129.99	110.63
36T3PW	Athlon 64 3400+ S754 512KB Box	147.99	125.95
36T4PW	Athlon 64 3500+ S939 512KB Box	180.00	153.19
36T6PW	Athlon 64 3700+ S754 1MB Box	315.99	268.93
36T7PW	Athlon 64 3800+ S939 512KB Box	423.00	360.00
3J38PW	Athlon 64 4000+ S939 1MB Box	479.99	408.50
3J39PW	Athlon 64 FX-55 S939 1MB Box	543.50	462.55

AMD

£129.99
(£110.63 ex VAT)

Processors

quicklinx	AMD	inc VAT	ex VAT
396FPW	Sempron 2400+ Box 1.67GHz SoA	39.99	34.03
396DPW	Sempron 2500+ Box 1.75GHz SoA	49.49	42.12
396CPW	Sempron 2600+ Box 1.83GHz SoA	58.99	50.20
396BPW	Sempron 2800+ Box 2.0GHz SoA	71.50	60.85
396BPW	Sempron 3100+ Box 1.8GHz S754	83.99	71.48
2574PW	Athlon XP 2400+ 2GHz SoA Box	55.99	47.65
2C1MPW	Athlon XP 2500+ 512KB SoA Box	58.99	50.20
2827PW	Athlon XP 2700+ 2.17GHz SoA Box	74.99	63.82
2LCKPW	Athlon XP 3200+ 512KB SoA Box	138.99	118.29
3J33PW	Athlon 64 3200+ 512KB S939 Box	130.99	111.48
3J34PW	Athlon 64 3500+ 512KB S939 Box	183.99	156.99
3J38PW	Athlon 64 4000+ 1MB S939 Box	479.99	408.50
INTEL			
1245CPW	Celeron 2.0 128KB S478 Box	46.99	39.99
3C0BPW	Celeron 2.4 256KB S478 Box	48.99	41.69
36LKPW	Celeron 2.67GHz 256KB S478 S33	55.99	47.65
365VPW	Celeron 2.8GHz 256KB S478 S33	72.99	62.12
3KDDPW	Celeron 345J S775 256kb	116.33	99.00

Gigabyte 7N400 Pro 2 Motherboard

quicklinx > 2QBP8PW Go



Image for illustrative purposes only.

quicklinx	GIGABYTE	inc VAT	ex VAT
37F5PW	GA-BANXP-D Intel 925X S775 ATX	154.00	131.06
37F7PW	GA-BGNXP-Duo Intel 915P S775 ATX	140.99	119.99
37F9PW	GA-B915S Duo Pro Intel 915P S775 ATX	79.00	67.23
37F1PW	GA-B915P D Pro Intel 915P S775 ATX	79.00	67.23
37F2PW	GA-B915P Pro Intel 915P S775 ATX	80.99	68.93
37C8PW	GA-B915P Duo Intel 915P S775 ATX	63.99	54.46
37F1PW	GA-B915P G Intel 915P S775 ATX	69.99	59.57
37F2PW	GA-B915P MF Intel 915P S775 MATX	66.99	57.01
34D1PW	GA-B915GL-MF Intel 910L S775 MATX	66.99	57.01
37G1PW	GA-B915G Pro Intel 915P S775 ATX	82.99	70.63
37G2PW	GA-B915CMF Intel 915C S775 MATX	60.99	51.91
37C8PW	GA-B915P Pro Intel 915P S775 ATX	71.99	61.27
37G4PW	GA-B915P G Intel 915P S775 ATX	53.99	45.95

GIGABYTE
TECHNOLOGY

MSI K8T Neo-FIS2R Motherboard

quicklinx > 2R4MPW Go



- VIA K8T800
- Socket 754

quicklinx	MSI	inc VAT	ex VAT
56M1PW	925X Neo Plat Intel 925X S775 ATX	124.98	106.37
39C0PW	925X Neo Plat S4G Intel 925X S775	132.99	113.18
36M2PW	915G Neo2 Intel 915C S775 ATX	102.99	87.65
36M3PW	915P Neo2 Plat Intel 915P S775 ATX	91.99	78.29
39C1PW	915P Neo2 Plat S4G Intel 915P S775	111.99	95.31
36M4PW	915P Combo Intel 915P S775 ATX	74.99	63.82
39C0PW	K8N Neo Plat S4G nForce3 S754	88.99	75.74
349XPW	K8N Neo Plat Edition nForce3 S754	79.00	67.23
39C0PW	K8N Neo2 Plat S4G nForce3 U S939	100.99	85.95
39C0PW	K8N Neo2 Plat nForce3 U S939	88.00	74.89
31C0PW	KT6V-LSR SoA KT600+ ATX A R L	37.99	32.33

MSI

£65.98
(£56.16 ex VAT)

Motherboards

quicklinx	ABIT	inc VAT	ex VAT
382YPW	AA8-3rd Eye Intel 925X S775 PCI-E ATX	111.99	95.31
381YPW	AA8-Duramax Intel 925X S775 ATX A L	100.99	85.95
382ZPW	AC8-V Intel 915P S775 PCI-E ATX ALR	84.99	72.33
3830PW	AC8-3rd Eye Intel 915P S775 PCI-E ATX	93.99	79.99
36L2PW	AC8 Intel 915P S775 ATX A L R	92.99	79.14
34SPSW	KV8 S754 VIA K8T800 ATX A L R	62.99	53.61
359VPW	KV8-Pro S754 VIA K8T800 Pro ATX A L	65.99	56.16
ASUS			
3720PW	PSAD2 Premium Intel 925X S775 PCI-E	149.99	127.65
372RWP	PSAD2 Deluxe Intel 925X S775 PCI-E	138.99	118.29
372SPW	PSOD2 Premium Intel 915P S775 PCI-E	138.99	118.29
3721PW	PSOD2 Deluxe Intel 915P S775 PCI-E	126.99	108.08
39P1PW	PSOD2 Intel 915P S775 PCI-E ATX ALR	105.99	90.20
372VPW	PSODC-V Deluxe Intel 915C S775 PCI-E	110.99	94.46
372WPW	PSODC Deluxe Intel 915P S775 PCI-E	98.99	84.25
372XWP	PSOD1 Intel 915P S775 PCI-E ATX ALR	85.99	73.18
38KVWP	PSOD1-VM Intel 915C S775 PCI-E MATX	76.99	65.52
39P2PW	PS800 Intel 915P S775 ATX A L	60.00	51.06
372VPW	Intel 865GV S478 ATX A V L	121.99	99.14
30H7PW	SKB S940 VIA K8T800 ATX A L R	121.99	103.82
37CCPW	ABV/Deluxe/WIFI VIA K8T800PR S939	85.99	73.18
372ZPW	K8N-E Deluxe nForce3 S754 ATX A L R	77.99	66.37
3C0NPW	K8N S754 nForce 3 ATX A L R	54.99	46.80
3584PW	K8V-SE/Deluxe S754 VIA K8T800 ATX A	74.99	63.82
3580PW	P4SP-MX S478 VIA S1661 MATX A V L	33.99	28.93
3581PW	P4VP-MX S478 VIA P4M266A MATX A L	32.99	28.09
GIGABYTE			
37G6PW	GA-K8N nForce 250 S754 ATX A L R	49.98	42.54
37C0PW	GA-K8N Pro nForce3 S754 ATX A L R	62.99	53.61
37C0PW	GA-K8NXP nForce3 S754 ATX A L R	126.00	107.23
3584PW	GA-K8NXP-939 nForce 3 250Ultra S939	114.99	97.86
37C1PW	GA-K8VMB00M VIA K8M800 S754 MATX	51.00	43.40
20K0PW	GA-K8V7800M S754 VIA K8T800 MATX A L	53.99	45.95
20K1PW	GA-K8V7800 S754 VIA K8T800 ATX A L R	56.99	48.50
20C0PW	GA-K8V7800 Pro S754 VIA K8T800 ATX A L	65.99	56.16
20R0PW	GA-K8VNPX S754 VIA K8T800 ATX A L R	98.00	83.40
MSI			
3840PW	VIA P4M266A Socket478 MATX A V L	29.99	25.52
384CPW	SS 551 Socket478 MATX ACP4x A V L	32.99	28.08
3849PW	Intel 848P Socket 478 ATX A L R	42.99	36.59
3848PW	Intel 865G Socket478 MATX A V L	56.99	48.50
36V4PW	Intel 915P Socket 775 ATX A L R	74.99	63.82
36M3PW	Intel 915P Socket 775 ATX A L R	91.99	78.29
39C1PW	Intel 915P Socket775 PCI-E ATX A L R	111.99	95.31

A7N8X-E / Deluxe

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- Memory Slots: DIMM x 3
- Chipsets: VIA Apollo KT400-VT8235
- CPU Bus Clock: 400MHz (EV6)
- AGP 8X/ DDR400*/ 5.1 channel/ ATA133/ LAN on-board

ASUS

K8T800Pro S939 AGP ATX

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- AMD K8 Athlon 64/64FX Socket 939 ATX Mainboard
- Dual DDR400, Gigabit LAN, USB2.0
- SATA150 RAID, IEEE1394, 6ch Audio, ?Guru™ Tech

ABIT

£75.98
(£64.67 ex VAT)

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- Intel® Pentium® 4 LGA775 Package 800MHz FSB, Celeron® 533MHz FSB
- Intel® 915G Chipset & Integrated 3rd gen. gfx onboard video

SUPERMICRO

£127.99
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Sonata Quiet Midi Tower

quicklinx > 2QJCPW Go



- 3.0 Ghz Compatible
- TruePower 380Watt ATX12V power supply with single fan design for enhanced quietness
- Front mounted USB & IEEE 1394 (FireWire® i.Link®)

Antec
The Power of You

Minuet Slimline PC Case

quicklinx > 2QJCPW Go



- SmartPower 220Watt ATX12V power supply
- Front mounted USB & IEEE 1394 (FireWire, i.Link) ports
- Front Audio ports
- 3 Drive Bays In easy to Install Flip-UP Drive Cage

Antec
The Power of You

£42.99
(£36.59 ex VAT)

Super LANBoy EU

quicklinx > 2W08PW Go



- Durable anodized aluminum finish
- Clear side window
- Front ports: 2x audio, 2x USB
- One low-speed 120mm fan (rear)
- One low-speed 120mm blue LED fan (front)

Antec
The Power of You

£65.98
(£56.16 ex VAT)

Midi Tower KOB-24

quicklinx > 3JRBPW Go



- 400W PSU
- 3x Ext 5.25"
- 2x Ext 3.5"
- 1x Int 3.5"
- AMD/P4 PSU

dabs value

LanFire ATX Midi Tower

quicklinx > 2SJPW Go



- Case Dimension: H440xW180xD460mm
- Ultra-light: only 4kg (8.8 lb)
- Drive Bays: 5.25"x3, 3.5"x2 (external), 3.5"x2 (internal)
- Thermaltake EL flash fire ball in front panel

Tt Thermaltake

£73.99
(£62.97 ex VAT)

Crystal Blue ATX Midi

quicklinx > 3045PW Go



- Supplied flatpack, the case is easy and quick to assemble
- The motherboard stand-off's are designed for a full size ATX board
- 470 x 215 x 432mm (L x W x H)

akasa

£86.98
(£74.05 ex VAT)

Cases

quicklinx	ANTEC	inc VAT	ex VAT
2QJCPW	SONATA UK	72.99	62.12
2RVMIPW	OVERTURE UK 380W	177.99	151.48
2QJFPW	MINUET UK	42.99	36.59
2QJHPW	SLX1600UK	43.99	37.44
2QJJPW	SLK2600AMB UK	49.98	42.54
2QJKPW	SLK3700AMB UK	54.99	46.80
2W07PW	SLK3700BUE UK 350W	66.99	57.01
2W08PW	Super LanBoy EU - No PSU	65.99	56.16
31Q2PW	P160EU	86.99	74.03
2RVDPW	PlusView 1000AMG EU	58.99	50.20
2QJNPW	SX635BI UK	57.99	49.35
2QJPPW	SX835 II UK	57.99	49.35
2QJQPW	SX1040B II UK	65.99	56.16
COOLERMASTER			
39HWPW	Stacker BTX ATX Case Silver	99.99	85.10
30JWPW	Stacker BTX ATX Case Window	130.99	111.48
39H2PW	WaveMaster ATX Blue	131.99	112.33
3J7DPW	Cavalier 1 Case Silver No PSU	73.99	62.97
3J7FPW	Cavalier 1 Case Black No PSU	74.99	63.82
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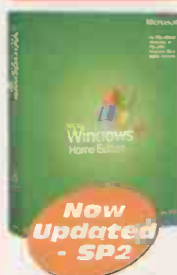
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21D6PW	Quicken Investor	39.95	34.00
39HQPW	MS Money 2005 Standard	28.98	24.67
39HQPW	MS Money 2005 Financial Suite	52.99	45.10
2R45PW	Sage Instant Accounts v10	113.98	97.01
QR4RPW	Sage Instant Payroll v10	99.99	85.10
ANTIVIRUS/SECURITY			
3HTCPW	Active VirusScan SMB Edition 5 User	153.99	131.06
3HTDPW	Active VirusScan SMB Edition 10 User	289.99	246.80
QSSVPW	McAfee VirusScan Home v8	29.37	25.00
2SS2PW	McAfee VirusScan Pro v8	41.12	35.00
23XDPW	Net Nanny 5	33.99	28.93
21NRPW	Symantec Norton Antivirus Small/Bu	170.98	145.52
3F8BPW	Symantec Norton Internet Security '05	44.65	38.00
BACKUP			
QHRQPW	Dantz Retrospect Pro v6.5	76.37	65.00
6-H5MPW	Executive DiskKeeper v9 Professional	47.98	40.84
3H5KPW	Executive DiskKeeper v9 Home	27.98	23.82
2X26PW	Symantec GoBack	29.37	25.00
33S5PW	Symantec Norton Ghost 2004	48.98	41.69
2WV7PW	Veritas Backup Exec v9.1	412.98	351.48
2WV8PW	Veritas Backup Exec v9.1 SBS	314.99	268.08
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335MPW	AutoCAD LT 2005	757.87	645.00
2MSFPW	AutoDesk Voio View v5	149.98	127.65
38MNPW	AutoSketch v9	160.98	137.01
33RMPW	IMS TurboCAD v10 Standard	64.98	55.31
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2LWDPW	Symantec PC Anywhere H+R v11	146.87	125.00
1G9PW	Symantec WinFax Pro v10	52.87	45.00
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244TPW	Act v6	122.98	104.67
244VPW	Act v6 5 User	578.99	492.76
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2-H01PW	MS Visual FoxPro Pro v8	503.99	428.93
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2R2KPW	Visio Professional 2003	401.99	342.12
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2ZSQPW	Adobe FrameMaker v7.1	797.98	679.14
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2N13PW	Quark Xpress v6	1059.99	902.12
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29Q5PW	Adobe Illustrator CS	482.99	411.06
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236RPW	Adobe Photoshop Elements v2	78.99	67.23
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3FJVPW	Jasc Paint Pro v9	84.60	72.00
2B2KPW	Macromedia Freehand MX	327.98	279.14
2R24PW	MS Powerpoint 2003	195.99	166.80
335KPW	Roxio PhotoSuite Platinum v7	48.98	41.69
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34TBPW	Corel Wordperfect Office v12	208.98	177.86
28QMPW	Lotus SmartSuite	202.99	172.76
2RYTPW	Office 2003 Standard	313.99	267.23
2RYVPW	Office 2003 Standard Upgrade	184.99	157.44
2RYZPW	Office 2003 Small Business	354.99	302.12
2RYWPW	Office 2003 Professional	381.87	325.00
3DX2PW	MS Works v8	36.98	31.48
3FJ3PW	MS Works Suite 2005 inc Word	72.99	62.12
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2V2HPW	ScanSoft OmniPage Pro v14	333.99	284.25
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2SL3PW	MS Windows SBS 2003	436.99	371.91
1J0PW	MS Windows 2000 server	850.99	724.25
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342KPW	SUSE Linux v9.1 Personal	22.32	19.00
3HCLPW	SUSE Linux v9.2 Professional	55.98	47.65
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2PCPW	MSDN Professional Subscription	929.98	791.48
2FT4PW	MS Visual Basic .NET 2003 Std	88.99	75.74
2FT8PW	MS Visual C++ .NET 2003 Std	88.99	75.74
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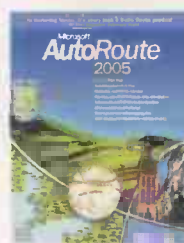
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39hKPW	MS Encarta 2005 Premium DVDROM	49.95	42.50
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395DPW	Symantec Norton Ghost 2004	48.98	41.69
33CLPW	Symantec NAV/NPF Bundle 2005	48.98	41.69
39W9PW	Symantec Partition Magic v8	60.99	51.91
3F2VPW	Norton Systemworks 2005 Standard	57.98	49.35
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37CKPW	WinZip v9	34.07	29.00
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3FJ3PW	MS Works Suite 2005 inc Word	72.99	62.12
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308KPW	Pinnacle Studio v9	44.06	37.50
2CCVPW	Roxio VideoWave v5 Power Edition	24.67	21.00
30ZWPW	Ulead DVD movie Factory 3	24.67	21.00
30PVPW	Ulead Video Studio v8	43.99	37.44
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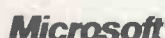
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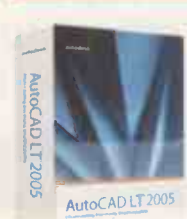
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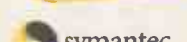


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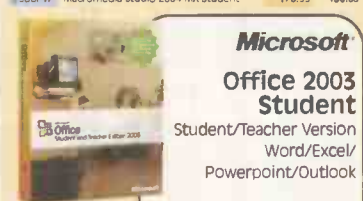
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2T32PW	Adobe Photoshop CS Windows	142.98	121.69
335NPW	Autodesk AutoCAD LT 2005	270.99	230.63
2MNNPW	Drive Image 7	38.98	33.18
2R53PW	Microsoft FineReader 7 Pro	70.99	60.42
2RYQPW	Microsoft FrontPage 2003	93.98	79.99
2RYVPW	Microsoft Office 2003 Pro	250.99	213.61
2R20PW	Microsoft Office 2003 Small Business	217.98	185.52
2RYVPW	Microsoft Office 2003 Standard	164.99	140.42
KYQPW	Microsoft Windows 2000 Pro Nt Wks	121.98	103.82
K2SPW	Microsoft Windows 2000 Prof Win9x-2K	195.99	166.80
ZLSPW	Microsoft Windows XP Home Edition	82.25	70.00
ZL7PW	Microsoft Windows XP Professional	151.57	129.00
2TDHPW	Norton SystemWorks 2004 Pro	48.98	41.69
3GRHPW	Pinnacle Studio 9 Plus	43.99	37.44
2PS2PW	Symantec NIS 2005	37.98	32.33
39WQPW	Symantec Norton Antivirus 2005	24.98	21.27
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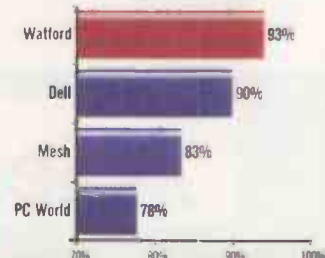
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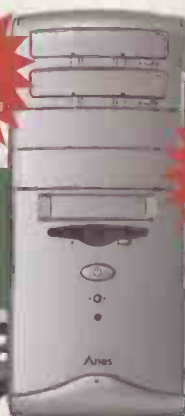
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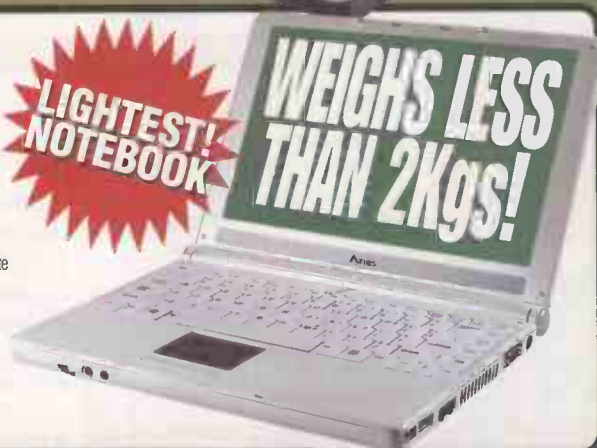
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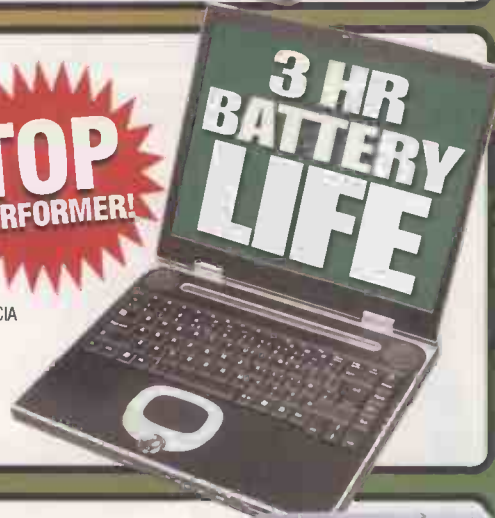
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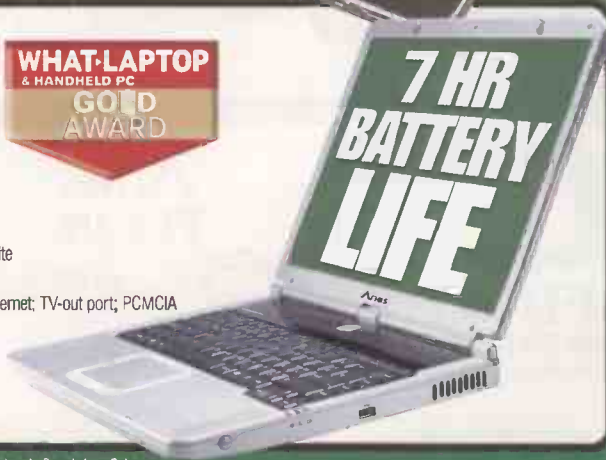
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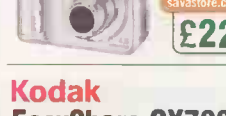
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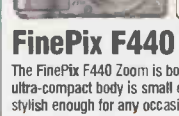
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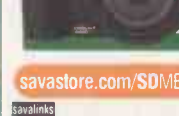
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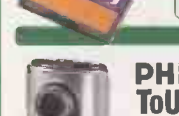
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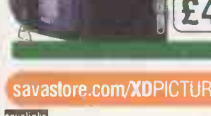
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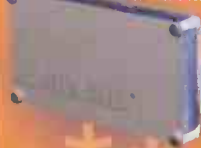
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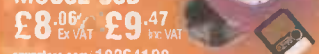
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10278134 Lacie 16x Dual Layer External USB2	72.21	84.85
10278445 LiteOn 16x33x50A Dual Layer USB2 16x Retail	64.74	76.07
10278400 MSI DR16-A Dual Layer Int IDE 16x	49.74	58.44
10277305 NEC ND3500A Dual Layer Int IDE 16x OEM	36.55	42.95
10277447 Pioneer DVR-108 16x Dual Layer IDE OEM	45.99	54.04
10277394 Plesher 4x Internal SATA OEM No sw	94.94	111.55
10278443 Sony DRU-710A Dual Layer Int IDE 16x Retail	60.98	71.65

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10271240 Benq CD-RW 12x 80min 700Mb Spk	3.18	3.74
10270570 DVD-R Media 4x 4.7GB 5 pack	10.10	11.87
10274921 Aries DVD-R Media 4x 4.7GB 100 pack	31.00	36.43
10275903 Memorex DVD-R Media 4x 4.7GB 100 pack	7.07	8.31
10266571 TDK DVD-R Media 4.7GB 1 pack	1.21	1.42
10266530 Maxell DVD-R Media 4.7GB 5 pack	11.11	13.05
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10266516 Sony DVD-R Media 4.7GB 1pk	4.84	5.69
10266574 TDK DVD-RAM Media x1 4.7GB 1pk	7.07	8.31

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10197393 Amacrom EZDisk 40GB Ext USB	120.19	141.22
10268254 Amacrom ZipDisk 60GB Ext USB	321.18	377.39
10268278 Amacrom EZ Disk 180GB with USB2.0 Cable	292.90	344.16
10265280 Archos Mini Hard Drive 20GB USB2	84.95	99.82
10271019 Freecom FHD-2 40GB GB Mobile USB2 + FW	92.76	108.99
10271020 Freecom FHD-2 60GB GB Mobile USB2 + FW	122.71	144.18
10270359 Iomega 40GB Ext USB 2 + FireWire	109.98	129.23
10271692 Iomega 120GB 7200RPM USB 2	141.89	166.72
10274095 Iomega 250GB 7200RPM USB2	145.12	170.52
10273582 Lacie 160GB 7200rpm ext USB 2.0 P3	72.40	85.07
10273583 Lacie 80GB 7200rpm ext USB 2.0 P3	55.00	64.63
10273585 Lacie 250GB 7200rpm ext USB 2.0 P3	97.21	114.22
10276564 Pinnacle FyCase Slim Silver 2.5" 40GB	78.78	92.57
10276563 Pinnacle FyCase Slim Silver 2.5" 20GB	63.12	74.17

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10273744 Acer MP3 player 128MB	70.68	83.05
10277263 Apple iPod Mini 4GB - Blue	149.91	176.14
10278306 Apple iPod 40GB 4th Generation	235.90	277.18
10278999 Apple iPod Photo 60GB	360.83	423.98
10275872 Archos Gmini 220 MP3 20GB	190.63	223.99
10275873 Archos Gmini 220 MP3 20GB	217.40	255.45
10276731 Archos AV480 80GB MP3/M4	407.95	479.34
10278162 Archos AV420 20GB MP3/M4	270.95	318.37
10273119 Benq Joybee 120 - 128MB Silver	109.00	128.08
10273120 Benq Joybee 150 - 128MB Silver	87.00	102.93
10273771 Benq Joybee 150 - 256MB Silver	100.42	117.99
10278953 Creative Jukebox ZEN Micro Silver 5GB	141.34	166.07
10279317 Creative MuVo 128MB	36.23	42.57
10279318 Creative MuVo TX 128 MB	42.51	49.95
10279320 Creative MuVo TX 256 MB FM	59.56	69.98
10279321 Creative MuVo Sports C100	66.14	77.71
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The stylish, compact Creative Zen Touch stores up to 10,000 songs on its 20GB hard disk and offers up to 24 hours playtime. The innovative Touch Pad supports fast, easy management of MP3, WMA or other digital files, while USB 2.0 connectivity ensures high-speed downloads. The large backlit display and multilingual interface mean added ease of use.

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MuVo Micro N200

The MuVo Micro N200 256MB is Creative's smallest digital audio player. With 256MB of memory, it stores up to 4 hours of music in MP3 and 8 hours in WMA. It offers up to 15 hours playtime with a single AAA battery (Supplied). Featuring USB 2.0 for speedy downloads it has a built in FM radio/microphone and can record from both. All in - allows you to directly encode to MP3. The MuVo Micro is also available in 128MB, 512MB and 1GB versions for alternative music storage.

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Everyone needs a little joy in their lives, and at 57 x 38 x 12mm, the BenQ Joybee 120 is certainly little.

The MP3/WMA is available with 128MB of Flash memory... The music player also includes FM stereo radio, voice recording, FM recording and a language learning function that allows rolling playback of a recording. The rechargeable Lithium-Ion battery provides up to 16 hours of power, with a room for up to 60 songs. Available in Autumn leaf, Lime Green and Silver. **256MB VERSION also available**

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ARCHOS Gmini XS200

The new Gmini XS200 is an extremely small 20GB hard-drive based audio player with a competitive low price. The ultra-compact music player is just as small as most 2GB audio players available today yet offers a huge capacity - able to hold up to 300 hours of music - that's up to 5000 songs!

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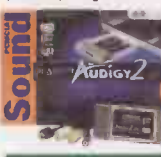
Zen Micro

Creative's Zen Micro is the micro-sized digital audio player with an ergonomic design and fingertip control. It will store up to 2,500 songs in WMA or 1,250 in MP3 on its 568 hard disk and gives up to 12 hours playtime via its removable, rechargeable battery. It downloads tracks from the PC at up to a song per second and is available in a choice of 10 colours.

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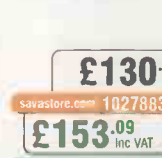
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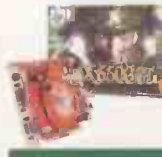
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10263824 Terratec Aureon 5.1 Fun PCI Sound Card	19.99	23.49
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10276307 PowerPack! Ultra/2400 TV-DVI Golden Sample	251.49	295.50
10277531 PowerPack! Ultra/2400 TV-DVI Golden Sample	284.03	289.41
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10268521 Nvidia FX5900 128MB DVI/TV Out	239.27	281.26
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10242543 GA MX440-8X AGP 64MB TV Out	27.21	31.97
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10269625 Verio GeForce FX5200 128MB 64-bit DOR 8X AGP	35.23	41.40
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10276420 GF FX5200XT 128MB DOR TV + DVI	117.82	138.44
10277377 GeForce FX 6600 128MB DOR TV + Dual DVI	188.84	221.89
10276635 GeForce FX 6600 GT 256MB DOR3 TV + Dual DVI	264.17	310.40
10276415 GeForce FX5500 AGP 8x 256MB DOR TV+DM	51.92	61.01
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10224822 Hauppauge WinTV USB FM	44.99	52.66
10278614 Hauppauge WinTV PVR 150 MCE	82.53	97.47
10270336 Hauppauge WinTV PVR USB 2	82.52	96.96
10011911 Hauppauge WinTV Nova	78.68	92.45
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10010135 Hauppauge WinTV DVB-S	129.99	152.74
10009776 Hauppauge DV Wizard Pro	90.30	106.81
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10268372 Pinnacle PCTV Sat CI	91.23	107.20
10263449 Pinnacle PCTV Deluxe External TV PVR	111.21	130.67
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ip1500 Bubble Jet Printer

The friendly and affordable home printer

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Canon

SmartBase MP390

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OfficeJet PSC1215

Designed to fit in any room, this is the world's smallest flatbed all-in-one. Versatile and easy-to-use, it delivers true-to-life photo quality colour printing at 4800-optimised dpi, plus flatbed scanning and convenient, standalone copying.



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OfficeJet 6110

The HP OfficeJet 6110 provides a complete home office solution with exceptional photo quality printing and scanning, combined with walk-up faxing and copying - no need to switch on the PC.



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DeskJet 3845

This versatile printer offers an attractive combination of value-for-money, ease-of-use and impressive performance, while also giving you the ability to produce true-to-life photos.

- Up to 4,800 optimised dpi or optional 6-ink
- Compact design - Ideal for limited spaces with 100 pages fold-up tray
- Photo enhancement features - discover the possibilities!



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Deskjet 5740

This versatile printer offers both high speed everyday printing and the ability to produce professional photo quality results at up to 4800-optimised dpi or with optional 6-ink colour.

- Professional photo quality with or without borders
- Up to 26 ppm laser-quality black, up to 18 ppm colour
- Compact design with advanced control panel



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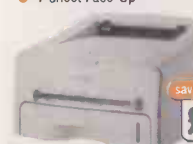
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Best in class entry level colour laser printer with duplex as standard.

- 20ppm Mono / 5 ppm Colour
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- 350 sheet capacity as standard
- 1200 dpi resolution
- Network version available



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Stylus C66

Mid range, general purpose inkjet printer

- DURABrite™ ink for exceptional image and text quality on specialist photo media through to uncoated plain paper
- 4 separate ink cartridges - only replace the ink you use
- Borderless printing up to 10 x 15 cm - great for photos
- Fast 17ppm black and 9ppm colour printing



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PictureMate

The Home Photo Centre - Premium Quality Photo EPSON PictureMate is the ideal digital camera accessory to print affordable photo lab quality 10x15cm photos conveniently at home - without the need for a computer.

- Ease-of-use - Easy, one-touch printing that's more convenient than making a trip to the photo lab
- Durability - Archival-quality photos for memories that last for generations, even longer than lab prints
- Affordability - Economical cost per photo that rivals the traditional photo lab
- Highly durable photo prints lasting up to 100 years*
- Up to 5760 dpi print resolution and microscopic droplets of 2.5 pL
- Easy to use hassle-free operation using the new EPSON Print Wizard



£114 Ex VAT
savastore.com/10276313
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*Details available at www.epson.co.uk

Stylus Photo R300

Premium quality photo printer - personalise, print and save your memories with or without a computer

- Borderless printing and resolution up to 5760 optimised dpi for highly durable photo-lab style prints
- 6 individual ink cartridges for economical printing - only replace the ink used
- Print directly from your USB DIRECT-PRINT or PictBridge compatible Digital Camera



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Stylus Photo RX420

Photo quality All-in-One home photo centre with stand-alone capability

- Long-lasting photo quality results with resolution up to 5760 optimised dpi*
- Individual ink cartridges for cost effective photo printing
- 1200 x 2400 dpi scanner for quality photo reproduction
- Restore old and faded photos with Epson photo restoration tool
- Integrated memory card reader



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Personal high speed and affordable mono laser printer for professional printing

- Fast and affordable - great personal desktop printer
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- Advanced EPSON print controller for superb throughput
- PC and Mac compatible with both USB and Parallel interfaces
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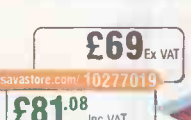
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Stylus C86PE EPSON

High end, multipurpose inkjet printer, it is ideal for all types of applications from home projects and photo printing to business documents and presentations.

- DURABrite™ ink for exceptional image and text quality on specialist photo media through to uncoated plain paper
- Cost efficient separate DURABrite™ ink cartridges - only replace the ink you use
- Borderless printing up to A4 - great for photos
- Optimised 5760 dpi and 3pL variable droplet size for crisp text and vivid colour prints
- 6 in 1 USB Card reader for easy data transfer



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Stylus Photo R800

The inkjet printer that brings photography out of the dark room.

- EPSON UltraChrome Hi-Gloss pigment ink for outstanding photo quality and durability
- Borderless printing and resolution up to 5760 x 1440 optimised dpi for outstanding photos reproduction
- Advanced connectivity with IEEE 1394 (FireWire) & USB 2.0 Hi-Speed
- 5760dpi high resolution direct printing onto CDs and DVDs



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Stylus Photo CX6600

High quality All in One packed with latest advanced features for home, office and photo printing

- New DURABrite ink for exceptional image and text quality
- Memory card slots for direct printing capability and scanning
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Perfection 3170

Exceptional quality, high speed, flatbed film scanning solution with new EPSON Photo Restoration features

- 3200dpi resolution
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AcuLaser C900/900N

The perfect compact colour laser solution for the small workgroup or business

- Extremely efficient printing speeds of 16ppm mono and 4ppm colour
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- Outstanding value with low operating costs



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acer AL1721HS 17" LCD

The professional AL1721HS supports the superior performing DVI digital interface for the office user with high performance and focused needs.

- 16ms Response Time
- Supports the latest TN+film panel technology
- In-built speakers
- Height adjustable



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AL1711S 17" LCD

- 17" TFT Black/Silver
- 1280 x 1024 @ 75Hz Max Resolution



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Agneovo

F417 17" LCD Black

Featuring an integrated power supply, slim bezel and cable management organizer with specifications usually seen on much higher priced monitors, the F417 is truly a different class of display.

- 15ms Response Time
- Resolution 1280 x 1024
- Contrast Ratio 430:1
- Analogue input
- 3 years onsite NBD swap out warranty



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Aries

AL150N 15" LCD Silver

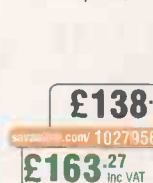
- 1024x768 @75Hz Max Res.
- Internal Speakers
- 25ms Response Time



£120.95 Ex VAT
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£142.11 Inc VAT

AL170 17" LCD Silver

- 1280 x 1024@75Hz Max Resolution
- 16ms Response Time
- Internal Speakers



£138.95 Ex VAT
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AL190N 19" LCD Silver

- DVI Support
- 2W X 2 Internal Speakers
- 16ms Response Time



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£230.24 Inc VAT

Belinea 101715 17" LCD

MONITORS BY MANDATA

With their combination of convincing quality and a low entry price, Belinea Multimedia TFT displays are ideal for individual home/office-based workstations.

- Resolution - 1280 x 1024
- Response time - 4 / 16ms
- Dot pitch in mm - 0.264 x 0.264
- Integrated speaker



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£167.44 Inc VAT

www.savastore.com/belinea

BenQ

FP71E+ 17" LCD Silver

- 8ms Response Time
- new Senseye Technology for a clearer image.
- 1280 x 1024 resolution



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CTX

COMMITTED TO EXCELLENCE

S965A 19" LCD Black

The S965A is the latest in high quality, well-priced products from CTX.

- 25ms Response Time
- contrast ratio of 450:1
- Built-in Stereo Speakers
- Built in Power supply



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F773L 17" LCD Silver

The F773L 17" screen has the brightest, sharpest and most three-dimensional picture quality offered to date by CTX.

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- CTX Neon-Life Visual Technology
- Vivid Colour Enhancement Technology
- 16ms Response Time



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iivama

Prolite E481S 19" LCD

Solid performance and sleek design. This model includes integrated speakers and can be wall/arm mounted for complete flexibility. Available in black, silver and ivory.

- 19" IPS TFT LCD
- Dual inputs offer VGA and DVI connectivity
- 25ms Response Time



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20.1" Photon LCD

Providing impressive native resolution, state-of-the-art colour accuracy, and increased brightness and contrast at a fantastic price.

- Max resolution 1600x1200 @ 75Hz
- Dot pitch 0.255mm, 16ms Response Time
- DVI & VGA



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An outstanding, reliable display which saves a lot of deskpace plus energy savings 20 percent above the industry average.



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- 16ms Response Time
- TCO'03

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190S5FS 19" Silver SXGA



£244.94 Ex VAT
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£287.80 Inc VAT

SAMSUNG

SM710V 17" LCD Silver

The Samsung SyncMaster™ 710V is a 17-inch LCD offering razor-sharpness and innovative features.

- 1280 x 1024 resolution
- 25ms Response Time
- 150°/120° horizontal/vertical viewingangle.



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SM793S 17" CRT



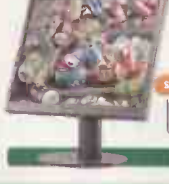
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SONY.

SDM-X73B 17" LCD Black

Sony HX-Series Displays are brilliantly designed with premium features that enhance your multimedia experience

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- Selectable picture mode (Game/Movie/PC/Auto) for optimal viewing experience
- Integrated speakers
- Super fast graphics processor to deliver consistent high-quality images and video



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£297.11 Inc VAT

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ViewSonic

VE710B 17" LCD

The ViewSonic VE710 LCD display not only brings images to life with vivid colour and outstanding realism. Its stylish design is also sure to catch your eye.

- Full 17.0" Viewable Screen
- 1280 x 1024 Resolution
- 25ms Response Time
- Fold Up 90° Base for wall mounting



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20.1" TFT-LCD TV Panel

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RELISYS

RLT1720 - 17" LCD TV

The RLT1720 is an exquisite 17" LCD TV, which delivers unparalleled picture performance and can be positioned almost anywhere in the home.

- 16ms response time
- High contrast ratio & brightness, of 400:1 & 400cd/m2
- Weighing 6.5Kg., & is VESA wall mountable



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ViewSonic

N2010 20" LCD TV

ViewSonic's N2010 20" LCD TV brings bright, crisp, vibrant video and TV images to your desktop, kitchen, bedroom or anywhere else you desire.

- UltraBrite™ technology brings images to life
- 16ms, High Brightness and 500:1 Contrast Ratio
- Wall Mountable (Vesa Standard)



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ORION

42" 4230 Plasma Screen

The product is designed, especially, for wide screen, high definition and handiness. Its brightness is almost equal to that of CRT, and provides so a wide angle of vision that it is possible to see at an angle of more than 160 degrees from the left or right side.



£899 Ex VAT
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"Thank you once again - the goods were collected to-day as planned."

CB, Clevedon, Somerset, December 04 Savastore.com Customer Survey

acer PD116 Projector
The PD116 DLP digital projector is the new standard display solution in the SVGA Class.

- DLP Projection System
- SVGA Resolution
- 1800 Ansi Lumen Brightness (1350 in ECO mode)

£609 Ex VAT
£715.57 Inc VAT

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SONY VPL-ES2
A versatile projector for work or play

- SVGA (800x600 pixels)
- 1500 lumens light output
- Extended 4000 hour lamp life
- Intelligent auto-set up for ease of use
- 3 years' warranty

£639.20 Ex VAT
£751.06 Inc VAT

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BenQ PE5120 Home Cinema Projector

- DLP Projection System
- Native 16:9 Widescreen
- 2000:1 High Contrast ratio

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1027610	AL1912MS 19" Silver / Black	244.08	286.79
1027611	AL2022WM 20" Black DVI	504.45	592.73
1027612	ADI		
1027613	AS05 15" Silver Multimedia	149.90	165.56
1027614	A705 15" Silver/Black	167.40	196.70
1027615	AG04 19" DVI Multimedia	392.89	461.65
1027616	AG NEOVO		
1027617	F415 15" Black	121.50	142.76
1027618	F417 17" Black	145.80	171.32
1027619	X19W 19" Black DVI	430.92	506.33
1027620	X20 20" Black DVI	819.72	963.17
1027621	10 15 55 15" Silver/Black TN	137.18	161.19
1027622	10 17 51 17" Silver Angle	176.58	207.48
1027623	10 19 06 19" Silver/Black	213.14	250.44
1027624	10 20 05 20" Silver DVI	366.51	430.65
1027625	BENQ		
1027626	FP531 15" Black	131.70	154.75
1027627	T701 17" Silver & Black	157.80	185.42
1027628	T904 19" Black	212.90	250.16
1027629	FP201 20" Silver DVI	627.00	736.73
1027630	CTX		
1027631	SS52A 19" Silver/Black	135.10	158.74
1027632	S762A+ 17" Black/Silver Zero DP	176.04	206.85
1027633	S965A 19" Silver/Black	237.90	279.18
1027634	ITAYAMA		
1027635	E3835-X Profile 15" White	157.59	185.17
1027636	E4355 17" Silver DVI	196.92	231.38
1027637	E4815 Profile 19" Beige	311.04	365.47
1027638	E5115 Profile 20" Black	550.40	646.72
1027639	NEC/MITSUBISHI		
1027640	LC0524 15" Black/Silver	154.55	181.60
1027641	LC0770X 17" Ivory DVI	236.52	277.91
1027642	LC0970X 19" Ivory DVI	315.35	370.54
1027643	LC02080X+ 20" Black DVI	627.50	737.31
1027644	PHILIPS		
1027645	150S5G 15" Ivory DVI	179.65	211.09
1027646	170S5B 17" Black	174.95	205.57
1027647	190S5S 19" Silver	244.94	287.80
1027648	200P3M 20"	789.00	927.08
1027649	RELISYS		
1027650	TL5405 15" Silver/Black	124.55	146.35
1027651	TL785B 17" Black Analogue	151.95	178.54
1027652	TL9700 19" Silver/Black	229.65	269.84
1027653	SAMSUNG		
1027654	SM152X 15" Silver	239.19	281.05
1027655	SM172X 17" Silver DVI	257.85	302.18
1027656	SM1910 19" Silver	265.90	312.43
1027657	SM213T 21" Silver	597.95	702.59
1027658	SONY		
1027659	SOM-5748 17" Black DVI	212.86	250.11
1027660	SOM-5948 19" Black DVI	283.59	333.22
1027661	SOM-5204 20" Grey DVI	538.92	633.23
1027662	VIEWSONIC		
1027663	V5500 15" Black	140.40	164.97
1027664	W721 17" Silver & Black	175.25	205.95
1027665	W912 19" Silver & Black DVI	305.81	359.33
1027666	W2018 20" Midnight Grey DVI	551.80	648.37

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1027394	AC713B 17" Black	64.80	76.14
1026833	ADI		
1027981	MicroScan V55 15"	49.99	58.74
1027982	MicroScan V75 17" Black	62.10	72.97
1027983	BELINEA		
1027984	10 30 75 17" Dynafast	68.49	80.48
1027985	10 30 35 21" Dynafast	199.92	234.79
1027986	CTX		
1027987	EX01F Plus 17" Black/Silver	68.95	81.02
1027988	V1951T 19" Beige	90.99	106.91
1027989	HANSOL		
1027990	730E 17"	59.85	70.32
1027991	Dynafast 9300 19"	114.95	135.07
1027992	ITAYAMA		
1027993	Vision Master 1403 17"	73.15	85.95
1027994	506 Vision Master 21" FST	313.59	368.47
1027995	513 Vision Master Pro 22"	313.10	367.89
1027996	LACIE		
1027997	Electron 19" Blue	223.24	262.31
1027998	Electron 22" Blue	469.00	551.06
1027999	PHILIPS		
1028000	10761 17" White	75.45	88.65
1028001	10940 19" White	186.45	219.08
1028002	20240 22" Colour	349.05	410.13
1028003	RELISYS		
1028004	TE555 15" Colour	52.01	61.11
1028005	TE770 17" Colour	70.75	83.32
1028006	TE886 19" Black	92.10	108.22
1028007	SAMSUNG		
1028008	SM7900 17" Dynafast Black	75.89	89.17
1028009	SH559F 19" White	159.25	187.12
1028010	SM1100F 21" Ivory	242.79	285.28
1028011	VIEWSONIC		
1028012	PerfectFlat 600+ 19" Grey	144.95	170.42
1028013	G2201 21"	307.07	360.81
1028014	P225F 22" PerfectFlat	363.96	427.65

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1027471	PD110 SVGA	702.00	824.85
1027472	PD310 SVGA	899.00	1056.33
1027473	PD112 DLP SVGA 1300 ANSI	502.15	590.03
1027474	PD112P DLP SVGA 1500 ANSI	598.52	703.26
1027475	BENQ		
1027476	P8610 DLP SVGA 1500 ANSI	510.59	599.94
1027477	P8620 DLP SVGA 1700 ANSI	709.95	834.19
1027478	P8710 DLP SVGA 1800 ANSI	768.35	902.81
1027479	P8810 DLP SVGA 1800 ANSI	737.20	866.21
1027480	CANON		
1027481	LV5210 SVGA 2000 ANSI	830.00	975.25
1027482	LV53 1200 ANSI	468.05	549.96
1027483	LV42 XGA 1100 ANSI	798.50	938.24
1027484	CTX		
1027485	P5610 XGA 1400 ANSI	980.42	1151.99
1027486	P5120 SVGA 1200 ANSI	503.60	591.73
1027487	EPSON		
1027488	EMP-S1H SVGA 1400 ANSI	599.00	703.83
1027489	EMP-TW10H WEGA 1200 ANSI	488.00	573.40
1027490	HP		
1027491	Digital S821	691.60	812.63
1027492	Digital X831	822.90	966.91
1027493	VP-6110 XGA 1500 ANSI	643.32	755.90
1027494	INFOCUS		
1027495	LP540 1700 ANSI XGA	815.00	957.63
1027496	X2 DLP 1600 ANSI	510.22	599.51
1027497	C40 1000 ANSI	425.00	499.58
1027498	PHILIPS		
1027499	Rups S12 XGA 1500 ANSI	940.00	1104.50
1027500	Astare W16A 800ANS	803.06	943.60
1027501	RELISYS		
1027502	RHP200 1700 ANSI	1399.00	1643.83
1027503	RLP1500 XGA 2000 ANSI	1275.74	1498.99
1027504	RLP2000 XGA 2000 ANSI	1148.54	1350.00
1027505	SANYO		
1027506	P.LC-SH00 SVGA 1250 ANSI	603.90	709.58
1027507	P.LC-XW20A 1100 ANSI XGA	923.00	1084.53
1027508	P.LC-SH00 SVGA 1500 ANSI	595.66	699.92
1027509	SONY		
1027510	VPL-CS6 SVGA	838.00	984.65
1027511	VPL-HS3 Home	987.00	1159.73
1027512	ES2 SVGA 1500 ANSI	639.20	751.06
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1027516	DLP SVGA 1400 ANSI	899.90	1057.27
1027517	SW20E DLP SVGA 1400 ANSI	899.90	1057.27
1027518	VIEWSONIC		
1027519	PJ255 DLP XGA 1100 ANSI	955.00	1122.13
1027520	PJ510 SVGA 1200 ANSI	514.50	604.54
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1027922	Profile C20W17 27"	810.95	952.87
1027923	Profile C30W17 30"	984.10	1156.32
1027924	LG ELECTRONICS		
1027925	RZ-15 15" Silver	508.96	598.03
1027926	RZ-17 17"	621.95	730.79
1027927	17" with Built in DVD Player	760.00	893.00
1027928	PHILIPS		
1027929	32P9988 32" Wide Screen	1813.32	2130.65
1027930	26P9956 26" Wide Screen	1269.99	1492.24
1027931	RELISYS		
1027932	15" Silver & Black	201.05	236.23
1027933	17" Silver	275.50	323.71
1027934	20" Silver	324.99	381.86
1027935	SANYO		
1027936	20" Silver Analogue	497.88	585.01
1027937	27" Silver Analogue	1103.76	1296.92
1027938	SHARP		
1027939	Aquos LC20S1E 20"	438.20	514.89
1027940	Aquos LC26GAE 26"	809.95	951.69
1027941	SAMSUNG		
1027942	SM173MP 17" Silver	452.62	531.83
1027943	SM930MP 19" Silver	396.95	466.42
1027944	VIEWSONIC		
1027945	N2010 20" Silver	382.50	449.44
1027946	N3000w 30" Wide Screen	1245.70	1463.70
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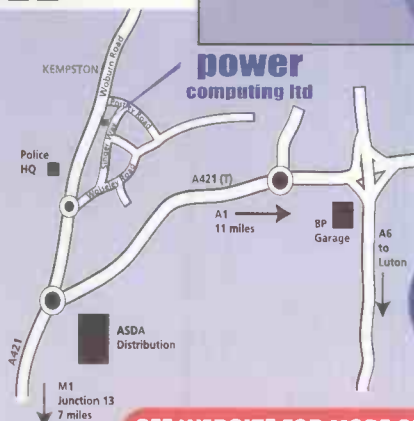
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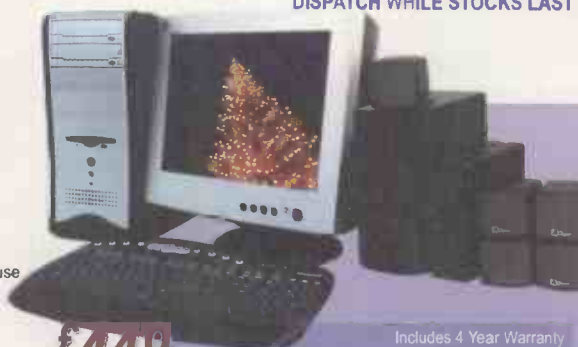
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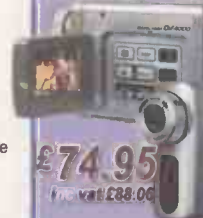
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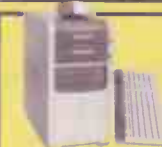


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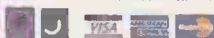
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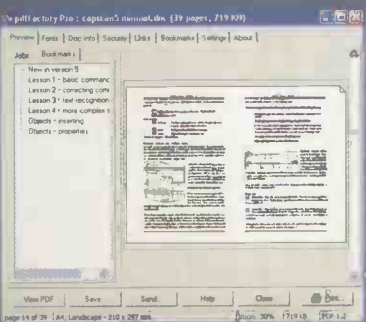
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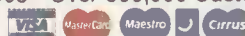
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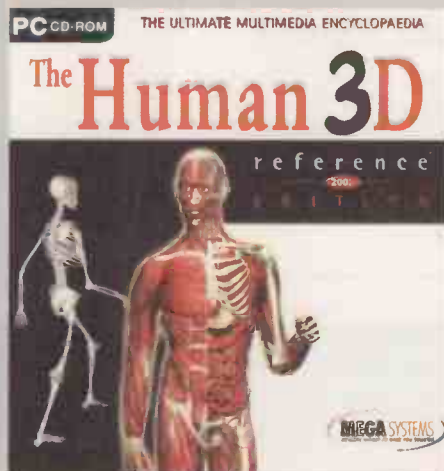
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Using the cover disc

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 that you can still copy them to your hard disk or install them manually (the standard download dialogue box will appear). Programs can be found in the \software\ folder on the disc.

Starting the disc

The CD-Rom (or DVD) should auto-start. If it doesn't, double-click the CD-Rom/DVD icon in My Computer, or open the terms.htm file on the root of the disc.

Problems?

Please note that we cannot give support on individual programs contained on this disc.

If you have problems running the disc or any of its content, please note these guidelines:

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PCW March 2005 cover disc

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Upminster, Essex RM14 3HL

quoting reference 'PCW Vol 28 No 3'.

PROBLEMS INSTALLING/RUNNING THE SOFTWARE >

Check the support page on the disc, or check the manufacturer's site.

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Ability Office 4 Basics

With Microsoft Office compatibility, a word processor, pdf export and easy-to-use spreadsheet, this could be the best-value productivity suite around

**FULL
VERSION**



Need to know

System requirements

Windows 98 or later, 51MB hard disk space

Information

www.ability.com

Registration

Obtain your serial code by clicking 'Activation' within the application, after installation. Follow the instructions provided

Limitations

None

Microsoft Office dominates the productivity software world, but you don't have to spend hundreds of pounds just to write a few letters. Just look at what Ability Office 4 Basics has to offer.

Write

Anyone familiar with Microsoft Word will quickly feel at home with the Ability 4 word processor. It looks very similar and shares many of the same menu entries and shortcuts.

Write can also read and save files in Word 97, 2000 and XP .doc format. It handles HTML files, and can create pdf documents.

Other programs make similar file import promises then throw away anything advanced in the file, but not Write. It has no problem with complex tables and images, and includes enough styles, templates, frames, call-outs and captions to produce exactly the effect you need. Add macro support, OLE automation, programmable forms and Mail Merge, and there's more than enough word processing power here for most people.

Spreadsheet

Ability Spreadsheet also bears a strong resemblance to its Microsoft Office competitor, Excel. If you're not happy with that, click Tools > Options > Customize and choose a new visual theme (Office 2000, XP, 2003 or Native XP), or change the toolbars, menus and shortcuts to anything you like.

There's plenty of support for importing existing spreadsheets in formats such as Excel, Lotus 1-2-3, Quattro Pro, csv. And with Spreadsheet able to handle workbooks of up to 255 worksheets of 256 columns by 65,536 rows, there's no shortage of processing power.

As you'd expect, Spreadsheet provides a range of different chart styles, and you can embed live graphs in a Write document. What you might not expect is the PDF Creator, creating pdf copies of your spreadsheet that can then be shared with others.

Photopaint Studio

Image editors are often the weak link in productivity suites, but not here. Photopaint Studio may offer all the bitmap graphics functionality you ever need.

It opens all the usual file formats (for instance, jpeg, Photoshop psd, tif, gif, png), and can acquire images directly from any connected Twain device. You can then adjust colours, brightness and contrast, tone curves in many different ways, or let Photopaint Studio do it all automatically.

The program also comes with nearly 100 different filters and effects, each of which can be further customised. Brush and Paint tools let you add your own touches to an image, while a range of Layer and Selection options help define the areas you're modifying.

Extras

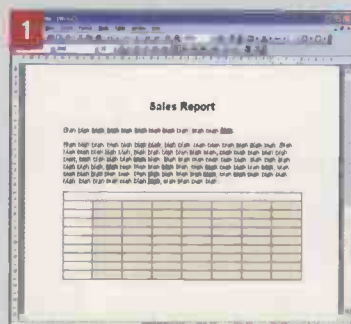
Also included is Draw, a vector drawing tool ideal for designing letterheads and logos. If you've created or edited images with Photopaint Studio, use Photoalbum to keep them in order. The program includes a thumbnail browser, and can group images into albums and produce slideshows.

There are plenty of Ability components to choose from, but run Launcher and they're all just one click away. This toolbar can be customised with any other common applications you like, then left floating, or docked at the edge of your screen.

Key features

- Highlights spelling errors as they're typed
- Creates and saves Microsoft Word and Excel-compatible documents
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- Vector drawing tool
- Customise the Ability interface

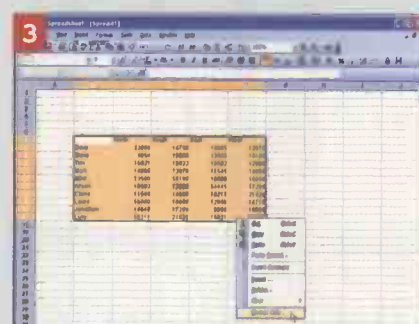
Improve your documents with Ability Office 4



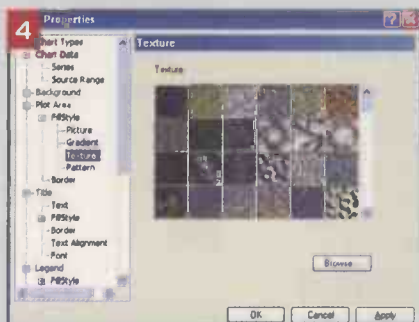
1 Creating a document starts with Write, Ability's word processor. It's very easy to use, especially if you're familiar with Microsoft Word, and you'll soon be formatting text and adding tables as required. However, by default, the first results probably won't be too visually exciting. Is there any way we can liven things up?



2 Ability Office provides a lot of options to spice up an otherwise dull document. Click Insert > WriteFX, for instance, to create customised 3D text headers. Start by choosing one of the 14 templates, then tweak them by entering your own caption, and playing with the font, shadow, border, colours, gradient fills and more.



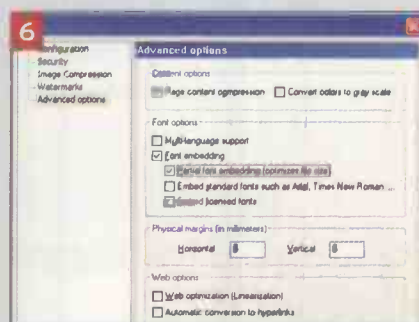
3 A colourful graph can look better than tables of figures – simply launch Ability Spreadsheet and enter your figures there. If you want to get both the text headers and data values to align the same way, highlight the cells, right-click on them, and choose Format Cells > Alignment > Left > OK.



4 With all the cells holding data still highlighted, click Insert > Chart > As New View (or just press F11). Choose the chart type you'd like to see, and it should appear in the document. If you can't see it, clear Chart Data > Source Range, and make sure 'First column' and 'First row' are set to 'Labels', if appropriate.



5 Adding a picture or two could improve the look of your document, but don't simply opt for the nearest royalty-free clipart. Load your images into Ability Photopaint and transform them into something more interesting, with the aid of special effects such as Page Curl, Negative Emboss and a range of powerful distortion options.



6 Now you've finished, saving the document as a pdf file will ensure it's easy to share with others. Click File > Save As > PDF, then select 'Printing Preferences'. Here you can choose the file resolution (72 to 1,200dpi), add a watermark, choose image compression options, and even password-protect the document with 128bit encryption.

Upgrade offer >> Ability Office 4 Pro

New features

- >> Full SQL statement editing
- >> Mdb file compatibility
- >> Range of visual and text effects

Ability Office Basics is a powerful package, but there are a couple of applications it doesn't include. Database is the Ability answer to Microsoft Access, with full SQL statement editing and mdb file compatibility. And Presentation includes a range of visual and text effects, designed to help you build professional presentations (and, yes, it's Powerpoint compatible, too).

PCW readers can upgrade from Ability Office 4 Basics to Professional and save 30 per cent on the retail price. To upgrade, head to www.pcw.co.uk/abilityoffice and follow the instructions.





ACDSee Powerpack 5

**FULL
VERSION**



Get your digital photo collection in order

Need to know

System requirements

Windows 98 or later, 45MB disk space, DirectX 8 or later for DirectX file support, Ghostscript 7.00-7.004 for pdf support, Quicktime 6 for Quicktime support

Information

www.acdsystems.com

Registration

Not required

Limitations

None

If your hard drive is cluttered with digital photos, there's no shortage of image organisers around to help you regain control, and you've probably tried most of them. So why should you bother with ACDSee Powerpack 5?

Versatility is a point in ACDSee's favour, with a thumbnail-browsing mode that supports up to 39 image formats (such as gif, jpeg, eps and psd). It can display thumbnails of images held in most archive formats.

There's more to your desktop than digital photos, of course, so the program can handle other files as well. Thirty-three different video and audio formats are supported, and will play in the built-in media player at a single click.

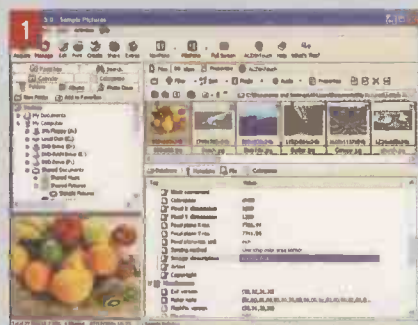
Along with organising images into folders or albums, ACDSee also lets you tag your

photos with a description, key words, date stamp and category ('family', 'friends', 'pets' and so on). Then use the built-in search tool to quickly locate any group of images.

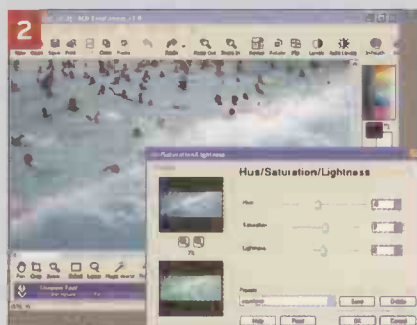
If you spot a photo that's not up to scratch, edit it with ACD Fotocanvas, a bundled image editor. It comes with simple tools to automatically fix problems (Auto levels, Red-eye remover), or you can manually tweak colours, brightness, contrast and more.

Once you've polished up your photos and they're all looking great, it's time to share them with others. ACD Fotoangelo is ideal for quickly building a slideshow with an optional soundtrack, and exporting the results as a slideshow or screensaver. They're standalone files, too, so friends and family don't need ACDSee installed to use them.

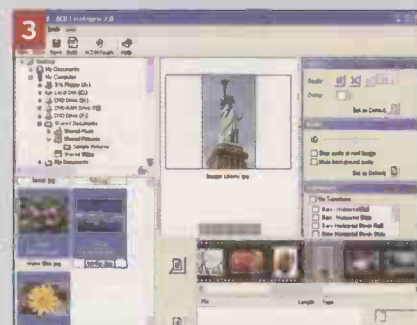
Organise, edit, then share your best photos with ACDSee Powerpack



1 Categorise your photos in ACDSee and you'll never lose them again. Right-click on an image, select Properties, and give it a description and date. Add any notes or keywords, then click Categories and check anywhere you'd expect to find this shot (click Categories to manage the list).



2 You can tell ACDSee to use any image editor (Activities > Edit > Editor > Configure Editors), but try the bundled ACD Fotocanvas first. It's ideal for simple colour, brightness, contrast or gamma tweaks, for instance. And don't miss the wide range of filters.



3 Use ACD Fotoangelo to build shots into a standalone slideshow. Launch the program, click Create New Project, and drag any images you like on to the timeline. Select each in turn, adding delay time, transition and an optional caption, then click 'Build' to produce the finished file.

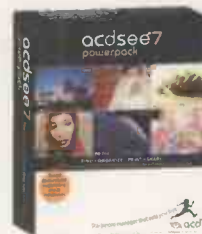
Upgrade offer >> ACDSee Powerpack 7

New features

- >> CD and DVD burning
- >> Pdf and Flash slideshows
- >> Free online image-sharing service
- >> More automatic correction tools
- >> ICM/ICC colour profile support
- >> Create calendars, cards and CD covers

The latest version of ACDSee includes goodies such as CD and DVD burning, pdf and Flash slideshows, and Sendpix, a free online image-sharing service.

Fotocanvas is now Photo Editor, with more automatic correction tools and ICM/ICC colour profile support. And Fotoslate helps create



calendars, greetings cards and CD covers from your favourite photos.

The bundle usually costs €79.99, but right now it can be yours for only €49.99 (about £34.50). Browse to www.acdsystems.com/nr/lp/pcw for more information.

Steganos Internet Anonym Pro 6

FULL
VERSION

Need to know

System requirements

Windows 98 or later, 32MB Ram, 12MB disk space, 16bit colour display

Information

www.steganos.com

Registration

Go to www.pcw.co.uk/steganospro6 and follow the instructions

Limitations

None



Internet Anonym Pro changes your IP address every second, making it very difficult to track your movements online

You can block all cookies, detect web bugs and uninstall spyware, but that still doesn't make you anonymous online. Every Internet resource you access gets to see your IP address, and if it doesn't change (common with many broadband accounts) then you're uniquely identified forever. But it doesn't have to be that way.

Install Steganos Internet Anonym Pro 6 and it routes all your Internet traffic through a group of anonymous proxy servers, switching your online identity every second. Any website you visit sees the server's IP address, instead of yours.

If you've used anonymous proxies before, you'll know speed can be a

problem, as all your browsing now involves this extra step of going to and from the proxy server. The program drops the slower proxies as you use it, though, so you're unlikely to notice any significant performance change.

This clever idea alone makes Internet Anonym Pro 6 worth trying, but it also comes with several other useful privacy-related options. Click 'Comfort and Security' to block anything from scripts, to cookies and ActiveX objects; select 'Private Favorites' to create an encrypted list of web bookmarks; and use 'Destroy Traces' and 'Shredder' to securely delete application histories, or wipe confidential files so they can't be undeleted.

Upgrade offer >> Internet Anonym Pro 7

Version 7 of Internet Anonym Pro now adapts its anonymous proxy list to your location, improving performance. The Internet Trace Destructor removes more than 150 Windows, Internet and application tracks, and the Update Wizard keeps the program up to date.



The normal price for Internet Anonym Pro 7 is £34.99, but as a registered user of version 6 you'll only be charged £24.99. Visit www.steganos.com, follow the Order links and visit the Upgrade Centre to get the lower price.

Axelab Winspeedup 2.52

FULL
VERSION

Need to know

System requirements

Windows 98 or later, 10MB disk space

Information

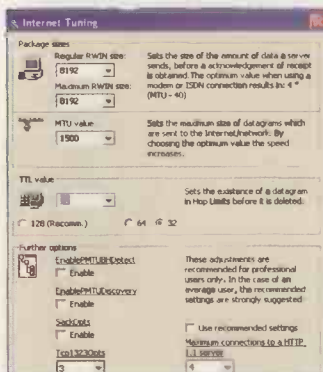
www.phoenixglobalsoftware.co.uk

Registration

Not required

Limitations

None



Internet connection tuning is just one area where Winspeedup can optimise your PC

Optimising your PC can be complicated, as you try to explore obscure Control Panel applets, undocumented areas of Windows, and the darkest corners of the Registry. So it's just as well that Winspeedup brings a host of tuning and optimisation settings together in one simple interface (and, unlike many similar tools, it doesn't only work with Windows XP).

There are options to help manage the junk accumulating in your PC, for instance. Click the Clean Up tab to locate and get rid of temporary files, wherever they're located. The Registry tab has an option to remove orphaned Registry settings, while the DLL tab displays and can remove any DLLs that Windows thinks you no longer need.

Other tabs help you directly optimise various system settings, such as Internet (Internet and network performance) and Windows (optimise Explorer and the operating system). Windows 2000 and XP users will find some advanced memory management tweaks under the Extra tab. Or you can click Clean Up > Start Winspeedup Wizard, and apply all the performance-boosting settings in one go.

No tweaks are guaranteed, of course, and the more powerful options might slow down your PC if they're applied incorrectly. Winspeedup makes it easy to restore your original settings, though; just click Menu > WinSpeedUp SettingsFreeze, and choose an earlier settings profile.

Try out >> Other Phoenix products

Winspeedup is just one of the system-tuning programs available from Phoenix Global Software. Others include Axelab XP Tuner (over 300 XP-specific tweaking functions), Spy Sweeper (detect and remove resource-sapping spyware and

adware), and Soap Box Turbo Memory (boost system speeds by improving memory management).

Read more about what's on offer at the Phoenix site (www.phoenixglobalsoftware.co.uk), then click 'Buy Now' for a list of resellers where you can place your order.



Webmaster Mailroom

**FULL
VERSION**

Need to know

System requirements

Windows 98 or later, 20MB disk space, Internet connection, Mapi-compatible email client

Information

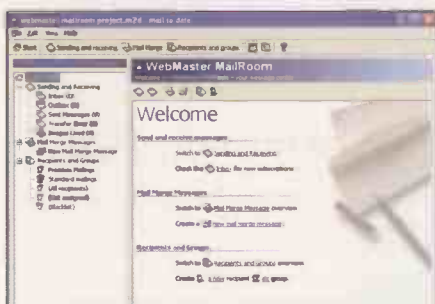
www.phoenixglobalsoftware.co.uk

Registration

Not required

Limitations

None



It looks like any other email client, but beneath the mild-mannered exterior is a range of powerful marketing tools

Conventional email clients are fine for personal use, but when it comes to managing newsletters, keeping in touch with customers, or other mass mailings, they're a little underpowered. Which is why you need a specialist tool such as Mailroom.

You might want to create a mailing list, for example, and allow anyone interested to subscribe. Try this manually and it's a lot of work, maintaining your client database, honouring subscription and cancellation requests, but with Webmaster Mailroom it's a different story. The program can produce HTML order and cancellation forms for you, and have the responses emailed back. It then picks

up those messages, and adds or removes the specified email address as requested.

Now you're free from all that tedious list management, you can concentrate on creating the newsletter, memo, or whatever you're mailing out. Webmaster Mailroom can help there, too, with straightforward tools for creating and editing Mail Merge Messages.

It's easy to organise your recipients into different groups, handy if you want to send out different messages to particular sets of people. And if someone says they don't want to receive any more emails, just add them to the blacklist; you'll still have their record, but they won't be included in future emails.

Try out >> Other Databecker programs

If you found Mailroom useful, look at these new Databecker packages. Maximum Creativity Suite helps you design calendars, CD labels and inlays, or labels for your home and office. Maximum Imaging Suite includes tools to scan, edit, retouch, enhance and print all your digital photos.

Buy either for £49.99 and you'll qualify for a £10 PC World voucher. Send a copy of this page, your receipt and your name and address to Phoenix Global Software, PO Box 3965, Binfield, Bracknell, RG42 5ZN. Offer is valid until 31 October 2005. Vouchers will be despatched within 28 days.

Ten Thumbs Typing Tutor

**FULL
VERSION**



Need to know

System requirements

Windows 98 or later, 10MB disk space, US or UK keyboard, Quicktime 4 or later for audio

Information

www.tenthumbstypingtutor.com

Registration

Go to www.pcw.co.uk/tenthumbs

Limitations

None



Simple games and exercises take the hassle out of learning to type

The slowest part of your PC is you. Upgrading your hard drive, CPU or graphics card might gain you a little extra speed, but to really save time there's no substitute for learning to touch type. You could quickly move from 'hunt and peck' speeds (15 words per minute) to professional typist (60 words per minute, or more), a 400 per cent performance improvement that will cost you nothing more than a little practice time.

It's surprisingly easy, too. Ten Thumbs Typing Tutor walks you through the whole process, with a fun, wizard-based approach that's suitable for kids and adults. There's guidance for everything,

from how to sit comfortably, to where your hands should rest on the keyboard. The program includes typing exercises and games to play, with immediate feedback in 'words per minute' graphs. You can watch your speed improve as each session progresses, and Ten Thumbs highlights any areas that need improvement (letters where you're not up to speed, for example).

The program works with US and UK keyboards, using the Qwerty or Dvorak layout. There's even support for multiple students, all learning at their own pace, while a Teacher's Report tracks their progress as they improve.

Upgrade offer >> Typing Tutor 3

The latest Ten Thumbs improves teacher support for multiple users, saving student files in their own folder. The interface has been redesigned, with new illustrations and backgrounds, and automatic detection of UK or US keyboard layout makes the program easier to use than ever.

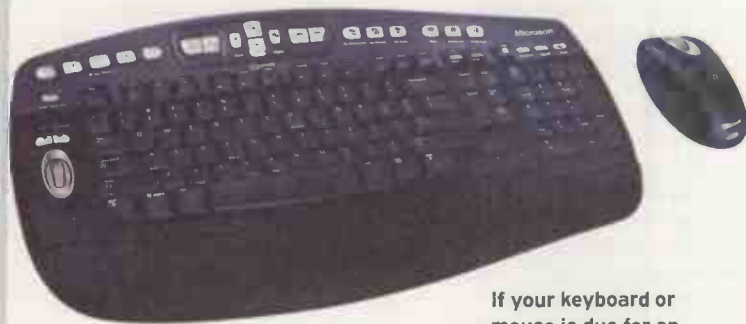
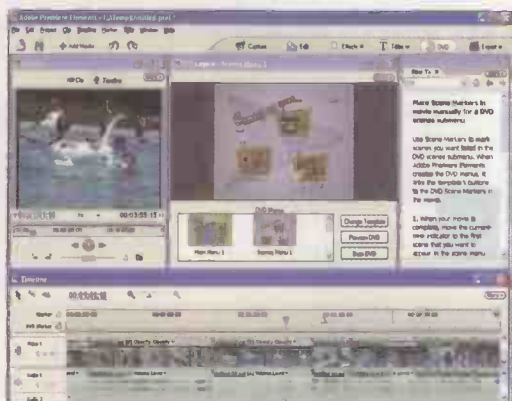
A regular single-user licence costs \$25.95, but you can upgrade from Ten Thumbs Typing Tutor 2 for a mere \$8.95 (that's around £4.60). Find out more at www.tenthumbstypingtutor.com/upgrades.shtml.



Next Month

on sale 17 February 2005

Learn how to become a master of video editing as we test out some tailor-made systems



If your keyboard or mouse is due for an upgrade, then our round-up will help you decide on the right device for you

Set up your own super-fast wireless network with the help of our guide



Don't miss April's PCW...

Video-editing PCs

Although digital video editing is one of the fastest growing PC-based hobbies, most domestic PCs are underpowered for this task. But not the tailor-made models reviewed in our group test – you'll find some of the latest technology in these super PCs, including dual Xeon processors, massive Raid systems and state-of-the-art graphics cards.

Freeware blockbuster

Free software is great, but sifting out the good from the bad isn't easy. We've hunted down dozens of the best freeware titles available – covering everything from video editing to Windows tweaking tools.

Input devices

You use them all the time, but when was the last time you thought of upgrading your keyboard or mouse? Our round-up puts the latest input devices through their paces.

High-speed wireless networking

Wireless home networking is faster than ever. We check out what routers, access points and other peripherals you can get for your money and how to set up your own super-fast wireless network.

For regular updates of what's in April's issue, go to www.pcw.co.uk/PCW/next.jsp

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PERSONAL
COMPUTER
WORLD



MARCH 1985

If the Sunday papers were to be believed, the home computer market was doomed back in March 1985. With Christmas 1984 sales figures down on previous years, several analysts believed the bubble had burst. Thankfully, Guy Kewney was on hand to reassure everyone there was nothing to worry about. He blamed the slight dip on the neglect of the home market by manufacturers and claimed no-one currently sold a true home micro. Far from predicting the home computer boom was over, Kewney believed it hadn't even started.

Meanwhile, Atari and Commodore were going head to



The Atari ST was the company's attempt at entering the home computer industry

head with their new models. The ST was Atari's attempt at getting a foothold in the home computing market, while the three-processor C128 was Commodore's model. Atari said that all the major software houses were developing software for the ST, but we had doubts about its future.

Finally, the electric-powered C5 made its first appearance. Built around a washing machine-derived motor it threatened to reach 15mph. Unfortunately for Sir Clive Sinclair, the C5 was more ridiculed than revered and never took off as he'd hoped.

MARCH 1990

In the News section, Guy Kewney compared hacking to a country walk. 'You are, of course, using someone else's land and you should be careful; but if you are, most landowners are not unhappy to see you there, and some actually help you around and show you the more interesting sights.' He questioned proposals to make hacking illegal; 'One doesn't need a law making trespass illegal before you arrest burglars... I know of no place in the world where making hacking a crime has stopped hacking.'

It's strange to look back at a time when your desk wasn't cluttered with PCs, monitors, printers, PDAs and other devices we now use daily. One of the features in this issue foresaw that

in the 1990s everyone from executives to students would do most of their work on a business workstation. School leavers would have considerable computer experience, from school and personal use of video recorders and computer games.

The 'True Confessions' feature described the 'strange world of the computer addict'. It was claimed that giving 'a teenager (invariably male) a home computer for passing his exams was a good way of ensuring that he failed his exams the following year.' And this was before Internet gaming and chat rooms had even begun to eat up teenagers' precious time.

MARCH 1995

It all seems so long ago – our news pages in March 1995 contained a warning about the impending BT number changes, where an extra digit was added to most area codes. Of course, since then, we've had a few more radical changes.

Also in the news was Intel's infamous Pentium floating-point bug, with the company offering a no-questions-asked replacement policy for faulty chips. Prior to this, in one of the company's most ill thought-out moves, Intel had only offered replacements to users of 'vulnerable high-precision applications'. It took Intel a long time to rid itself of the fallout of this appalling piece of public relations.

Meanwhile, our cover trumpeted our 'Notebook Supertest', including '40 colour portables – one for every pocket'. The Editor's Choice was won by Texas Instruments' Travelmate 4000. Its 486DX4-75 processor and 4MB of Ram may have cost a whopping £4,509, but the superior keyboard and TFT screen meant that it beat the competition hands down.

Other noteworthy cover items included a 110MHz Power Mac and the Cyrix 6x86 processor that was set to take on Intel's Pentium. In the reviews section, the Matrox MGA Impression caught our eye. Today 3D graphics are taken for granted, but it was very different in 1995. For £245 you could get yourself this card, which supported 16bit colour depths at 1,280 x 1,024 resolutions, more than adequate for the standard 14in or 15in monitors that everyone used in those days.

MARCH 2000

The cover of our 528-page March 2004 issue promised a round-up of the fastest desktop PCs. Evesham topped the performance charts with its 750MHz Athlon-based machine, the highlight of which was a fast Guillemot 3D Prophet graphics card.

Elsewhere, our Disable the Cable feature highlighted the impending arrival of Bluetooth wireless technology. High-speed 802.11g networks were a long way off at this stage, but the arrival of Bluetooth hinted at a future where communications between devices could be achieved at decent data rates without the hassle of wires.

We also looked into the bizarre but exciting concept of haptic systems – computers that allowed you to physically feel data. Force-feedback joysticks had been around for some time, but the Reachin system provided stereoscopic imagery and force feedback in one.

The most intriguing aspect of the system was a stylus that could relay haptic sensations back to the user. Our reporter experienced some rather creepy applications of the technology, including injecting a needle into the vein of a virtual hand, which relayed a feeling of resistance as the needle penetrated the 'skin'.

As we continued our look towards the future, we investigated self-learning software that could speak all languages. A group of researchers at the University of Southern California Information Sciences Institute (USCISI) developed a system known as Gazelle that was designed to translate complex languages such as Arabic or Japanese into English.

The PCW team

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"Great Looks, great specs and plenty of upgrade potential.... handles Doom 3 as if it were Space Invaders."

Jim Martin, Labs Editor, PC Pro, January 2005 Issue

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- Logitech Optical Wheel Mouse
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Ben Henley, Labs Writer, Computer Buyer January 2005 Issue

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- Intel Hardware PCI V92 56K Modem
- 8x DVD/RW, integrated 7 in 1 card reader
- ViewSonic E72f+SB Monitor
- Logitech Multimedia Keyboard
- Logitech Optical Wheel Mouse
- Windows XP Home Edition, Nero Burning Rom, DVD Software, all original CD's are shipped with the System

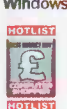


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Jim Martin, Labs Editor, PC Pro, February 2005 Issue

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